From: B W
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, November 8, 2025 2:59:23 PM

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Question 1. What are the long-term environmental impacts of PFAS contamination due to dredging PFAS-laden spoils in the lower Cape Fear River?

Question 2. How do PFAS pollutants affect the health of aquatic life during the dredging process?

Question 3. What measures can NC DEQ implement to mitigate PFAS contamination in dredged materials?

Question 4. How does PFAS contamination in the Lower Cape Fear River influence local subsistence fishing communities and their lives and livelihoods?

Question 5. What role will NC DEQ regulatory play in addressing PFAS contamination issues related to river dredging and spoil pile location and disposal activities now and in the future?

Question 6. Established by Executive Order, the State of Michigan created the PFAS Action Response Team (MPART) to identify and investigate numerous contaminated sites across the state, including harbors and other waterways. With that, MPART is working with the federal government to clean up contaminated sites, but the large scale and persistence of PFAS make this a complex and long-term challenge. Supposing that this is such a challenge for the State of Michigan, why wouldn't the State of North Carolina be just as aggressive in addressing and responding to the PFAS challenges we have right here in our own Lower Cape Fear River, especially when considering all of the negative impacts related to the proposed dredging and deepening project and all future related operation and maintenance requirements?

When applying the rigors and requirements of the National Environmental Policy Act (NEPA) to the benefit-cost analysis of the potential effects of any proposed federally funded project, it is crucial to consider the community's social, cultural, and environmental well-being. In the case of the dredging and deepening of the Cape Fear River, NEPA requires that both NC DEQ and USACE consider all relevant direct and secondary effects on citizens who live and work in the area, as well as any related impacts on the local environment. The USACE's decision on this proposed project will significantly impact the physical and environmental character of our community for generations to come.

Increasingly, managing contaminated dredged material is a growing concern in Ports around the country. For example, many of Michigan's harbors have been impacted by PFAS contamination, which has entered waterways through sources such as former military bases, industrial runoff, and contaminated groundwater. The State of Michigan's PFAS Action Response Team (MPART), established under an executive order, has identified 14 federal harbors and numerous other harbors

and waterways with known or suspected contamination.

This is what we here in North Carolina know: from 1980 to 2017, Chemours (and its predecessor, DuPont) released large amounts of PFAS compounds, including GenX, into the Cape Fear River from the Fayetteville Works facility, heavily contaminating about 100 miles of the river and its surrounding environment, including the river sediments within the congressionally authorized navigation channel. This contamination also affects the primary drinking water source for many downstream communities. This pollution is crucial for USACE evaluators to consider in their Draft Environmental Impact Statement (DEIS), as it has a widespread impact on the Port's project under review.

As a further complicating factor, the Reverse Osmosis (RO) Water Treatment Plant, currently under construction in Brunswick County, is nearing completion and is expected to commence operations soon. This facility will use a low-pressure RO process with a capacity of 45 to 60 million gallons per day, specifically designed to remove per- and polyfluoroalkyl substances (PFAS) that are currently contaminating the drinking water supply. The National Pollutant Discharge Elimination System (NPDES) permit number authorizing this discharge is NC0057533. Once operational, the RO plant will be capable of discharging up to five million gallons per day of highly concentrated wastewater containing PFAS and other contaminants, including 1,4-dioxane.

The pipeline designated for the discharge of this highly concentrated wastewater into the Cape Fear River is situated approximately three miles upstream of the Port of Wilmington. Based on preliminary assessments, the volume of concentrated PFAS waste being discharged is expected to significantly exceed the current public health standards established by the Environmental Protection Agency (EPA).

This discharge of PFAS-contaminated wastewater, regardless of source, poses significant challenges for individuals, communities, and ecosystems that rely on the vital natural resources of the Lower Cape Fear River. It is well known that PFAS can accumulate in fish and other seafood, posing risks to human health and the environment. The effects of PFAS on marine fisheries can appear in various ways, including:

- Bioaccumulation: PFAS can contaminate surface water, leading to bioaccumulation and biomagnification in aquatic organisms, particularly fish.
- Exposure Routes: The primary route of exposure for individuals to PFAS occurs through dietary intake, primarily through the consumption of fish and other seafood.
- Vulnerable Populations: Certain populations, particularly African-American communities that engage in subsistence fishing along the Cape Fear River, face heightened vulnerability to PFAS exposure due to their reliance on traditional diets that include fish and marine mammals. Individuals and communities that rely on locally sourced fish may be exposed to significantly elevated levels of PFAS and other industrial pollutants, which are linked to various adverse health effects.
- Beach Activities: PFAS, including GenX chemicals, have already been found in the foam at our Brunswick County beaches, originating from the Chemours Fayetteville Plant.
- Anglers: Recreational anglers who consume wild-caught fish may exhibit higher levels of PFAS exposure than the general population.

- Shellfish: Shellfish, including crabs, may be particularly susceptible to PFAS accumulation as they inhabit and feed on the seafloor, which is in proximity to PFAS sources.
- Larger Species: Larger marine species can ingest PFAS by consuming smaller species that have already accumulated these substances in their systems.
- Fish Fitness: Research has indicated a correlation between PFAS exposure and decreased fitness in fish populations.

The highly concentrated RO waste stream of PFAS pollutants from Brunswick County will also settle throughout the entire proposed dredged area of the Cape Fear River, which also has a regular dredging maintenance component of deepening and widening of the river channel.

The Port's Section 203 report estimates that the total amount of material projected to be dredged under the deepening project could be as high as about 26.8 million cubic yards, which would be disposed of over the course of three years of construction. The issue of PFAS contamination of dredged spoils, as well as dredged spoil storage piles, and its impact on public health and the environment is yet to be resolved by the State of North Carolina and poses a uniquely significant challenge for future dredging activities in the Lower Cape Fear River and other areas where this activity may be contemplated.

In a recent white paper report titled "Treatment of PFAS to Allow for Beneficial Use of Impacted Dredged Sediments" by John M. Rice, P.E., P.H., and Ben Wachholz, P.E. | July 5, 2024, https://www.trccompanies.com/insights/treatment-of-pfas-to-allow-for-beneficial-use-of-impacted-dredged-sediments/ In a preface to their paper, they note that "Approximately 200 to 300 million cubic yards of sediment are dredged each year by the US Army Corps of Engineers (USACE) and other federal interests (USEPA, 2007). Most of this dredging is performed to improve navigation in harbors, channels, and rivers, providing economic benefits and recreational opportunities. Strategically considering opportunities for beneficial use of sediments is crucial for local governments, developers, property owners, and other stakeholders. However, serious issues and inaccurate perceptions often prevent the beneficial use of sediment. Although this dredged sediment could be a valuable resource, most of it is placed in confined disposal facilities (CDFs) or dumped in open water."

Open water disposal of contaminated soil is illegal and strictly prohibited in North Carolina. Federal laws, such as the Marine Protection, Research, and Sanctuaries Act of 1972 (also known as the Ocean Dumping Act), and state laws prohibit the dumping of hazardous materials into water bodies. Instead of being disposed of in water, contaminated soil must be managed through remediation or disposed of at facilities permitted by the state. The NC DEQ supervises this process.

Regulated disposal options in North Carolina:

- Permitted soil treatment facilities: Also called dedicated contaminated soil facilities, the NC DEQ permits these to receive and treat contaminated soil from multiple sources.
- Treatment and containment: These facilities use various methods, including land application, storage, and other containment and treatment procedures.
- On-site vs. off-site: Depending on the type and volume of contamination, soil may be treated on-site or transported for disposal at a licensed off-site facility. This process often

involves excavating and segregating contaminated soil.

- Tracking and monitoring: Permitted facilities must track every shipment of contaminated soil. They are also required to monitor soil, groundwater, surface water, and air to ensure safety.
- Hazardous waste: Soil containing hazardous waste is subject to federal Resource Conservation and Recovery Act (RCRA) regulations and must be treated to meet standards before being disposed of on land.

Dumping or even the random incidental disturbance of PFAS-contaminated soil into the Cape Fear River poses severe risks to human health and the environment:

- Sediment contamination: Sediment at the bottom of the 100-mile downstream reach from Chemours in Fayetteville, for years, has acted as a sink for these "forever chemicals," trapping high concentrations of PFAS.
- Ecosystem damage: PFAS contaminants have accumulated in Cape Fear River sediments, harming local wildlife and aquatic ecosystems.
- Public health concerns: Exposure to contaminants through contaminated fish or water can cause serious health issues.

When applying both state law and established guidelines, NC DEQ must absolutely consider the risks and uncertainties regarding the impact on both human health and the marine environment as a fundamental aspect of the Port's proposed Section 203 dredging requirements. A prudent approach is warranted in this context. Guidelines should be formulated with the understanding that permitting the disposal of materials under certain conditions does not absolve the obligation to continue making efforts to mitigate the need for such disposal. In accordance with state and federal regulations, the North Carolina Department of Environmental Quality (NC DEQ) is responsible for identifying and regulating the sources of PFAS-contaminated dredged material in the Cape Fear River, as well as ensuring its proper disposal.

So, why is PFAS-contaminated soil a problem for us here in and around the lower Cape Fear River?

- PFAS can accumulate in our bodies and in all living organisms.
- PFAS exposure has been linked to various health issues, including increased cholesterol levels, liver and kidney damage, suppressed immune systems, and increased risk of certain cancers.
- These chemicals do not degrade easily, meaning they can persist in the environment for decades.

As the Cape Fear River navigation channel has been dredged deeper over time, the saltwater "wedge" has slowly moved upstream, to the detriment of a once-thriving riverine environment. When freshwater containing PFAS mixes with saline water at the wedge interface, the salt increases PFAS sorption to soil and sediment particles. Sorption is the generic term for processes by which a substance accumulates on or within another substance. In saltwater, PFAS reactions are characterized by increased sorption to solids, particularly in estuarine environments, a process known as "salting out." That is, high salt concentration lowers water solubility and promotes PFAS adsorption to sediment particles and other organic matter. In addition, PFAS are highly persistent

and do not easily degrade, leading to their detection and potential bioaccumulation in marine ecosystems, as well as concerns for human health through the consumption of seafood.

How does PFAS contamination relate to this proposed dredging project?

PFAS can adhere to or settle into fine sediments, such as silt and clay, found in the contaminated soils in and around the lower reaches of the Cape Fear River. It only makes common sense that when these contaminated sediments are dredged, a safe disposal management plan is a must for federal and state regulators. When PFAS is detected in dredged sediment, our regulators have the duty to determine if the material is suitable for placement or eventual disposal, especially for upland sites or beach renourishment projects.

The USACE "Beneficial Use" strategy aims to reuse the dredged material as a resource. Still, it faces significant challenges because it must also meet stringent criteria to prevent PFAS from entering the environment. The Eagles Island disposal area, built before NEPA on a once-healthy wetland and floodplain, is an unsuitable location for disposing of contaminated dredged soil because it lacks a liner. In addition, researchers in North Carolina and around the world are currently investigating the damage PFAS is causing to aquatic ecosystems as it transfers from sediment to water during dredging and placement activities.

NC DEQ must address PFAS contamination as part of the Cape Fear deepening options, particularly when evaluating the USACE disposal plans and considering the beneficial uses of these contaminated sediments. PFAS contamination introduces additional complexity, requiring more testing and potentially significantly affecting project costs and feasibility.

As I mentioned at the beginning of this comment, the lower Cape Fear Riverine environment has suffered severe long-term impacts caused by Chemours' willful release of excessive amounts of PFAS compounds. This contamination will be further exacerbated by Brunswick County's Reverse Osmosis Water Treatment Plant, which is soon set to discharge up to five million gallons of highly concentrated wastewater containing PFAS and other contaminants, including 1,4-dioxane. The pipeline for releasing this highly concentrated wastewater into the Cape Fear River is located about three miles upstream of the Port of Wilmington. Based on my initial assessments, the amount of concentrated PFAS waste being discharged will exceed the current public health standards established by the Environmental Protection Agency (EPA) by more than 100-fold. This highly toxic mixture will add to the PFAS contamination already flowing downstream from the Chemours facility in Fayetteville.

Aside from two minor references in the Geology and Geotechnical Engineering Sub-Appendix Attachment III-A, HTRW Report page X-7, the issue of dredging and disposing of PFAS-contaminated soils is not addressed anywhere in the Port's Section 203 report or the USACE DEIS. The potential impacts of PFAS contamination from the discharge of contaminated waste, including that from Brunswick County's nearly finished reverse osmosis (RO) plant, are not covered in the main USACE DEIS report or any of the related appendices. This issue is also completely absent from the Port of Wilmington's Section 203 Report risk register. In my opinion, PFAS contamination in the Cape Fear navigation channel is currently one of the many critical environmental concerns facing project

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The NC DEQ is responsible for defending and safeguarding the air, land, and waters in and around the Lower Cape Fear River. I appreciate the opportunity to comment on this important endeavor.

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Question: Why were the secondary and/or direct impacts upon the culturally significant North Carolina Gullah Geechee Blueway Trail intentionally or inadvertently omitted in the USACE Draft Environmental Impact Statement (DEIS) or the Port of Wilmington's 203 Report in direct violation of the National Environmental Policy Act (NEPA)?

The North Carolina Gullah Geechee Greenway Blueway Heritage Trail aims to further preserve, protect, and honor the culture and heritage of the Gullah Geechee people and their vital connection to the Lower Cape Fear River area through active community involvement in developing and maintaining a 30-mile Heritage Trail. This trail is a key part of the Cape Fear River reach that extends several miles above the Port of Wilmington to its end in Southport.

The blueway route connects many historic features along the Cape Fear River coastline, helping ensure that the contributions of the Gullah Geechee people to their language, customs, and crafts are appropriately recognized and celebrated. At Eagles Island, the blueway trail winds its way in and around miles of paddle trails surrounding the proposed Eagles Island Nature Park and the maze of interior creeks and canals, which affords immersive access to the site's natural landscape and history while also connecting to existing local and regional blueway networks.

The enslaved Gullah Geechee people played a crucial role in the growth of Wilmington's port and economy, arriving through its docks, working in maritime industries, and contributing to the city's infrastructure. The modern port facility was established in the 1920s; however, enslaved people had contributed to the city's success as a port for centuries prior. Yet, this vital moment in the Port's history was completely ignored in the Port's Section 203 report. To fully document the Port's history over the centuries, records must include those who toiled with backbreaking work to put the Port on our Nation's map.

Deepening the Cape Fear River will negatively impact our culturally significant, state-established North Carolina Gullah Geechee Blueway portion of our trail by increasing saltwater intrusion, worsening erosion, and degrading water quality, thereby threatening sensitive habitats. These changes will dramatically harm wildlife, alter shorelines, and create larger wakes from larger ships, making many areas less suitable for recreational kayaking and canoeing, while damaging sensitive and culturally significant artifacts hundreds of years old.

Potential negative impacts on our blueway trail:

- **Increased erosion could harm historic and culturally significant sites:** The project might accelerate shoreline and wetland erosion, potentially impacting trail access points and scenic views, and damaging artifacts of cultural significance already identified by researchers.
- **Habitat degradation:** Deepening the Cape Fear River will likely cause more saltwater to intrude further upstream, changing freshwater wetlands into saltwater wetlands. This can kill freshwater-dependent trees and alter habitats that support fish, birds, and other wildlife that are often part of the blueway experience.
- **Larger wakes:** If the river is deepened to accommodate larger ships, the wakes from these vessels will increase, leading to more significant wave action that can damage shorelines and pose a risk to smaller craft on the blueway trails.
- **Reduced water quality:** The deepening project will significantly degrade water quality, which can harm the visual appeal and safety of those enjoying the blueway.
- **Changes to marine life:** The estuary is a nursery for juvenile fish, crabs, and shrimp, so changes to salinity and habitat could have a significant impact on the marine life that recreational users may want to observe.

This Blueway Trail is entirely within the Gullah Geechee Cultural Heritage Corridor, located along the Lower Cape Fear River. The Corridor itself is a National Heritage Area established by the U.S. Congress to honor the unique culture of the Gullah Geechee people, who have historically resided in the coastal regions and sea islands of North Carolina, South Carolina, Georgia, and Florida. Visit us to learn more about the Gullah Geechee community and its distinctive culture.

While some citizens of the lower Cape Fear region are generally familiar with Gullah Geechee people and their important links and contributions to the Lower Cape Fear River, many local residents, especially newcomers, do not understand who the Gullah Geechee people were or the role they played in shaping the history, culture, and early economy of this area. This trail aims to bring together and build upon the various efforts and reports that have established a vital foundation for cultural, historical, and ecological work, all designed to enhance our understanding and appreciation of the past, present, and future of Gullah Geechee culture in the lower Cape Fear region.

This trail will greatly support marginalized communities who, for years, have faced environmental and health issues caused by industrial contamination, including climate change. We volunteer because we care for our children, grandchildren, and future generations, leaving a legacy of character, resilience, and faith.

The specific goals of this Trail are:

- Educational Outreach: Increasing a local, regional, and nationwide

understanding and awareness of Gullah Geechee people, culture, and history.

- Support for tourism and businesses: promoting the preservation of the land and natural resources leads to meaningful, healthy ways of life and a sense of place.
- Social Inclusion: Recognition and participation of stakeholders and vulnerable groups are key components of our community workshop efforts. Focusing on historically marginalized communities, this effort will bring their influence in the decision-making process by providing a seat at the table.
- Documentation and preservation of historic places: connecting and bonding our residents and visitors to the fabric of our society by preserving, celebrating, and providing access to them.
- Environmental protection of our essential natural landscape, giving necessary links between our fragmented local habitats, and offering tremendous opportunities to protect our ecosystems, wetlands, and floodplains.

Within the expansive landscape of longleaf pines and ancient cypress trees, the empty fields and swamps were once plied by enslaved West Africans to satisfy the relentless pursuit of profit gained from their labor. Fast forward to today, and this persistent and unfortunate greed still persists, though in a different form. It now feeds off the wallets of those who move here, who blindly alter the composition of our southern soils and beautiful rivers. And, sadly, we emigrants and migrants to this land, along with the greedy among us, have changed our earth and the spaces we now occupy, not for the better, but in the image we mistakenly believe is better. Within that false belief lies a profound, irreparable loss to our environment, our citizens, and our future.

The significance of Section 106 Historic Preservation was clearly underestimated in the recognition and mitigation efforts in the USACE DEIS and the Port's Section 203 Report. We look forward to your acknowledgment of our community-wide efforts, as well as those representing the Gullah Geechee Corridor, in your updates of the DEIS.

Thank you.

Brayton Willis
Retired USACE Senior Project Manager
Leland, NC

From: B W
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Tuesday, November 11, 2025 5:05:08 PM

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Subject: Secondary and/or direct impacts of the proposed Wilmington Rail Relocation Project ignored in the Draft EIS (DEIS) and the Port's Section 203 Report, which violates the requirements outlined in the National Environmental Policy Act (NEPA).

QUESTION: Why would the USACE DEIS and the Port's Section 203 completely ignore NEPA requirements for direct and/or secondary effects related to the proposed Wilmington Rail Relocation Project, directly linked to the proposed deepening of the Cape Fear River, in violation of that Act?

Referencing the "Wilmington Rail Realignment DRAFT, Purpose and Need Report, Prepared For: Federal Railroad Administration and the City of Wilmington," pages 10, 12, and 13 serve as explicit references highlighting the need to spend over $1 billion to relocate this rail line for the future Port expansion, establishing that this effort is either a direct or secondary effect.

"Wilmington Urban Area Metropolitan Planning Organization Long-Range Transportation Plans The Cape Fear Moving Forward 2045 Metropolitan Transportation Plan (City of Wilmington 2020), was adopted in November 2020. A key focus of the 2045 plan is improving freight movement within the region by promoting intermodal connections for ports, rail, and highway to improve supply chain reliability. This includes improvements to the US 74 highway corridor and the CSXT rail line connecting the Port of Wilmington to Charlotte, as well as restoration of the rail line between Castle Hayne and Wallace to provide rail access to Raleigh and the Northeast. The plan notes the Wilmington Rail Realignment as an important connection within the region's transportation network and includes a number of roadway and rail projects to improve freight movement in the region. Truck/roadway projects include several projects along Shipyard Boulevard, the primary access to the Port, as well as roadway widenings and intersection improvements on truck routes to the Port. Rail projects include safety improvements at several at-grade crossings of the CSXT Beltline. Other projects listed in the Roadway element of the plan are also targeted at reducing/maintaining the rate of mean travel time for people and freight, reducing vehicle miles travelled (VMT), maximizing throughput for each lane, reducing peak hour delay, and addressing future growth in employment, population, and freight/industry.

Cape Fear Memorial Bridge Feasibility Study (NCDOT SPOT ID H185357)
NCDOT Feasibility Studies Unit completed an express design and environmental screening for replacing the Cape Fear Memorial Bridge, which carries US 17/US 76/US 421 over the Cape

Fear River between New Hanover and Brunswick Counties north of Wilmington. The existing bridge is a 4-lane steel center-span vertical lift bridge. The feasibility study proposed expanding to a 6-lane median divided facility with one alternative (Alternative 4) incorporating a new railroad crossing." [1]

This draft report further states on pages 12 and 13:

"The Project will address three main needs including the need for enhanced efficiency of freight movement, improved safety, and improved regional mobility and reliability. The challenges the City of Wilmington faces with rapid population growth and increasing traffic congestion combined with increases in freight movement through the Port of Wilmington are straining the existing transportation network. Of concern are the numerous at-grade crossings through the city that pose a risk to public safety, increased traffic delays and travel times, and increased auto emissions due to longer idling. To access the Port of Wilmington, freight trains must currently travel over 10 miles through Wilmington, crossing 32 at-grade crossings (30 public crossings and 2 private crossings) within the Project Study Area. The at-grade crossings frequently cause traffic delays, present a safety risk and reduce the quality of life for the 50,000 residents in the study area. Due to increasing volumes at the Port and sustained population growth, compounded impacts are expected to worsen in the coming years.

Under future conditions, the project assumes the local transportation system would evolve as currently planned without implementation of the Project. With the exception of routine maintenance and fiscally constrained programmed projects, such as the Wilmington Beltline Improvements Project (P-5740), no change would take place along the existing corridor within the Project Study Area.

1.5.1 Efficient Freight Movement
Brunswick and New Hanover Counties have experienced robust population increases in recent years, affecting the fluidity of the local transportation network. Added delays at rail crossings due to slow moving or stopped trains affects the local operations of the freight and vehicular network within the Project Study Area." [1]

A direct quote from the Wilmington Realignment Project update, July 2019 PowerPoint:

- *" 8 round-trip, longer trains through the city, 16 passes a week by 2025.*
- *6 round-trip, longer trains through the city, 12 passes a day to reach capacity, eventually expected increase of truck traffic and congestion, especially once Port traffic reaches the maximum of 6 trains*
- *Minimum 20–30 minute delays at street crossings, >4 hours wait in 24 hours.*
- *Combined congestion reaches gridlock and blocks emergency services over large areas of the city.*
- *Lost opportunity for both Port growth and regional business and trade growth."*

The Port of Wilmington plans to expand cargo transportation by using longer trains to handle freight more efficiently in the future, as already noted by USACE and the Port of Wilmington in their documentation. In that case, NEPA clearly requires the USACE to evaluate the environmental impacts of all such methods and the costs related to the rail realignment, considering potential effects on natural, human, and economic resources.

Problems with the Wilmington Rail Realignment project's routing include potential impacts on wetlands and streams, insufficient environmental reviews, and the challenge of creating a new, shorter route while balancing diverse land-use and infrastructure needs. A significant concern is the number of wetland and stream crossings along the proposed route, which requires thorough review and mitigation to minimize environmental harm. The project aims to create a new, shorter route to bypass the city's most congested streets. Still, this new alignment is complex to design due to various geometric and environmental constraints.

Since this realignment is a secondary effect of the Port's proposed Cape Fear River deepening project, the proposed realignment route must consider existing land use, such as undeveloped areas and industrial development, especially near the Port of Wilmington, and account for how the new route will interact with existing infrastructure, such as bridges and highways.

Without question, the Port's proposed dredging project footprint has been artificially limited, either intentionally or unintentionally, to exclude the complete impact cycle of the Port of Wilmington's effects on the rail system and other critical infrastructure, such as roads and bridges.

I appreciate the opportunity to comment on this important endeavor.

Thank you.
//SIGNED//
Mr. Brayton Willis
USACE Senior Project Manager, Retired

From: bmilliken44@gmail.com
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, December 1, 2025 11:24:15 AM

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There have been numerous references to the environmental and financial damage that will likely be associated with deepening the Cape Fear River and the corrresponding “economic imperative” to do so in order to sustain the viability of the ports. History shows that large-scale efforts to reengineer nature usually result in expensive retrofitting and or restoration to mitigate unforeseen consequences that emerge in the future. See the Everglades. The Control of Nature is a book by John McPhee which chronicles some of these attempts. The economy is a subset of ecology, not the other way around. What is the opportunity cost of investing the money required to deepen vs. its deployment for other public goods. There are some things that just a priori don’t make sense. I think deepening the river is one of them.

Thanks,

The Milliken Company
Sustainable Real Estate Development & Consulting

Alvin E. (Buddy) Milliken, Jr.
cell-910-612-6009
bmilliken44@gmail.com
401 South 4th St. #2
Wilmington, NC 28401

From: Andrew Marhevsky
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Cape Fear River channel deepening
Date: Friday, November 21, 2025 5:55:35 AM

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I am against the channel deepening. My largest concern is regarding the flooding of downtown Wilmington. A number of studies have been conducted on the effects of dredging on the flooding issue. This was a part of an article on dredging's effect along the Cape Fear River.

"WILMINGTON, N.C. (WECT) - It's a somewhat common scene in Wilmington and the Cape Fear region — a beautiful sunny day without a cloud in the sky — yet, water across the road. It's known as many things, sunny day flooding, nuisance flooding; but, according to new research, it's getting worse, and Wilmington was at the top of the list for the increase in nuisance flooding events.
While most people attribute these instances to events like king tides or full moons, a new report shows that humans might have a bigger role in exacerbating these events than previously thought.
Dr. Thomas Wahl is a researcher and assistant professor at the University of Central Florida. He, along with others, recently published a research article that shows just how big of an impact things like dredging is having on tidal events."
If the Corps of Engineers approves the deepening of the channel, what would be done to mitigate the deepening effect? Who will pay for the increase in flooding incidents in downtown Wilmington?
Andrew Marhevsky
5017 Dockside Drive
Wilmington, NC
28409

From: Anna Whitener
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor Dredging Project
Date: Saturday, December 6, 2025 11:13:51 AM

You don't often get email from annawhitener75@yahoo.com. Learn why this is important

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Sent from my **Executive Summary: The Draft Environmental Impact Study (DEIS) of the proposed Wilmington harbor expansion as submitted by the US Army Corps of Engineers (USACE) does not address the full impact this project will have on the lower Cape Fear environment. The absence of detailed, scientific references supports the argument that the proposed project is inconsistent with NC's coastal management charter.**

NC law states "among NC's most valuable resources are it's coastal lands and waters…..which should be preserved and enhanced." The proposed Wilmington Harbor 403 project will severely, adversely, affect both.

Loss of vital wetlands that currently mitigate flooding in downtown Wilmington.

The proposed widening of the Wilmington port channel will destroy a large swath of wetland. Preliminary estimates indicate over a 1000 acres (over 1.5 sq miles) of wetland on both shores of the Cape Fear river will be lost as a result of widening parts of the Wilmington navigation channel from 100ft to 300ft. Currently this wetland serves as a sponge during heavy rainfall in the Cape Fear river watershed, and as a sponge and filter during periods of high tide.

Coupled with a predicted rise in sea level, downtown Wilmington and adjacent riverside communities will be exposed to more frequent and severe flooding. This is already a problem, why compound it?

Loss of wildlife and estuarine habitat.

While acknowledging that saline (sea) water will migrate further up river due to the deepening of the ship channel (from 44 to 49ft at the entrance, and 42 to 47ft at the port) the DEIS posits that freshwater wetland will transition into another type of wetland. This will come at a price, thousands of cypress trees have already been lost due to migration of salt water upstream.

There is a reason beachfront sand dunes expand inland. The existing reeds and grasses that flourish in freshwater wetland are vital wildlife habitat. Similarly the marine ecosystem in this estuarine environment supports small organisms that in turn provide a nursery for larger species of fish and crustaceans. In addition, this unique estuarine ecosystem is the 'classroom' for UNCW scientists and students as well as an ecotourism 'hot spot' for all who appreciate it's value in the NC coastal plain.

River bank erosion due to increased wave action and dredging.

Existing ship traffic is steadily eroding the Cape Fear river shoreline. Bald Head Island, at the river mouth, alone has already spent over $90 million to preserve their shoreline. Ships of greater displacement will generate proportionately larger waves which accelerate shoreline erosion; it follows that this will require more frequent dredging of the navigation channel, thereby creating an ongoing, vicious cycle. The projected $18 million annual port

maintenance costs (mostly for dredging) will increase as a result, and local and regional NC residents will inevitably be burdened accordingly.**Return on investment (ROI)**

The initial cost of this project is estimated to be $1.3 billion. However, with projected startup only likely to occur several years from now, this figure will inevitably increase, indeed estimates based on projected future costs indicate costs may actually result in a *net loss in terms of ROI*. Additionally the USACE notes that only international shipping companies will benefit, not the NC Ports Authority nor local communities, based on their projection that shipping companies will transport more cargo on fewer ships.

I**t's notable that there is no demonstrated need for harbor expansion.**

The Corps claims that the same amount of cargo will go through the port with or without deepening the ship channel, and the port already accommodates the large ships that the project is designed to handle.

Why threaten North Carolina's natural, coastal resources if economic and transportation needs currently in place already meet future goals?

The project does not offer resiliency to climate change.

NC's coastal management plan demands that actions be taken to make our coastal habitats and species "more resilient" to the impacts of climate change. But the Corps' analysis of the Wilmington Port Expansion understates the future vulnerability of the Wilmington area and its coastal resources due to predicted sea level rise, storm surge and coastal flooding.

The Corps does not adequately evaluate flood risks caused by the deepening, harm to

wetlands, wildlife habitat. On the other hand, scientific projections, based on experience,
confirm that this project will make Cape Fear River coastal habitat less resilient.

Relocating dredged sediment.

NC state has not yet accepted that exposure to PFAS and PFOS are a potential health
hazard, even though this of growing, national concern and some states are already
implementing the necessary restrictions and precautions to address it. The USACE ignores
this potential health hazard (to all living organisms) and therefore plans to deposit dredged
material along local beach front to counter ongoing erosion. Samples of this material are
recorded to contain large amounts of PFAS/PFOS and more. Brunswick County beaches
have already been closed due to incidents of sewage contamination, high concentrations of
PFAS/PFOS have already been found in samples of sea foam. The impact on quality of life in
the lower Cape Fear region, to residents and visitors, cannot be understated when these
'forever chemicals' are finally accepted by NC officials as being hazardous to our health.

**Numerous letters were submitted to the USACE in reference to all of the above
prior to release of the Draft Environmental Impact Study. These letters described
in far more detail, applying science and proven practices, the pitfalls of the
proposed project. It is most unfortunate that this thoroughly researched
information was overlooked by the USACE when they prepared their DEIS.**

Thank you in advance for your urgent attention to this matter

From: Anne McKay
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 5:05:23 PM

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I am opposed to the dredging of the Cape Frear River to allow larger ships to access the port of Wilmington. I live downstream in Southport and am worried about the chemicals in the sediments that will be disturbed during the dredging process and ending up in the Brunswick County drinking water supply.

local citizen,
Anne McKay

Audubon | NORTH CAROLINA

P.O. Box 584
Garner, NC 27529

919.929.3899
nc.audubon.org

December 20, 2025

Division of Coastal Management
ATTN: Federal Consistency Coordinator
400 Commerce Avenue
Morehead City, NC 28557

Re: Wilmington Harbor 403 Draft EIS

I am writing on behalf of Audubon North Carolina and our network of bird lovers, conservationists, and community members to tell you that the Division of Coastal Management must deem the proposed Wilmington Harbor Navigation Project inconsistent with the state's coastal management program.

The program is designed to protect and conserve our state's fisheries, wildlife habitat, water quality, and other coastal resources. The Cape Fear River is one of the state's largest and most iconic estuaries, and as such is an Area of Environmental Concern that the Division of Coastal Management is charged with protecting. If allowed, the expansion of the Port of Wilmington would exacerbate current issues in the estuary, including erosion, water pollution, and flooding—impacts the state could avoid by protecting our natural resources.

Audubon and partners argue that the draft environmental impact statement put forward by the U.S. Army Corps of Engineers fails to properly address these impacts and puts essential natural resources at risk. In short, the proposed expansion would cause irreversible harm to the Cape Fear River, its wildlife, cultural resources, and surrounding communities, all without a proven public need.

- The Corps has failed to fully evaluate the project's long-term costs, including the need for more frequent maintenance dredging and flood mitigation.
- Surrounding communities and habitat would see worsened sunny day and storm-related flooding.
- The project would destroy more than 1,000 acres of wetlands and degrade surrounding fisheries—all without adequate mitigation.

That's why the state must deem the proposed Port of Wilmington expansion inconsistent with the coastal management plan.

Sincerely,

Curtis Smalling

Curtis Smalling
Vice President
Audubon North Carolina

Please note that the 517 Audubon members listed below have signed on in support for our comments.

Martha Spencer, Brevard North Carolina
Christi Dillon, Mooresville North Carolina
Evelyn Durmaz, Cary North Carolina
Priscilla Rebillard, Wilmington North Carolina
Nancy Hanley, Durham North Carolina
Jennifer Duncan, Matthews North Carolina

Karen Langelier, Wilmington North Carolina
Laura Luyendyk, Raleigh North Carolina
Cathy Nieman, Weaverville North Carolina
Willie Hinze, Winston Salem North Carolina
Mark Sullivan, Indian Trail North Carolina
Jackie Neece Gray, Carrboro North Carolina
Kevin Byrne, Durham North Carolina
Jocelyn McLaughlin, Charlotte North Carolina
Susan Phillips, East Bend North Carolina
Tanya DeGrace, Charlotte North Carolina
Annmarie Celano, Waxhaw North Carolina
M Stanley, Wilmington North Carolina
Michelle Rivers, Mooresville North Carolina
Karen Mallam, Siler City North Carolina
Ann Tarbet, Raleigh North Carolina
Alan Lenk, Asheville North Carolina
Pamela Derr, Hillsborough North Carolina
Joyce Pusel, Chapel Hill North Carolina
Laree Farmer, Pineville North Carolina
Suzy Lawrence, Chapel Hill North Carolina
Janet Palmer, Charlotte North Carolina
William Reavis, Kernersville North Carolina
Catherine Wandell, Pfafftown North Carolina
Clodagh Bastian, Raleigh North Carolina
Meghan Olis, Cary North Carolina
BJ Ryan, Greenville North Carolina
Jeff Morgan, Winston Salem North Carolina
Nancy Crouch, Southport North Carolina
Gerhard Weinberg, Efland North Carolina
Marge De Forest, Wilmington North Carolina
Natalie Coe, Rocky Point North Carolina
Mark Hemenway, Charlotte North Carolina
Susan Mitchell, Raleigh North Carolina
John Mantia, Emerald Isle North Carolina
Kaye Ratliff, Wadesboro North Carolina
Eileen Field, Belmont North Carolina
Jane Matanga, Cheshire North Carolina
Nichole Huntley, Marshall North Carolina
Stephanie Faucette, Chapel Hill North Carolina
Shonni Wiggins, Rocky Mount North Carolina
Evelyn Coltman, Waynesville North Carolina
Pamela Homer, Leland North Carolina
Song Kinnamon, Indian Trail North Carolina
Norma Speights, Lumberton North Carolina
Bru Gallo, Calabash North Carolina
Doris Kitchen, East Flat Rock North Carolina
Debra Hanson, Winston Salem North Carolina
Scott England, Wilmington North Carolina
David Stuart, Raleigh North Carolina
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Brenda Harris, Wilmington North Carolina
Victoria Hagemeister, Camden North Carolina
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Rosemary Goeller, Raleigh North Carolina
Debra Garrett, Davidson North Carolina
Hubert Hamilton, Wilmington North Carolina
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Catherine Krug, Hendersonville North Carolina
Karl Mueller, Chapel Hill North Carolina
Sherry Colangelo, Belmont North Carolina
Susane Boukamel, Cary North Carolina
Shannon Schlater, Cary North Carolina
Frances Janie MacBryde, Advance North Carolina
Sandra Hillerstrom, Southport North Carolina
Diane Beckman, Cary North Carolina
Candace Thompson, Wilmington North Carolina
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Evelyn Lilly, Durham North Carolina
Warren Tadlock, Charlotte North Carolina
Julia Hartman, Alexander North Carolina

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Laura Faber, Fayetteville North Carolina
David Fouche, Winston Salem North Carolina
Don Bergey, Winston Salem North Carolina
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John Franklin, Raleigh North Carolina
Diane Thomas, Durham North Carolina
Mary Frazer, Raleigh North Carolina
Mark Stanback, Davidson North Carolina
Ken Bosch, Raleigh North Carolina
Elizabeth Willett, Charlotte North Carolina
Pam Denmon, Cape Charles North Carolina
Suzanne J. Dickson, Sneads Ferry North Carolina
Mary Ann C Snedeker, Asheville North Carolina
Sharon Daugherty, Kure Beach North Carolina
Glenda Steel, Concord North Carolina
Dianne Mumola, Brevard North Carolina
Laura Wurzel, Charlotte North Carolina
Suzanne Roberts, Durham North Carolina
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Amber Raymond, Willow Spring North Carolina
Kicab Castaneda-Mendez, Pittsboro North Carolina
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Carol Aldridge, Blowing Rock North Carolina
Kathleen Wassell, Cary North Carolina
Beatrice Mango, Raleigh North Carolina
Ann McCormick, Lillington North Carolina
Jayne Boyer, Durham North Carolina
David Paynter, Wilmington North Carolina
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Pam Bacon, Lexington North Carolina
S B, Burnsville North Carolina
Tracy Feldman, Durham North Carolina
Elise Koehncke, Chapel Hill North Carolina
Suzanne Jones, Brevard North Carolina

Joe Bearden, Raleigh North Carolina
Susan Cates, Durham North Carolina
Susan Davis, Apex North Carolina
Jean Hodgins, Durham North Carolina
Tom Flagg, Waynesville North Carolina
Devon Seltzer, High Point North Carolina
Deborah DeSimone, Huntersville North Carolina
Lowell Strine, Pinehurst North Carolina
Renee Skudra, Greensboro North Carolina
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Brenda Dixon, Wilmington North Carolina
Marilyn Shup, Beaufort North Carolina
Jeffery Blanton, Cherryville North Carolina
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M C Rimmer, Greensboro North Carolina
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Robert Horton, Garner North Carolina
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Rocky Reuter, Greensboro North Carolina
Peggy Fry, Wilmington North Carolina
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Barbara Brank, Charlotte North Carolina
Tracey Laszloffy, Wilmington North Carolina
Michael Bianconi, Raleigh North Carolina
Sharon Hauser, Forest City North Carolina
Pamela Phillips, Durham North Carolina
Jack Jezorek, High Point North Carolina
Marina Frei, Chapel Hill North Carolina
Don Lendle, Winston Salem North Carolina
Donna Murphy, Caswell Beach North Carolina
Shirley Walker, Durham North Carolina
Leslie Hardie, Burlington North Carolina
Gary Lee Cottrell, Charlotte North Carolina
Sharon Mora, Whittier North Carolina
James Bengel, Wendell North Carolina
Shelley Potts, Raleigh North Carolina
Dwight Koeberl, Durham North Carolina
Wes Weaver, Boone North Carolina
Fred Martin, Nebo North Carolina
Leslie Stewart, Chapel Hill North Carolina
Jacqueline Cuthberts Cuthbertson, Charlotte North Carolina
JoAnn Hummers, Nags Head North Carolina
Martha Brimm, Durham North Carolina
Doug DeNeve, Kernersville North Carolina
Lynne Kane, Chapel Hill North Carolina
Tiffany Ehnes, Advance North Carolina
Alexis LaMere, Elon North Carolina
Cynthia Sampson, Asheville North Carolina
Bonnie Zotos, Sherrills Ford North Carolina

Marshall Stein, Laredo North Carolina
Mary Etherton, Asheville North Carolina
Catherine Ford, Hendersonville North Carolina
Gale Rullmann, Youngsville North Carolina
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Michele Hickman, Wilmington North Carolina
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Gina Petty, Matthews North Carolina
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Pamela Watkins, Durham North Carolina
Lynn Killam, Almond North Carolina
Micki Jay, Wilmington North Carolina
Daniel Friedman, Durham North Carolina
Juliana Henderson, Winston Salem North Carolina
Toni Meador, Asheville North Carolina
Randy Bernard, Asheville North Carolina
Michelle Trajanovska, Clayton North Carolina
Ginger White Almeida, Boone North Carolina
Jaya Reddy, Raleigh North Carolina
Diane Clark, Colfax North Carolina
Mary Bond, Winston Salem North Carolina
Suzann Herrington, Wilmington North Carolina
Ann Norris, Durham North Carolina
Susan Disher, Winston Salem North Carolina
Jennifer Barbara, Waxhaw North Carolina
Louanne Kaye, Wilmington North Carolina
Mary Cameron, Wilmington North Carolina
Donna Pettigrew, Greensboro North Carolina
Phyllis Rosenbaum, Mint Hill North Carolina
Patricia Tennis, Hillsborough North Carolina
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Bettina Darveaux, Hillsborough North Carolina
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Mary Abrams, Cary North Carolina
Lily Salisbury, Wilmington North Carolina
Michael D Ashby, Asheville North Carolina
Evelyn White, Lillington North Carolina
Vivienne Graves, Franklinton North Carolina
Ellen Adelman, Raleigh North Carolina
Elizabeth Giles, Hampstead North Carolina
Jen Haggard, Oriental North Carolina

Andrea Thompson, Hendersonville North Carolina
Michael Sullivan, Chapel Hill North Carolina
Stephen Boletchek, Apex North Carolina
Ellen Gannon, Wrightsville Beach North Carolina
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Alecia Waite, Raleigh North Carolina
Cathy Cummins, Leland North Carolina
Lynn Richardson, Durham North Carolina
Robert Schwartz, Mount Holly North Carolina
Darrell Young, Carthage North Carolina
Patricia Nagorski, Cornelius North Carolina
Brenda Staab, Marion North Carolina
Hygie Starr, Brasstown North Carolina
Jan LeFrancois, Southport North Carolina
Dale Henderson, Flat Rock North Carolina
Margot Raynor, Wilmington North Carolina
Henrietta Mayo, Oak Island North Carolina
Hal Marcus, Raleigh North Carolina
Janice Stevenson, Asheville North Carolina
Ellen Ford Nentrup, Bakersville North Carolina
Deborah Warner, Wilmington North Carolina
Lisa Tichenor, Asheville North Carolina
Kathryn Bailey, Wilmington North Carolina
Courtenay Willcox, Corolla North Carolina
Diane Wallace, Kernersville North Carolina
Davey Anne McEvers, Hickory North Carolina
Katherine Tripp, Greensboro North Carolina
Keith Johnson, Siler City North Carolina
Kim Brower, Asheboro North Carolina
Jo Ellen Brandmeyer, Chapel Hill North Carolina
Karen Hurka Richardson, Chapel Hill North Carolina
Diana Renfro, Grassy Creek North Carolina
Marla West, Asheville North Carolina
Kathy Kern, Wilmington North Carolina
Julia Ellis, Cary North Carolina
Sarah Romereim, Charlotte North Carolina
Debbie Kenyon, Apex North Carolina
David Graham, Durham North Carolina
Ellen Larion, Hendersonville North Carolina
Gail Powell, Asheville North Carolina

Cathy Rodrigues, Chapel Hill North Carolina
Patricia Eargle, Candler North Carolina
Michael Pittman, Asheville North Carolina
June Richardson, Winterville North Carolina
Debra Levin, Chapel Hill North Carolina
Judith A Gale, Raleigh North Carolina
Liz Kos, Cary North Carolina
John Rudisill, Charlotte North Carolina
Van Redford, Roanoke Rapids North Carolina
Sharon Nasholds, Wake Forest North Carolina
Donald Harland, Candler North Carolina
Ellen Osborne, Pleasant Garden North Carolina
Perry Haaland, Carrboro North Carolina
Gregory Strauss, Chapel Hill North Carolina
Carolyn DuBois, Southport North Carolina
Jaymie Eichorn, Greensboro North Carolina
Lauren Beard, Advance North Carolina
Catherine Marie, Raleigh North Carolina
Catherine Webb, Marshall North Carolina
Marion Kreh, Castle Hayne North Carolina
Christine Payden-Travers, Winston Salem North Carolina
Jeri Edwards, Alexander North Carolina
Abigail O'Neill, Durham North Carolina
David Davis, Apex North Carolina
Trisha Houser, Durham North Carolina
Lauren Mageau, New Bern North Carolina
Deanna Sedlak, Durham North Carolina
Meredith Maker, Naples North Carolina
Victoria Childers, Mebane North Carolina
Jennifer Crump, Lenoir North Carolina
Cynthia Joos-Dart, Benson North Carolina
Michael Fleming, Greenville North Carolina
Mimi Austin, Gastonia North Carolina
Anthony Scrimenti, Durham North Carolina
P. Clark, Asheville North Carolina
Elizabeth Kane, Raeford North Carolina
George Czerw, Caswell Beach North Carolina
Ralph Benfield, Charlotte North Carolina
Suzanne Evans, Wilson North Carolina
Denise Mulhollen, Hampstead North Carolina
Paula Schlesinger, Asheville North Carolina
Karen Watson, Wilmington North Carolina
Deborah Fleming, Hendersonville North Carolina
John Buckley, Hayesville North Carolina
Jay Capan, Chapel Hill North Carolina
Mary Lou Surgi, Candler North Carolina
Phillip Poovey, Raleigh North Carolina
Ann Bullock, Whittier North Carolina
Sharon Valentine, Wilmington North Carolina
Summer Shah, Charlotte North Carolina
Joseph Sauder, Sanford North Carolina
Maureen Copan, Raleigh North Carolina
Andrew Hefner, Durham North Carolina

Sally Pass, Elkin North Carolina
Kurt Patzer, Chapel Hill North Carolina
William Garrard, Hickory North Carolina
Matthew Collogan, Wilmington North Carolina
Jim Laumann, Wilmington North Carolina
Nancy Wojtasek, Youngsville North Carolina
Bonnie Harvell, Harkers Island North Carolina
Jan Scott, Wendell North Carolina
LuAnn Polk, Wake Forest North Carolina
Michael D Genovese, Newton North Carolina
Danielle Tomlinson, Roanoke Rapids North Carolina
Tristan Schuiteboer, Norfolk North Carolina
Eli Celli, Chapel Hill North Carolina
Blane Warrene, Pittsboro North Carolina
L Smith, Mt Holly North Carolina
Tracey Flanagan, Murphy North Carolina
Nina Furry, Durham North Carolina
Laila Mandour, Leland North Carolina
Carrie Watkins, Arden North Carolina
Christina E Dickson, Black Mountain North Carolina
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Maxine Priest, Glen Alpine North Carolina
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L Sen, Durham North Carolina
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Sam Todd, Mint Hill North Carolina
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Jason Lee, Dunn North Carolina
Megan McDonald, Jacksonville North Carolina
Nina Insardi, Leland North Carolina
Michelle Lepp, New Bern North Carolina
Ken Norris, Raleigh North Carolina
Joel Carpenter, Cameron North Carolina
Ivy Brezina, Chapel Hill North Carolina
Candace Bishop, Denver North Carolina
Marc Fayssoux, Ellenboro North Carolina
Michelle Neff, Fairview North Carolina
Anne Jones, Greensboro North Carolina
Laura Cochrane, Asheville North Carolina
Pamela Lipman, Denver North Carolina
Jennifer Atkins, Eden North Carolina
Thomas Hale, Asheville North Carolina
Mollie Flanagan, Washington North Carolina
Curtis Smalling, Boone North Carolina
Bonnie Smith, Winston Salem North Carolina
Catherine Sims, Knightdale North Carolina
Mary Ann Ford, Wilmington North Carolina
Anna Cobbett, Durham North Carolina

James Blackburn, Weaverville North Carolina
Jane Brody, Wilmington North Carolina
Diana Gray, Winston Salem North Carolina
Cindy nelson, Asheville North Carolina
Sharon Daugherty, Greensboro North Carolina
Brandy Peters, Hampstead North Carolina
Michel Valin, Asheville North Carolina
Betty Welborn, Winston Salem North Carolina
Jude Pasqualini, Candler North Carolina
Lori Goldberg, Wilmington North Carolina
Kayla Igo-Kneasel, Durham North Carolina
Leslie Phillips, Wilmington North Carolina
Nils Skudra, Greensboro North Carolina
Angela Wastchak, Cary North Carolina
Joshua Gray, Cary North Carolina
Daniel Wastchak, Cary North Carolina
Debra Plautz, Fuquay Varina North Carolina
Doug Spires, Marshall North Carolina
Courtney Hunter, Wilmington North Carolina
Alicia Studley, Wilmington North Carolina
Phoebe Glazer, Mocksville North Carolina
Elisabeth Nadler, Durham North Carolina
Rosemary Clark, Rocky Mount North Carolina
Zachary Ranger, Raleigh North Carolina
D Provance, Apex North Carolina
Kristine Reiger, Mc Leansville North Carolina
S Fol, Charlotte North Carolina
Scott Milam, Candler North Carolina
Paige Humphreys, Smyrna North Carolina
Jim DeGrave, Arden North Carolina
Abbie Carson, Durham North Carolina
Mae Basye, Fuquay Varina North Carolina
Leonard Bull, Wilmington North Carolina
Bridget Tarrant, Wilmington North Carolina
Ken Goldsmith, Kitty Hawk North Carolina
Beth Carter, Wilmington North Carolina
Elizabeth King, Rougemont North Carolina
Trevor Roche, Poplar Branch North Carolina
John Noble, Wilmington North Carolina
Claire Lira, Malibu North Carolina
James Clark, Lansing North Carolina
James Porcello, Matthews North Carolina
Page Turner, Wilmington North Carolina
Peter Gorham, Robbinsville North Carolina
Stacey Amodeo, Garner North Carolina
Robert Jenks, Hendersonville North Carolina
Tina Vazquez, Asheville North Carolina
Keith Kirkpatrick, Lillington North Carolina
Todd Crawford, Surf City North Carolina
Duffy Lincoln, Greenville North Carolina
Kathleen Tiberia, Leland North Carolina
Charlene Perry, Asheville North Carolina
Marsha Hannah, Charlotte North Carolina

Kathleen Bayes, Ocean Isle Beach North Carolina
Bonnie Yankaskas, Chapel Hill North Carolina
Paula Galwith, Fuquay Varina North Carolina
William Dinnean, Southport North Carolina
Stacy Wilson, Holly Ridge North Carolina
Brenda Brown, Carthage North Carolina
K Hecker, Greensboro North Carolina
Betty Hastings, Winston Salem North Carolina
Susan Lasley, Durham North Carolina
J. Patrick George, Black Mountain North Carolina
Rachel McManus, Chapel Hill North Carolina
Katherine Hegemann, Benson North Carolina
Charlene Madison, Creedmoor North Carolina
Markus Horn, Charlotte North Carolina
Christine Doyle, Wilmington North Carolina
Kevin Walker, Kill Devil Hills North Carolina
Marylee Hawse, Wilmington North Carolina
Anthony Mallalieu, Wilmington North Carolina
Andreana Galanos, Fletcher North Carolina
George Sawyer, Charlotte North Carolina
Jacquelyn Hawkins, Red Springs North Carolina
Sabrina Rankin, Asheville North Carolina
D. Rosengrant, Brevard North Carolina
Edith Klein, Pittsboro North Carolina
Karen McCall, Chapel Hill North Carolina
Vincenzo Marsella, Advance North Carolina
Peter DiGangi, Leland North Carolina
Leah Davis, Apex North Carolina
Amy Bullock, Wilmington North Carolina
J C, Germanton North Carolina
Edward Stelli, Cary North Carolina
Jeff Watson, Wilmington North Carolina
Diane Butzin, Oak Island North Carolina
John and Victoria Miller, Charlotte North Carolina

From: A woods
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Wilmington Harbor expansion
Date: Saturday, December 13, 2025 11:16:16 AM

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The **proposed Wilmington Harbor expansion would cause irreversible harm to the Cape Fear River, its wildlife, and surrounding communities, all without a proven public need.**

- **North Carolina law declares that "among North Carolina's most valuable resources are its coastal lands and waters…which should be preserved and enhanced." To protect and preserve our coastal resources, the Division of Coastal Management must ensure that projects occurring at the coast are consistent with the State's coastal management plan.**

- **There is no compelling need for deepening and widening the harbor. The Corps claims that the same amount of cargo will go through the port with or without the deepening. Also, the Wilmington Harbor already sufficient to accommodate the large vessels that the harbor is designed to handle.**

- **The project is expected to cost more than $1 billion and the only benefits identified are cost savings to international shipping companies, not the N.C. Ports Authority, North Carolina communities, or coastal resources.**

- **The Army Corps' analysis of the Wilmington Port Expansion underestimates the future vulnerability of the Wilmington area and its coastal resources due to sea level rise and coastal flooding.**

- **The expansion will threaten wildlife habitat and coastal towns, increase erosion rates, and increase the need for maintenance dredging.**

- **The expansion will destroy more than a thousand acres of freshwater wetlands. The Corps unjustifiably assumes that freshwater wetlands will transition into other types of wetlands without accounting for the loss of habitat and storm protection that freshwater wetlands would provide.**

- **The expansion could expose wildlife to extreme PFAS ("forever chemicals") pollution through dredging and disposal of contaminated sediment.**

- **Deepening the harbor will adversely impact threatened and endangered**

species, including sea turtles, especially through the consequent increased amount of regular maintenance dredging.

Please do not proceed with this Expansion.

AV Woods NC resident

Bald Head Island Conservancy
PO Box 3109
700 Federal Road
Bald Head Island, NC 28461

Division of Coastal Management
ATTN: Federal Consistency Coordinator
400 Commerce Avenue
Morehead City, NC 28557
Re: Wilmington Harbor 403 Draft EIS

December 19, 2025

To Whom It May Concern,

We are writing on behalf of Bald Head Island Conservancy, a 501(c)(3) nonprofit organization on Bald Head Island, NC (BHI), to relay concerns about the Wilmington Harbor Port Expansion Project and its consistency with the state of North Carolina's enforceable coastal policies affecting the state's coastal uses and resources. Our organization has focused on our mission to Discover, Learn, Conserve, and Preserve Bald Head Island for more than 40 years. We specialize in sea turtle nesting ecology and barrier island conservation, and conduct a number of environmental monitoring projects and studies on behalf of the Village of Bald Head Island. Our staff includes multiple specialists in marine and environmental science, and we collaborate closely with state and federal conservation organizations and academic institutions throughout North Carolina and the region. Our Director of Science participated in the USACE Early Scoping Expert Workshops in 2024 and we have been engaged in the process during public comment periods.

The goal of this letter is to comment on the Draft Environmental Impact Statement (DEIS) presented by the USACE in October of this year and to provide specific concerns about the potential impacts of the Port Expansion project that would make it inconsistent with North Carolina DCM's role to protect the state's coastal resources. Bald Head Island, at the mouth of the Cape Fear River adjacent to the current Cape Fear channel, is in a vulnerable location relative to this proposed project. Bald Head Island also consists of rare and special species and ecosystems that should be preserved and protected by the state of North Carolina. BHI is one of two index beaches in North Carolina for federally-listed nesting sea turtles, and our organization is charged with conserving and protecting nesting sea turtles on BHI, on behalf of the NC Wildlife Resources Commission. Beyond BHI, we are also concerned about river-wide impacts, which would undoubtedly affect the natural resources throughout the entire watershed, including BHI. Concerns that we and others have raised throughout the Public Scoping Period have not been fully addressed through the 403 process, since very few new data were collected.

Specifically, our concerns include:

- **<u>Impacts of channel deepening to shoreline sediment dynamics at the river mouth.</u>** An increase of 150-300 feet of channel width will almost assuredly increase wave runup and erosion of BHI's beaches. Erosion of BHI beaches and sediment movement from east to west (from BHI's south and west beaches to the river channel) were severely underestimated during the 2000 channel realignment. This is a complex and vulnerable area and great care should be taken to be as accurate as possible with predicted impacts. **Sediment fluxes along BHI's incredibly dynamic south and west beaches <u>have not</u> been carefully measured using *current* and *location-specific* data to parameterize, calibrate, and validate the model.**
    a. It appears that the current Delft 3D model for the 403 DEIS (Appendix B) was generated during the 203 process, and uses wave and wind data that are 20+ years old, and sediment transport parameters that were adopted from other models, instead of collected in the field. The final model was selected using a match to the 2020 shoreline position after "several iterations of the model were conducted to obtain a satisfactory calibrated model."
    b. The model results presented in the DEIS did not include any results for BHI's West Beach (river beach), which is likely to be the most severely impacted by channel deepening.
    c. Impacts of erosion include: Loss of beach nesting habitat for listed species of concern, including Loggerhead, Green, Leatherback, and Kemps Ridley sea turtles, and shorebirds such as Least Terns, American Oystercatchers, and Wilson's Plovers. Tides/storms have been the largest threats to BHI sea turtle nests over the past 5 years, and these impacts are also expected to increase with climate change and sea level rise.
    d. Impacts of erosion and beach loss affect individual home and business owners, coastal tourism, and thus, the local and state economy.
    e. Erosion increases vulnerability of barrier islands (BHI, Oak Island) and other coastal communities to climate change related sea level rise and predicted increased storminess.
    f. There are unknown and unmodeled impacts of erosion and sediment dynamics on back-barrier creeks and marshes, including tidal flushing and water quality.

  "Beneficial use" of dredge spoil material to renourish beaches is not an ideal solution for increasing erosion rates. When beaches are artificially nourished, escarpment formation limits access to the beach by nesting sea turtles, and creates dangerous cliffs/dropoffs for hatchlings. **Any plans for beneficial use of dredge spoil material on sea turtle nesting beaches must include plans and costs for mitigation of escarpments during nesting season (May - November).**

- **<u>Impacts of dredging and increased shipping on wildlife and fisheries.</u>** The initial impacts of increasing channel depth and width will be substantial. Under a 47-foot scenario (49 feet in the reach near BHI), channel maintenance dredging will need to occur more often and for longer periods than the no-action alternative.

a. How much "take" of federally listed sea turtles will be permitted under this project? The hopper dredges planned to conduct construction work on the Baldhead Shoal and Baldhead-Caswell reaches are expected to entrain and kill sea turtles. Sea turtle species such as Loggerhead and Green Turtles use the beaches of the Lower Cape Fear River and adjacent barrier island as a primary hotspot for nesting and foraging. Kemps Ridley forage here as well.
b. Sea turtle foraging activities occur year-round, not just during the traditional dredging and placement timeframes.
c. Entrainment and mortality of just one adult female Loggerhead sea turtle removes the potential for 25-50+ years of reproduction and 15,000+ hatchlings. Already, channel maintenance dredging kills or injures numerous sea turtles and shorebirds each year. BHI Conservancy leads emergency wildlife response on the island, and we spend hundreds of hours each year transporting and providing care for animals hit by boats or caught in dredging equipment (those that survive the initial injury). These animals are also cared for by nonprofit organizations such as Sea Biscuit Wildlife Shelter and the Karen Beasley Sea Turtle Hospital, who rely solely on donations for support.
d. The DEIS frequently makes the assertion that channel dredging during the construction phase and/or maintenance phase for action alternatives AA1 and AA2 will not contribute to more disturbance or damage to the environment than the no action alternative (NAA). However, on top of the 35 million cubic yards of dredged material from initial construction, 3-4 million cubic yards of sediment will be moved per year for maintenance dredging, **adding 1 million cubic yards of maintenance dredging to be conducted each year**, compared to the NAA. This is the equivalent of a standalone multiple-month dredging and beach renourishment project. Many more months each year will be required to conduct dredging and spoil placement operations, for the foreseeable future, exposing animals to dredging operations for a longer window every year.
e. The lights and noise from dredging equipment can disturb and change behavior of foraging and nesting sea turtles. We have observed this directly causing false crawls and misorientation of emerging hatchlings.
f. Dredging has immediate impacts on the benthic environment, including benthic invertebrates that provide the forage base for sea turtles and important fisheries species. Increasing the magnitude, geographic scale, and frequency of this dredging will have longer-lasting effects throughout the food chain, and impacts on the fisheries economy in the Cape Fear watershed.

- **Impacts of channel deepening to the freshwater aquifer.** The model of aquifer-surface water dynamics that was created (Appendix C), ***did not include interactions with specific semi-confined aquifers on barrier islands.*** The model was not calibrated for changes to groundwater salinity (due to lack of calibration data), yet the Appendix notes the risk of saltwater intrusion between the Cape Fear River and Atlantic Ocean. BHIC has 20 years of aquifer depth and water quality data that were offered to the USACE to assist with modeling efforts, but these were not requested, nor used.

  Concerns specific to BHI include:

a. Saltwater intrusion into BHI's semiconfined aquifer is already occurring on BHI's west and south beaches (we have data supporting this contention). Further encroachment of salinity caused by channel deepening/widening will reduce the size of BHI's only freshwater source for island ecosystems. It is unknown whether this is predicted to occur, because BHI was not included in the aquifer model.
b. BHI's maritime forest (Bald Head Woods Coastal Reserve, managed by the NCDCM) is supported by this aquifer, is the second-largest maritime forest in the state of North Carolina, is considered a globally-imperiled forest subtype, and is protected by the NC Natural Heritage Program. Several listed plant species are found on BHI.
c. Loss of a drinking water resource to the public. Most of BHI's drinking water is groundwater-derived. The Village of BHI has invested in careful environmental monitoring and studies of responsible water use to minimize the impact of freshwater production on the island's natural resources. Loss of groundwater for production will increase municipal costs for water consumption.
d. Loss of/salinization of freshwater wildlife habitat. The freshwater ponds and lagoons fed by the aquifer are home to one of the largest breeding populations of protected American alligators in the state, and also provide important roosting and feeding grounds for a variety of waterbird species.

- **Impacts throughout the Cape Fear River and watershed.** The Port of Wilmington is 28 miles from the Atlantic Ocean, which is 28 miles of direct impact to the river. Other regional ports such as Savannah (18 miles) and Charleston (5.5 miles) have shorter distances to the open sea (and a higher benefit:cost ratio of channel deepening projects). The scale of hydrodynamic impacts of a project of this cannot be underestimated. Our concerns include:
    a. Placement location of dredge spoil material and quality of the material
    b. Potential contamination of dredge spoil and impacts of this on water quality (heavy metals, methyl mercury, PFAS)
    c. Large scale of perturbations and fluidization of the seabed, and impacts on biogeochemical cycling
    d. Erosion, flooding, and salinization impacts to marshes and wetlands, including the Bald Head Island/Smith Island Complex. Eroding marshes bordering developed areas will have no space to migrate, and marsh loss due to sea level rise may be accelerated. Marshes provide buffer to storm surge, habitat to wildlife and fisheries species, water filtration, and carbon sequestration benefits.
    e. Increased flooding impacts to vulnerable areas and resources which have already been stressed by Hurricane Florence, PFAS contamination, and are not fully recovered (e.g., residential areas in downtown Wilmington and Brunswick County, wastewater treatment facilities).

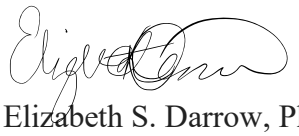
- **Economic justification.** The Benefit-Cost Ratio of this project is cited as 1.3, meaning 1.3 dollars of benefit for every 1 dollar spent. Does the increased projected profit of 30 cents per dollar spent justify the environmental costs of such a project?

a. The major claim of inefficiencies due to light loading of vessels justifying the increased channel depth was not supported by data in any of the documents provided with the DEIS (example: Attachment 5 on Economic Considerations).
b. Costs of environmental degradation, such as loss of fisheries species, have not been accounted for in the Economic study. A study conducted 2015 by NCDMF estimated 67 jobs, $14.2 million in income, and $35.7 million in business sales supported by fisheries of the mid- and lower Cape Fear.
c. Costs to local and regional businesses and transportation inefficiencies due to disruptions of ferry service and other maritime traffic due to dredging (e.g., Southport-Bald Head and Southport-Fort Fisher ferries) have not been mentioned.

It is our scientific opinion that a channel deepening to 47 feet or the alternative of 46 feet would be too environmentally destructive, or at least far too environmentally risky given the dearth and scope of environmental studies at this time. Therefore, we do not support this proposed channel deepening project and urge you to find the Wilmington Harbor Port Expansion Project inconsistent with the state of North Carolina's enforceable coastal policies affecting the state's coastal uses and resources.

Thank you for considering our concerns.

Sincerely,



Elizabeth S. Darrow, Ph.D.
Director of Science
Bald Head Island Conservancy
910-338-0942
darrow@bhic.org



G. Christopher Shank, Ph.D.
Executive Director
Bald Head Island Conservancy
910-338-0910
shank@bhic.org

BROOKS PIERCE

230 North Elm Street, Suite 2000
Greensboro, NC 27401

T 336.373.8850
F 336.378.1001
www.brookspierce.com

December 12, 2025

Via U.S. Mail and Email

Cameron Luck
Policy Analyst | Federal Consistency Coordinator, Division of Coastal Management
Department of Environmental Quality
400 Commerce Avenue
Morehead City, NC 28557
Federalconsistencycomments@deq.nc.gov

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Re: **Federal CZMA Consistency:**
USACE Wilmington Harbor 403 Navigation Project

COMMENTS SUBMITTED ON BEHALF OF THE VILLAGE OF BALD HEAD ISLAND

This firm represents the Village of Bald Head Island ("**VBHI**") in connection with the proposed Wilmington Harbor Navigation Project ("**Project**"). We are submitting these **VBHI CZMA Comments** to address issues relevant to the request by the United States Army Corps of Engineers ("**USACE**" or "**Corps**") for a Federal Consistency review by your office of the USACE's consistency determination ("**Determination**") under the federal Coastal Zone Management Act ("CZMA").

On 3 November 2025, we submitted to the Corps comments ("**VBHI USACE Comments**") in response to its Notice of Draft Letter Report and Environmental Impact Statement, and we supplied you a copy of those on 6 November 2025.[1] On 17 November 2025, we filed with the Corps **VBHI Supplemental Comments**, addressing the Economic Impact of the Project, and again supplied you a copy of those. Each of those are incorporated by reference in these VBHI CZMA Comments.

I. BACKGROUND AND SUMMARY OF RELEVANT VBHI USACE COMMENTS

Bald Head Island ("**BHI**") sits at the mouth of the Cape Fear River ("**River**") and is immediately adjacent to the Corps-constructed and -maintained Wilmington Harbor Federal Navigation Channel ("**Channel**") which is the subject of the Project. The historical Corps-navigation projects in the River have caused the Channel to be deepened and widened (collectively herein, "deepened"), interrupting the natural sand transport system across the River's mouth. *See* Ex. 2, Attachment B (historical review of BHI impacts by Erik Olsen, consulting coastal

[1] The Attachments to VBHI USACE Comments (A-K) attached for ease of reference, plus two additional Attachments (L and M) discussed below.

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engineering expert). The last Corps navigation deepening project was the 2000 Wilmington Harbor Project, "**2000 WHP.**" As a result, of the 2000 WHP, the Bald Head Island Shoal ("Shoal") supporting BHI and its beaches has eroded and collapsed, and the beaches have eroded dramatically. *Id. See also* Attachments G and L, Foth Review and Supplement. VBHI has spent over $70 million to offset the erosion caused by the deepening and subsequent maintenance done pursuant to the 2000 WHP. *See* Attachment A. As has been demonstrated by the Foth Reviews, the new Project will further harm the sand transport system and its constituent parts, including ultimately the adjacent beaches and nearshore areas, including the Shoal. In the Draft Environmental Impact Statement ("**DEIS**"), the Corps did not analyze the impacts to North Carolina's coast caused by the Project's interference with the natural sand transport systems.

The Sand Management Plan ("**SMP**") (*see* discussion below in V), Attachment C, was adopted as part of the 2000 WHP to satisfy the conditions set by NC DCM in its conditional CZMA concurrence. The SMP's stated purpose is to protect valuable AECs by retaining sand in the defined littoral cell in order to protect the shoals and beaches adjacent to the Channel at the Cape Fear River entrance. The DEIS ignores the SMP and proposes work inconsistent with it. If the Project proceeds according to the DEIS, it will exacerbate damage to those shoals and beaches caused by both the 2000 WHP and the new proposed Project.

The DEIS is the major document identifying Project impacts and resulting costs incorporated into the Draft Letter Report ("**DLR**") issued by the Corps for this Project. The DLR finds that the Project is "feasible," meaning the national economic benefits over the fifty-year life of the Project are greater than the costs of constructing and maintaining the Project. Correctly identifying all Project impacts and the costs necessary to avoid or mitigate them is critical to DLR's conclusion of feasibility: additional costs necessary to address the impacts discussed below could be determinative to authorizing this Project, as discussed in VBHI Supplemental Comments, Section III, pp. 9-13.

II. OVERVIEW OF VBHI CZMA COMMENTS

The USACE Consistency Determination and the DEIS on which it relies fail to analyze material and significant Project impacts to areas of environmental concern ("**AECs**") protected by the Coastal Area Management Act, N.C. Gen Stat. Chapter 113A, Article 7 ("**CAMA**"). As a result, the Corps' submission to your office is incomplete, thus preventing you from conducting the analysis necessary for a CZMA consistency review. Even considering the incomplete Corps' submission, it is clear that the Project will inflict extensive harm and injure significant North Carolina interests protected under CAMA and, in turn, the CZMA. The 2000 WHP presented the same threats, and NC DCM responded with a conditional CZMA concurrence. *See* SMP history in Section V A, below. The Corps promised to comply with the conditions set by your office to ensure that the Corps' dredging activities would not cause a net removal of sand from the littoral system at the River's mouth, and thus ultimately deprive VBHI and other AECs of sufficient sand to counteract dynamic erosional forces. *Id.* But the Corps broke that promise in the intervening years, triggering litigation that ultimately proved such Corps' promises are worthless. *See* Section V B, below. Unsurprisingly, then, the Corps abandoned those previously promised conditions in the new DEIS, renewing old threats to these AECs and adding new ones. *Id.*

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If the Project is to move forward in compliance with CZMA and North Carolina coastal policy, your office must require restoration of the previously promised conditions in a form that assures their continued performance. Given the long history of the Corps' activities in the Wilmington Channel and Harbor, we believe that similar, actually enforceable protections will be necessary for any other mitigation or avoidance identified by your office as necessary to protect the State's AECs.

III. STATUTORY FRAMEWORK

A. Coastal Zone Management Act, 16 U.S.C. §§ 1451 to 1468.

The federal CZMA requires the Corps to seek NC DCM review of the Project's consistency with North Carolina coastal policy to insure the Project is "carried out in a manner which is **consistent to the maximum extent practicable with the enforceable policies of approved State management programs.**"

16 U.S.C.A. § 1456 (c)(1)(A) (emphasis added).

> The term "consistent to the maximum extent practicable" means **fully consistent with the enforceable policies of [State] management programs** unless full consistency is prohibited by existing law applicable to the Federal agency.

15 C.F.R. § 930.32(a)(1) (emphasis added).

The "enforceable policies" here are North Carolina's CAMA and the policies and regulations adopted pursuant thereto, including all those regulations and policies incorporated into the State's approved plan. 16 U.S.C.A. § 1453(6a); 15 C.F.R. § 930.11(h).

B. North Carolina Coastal Area Management Act of 1974, N.C. Gen. Stat. §§ 113A-100 to 113A-134.3 ("CAMA").

CAMA includes a broad statement of purpose:

> **...Unless these pressures [on the coast] are controlled by coordinated management, the very features** of the coast which make it economically, esthetically, and ecologically rich **will be destroyed**. The General Assembly therefore finds that an immediate and pressing need exists to **establish a comprehensive plan for the protection, preservation, orderly development, and management of the coastal area of North Carolina.**
>
> In the implementation of the coastal area management plan, **the public's opportunity to enjoy the physical, esthetic, cultural, and recreational**

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> **qualities of the natural shorelines of the State shall be preserved to the greatest extent feasible;**....

N.C. Gen. Stat. § 113A-102(a) (emphasis added). CAMA also sets forth specific goals, three of which are particularly relevant here:

> Goals.--The goals of the coastal area management system to be created pursuant to this Article are as follows:
>
> (1) To **provide a management system capable of preserving and managing the natural ecological conditions of the estuarine system, the barrier dune system, and the beaches, so as to safeguard and perpetuate their natural productivity and their biological, economic and esthetic values**;
>
> (2) To insure that the development or preservation of the land and water resources of the coastal area proceeds in a manner consistent with the capability of the land and water for development, use, or preservation based on ecological considerations;
>
> (3) To insure the orderly and balanced use and preservation of our coastal resources on behalf of the people of North Carolina and the nation; ...

Id., § 113A-102(b) (emphasis added).

CAMA specifically directs the Coastal Resources Commission to "designate geographic areas of the coastal area as areas of environmental concern [AECs]...." N.C. Gen. Stat. § 113A-113(a). Such areas include:

> (6) Natural-hazard areas where uncontrolled or incompatible development could unreasonably endanger life or property, **and other areas especially vulnerable to erosion**, flooding, or other adverse effects of sand, wind and water, which may include:
>
> a. Sand dunes along the Outer Banks;
>
> b. **Ocean and estuarine beaches and the shoreline of estuarine and public trust waters**;....

N.C. Gen. Stat. § 113A-113(b) (emphasis added).

The regulations implementing CAMA (discussed below) must be interpreted and applied in light of the Act's stated purpose and goals[2] and must further CAMA's statutory goals.

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[2] *See, e.g., Mourning v. Family Publications Service, Inc.*, 411 U.S. 356 (1973) (rules issued pursuant to a statute are to be upheld if they are "reasonably related to the purposes of the enabling legislation."); *see also Brown & Williamson Tobacco Corp. v. Food & Drug Admin.*, 153 F.3d 155

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IV. NORTH CAROLINA'S COASTAL MANAGEMENT PROGRAM PROTECTS VBHI'S SAND SYSTEMS AND BEACHES.

A. The Determination concedes that the Project will impact certain AECs, but studiously ignores the restrictions imposed by North Carolina's coastal management program.

The Corps acknowledges that the "enforceable policies of approved State management programs plan" with which the Project must be consistent include the AEC regulations adopted by the Coastal Resource Commission and listed in 15A NCAC 7H. *See* Consistency Determination over letter and pp. 14-17. The BHI Shoal and beaches and the sand transport system on which they depend fall squarely within the definitions of protected AECs as "public trust areas" and "ocean hazard areas" especially vulnerable to erosion and thus requiring special safeguards. Public trust areas include the Shoal ("all natural bodies of water subject to measurable lunar tides **and lands thereunder** to the normal high water or normal water level," 15A NCAC 7H .0207(a) (emphasis added), Determination, p. 15).[3] Ocean hazard areas include "frontal dunes, inlet lands, and other areas" "because of their vulnerability to erosion." 15A NCAC 7H .0301, Determination, pp. 16-17. Specific areas include ocean erodible areas "where there exists a substantial possibility of excessive erosion and significant shoreline fluctuation," 15A NCAC 7H .0304(1) and State Ports Inlet Management Areas ("SPIMA"). *Id.*, 7H .304(4). "These [SPIMAs] are unique due to the influence of federally-maintained channels, and the critical nature of maintaining shipping access to North Carolina's State Ports. **These areas may require specific management strategies not warranted at other inlets to address erosion and shoreline stabilization.**" *Id.* (emphasis added).

But omitted from the Determination's discussion are the regulations detailing the threats posed to these AECs and why these AECs therefore require special protection:

> Significance of the ocean hazard category (a) Hazards associated with ocean shorelines are due to the **constant forces exerted by waves, winds, and currents upon the unstable sands that form the shore**. During storms, these forces are intensified and can cause changes in the bordering landforms and to structures located on them. Ocean hazard area property is in the ownership of a large number of private individuals as well as several public agencies and is used by a vast number of visitors to the coast. **Ocean hazard areas are critical** due to both the severity of the hazards and the intensity of interest in these areas.

(4th Cir. 1998) ("it is the power [of agencies] to adopt regulations to carry into effect the will of Congress as expressed by the statute."); *see also State v. Owen*, 242 N.C. 525, 88 S.E.2d 832 (1955) ("the validity of [an ordinance] must be tested by the limitations of the enabling act.").

[3] Shoals are also AEC nearshore landforms: "the portion of the beach seaward of the mean low water that is characterized by dynamic changes in time and space as a result of storms." 15A NCAC 7H .0305(2).

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> (b) **The location and form of the various hazard area landforms,[4] in particular the beaches, dunes, and inlets, are in a permanent state of flux,** responding to meteorologically induced changes in the wave climate. **For this reason, the siting of development on and near these landforms shall be subject to the provisions in this Section in order to avoid their loss or damage.** The flexible nature of these landforms presents hazards to development situated immediately on them and offers protection to the land, water, and structures located landward of them. The value of each landform lies in the particular role it plays in affording protection to life and property. **Development[5] shall not diminish the energy dissipation and sand storage capacities of the landforms essential to the maintenance of the landforms' protective function.**

15A NCAC 7H .0302 (emphasis added).

> Management objective of ocean hazard area (a) The CRC recognizes that absolute safety from the destructive forces of the Atlantic Ocean shoreline is an impossibility for development located adjacent to the coast. **The loss of life and property to these forces, however, can be greatly reduced by the proper location and design of structures and by care taken in prevention of damage to natural protective features particularly primary and frontal dunes.** Therefore, it is the CRC's objective that development in ocean hazard areas shall be sited to minimize danger to life and property and achieve a balance between the financial, safety, and social factors that are involved in hazard area development.
>
> (b) **The rules set forth in this Section shall further the goals set out in G.S. 113A-102(b),** to minimize losses to life and property resulting from storms and long-term erosion, prevent encroachment of permanent structures on public beach areas, **preserve the natural ecological conditions of the barrier dune and beach systems,** and reduce the public costs of development within ocean hazard areas, and protect common-law and statutory public rights of access to and use of the lands and waters of the coastal area.

15A NCAC 7H .0303 (emphasis added). *See also* 15A NCAC 7H .0207(d) (specifically addressing navigation channels as areas where development should not be "detrimental to the . . .physical functions of the estuary."

---

[4] The regulations define "landforms" as ocean beaches, primary dunes, frontal dunes and nearshore. 15A NCAC 7H .0305.

[5] "Development" includes dredging in any AEC. N.C. Gen. Stat. § 113A-103(5)(a).

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B. The Project threatens impacts to Bald Head Island AECs.

The studies leading to adoption of the SMP in 2000 showed the dynamics of the sand transport system at work and predicted that interrupting that system with a deeper, wider, and relocated Channel (closer to the toe of BHI) would degrade nearshore landforms (including the Shoal), beaches, and dunes—all protected AECs. Attachment B, Ex. 2. Those predictions proved to be accurate and, as a result of the 2000 WHP, the nearshore Shoal (7H .0305) supporting BHI has collapsed, dramatically accelerating beach erosion and vulnerability to waves and storms. Twenty years of subsequent monitoring of actual erosion rates have confirmed the ongoing sand deficit and significant sand loss rates that the Channel causes at BHI. Foth Reviews, Attachments G and L. That experience removes any doubt that the Channel's construction, repeated deepening, and maintenance are "detrimental to public trust rights and the biological and physical functions of the estuary … , increase shoreline erosion, [and] cause adverse water circulation patterns [7H .0207(d)]; and, "diminish the energy dissipation and sand storage capacities of the landforms essential to the maintenance of the landforms' protective function." 7H .0302(b). Plainly, these areas "require specific management strategies." 7H .0304(4). But the DEIS provides none, which the Corps' Determination fails to recognize.

Specifically, as detailed in the VBHI USACE Comments, pp. 8-10, the DEIS fails to comply with NEPA's requirements to consider the cumulative impacts[6] of the historic navigation projects and the "connected actions" [40 CFR § 1501.9(e)] of this Project. Those connected actions most relevantly include maintenance dredging, which regularly renews the stress imposed on the sand sharing system. The Foth Supplemental Report (Attachment L) confirms that in addition to GenCade being an inappropriate model for the system at issue (detailed below), its method of application in the DEIS eliminated the impact of prior projects and, as a result, failed to analyze cumulative impacts or account for the costs to mitigate them.

DCM must consider this historical experience in analyzing whether to concur in the Corps' consistency determination for the present Project. "Development shall not diminish the energy dissipation and sand storage capacities of the landforms essential to the maintenance of the landforms' protective function." 15A NCAC 7H .0302. DCM cannot perpetuate the DEIS's error in failing to analyze cumulative impacts—CAMA and the North Carolina coastal management program require DCM to consider those cumulative impacts. Indeed, had the Corps followed through on the 2000 SMP and complied with the conditions of DCM's last concurrence (including adjusting the sharing ratio to reflect monitoring results), those cumulative impacts would not be as severe, if they existed at all.

The analyses on which the DEIS and Determination rely are also technically insufficient to provide any assurance that these AECs will be protected. The Corps' DEIS consultant, Stantec,

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[6] *See Nat'l Audubon Soc'y v. Dep't of Navy*, 422 F.3d 174, 185, 196 (4th Cir. 2005) (citing prior CEQ regulations substantively identical to the version of regulations applicable here); *see* 40 CFR 1508.1(g)(3) (version eff. May 20, 2022 to April 10, 2025).

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adopted and relied on the earlier studies and models by the Project Sponsor's consultant (Moffatt & Nichol, "M&N"), whose impartiality has been questioned by VBHI.[7] The Foth Review and Supplement detail the many technical defects and shortcomings of the DEIS. Attachments G and L. In many areas, the DEIS explanations of analytical assumptions are incomplete or opaque,[8] rendering the conclusions unverifiable and hence do not provide assurance "to the greatest extent practicable" that the AECs will be protected. In other studies, there are errors in technique[9] or use of over-simplified or inappropriate models, both leading to predictions demonstrably incorrect—contradicted by the observed surveys of beach conditions.[10]

In particular, as specifically related to the DEIS reliance on GenCade, the Foth reports explain why it is an inappropriate and unreliable tool to assess Project impacts to the BHI shoreline. GenCade (like any model) is premised on certain assumptions, but Foth found that **each** the four critical GenCade assumptions are conditions that do not exist at BHI. Attachment L, p.1, ⁋ 1. In addition, it fails to "incorporate several critical physical processes that govern sediment transport along Bald Head Island." *Id.*, p. 2, ⁋ 2. These and other defects result in the model underpredicting the impacts actually observed over the last 20 years by a factor of **more than five-and-a-half times**. *Id.*, p. 2, ⁋⁋ 3, 4. The Foth Review concludes:

> The application of GenCade at this location and for this purpose is **inappropriate for the intended use and the results are misleading**. … As such, **results from the model cannot be used or relied upon** to drive project design decision making or conduct an impact assessment of the Bald Head Island Shoreline.

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[7] M&N's employer, the Project's Sponsor, denies impacts from the Project to the beaches. In addition, M&N is an advocate for the Town of Oak Island in recurring efforts to remove sand from the Channel and place it outside the littoral cell, permanently harming BHI and Caswell beaches in violation of the SMP. *See* VBHI USACE Comments, pp. 16-17.

[8] Attachment G, pp. 1-2, ##1, 3, 6, 7; p. 3 (Wave-related Sediment Transport: inadequate sensitivity analyses and justification of calibration and verification procedures); p. 4 (Channel Shoaling: unclear calculations, calibrations, verifications; polygon selection evaluation criteria); pp. 4-5 (Slope Avalanching: unclear calibration and sensitivity testing); pp. 5-6 (Vessel Wake: acknowledged failure to quantify recognized impacts; unexplained variations in grain size assumptions).

[9] *Id.*, pp. 1-2, ##2, 3, 4, 6, 8; p. 3 (Wave-related Sediment Transport, parameters calibrated incorrectly), p. 4 (Channel Shoaling: failure to distinguish shoaling rates and one-off dredge volumes); pp. 4-5 (Slope Avalanching: incorrect parameters); pp. 5-6 (Vessel Wake: incorrect/inconsistent median grain size assumptions and shear stress assumptions); pp. 6-9 (Use of GenCade: failure to incorporate critical physical processes; improper grain size for calibration; improper citation of prior studies).

[10] *Id.*, pp. 2-3, ##5, 9, p. 4 (Channel Shoaling: overpredicts).

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Id., p. 3 (emphasis added). Similarly, *see* Attachment G, p. 3, #9. In other words, **the Project's impact on BHI was not analyzed in the DEIS, despite a demonstrated history of adverse effects to BHI from the prior Channel project and maintenance**.

Without analyzing cumulative impacts and the impacts of connected actions, the DEIS is incomplete, and, accordingly, the Determination is unsupported. DCM's concurrence decision must apply the AEC regulations to further the goals of CAMA and must therefore be based on facts establishing clear evidence that these AECs will be protected. 15A NCAC 7J.0604; N.C. Gen. Stat. §§ 150B-4, 51. The Corps' Determination and related DEIS markedly fail to provide any basis for DCM to concur that the Project is consistent with North Carolina's coastal management program.

C. The Determination ignores other BHI AECs, which, when considered, further show the Project's lack of consistency with the North Carolina coastal management program.

BHI also contains AECs not considered in the Determination (collectively here, "protected natural areas").

Coastal areas that sustain remnant species

> (a) Description. Coastal areas that sustain remnant species are those areas that support native plants or animals determined to be rare or endangered (synonymous with threatened and endangered), within the coastal area. Such places provide habitats necessary for the survival of existing populations or communities of rare or endangered species within the coastal area....
>
> (b) Significance. The continued survival of certain habitats that support native plants and animals in the coastal area is vital for the preservation of our natural heritage and for the protection of natural diversity which is related to biological stability. These habitats and the species they support provide a valuable educational and scientific resource that cannot be duplicated.
>
> (c) Management Objective. To protect unique habitat conditions that are necessary to the continued survival of threatened and endangered native plants and animals and to minimize land use impacts that might jeopardize these conditions.

15A NCAC 7H.0505. *See* N.C. Gen. Stat. § 113A-113(b)(4)(f).

Coastal complex natural areas:

> (a) Description. Coastal complex natural areas are defined as lands that support native plant and animal communities and provide habitat qualities which have remained essentially unchanged by human activity. Such areas may be either significant components of coastal systems or especially notable habitat areas of scientific, educational, or aesthetic value. They may be surrounded by landscape

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> that has been modified but does not drastically alter conditions within the natural area. …
>
> (b) Significance. Coastal complex natural areas function as key biological components of natural systems, as important scientific and educational sites, or as valuable scenic or cultural resources. Often these natural areas provide habitat suitable for threatened or endangered species or support plant and animal communities representative of pre-settlement conditions. These areas help provide a historical perspective to changing natural habitats in the coastal area and together are important and irreplaceable scientific and educational resources. The CRC may determine significance of a natural area by consulting the Natural Heritage Priority List maintained by the Natural Heritage Program within the Division of Parks and Recreation.…
>
> (c) Management Objectives. The management objectives of this Rule are to protect the features of a designated coastal complex natural area in order to safeguard its biological relationships, educational and scientific values, and aesthetic qualities. Specific objectives for each of these functions shall be related to the following policy statement either singly or in combination:
>
> (1) To protect the natural conditions or the sites that function as key or unique components of coastal systems. The interactions of various life forms are the foremost concern and include sites that are necessary for the completion of life cycles, areas that function as links to other wildlife areas (wildlife corridors), and localities where the links between biological and physical environments are most fragile.
>
> (2) To protect the identified scientific and educational values and to ensure that the site will be accessible for related study purposes.
>
> (3) To protect the values of the designated coastal complex natural area as expressed by the local government and citizenry. These values should be related to the educational and aesthetic qualities of the feature.

15A NCAC 7H. 0506. *See* N.C. Gen. Stat. § 113A-113(b)(4)(e).

VBHI has protected significant tracts of natural areas since it first authorized development on the island. These tracts include the 191- acre Bald Head Woods, which is a Dedicated Nature Preserve, authorized by G.S. 143B-135.250, and thus part of the State's Natural Heritage Program. *See* N.C. Gen. Stat. § 113A-113(b)(4)(a). In addition, the island's beaches and dunes provide important habitat for threatened and endangered species that also depend on those protected areas. A non-profit conservation group, the Bald Head Island Conservancy, filed comments with the Corps (*see* Attachment H) detailing how the past projects have impacted, and the proposed Project will continue to harm, nesting habitat for species of concern, including Loggerhead, Green, and Kemps Ridley sea turtles, and shorebirds such as Least Terns, American Oystercatchers, and Wilson's Plovers.

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Negative Project impacts also extend to the impacts of erosion and sediment dynamics on back-barrier creeks and marshes, including tidal flushing and water quality. *Id.* These back-barrier creeks directly abut and influence the protected areas described above. The Channel deepening will also exacerbate saltwater intrusion threatening these delicate BHI freshwater natural ecosystems and their dependent flora and fauna. *Id.*

Maintenance dredging kills and injures numerous sea turtles and shorebirds, disrupts foraging and nesting behaviors, and damages the benthic community so important to sea turtles and fish species. *Id.* It appears (again, the DEIS is opaque) that the Conservancy's concerns were ignored. These are equally concerns of VBHI, which has always placed a premium on protecting these natural resources.

These additional failures to identify—let alone analyze and address—these AECs demonstrate that the Corps has not met its burden of demonstrating protection of AECs "to the maximum extent practicable," as CZMA requires. 16 U.S.C.A. § 1456 (c)(1)(A).

V. THE 2000 SAND MANAGEMENT PLAN CANNOT BE IGNORED.

A. The SMP was intended to protect the same AECs threatened by the current Project.

When the 2000 WHP proposed to deepened the existing Channel and re-aligned it closer to BHI, VBHI's then-consultant, Erik Olsen, analyzed the affected sand sharing system and predicted devastating impacts to the island. The VBHI USACE Comments, pp. 4-7, detail his critique of the proposed 2000 WHP and the origins of the Sand Management Plan ("SMP"). *See also* Attachments B (Olsen correspondence) and C (complete SMP). The Corps responded to the concerns articulated by Mr. Olsen by studying the rate of longshore sediment transport moving toward the Cape Fear River entrance. SMP, ⁋ 21, p. 10. The SMP recognizes **the critical importance to beach protection of retaining sand within the active littoral cell.** *Id.*, ⁋ 20, pp. 9-10. The forecasted (and later realized) Project-induced harm was because the "Federal Standard" for maintaining navigation projects "has not included the disposal of littoral sands on the adjacent beaches or in the active littoral zone" and "did not consider the overall impact of removing littoral sediment from the littoral system." *Id.*, ⁋⁋ 19, 20, p. 9. The SMP therefore committed to placing all beach-quality dredged sand on the **adjacent beaches** in the same littoral cell. *Id.*

In response to Olsen's memo and similar concerns raise by DCM in its CZMA review, the Corps Wilmington District Chief Engineer, Col. James DeLony, sent a letter assuring that sand placement will be "according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to [VBHI]" and "the Sand Management Plan." DeLony Letter, 9 June 2000, pp. 2-3, Attachment D. In addition, he said:

> The Corps will conduct a monitoring program … [and] will use this monitoring data to **evaluate and adjust** the Sand Management Plan, as determined necessary, after coordination with the parties.

Id. p. 3 (emphases added). This letter formed the basis for DCM's conditional CZMA concurrence back in 2000:

> **Based upon** our review of **the EA [Environmental Assessment] and the Corps of Engineers' response to comments [the DeLony Letter]**, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, **provided that the project is performed according to the EA (including the Sand Management Plan** and other appendices)...and that the conditions below are met.

Letter from Donna Moffitt, Director, NCDENR/DCM, 15 June 2000 to Col. DeLony, USACE District Engineer, p. 2 (emphasis added), Attachment E. Among the other conditions then listed by DCM are: "impacts of this multifaceted project will be well documented in order to evaluate the effects on these resources on the overall coastal environment," including **an "integrated monitoring plan"** [Condition # 1]; **adherence to the SMP** [Condition # 3]; Corps request for review (supported by impact documentation) for any modification in future maintenance practices [Condition 4]; and, a separate consistency review of any proposal to place maintenance dredged material outside the locations established in the SMP [Condition 5]. *Id.*, pp. 3-4 (emphasis added).

Following the CZMA concurrence, the Corps issued its Finding of No Significant Impact (FONSI), relying specifically on the Moffitt Letter and its incorporation of the assurances in the DeLony Letter: "**We will comply with the indications in the [Moffitt] letter.**" FONSI, § 3.00, p. 5, final bullet point, Attachment F (emphasis added). The final EA adopts the SMP goal that displaced "sand should be retained within the active coastal sand system." EA, §1.03, p. 3.

> The sand management plan (Appendix A [to the EA]) for the deepened Wilmington Harbor project **requires** that **all** beach-quality maintenance material **be returned to the adjacent beaches**. This will result in enhancement of the regional sediment budget.

Id., §5.01, p. 27 (emphasis added).

Accordingly, the final 2000 North Carolina CZMA consistency determination and the EA-FONSI were **specifically conditioned** on the Corps complying with the Moffit letter Conditions, including the SMP, to maintain sand in the littoral system by placing it on the **adjacent** beaches—BHI and Caswell Beach—and not in the Ocean Dredge Disposal Site or other beaches beyond the littoral cell. **The SMP and the Moffit letter are baseline conditions for protection of AECs.** Without the protection those conditions provide, the damage from the 2000 WHP and associated maintenance dredging will be amplified and added to the new damage from the proposed Project.

B. The Corps has effectively abandoned the SMP.

Importantly for the present consistency review, the history of the Corps' actions shows that it does not consider its commitments to DCM as imposing actual restrictions on the Corps' actions. Specifically, in 2010, after the Corps repeatedly failed to follow the dredging schedule in the SMP, VBHI sued to enforce that schedule because delay was resulting in severe BHI erosion going un-

remediated. The US District Court for the Eastern District of North Carolina and then the Fourth Circuit Court of Appeals ruled against VBHI because "the Corps' continuing implementation of the Wilmington Harbor Project, as revised, does not constitute final agency action that is subject to judicial review under the APA." *Vill. of Bald Head Island v. U.S. Army Corps of Eng'rs*, 714 F.3d 186, 196 (4th Cir. 2013). Therefore, the Corps could not be forced to follow the SMP schedule. Importantly for the purposes of future CZMA objections, in that litigation the Corps argued that it never "agreed" to the SMP (the DeLony letter was characterized as a non-binding statement of intended future action) and that the Corps District Office could not legally enter into a binding agreement.

The Corps' 2025 maintenance dredging project is continuing to disregard the SMP. Under the SMP, the 2025 maintenance dredge material should be deposited on Caswell Beach. However, based on funding needs, the Corps justifies depositing sand dredged from the Channel on Oak Island beaches east of Caswell Beach and thus outside the recognized River mouth littoral cell: there is more sand in the navigation Channel than the Corps says it has funding to remove, and the Town of Oak Island is paying to have it placed on its beaches. *See* Attachment K, Corps response, June 30, 2025, p. 4, to VBHI objection to 2025 maintenance contract. Placing this sand outside the Channel littoral cell is to the detriment and expense of VBHI, despite VBHI's objections and in violation of the Conditions in the Moffitt letter (Attachment E, Conditions 3 and 5). Regardless of the Corps' broad reading of its flexibility under the SMP,[11] that reading clearly does not protect the littoral cell identified in the studies leading to the SMP, and thus does not protect that AEC.

The DEIS for the Project proposes to continue these practices. DEIS p. 2-18, Table 2-7. The proposed Project is thus inconsistent with the North Carolina coastal management program and DCM's prior conditional concurrence, and, if approved, will perpetuate and exacerbate the damage to BHI and the sand that forms it. Foth Review (Attachment G), p. 10, ¶¶ 1 and 2.

C. Lessons learned: the Corps' 2000 WHP commitments are not enforceable

The lesson to be learned is that **protection of AECs, including the BHI-Caswell sand transport system and the shoals and beaches it supports, requires legally binding, enforceable commitments by the Corps or Project Sponsor. Unfunded assurances of future mitigation and performance do not provide the protection necessary for a consistency concurrence.**

The form of such enforceable commitments is beyond the scope of these comments but such commitments should be sufficient to enforce compliance with the North Carolina coastal management program. This likely will require some combination of the following mechanisms: (a) incorporating the required action into an element of the initial Project construction as an explicit, mandatory term; (b) including an on-going commitment (like the SMP) into a judicial consent decree, enforcement of which is within the power of a US District Court; and/or (c)

[11] Correspondence from the Corps regarding the 2025 O&M dredging focuses on areas where the SMP uses general language ("Oak Island") and does not address the overall specifically articulated goal of littoral cell protection, which does not encompass all of Oak Island. *See* Attachment K.

establishing a protected fund to pay for the commitment. The City of Southport and VBHI have each recently passed resolutions (Attachment M) calling for an adaptive management plan with a dedicated fund placed in escrow before construction commences to ensure monitoring and remediation of Project impacts.

D. The SMP should be re-instituted, updated, and made enforceable.

The 2000 DeLony letter stated the Corps would monitor and adjust the placement volumes if the actual sharing ratio resulted in an imbalance with the demonstrated impacts. Attachment D, p. 3. No adjustment has been made despite the subsequent 20+ years of monitoring data showing a significant recurring sand deficit at BHI and excess sand at Caswell Beach: the correct ratio (BHI to Caswell) is closer to 7:1 instead of 2:1. *See* Foth Review, (Attachment G), p. 11. In addition, the new Channel design will reduce the frequency of necessary maintenance dredging, thus reducing the frequency and quantity of regular renourishment of the adjacent beaches, further exacerbating the deleterious effects on the beaches and their dependent habitats and infrastructure. *Id.*, ¶ 1.

The SMP stressed the importance of maintaining sand within the littoral cell:

> Thus, the removal of a cubic yard of littoral sediment from a tidal entrance or inlet with deposition outside the active littoral zone of the beach will ultimately cause a cubic yard deficit somewhere within the sand sharing system affected by that particular entrance or inlet. **The impact of the removal of littoral sediment from the active littoral zone through channel maintenance is identified as a major cause of man-induced erosion in the US Army Corps of Engineers Shore Protection Manual.** From an engineering perspective, the primary requirement of the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to **prevent project induced erosion of the adjacent beaches by conserving the limited natural resource, sand, through deposition directly on the adjacent beaches.**

SMP ¶ 20, p. 10 (emphasis added). It is now clear that the protection afforded by retaining sand within the littoral cell is secondary to the Corps' primary purpose of least-cost Channel maintenance. The Bald Head-Caswell sand sharing system is plainly no longer protected by the SMP. To protect the integrity of this AEC—to assure compliance with CAMA "to the maximum extent practicable"—the SMP should be updated and made enforceable as a consistency requirement.

VI. CONCLUSION

The Wilmington Harbor Project cost has ballooned to $1.4 billion, of which North Carolina will have to pay $339 million. Yet only $60 million is set aside for mitigation, addressing only the loss of some freshwater wetlands and improving fish passages at Lock and Dam 1 and 2. By

comparison, the recent Savannah Harbor[12] deepening project cost $973 million, of which almost half (over $480 million) was dedicated for mitigation and monitoring. The scale of the Wilmington Project and the scope of potential harm to AECs over 28 miles of river plus ocean shoals and beaches mandate a comparable, significant commitment of resources to the protection of North Carolina's environment.

Since the 2000 WHP, it has become clear that the Corps' navigation projects are inflicting serious, on-going harm to numerous AECs, to the direct detriment and expense of VBHI. As the Foth Reviews demonstrate, the DEIS failed to analyze the integrated sand transport system at the mouth of the River and the DEIS **forecasts impacts more than five-and-a-half times less than those actually observed** based on historical data. VBHI has already spent $70+ million in twenty-five years, and can anticipate spending more than twice that in the fifty-year life of the Project, if left un-mitigated. In light of the Corps' disregard of the prior commitments and the lack of analysis in the DEIS, it is clear that adequate protections of the AECs are not being provided "to the maximum extent practicable," as required by law. Indeed, it is clear that those AECs are actually at risk and will be harmed. We urge NC DCM to object to this Project and pursue **enforceable** methods of protecting North Carolina's coastal resources in fulfillment of our State's coastal management program, including specific, funded plans for future monitoring and on-going mitigation.

Very truly yours,



William P. H. Cary
Counsel for Village of Bald Head Island

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Justin McCorcle, Wilmington District Counsel, U.S. Army Corps of Engineers
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Heather Coats, Beach & Inlet Management Project Coordinator,
Div. of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Dr. Joe Pat Hatem, Mayor, City of Southport
Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer

[12] Savannah handles 16 times more containerized cargo than Wilmington, and its project has a BCR of 7.3, compared to the Corps' current estimate of 1.3 for Wilmington, and Dr. Ashar's estimate of less than 1:1. *See* VBHI Supplemental Comments.

VILLAGE OF BALD HEAD ISLAND COMMENTS

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ATTACHMENTS

Attachment A:	Bald Head Island Mitigation Costs of Navigation Channel Impacts
Attachment B:	Olsen Letter to USACE 21 July 1999
Attachment C:	Sand Management Plan
Attachment D:	DeLony Letter 9 June 2000
Attachment E:	Moffitt Letter 15 June 2000
Attachment F:	Finding of No Significant Impact
	Wilmington Harbor 2000 (excerpt)
Attachment G:	Foth Review of Wilmington Harbor DLR and DEIS for VBHI
Attachment H:	Bald Head Island Conservancy
	Initial Scoping Comments-30 June 2023
Attachment I:	E-Mails Regarding Public Participation in NED
Attachment J:	E-Mails Regarding Comment Period Extension
Attachment K:	Correspondence with USACE Regarding 2025 Maintenance Dredging
Attachment L:	Foth Supplemental Report
Attachment M:	Resolutions of City of Southport and Village of Bald Head Island

ATTACHMENT A

VILLAGE OF BALD HEAD ISLAND COMMENTS

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BALD HEAD ISLAND

MITIGATION COSTS OF NAVIGATION CHANNEL IMPACTS

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

Previous Projects

• Engineered Beach Project 2009/2010		
• Dredging Contract	$	14,800,000
• Interest Expense	$	1,536,000
• Permitting – *Land Management Group, Inc., Olsen Associates, Inc., Legal*	$	1,000,000
• Sand Filled Geotextile Groinfield		
• 1995	$	320,000
• 2005	$	850,000
• 2009/2010	$	1,150,000
• Road Overwash		
• South Bald Head Wynd Road Repair 2004	$	250,000
• Sandbag Revetment Wall	$	250,000
• Sandpiper Trail Sandbag Wall + 2009 Repairs	$	65,000
• 2007 Sand Placement (Assist USACOE- limited funds)	$	900,000
• Periodic Beach Profile Monitoring	$	595,000
• Required Jay Bird Shoal Biological Monitoring per Permit	$	50,985
• Required Beach Front Biological Monitoring per Permit	$	30,030
• Install Emergency Sandbag Revetment at the Point	$	230,000
• Repair & Maintenance of Revetment at the Point	$	8,000
• BH Creek 2006 dredging Project w/ sand placed on West Beach	$	737,858
Total	$	**22,772,873**

Additional Expenditures Reimbursed through FEMA Public Assistance Funds

• Bald Head Creek Dredging Project (Emergency Sand Source to mitigate Erosion due to Hurricane Irene)	$	1,230,000
• Sand-filled Tube Groin Field Repairs due to Hurricane Irene	$	650,000
	$	**1,880,000**

Additional Expenditures Reimbursed through State of NC/DENR Water Resources Development Grant Funds

• Bald Head Creek Dredging Project 2006 (Southwind Construction Co.)	$	**260,000**

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

The Terminal Groin Project (2015)

- Terminal Groin GO Bond Expenditures @ 2-28-18 (2015 Project)
  Engineering/Design/Modeling/NEPA EIS costs $ 1,177,000
  (Phase I Construction/Orion w/ Corps 2015 O&M Sand)
  - Terminal Groin Construction, part of the T6 project, placing approximately 1 million for the fillet sand to place behind the T6 structure $ 7,876,858
  - Harbor Jetty Extension w/ Spurs $ 1,456,316
  - West Beach and Row Boat Row (Bald Head Creek Dredging) $ 1,261,026

    - Army COE Reimbursement $ 105,341
    - MECA Reimbursement 830,514
    - Contract Reimbursements 140,363
      - Total $ 1,076,218 $ (1,076,218)

  Total Cost, Phase I $ **9,517,982**

- Breakwaters Project:
  - Construction of two detached rock breakwaters located north of the Marina
    - Intercoastal Maine, LLC $ **895,052**

Sand Re-nourishment / Groin Tube Project (2018-19)

- Sand Re-nourishment / Groin Tube Replacements (2019 Project)
  (Phase II Construction/ SJ Hamill Construction, Bradley Textile Tubes)
  - Beach Nourishment 1million cubic yards, including mobilization $ 11,767,000
  - Groin Tube manufacture and installation 1,514,429
  - Engineering Costs 445,000
  - Legal Costs $ 62,500

  Total Cost, Phase II $ **13,788,929**

Marina Channel Maintenance Program

(Grant received from Department of Environmental Quality Resource Development Project to reimburse the Village for 66% of the cost, current expiration of Grant May 2019.)

- Village portion of expenses paid for Dredging the Channel:
  2017 – 2023: $ **289,140**

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

Sand Re-nourishment / Groin Tube Project (2024-25)

- Sand Re-nourishment / Groin Tube Replacements (2025 Project)
  Beach Fill Construction/Marinex, Flint Textiles Geotubes, McPherson Marine Service

• Beach Nourishment 1 million cubic yards, including mobilization	$	16,175,000
• Groin Tube Installation	$	1,517,430
• Tube manufacturing (Flint)	$	446,425
• Engineering Costs – JBS Borrow Site Permitting	$	230,200
• Beach Fill Design/Construction Document (including groins)	$	350,000
• Construction Management/observation	$	425,000
• Legal – Construction Contracts Review/Bid	$	7,500
Total Cost	$	**19,151,555**

Beach Monitoring

Annual Shoreline Monitoring Program Expenses (last 10 years): **$2,000,000**
(Includes spring/fall surveying and aerial imagery documentation w/ final report from Coastal Engineer)

Total Accumulated Costs Associated with the Mitigation of the Navigation Channel **$69,303,391**

Overall Total To Date - $71,732,531

(25-year average expenditure annually - $2.87M)

ATTACHMENT B

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

OLSEN LETTER TO USACE 21 JULY 1999



Coastal Engineering

July 21, 1999

District Engineer
U.S. Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

Attn: Mr. John Meshaw, (CESQW-TS-PE)

Re: Wilmington Harbor Navigation Project - Ocean Bar Channel Realignment
Comments To The File

Dear Mr. Meshaw:

This letter is submitted to the District on behalf of the Village of Bald Head Island and constitutes a second response to your Request-For-Comments dated June 22nd, 1999 regarding the above-referenced project improvements. This information serves to augment both our comments dated July 2, 1999 (see Exhibit No. 1) and a "Position Paper" dated March, 1999 (see Exhibit No. 2). The comments presented herein address both the selected entrance channel alignment, which will directly impact the existing Bald Head Island shoreline, and our ongoing request to the District regarding long-term project mitigation, appropriately placed beach disposal, and the placement of sand at Bald head Island during sea turtle nesting season of Year 2000. Accordingly, please consider the following additional information submitted to the file:

1.) **Project Impacts**

a.) **Sediment Budget** - The proposed entrance channel realignment proposes to excavate well in excess of 6M cy of high quality sand from the existing *sand sharing system* directly seaward of Bald Head Island (BHI). For purposes of discussion, the latter can be considered to be all offshore portions of the seabed eastward of the existing Wilmington Harbor entrance channel centerline. In addition, project construction will remove several million cubic yards of "mixed quality" sand, (i.e., materials with greater than 10% fines) from existing shoals directly seaward of BHI.

It is reliably predicted that the adjacent shoal system seaward of BHI will adjust to the new channel alignment -- thereby resulting in the requirement for the continued removal of sand by maintenance dredging from the channel fairway as well as from project wideners. Within the first 10 years, or more, following entrance channel reconfiguration, the continuing loss of material from the BHI sand sharing system due to maintenance will be significant.

olsen associates, inc.
4438 Herschel Street
Jacksonville, FL 32210
(904) 387-6114
(Fax) 384-7368

It is the position of the Village of Bald Head Island that the cumulative removal of material from the adjacent seaward sand-sharing system of Bald Head Island must be adequately mitigated by the project sponsor and the Wilmington District, COE.

b.) **Alongshore Sediment Transport Potential** - A 2nd source of anticipated impact to Bald Head Island as a result of entrance channel construction is a modification of alongshore littoral transport potential. Although the District staff is performing analyses of this phenomenon, it is acknowledged that it's quantification is often difficult – particularly, with the type of bathymetric conditions under consideration. Hence, predicted positive or negative changes in littoral transport potential often result in non-conclusive opinions regarding impacts, or the lack thereof.

It is the position of the Village of Bald Head Island that any identification of project related mitigation predicated solely upon variations in littoral transport at BHI will be unacceptable. The Village will be satisfied with nothing less than mitigation based upon readily identified and easily quantified sediment budget impacts as discussed in item "a" above.

c.) **Current Flow Field Modification** - The impinging hydraulic flow of the existing navigation channel along West Beach at BHI is considered to be a factor contributing to existing shoreline erosion at that location. Proposed channel modifications within the Jay Bird shoals segment of work could exacerbate existing West Beach impacts by way of increased flow magnitude. Moreover, the reorientation of the channel seaward of BHI from sta.90+00 seaward could result in a meander phenomenon type impact along the West Beach shoreline between sta. 0+00 and sta. 60+00. The District has not performed any level of numerical hydrodynamic modeling to address such impacts.

It is the position of the Village of Bald Head Island, that the District must recognize, monitor and directly mitigate, as necessary, any reconfiguration of the West Beach shoreline resulting from entrance channel reorientation. Such mitigation could potentially require structures necessary to restrict channel migration in the future.

2. Timing of Mitigation

It is relatively clear that no landform adjacent to the Wilmington Harbor Entrance Channel has been more adversely affected over time than BHI. Similarly, it is reasonable to assume that due to the reorientation of the entrance channel from sta. 90+00 seaward, BHI will experience substantial immediate and long term impacts to its sand sharing system. Hence, the timing of beach disposal operations at Bald Head is extremely important with respect to the mitigation of project impacts.

It is the position of the Village of Bald Head Island that the Wilmington District should initiate a contract sufficient to allow for beach disposal at Bald head Island at as early a date as possible during Year 2000. It is the opinion of the Village that a favorable Section 7 Consultation can be achieved in order to sufficiently protect sea turtle nesting at Bald Head Island during summer construction. The Village has volunteered to assist the District in this regard.

3. Brunswick Beaches Consortium (BBC)

The Wilmington District has formulated a tentative broad-based, countywide beach disposal program utilizing the 8M cy+ of beach quality sand to be excavated as a result of the Entrance Channel improvements. As discussed above, the vast majority of that sand will be derived solely from the sand sharing system of BHI and as such must be ultimately mitigated for (by the District and the project sponsor) at that location.

Although the Village of Bald Head Island is a contributing member of the BBC, neither the potential lack of fiscal resources nor the global interests of that entity, or its individual members, should influence in any way the Wilmington District's beach disposal scheduling or mitigation requirements for Bald Head Island. The Village of BHI has the resources, expertise and intentions of assisting the District in the construction of a suitably sized beach disposal project at as early a date as possible next year. Based upon the total length of shoreline along South Beach and West Beach at BHI subject to sand placement, the District proposal of an initial disposal of 1.5M cy of sand at that location is considered to be insufficient to meet current needs and potential near term impacts of entrance channel realignment.

The Village of Bald Head Island does not object to the initial construction of beach disposal projects at other Brunswick County locations which seek to maximize public benefits associated with channel construction. It is the position of the Village of BHI, however, that such disposal efforts must not reduce the direct mitigation commitments which need to be obligated at BHI for purposes of addressing both project construction and future maintenance.

4. Legal Action(s)

As of this date, the Village is laboring under the assumption that the Environmental Assessment (EA) and other studies, or analyses, being prepared by the Wilmington District, COE will both adequately and equitably address the mitigation requirements of BHI. Those mitigation considerations should address a Beach Disposal Plan at that location which obligates both an adequately sized initial effort as well as the continued disposal of future maintenance material that consists of sand, at no cost to local interests.

Without an appropriate finding and adequate assurances required to provide comprehensive project mitigation at BHI, the Village will consider legal recourse to protect its interests. Although it is not our intent, such legal action could unfortunately delay the proposed entrance channel improvement project.

The Village of Bald Head Island appreciates the District's consideration of this submittal in your formulation of the final EA and attendant project formulations necessary to allow for construction of the reconfigured Wilmington Harbor Entrance Channel.

Thank you.

Sincerely,

Erik J. Olsen, P.E.

EJO:lfm

Enc:

cc: Kitty Henson, Mayor
Wade Horne, Village Manger
Tom Jarrett, P.E.
W. Bissett, P.E.

EXHIBIT No.1



Coastal Engineering

July 2, 1999

District Engineer
US Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

Attn: Mr. John Meshaw, (CESAW-TS-PE)

Re: Wilmington Harbor Navigation Project - Ocean Bar Channel Realignment

Dear Mr. Meshaw:

This letter is submitted to the District on behalf of the Village of Bald Head Island and is in response to your solicitation of June 22nd, 1999 regarding the above-referenced project improvements. As the District files will show, the Village has requested beach disposal along the entirety of both West Beach and South Beach. Similarly, the Village is prepared to accommodate 3M cy or more of sand (in-place) in a design configuration (see attached correspondence dated June 14, 1999 to D. Wayne Bissette, P.E.).

As a result of chronic beach erosion, the Village of Bald Head Island requests an initiation of sand placement at as early a data as possible in Year 2000. Accordingly, we strongly urge the District to initiate a Section 7 Consultation for purposes of allowing beach fill placement during the turtle nesting season next year. I have both personally met and discussed this recommendation with various District staff. Accordingly, we are gratified that the District is presently considering this option by way of soliciting public comment.

It is our opinion that a favorable Section 7 Biological Opinion can be rendered by the U.S.F.& W.S. sufficient to allow oceanfront construction during turtle nesting season at Bald Head Island next year. We are relatively confident in that regard for the following reasons:

- The beaches of Bald Head Island are sufficiently eroded such that large scale nest relocation is presently necessary in order to protect the species,

- The local Bald Head Island Conservancy is well skilled at implementing a suitable *Sea Turtle Protection Plan* during the period of construction. Note - the Village is presently seeking the support of the Conservancy's Board in this regard.

olsen
associates, inc.

4438 Herschel Street
Jacksonville, FL 32210
(904) 387-6114
(Fax) 384-7368

- The placement of sand at Bald Head Island beginning in April of 2000 will advance both the Navigation Project construction schedule as well as the attendant COE beach disposal plan for other locations within Brunswick County, and

- The allowance of sand placement during turtle nesting season in areas where impacts can be avoided will allow for the preservation and beneficial use of over 8M cy of beach quality sand. Conversely, the placement, or transfer, of this resource to the ODMDS or other non-beach locations, due to scheduling constraints, would constitute an extremely significant adverse physical and economic impact to Brunswick County.

For the record, we would note that the Village formally objects to the potential placement of sand on their beaches where disposal is "limited to the area below the high tide line," as described in the District's Request For Information dated June 22, 1999. It is our position that the placement of disposal material in an appropriate beach nourishment design configuration will render the greatest level of protection to both existing development and endangered species. With regard to future turtle nesting habitat, it should be intuitively obvious that the highest level of benefit will be achieved through the construction of a wide, dry beach berm which exhibits longevity after restoration. The latter would be expected to provide the longest duration of nesting habitat, thereby offsetting the continuing need to relocate nests along any section of erosional shoreline so improved. Furthermore, we do not know of any scientific data, or turtle impact studies, which argue for sand placement below the MHWL. Our firm's collective personal observation is that sand placement at that location to either avoid Easement requirements, or to placate environmental "concerns," ultimately compromises nesting habitat. That is to say, such placement techniques commonly result in a saddle, or low area, in the beach between the existing dune or upland and the outer limit of sand fill. Such low areas can subject nests to inundation -- as well as obscure turtle crawl processes both during nesting and hatchling return to the ocean. Hence, such fill placement techniques should be avoided due to potential adverse impacts to the species.

In summary, the Village supports the placement of beach compatible materials, but only in a strategic design configuration. It is the Village's intent to provide the District with a preferred design plan to be incorporated into project contract documents. The Village opposes the placement of beach quality sand within the ODMDS or in the nearshore littoral zone. The Village does not object to the placement of non-beach compatible material within the old ocean bar channel; however, it is requested that the Wilmington District develop a protocol for the definition of non-sandy sediments mutually acceptable to the Brunswick Beaches Consortium. The reconfiguration of the Cape Fear River Ocean Bar channel will necessitate both initial *and* long term mitigation at Bald

Head Island. Hence, a disposal plan for sand derived from future channel maintenance is of significant interest to the Village of Bald Head Island.

Thank you for your consideration in these matters.

Sincerely,

Erik J. Olsen, P.E.

EJO:lfm

Enc:
cc: Wade Horne, Village Manager
Bald Head Island Nature Conservancy, Inc.

EXHIBIT No.2

POSITION PAPER

OPINIONS AND RECOMMENDATIONS REGARDING THE CAPE FEAR RIVER ENTRANCE CHANNEL AND BEACH EROSION AT BALD HEAD ISLAND, N.C.

Village of Bald Head Island
March, 1999

HISTORICAL PERSPECTIVE AND EXISTING CONDITIONS

Since about 1974, beach erosion along Bald Head Island has been manifest as chronic and severe shoreline recession along the South Beach (most particularly the western portion) and selected reaches of the West Beach (ref. Figure 1). Most recently, erosion stress has accelerated along central South Beach. Long-term shoreline retreat has averaged over 30-ft per/yr at the former Inn location, 10 to 25 ft/yr elsewhere along the western portion of South Beach, and 3 to 5 ft/yr along the West Beach.

The island's erosion is the apparent result of several combined factors: (1) divergent alongshore sediment transport gradients, (2) tidal currents and proximity to the Cape Fear River Entrance, and (3) impacts of the adjacent federal navigation project.

Along South Beach, the net alongshore transport potential diverges at a nodal point between Sea Oats Trail and Silversides Trail. To the west, transport accelerates rapidly westward due to both wave and tidal current forces. To the east, transport accelerates rapidly eastward. Simplisticly, this means that sand is stripped off of central South Beach and transported to the west and east. Toward the west, it deposits as a spit and/or is lost from the island to the Cape Fear River Entrance. To the east, predicted deceleration in the transport potential within 3000 ft west of the Point allows some deposition of this sand (and therefore local beach stability or periodic accretion), though most of the sand is ultimately lost to Frying Pan Shoals at Cape Fear.

Likewise, sand is lost from West Beach via wave stress that transports sand *northward* toward the marina entrance and marshes, and via ebb tidal currents that transport sand *southward* toward the spit between the South and West Beach. These ebb currents, in addition to the flood currents along South Beach, episodically "trim" the spit and ultimately move sand from the island toward the adjacent, deep navigation project channel. The proximity of West Beach to the federal navigation channel provides little width upon which to create (or enhance) a stable beach along much of the West Beach shoreline. The latter is similarly adversely affected by the orientation of the Smith Island Range navigation channel segment and the resultant directionality and impingement of ebb tidal flow upon the West Beach shoreline.

It is submitted that the construction and maintenance of the Cape Fear River Federal Navigation Project, at its current location, permanently interrupted the pre-existing natural sand bypassing system between Caswell Beach and Bald Head Island. Initially, the entrance channel severed the inlet's ebb tidal shoal, causing the eastern lobe (Bald Head Shoal) to migrate shoreward and onshore toward Bald Head Island. As a result, the western shore of the island responded by advancing some 1500 to 2000 feet between the late 1800's and the mid 1920's.

Between about 1925 and 1971, the net shoreline location remained relatively stable; however, during the same period, the submerged portions of the offshore shoal that had led to the previous unprecedented accretion were eroding as a result of the navigation project channel's interruption of easterly sand drift. Beginning in about 1974, the shoreline abruptly responded to the eroding seabed and commenced a trend of rapid retreat -- reaching 60 feet per year along portions of the recently developed Bald Head Island oceanfront.

It appears, therefore, that the island's present day beach erosion trend results predominantly from ongoing "deflation" (recession) of the beach growth that occurred in the early 1900's when Bald Head Shoal migrated onshore. That migration was associated with the early navigation project's severance of the natural ebb tidal shoal. The island's oceanfront was developed when the shoreline was at the anomalously advanced location that had resulted from the onshore movement of the severed shoal. The existing navigation project's continued interruption of the Cape Fear River sand bypassing system, including the historic removal of sand from the system by maintenance dredging, has led to the retreat of this "advanced" shoreline location and is expected to continue to contribute to beach erosion and shoreline recession in the future. It is likely that proposed navigation project improvements, and in particular realignment of the existing entrance channel, could further exacerbate the condition.

PRIOR FEDERAL ACTIONS

In 1989, the Wilmington District, US Army Corps of Engineers, performed a Section 111 Reconnaissance Report at the request of the Village of Bald Head Island. The purpose of this preliminary study was to make an initial determination as to whether or not continued dredging of the Cape Fear River entrance channel was causing or accelerating erosion on the Island. Authority for the investigation was provided by Section 111 of the Rivers and Harbors Act of 1968.

The District concluded at the time that "no evidence exists to connect the severe erosion of the west end of Bald Head Island with maintenance dredging in the Cape Fear entrance channel." Hence, mitigation of the erosion under Authority of Section 111 was not determined to be warranted.

The District, however, did favorably determine that placement of beach quality, dredged material recovered from the Cape Fear River entrance channel on the westward end of Bald Head Island was feasible and satisfied the criteria necessary for 50-50 cost sharing under the provisions prescribed by Section 933 of WRDA (1996).

Likewise, in 1989, the coastal engineering firm of Olsen Associates, Inc. as consultant to the Village, rendered a contradictory opinion regarding the probability of a cause and effect relationship between ongoing erosion trends at Bald Head Island and the construction and maintenance of the adjacent navigation channel. Pragmatically, however, the firm noted that Section 111 of the Rivers and Harbors Act of 1968 held virtually no promise as a potential mechanism for seeking federal mitigation, solely on the basis that it requires a concurrent congressionally authorized Shore Protection Project. Accordingly, even if the federally constructed navigation works were definitely proven to have had a large scale quantifiable adverse impact on Bald Head Island, Section 111 expenditures by the Wilmington District to resolve the problem could, in all probability, not be made due to Policies implemented by Higher Authority.

As a result, Olsen Associates, Inc. supported the District's finding that beach disposal via Section 933 constituted the most advantageous (and timely) opportunity for initiating a program of erosion control along South Beach at Bald Head Island. Since that date, two Section 933 projects have been constructed: 350,000 cy in 1991 and 450,000 cy in 1997.

PROPOSED NAVIGATION PROJECT MODIFICATIONS

Initial plan formulation of modifications to the Wilmington Harbor Navigation Project has resulted in a recommended increase in the authorized channel depth for the ocean entrance channel from -40 ft to -44 ft, MLW. Actual depths constructed would exceed the authorized depth by 2 to 3 feet. Unfortunately, geotechnical studies have shown substantial quantities of rock to exist above elevation -40 MLW, within portions of the existing entrance channel alignment.

Subsequent Value Engineering analyses by the Wilmington District have recommended for the adoption of an alternate ocean entrance channel alignment for purposes of avoiding the substantial additive costs of rock removal. Similarly, portions of the outer channel extension were found to have seabeds which include hard corals. Accordingly, several alternate alignments are presently under consideration. As shown by Figure 2, the channel alignments under evaluation all turn easterly directly seaward of Bald Head Island. Several alternatives likewise include modifications westward of BHI in the vicinity of Jay Bird Shoals. The latter would result in a more shore perpendicular alignment of ebb tidal flow from the Cape Fear River in the vicinity of Bald Head Island.

As of January 1999, Wilmington District staff were evaluating issues regarding potential post-construction shoaling; navigability; environmental impacts and construction costs for each alternative channel alignment.

CONSIDERATIONS TO BALD HEAD ISLAND

Long term impacts of the existing navigation project channel alignment and authorized dimensions are expected to be occurring at Bald Head Island as a result of:

a.) the elimination of natural pre-project sand bypassing phenomena associated with shoal migration at the mouth of the Cape Fear River;

b.) the fixation of the navigation channel alignment at one location in extremely close proximity to the Bald Head Island shoreline;

c.) continuous and long-term impacts to the sediment budget of the local sand sharing system extending from the Cape Fear Shoals to portions of Oak Island;

d.) resultant significant long-term deflation of the ebb tidal shoals seaward of Bald Head Island;

e.) the accentuation of the hydraulic gradients of flood tidal flows along the South Beach and West Beach shorelines of Bald Head Island and the increase in magnitude and frequency of occurrence of a major nearshore marginal flood tidal channel at the western extremity of South Beach, and

f.) The directionality of ebb tidal flow directly toward West Beach resulting from the artificially maintained alignment of the Smith Island Range.

All of these phenomena exist today; and it is abundantly clear that most (if not all) of these phenomena will be exacerbated by the implementation of a channel realignment within the corridor under consideration (see Figure 2). It is therefore altogether reasonable to expect that the shoreline of Bald Head Island will react both adversely and concurrently with both initial construction of a channel re-alignment -- as well as its continuing maintenance into the future at a new location within the existing, undisturbed portions of the ebb tidal shoal platform.

PROPOSED MITIGATION BY FEDERAL INTERESTS

For purposes of offsetting anticipated navigation project impacts associated with channel realignment and project deepening, three (3) mitigation elements should be implemented as part of *both* project construction and future project maintenance. The work should be performed integrally with the federal navigation project at 100% federal cost. The mitigation elements are as follows:

a.) *Beach Fill* - At a *minimum*, some 2-3 Mcy of beach quality sand should be placed along the South Beach shoreline on Bald Head Island as advance fill. The fill should address the entire 16,000 ft. of shoreline and should be placed in accordance with a rational design based upon both existing and anticipated future littoral transport trends. Depending upon the condition of the shoreline at the time of project construction and the channel alignment selected by the Wilmington District, additional limited advance filling of West Beach should likewise be performed as a mitigation measure.

b.) *Fill Maintenance* - Continuing maintenance of both the South Beach and West Beach shorelines should be performed utilizing beach quality sand excavated during annual channel maintenance. The *minimum* initial equivalent annualized requirement is presently estimated at 350,000 cy/yr. An updated maintenance requirement should be continually computed in the future based upon the best available data. The stipulated volume should be updated annually based upon a comprehensive monitoring program of both affected shorelines on Bald Head Island. All fill should be placed in such a manner that it results in the greatest spatial and temporal benefit to the affected shorelines, both developed and undeveloped.

c.) *Nearshore Disposal* - Should beach quality sand in excess of initial or annual fill requirements become available, preference should be given to additional beach width enhancement. Should annualized beach filling be restricted due to permitting conditions, or other extenuating circumstances, nearshore disposal of "excess" material below the MLWL should be considered in the immediate vicinity of Bald Head Island. All such material placement should be strategically performed *only* in the more dynamic portions of the nearshore zone where direct benefit to the active littoral system can be assured via onshore transport by natural forces.

d.) *Damages* - In the event that mitigation via item "a" through "c" above prove insufficient to offset project related impacts to Bald Head Island, the District must commit to the construction of additional structural or non-structural alternatives. Such mitigation must be provided at no expense to local interests, although the consent of local interests must be obtained in the selection of a preferred alternative.

Just as various federal agencies have determined that rock removal during project construction is uneconomical and that associated resource impacts are environmentally unacceptable, the Village of Bald Head Island feels similarly compelled to be adequately considered in the issue of ongoing and future erosional impacts due to navigation channel modifications. As a stakeholder in the process of "resource" impact evaluation, the Village believes that partnering with the District is possible, assuming that an adequate comprehensive Mitigation Plan between the two parties is reached. To that end, the Village is of the opinion that existing North Carolina Statutory requirements, as well as the necessity to be consistent with the State's Coastal Zone Management Plan, provide ample justification for the implementation of the mitigation elements discussed herein.

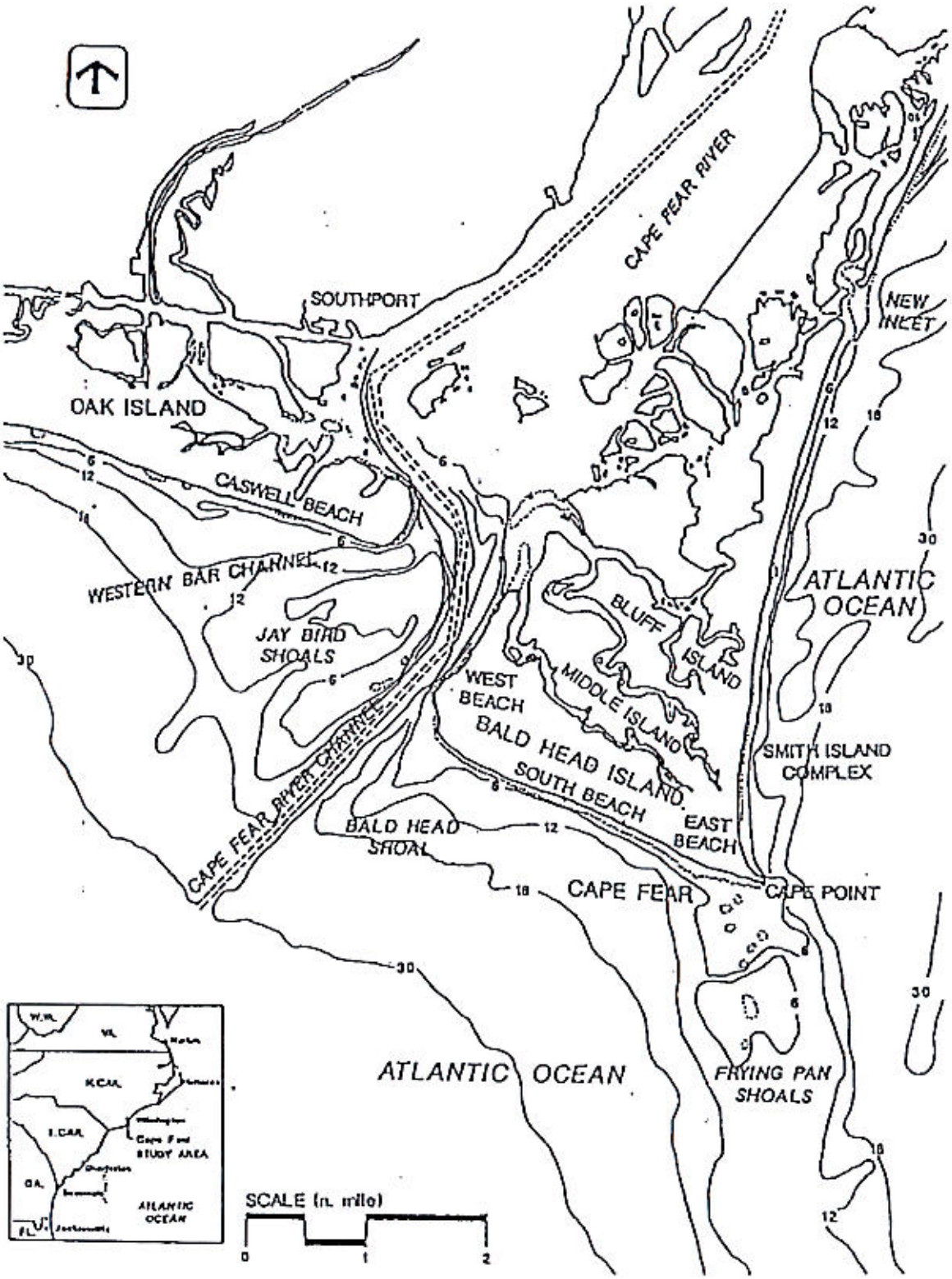
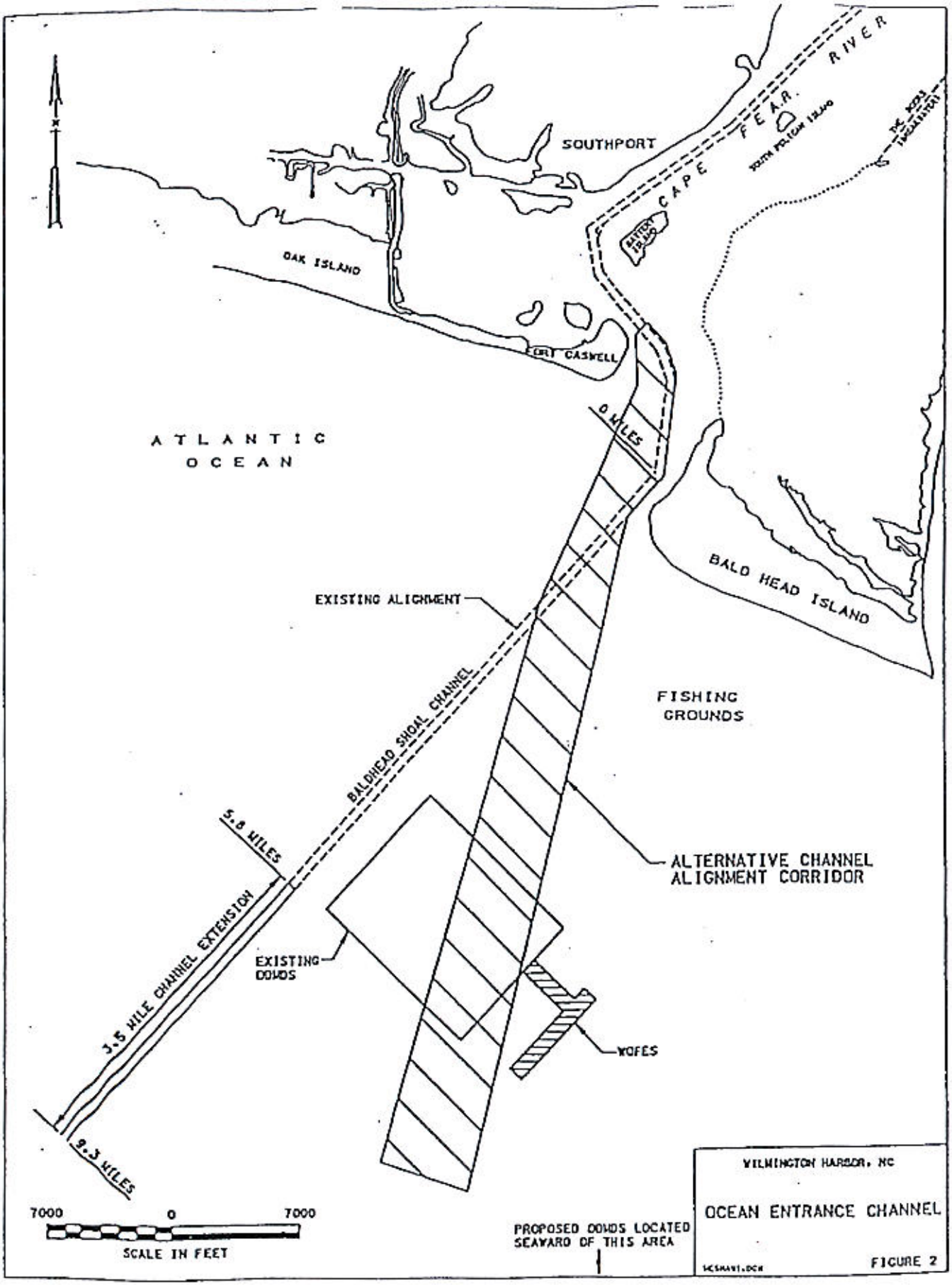


FIGURE 1 Vicinity map of Bald Head Island, North Carolina, USA.


SOUTHPORT
CAPE FEAR RIVER
OAK ISLAND
FORT CASWELL
ATLANTIC OCEAN
0 MILES
BALD HEAD ISLAND
EXISTING ALIGNMENT
BALDHEAD SHOAL CHANNEL
FISHING GROUNDS
5.8 MILES
3.5 MILE CHANNEL EXTENSION
ALTERNATIVE CHANNEL ALIGNMENT CORRIDOR
EXISTING ODMDS
WOFES
9.3 MILES
7000 0 7000
SCALE IN FEET
PROPOSED ODMDS LOCATED SEAWARD OF THIS AREA
WILMINGTON HARBOR, NC
OCEAN ENTRANCE CHANNEL
FIGURE 2

ATTACHMENT C

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

SAND MANAGEMENT PLAN

WILMINGTON HARBOR

SAND MANAGEMENT PLAN
OCEAN ENTRANCE CHANNELS AND INNER HARBOR FROM SNOWS MARSH THROUGH HORSESHOE SHOAL CHANNELS

1. **General.** Deepening of Wilmington Harbor will involve the removal of large quantities of material including beach quality sand. Most of the beach quality material to be removed during deepening will come from the Ocean Entrance Channels consisting of the following ranges: Baldhead Shoal; Smith Island; Baldhead – Caswell; Southport; Battery Island, and Snows Marsh seaward of station 10+00. These ranges are shown on *Figure 1*. Beach quality sands will also be removed from portions of the Inner Harbor channel extending from the upper 1000 feet of the Snows Marsh Range through the Horseshoe Shoal Range. These Inner Harbor channel ranges are also shown on *Figure 1*. A maximum of 6.0 million cubic yards of beach quality material will be removed from the lower portion of the Snows Marsh Range seaward through the Baldhead Shoal Range. Approximately 0.6 million cubic yards of beach quality material will be removed from the upper Snows Marsh Range through the Horseshoe Shoal Range. Sand management plans for these two segments of the harbor are developed below for both the new work material; i.e., the beach quality material to be removed during deepening; and future maintenance of these harbor segments that will involve the removal of littoral shoal material.

Ocean Entrance Channels – Sand Management Plan

2. **Introduction.** The sand management plan for the ocean entrance channels addresses dredging and disposal issues associated with the realigned Baldhead Shoal Channel as well as the Smith Island, Baldhead – Caswell, Southport, Battery Island, Lower Swash, and Snows Marsh Channels. Construction of the ocean entrance channels into Wilmington Harbor will entail the removal of approximately 15.5 million cubic yards of material, up to 6.0 million cubic yards of which is beach quality sand. Beach quality sand exists throughout all of the entrance channel except the new Baldhead Shoal Channel. Within the Baldhead Shoal Channel, beach quality sand is located between stations 0+00 and 120+00. Between station 0+00 and approximately 66+00, the entire channel prism is considered to be beach quality material. Between station 66+00 and 120+00, beach quality material is layered with the material lying above elevations ranging from -30 to -41 feet MLLW. Material below these depths contains a high percentage of clay and silt and is not suitable for beach disposal. Seaward of station 120+00, the new work material contains high concentrations of silt and clay and is not suited for placement on the beach. The beach quality material will be dredged primarily from the portion of Jay Bird Shoal which overlays the west side of the realigned bar channel and from Baldhead Shoal. Baldhead Shoal forms the east boundary of the existing channel, however, the realigned bar channel will cut across the seaward portion of this shoal. The present alignment of the ocean bar channel and that of the new bar channel are shown on *Figure 1*. As shown on *Figure 1*, the new bar channel passes through the eastern side of the existing Ocean Dredged Material Disposal Site (ODMDS).

3. The Brunswick County beach towns of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach have expressed an interest in receiving the beach quality material. Under Section 933 of the Water Resources Development Act of 1986 (Public Law 99-662), the Federal Government can cost share up to 50 percent of the added cost of depositing the material on the beach providing certain criteria are met. The primary requirement for Federal participation is that any added cost for placing sand on a particular beach segment must be economically justified. A base disposal plan associated with the least costly means of placing the beach quality material and a Section 933 disposal plan are discussed in the following paragraphs. In addition, a disposal plan for the annual maintenance material is presented following the disposal plan for the new work material.

4. **Plan Formulation – Ocean Entrance Channels New Work Material Disposal Plan.** The disposal plan for the new work material contained in the 1996 project feasibility report had all of the material from the Lower Big Island Range through the existing Baldhead Shoal Channel going to the ODMDS. It should be mentioned that the disposal plan in the feasibility report did not include consideration of the realigned Baldhead Shoal Channel. The alignment of the new Baldhead Shoal Channel came from a recommendation contained in a Value Engineering Study that demonstrated significant construction cost savings could be realized by avoiding rock in the existing Baldhead Shoal Channel. In any event, increased utilization of the existing ODMDS for disposal of maintenance and new work material has resulted in the existing ODMDS for Wilmington Harbor approaching full capacity. This combined with the passage of the realigned Baldhead Shoal Channel through the existing ODMDS has necessitated the development of a new ODMDS. The new ODMDS, which is being developed in cooperation with the Environmental Protection Agency (EPA), is located approximately 5 miles offshore of the existing ODMDS as shown on *Figure 1*. The new ODMDS is expected to be available for use by the end of 2001; consequently, the existing ODMDS must have sufficient capacity to accommodate the new work and maintenance material expected to be removed though the year 2001.

5. The remaining capacity of the existing ODMDS was estimated assuming that the area could be filled to an average elevation of 26 feet below mean lower low water (mllw). All future placement of dredge material in the existing ODMDS will take place west of the new channel alignment. In addition, no material would be placed in a 2,500-foot wide corridor parallel to and west of the new entrance channel in order to reduce the chance deposited material will move into and shoal the new channel (see *Figure 1*). The size of the corridor through the ODMDS is needed to prevent the return of deposited material into the channel and was based on the distance between the western toe of the existing ODMDS and the existing ocean entrance channel, which, as shown on *Figure 1*, is about 2,500 feet. Based on these assumptions, the remaining capacity of the existing ODMDS is approximately 17.8 million cubic yards.

6. Deepening of the Wilmington Harbor project is scheduled to begin in May 2000 with the award of a contract to construct the offshore portion of the Baldhead Shoal Channel seaward of station 120+00. The material to be removed from this segment of the new channel, which totals about 6.6 million cubic yards, contains significant quantities of silt and clay and will have to be deposited in the existing ODMDS. The contract for the

landward segment of Baldhead Shoal Channel and the other ocean entrance channels, which will include up to 6.0 million cubic yards of beach quality sand and 2.8 million cubic yards of material not suited for placement on the beach, will be awarded near the end of calendar year 2000. Work on the inner portions of the project from upper Snows Marsh Range to Horseshoe Shoal Range that contains 0.6 million cubic yards will also be performed in early 2001. The economic and engineering viability of options for the disposal of the beach quality material to be removed from upper Snows Marsh to Horseshoe Shoal is presented later in the section of this report entitled " Inner Harbor – Sand Management Plan." Finally, a contract for removal of rock and other sediments from the Big Island Range will be awarded in 2000 as a test to help determine contract scopes for rock removal from other sections of the harbor. All of the material from the Big Island Range (approximately 2.2 million cubic yards) will be deposited in the ODMDS. In summary, construction of the deeper channel between 2000 and 2001 will involve the removal of approximately 18.2 million cubic yards of material with all of this material scheduled to be placed in the existing ODMDS.

7. During the new ocean entrance channel construction period, periodic maintenance of the existing ocean entrance channel will have to continue as will the maintenance of the interior portions of the harbor. This maintenance material, which averages around 800,000 cubic yards per year from the entrance channel and 300,000 cubic yards from the interior channels, is normally placed in the ODMDS. In addition to the Wilmington Harbor maintenance material, material removed for maintenance of the Military Ocean Terminal at Sunny Point (MOTSU) is also normally placed in the ODMDS. Maintenance of MOTSU averages 1 million cubic yards per year. Thus, the combined volume of new work and maintenance material to be removed from Wilmington Harbor and MOTSU between 2000 and 2001 could total 22.4 million cubic yards, exceeding the remaining capacity of the existing ODMDS by more than 4.6 million cubic yards.

8. **Base Disposal Plan-New Work Material.** With the capacity of the existing ODMDS insufficient to accommodate the dredged material disposal volume requirements through 2001, the logical solution is to place up to 6.0 million cubic yards of beach quality material on adjacent beaches. The only other option would be to delay the construction of the harbor deepening project by at least one year which is not acceptable to the State of North Carolina, the project sponsor. Placement of up to 6.0 million cubic yards of new work material on the beach would reduce the volume of material to be placed in the existing ODMDS through the year 2001 to 16.4 million cubic yards, effectively depleting the remaining capacity of the existing ODMDS. Once the new ODMDS becomes operational, all future dredge material requiring ocean disposal will be placed in the new area.

9. The disposal of up to 6.0 million cubic yards of new work beach quality material would be distributed along 16,000 feet on Bald Head Island and 25,000 feet on Oak Island-Caswell Beach. Deposition on Bald Head Island would occur along 2,000 feet of West Beach, which faces the Cape Fear River Entrance, and along 14,000 feet of South Beach. Disposal on Oak Island-Caswell Beach would begin at the west boundary of the Fort Caswell Baptist Assembly grounds and proceed west. The 25,000-foot disposal area on Oak Island-Caswell Beach would extend the fill to the east end of the sea turtle habitat area

on Oak Island. These disposal areas are shown on Figure 2. The sea turtle habitat, which is basically a beach fill with a small dune feature to prevent nesting sea turtles from crossing into the ocean front road, will be constructed under authority of Section 1135 of the Water Resources Development Act of 1986. Construction of the sea turtle habitat will be completed in April 2001. The combined total of new work material to be deposited on Bald Head Island under the base plan would be 2,580,000 cubic yards. The balance of the new work beach quality material (up to 3,420,000 cubic yards) would be equally distributed along the 25,000-foot disposal area on Oak Island-Caswell Beach. The base plan beach fill placement characteristics associated with placement of up to 6.0 million cubic yards of new work material are presented in *Table 1*. Based on the characteristics of the sediment to be removed, about 83 percent of the dredged material is expected to remain in place. The lower placement rates used on West Beach and at the west end of South Beach are intended to reduce the possibility of increased sediment transport from the disposal area back into the navigation channel. Following initial adjustments, the deposited material will begin to erode at a rates comparable to or slightly faster than the erosion rates experienced on the existing beach. The base disposal plan addresses provisions for the disposal of up to 6.0 million cubic yards of beach quality material, however, the maximum volume may be reduced by 20 to 30 percent depending on the final quantitative and qualitative sand analysis and actual dredging operations associated with the dredging contractors decisions to obtain the total allowable overdepth.

Table 1
Base Plan Beach Disposal Characteristics

Location	Length along Shoreline (feet)	Disposal Rate (cubic yds per ft)	Initial Placement Width Range (feet)	Adjusted Placement Width Range (feet)	Initial Placement Volume (cubic yds)	Net In-place Volume (cubic yds)
Bald Head Island	16,000				2,580,000	
West Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	12,000	175	280 to 300	140 to 150	2,100,000	1,734,000
Oak Is - Caswell Beach	25,000	137	220 to 240	110 to 120	3,420,000	2,839,000
Totals	41,000				6,000,000	4,973,000

10. **Section 933 Disposal Plan – New Work Material.** The Brunswick County beach towns of Bald Head Island, Caswell Beach, Oak Island, Holden Beach, Ocean Isle, and Sunset Beach formed the Brunswick County Consortium for the purpose of working together to assure that the beach quality material is placed on the beach. Since Ocean Isle has received approval for a Federal Storm Damage Reduction Project, it is not vying for any of the Wilmington Harbor material. Construction of the Ocean Isle project is scheduled to begin in 2000. As mentioned above, a segment of Oak Island, lying between East 26th Street and East 58th Street, has been approved for a Section 1135 sea turtle habitat. The length of shoreline included in the sea turtle habitat consist of an 8,900-foot main section and 1,600-foot transitions on each end of the main fill. Construction of the sea turtle habitat will involve the removal of about 1.6 million cubic yards of material from an existing upland dredged material disposal area located adjacent to the Atlantic Intracoastal Waterway (AIWW). The expected in place volume resulting from this project is 1.34 million cubic yards. Within the main portion of the sea turtle habitat, the placement rate will be approximately 130 cubic yards/foot of beach. Accordingly, no material from the Wilmington Harbor project will be placed in the main portion of the sea turtle habitat. Some harbor material will be placed in the habitat transition areas to make up the difference in the volume that will be placed under Section 1135 and the rate of fill proposed under Section 933. This volume difference is around 25,000 to 30,000 cubic yards. As discussed below, disposal of material from the Wilmington Harbor project along Oak Island could occur at rates varying from 78 to 110 cubic yards/foot of beach. While these placement rates are less than the placement rate within the main portion of the Sea Turtle Habitat project, the relative protrusion in the shoreline resulting from the sea turtle project would be less than that which would have been produced in the absence of the harbor material. The reduction in the relative seaward protrusion of the shoreline within the habitat area resulting from the placement of the harbor material on the beach would also reduce the expected rate of loss from the habitat project due to end losses.

11. The shoreline segments that could receive material from Wilmington Harbor as a result of the Section 933 study include: 16,000 feet on Bald Head Island; 25,000 feet on Caswell Beach and the east end of Oak Island; 25,600 feet on the west end of Oak Island lying west of the sea turtle habitat; and 10,600 feet on the east end of Holden Beach. This represents a total shoreline length of 77,200 feet. These shoreline segments are shown on *Figure 2*. The distribution of available beach quality sand along the Brunswick County beaches will depend on the final results of the Section 933 study, analysis of project engineering and economic constraints, and the desires of the project sponsor and the Brunswick County consortium. To account for variations in sand placement along the Brunswick County beaches under the section 933 authority, *Table 2* presents the maximum beach fill disposal characteristics associated with the maximum beach fill for each beach segment resulting from the various possible distributions of beach quality material. Although the final distribution of the beach quality material for the Section 933 work along the Brunswick County beaches has not been determined, the total placement will not exceed 6.0 million cubic yards. Six million cubic yards of beach quality material to be removed from the channel equates to 5.0 million cubic yards of in place sand on the beach based on a retention rate of 83 percent discussed previously. Following the initial adjustments, erosion of the fill material will occur at rates equal to or slightly higher than the historic erosion

rates. The Section 933 disposal plan addresses provisions for the disposal of up to 6.0 million cubic yards of beach quality material, however, the maximum volume may be reduced by 20 to 30 percent depending on the final quantitative and qualitative sand analysis and actual dredging operations associated with the dredging contractors decisions to obtain the total allowable overdepth.

Table 2
MAXIMUM
Section 933 Disposal Characteristics

Location	Length along Shoreline (feet)	Disposal Rate (cubic yds per ft)	Initial Placement Width Range (feet)	Adjusted Placement Width Range (feet)	Initial Placement Volume (cubic yds)	Net In-place Volume (cubic yds)
Bald Head Island	16,000				2,200,000	1,826,000
West Beach	2,000	120	190 to 210	95 to105	240,000	200,000
South Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	12,000	143	220 to 240	110 to 120	1,720,000	1,426,000
Oak Island	50,500				4,740,000	3,933,000
East Oak Island - Caswell Beach	25,000	110	170 to 190	85 to 95	2,750,000	2,283,000
West Oak Island - Caswell Beach	25,600	78	120 to 140	60 to 70	1,990,000	1,650,000
Holden Beach	10,600	78	120 to 140	60 to 70	830,000	690,000

Inner Harbor – Snows Marsh Range to Horseshoe Shoal Range Sand Management Plan

12. **Introduction.** The sand management plan for the inner harbor addresses dredging and disposal issues associated with the Snows Marsh and Horseshoe Shoal channels. An estimated 0.6 million cubic yards of beach quality material will be removed from this

portion of the project. Disposal islands 3 and 4, located near the intersection of Horseshoe and Snows Marsh channels, are at maximum capacity and contain an estimated 1.3 million cubic yards of beach quality material. Maintenance material removed from this area is predominately sand of beach quality. Existing maintenance dredging operations in this area utilizes the offshore disposal area. The removal of the existing material from disposal islands 3 and 4 in conjuction with the new work dredging will facilitate placement of future maintenance material in islands 3 and 4. Future maintenance material placed in islands 3 and 4 would be used to nourish adjacent beaches.

13. **Plan Formulation.** The disposal plan for material presented in the June 1996 Cape Fear-Northeast Cape Fear Rivers project feasibility report proposed the placement of all dredge material from these channel reaches in the offshore disposal area. Subsequent investigations of material characteristics have shown that this material is of beach quality and this valuable resource would be best utilized to meet nourishment needs of the nearby beaches. Placement options for the 0.6 million cubic yards of new work material from the navigation channel includes potential placement of this material on Carolina Beach, Kure Beach, or Fort Fisher for 7,000 feet south of the southern terminus of the rock revetment. Placement options for the new work material from the navigation channel combined with pump out of islands 3 and 4 includes provisions for placement of 1.9 million cubic yards of material on adjacent beaches including Carolina Beach, Kure Beach, the Fort Fisher area, Bald Head Island , or Caswell Beach. Final placement decisions for the new work and maintenance material associated with the inner harbor from the Snows Marsh reach through the Horseshoe Shoal reach will assure that the dredge material disposal occurs in the least costly, environmentally acceptable manor, consistent with engineering requirements established for the project.

Maintenance Material Disposal Plan

14. **Plan Formulation.** Maintenance of the Wilmington Harbor Entrance Channel has historically required the removal of between 850,000 to 1,000,000 cubic yards of material each year. The maintenance material has normally been deposited in the ODMDS. Of the total volume removed each year, about 300,000 to 400,000 cubic yards has been littoral material derived from the adjacent beaches on Oak Island and Bald Head Island. This volume of littoral sediment constitutes 40 to 50 percent of the gross littoral transport along the Brunswick County beaches. Littoral material deposits in the bar channel primarily as a result of the eastward movement of Jay Bird Shoal and the westward movement of Bald Head Shoal into the channel area. The littoral sands generally deposit in channel reaches between channel stations 0+00 and 120+00. Seaward of station 120+00, the shoal material consist primarily of riverine silts and clays. While the new ocean bar channel will have an alignment different from the existing bar channel, shoaling patterns in the new channel, particularly in the vicinity of Jay Bird Shoal and Bald Head Shoal, are expected to be similar to the existing channel. The rate of shoaling of littoral sand in the new channel is estimated to be 545,000 cubic yards per year. The higher rate of deposition of littoral material in the new bar channel compared to the existing is due to channel modifications that would widen the channel to the west along the Smith Island Range and portions of the Baldhead Shoal range and cut across the seaward portions of Bald Head Shoal, as shown

on *Figure 1*. The volume of riverine silts and clays that will shoal the seaward portions of the new entrance channel are projected to be 538,000 cubic yards per year or about the same as that which occurs in the existing entrance channel.

15. The dredged material disposal plan for the entrance channel maintenance material was developed in accordance with U.S. Army Corps of Engineers policy with regard to the disposal of dredged material from Federal navigation channels. The Corps policy is contained in 33 CFR Parts 335-338 reads as follows:

> **"It is the Corps' policy to regulate the discharge of dredged material from its projects to assure that dredged material disposal occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project."**

The policy further states:

> **"The least costly alternative, consistent with sound engineering practices and selected through the 404(b)(1) guidelines or ocean disposal criteria, will be designated the Federal standard for the proposed project."**

(Note: Section 404 guidelines of the Clean Water Act apply to beach nourishment, island creation, or construction of underwater berms whereas ocean disposal is covered by the Ocean Dumping Act.)

Finally, with specific reference to the disposal of maintenance material, the policy sates (33 CFR Part 337.9):

> **"(a) District engineers should identify and develop dredged material disposal management strategies that satisfy the long-term (greater than 10 years) needs for Corps projects. Full consideration should be given to all practicable alternatives including upland, open water, beach nourishment, within banks disposal, ocean disposal, etc."**

16. The Federal policy notwithstanding, the State of North Carolina adopted a set of policies in 1992 designated to insure that beach quality sand not be removed from the active beach system. The U.S. Department of Commerce, pursuant to the Federal Coastal Zone Management Act of 1972, has incorporated these policies into the North Carolina Coastal Management Program. As a result, the State of North Carolina includes these policies in its consistency review of Federal activities. In 1993, the North Carolina General Assembly enacted a statute that put the coastal management policy into law. While there is continuing legal debate over the applicability of the State Law to Federal projects, the Federal Government is required to be consistent with the State's coastal management program to the maximum extent practicable. Accordingly, the disposal plan for the maintenance material removed from the Wilmington Harbor entrance channel will attempt to satisfy these State requirements.

17. Based on the Corps policy given above, three factors were considered in the development of a dredged material disposal plan for maintenance of the harbor entrance, namely; engineering requirements of the project, environmental impacts, and cost. These factors are discussed below.

18. **Engineering Requirements.** The construction and maintenance of a deep ocean entrance channel through a tidal inlet will have the same impact on the movement of littoral sediment past the entrance as stabilizing structures such as jetties. However, the impacts of a dredge channel on the adjacent shorelines are generally more subtle than the impacts associated with stabilizing structures. In the case of stabilizing structures, there is usually a visible build-up of material adjacent to the updrift structure with corresponding erosion downdrift of the opposite structure. These impacts are normally clearly visible and measurable within distances of thousands of feet of the structures. Navigation projects that include stabilizing structures are generally formulated to include some means to bypass sand from one side of the entrance to the other in order to prevent project induced erosion on the adjacent beaches. Dredged channels, on the other hand, do not cause material to build-up on one side of the inlet or the other, rather, the impact of sediment removal from the dredged channel tends to be diffused throughout the impacted area. Since this diffusion process can extend over miles of shoreline, the erosive impact of the sediment removed from the navigation channel and its deposition outside the active littoral zone is difficult to detect in the short term since the magnitude of the impact may be of the same order as normal temporal fluctuations in the shoreline position. Also, where stabilizing structures generally have a well-defined impact on the predominant downdrift beach, channel projects affect both sides as material is deposited in the navigation channel from both the updrift and downdrift beaches.

19. The Wilmington Harbor project, historically, has not included the disposal of littoral sands on the adjacent beaches or in the active littoral zone. This has been primarily due to the maintenance practices that were established with the inception of the project over 100 years ago. Dredging technology that existed during the early history of the project dictated maintenance procedures and dredged material disposal practices. In this regard, hopper dredges, with hopper doors that opened by swinging down, were highly efficient in removing shoal material from channels but were restricted by their loaded drafts and swinging hopper doors to depositing the dredged material in relatively deep water. As a result, the "Federal Standard" for maintaining navigation projects, like Wilmington Harbor, became the cost and impacts associated with hopper dredging and ocean disposal of the dredged material in water depths of 30 feet or more.

20. The early establishment of the "Federal Standard" for maintenance of Wilmington Harbor did not consider the overall impacts of removing littoral sediment from the littoral system. This was due in part to the limited coastal development that existed when the projects were first constructed, but also due to lack of sufficient scientific understanding of coastal processes and the sand sharing system associated with tidal inlets and adjacent beaches. Years of research by the U.S. Army Corps of Engineers and practical knowledge gained from the operation of the numerous coastal navigation projects around the country has resulted in the realization that littoral material must be conserved. Natural supplies

from rivers and streams are not replenishing littoral sediments, particularly on the East Coast of the United States. Thus, the removal of a cubic yard of littoral sediment from a tidal entrance or inlet with deposition outside the active littoral zone of the beach will ultimately cause a cubic yard deficit somewhere within the sand sharing system affected by that particular entrance or inlet. The impact of the removal of littoral sediment from the active littoral zone through channel maintenance is identified as a major cause of man-induced erosion in the U.S. Army Corps of Engineers Shore Protection Manual. From an engineering perspective, the primary requirement for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to prevent project induced erosion of the adjacent beaches by conserving the limited natural resource, sand, through deposition directly on the adjacent beaches.

21. Wave transformation/sediment transport studies were conducted by the Coastal and Hydraulics Laboratory (CHL), U.S. Army Corps of Engineers, Engineer Research and Development Center, for the Wilmington District, to determine the theoretical rate of longshore sediment transport moving toward the Cape Fear River Entrance. The results of this study are reported in reference 3.

22. The results of the sediment transport analysis for the existing condition near the Cape Fear River entrance found that sediment transport potential to the east off Caswell Beach is 270,000 cubic yards per year while a comparable rate to the west off Bald Head Island is about 527,000 cubic yards per year. Combining these two transport rates results in a gross transport of littoral sediment moving into the entrance of 797,000 cubic yards per year. In terms of percentages, approximately 66 percent of the sediment shoaling the entrance channel comes from Bald Head Island while 34 percent is derived from Caswell Beach. In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel will be placed back on the beach from whence it came. Accordingly, two out of every three cubic yards of littoral shoal material removed from the entrance channel will be placed back on Bald Head Island and the remaining cubic yard placed on East Oak Island-Caswell Beach. The disposal locations on each island will be based on the results of annual beach profile monitoring surveys. In general, the material will be placed primarily along portions of South Beach and West Beach on Bald Head Island and on East Oak Island-Caswell Beach beginning at a point just east of the Carolina Power and Light Company cooling water discharge canal.

23. The distribution of littoral shoal material between Bald Head Island and East Oak Island – Caswell Beach given above will be accomplished by placing material from two consecutive maintenance operations on Bald Head Island with the third operation involving placement on Oak Island-Caswell Beach. Historically, littoral sediment shoaling in the entrance channel has been the highest in the Smith Island Range as a result of the eastward encroachment of Jay Bird Shoal into the channel. In 1991, a 50-foot channel widener was constructed along the west side of the Smith Island Range and was effective in trapping east moving sediment off of Jay Bird Shoal but was not large enough to significantly increase the time between maintenance dredging operations. In 1996, the widener was increased to 100 feet, which increased the maintenance cycle for this segment of the entrance channel to approximately every two years. The design of the deeper

channel into Wilmington Harbor includes a 150-foot channel widener west of the Smith Island Range, as shown on *Figure 1*. Consequently, maintenance dredging of the Smith Island Range and the landward end of the Baldhead Shoal Range should only be required every two years. Based on a two year maintenance cycle, 1,090,000 cubic yards of littoral material will be placed on Bald Head Island in year 2 and year 4 following the initial deepening of the harbor with this same volume placed on Oak Island-Caswell Beach during the 6th year following channel deepening. This disposal cycle is planned for the life of the project. The equivalent annual deposition of material would be 363,000 cubic yards per year to Bald Head Island and 182,000 cubic yards per year to Oak Island-Caswell Beach.

24. **Environmental Impacts.** The dredged material disposal plan for the new work material and that for the sandy maintenance material would not only improve the condition of the beaches adjacent to the harbor entrance but would maintain the beaches in a more stable condition. The wider more stable beaches, particularly along Bald Head Island and the East Oak Island-Caswell Beach disposal areas, would provide improved sea turtle nesting habitat compared to the present condition of these beaches. Even in their present state, the shorelines of East Oak Island, Caswell Beach, and Bald Head Island provide some of the most important sea turtle nesting habitat in North Carolina. In this regard, statistics compiled by the North Carolina Wildlife Resources Commission over the last 6 years (1994 to 1999 inclusive) show that approximately 33 percent of the sea turtle nest in North Carolina occurred on these three beaches. This relative high percentage of the total statewide nests is even more impressive given that these beaches constitute only 5 percent of the entire shoreline of North Carolina.

25. The disposal of material on the beach will have some short term negative impacts including the temporary increase in turbidity during the disposal operation and the smothering or otherwise displacement of organisms that live in or near the beach foreshore. Turbidity caused by the disposal operation normally does not persist more than one or two tidal cycles (12 to 24 hours) following the cessation of the disposal operation. With regard to the smothering or displacement of the nearshore organisms, studies by the University of Virginia for the U.S. Fish and Wildlife Service on Pea Island have shown that the organisms generally return to the area in about one year. The disposal plan for the maintenance material discussed above would involve the placement of material on Bald Head Island in intervals of 2, 4, and 8 years while disposal on Oak Island-Caswell Beach would occur in 6 year intervals. Thus, the nearshore organisms would not be completely eliminated from the area as a result of the disposal operation. In summary, the positive environmental impacts associated with the deposition of the littoral shoal material on the beach versus depositing it in an ocean disposal site far outweigh the negative impacts.

26. **Cost.** The "Federal Standard" for constructing and maintaining navigation channels focuses on the least costly method of disposing the material, even though policy dictates that the environmental and engineering requirements must also be considered. With respect to the disposal plan for the new work entrance channel material, the limited capacity of the existing ODMDS dictates that the beach quality material be placed on the adjacent beaches, otherwise, the construction of the deeper project would have to be

delayed by about a year. Even if the project were to be delayed a year to allow ocean disposal of the beach quality material, cost comparisons indicate that beach disposal would still be the most cost effective disposal option.

27. **Maintenance Material Disposal**. Even if beach disposal of the maintenance material resulted in some additional cost, the Corps of Engineers, under authority of Section 207 of the Water Resources Development Act of 1996, can elect to use a slightly more costly disposal method if there are overriding environmental and erosion control benefits associated with the more costly disposal scheme.

28. Future disposal of maintenance material in the ocean will be in the new ODMDS located 5 miles farther offshore than the existing ODMDS. This additional haul distance almost doubles the cost of ocean disposal. As a result, beach disposal of the beach quality maintenance material becomes the least costly option, particularly if maintenance of the beach quality material is only required every two years. While the intent of the sand management plan is to return littoral material to the beach, the primary purpose of the project is to provide safe navigation through the ocean entrance into Wilmington Harbor. In this regard, there may be occasions during the life of the project when problem shoals occur in the entrance channel between normal 2-year maintenance cycle. In order to prevent disruption of navigation, these shoals must be removed in an expedient manner. If the size of these problem shoals are small (for example less than 100,000 cubic yards), mobilization and demobilization of an ocean certified pipeline dredge may not be economical. Therefore, on these occasions, removal of the shoals could be accomplished with a hopper dredge with disposal of the material in the ODMDS. In any event, a comparison of the cost for ocean disposal versus beach disposal of the littoral material is provided in *Table 3*. This cost comparison is made over a 6 year period which corresponds to the time period associated with the sand sharing formula between Bald Head Island and Oak Island-Caswell Beach.

29. **Summary**. The sand management plan developed for the new work beach quality material and maintenance material to be removed from the entrance channels into Wilmington Harbor includes the following:

(a) Disposal of the new work beach quality material on Bald Head Island and Oak Island-Caswell Beach.

(b) In the absence of Section 933, up to 2,580,000 cubic yards of the new work material would be placed on Bald Head Island and up to 3,420,000 on Oak Island-Caswell Beach.

(c) Under Section 933, the material would be distributed along Bald Head Island, Caswell Beach, Oak Island, and Holden Beach.

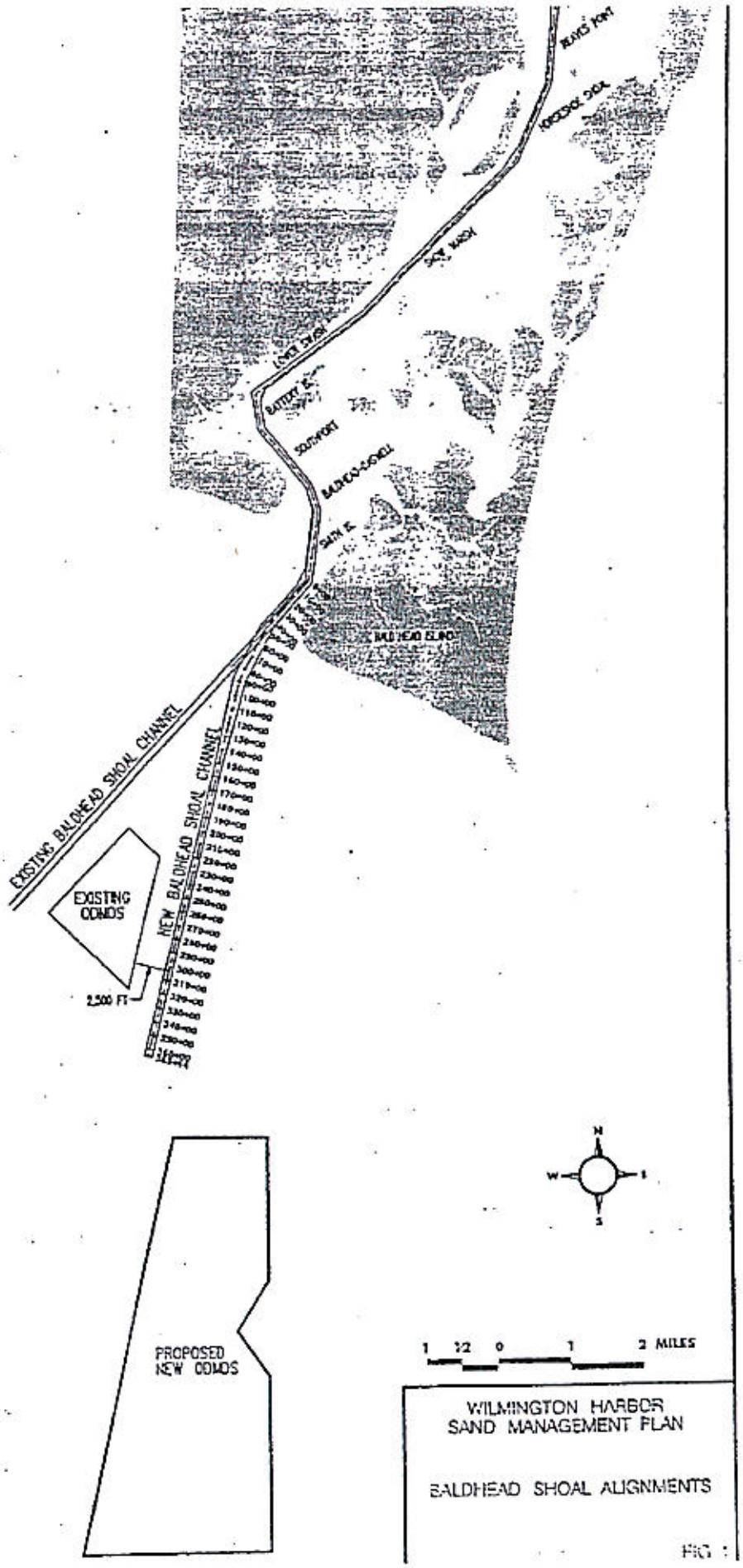
(d) Beach quality maintenance material will be deposited directly on Bald Head Island and Oak Island-Caswell Beach with Bald Head Island receiving 2 yards for every yard placed on Oak Island-Caswell Beach.

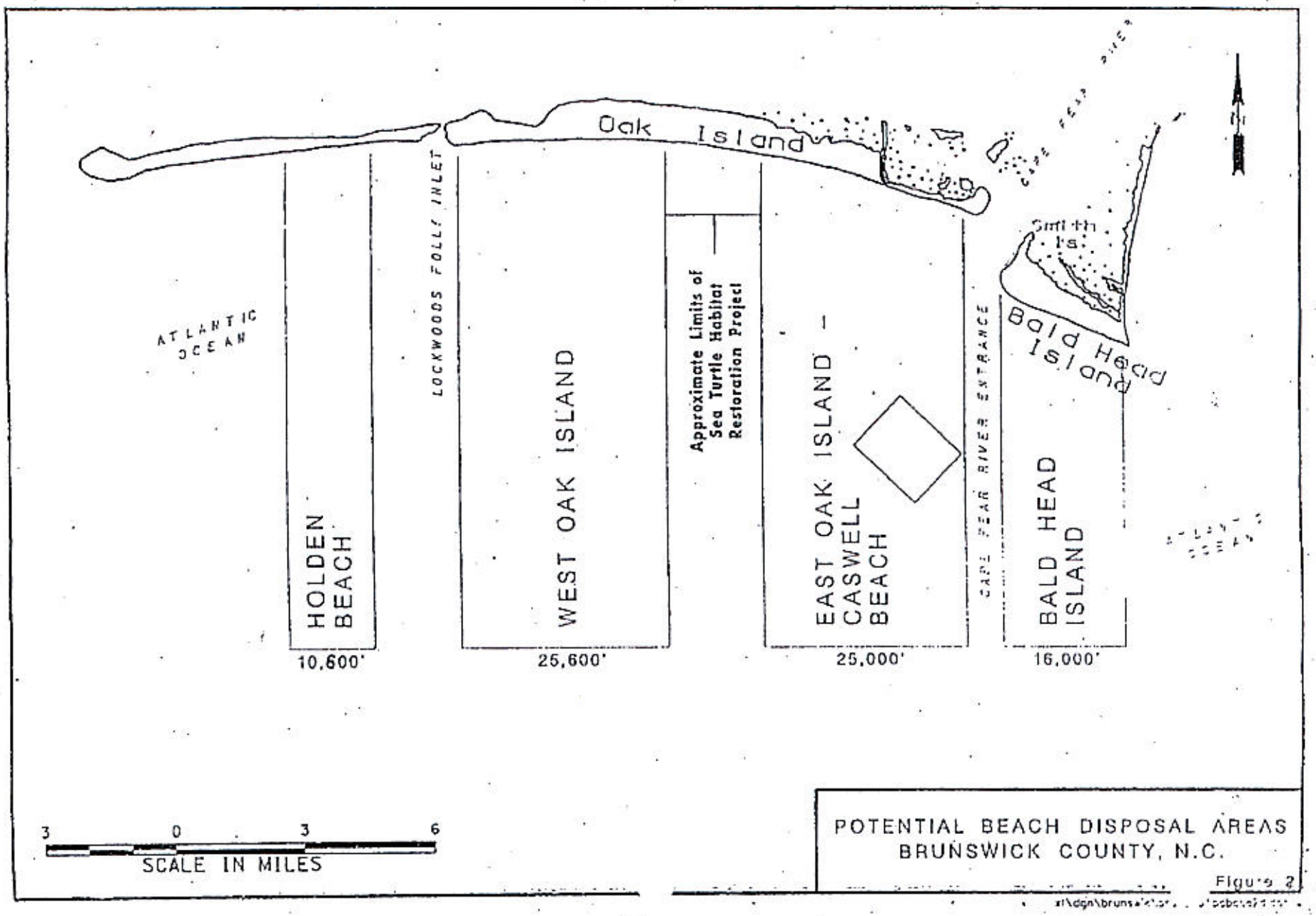
Table 3
Cost Comparison – Ocean Disposal versus Beach Disposal
Ocean Entrance Channel Maintenance Material

Item	Quantity	Unit	Unit Cost	Cost
Beach & Ocean Disposal – Maintenance Material				
Year 1: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Total Year 1 Dredging Cost				**$2,483,000**
Year 2: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Mob & Demob Pipeline Dredge	1	job	$948,000	$948,000
Dredging-Disposal on Bald Head	1,090,000	CY	$3.10	$3,379,000
Total Year 2 Dredging Cost				**$6,810,000**
Year 3: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Total Year 3 Dredging Cost				**$2,483,000**
Year 4: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Mob & Demob Pipeline Dredge	1	job	$948,000	$948,000
Dredging-Disposal on Bald Head	1,090,000	CY	$3.10	$3,379,000
Total Year 4 Dredging Cost				**$6,810,000**
Year 5: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Total Year 5 Dredging Cost				**$2,483,000**
Year 6: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Mob & Demob Pipeline Dredge	1	job	$1,275,000	$1,275,000
Dredging-Disposal on Oak Island-Caswell	1,090,000	CY	$4.60	$5,014,000
Total Year 6 Dredging Cost				**$8,772,000**
Total 6-Year Dredging Cost				**$29,841,000**

Ocean Disposal of All Maintenance Material				
Yearly Hopper Dredge Cost for Ocean				
Disposal of all Maintenance Material				
Mob & Demob	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	1,083,000	CY	$4.40	$4,765,200
Total Annual Dredging Cost				$5,096,200
Total 6-Year Dredging Cost				$30,577,200

Date Revised: 02/04/00-sv


EXISTING BALDHEAD SHOAL CHANNEL
NEW BALDHEAD SHOAL CHANNEL
EXISTING CONDOS
2,500 FT
PROPOSED NEW CONDOS
N
W
E
S
1 1/2 0 1 2 MILES
WILMINGTON HARBOR
SAND MANAGEMENT PLAN
BALDHEAD SHOAL ALIGNMENTS
FIG 1



POTENTIAL BEACH DISPOSAL AREAS
BRUNSWICK COUNTY, N.C.

Figure 2

ATTACHMENT D

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

DELONY LETTER 9 JUNE 2000

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO
Project Management Branch

June 9, 2000

Honorable Freeman A. Berne
Mayor of the Village of Bald Head Island
Post Office Box 3009
Baldhead Island, North Carolina 28461

Honorable Harry Simmons
Mayor of Caswell Beach
707 Caswell Beach Road
Caswell Beach, North Carolina 28465

Honorable Joan Altman
Mayor of Oak Island
4601 East Oak Island Drive
Oak Island, North Carolina 28465

Honorable James W. Lowell
Mayor of Holden Beach
110 Rothschild Street
Holden Beach, North Carolina 28462

Dear Mayors:

After years of effort by many, it is a pleasure to see the various elements of the Wilmington Harbor Navigation project (hereinafter the "Project") coming together. As we approach the decision point for the Finding of No Significant Impact (FONSI), I want to bring everyone up to date on the status of our plan to place beach quality sand excavated for the project on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach.

As you know, the details of our plan are presented in the Environmental Assessment, in particular, Appendix A - Sand Management Plan, in the Wilmington Harbor Monitoring Plan, and in the Section 933 Evaluation Report. The shoreline segments recommended to receive sand are the Village of Bald Head Island (up to 16,000 linear feet), Caswell Beach (up to 25,000 linear feet), Oak Island (up to 25,600 linear feet), and Holden Beach (up to 10,600 linear feet). This represents a maximum shoreline length of 77,200 linear feet.

Bald Head Island will be the site of initial beach disposal associated with construction. This site, along with the easternmost 25,000 linear feet of Caswell Beach-Oak Island, represents the least cost alternative of disposal available to the Project; accordingly, placement will be accomplished at Project cost and at no cost to the Village of Bald Head Island.

Placement will be according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to the Village of Bald Head Island referencing the Village of Bald Head Island Beach Disposal Plan (2000/2001) (enclosed and incorporated by reference) to the U.S. Army Corps of Engineers, Wilmington District (hereinafter "Corps").

Once disposal has begun at the Village of Bald Head Island, fill operations will continue until the estimated minimum of 1,536,000 cubic yards of sand in the channel prism allocated to the Village of Bald Head Island (based on channel surveys conducted in October and December 1999) have been dredged and placed on the beach in accordance with the March 31, 2000 memorandum. Assuming a potential effective reduction of 20 percent in the gross fill dredged, the final in-place fill volume is expected to range between 1,228,000 cubic yards and 1,536,000 cubic yards.

Project construction beach disposal operations at the Village of Bald Head Island will be performed along both West Beach and South Beach, as indicated by the March 31, 2000 memorandum. The Village of Bald Head Island will provide all requisite easements necessary to construct the template(s) provided for by the March 31, 2000 memorandum.

Once the placement of beach quality sand at the Village of Bald Head Island is complete, placement along approximately 25,000 linear feet of shoreline at the easternmost end of Caswell Beach-Oak Island will be accomplished. Placement will be made in accordance with the template agreed to by the Corps, NCDENR, and the communities of Caswell Beach and Oak Island. The final in-place fill volume is expected to range between 1,451,000 cubic yards and 1,814,000 cubic yards. Since this reach comprises the balance of the least cost alternative for disposal available to the Project, placement will be at Project cost and at no cost to those communities. All requisite easements will be provided by the communities at no cost to the Project.

Under the provisions of the draft Section 933 report, the remaining beach quality sand will be placed along approximately 25,600 linear feet of the westernmost shoreline of Oak Island and along approximately 10,600 linear feet of the eastern shoreline of Holden Beach. Placement will be made in accordance with the template agreed to among the Corps, NCDENR, and the affected beach communities and cost shared at the rate of 65 percent Federal (currently estimated at $6,500,000) and 35 percent non-Federal (currently estimated at $3,500,000). The final in-place fill volume along the cost shared reach of Oak Island is expected to range between 1,272,000 cubic yards and 1,590,000 cubic yards. The final in-place fill volume along the cost shared reach of Holden Beach is expected to range between 528,000 cubic yards and 660,000 cubic yards. The communities will provide all required easements at no cost to the Project.

After construction of the Smith Island and Bald Head Island Shoal portions of the project, the U.S. Army Corps of Engineers will conduct periodic maintenance dredging of the navigation channels. The disposal of all beach quality dredged material will be accomplished in accordance with the Environmental Assessment of Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 2000 and its Sand Management Plan (Appendix A), and the Wilmington Harbor Monitoring Plan (enclosed and incorporated by reference). The associated disposal will be as called for therein, namely:

Year 2: Placement at Bald Head Island (estimated @ 1Mcy)
Year 4: Placement at Bald Head Island (estimated @ 1 Mcy)
Year 6: Placement at Caswell Beach and easternmost end of Oak Island (estimated @ 1 Mcy).

This disposal cycle is planned for the life of the project. As provided on page 8 of the Environmental Assessment and on page 12 of the sand management plan, in some cases problem shoaling involving small quantities of sand may develop in the channel between regular dredging events, making use of a pipeline dredge unfeasible and the sand may need to be deposited in the ocean disposal area.

Prior to each disposal operation at either the Village of Bald Head Island, or Caswell Beach, or the easternmost shoreline of Oak Island, the community receiving the sand may provide advance guidance to the Corps regarding placement distributions and fill template design. The Corps will follow that guidance to the maximum extent practicable.

The Corps will conduct a monitoring program as referred to in the Environmental Assessment and Sand Management Plan, and as set out in the Wilmington Harbor Monitoring Plan, which is enclosed and incorporated by reference. An annual report will be prepared, as described in the Monitoring Plan. The Corps will use this monitoring data to evaluate and adjust the Sand Management Plan, as determined necessary, after coordination with interested parties.

All initial and future disposal activities at the Village of Bald Head Island, Caswell Beach, and easternmost Oak Island, (as described in the Environmental Assessment and its Sand Management Plan, and in the Wilmington Harbor Monitoring Plan) will be at no cost to either community.

If the Project causes significant adverse effects on adjacent beaches, the Corps and the Sponsor will respond by adjusting the Sand Management Plan, after consultation with interested parties. If the Project causes significant adverse effects that cannot be dealt with by

modifications to the Sand Management Plan, the Corps and the Sponsor will promptly seek and use their best efforts to implement appropriate corrective measures, such as additional nourishment, subject to consistency review.

Our current schedule for execution of the FONSI is June 14, 2000. Our current schedule for our higher headquarters approval of the draft Section 933 Evaluation Report is July 31, 2000. We expect to award a contract to construct the inshore reaches of the Ocean Bar entrance channel on or about November 15, 2000. We are moving prudently but aggressively to make this important Project a reality.

The support of the members of the Brunswick Beaches Consortium and our Project sponsor represented by Mr. John Morris in optimizing this unique opportunity for nourishing your beaches has been wise, energetic, and timely. We salute your efforts and look forward to continued close coordination through to the successful completion and operation of the Project and the associated beneficial use of beach quality sand.

Sincerely,

James W. DeLony
Colonel, U.S. Army
District Engineer

Enclosures

Copies Furnished:

Mr. John N. Morris, Director
Division of Water Resources
North Carolina Department of Environment
and Natural Resources
1611 Mail Service Center
Raleigh, North Carolina 27699-1611

Ms. Donna D. Moffitt, Director
Division of Coastal Management
North Carolina Department of
Environment and Natural Resources
1638 Mail Service Center
Raleigh, North Carolina 27699-1638

ATTACHMENT E

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

MOFFITT LETTER 15 JUNE 2000

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
Division of Coastal Management

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EXECUTIVE OFFICE
2000 JUN 26 A 11:03

June 15, 2000

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

DONNA D. MOFFITT
DIRECTOR

Colonel James W. DeLony
District Engineer
U.S. Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

Action: PM-C
CF: DE
DX
DP
TS
OC

REFERENCE: DCM00-14 EA and CD - Preconstruction Modifications of Authorized Improvements, Wilmington Harbor 96 Project

Dear Col. DeLony:

On May 17, 2000 the State of North Carolina completed its review, pursuant to 15 CFR 930 Subpart C - Consistency for Federal Activities, of the referenced document describing proposed modifications to the authorized Wilmington Harbor 96 Project in New Hanover and Brunswick Counties, North Carolina. The Corps of Engineers submitted the document to the state on February 17, 2000, and the project was assigned the number DCM00-14 for our review purposes.

During the course of our review several environmental concerns were raised by state agencies regarding potential impacts on the resources of the coastal zone. These comments were forwarded to the Corps for its consideration. As the consistency deadline was approaching, we extended our original consistency deadline 15 days, pursuant to 15 CFR 930.41, at the end of March. On April 10, 2000, our review was again extended to allow concerned state agencies to review the Corps' responses to comments on the Environmental Assessment (EA). The Division of Coastal Management received the Corps' responses on May 3 and again solicited comments from concerned state agencies.

The modifications that the Wilmington District Corps of Engineers seeks authorization for are as follows:

1. Construction and maintenance of the Wilmington Harbor entrance channel along a new alignment across the ocean bar.
2. Backfilling the abandoned channel length with dredged material not suited for beach or littoral zone disposal.

MAILING: 1638 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1638
PHYSICAL: 2728 CAPITAL BLVD., RALEIGH, NC 27604
PHONE: 919-733-2293 FAX: 919-733-1495
AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER - 50% RECYCLED / 10% POST-CONSUMER PAPER
DENR TOLL FREE HOTLINE: 1-877-623-6748

3. Placement of material dredged from the new channel alignment and other portions of the project on area beaches in New Hanover and Brunswick Counties.
4. Establishment of a comprehensive plan for dredging and disposal operations for each portion of the harbor, including hopper dredge with overflow.
5. Utilization of blast pressure criteria to measure impacts of blasting on aquatic resources and the elimination of the bubble curtain during blasting operations.
6. Placement of dredged material that does not go to the old channel, the littoral zone, the beaches, or other existing disposal sites, into the Offshore Dredged Material Disposal Site (ODMDS).

The Corps proposes to construct the new entrance channel alignment and place all suitable material on the nearby beaches over an approximately eighteen month period covering two winter seasons and one summer season. Turtle monitoring and shorebird surveys of affected beaches will be conducted. Details of the disposal operations for construction and maintenance of the channel are documented in a Sand Management Plan (SMP). In addition, the Corps has clarified details of the placement, timing, costs, and amount of sand to be deposited on the beaches of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach in a letter dated June 9, 2000from Colonel James W. DeLony, District Engineer, to the mayors of the respective beach towns. We understand that disposal of dredged material from construction and maintenance of the project will be conducted according to the SMP and letter, as agreed to by the NC Division of Water Resources, the Brunswick County beach communities and the Corps of Engineers. We also understand that the use of hopper dredge with overflow will be limited to times of year and reaches of the project in which impacts on coastal resources will be minimized.

Based upon our review of the EA and the Corps of Engineers' response to comments, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, provided that the project is performed according to the EA (including the Sand Management Plan and other appendices) and the Corps' responses to comments from the EA, and to Colonel DeLony's letter of June 9, 2000 (including attachments), and that the conditions below are met.

1. Principal amongst the issues raised were potential impacts on sea turtles, shore and water birds, beach and benthic infauna, fisheries, and water quality parameters. It is extremely important that the impacts of this multifaceted project be well documented in order to evaluate the effects on these resources and on the overall coastal environment. The Corps of Engineers will pursue an integrated monitoring plan to address the resources noted in the first sentence of this paragraph, and will coordinate all monitoring efforts with the appropriate state agencies. This will include but not be limited to the North Carolina Division of Coastal Management, the Wildlife Resources Commission, the Division of Marine Fisheries, and the Division of Water Quality. We understand that the Corps intends to initiate monitoring coordination with the resource agencies in June of 2000.
2. As additional mitigation for impacts on fisheries resources, a fish passage structure will be constructed at Lock and Dam 1 on the Cape Fear River. In addition, fish passage alternatives for Lock and Dams 2 and 3 will be investigated. The Corps of Engineers and, as the Wilmington Harbor Project Sponsor, the State of North Carolina, have agreed to these actions.
3. The placement, timing, costs, and amount of sand to be deposited on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach, both during construction and future maintenance; monitoring; and response to impacts shall be in accordance with Col. DeLony's letter of June 9, 2000, to the mayors of the respective towns receiving the sand (attached and incorporated by reference). If the towns, Corps, and project sponsor's representative mutually agree to modifications to the SMP or Col. DeLony's June 9, 2000 letter, those modifications shall be submitted to the North Carolina Division of Coastal Management for a determination of whether another consistency review is necessary on the modifications.
4. The state must have the opportunity to review the project, including monitoring results, to determine if it continues to be consistent with the North Carolina Coastal Management Program in two situations: 1) After five years from the date of this letter, and 2) before any subsequent modifications for future maintenance or other requests to modify the Wilmington Harbor 96 Project are considered. The Corps shall request this review and provide documentation of impacts (or lack thereof) on the coastal resources of concern.

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5. If in the future the Corps considers requesting authorization to conduct hopper dredging with over flow or to place maintenance dredge spoil on a beach, outside of the established time periods or locations, a separate consistency review will be required for each of these activities.

While the State of North Carolina supports beach nourishment and the placement of suitable spoil material on the beaches, we remain concerned about the short term and long term impacts on the biologic and ecologic resources of the coast. We maintain that the best time for such beach nourishment and renourishment is outside of the period of peak impacts on infauna, sea turtles, and fisheries. The State discourages individuals and agencies from seeking authorization to perform work outside established moratoria, and caution that our response is not to be interpreted as a precedent assuring authorization for future renourishment or disposal of sand on beaches outside of established dredging and disposal moratoria. We understand that summer beach disposal is necessary only during the construction phase of the project and that maintenance of the harbor channels will be conducted within established biological time frames.

Finally, with the increasing number of beach disposal and renourishment projects, much of the state's southern coast beaches will be in the placement or recovery phases in any given year. To this end, the Division of Coastal Management requests that the Corps consider combining the monitoring studies and environmental considerations of this project, the Wrightsville Beach, Carolina Beach, Kure Beach projects, and all of the Brunswick County Beaches projects to achieve a more comprehensive and cumulative impact analysis. Although these projects are separate in authorization and funding, we feel that concurrent studies could provide beneficial insights on impacts to resources from beach disposal and nourishment along this extended reach of shoreline.

If you have any questions regarding our findings, conditions, or recommendations, please contact Ms. Caroline Bellis, Division of Coastal Management, at (919) 733-2293. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Donna D. Moffitt

Donna D. Moffitt

Attachment

cc: Bob Stroud, Division of Coastal Management, Wilmington
Franklin McBride, NC Wildlife Resources Commission
Bennett Wynne, NC Wildlife Resources Commission
Ruth Boettcher, NC Wildlife Resources Commission
Fritz Rohde, NC Division of Marine Fisheries
Mike Street, NC Division of Marine Fisheries
John Dorney, Division of Water Quality
Frank Yelverton, US Army Corps of Engineers
John Meshaw, US Army Corps of Engineers

ATTACHMENT F

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

FINDING OF NO SIGNIFICANT IMPACT

WILMINGTON HARBOR 2000 (EXCERPT)



US Army Corps of Engineers
Wilmington District

FINDING OF NO SIGNIFICANT IMPACT

PRECONSTRUCTION MODIFICATIONS OF AUTHORIZED IMPROVEMENTS

WILMINGTON HARBOR
NORTH CAROLINA

August 2000

and about $20 million for elimination of the air curtains. Environmentally the new ocean bar channel would avoid live coral bottom. The air curtains are eliminated because they did not provide the environmental protection anticipated, and environmental impacts in their absence are anticipated to be minor.

3.00 PUBLIC AND AGENCY COORDINATION: On February 7, 2000, the EA referenced above was mailed to Federal and State agencies and the interested public for a 30-day review and comment period. Based on a request from the North Carolina Clearinghouse and others, the response date was extended about 2 weeks until April 3, 2000. Everyone providing comments on the EA will be mailed a copy of the Finding of No Significant Impact (FONSI). A notice of availability of FONSI will be mailed to others on the project mailing list. Comments on the EA were received from the following:

Federal Agencies
- US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
- US Environmental Protection Agency, Region IV
- US Department of the Interior, Fish and Wildlife Service

State Agencies
- North Carolina Ports
- NC Department of Environment and Natural Resources
- NC Division of Coastal Management
- NC Department of Cultural Resources
- NC Division of Water Quality
- NC Department of Commerce
- NC Wildlife Resources Commission
- NC Division of Marine Fisheries

Local Agencies
- Brunswick Beaches Consortium

Elected Officials
- New Hanover County Board of Commissioners
- Representative Daniel F. McComas
- Mayor Harry Simmons, Town of Caswell Beach
- Mayor Joan L. Altman, Town of Oak Island

Conservation Groups
- National Audubon Society

Interested Businesses, Groups, and Individuals
- Burlington Industries, Inc.
- H. Spalding Craft
- Star Shipping, Inc.
- Solar International Shipping Agency, Inc., General Agent for Yang Ming Line
- Andrew Koeppel

- OxyChem
- Morehead City Terminals, Inc.
- Hanjin Shipping Company, Ltd.
- North Carolina Citizens for Business and Industry
- Frank S. Conlon
- Laela S. Sayigh
- Brooks, Pierce, McLendon, Humphrey & Leonard, L.L.P, firm representing Village of Bald Head Island

In addition, all the required environmental clearances or coordination documents have been received for the proposed action. They were received after April 3, 2000, the end of the EA comment period, and are as follows:

- Water Quality Certification No. 3085 issued October 17, 1996, was modified by letter dated April 10, 2000 to cover the proposed action.
- Supplement to the Final Fish and Wildlife Coordination Act Report, Wilmington Harbor, North Carolina, 96 Act, New Hanover and Brunswick Counties, North Carolina, April 2000, transmitted by letter dated April 28, 2000. Responses to recommendations are indicated in Paragraph 5.06 above.
- US Fish and Wildlife Service Biological Opinion for the Proposed Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, May 3, 2000. We will comply with the incidental take statement, associated reasonable and prudent measures, and terms and conditions implementing them.
- Environmental Protection Agency letter of May 1, 2000, indicating concurrence with our Tier 1 evaluation under the Ocean Dumping Act that the new work and maintenance dredged material is acceptable for ocean disposal in the Wilmington ODMDS.
- National Marine Fisheries Service Biological Opinion for the Proposed Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, August 3, 2000. We will comply with the incidental take statement, associated reasonable and prudent measures, and terms and conditions implementing them.
- NC Division of Coastal Management letter of June 15, 2000, providing a statement of concurrence that the proposed action is consistent with the NC Coastal Management Program. We will comply with the conditions indicated in the letter.

4.00 RESPONSES TO COMMENTS ON THE EA AND RESOLUTION OF ISSUES: All comments received on the EA and other correspondence indicated above were considered in making the decision to sign a FONSI. Copies of the letters commenting on the EA are included in Attachment 1. Pertinent comments from each commentor are summarized and addressed below. All comments received on the EA have been resolved either through providing additional information in this FONSI or agreeing to develop appropriate monitoring as indicated in paragraph 11 of this FONSI. As indicated in paragraph 1.00 above, monitoring is proposed for limited aspects of the project where some uncertainty exists regarding project impacts. However, the results of this monitoring are not anticipated to alter the Corps position that the proposed modifications will not significantly affect the quality of the human environment.

ATTACHMENT G

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

FOTH REVIEW OF WILMINGTON HARBOR DLR AND DEIS FOR VBHI

MEMORANDUM

Foth Infrastructure & Environment, LLC
2618 Herschel Street
Jacksonville, FL 32204
(904) 387-6114

October 30, 2025

TO: The Village of Bald Head Island

FROM: Chris Creed, P.E.
Steve Howard, P.E.

RE: Review of Wilmington Harbor 403 Letter Report and Draft Environmental Impact Statement for the Village of Bald Head Island

---

Foth Infrastructure & Environment, LLC has reviewed the Wilmington Harbor 403 Letter Report and Draft Environmental Impact Statement (DEIS) and identified deficiencies in engineering analyses and conclusions therein. Our review focused on potential effects from channel deepening and subsequent channel use by commercial ship traffic to areas of the Village of Bald Head Island's shoreline. Our specific concerns are related to shortcomings in the numerical modeling approach and an underestimation of the proposed project's contributions to shoreline erosion. In summary, several important points discussed in detail in this report are noted below:

1) The version of the Delft3D model applied in this study was not clearly stated in the DEIS, nor whether the same version was used consistently across all phases of the modeling effort.

2) According to the DEIS, wave-driven suspended and bedload sediment transport in Delft3D were disabled reducing total transport to only current components. Waves play a critical role in shaping morphology along the ocean-facing sandy beaches like those of Bald Head Island bounding the Cape Fear River Entrance. The omission of all explicit wave-related sediment transport terms in the Delft3D model was not explained and the calibration/verification procedures used to justify this decision was not detailed in the DEIS.

3) The model calibration and evaluation appear to emphasize channel shoaling, which may not represent sediment dynamics on adjacent shorelines unless sediment sources and alongshore transport rates for Bald Head and Oak Islands were explicitly computed and

used in the calibration. There is no clear documentation in the DEIS if this was performed.

4) The DEIS attributes channel shoaling variability largely to differences in dredge quantities. The DEIS also acknowledges that dredged quantities and measured shoaling rates are not directly comparable. There is no apparent attempt to distinguish between actual shoaling rates and one-off dredge events, and this conflation complicates interpretation of the model's predictive capabilities.

5) Based upon tabulated comparisons in the DEIS for the Inner Ocean Bar Channels in the vicinity of Bald Head Island, the model significantly overpredicts shoaling in the Smith Island reach and underpredicts shoaling in the Bald Head Island reaches—by as much as 2.9 times while the overall total shoaling volumes are similar. This indicates that similar total shoaling volumes may be coincidental rather than evidence of model accuracy. Such discrepancies risk misrepresenting the real-world sand distribution with significant inlet management implications.

6) The gravity-driven process of slope avalanching is of critical importance to the Village of Bald Head Island, given the proximity of the planned channel deepening to the shoreline. According to the DEIS, this functionality was implemented by using default values for the critical subaqueous slope parameter and time-dependent function. However, if this functionality was activated, one would expect significant slope modifications throughout model results, including along the navigation channel side slopes. Such slope modifications are not readily apparent in the DEIS results, as such it is not apparent if this functionality was correctly implemented in the model.

7) A primary objective of the DEIS was to quantify potential impacts to adjacent shorelines. However, the DEIS states *"Higher observed bed shear stresses suggest a potential for increased sediment resuspension and erosion, but no quantification of erosion rates or shoreline change is presented in this report."*, suggesting the investigation is incomplete.

8) The median grain size parameter (D50) is highly influential to morphological model results. However, different values for D50 were applied in the morphological model (0.22 mm) while significantly higher values were used for the evaluation of secondary ship wakes (e.g. 0.38 mm at "Bald Head Shoal 1"). This discrepancy for such an influential and easily verifiable model parameter was not explained.

9) The DEIS predicts shoreline impacts adjacent to the inlet using the one-line GenCade model. However, the application of GenCade in this context represents a severe oversimplification of the physical processes governing sediment transport in the areas of concern to the Village of Bald Head Island. Furthermore, the DEIS mischaracterizes prior work by other consultants to support a poorly

calibrated GenCade model. Specifically, sediment transport rates computed by GenCade are more than five and a half times lower than both the works cited and those derived from long-term beach profile monitoring. This discrepancy underscores the model's inability to reliably estimate sediment transport along Bald Head Island.

As presented in the DEIS, GenCade is not capable of accurately computing sediment transport in this setting and should not be relied upon for impact assessment or project design decisions affecting the Bald Head Island shoreline.

10) Additional observations on the DEIS which are not specifically related to numerical modeling are also included.

Wave-related Sediment Transport

According to the DEIS, the calibrated non-cohesive sediment transport model applied values of zero (0.0) to both the susW and bedW parameters. In a Delft3D coastal morphology model, setting these parameters to zero disables the wave-related components of suspended load (susW) and bed load (bedW) sediment transport. These parameters normally scale the magnitude of wave-induced transport formulations, where waves influence sediment dynamics through enhanced bed shear stress, orbital velocities, asymmetric effects, and interactions with currents. Under this calibration, the model ignores these processes and reduces total transport to current-only components, controlled by the analogous parameters sus and bed, which were each set to their default values of 1.0.

The coastlines bounding the Cape Fear River Entrance are ocean-facing sandy beaches where waves play a critical role in shaping morphology. With the published calibration, bed-level changes driven by wave propagation would be absent or substantially diminished. Instead, morphological updates rely solely on current-driven processes, making the simulations potentially suitable for current-dominated cases but inaccurate for combined wave-current systems. This approach may affect depth-integrated mass conservation and bed updating equations, potentially producing stable but unrealistic bed compositions or elevations over time.

The appropriateness of omitting all explicit wave-related sediment transport terms from modeling the physics governing morphological changes along Bald Head and Oak Islands was not explained in the DEIS. Additionally, a description of how the calibration and verification procedures justified this decision was not provided in the DEIS. It is unclear in the DEIS if wave-current interactions were represented through alternative mechanisms (e.g., eddy diffusivity or other coupling approaches) and how sensitivity analyses of these settings influenced predicted sediment transport along the beaches adjacent to the inlet.

Channel Shoaling

It appears that the model calibration and evaluation were focused primarily on shoaling rates within the navigation channel. However, depending on the origin of the shoal material, these rates may or may not reflect sediment dynamics along the adjacent islands. It is unclear in the DEIS if sediment transport rates along the shorelines of Bald Head and Oak Islands were computed or otherwise considered during calibration and verification.

The cited variability in channel shoaling is largely attributed in the report to differences in dredge quantities. By extension, model skill is assessed relative to these uncertainties. Yet, as acknowledged in Section B-9.5.2 (*Data Uncertainty*), dredged volumes and measured shoaling rates are not directly comparable metrics. Table 9-11 does not attempt to distinguish between actual shoaling rates and one-off dredge volumes, which complicates interpretation of model skill.

Further, based on Table 9-8 alone, the model significantly overpredicts shoaling in the Smith Island reach and, except for one data point, underpredicts shoaling in the Bald Head Island reaches—by as much as 2.9 times (Bald Head Shoal 2, relative to the 2015/16 condition survey). These discrepancies could lead to serious misinterpretations regarding sand distribution and inlet management, suggesting that similarities in total shoaling volumes may be more coincidental than indicative of model accuracy.

Finally, page B-207 states: *"The extents of the polygon used to extract sedimentation volumes should be carefully considered when interpreting modeled output."* How should a reviewer interpret this statement in the context of evaluating the polygon selection described in the report? Clear guidance on this point is essential for assessing the reliability of the reported sedimentation volumes.

Slope Avalanching

The Village has repeatedly requested that the modeling effort accurately consider the effects of slope avalanching resulting from dredging of the nearshore beach platform. The gravity-driven process of slope avalanching is of critical importance to the Village of Bald Head Island, given the proximity of the planned channel deepening to the shoreline. The most recent response to this request indicated slope avalanche was considered and directed us to review the relevant appendix in the DEIS document. Based on the information provided there, it appears the modelers attempted to activate subaqueous dune-front slumping within Delft3D.

According to the DEIS, this was implemented by specifying a critical subaqueous slope using the parameter WetSlope and a time function for resolving slope adjustments using AvalTime. Default values were applied, establishing a critical slope of 1V:10H (i.e., 0.2V:1H per the DEIS) and an AvalTime of one day (86,400 seconds).

These settings create a threshold in the model whereby wet slopes steeper than 1V:10H are automatically adjusted to the critical slope. If this functionality was active, one would expect significant slope modifications throughout the model domain, including along the navigation

channel side slopes. However, such erosion and sedimentation patterns are not readily apparent in the DEIS results. To initiate dune-slumping functionality in Delft3D, the parameter DuneAvalan must be specified in the input ".mor" file. The DEIS does not provide the full input files; therefore, evaluation of the incorporation of slope avalanche is hampered.

It is unclear in the DEIS if dune slumping was initiated nor what if any calibration and sensitivity-testing procedures were performed for these parameters. Specifically, missing was an explanation of how the default values were determined to be suitable for use, as they do not appear appropriate for the slopes present in the model domain or for the time frame required to resolve avalanching. There was no clarification as to the extent to which the critical slope criteria were applied to non-dune portions of the model. Sectional views of the modeled bathymetry were not provided which would illustrate both the calibration results and any slopes that were automatically adjusted based on these parameters.

Vessel Wake

Per page B-270, the report states: *"Higher observed bed shear stresses suggest a potential for increased sediment resuspension and erosion, but no quantification of erosion rates or shoreline change is presented in this report."* One of the essential objectives of this study was to quantify potential impacts to adjacent shorelines. This admission suggests the investigation is incomplete. The DEIS is unclear as to how discrete, project-related increases in bed shear stress predicted to influence sediment transport on the adjacent beaches.

The median grain size parameter (D50) is identified in the DEIS as being highly influential to morphological model results. Even small changes in median grain size are reported to significantly alter predicted sediment transport volumes. A D50 of 0.20 mm was selected for the morphological model, yet Table 11-22 applies higher values of D50 when evaluating erosion from secondary ship wakes (e.g., 0.38 mm at "Bald Head Shoal 1"). For reference, the median grain size of sand placed in the 2025 renourishment project was 0.36 mm. The DEIS does not explain why such substantial differences exist in a key and easily verifiable model parameter, and to what extent do larger D50 values reduce predicted erosion in the wake model.

Section B-11.3 concludes: *"These findings suggest the consideration of localized impacts is crucial when evaluating the feasibility and environmental implications of the alternative channel modifications."* It also states: *"Certain model domains, such as Fort Caswell and Bald Head Island, exhibit minimal differences in bed shear stress increases along shorelines, with small clusters of higher shear stress in specific regions where wave energy might be expected to concentrate."* These increases are described in the text as being on the order of 17% (p. B-266), although Table 11-5 indicates potential for larger increases at Bald Head 2 and Fort Caswell. If location matters in quantifying impacts, the report should not summarily dismiss all impacts as minimal without providing a clear, technical, and unbiased basis for that determination.

Moreover, Section 11.3 asserts without basis that impacts are minimal because increases in shear stress are less than 0.5 lbf/ft². However, Table 11-17 cites critical shear stress values ranging from 0.003 to 0.006 lbf/ft² for grain sizes used in the morphological and wake models.

The predicted changes exceed these critical values by more than two orders of magnitude, yet no quantification of erosional potential is provided. There is no explanation in the DEIS for the rationale for describing these predicted increases as minimal and quantify the resultant erosion. The investigation is incomplete without these results.

Use of GenCade

The DEIS evaluates potential impacts to the oceanfront shorelines of Oak Island, Caswell Beach, and Bald Head Island using the one-dimensional shoreline change model GenCade. While GenCade accounts for changes in the incident wave climate, it does not incorporate several critical physical processes that govern sediment transport along Bald Head Island. These omitted processes include:

- Inlet morphodynamics
- Wave-current interactions
- Sediment scour, resuspension, and deposition within the channel
- Morphological feedback mechanisms

The exclusion of these processes represents a significant oversimplification of the sediment transport system in this region.

Additionally, the GenCade model calibration utilized a median sediment grain size of 0.25 mm, which differs from the values used in other modeling efforts: 0.20 mm in the Delft3D model and 0.38 mm in the ship wake analysis. The DEIS does not provide a rationale for this inconsistency in a key model parameter. The GenCade model was subsequently used to estimate sediment transport rates along Bald Head Island and reported the following (DEIS p. B-163):

> *"Based on the modeling, there is a net westerly transport of 50,000 cubic yards per year toward the Cape Fear River and a net easterly transport of 300,000 cubic yards per year."*

These results are presented in Figure 8-6 of the DEIS, reproduced below. Based on the narrative in the DEIS (partially quoted above), positive values represent westerly directed transport while negative values reflect easterly directed sediment transport. The magnitude and direction of sediment transport shown in the graph appear to be consistent with the referenced narrative from the DEIS.

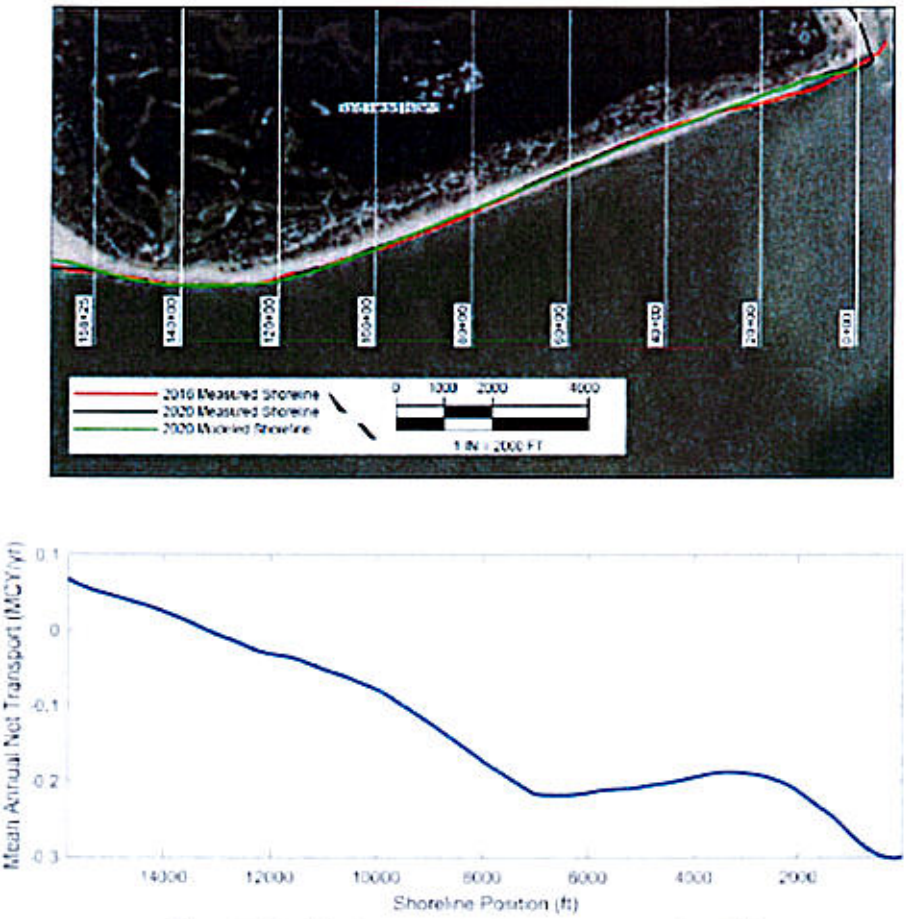


Figure 8-6 Modeled net annual sediment transport along BHI.

Location map from DEIS Fig 8-5 (above) and sediment transport from DEIS Fig 8-6 (below).

The DEIS references a prior study by Olsen Associates, Inc. (2012[1]) as supporting this magnitude and pattern of transport. However, this citation is inaccurate. The Olsen report describes measured sediment transport along the western portion of Bald Head Island as being directed westward, with rates *"ranging between -278,200 and -355,600 cy/yr, based on best-fit analysis of available data* (Olsen Associates, 2012, p. 95)". These

[1] Olsen Associates, Inc. (2012). Calibration of a Delft3D model for Bald Head Island and the Cape Fear River Entrance, Phase I. Prepared for the Village of Bald Head Island, North Carolina.

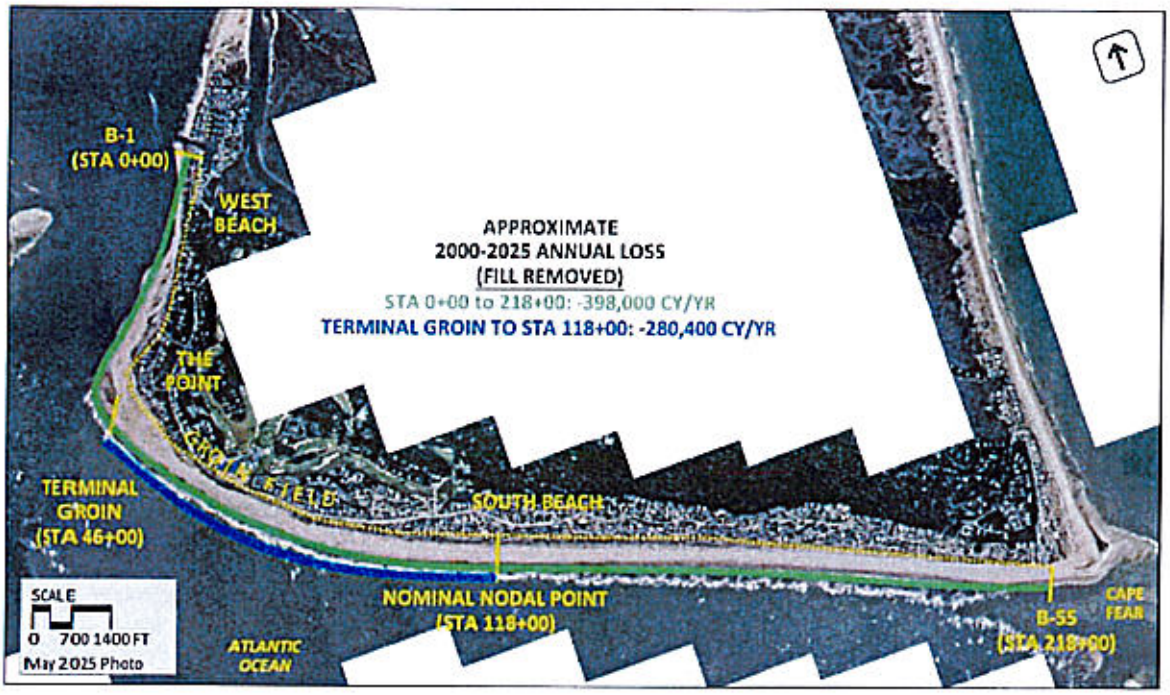
estimates do not account for the influence of the terminal groin, yet they still differ significantly from the published GenCade result of 50,000 cy/yr directed westward.

Further, the 2025 Physical Monitoring Report for the Bald Head Island renourishment project, prepared by Foth Infrastructure & Environment, LLC[2], provides updated long-term sediment transport estimates. Using survey data from November 2000 through May 2025, the report concludes that measured net transport along western Bald Head Island averages 280,400 cy/yr over the last 25 years. For reference, the following figures are excerpted from the 2025 monitoring report. The blue dashed line represents measured sediment transport rates from the terminal groin to STA 118+00, while the black line reflects the full monitored shoreline.

The sediment transport rates computed by GenCade are more than five and a half times lower than those derived from long-term beach profile surveys. As presented in the DEIS, the GenCade model is not capable of accurately computing sediment transport along Bald Head Island and should be deemed unreliable in terms of assessing impacts to said shoreline.

[2] Foth (2025). "Village of Bald Head Island; Beach Monitoring Program, Report No. 23 (April 2024 to May 2025)", Report Prepared for Village of Bald Head Island. Foth Infrastructure & Environment, LLC, 2618 Herschel St., Jacksonville, FL 32204. 62 pp plus apps. (November 2025, not yet published).

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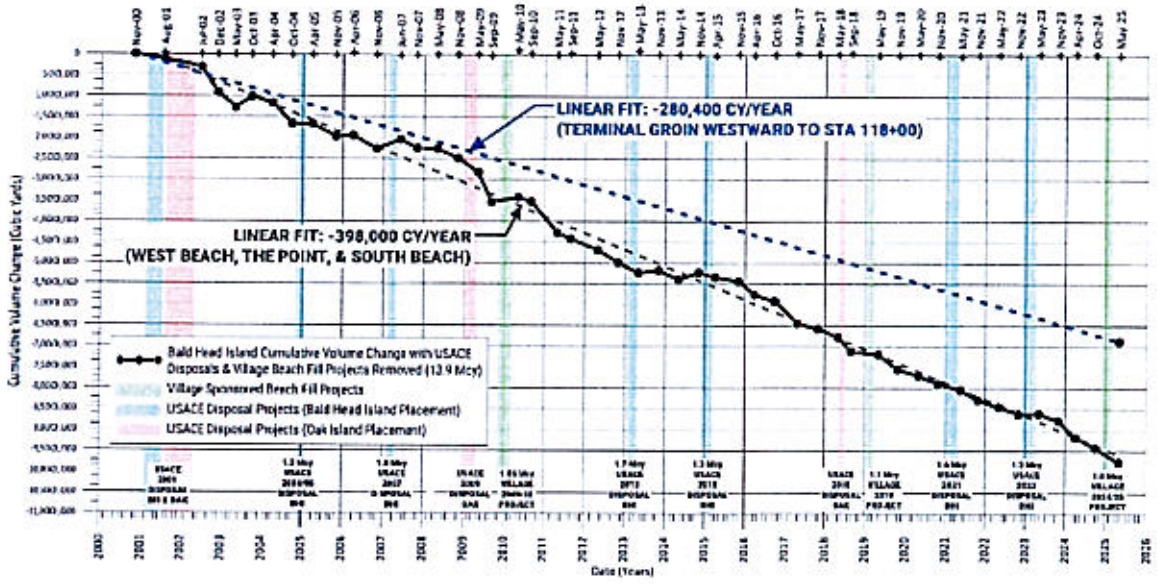


Figure 1: Cumulative volume change along Bald Head Island West Beach, the Point, and South Beach shorelines (above -16 ft-NGVD) through time relative to November 2000 conditions, excluding nourishment events.

Location map (above) and sediment transport rates (below) along Bald Head Island as reported in Foth (2025, to be published).

Additional DEIS Observations Not Directly Related to Numerical Modeling

1. Channel width expansions have been incorporated into the proposed next deepening project that expand federal navigation channel into naturally deeper waters. For example, the Smith Island Range will be expanded from 650 ft to 900 ft. This was an obvious shortcoming of the last deepening project which resulted in additional annual maintenance dredging. This will likely reduce both the frequency and volume of sand periodically dredged from the channel to maintain authorized conditions. This will potentially reduce the quantity of sand available for distribution to the adjacent island beaches.

2. Coincident with the probability of reduced dredge volumes and/or less frequent maintenance dredging for the 3 inner bar channel reaches of interest, the DEIS does not speak to how this will impact the tenets of the existing Wilmington Harbor Sand Management Plan ("WHSMP"). Rather, it generally speaks to sand disposal placement along the adjacent shorelines being "similar" to existing practices following Project implementation. However, the DEIS designated disposal area on Oak Island continues to extend beyond the western limit of the Town of Caswell Beach, or the littoral drift nodal point on Oak Island (ref: Appendix D, page 36). Sand placement west of the nodal point will be detrimental to the Cape Fear River Inlet sediment budget. This is a continuation of the District's current operational plan for sand placement on Oak Island which is not consistent with the intent and tenants of the WHSMP. As such, this approach defeats the mitigation aspect of the Federal Project by not ensuring that sand placed on the two barrier island beaches moves back toward the mouth of the Cape Fear River. Rather, sand placed beyond the nodal point will move westward away from the river mouth and not be available for future mitigative sand placement along the VBHI and CB shoreline, which is contrary to the WHSMP.

3. During the 2000 channel deepening & widening project which included realignment through Jay Bird Shoal, significant beach quality sand was encountered and placed on the two barrier island beaches. Although the DEIS cites the predicted project related to dredging of some 5.8M cy of beach quality sand, it is expected that only 2.3 M. cy is available for beach disposal (Ref: Appendix D, page 36). Where the bulk of the remaining sand goes is not explained. It is noted that the District is modifying the WH ODMDS to now include a corner segment to be used for the dumping of "beach quality" sand for future possible access and reuse via hopper dredge (Ref. Appendix P, pages 54-55). This potentially implies that quantities of beach quality sand will not necessarily be returned to the barrier island beaches but rather dumped offshore by hopper dredge and possibly available as beach fill along beaches that are not directly adjacent to the Cape Fear River Inlet. This would violate the intent and agreement of the SMP. Moreover, this could impact future maintenance material, further reducing sand available for placement along the VBHI and CB shorelines.

4. In Appendix B it is acknowledged that the USACE consultant Stantec interfaced with M&N (the prior Section 203 Report author and consultant to the W.H. Port Authority) and essentially adopted the M&N model setups, grid files, bathymetry, spatial parameters, boundary conditions, etc. This is tantamount to their utilizing the same DELFT3D hydraulic model, ship wake model, etc. Most protocols analyzing project impacts, or lack thereof, were similarly adopted. Hence, the DEIS report findings are anything but independently derived.

Stantec likewise adopted the results of the simplistic GENCADE 1-D shoreline evolution model performed by the District several years ago which were shown to be erroneous when compared to the more sophisticated littoral transport modeling. The latter VBHI sponsored DELF3D modeling was associated with the permitting of a terminal structure on BHI bordering the subject navigation project– and as such included detailed site-specific littoral transport analyses of sand transport rates toward the Cape Fear River at both Caswell Beach and South Beach at Bald Head Island. Interestingly those analyses computed the ratio of annual littoral contributions from the two barrier islands to the inlet at a ratio of 4.7:1. This finding contrasts with the 2:1 ratio adopted by the Wilmington District in the WHSMP in approximately 1999, at which time the District Commander also said that the Plan would be adjusted as necessary, based on monitoring results. No adjustments have been made. The discrepancy between an appropriate and equitable ratio of sand management viz. disposal of beach quality maintenance material has been well substantiated. More recently, a more current estimate (based upon recent comprehensive beach surveys) of the ratio between littoral contributions could be as high as 7:1.

The adopted 2:1 ratio for the location of episodic disposal of dredged channel maintenance sand from the 3 inner ocean entrance channel segments has been a subject of debate since its inception. That is to say, the littoral transport rates proffered by the federal feasibility study prior to construction in 2000 (ref: Tech Report CHL 99-18) are clearly technically unsupportable and contrary to ongoing dredge records, as well as observed shoreline erosion rates at Caswell Beach and BHI.

The net result of this inequity has manifested itself in an ongoing lack of appropriate mitigation of the channel project's historical impacts and the requirement for the VBHI to expend over $70M for beach erosion control since the 2000 Harbor Deepening Project. Conversely, the Town of Caswell Beach at the eastern end of Oak Island has expended zero dollars on inlet related impacts over the same period of time. This ongoing fiscal discrepancy is directly attributable to the imbalance of maintenance sand sharing erroneously codified and subsequently implemented by the District's interpretation of the original Wilmington Harbor Sand Management Plan.

References

Foth (2025), *"Village of Bald Head Island; Beach Monitoring Program, Report No. 23 (April 2024 to May 2025)"*, Report Prepared for Village of Bald Head Island. Foth Infrastructure & Environment, LLC, 2618 Herschel St., Jacksonville, FL 32204. 62 pp plus app. (November 2025).

USACE (1999), *"Wave Climate and Littoral Sediment Transport Potential, Cape Fear River Entrance and Smith Island to Ocean Isle Beach, North Carolina"* Technical Report CHL-99-18, U.S. Army Corps of Engineers (September 1999).

ATTACHMENT H

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

BALD HEAD ISLAND CONSERVANCY

INITIAL SCOPING COMMENTS

30 JUNE 2023

Bald Head Island Conservancy
PO Box 3109
700 Federal Road
Bald Head Island, NC 28461

June 30, 2023

Ms. Chrisa Waite, Public Involvement Specialist
USACE Wilmington District
69 Darlington Avenue
Wilmington, NC 28403
Attn: Wilmington Harbor 403

Dear Ms. Waite,

We are writing on behalf of Bald Head Island Conservancy, a 501(c)(3) nonprofit organization on Bald Head Island, NC (BHI), to relay concerns and share information about the Wilmington Harbor Port Expansion Project during this Scoping Period of the 403 Process. Our organization has focused on our mission to Discover, Learn, Conserve, and Preserve Bald Head Island for 40 years. We specialize in sea turtle nesting biology and barrier island conservation, and conduct a number of environmental monitoring projects and studies on behalf of the Village of Bald Head Island. Our staff includes specialists in marine and environmental science (3 PhD level, 1 MS, 1 BS), and we collaborate closely with state and federal conservation organizations and academic institutions throughout North Carolina and the region. Our education and outreach programs serve the Brunswick and New Hanover county populations beyond just BHI; for example, all sixth graders in Brunswick County (~1,000 students) experience a field trip to BHI each year, and overnight summer science camps are offered to underserved Wilmington youth.

The goal of this letter is to share potential impacts of the Port Expansion project that should be considered fully during the 403 process, and to also offer data and resources to the project as needed. Bald Head Island, at the mouth of the Cape Fear River adjacent to the current Cape Fear channel, is in a vulnerable location relative to this proposed project. Bald Head Island also consists of rare and special ecosystems that should be preserved and protected at all costs. We are also concerned about river-wide impacts that have been more broadly discussed already, which would undoubtedly affect the natural resources throughout the entire watershed, including BHI.

Specifically, our concerns include:

- **Impacts of channel deepening to sediment dynamics at the river mouth.** Erosion of BHI beaches and sediment movement from east to west (from BHI's south and west

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beaches to the river channel) were severely underestimated during the 2000 channel realignment. Sediment fluxes along BHI's incredibly dynamic south and west beaches need to be carefully measured, and a fine-scale 3D model of sediment movement at the river mouth should be constructed, using *current* and *location-specific* data. This is a complex and vulnerable area and great care should be taken to be as accurate as possible with predicted impacts. Further impacts of erosion include:

a. Loss of beach nesting habitat for listed species of concern, including Loggerhead, Green, and Kemps Ridley sea turtles, and shorebirds such as Least Terns, American Oystercatchers, and Wilson's Plovers. Tides/storms have been the largest threats to BHI sea turtle nests over the past 5 years, and these impacts are also expected to increase with climate change and sea level rise.
b. Impacts of erosion and beach loss to individual home and business owners and the local and state economy
c. Increasing vulnerability of barrier islands (BHI, Oak Island) and other coastal communities to climate change related sea level rise and predicted increased storminess
d. Impacts of erosion and sediment dynamics on back-barrier creeks and marshes, including tidal flushing and water quality

- **Impacts of channel deepening to the freshwater aquifer.** A location-specific 3D model of aquifer-surface water dynamics should be created, including scenarios for channel deepening/widening at different potential depths, and the impacts of sea level rise. This model should include impacts to the Castle Hayne aquifer, but also interactions with specific semi-confined aquifers on barrier islands. Model should also include scenarios for changes to riverine tides and salinity that will result from changes to the hydrogeography.
    a. Saltwater intrusion is already occurring on BHI's west and south beaches. Further encroachment of salinity caused by channel deepening/widening will reduce the size of BHI's only freshwater source to island ecosystems
    b. BHI's maritime forest (Bald Head Woods Coastal Reserve) is fed by this aquifer, is the second-largest maritime forest in the state, is considered a globally-imperiled forest subtype, and is protected by the NC Natural Heritage Program. Several listed plant species are found on BHI.
    c. Loss of a drinking water resource to the public. Most of BHI's drinking water is groundwater-derived. The Village of BHI has invested in careful environmental monitoring and study of responsible water use to not impact natural resources on the island.
    d. Loss of/salinization of freshwater wildlife habitat. The freshwater ponds and lagoons fed by the aquifer are home to one of the largest breeding populations of protected American alligators in the state, and also provide important roosting and feeding grounds for a variety of waterbird species.

- **Impacts of dredging and increased shipping on wildlife and fisheries.** The initial impacts of increasing channel depth and width will be substantial. It is currently unknown how often channel maintenance dredging will occur, but we expect that it will need to occur more often and for longer periods than currently.

a. Already, channel maintenance dredging kills or injures numerous sea turtles and shorebirds each year. BHI Conservancy leads emergency wildlife response on the island, and we spend hundreds of hours each year transporting and providing care for animals hit by boats or caught in dredging equipment (those that survive the initial injury). These animals are also cared for by nonprofit organizations such as Sea Biscuit Wildlife Shelter and the Karen Beasley Sea Turtle Hospital, who rely solely on donations for support.
b. The lights and noise from dredging equipment can disturb and change behavior of foraging and nesting sea turtles. We have observed this directly causing false crawls and misorientation of emerging hatchlings.
c. Dredging has immediate impacts on the benthic environment, including benthic invertebrates that provide the forage base for sea turtles and important fisheries species. Increasing the magnitude, geographic scale, and frequency of this dredging will have longer-lasting effects throughout the food chain, and impacts on the fisheries economy in the Cape Fear watershed.

- <u>Impacts throughout the Cape Fear River and watershed.</u> The Port of Wilmington is 28 miles from the Atlantic Ocean, which is 28 miles of direct impact to the river. Other regional ports such as Savannah (18 miles) and Charleston (5.5 miles) have shorter distances to the open sea. The scale of hydrodynamic impacts of a project of this size cannot be underestimated. Our concerns include:
    a. An estimated 32 million cubic yards of dredge material will need to be transported and disposed of, not including maintenance dredge materials.
    b. Placement location of dredge spoil material and quality of the material
    c. Potential contamination of dredge spoil and impacts of this on water quality (heavy metals, methyl mercury, PFAS)
    d. Large scale of perturbations and fluidization of the seabed, and impacts on biogeochemical cycling
    e. Exacerbation of existing acceleration of sea level rise in the Cape Fear Watershed
    f. Erosion, flooding, and salinization impacts to marshes and wetlands, including the Bald Head Island/Smith Island Complex. Eroding marshes bordering developed areas will have no space to migrate, and marsh loss due to sea level rise may be accelerated. Marshes provide buffer to storm surge, habitat to wildlife and fisheries species, water filtration, and carbon sequestration benefits.
    g. Increased flooding impacts to vulnerable areas and resources which have already been stressed by Hurricane Florence, PFAS contamination, and are not fully recovered (e.g., residential areas in downtown Wilmington and Brunswick County, wastewater treatment facilities).

We urge you to fully consider the potential impacts of this proposed project by collecting the necessary scientific data and allowing adequate input from local and regional experts and the public to make an informed decision. We would be glad to provide data we have already collected if it can be of use, or partner with the USACE to collect future data or samples on Bald Head Island as part of the NEPA process.

Available datasets:

- Bald Head Island Sea turtle nesting (1983-present), including annual trends, locations, and impacts of erosion/washover/disturbance on nesting and hatching
- Bald Head Island aquifer volume (2009-present) and water quality (2014-present)
- Bald Head Island aquifer modeling study (Dr. Peter Zamora, 2021)
- Bald Head Creek water quality (2012-present)
- Bald Head Island Bird monitoring (2015-present)
- Bald Head Woods Coastal Reserve maritime forest study (Dr. Jodi Forrester, 2020)
- Bald Head Island alligator population monitoring (2007-present)
- Bald Head Creek siltation and sediment characteristics (2018-2019)
- Bald Head Island wildlife emergency response (2020-present)

Thank you for considering our concerns.

Sincerely,

Elizabeth S. Darrow, Ph.D.
Chief Scientist
Bald Head Island Conservancy
910-338-0942
darrow@bhic.org

G. Christopher Shank, Ph.D.
Executive Director
Bald Head Island Conservancy
910-338-0910
shank@bhic.org

ATTACHMENT I

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

E-MAILS REGARDING PUBLIC PARTICIPATION IN NED

Bill Cary

From: Walters, Bret L CIV USARMY CESAW (USA) <Bret.L.Walters@usace.army.mil>
Sent: Monday, July 22, 2024 5:20 PM
To: Bill Cary
Cc: Hill, Suzanne CIV USARMY CESAS (USA); Charles S. Baldwin, IV; Chris McCall; Stolba, Andrea M CIV USARMY CESAW (USA)
Subject: RE: Wilmington Harbor 403
Attachments: 10-R-4_NED_DeepDraft.pdf

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Mr. Cary,

Thank you for your message and the conversation at the meeting last month. We have considered your request for detailed information. The information you are asking for is too preliminary to share at this stage of the process. The analysis and documentation currently being developed will be refined substantially over the next several months and incorporated into the draft report and provided for public review, with a public comment period in the Fall of 2025 (a little over a year from now).

Please see the attached US Army Corps of Engineers' Institute for Water Resources' National Economic Development Manual for Deep Draft Navigation. This manual describes accepted economic analysis procedures for deep draft navigation projects and describes the fundamentals of containership analysis. The analysis for the Wilmington Harbor 403 Letter Report and Environmental Impact Statement will follow the guidance in this manual.

I hope this helps.

Bret Walters
Chief, Planning and Environmental Branch
Wilmington District, US Army Corps of Engineers
(910) 251-4505 (desk)
(910) 690-0852 (cell)

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From: Bill Cary <BCARY@brookspierce.com>
Sent: Thursday, June 27, 2024 2:02 PM
To: Walters, Bret L CIV USARMY CESAW (USA) <Bret.L.Walters@usace.army.mil>
Cc: Hill, Suzanne CIV USARMY CESAS (USA) <Suzanne.Hill@usace.army.mil>; Charles S. Baldwin, IV <CBaldwin@BrooksPierce.com>; Chris McCall <cmccall@villagebhi.org>
Subject: [Non-DoD Source] Wilmington Harbor 403

I am writing on behalf of the Village of Bald Head Island to ask that the more detailed Project economic justification and analyses currently being prepared can be shared prior to the July 22. 2024 deadline for NEPA initial comments. I note that the ASACW Review Assessment (A-4, C-4, C-6, and C-8) is critical of the 203 assumptions and analysis and requires a new analysis, which your team is apparently undertaking, and you have shared some initial observations in the public sessions. If the 203 had originally done a thorough and well-founded analysis, the NEPA public comments would be informed and could focus on analytical concerns and make suggestions for additional study, but we are currently shooting largely in the dark. Our (the Village of Bald Head Island) 203 Scoping Comments specifically asked that this

process be opened up to public involvement (since the public was unable to meaningfully participate in the 203, as explained in those comments), but that was apparently not feasible.
We ask that the new analyses be shared in detail now (even if still in draft) so that meaningful comments can be made prior to the current deadline for consideration during the NEPA process, **before** the Draft EIS is prepared. Alternatively, we ask that once the analyses are available, they be provided and an additional comment period be allowed. Meaningful public comment, which will require study and review of the analysis, should be received before the Draft EIS is prepared. Thank you for your consideration to this request.

Bill

Bill Cary

BROOKS PIERCE

t: 336.271.3115
f: 336.232.9115

2000 Renaissance Plaza
230 North Elm Street
Greensboro, NC 27401
P.O. Box 26000 (27420)

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ATTACHMENT J

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

E-MAILS REGARDING COMMENT PERIOD EXTENSION

Bill Cary

From: McCorcle, Justin P CIV USARMY CESAW (USA) <Justin.P.Mccorcle@usace.army.mil>
Sent: Monday, October 27, 2025 4:23 PM
To: Bill Cary; Daniel F. E. Smith; Charles S. Baldwin, IV; Jayant Joshi
Cc: Nygren, John T CIV (USA); Stolba, Andrea M CIV USARMY CESAW (USA); Fiocchi, Elizabeth C CIV USARMY CESAW (USA); Morgan, Brad A COL USARMY CESAW (USA); Walters, Bret L CIV USARMY CESAW (USA)
Subject: FOIA Interim Response and Comment Extension
Attachments: WH 403 Public Econ IPR Nov 2024 - Presentation with Notes.pdf

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Messrs. Cary, Baldwin, Smith, and Joshi,

This is an interim response to FOIA request 26-012, related to the economic data supporting the Wilmington Harbor 403 Draft EIS and Letter Report. Much of that data is derived from others and likely will not be able to be made available, as further detailed below:

1. We have in our possession seven documents derived from the NC State Ports Authority, potentially exempt under Exemption 4, which covers trade secrets and commercial or financial information obtained from a person or corporation that is privileged or confidential. Four of those appear to be economic forecasts for industries which may utilize waterborne commerce, two are documents related to port expansion or re-design, and one is a set of notes from interviews held with the Ports and its customers. We have sent these documents to the NCSPA for its review and potential objection to release.
2. The author of our Economics Chapter and Appendix obtained the data used to create his forecasts from several subscription or proprietary sets of data, which he signed Non-Disclosure Agreements (NDAs) in order to access. These include documents from our license agreements with IHS-Fairplay, Lloyds Registry-Fairplay, and S&P Global, as well as government databases or applications to include commerce statistics from the US Census Bureau, the USACE Waterborne Commerce Statistics Center, and the Institute of Water Resources (IWR) Deep Draft Vessel Operating Cost (DDVOC) database. This data is not releasable subject to these non-disclosure agreements and licensure restrictions. We are working with our Deep Draft Navigation Center of Expertise (DDNPCX) and our respective experts at the IWR to more thoroughly describe these restrictions, but it appears unlikely at this time that there will be much releasable data.

I have attached to this request a presentation prepared by our Economist to help explain his analysis. The presentation was accurate as of the date it was made, but we caveat that the report will continue to evolve as the data evolves.

As you have also requested an extension of time for comments on the DEIS, I wanted to extend to you on behalf of the Commander an extension for comments for your client, the Village of Bald Head Island, commensurate with the time your request was under review up to this point. Accordingly, **we will extend the comment period for your client two weeks, until November 17, 2025.** It is recommended that you seek some of the subscription/license services listed above for your own access to their data, as it does not appear to be within our authority to grant it to you.

Respectfully,

Justin P. McCorcle
District Counsel
USACE, Wilmington District
69 Darlington Avenue, Wilmington NC 28403
Office: (910) 251-4699
Cell: (910) 366-3822

ATTACHMENT K

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

CORRESPONDENCE WITH USACE REGARDING 2025 MAINTENANCE DREDGING

Attachment	Description
K-1	Letter dated June 20, 2025, to Corps and Contractor regarding Contract No. W912PM25CA005.
K-2	Letter dated June 30, 2025, from Justin P. McCorcle.
K-3	Letter dated July 18, 2025, to Justin P. McCorcle regarding Dredging Contract.
K-4	Letter dated September 4, 2025, from Justin P. McCorcle responding to WPHC

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230 North Elm Street
Greensboro, NC 27401

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F 336.378.1001
www.brookspierce.com

June 20, 2025

Colonel Brad A. Morgan
District Commander
Wilmington Regulatory Field Office
69 Darlington Avenue
Wilmington, NC 28403
brad.a.morgan@usace.army.mil

Norfolk Dredging Company
110 N. Centerville Turnpike
Chesapeake, Va. 23220
Attn: Michael Haverty
mhaverty@norfolkdredging.com

Re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

Dear Colonel Morgan and Mr. Haverty,

As counsel for the Village of Bald Head Island ("VBHI"), we have been asked by our client to submit this letter in light of the recent Notice of the above Contract, which Notice indicates that sand from this year's maintenance dredging of the Wilmington Harbor Chanel will "be strategically placed to nourish the beaches of Oak Island (Town Caswell Beach and Town of Oak Island)." *See* Attachment 1. **Placement of such sand on any beaches other than Caswell Beach or VBHI would be a violation of the existing terms of the Wilmington Harbor Project (WHP), authorized in 2000.** The purpose of this letter is to alert you to the existing restrictions on sand placement and to seek assurance that the Contract's Placement Plan (Section 1.7.2) will comply with the WHP.

A. Summary

VBHI opposes any placement of sand dredged pursuant to the Contract on the beaches of the Town of Oak Island (TOI), west of Caswell Beach, as indicated in the Notice. The placement of sand removed from the Cape Fear River Wilmington Harbor Channel onto TOI beaches will remove that sand from its natural sand-sharing system and place it in a different littoral cell, to the permanent harm of VBHI as part of the originating system and in violation of the terms of the WHP's underlying Environmental Assessment (EA), discussed below. In particular, the EA addressed concerns over the WHP's adverse effects to the **adjacent** beaches and incorporated a Sand Management Plan (SMP) to assure displaced sand would remain in the same littoral system. The ultimate Finding of No Significant Impact (FONSI) specifically relied on and affirmed the SMP as an integral part of the necessary conclusion of no significant environmental impact. The proposed recipient TOI beaches are outside that littoral system and are not part of the SMP. Moreover, the proposed work will endanger VBHI infrastructure, will disrupt the regular maintenance schedule and re-nourishment of the beaches impacted by the WHP, and will exacerbate damage to those beaches and the VBHI infrastructure.

B. Background and VBHI Interest

1. Geography

VBHI is situated on Bald Head Island, North Carolina, at the mouth of the Cape Fear River. Bald Head Island is directly adjacent to and eastward of the Wilmington Harbor Channel, a federally maintained navigation channel that connects the port city of Wilmington to the Atlantic Ocean. Immediately to the west of the Channel at this point is the eastern tip of Oak Island, on which is situated Fort Caswell and Caswell Beach. The central and western portion of Oak Island, abutting Lockwood Folly to the west, is the Town of Oak Island (TOI). A stretch of the Channel is situated directly between Bald Head Island (to the east) and Caswell Beach (to the west). As the stretch of the Channel between Bald Head Island and Caswell Beach is periodically dredged, it gradually is refilled with sand eroding from those two **adjacent** beaches in what is sometimes referred to as a sand sharing system between two littoral cells. Caswell Beach and Bald Head Island, being immediately adjacent to the Channel, are directly affected by the dredging and maintenance of that Channel and are integral components of that littoral system. The TOI beaches comprise a distinct littoral cell and are not part of the Bald Head Island-Caswell Beach sand sharing system.

2. Historical Impacts

VBHI has a long history of having to endure and respond to the impacts of the Corps' historical deepening and realignment of the Channel. The Channel was deepened in 1976 and several times subsequently. As part of the 2000 WHP, the section of the Channel directly adjacent to Bald Head Island was reoriented closer to the Island, widened, and deepened by approximately four feet (40 to 44 feet).

Since those Channel alterations, Bald Head Island's beaches have experienced accelerated erosion, which has resulted in destabilization of the Island's nearshore environs and increased incident wave energy immediately adjacent to the Island. In effect, the sand of Bald Head Island shores is both sliding into the Channel and being swept away by increased tidal forces. Despite the assurances in the Environmental Assessment (EA) of the WHP, the Channel alterations have caused dramatic increases in erosion and sand volume loss on and near Island beaches—as VBHI's consultant had projected. Faced with an ongoing sand budget deficit, VBHI has taken a number of actions to mitigate or minimize impacts of the prior Channel alterations and protect its beaches, critical habitats,[1] infrastructure, and residents. VBHI's actions since 1995 have included permitting and constructing a terminal groin at the point of the Island (adjacent to the Channel); constructing and periodically replacing the sand-filled geotextile tubes in the groin field behind the terminal groin; and, undertaking two storm mitigation re-nourishment projects to replenish lost sand on the Island's western and southern beaches. The costs incurred by VBHI to plan, permit, and implement mitigation measures are over $69 million, as shown on Attachment 2 hereto—and are ongoing.

While the SMP designates the Town of Caswell Beach as the recipient of the sand dredged in this year's cycle, VBHI is nevertheless harmed if, instead, sand is diverted to any other beach, as documented in the EA and SMP.

C. The EA and the SMP

Sand losses from the adjacent beaches were anticipated during the planning and implementation of the 2000 WHP, and the SMP was incorporated into the project's required Environmental Assessment (EA). The goal of the SMP was that the displaced "sand should be retained within the active coastal sand system". EA, §1.03, p. 3.

> The sand management plan (Appendix A [to the EA]) for the deepened Wilmington Harbor project **requires** that **all** beach-quality maintenance material **be returned to the adjacent beaches**. This will result in enhancement of the regional sediment budget.

[1] The subject beaches are nesting areas for endangered turtles and birds, as discussed in the EA.

Id., §5.01, p. 27 (emphasis added). This requirement is the result of the fact that:

> Natural supplies from rivers and streams are not replenishing littoral sediments, particularly on the East Coast of the United States. Thus, the **removal of a cubic yard** of littoral sediment from a tidal entrance or inlet with deposition outside the active littoral zone of the beach **will ultimately cause a cubic yard deficit** somewhere within the sand sharing system affected by that particular entrance or inlet.

SMP, ¶ 20, pp. 9-10 (emphasis added). Such removal has been identified by the Corps as "a major cause of man-induced erosion." *Id.*

> From an engineering perspective, **the primary requirement** for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to **prevent project induced erosion of the adjacent beaches** by conserving the limited resource, sand, **through deposition directly on the adjacent beaches**.

Id. (emphasis added). The SMP finds that 66% of the sediment shoaling at the Channel entrance comes from Bald Head Island, and 34% from Caswell Beach. *Id.*, ¶ 22, p. 10.

> In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel **will be placed back on the beach from whence it came.**

Id. (emphasis added). To be clear, the placement will be on "Bald Head Island" and "on East Oak Island-Caswell Beach beginning at a point just east of the Carolina Power and Light cooling water discharge canal." *Id.* TOI is west of the canal.

These protections for the Bald Head Island-Caswell Beach littoral system did not happen accidentally. VBHI had engaged a coastal and oceanographic engineering expert, Erik J. Olsen, to study the historical effects of Channel deepening projects and the potential impact of the 2000 WHP. His analyses, as well as the Corps' studies as part of the Environmental Assessment of the WHP, concluded there would be severe impacts to the beaches adjacent to the Channel.

In response to the concerns raised, the Corps Wilmington District Chief Engineer, Col., James DeLony, sent a letter assuring the local mayors that sand placement will be "according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to [VHBI]...." DeLony Letter, June 9, 2000, p. 2. Attachment 3. More specifically, he stated:

> The disposal of **all beach quality dredged material** will be accomplished in **accordance with** the Environmental Assessment [...dated February 2000] and its **Sand Management Plan....**"

Id. p. 3. Because the WHP required the State of North Carolina to conduct its own consistency review under the Coastal Zone Management Act, the NC Department of Environment and Natural Resources (now, NC Department of Environmental Quality), Division of Coastal Management, conducted that review and raised serious concerns about impacts to the sand systems. The final State determination states:

> **Based upon** our review of **the EA** [Environmental Assessment] **and the Corps of Engineers' response to comments [the DeLony Letter]**, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, **provided that the project is performed according to the EA (including the Sand Management Plan** and other appendices)...[and other conditions stated therein].

Letter from Donna Moffitt, Director, NCDENR/DCM, June 15, 2000 to Col. DeLony, USACE District Engineer, p. 2 (emphasis added). Attachment 4.

The Corps then issued its Finding of No Significant Impact (FONSI), relying specifically on the Moffitt Letter and its incorporation of the assurances in the DeLony Letter: "We will comply with the indications in the [Moffitt] letter." FONSI, § 3.00, p. 5.

Thus, the final North Carolina consistency determination, the EA, and the FONSI were *specifically conditioned* on the Corps complying with the SMP to maintain sand in the littoral system by placing it on the **adjacent** beaches—Bald Head Island and Caswell Beach.

D. Proper Use of Contract-dredged Sand

To meet the goals of the SMP, sand should not be placed westward of the "nodal point" on Caswell Beach, where the directionality of net littoral transport changes from east to west. As defined by the Corps and as validated by Delft 3-D modeling, that point has historically been understood to be approximately at the nuclear Powerplant channel and outfall. Because erosion experienced at Caswell Beach has been less than been forecast by the SMP (and greater at Bald Head Island), the sand this year is apparently not needed at Caswell Beach and hence the suggestion to place it on TOI beaches. If the current dredging Contract will produce more sand than Caswell Beach needs or can accept, the alternative contemplated in the SMP, as

stated in Colonel DeLony's letter, is to adjust the placement to reflect the actual impacts by placing excess sand on the VHBI beaches. The sand from the Smith Island range (closest to Caswell Beach) could be placed on Caswell Beach while the sand from the remaining two sections closest to Bald Head Island could be placed on Bald Head Island. Because of the immediate proximity, there should be no incremental cost. If there is, VBHI is open to discussing bearing that cost.

E. The Contract As Described in the Notice Would Violate 33 USC § 408

The 2000 WHP, including on-going maintenance of the Channel to assure efficacy of that Project (*i.e.*, navigability), is an "authorized project" which cannot be interfered with:

> It shall not be lawful for **any person ... to take possession of** or make use of for any purpose, or ... alter, deface, destroy, move, injure, ... **or in any manner whatever impair the usefulness of any ... work built by the United States**, ... in whole or in part, for the preservation and improvement of any of its navigable waters or to prevent floods, or as boundary marks, tide gauges, surveying stations, buoys, ... **nor remove for ... other purposes any stone or other material composing such works** ....

33 USC § 408(a) (emphasis added). The proposed removal of sand to a TOI beach violates this provision in several ways. First, the SMP is a Project "condition," and violating its specific conditions and purpose will impair "the ability of the project to function **as authorized**" (emphasis added).

Second, sand is an element of the WHP which cannot be removed from the Project *or* received by anyone not a part of the Project. The beaches of TOI are not included in the disposal plan in the SMP for the simple reason that they are in a different littoral cell and are not part of the Channel entrance littoral system being impacted by the WHP[2] and its on-going need for maintenance dredging. The TOI beaches are not part of the WHP of deepening and maintaining the Wilmington Harbor Channel. Therefore, the sand being deposited in the Channel by the natural and anticipated consequences of the WHP, and its planned use on the adjacent beaches as part of the Project, is "stone or other material composing such work" and may **not** be removed from the system *and* may not be received by TOI. 33 USC § 408(a).

[2] The pre-WHP studies confirmed that the littoral transport of sand along most of the TOI beaches is westward, away from the Cape Fear Channel entrance, and hence not a part of the that littoral system.

F. VBHI is a named, intended third-party beneficiary of the SMP.

As discussed above, the SMP, and the Corps' commitment to comply with it, were specifically because of the projected negative impacts to VBHI, which was forecast to suffer 2/3rds of the sand loss caused by the WHP. The SMP protects the public interest from the detrimental effects of the WHP on the adjacent beaches, as explained above, and any proposed deviation from it will therefore negatively impact the public interest as well as VBHI's interests.

Even with the SMP maintenance of adjacent beaches, the negative impact of the WHP has been significant, as detailed above. The on-going, necessary projects are costing VBHI millions of dollars. Permanent removal of significant quantities of beach quality sand from this littoral system will further exacerbate these damages, including: conservation and environment (the eroded beaches negatively impact nesting habitat for endangered birds and turtles, as detailed in the EA), flood hazards (storm resilience), economic development (the on-going and increasing financial burden on VBHI in protecting its residents' properties), recreation (usability of beaches), residual risk, induced damages, and shore erosion. Accordingly, deviating from the SMP to benefit TOI interferes with VHBI's rights.

G. Allowing Deviation from the SMP Undermines Credibility in Corps Permitting

In 2000, the Corps evaluated the WHP and its environmental consequences. It undertook to assuage the public by assurances of protective measures, specifically adherence to the SMP as a method of protecting the adjacent beaches from project-induced erosion. *See* assurances in DeLony Letter, including implementation of the SMP and even enhancing it with additional nourishment if it is inadequate.

> From an engineering perspective, **the primary requirement** for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to **prevent project induced erosion of the adjacent beaches** by conserving the limited resource, sand, **through deposition directly on the adjacent beaches.**

SMP ¶ 20, p. 10. "We will comply with the indications in the [Moffitt] letter [conditioning North Carolina CZMA concurrence on Col. DeLony's assurances of adherence to the SMP]." EA, § 3.00, p. 5.

The Corps is currently evaluating a new Wilmington Harbor project, which would further deepen and widen the Cape Fear Channel. The impacts of that proposed project are currently being studied and plans for mitigation of the effects are being drawn and vetted. **Now** is the time to demonstrate that this evaluation of

project impacts and the Corps' commitment to fairly evaluating and offsetting project impacts is not ephemeral and its promises of mitigation are not illusory.

H. Conclusion

Dredging the Cape Fear River to ensure and enhance its navigability comes at a price beyond the financial cost: it affects the transport of sand within that immediate littoral system, which in turn impacts the systems (beaches) on which that sand depends. Recognizing those impacts, and mitigating those damages, is part of the price of the Project. The displaced sand is not a bonus to be applied where convenient. It is owed to the communities whence it came. TOI has a legitimate need for beach sand, but the Channel sand is not a legitimate source. The system described in the EA and SMP—where every cubic yard of sand removed from the littoral system results in a cubic yard deficit on the adjacent beaches—demonstrates that the sand in this littoral system is a constituent part of the system, migrating to and from the Channel. The proposal to use Channel sand at TOI is equivalent to directly removing the sand from the beaches at VBHI and Caswell Beach and trucking it to TOI. It should not be allowed, under any conditions.

Accordingly, we ask the Norfolk Dredging Company to confirm it will not submit a Placement Plan that places sand anywhere other than on Caswell Beach or VBHI beaches, and we ask the Corps to confirm that it will not approve any Plan other than one that is confined to Caswell Beach and VBHI beaches.

We look forward to hearing from you on the intending Placement Plan. Please feel free to contact me if you have any questions.

Brooks, Pierce, McLendon, Humphrey, and Leonard, LLP,

Attorneys for the Village of Bald Head Island

By: 

William P. H. Cary
bcary@brookspierce.com
(336)-271-3115

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Justin McCorcle, Wilmington District Counsel, U.S. Army Corps of Engineers
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Federal Consistency Coordinator,
Div. of Coastal Management, NC DEQ
Heather Coats, Beach & Inlet Management Project Coordinator,
Div. of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer
Rosalind M. Shoemaker, Contracting Officer
USACE Wilmington Regulatory Field Office

ATTACHMENT 1

NOTICE OF CONTRACT AWARD

US Army Corps of Engineers

USACE Wilmington

News Release

Contract award: maintenance dredging of the Wilmington Harbor Inner Ocean Bar will benefit Oak Island beaches

Published May 19, 2025

WILMINGTON, N.C. --

WILMINGTON, N.C. (May 19, 2025) – The U.S. Army Corps of Engineers (USACE) Wilmington District has awarded an $18.6 million contract to Norfolk Dredging Company for the crucial maintenance dredging of the Wilmington Harbor Inner Ocean Bar. With the inclusion of all options, the total contract value is estimated at $25.3 million.

This essential project will remove approximately 1.3 million cubic yards of beach-compatible material, which will be strategically placed to nourish the beaches of Oak Island (Town of Caswell Beach and Town of Oak Island). To protect sea turtle nesting, this work is scheduled to be completed within the current beach placement window, from November 16th to April 30th.

Maintaining the navigability of Wilmington Harbor is vital to the economic health of the region. This dredging project will ensure safe and efficient passage for commercial vessels while also providing the valuable benefit of beach nourishment for Oak Island.

Maintenance dredging is a necessary process to remove accumulated sediment from the Inner Ocean Bar, ensuring the harbor maintains its authorized depth. The USACE Wilmington District remains dedicated to its mission of maintaining the nation's waterways and supporting the economic vitality of the region through projects like this.

--30--

U.S. ARMY CORPS OF ENGINEERS –WILMINGTON DISTRICT

69 DARLINGTON AVE, WILMINGTON, N.C. 28403

WWW.SAW.USACE.ARMY.MIL

Contact
David Connolly
910.251.4626

Release no. 25-005

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

15 May 2025

REPLY TO:
Contracting Division

VIA EMAIL

SUBJECT: Award of Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Inner Ocean Bar

CONTRACTOR:
Via Email mhaverty@norfolkdredging.com
Norfolk Dredging Company
ATTN: Mr. Michael Haverty
110 N Centerville Turnpike
Chesapeake, VA 23320

Mr. Haverty:

Congratulations on your award of the subject contract. Attached is a copy of the signed contract for your records. Award was made on 15 May 2025, in the amount of **$18,645,765.00**, for Line items 0001-0004, (funded base line items).

I, **Rosalind M. Shoemaker,** will be the Contracting Officer on your contract. In my absence, the following Contracting Officer may sign actions under this contract: Ms. Jenifer M. Garland and Mr. Troy D. Small. We will be working with you and your team on this contract until completion. The Administrative Contracting Officers for this project will be Mr. Jeremiah L. Smith.

Rosalind M. Shoemaker, Contracting Officer	910-251-4436
Jenifer M. Garland, Contracting Officer	910-251-4134
Troy D. Small, Contracting Officer	910-251-4650
Jeremiah L. Smith, Administrative Contracting Officer	910-241-4642

This letter is not a notice-to-proceed. Notice to Proceed will be issued as part of the preconstruction meeting.

It is emphasized that only a warranted Contracting Officer (either a Contracting Officer or an Administrative Contracting Officer (ACO)), acting within their appointed limits, has the authority to issue modifications or otherwise change the terms and conditions of this contract. If an individual other than the Contracting Officer attempts to make changes to the terms and conditions of this contract, you shall not proceed with the change and shall immediately notify the Contracting Officer. Proceeding with any work not authorized by the Contracting Officer will be at the Contractor's own risk.

SUBJECT: Award of Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Inner Ocean Bar

Timely and successful completion of this project is critical to the mission of the Wilmington District, U.S. Army Corps of Engineers. Accordingly, we are looking forward to a great partnership with your company, as you perform this important work. If you have any questions, do not hesitate to contact me. I look forward to working with you to meet the needs of our nation.

Sincerely,

Rosalind M. Shoemaker
Digitally signed by Rosalind M. Shoemaker
Date: 2025.05.15 06:58:52-04'00'

Rosalind M. Shoemaker
Contracting Officer

Copy Furnished
Official Contract file/Contracting Division

ATTACHMENT 2

VBHI MITIGATION COSTS

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

Previous Projects

• Engineered Beach Project 2009/2010		
▪ Dredging Contract	$	14,800,000
▪ Interest Expense	$	1,536,000
▪ Permitting – *Land Management Group, Inc., Olsen Associates, Inc., Legal*	$	1,000,000
• Sand Filled Geotextile Groinfield		
▪ 1995	$	320,000
▪ 2005	$	850,000
▪ 2009/2010	$	1,150,000
• Road Overwash		
▪ South Bald Head Wynd Road Repair 2004	$	250,000
▪ Sandbag Revetment Wall	$	250,000
▪ Sandpiper Trail Sandbag Wall + 2009 Repairs	$	65,000
▪ 2007 Sand Placement (Assist USACOE- limited funds)	$	900,000
• Periodic Beach Profile Monitoring	$	595,000
• Required Jay Bird Shoal Biological Monitoring per Permit	$	50,985
• Required Beach Front Biological Monitoring per Permit	$	30,030
• Install Emergency Sandbag Revetment at the Point	$	230,000
• Repair & Maintenance of Revetment at the Point	$	8,000
• BH Creek 2006 dredging Project w/ sand placed on West Beach	$	737,858
Total	$	22,772,873

Additional Expenditures Reimbursed through FEMA Public Assistance Funds

• Bald Head Creek Dredging Project (Emergency Sand Source to mitigate Erosion due to Hurricane Irene)	$	1,230,000
• Sand-filled Tube Groin Field Repairs due to Hurricane Irene	$	650,000
	$	1,880,000

Additional Expenditures Reimbursed through State of NC/DENR Water Resources Development Grant Funds

• Bald Head Creek Dredging Project 2006 (Southwind Construction Co.)	$	260,000

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

The Terminal Groin Project (2015)

- Terminal Groin GO Bond Expenditures @ 2-28-18 (2015 Project)
  Engineering/Design/Modeling/NEPA EIS costs $ 1,177,000
  (Phase I Construction/Orion w/ Corps 2015 O&M Sand)
  - Terminal Groin Construction, part of the T6 project, placing approximately 1 million for the fillet sand to place behind the T6 structure $ 7,876,858
  - Harbor Jetty Extension w/ Spurs $ 1,456,316
  - West Beach and Row Boat Row (Bald Head Creek Dredging) $ 1,261,026

    - Army COE Reimbursement $ 105,341
    - MECA Reimbursement 830,514
    - Contract Reimbursements 140,363
      - Total $ 1,076,218 $ (1,076,218)

  Total Cost, Phase I $ 9,517,982

- Breakwaters Project:
  - Construction of two detached rock breakwaters located north of the Marina
    - Intercoastal Maine, LLC $ 895,052

Sand Re-nourishment / Groin Tube Project (2018-19)

- Sand Re-nourishment / Groin Tube Replacements (2019 Project)
  (Phase II Construction/ SJ Hamill Construction, Bradley Textile Tubes)
  - Beach Nourishment 1million cubic yards, including mobilization $ 11,767,000
  - Groin Tube manufacture and installation 1,514,429
  - Engineering Costs 445,000
  - Legal Costs $ 62,500

  Total Cost, Phase II $ 13,788,929

Marina Channel Maintenance Program

(Grant received from Department of Environmental Quality Resource Development Project to reimburse the Village for 66% of the cost, current expiration of Grant May 2019.)

- Village portion of expenses paid for Dredging the Channel:
  2017 – 2023: $ 289,140

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

Sand Re-nourishment / Groin Tube Project (2024-25)

- Sand Re-nourishment / Groin Tube Replacements (2025 Project)
  Beach Fill Construction/Marinex, Flint Textiles Geotubes, McPherson Marine Service

• Beach Nourishment 1 million cubic yards, including mobilization	$	16,175,000
• Groin Tube Installation	$	1,517,430
• Tube manufacturing (Flint)	$	446,425
• Engineering Costs – JBS Borrow Site Permitting	$	230,200
• Beach Fill Design/Construction Document (including groins)	$	350,000
• Construction Management/observation	$	425,000
• Legal – Construction Contracts Review/Bid	$	7,500
Total Cost	$	**19,151,555**

Beach Monitoring

Annual Shoreline Monitoring Program Expenses (last 10 years): **$2,000,000**
(Includes spring/fall surveying and aerial imagery documentation w/ final report from Coastal Engineer)

Total Accumulated Costs Associated with the Mitigation of the Navigation Channel **$69,303,391**

Overall Total To Date - $71,732,531

(25-year average expenditure annually - $2.87M)

ATTACHMENT 3

DELONY LETTER

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO
Project Management Branch

June 9, 2000

Honorable Freeman A. Berne
Mayor of the Village of Bald Head Island
Post Office Box 3009
Baldhead Island, North Carolina 28461

Honorable Harry Simmons
Mayor of Caswell Beach
707 Caswell Beach Road
Caswell Beach, North Carolina 28465

Honorable Joan Altman
Mayor of Oak Island
4601 East Oak Island Drive
Oak Island, North Carolina 28465

Honorable James W. Lowell
Mayor of Holden Beach
110 Rothschild Street
Holden Beach, North Carolina 28462

Dear Mayors:

After years of effort by many, it is a pleasure to see the various elements of the Wilmington Harbor Navigation project (hereinafter the "Project") coming together. As we approach the decision point for the Finding of No Significant Impact (FONSI), I want to bring everyone up to date on the status of our plan to place beach quality sand excavated for the project on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach.

As you know, the details of our plan are presented in the Environmental Assessment, in particular, Appendix A - Sand Management Plan, in the Wilmington Harbor Monitoring Plan, and in the Section 933 Evaluation Report. The shoreline segments recommended to receive sand are the Village of Bald Head Island (up to 16,000 linear feet), Caswell Beach (up to 25,000 linear feet), Oak Island (up to 25,600 linear feet), and Holden Beach (up to 10,600 linear feet). This represents a maximum shoreline length of 77,200 linear feet.

Bald Head Island will be the site of initial beach disposal associated with construction. This site, along with the easternmost 25,000 linear feet of Caswell Beach-Oak Island, represents the least cost alternative of disposal available to the Project; accordingly, placement will be accomplished at Project cost and at no cost to the Village of Bald Head Island.

6

Placement will be according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to the Village of Bald Head Island referencing the Village of Bald Head Island Beach Disposal Plan (2000/2001) (enclosed and incorporated by reference) to the U.S. Army Corps of Engineers, Wilmington District (hereinafter "Corps").

Once disposal has begun at the Village of Bald Head Island, fill operations will continue until the estimated minimum of 1,536,000 cubic yards of sand in the channel prism allocated to the Village of Bald Head Island (based on channel surveys conducted in October and December 1999) have been dredged and placed on the beach in accordance with the March 31, 2000 memorandum. Assuming a potential effective reduction of 20 percent in the gross fill dredged, the final in-place fill volume is expected to range between 1,228,000 cubic yards and 1,536,000 cubic yards.

Project construction beach disposal operations at the Village of Bald Head Island will be performed along both West Beach and South Beach, as indicated by the March 31, 2000 memorandum. The Village of Bald Head Island will provide all requisite easements necessary to construct the template(s) provided for by the March 31, 2000 memorandum.

Once the placement of beach quality sand at the Village of Bald Head Island is complete, placement along approximately 25,000 linear feet of shoreline at the easternmost end of Caswell Beach-Oak Island will be accomplished. Placement will be made in accordance with the template agreed to by the Corps, NCDENR, and the communities of Caswell Beach and Oak Island. The final in-place fill volume is expected to range between 1,451,000 cubic yards and 1,814,000 cubic yards. Since this reach comprises the balance of the least cost alternative for disposal available to the Project, placement will be at Project cost and at no cost to those communities. All requisite easements will be provided by the communities at no cost to the Project.

Under the provisions of the draft Section 933 report, the remaining beach quality sand will be placed along approximately 25,600 linear feet of the westernmost shoreline of Oak Island and along approximately 10,600 linear feet of the eastern shoreline of Holden Beach. Placement will be made in accordance with the template agreed to among the Corps, NCDENR, and the affected beach communities and cost shared at the rate of 65 percent Federal (currently estimated at $6,500,000) and 35 percent non-Federal (currently estimated at $3,500,000). The final in-place fill volume along the cost shared reach of Oak Island is expected to range between 1,272,000 cubic yards and 1,590,000 cubic yards. The final in-place fill volume along the cost shared reach of Holden Beach is expected to range between 528,000 cubic yards and 660,000 cubic yards. The communities will provide all required easements at no cost to the Project.

After construction of the Smith Island and Bald Head Island Shoal portions of the project, the U.S. Army Corps of Engineers will conduct periodic maintenance dredging of the navigation channels. The disposal of all beach quality dredged material will be accomplished in accordance with the Environmental Assessment of Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 2000 and its Sand Management Plan (Appendix A), and the Wilmington Harbor Monitoring Plan (enclosed and incorporated by reference). The associated disposal will be as called for therein, namely:

Year 2: Placement at Bald Head Island (estimated @ 1Mcy)
Year 4: Placement at Bald Head Island (estimated @ 1 Mcy)
Year 6: Placement at Caswell Beach and easternmost end of Oak Island (estimated @ 1 Mcy).

This disposal cycle is planned for the life of the project. As provided on page 8 of the Environmental Assessment and on page 12 of the sand management plan, in some cases problem shoaling involving small quantities of sand may develop in the channel between regular dredging events, making use of a pipeline dredge unfeasible and the sand may need to be deposited in the ocean disposal area.

Prior to each disposal operation at either the Village of Bald Head Island, or Caswell Beach, or the easternmost shoreline of Oak Island, the community receiving the sand may provide advance guidance to the Corps regarding placement distributions and fill template design. The Corps will follow that guidance to the maximum extent practicable.

The Corps will conduct a monitoring program as referred to in the Environmental Assessment and Sand Management Plan, and as set out in the Wilmington Harbor Monitoring Plan, which is enclosed and incorporated by reference. An annual report will be prepared, as described in the Monitoring Plan. The Corps will use this monitoring data to evaluate and adjust the Sand Management Plan, as determined necessary, after coordination with interested parties.

All initial and future disposal activities at the Village of Bald Head Island, Caswell Beach, and easternmost Oak Island, (as described in the Environmental Assessment and its Sand Management Plan, and in the Wilmington Harbor Monitoring Plan) will be at no cost to either community.

If the Project causes significant adverse effects on adjacent beaches, the Corps and the Sponsor will respond by adjusting the Sand Management Plan, after consultation with interested parties. If the Project causes significant adverse effects that cannot be dealt with by

modifications to the Sand Management Plan, the Corps and the Sponsor will promptly seek and use their best efforts to implement appropriate corrective measures, such as additional nourishment, subject to consistency review.

Our current schedule for execution of the FONSI is June 14, 2000. Our current schedule for our higher headquarters approval of the draft Section 933 Evaluation Report is July 31, 2000. We expect to award a contract to construct the inshore reaches of the Ocean Bar entrance channel on or about November 15, 2000. We are moving prudently but aggressively to make this important Project a reality.

The support of the members of the Brunswick Beaches Consortium and our Project sponsor represented by Mr. John Morris in optimizing this unique opportunity for nourishing your beaches has been wise, energetic, and timely. We salute your efforts and look forward to continued close coordination through to the successful completion and operation of the Project and the associated beneficial use of beach quality sand.

Sincerely,

James W. DeLony
Colonel, U.S. Army
District Engineer

Enclosures

Copies Furnished:

Mr. John N. Morris, Director
Division of Water Resources
North Carolina Department of Environment
and Natural Resources
1611 Mail Service Center
Raleigh, North Carolina 27699-1611

Ms. Donna D. Moffitt, Director
Division of Coastal Management
North Carolina Department of
Environment and Natural Resources
1638 Mail Service Center
Raleigh, North Carolina 27699-1638

ATTACHMENT 4

MOFFITT LETTER

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

DONNA D. MOFFITT
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF COASTAL MANAGEMENT

RECEIVED
EXECUTIVE OFFICE
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June 15, 2000

Action: PM-C
CF: DE
DX
DP
TS
OC

Colonel James W. DeLony
District Engineer
U.S. Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

REFERENCE: DCM00-14 EA and CD - Preconstruction Modifications of Authorized Improvements, Wilmington Harbor 96 Project

Dear Col. DeLony:

On May 17, 2000 the State of North Carolina completed its review, pursuant to 15 CFR 930 Subpart C - Consistency for Federal Activities, of the referenced document describing proposed modifications to the authorized Wilmington Harbor 96 Project in New Hanover and Brunswick Counties, North Carolina. The Corps of Engineers submitted the document to the state on February 17, 2000, and the project was assigned the number DCM00-14 for our review purposes.

During the course of our review several environmental concerns were raised by state agencies regarding potential impacts on the resources of the coastal zone. These comments were forwarded to the Corps for its consideration. As the consistency deadline was approaching, we extended our original consistency deadline 15 days, pursuant to 15 CFR 930.41, at the end of March. On April 10, 2000, our review was again extended to allow concerned state agencies to review the Corps' responses to comments on the Environmental Assessment (EA). The Division of Coastal Management received the Corps' responses on May 3 and again solicited comments from concerned state agencies.

The modifications that the Wilmington District Corps of Engineers seeks authorization for are as follows:

1. Construction and maintenance of the Wilmington Harbor entrance channel along a new alignment across the ocean bar.
2. Backfilling the abandoned channel length with dredged material not suited for beach or littoral zone disposal.

MAILING: 1638 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1638
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3. Placement of material dredged from the new channel alignment and other portions of the project on area beaches in New Hanover and Brunswick Counties.
4. Establishment of a comprehensive plan for dredging and disposal operations for each portion of the harbor, including hopper dredge with overflow.
5. Utilization of blast pressure criteria to measure impacts of blasting on aquatic resources and the elimination of the bubble curtain during blasting operations.
6. Placement of dredged material that does not go to the old channel, the littoral zone, the beaches, or other existing disposal sites, into the Offshore Dredged Material Disposal Site (ODMDS).

The Corps proposes to construct the new entrance channel alignment and place all suitable material on the nearby beaches over an approximately eighteen month period covering two winter seasons and one summer season. Turtle monitoring and shorebird surveys of affected beaches will be conducted. Details of the disposal operations for construction and maintenance of the channel are documented in a Sand Management Plan (SMP). In addition, the Corps has clarified details of the placement, timing, costs, and amount of sand to be deposited on the beaches of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach in a letter dated June 9, 2000from Colonel James W. DeLony, District Engineer, to the mayors of the respective beach towns. We understand that disposal of dredged material from construction and maintenance of the project will be conducted according to the SMP and letter, as agreed to by the NC Division of Water Resources, the Brunswick County beach communities and the Corps of Engineers. We also understand that the use of hopper dredge with overflow will be limited to times of year and reaches of the project in which impacts on coastal resources will be minimized.

Based upon our review of the EA and the Corps of Engineers' response to comments, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, provided that the project is performed according to the EA (including the Sand Management Plan and other appendices) and the Corps' responses to comments from the EA, and to Colonel DeLony's letter of June 9, 2000 (including attachments), and that the conditions below are met.

1. Principal amongst the issues raised were potential impacts on sea turtles, shore and water birds, beach and benthic infauna, fisheries, and water quality parameters. It is extremely important that the impacts of this multifaceted project be well documented in order to evaluate the effects on these resources and on the overall coastal environment. The Corps of Engineers will pursue an integrated monitoring plan to address the resources noted in the first sentence of this paragraph, and will coordinate all monitoring efforts with the appropriate state agencies. This will include but not be limited to the North Carolina Division of Coastal Management, the Wildlife Resources Commission, the Division of Marine Fisheries, and the Division of Water Quality. We understand that the Corps intends to initiate monitoring coordination with the resource agencies in June of 2000.
2. As additional mitigation for impacts on fisheries resources, a fish passage structure will be constructed at Lock and Dam 1 on the Cape Fear River. In addition, fish passage alternatives for Lock and Dams 2 and 3 will be investigated. The Corps of Engineers and, as the Wilmington Harbor Project Sponsor, the State of North Carolina, have agreed to these actions.
3. The placement, timing, costs, and amount of sand to be deposited on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach, both during construction and future maintenance; monitoring; and response to impacts shall be in accordance with Col. DeLony's letter of June 9, 2000, to the mayors of the respective towns receiving the sand (attached and incorporated by reference). If the towns, Corps, and project sponsor's representative mutually agree to modifications to the SMP or Col. DeLony's June 9, 2000 letter, those modifications shall be submitted to the North Carolina Division of Coastal Management for a determination of whether another consistency review is necessary on the modifications.
4. The state must have the opportunity to review the project, including monitoring results, to determine if it continues to be consistent with the North Carolina Coastal Management Program in two situations: 1) After five years from the date of this letter, and 2) before any subsequent modifications for future maintenance or other requests to modify the Wilmington Harbor 96 Project are considered. The Corps shall request this review and provide documentation of impacts (or lack thereof) on the coastal resources of concern.

5. If in the future the Corps considers requesting authorization to conduct hopper dredging with over flow or to place maintenance dredge spoil on a beach, outside of the established time periods or locations, a separate consistency review will be required for each of these activities.

While the State of North Carolina supports beach nourishment and the placement of suitable spoil material on the beaches, we remain concerned about the short term and long term impacts on the biologic and ecologic resources of the coast. We maintain that the best time for such beach nourishment and renourishment is outside of the period of peak impacts on infauna, sea turtles, and fisheries. The State discourages individuals and agencies from seeking authorization to perform work outside established moratoria, and caution that our response is not to be interpreted as a precedent assuring authorization for future renourishment or disposal of sand on beaches outside of established dredging and disposal moratoria. We understand that summer beach disposal is necessary only during the construction phase of the project and that maintenance of the harbor channels will be conducted within established biological time frames.

Finally, with the increasing number of beach disposal and renourishment projects, much of the state's southern coast beaches will be in the placement or recovery phases in any given year. To this end, the Division of Coastal Management requests that the Corps consider combining the monitoring studies and environmental considerations of this project, the Wrightsville Beach, Carolina Beach, Kure Beach projects; and all of the Brunswick County Beaches projects to achieve a more comprehensive and cumulative impact analysis. Although these projects are separate in authorization and funding, we feel that concurrent studies could provide beneficial insights on impacts to resources from beach disposal and nourishment along this extended reach of shoreline.

If you have any questions regarding our findings, conditions, or recommendations, please contact Ms. Caroline Bellis, Division of Coastal Management, at (919) 733-2293. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Donna D. Moffitt

Donna D. Moffitt

Attachment

cc: Bob Stroud, Division of Coastal Management, Wilmington
Franklin McBride, NC Wildlife Resources Commission
Bennett Wynne, NC Wildlife Resources Commission
Ruth Boettcher, NC Wildlife Resources Commission
Fritz Rohde, NC Division of Marine Fisheries
Mike Street, NC Division of Marine Fisheries
John Dorney, Division of Water Quality
Frank Yelverton, US Army Corps of Engineers
John Meshaw, US Army Corps of Engineers

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

CESAW-OC

June 30, 2025

SUBJECT: Response to VBHI Letter of June 20, 2025, re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

William P.H. Cary, Esq.
Attorney for the Village of Bald Head Island
bcary@brookspierce.com

VIA EMAIL ONLY

Dear Mr. Cary,

This correspondence is in reference to your letter to Wilmington District Commander COL Brad A. Morgan, dated June 20, 2025, asserting that "[p]lacement of [Wilmington Harbor] sand on any beaches other than Caswell Beach or VBHI would be a violation of the existing terms of the Wilmington Harbor Project (WHP), authorized in 2000." It is the position of the Wilmington District, Corps of Engineers that the Wilmington Harbor Inner Ocean Bar Contract, Contract No. W912PM25CA0005, is consistent with the Environmental Assessment (EA), the Sand Management Plan (SMP), COL DeLony's letter of June 9, 2000, and the relevant Coastal Zone Management Act Consistency concurrence.

In the SMP, incorporated as Appendix A of the EA dated February 2000, the Corps addressed its intent as it related to the Maintenance Material Disposal Plan, and noted as follows:

> In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel will be placed back on the beach from whence it came. Accordingly, two out of every three cubic yards of littoral shoal material removed from the entrance channel will be placed back on Bald Head Island and the remaining cubic yard placed on **East Oak Island-Caswell Beach.** The disposal locations on each island will be based on the results of annual beach profile monitoring surveys. **In general,** the material will be placed primarily along portions of South Beach and West Beach on Bald Head Island and on **East Oak Island-Caswell Beach** beginning at **a point just east of the Carolina Power and Light Company cooling water discharge canal**. [Emphasis added] See SMP, Page 10.

SUBJECT: Response to VBHI Letter of June 20, 2025, re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

On page 4 of your letter, you opine that the westerly limit on our placement is "on East Oak Island-Caswell Beach beginning at a point just east of the Carolina Power and Light cooling water discharge canal." However, given the estimated quantities of future maintenance dredging and the short distance between the cooling water discharge canal and the North Carolina Baptist Assembly property (approximately 8,000 feet), it is not reasonable to interpret our placement area to be so limited in size.[1] Additionally, your position that the Town of Oak Island is not to receive sand because it is west of the canal is inconsistent with the EA and the SMP. Both documents contain the following diagram that clearly identifies the extent of "East Oak Island-Caswell Beach". See Figure 4 of the EA; and Figure 2 of the SMP.

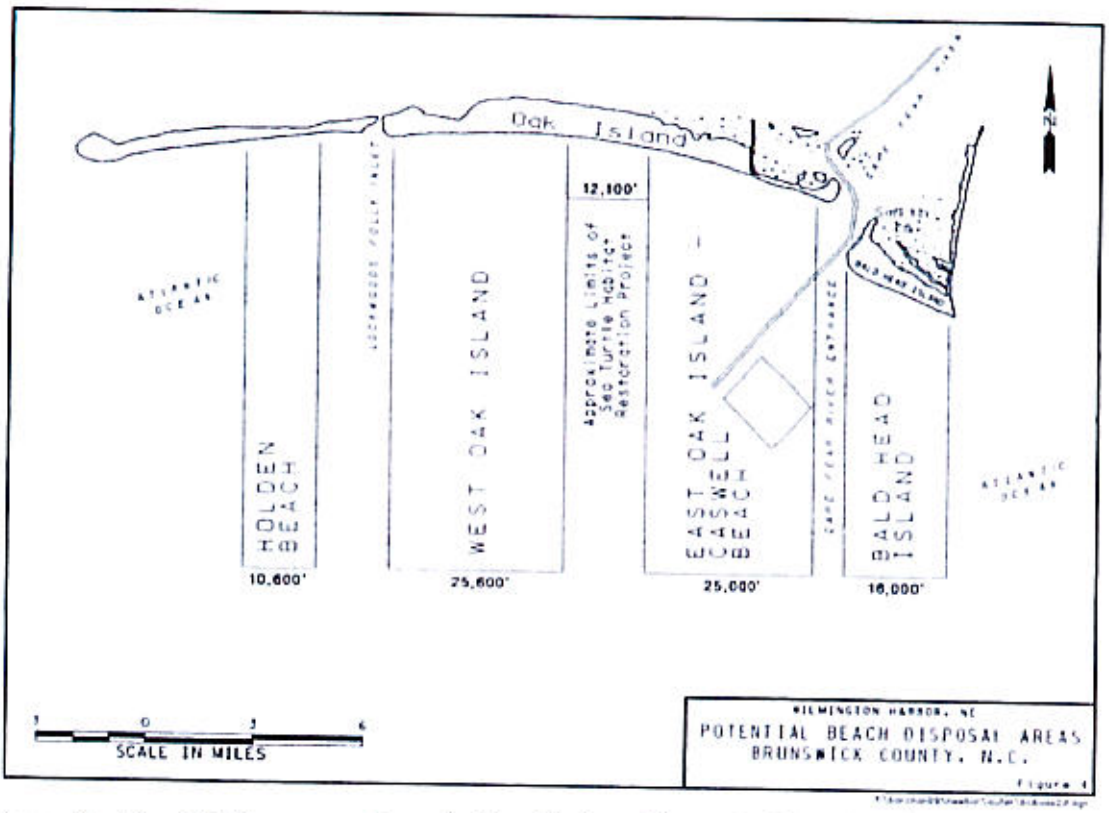


Figure 4 of the EA (the same figure is identified as Figure 2 of the SMP)

This figure shows that "East Oak Island-Caswell Beach" refers to the 25,000 feet of beach extending all the way to the Turtle Habitat Restoration Project boundary, an area that clearly extends into the Town of Oak Island. The text of the SMP also makes it clear that the cooling water discharge canal is not the western limit of the disposal area, as it states:

[1] By way of comparison, the placement area on VBHI is approximately 16,000 feet on South Beach, with some area on West Beach also authorized.

> Disposal on **Oak Island-Caswell Beach** would begin at the west boundary of the Fort Caswell Baptist Assembly grounds and proceed west. The 25,000-foot disposal area on **Oak Island-Caswell Beach** would extend the fill to the east end of the sea turtle habitat area on Oak Island. [Emphasis added] See SMP, Page 3.

While this referenced text is contained in the section talking about initial construction, references to both "East Oak Island-Caswell Beach" and "Oak Island-Caswell Beach" are echoed in the section discussing the Maintenance Material Disposal Plan. See SMP Page 10 ("[t]he distribution of littoral shoal material between Bald Head Island and **East Oak Island - Caswell Beach** given above will be accomplished by placing material from two consecutive maintenance operations on Bald Head Island with the third operation involving placement on **Oak Island-Caswell Beach**") and Page 11 ("[b]ased on a two year maintenance cycle, 1,090,000 cubic yards of littoral material will be placed on Bald Head Island in year 2 and year 4 following the initial deepening of the harbor with this same volume placed on **Oak Island-Caswell Beach** during the 6th year following channel deepening.")

A review of COL DeLony's letter dated June 9, 2000 also reveals that sand was intended to be placed within the same approximately 25,000 linear foot portion of Oak Island that includes portions of both the Town of Caswell Beach and the Town of Oak Island, as described in the SMP. The letter states as follows:

> After construction of the Smith Island and Bald Head Island Shoal portions of the project, the US Army Corps of Engineers will conduct periodic maintenance dredging of the navigation channels. The disposal of all beach quality dredged material will be accomplished in accordance with the Environmental Assessment of Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 2000, and its Sand Management Plan (Appendix A), and the Wilmington Harbor Monitoring Plan (enclosed and incorporated by reference). The associated disposal will be as called for therein, namely:
>
> Year 2: Placement at Bald Head Island (estimated@ 1 Mcy)
> Year 4: Placement at Bald Head Island (estimated@ 1 Mcy)
> Year 6: Placement at **Caswell Beach and easternmost end of Oak Island** (estimated @ 1 Mcy). [Emphasis added] See DeLony letter, Page 3.

The North Carolina consistency concurrence from the North Carolina Department of Environment and Natural Resources, Division of Coastal Management (NCDENR, DCM) dated June 15, 2000, states as follows:

SUBJECT: Response to VBHI Letter of June 20, 2025, re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

> We understand that disposal of dredged material from construction and maintenance of the project will be conducted **according to the SMP and letter**, as agreed to by the NC Division of Water Resources, the Brunswick County beach communities and the Corps of Engineers. [Emphasis added] See Consistency, Page 2

With this understanding, NCDENR, DCM provided their concurrence with the Corps' Consistency Determination as follows:

> Based upon our review of the EA and the Corps of Engineers' response to comments, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable provided that the project is performed according to the EA (including the Sand Management Plan and other appendices) and the Corps' responses to comments from the EA, and to Colonel DeLony's letter of June 9, 2000 (including attachments), and that the conditions below are met. See Consistency, Page 2

While the intent of the sand management plan is to return littoral material to the beach, the primary purpose of the project is to provide safe navigation through the ocean entrance into Wilmington Harbor. SMP page 12. The Corps routinely receives appropriated funds that are allocated to the maintenance dredging of the Wilmington Harbor Federal Navigation Project, a portion of which are intended to dredge the portion of the channel identified as the Inner Ocean Bar. The Town of Oak Island expressed an interest in providing non-federal funding to enable the Corps to dredge an additional amount of material from within the authorized project dimensions. Since this is a benefit to the federal navigation mission, the Corps entered into a memorandum of agreement with the Town to fund work identified in optional bid items. The Village of Bald Head Island is very familiar with this process, as it has requested and received the same consideration. Since the additional work funded by the Town of Oak Island merely supplements the work performed by the Corps in this iteration of the Inner Ocean Bar Contract, the Corps performing the work funded accordingly is not a violation of 33 U.S.C. 408.

In conclusion, the Wilmington District, Corps of Engineers has reviewed your correspondence and determined that the Wilmington Harbor Inner Ocean Bar Contract, Contract No. W912PM25CA0005, is consistent with the Environmental Assessment (EA), the Sand Management Plan (SMP), COL DeLony's letter of June 9, 2000 and the Consistency concurrence. However, we do intend to verify that the placement of material will be limited to East Oak Island-Caswell Beach, and will modify the contract to the extent necessary to ensure that the placement does not extend into the turtle habitat restoration area.

SUBJECT: Response to VBHI Letter of June 20, 2025, re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

Sincerely,

Justin P. McCorcle
District Counsel

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Michael Haverty, Norfolk Dredging Company
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Division of Coastal Management, NC DEQ
Heather Coats, Division of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer

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T 336.373.8850
F 336.378.1001
www.brookspierce.com

July 18, 2025

Via Email (justin.p.mccorcle@usace.army.mil)

Justin P. McCorcle
District Counsel
Wilmington Regulatory Field Office
69 Darlington Avenue
Wilmington, NC 28403

Re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

Dear Justin:

Thank you for your letter dated June 30, 2025. My client, the Village of Bald Head Island (VBHI), respectfully disagrees with the conclusions reached in that letter for the reasons stated below.

When the Sand Management Plan was prepared, it addressed two issues, as alluded to but conflated in your letter: first was the initial construction of the project, and the second was the maintenance dredging of the channel, which is the subject of our current concern. Disposal of beach quality sand during the initial construction phase was pursuant to a Section 933 study and plan, under which the 25,000 feet of East Oak Island-Caswell Beach referred to in the SMP was scheduled to receive over 2,750,000 yd.^{3} of sand at a disposal rate of 110 yd.^{3}/foot. Table 2. Assuming it was distributed evenly along the 25,000 feet, the section east of the canal (8,000 feet) would have received 880,000 yd.^{3}

The Maintenance Material Disposal Plan section of the SMP, beginning at section 14, first recognizes that North Carolina policy has established that "beach quality sand not be removed from the active beach system." SMP § 16. As a result, the US Dept. of Commerce incorporated these policies into the NC Coastal Zone Management Program and the NC legislature enacted this Program. "Accordingly, the disposal plan for maintenance material removed from the Wilmington Harbor

entrance channel will attempt to satisfy these State requirements." *Id.* Recognizing that the Wilmington Harbor project "historically, has not included the disposal of littoral sand on adjacent beaches or in the active littoral zone", the SMP explains this as "maintenance practices that were established with the inception of the project over 100 years ago", based on then-existing dredge technology, the lack of coastal development, and "a lack of sufficient understanding of coastal processes and the sand sharing system associated with tidal inlets and adjacent beaches." SMP §§ 19-20. The SMP goes on to address and attempt to correct these historical mistakes by applying facts and science as the Corps then understood them[1] (2000) to the conditions at the channel entrance, emphasizing the importance of maintaining sand within the impacted littoral system. SMP §§ 20-22. It finds that it is "Caswell Beach" (270,000 yd.^{3}/yr.) and Bald Head Island (527,000 yd.^{3}/yr.) that are suffering the sand loss into the channel as part of that littoral system. SMP § 22. As the SMP points out, removal of sand from this littoral system is equivalent to removing it directly from the affected beaches. Hence, the SWP states: "In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel will be **placed back on the beach from when it came.**" *Id.* (emphasis added). It is here that the section of Caswell Beach east of the canal is identified. *Id.* **There is no evidence in the SMP or your letter that the littoral system extends further west.** The intention to place sand outside the bounds of the littoral system impacted by the Project is a deviation from the SMP without an evidentiary basis.

The 8,000 feet of Caswell Beach east of the canal is more than adequate to accept the annual amounts (538,000 yd.^{3}) projected in the SMP, which is only 63% of the amount deposited there during initial construction. If the amount to be deposited this year exceeds that amount, or if the section of Caswell Beach east of the canal does not need the amount of sand available this year, the intent of the SMP is clearly to maintain that sand within the impacted littoral system and hence it should be placed on Bald Head Island. The VBHI stands ready to cooperate in that placement, which should be at no incremental cost to the contractor, given the proximity of the beaches. If there is claimed to be a cost impact, the VBHI is equally ready to address that. In addition, the DeLony Letter (June 9, 2000) committing the Corps to comply with the SMP also provides for adjustments to the SMP if monitoring determines it necessary, which would appear to apply, especially in light of the historical monitoring data showing the sand loss ratios between Bald Head Island and Caswell beach are approximately 4:1.

Therefore, we reiterate that placement of sand pursuant to this Contract west of the canal would violate the SMP and 33 USC § 408(a) and would undermine the

[1] Subsequent events, as discussed in our earlier letter, have demonstrated that the beach impacts of the WHP have been significantly greater than projected, and even the maintenance practices under the SMP have been insufficient—hence our concern that its protections not be eroded even further.

Corps's assurances that it will protect the impacted littoral system from the effects of this project and thereby comply with State law and the CZMA Program. We again ask the Norfolk Dredging Company to confirm it will not submit a Placement Plan that places sand anywhere other than on Caswell Beach east of the canal or VBHI beaches, and we ask the Corps to confirm that it will not approve any Plan other than one that is confined to Caswell Beach east of the canal and VBHI beaches.

We look forward to hearing from you on the Placement Plan. Please feel free to contact me if you have any questions or to discuss placement on Bald Head Island.

Brooks, Pierce, McLendon, Humphrey, and Leonard, LLP,

Attorneys for the Village of Bald Head Island

By: _____

William P. H. Cary
bcary@brookspierce.com
(336)-271-3115

Cc: Colonel Brad A. Morgan, District Commander
Michael Haverty, Norfolk Dredging Company
Peter Quinn, Mayor, Village of Bald Head Island
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Federal Consistency Coordinator,
Div. of Coastal Management, NC DEQ
Heather Coats, Beach & Inlet Management Project Coordinator,
Div. of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer
Rosalind M. Shoemaker, Contracting Officer
USACE Wilmington Regulatory Field Office

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

CESAW-OC

September 4, 2025

SUBJECT: Response to VBHI Letter of July 18, 2025, re: Contract No. W912PM-25-CA-005, Maintenance Dredging, Wilmington Harbor Bar

William P.H. Cary, Esq.
Attorney for the Village of Bald Head Island
bcary@brookspierce.com

VIA EMAIL ONLY

Dear Mr. Cary,

The Wilmington District has reviewed your correspondence dated July 18, 2025, and we are still of the opinion that the placement of sand on East Oak Island as part of the FY26 Wilmington Inner Ocean Bar Contract is proper, and we will continue as planned. While I understand your desire to assert the Village of Bald Head Island's (VBHI's) entitlement to sand within the channel, I must remind you that the Sand Management Plan (SMP) is merely a plan for disposing of material dredged from a portion of the Wilmington Harbor federal navigation channel. The SMP is not an independent beach nourishment plan or project, and confers no rights on VBHI, Oak Island, or Caswell Beach. In operating our navigation project, we try to balance various concerns, as acknowledged in the SMP as follows: "*[w]hile the intent of the sand management plan is to return littoral material to the beach, the primary purpose of the project is to provide safe navigation through the ocean entrance into Wilmington Harbor.*"

During each maintenance operation, there is more sand in the federal navigation channel than we have available funding to dredge. Therefore, decisions related to the work conducted are made on the basis of navigation needs and available funding. The local communities of VBHI and Oak Island have often provided non-federal funding to pay for additional dredging with placement of material on their respective beaches, which is in the interest of the federal navigation mission. The maintenance dredging project continues to be consistent with the enforceable policies of the NC Coastal Management Plan. As stated in detail in my last correspondence, this contract also is in complete compliance with the Environmental Assessment (EA), the Sand Management Plan (SMP), and applicable environmental and project commitments.

A goal of the SMP, as you have noted, is to return littoral material to the beaches from whence it came in a proportion commensurate with the loss rates identified. These rates historically worked out to approximately 2/3 of the losses to the channel experienced on

the Bald Head Island side, and 1/3 on the Oak Island side. The SMP states that "[b]ased on a two year maintenance cycle, 1,090,000 cubic yards of littoral material will be placed on Bald Head Island in year 2 and year 4 following the initial deepening of the harbor with this same volume placed on Oak Island-Caswell Beach during the 6th year following channel deepening." While funding has not always allowed us to dredge every two years, we have maintained this basic cycle, now in its third full iteration. VBHI has received material on six occasions, including each of the two most recent events. It is now Oak Island/Caswell Beach's turn, and this placement will successfully complete another cycle.

Your letters seek to constrain our placement of material on the Oak Island/Caswell Beach side of the channel, ostensibly to limit our placement of material there and maximize the amount of material VBHI will receive either now or in the future. In your more recent letter, you point to the volumes placed on Oak Island during initial construction as an indication that this small stretch of beach can hold large volumes of material, up to 880,000 cy in the estimation of your engineer. Actual volumes were not placed in this amount. Under the initial deepening contract, on the order of 5 million cubic yards of sediment (in-place beach volume measurement) were placed on Brunswick County beaches. Of this total and within the limits of the sand management zone, Bald Head Island received 1,849,000 cubic yards between February-July 2001. Oak Island/Caswell Beach then received a total of 1,181,800 cubic yards between July-August 2001, extending to station 294+00, an area of approximately 23,000 feet with a 4,000-foot gap. As indicated in the table, the balance of new work dredged material went to western Oak Island (1,269,800 cubic yards) and Holden Beach (501,400 cubic yards).

LOCATION	PLACEMENT LIMITS			PLACEMENT DATES		BEACH VOLUME (INPLACE)
	APPROX BL STA	NORTHING (ft, NAD83)	EASTING (ft, NAD83)	START	STOP	
Bald Head Island	41+60	43,692.25	2,300,542.01	2/23/2001		1,849,000
	205+50	35,750.21	2,314,236.42		7/4/2001	
Caswell Beach	60+00	52,126.62	2,295,138.57	7/5/2001		133,200
	80+00	52,847.44	2,292,954.85			
Oak Island East	121+00	53,711.05	2,289,255.43			1,048,600
	294+00	58,418.34	2,272,322.77		8/12/2001	
Oak Island West	415+00	60,332.24	2,260,537.66	8/13/2001		1,269,800
	665+50	59,778.68	2,235,486.44		4/25/2002	

Holden Beach	84+00	60,092.96	2,222,254.95	12/9/2001		501,400
	195+00	58,820.26	2,211,433.72		2/20/2002	

Table 1 – Initial Construction

Historical placement of material on both the VBHI side and the Oak Island side in the past two cycles has ranged between roughly 1.1M-1.5M cy of material in total, a larger volume of material than good engineering would support being placed on the small stretch of beach in Caswell Beach that you wish to constrain us to.

You also state as evidence for the constrained placement area the language from the SMP discussing losses of sand to the channel from Caswell Beach, which you apparently take to imply that Oak Island is not also suffering losses toward the channel. I find this to be an unduly narrow reading of the language and context of the SMP. Because Caswell Beach sits next to the channel, *only* Caswell Beach can suffer losses *directly to the channel*. That does not mean that losses experienced on Oak Island, with the sand moving east toward the channel, are not also important to the littoral system. It is important to note that the SMP consistently references Oak Island *and* Caswell Beach as the placement area. For example, the SMP states: "[t]he distribution of littoral shoal material between Bald Head Island and **East Oak Island - Caswell Beach** given above will be accomplished by placing material from two consecutive maintenance operations on Bald Head Island with the third operation involving placement on **Oak Island-Caswell Beach**." [Emphasis added] I do not find that the SMP language that you cited states, either explicitly or implicitly, that Oak Island/East Oak Island is not in the littoral system, and I cannot support an artificial restriction of the placement area that does not fit with the general context of the project, the plan, and navigational needs.

In both of your letters, you claim that the United States, through issuance of a dredging contract which includes placement of dredged material in a location to which you object, is in violation of 33 USC § 408. This allegation is misplaced; the United States cannot be considered a "person" under § 408. The law protects the United States from injuries to navigation or civil works projects from persons operating outside our permission. Courts have consistently applied a presumption that the term "person" in federal statutes does not include the sovereign unless there is some clear evidence to the contrary, which is not found in this instance.

Finally, I must respectfully request that that you direct your communications to the District rather than our contractor. Such communications directed toward the contractor could constitute improper interference with the contract, potentially resulting in adverse effects to the economic interests of the Corps and disruption of the operation and maintenance of the federal navigation project. Our contractor has no independent ability to alter the placement area for the contract.

SUBJECT: Response to VBHI Letter of July 18, 2025, re: Contract No. W912PM-25-CA-005, Maintenance Dredging, Wilmington Harbor Bar

While we appreciate the partnership we have shared with VBHI in previous dredging and placement events, we respectfully but firmly state that we are operating within our established and approved plans, and plan to proceed as indicated in the fall.

Sincerely,

Justin P. McCorcle
District Counsel

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Michael Haverty, Norfolk Dredging Company
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Division of Coastal Management, NC DEQ
Heather Coats, Division of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
Charles S. Baldwin IV, Brooks Pierce

ATTACHMENT L

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

FOTH SUPPLEMENTAL REPORT

MEMORANDUM

Foth Infrastructure & Environment, LLC
2618 Herschel Street
Jacksonville, FL 32204
(904) 387-6114

December 12, 2025

TO: The Village of Bald Head Island

FROM: Chris Creed, P.E.

RE: Supplemental Information to the 30-October-2025 Review of Wilmington Harbor 403 Letter Report and Draft Environmental Impact Statement for the Village of Bald Head Island

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This technical memorandum serves as a supplement to the Foth Infrastructure & Environment, LLC review dated 30-October-2025 of the Wilmington Harbor 403 Letter Report and Draft Environmental Impact Statement (DEIS). This supplement focuses on the use and shortcomings of the GenCade model for the applied analysis. Several important points regarding the use of GenCade are noted below:

1.) The DEIS attempts to predict project related impacts to the shoreline adjacent to the project using the USACE model GenCade. The USACE Model Theory and User's Guide for the GenCade model (USACE, 2012) specifically states:

"GenCade is a one-line model that is constrained by the standard assumptions upon which this type of model is based. These assumption are:

- *The beach profile shape remains constant;*
- *The shoreward and seaward depth limits of the profile are constant;*
- *Sand is transported alongshore by the action of breaking waves and longshore currents; and*
- *The detailed structure of the nearshore circulation is ignored."*

For the area where the model is applied along Bald Head Island, each of these conditions upon which the model is based do not exist. For example, the beach profile shape along the southern shoreline varies significantly as the shoreline transitions from east to west toward the Cape Fear River. Likewise, the seaward depth limit along this reach of this island is not constant and varies significantly as the shoreline transitions from the open coast to the deep Cape Fear River. Sediment transport along the area that will be impacted most by the proposed project is affected by the combined effects of breaking waves, longshore currents, and the tidal flows of the Cape Fear River.

2.) In addition, while GenCade accounts for changes in the incident wave climate, it does not incorporate several critical physical processes that govern sediment transport along Bald Head Island. These omitted processes include:

- Inlet morphodynamics
- Wave-current interactions
- Sediment scour, resuspension, and deposition within the channel
- Slope avalanching
- Morphological feedback mechanisms

The exclusion of these processes represents a significant oversimplification of the sediment transport system in this region and the proposed project's potential impact to the Bald Head Island beach and dune system.

3.) The GenCade model calibration utilized a median sediment grain size of 0.25 mm, which differs from the values used in other modeling efforts: 0.20 mm in the Delft3D model and 0.38 mm in the ship wake analysis. The DEIS does not provide a rationale for this inconsistency in a key model parameter which dictates sediment transport potential – smaller grain sizes equate to higher transport rates, and vice-versa. The GenCade model was subsequently used to estimate sediment transport rates along Bald Head Island and reported the following (DEIS p. B-163):

"Based on the modeling, there is a net westerly transport of 50,000 cubic yards per year toward the Cape Fear River and a net easterly transport of 300,000 cubic yards per year." These results are presented in Figure 8-6 of the DEIS, reproduced below, see **Figure 1**. Based on the narrative in the DEIS (partially quoted above), positive values represent westerly directed transport (towards Cape Fear Inlet) while negative values reflect easterly directed sediment transport.

4.) Further, the 2025 Physical Monitoring Report for the Bald Head Island renourishment project, prepared by Foth Infrastructure & Environment, LLC[1], provides updated long-term sediment transport estimates. Using survey data from November 2000 through May 2025, the report concludes that measured net transport along western Bald Head Island averages 280,400 cy/yr over the last 25 years. For reference, **Figure 2** is excerpted from Foth's 2025 monitoring report. The blue dashed line represents measured sediment transport rates from the terminal groin to STA 118+00 (i.e., western portion of South Beach), while the black line reflects the full monitored shoreline.

In short, the sediment transport rates computed by GenCade are more than five and a half times lower than those derived from long-term, measured beach profile surveys.

[1] Foth (2025). "Village of Bald Head Island, Beach Monitoring Program, Report No. 23 (April 2024 to May 2025)", Report Prepared for Village of Bald Head Island. Foth Infrastructure & Environment, LLC, 2618 Herschel St., Jacksonville, FL 32204. 62 pp plus app. (November 2025, not yet published)

This discrepancy underscores the GenCade model's inability to reliably estimate sediment transport along Bald Head Island. As presented in the DEIS, the GenCade model is not capable of accurately computing sediment transport along Bald Head Island nor the potential project related effects to the island. The model should be deemed inappropriate for this use and unreliable in terms of assessing impacts to said shoreline.

5.) The DEIS mischaracterizes prior work by other consultants to support a poorly calibrated GenCade model. The DEIS references a prior study by Olsen Associates, Inc. (2012) as supporting the magnitude and pattern of transport computed by the GenCade model. However, this citation is inaccurate. The Olsen report describes measured sediment transport along the western portion of Bald Head Island as being directed westward, with rates *"ranging between -278,200 and -355,600 cy/yr, based on best-fit analysis of available data* (Olsen Associates, 2012, p. 95)". The Olsen (2012) estimates of sediment transport differ significantly from the published GenCade result of 50,000 cy/yr directed westward (**Figure 1**).

CLOSING

The application of GenCade at this location and for this purpose is inappropriate for the intended use and the results are misleading. Fundamentally, the GenCade model cannot represent the hydrodynamic, sediment transport, and morphological processes that affect the Bald Head Island shoreline and the changes to the same will be produced by the proposed project. As such, results from the model cannot be used or relied upon to or drive project design decision making or conduct an impact assessment of the Bald Head Island shoreline.

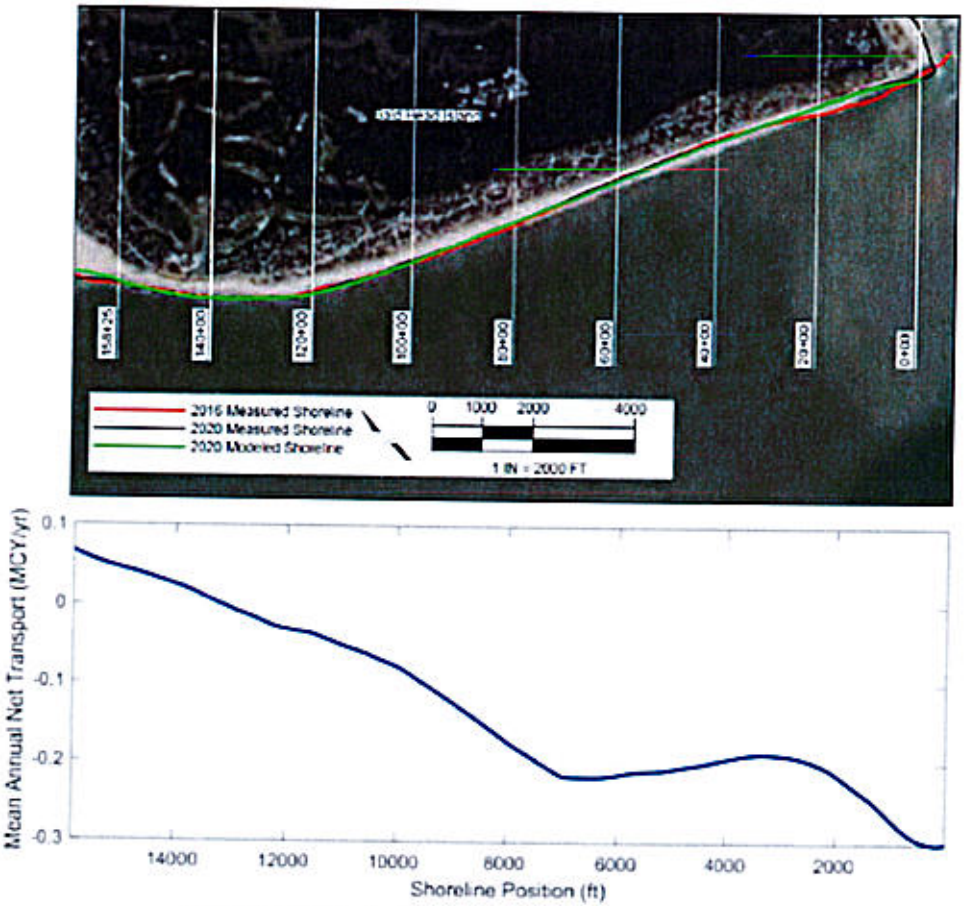


Figure 8-6 Modeled net annual sediment transport along BHI.

Figure 1: Location map from DEIS Fig 8-5 (above) and sediment transport from DEIS Fig 8-6 (below).

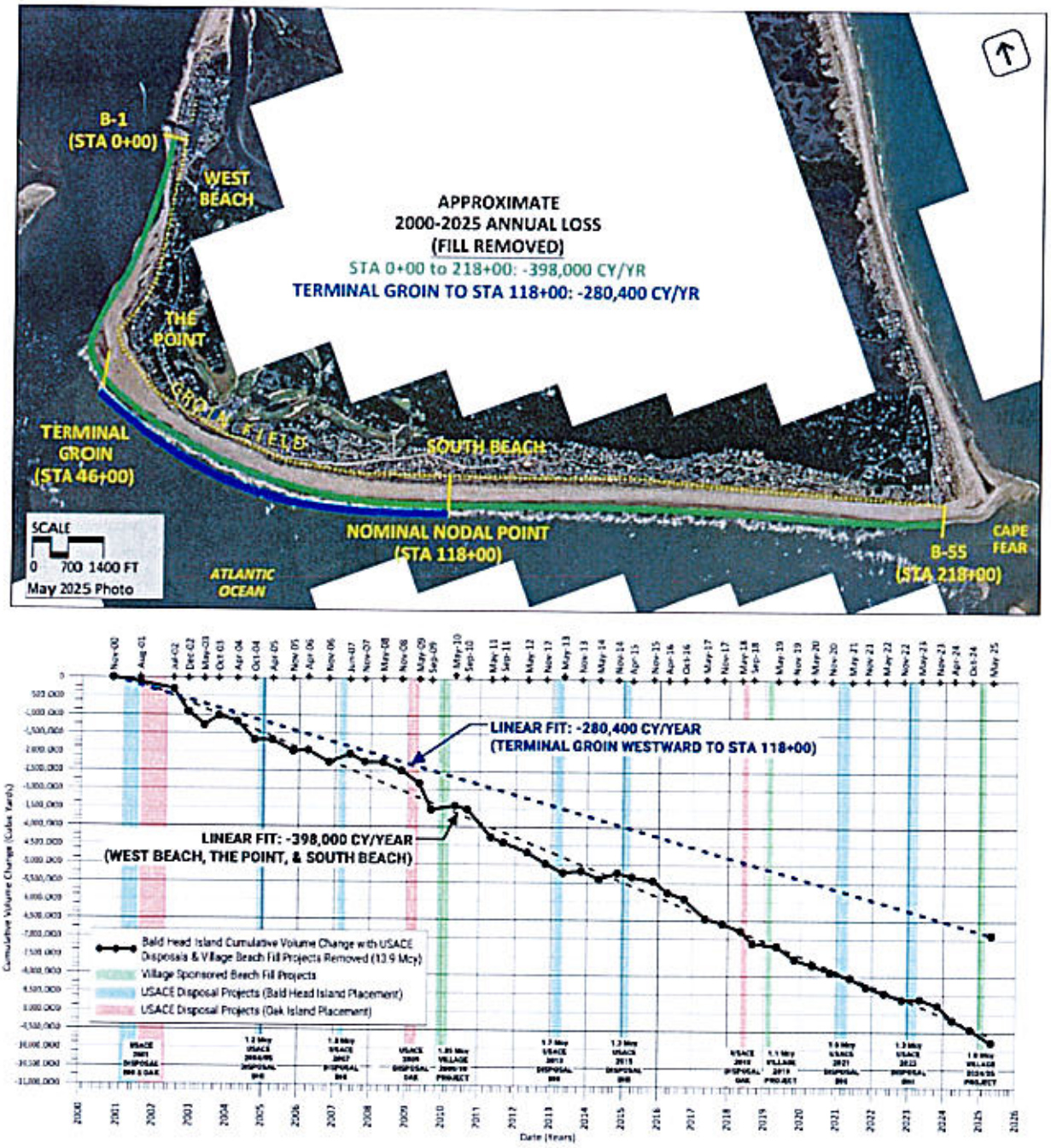


Figure 2: Location map (above) and sediment transport rates (below) along Bald Head Island as reported by Foth (2025, to be published).

References

Foth (2025), *"Village of Bald Head Island; Beach Monitoring Program, Report No. 23 (April 2024 to May 2025)"*, Report Prepared for Village of Bald Head Island. Foth Infrastructure & Environment, LLC, 2618 Herschel St., Jacksonville, FL 32204. 62 pp plus app. (November 2025).

Olsen Associates, Inc. (2012), *"Calibration of a Delft3D model for Bald Head Island and the Cape Fear River Entrance, Phase I"*, Report Prepared for Village of Bald Head Island. Foth Infrastructure & Environment, LLC (FKA, Olsen Associates, Inc.), 2618 Herschel St., Jacksonville, FL 32204. (2025).

USACE (1999), *"Wave Climate and Littoral Sediment Transport Potential, Cape Fear River Entrance and Smith Island to Ocean Isle Beach, North Carolina"* Technical Report CHL-99-18, U.S. Army Corps of Engineers (September 1999).

ATTACHMENT M

VILLAGE OF BALD HEAD ISLAND COMMENTS

12 DEC. 2025

RESOLUTIONS OF CITY OF SOUTHPORT AND VILLAGE OF BALD HEAD ISLAND

Resolution #25-1202.01

A RESOLUTION OF THE SOUTHPORT BOARD OF ALDERMEN URGING ROBUST MITIGATION, LONG-TERM MONITORING, AND ADAPTIVE MANAGEMENT FOR THE WILMINGTON HARBOR 403 PROJECT

WHEREAS, the City of Southport is located at the confluence of the Cape Fear River and the Atlantic Ocean, a uniquely sensitive estuarine environment that supports diverse wildlife, coastal communities, and natural systems; and

WHEREAS, the proposed Wilmington Harbor 403 Project seeks to deepen, widen, or otherwise modify the federal navigation channel, changes that may significantly alter hydrodynamic patterns, sediment transport, and shoreline stability in the Lower Cape Fear River region; and

WHEREAS, these alterations have the potential to increase erosion risk to sensitive shorelines, marsh platforms, and riverfront areas, and increase the likelihood of subsidence of adjacent riverbed and shoreline areas into the dredge prism, particularly within and adjacent to the City of Southport, threatening natural buffers that protect homes, public spaces, cultural resources, and community infrastructure; and

WHEREAS, the region's barrier and estuarine islands—including Battery Island, Shellbed Island, and others—play a critical ecological role in supporting fisheries, marsh nurseries, colonial waterbirds, and migratory shorebirds; and

WHEREAS, Battery Island in particular is recognized as one of the most significant colonial waterbird nesting sites on the East Coast, and in total all bird nesting islands on the Lower Cape Fear River provide habitat for approximately 30% of North Carolina's nesting coastal waterbird population, and are highly vulnerable to erosion, sea level rise, and habitat loss that may be exacerbated by channel deepening activities; and

WHEREAS, the environment surrounding Southport is an essential part of the city's core values, contributing to residents' quality of life, recreational enjoyment, cultural heritage, and long-standing community identity rooted in conservation and stewardship; and

WHEREAS, the economic resilience of Southport is directly connected to the integrity of its surrounding natural resources, with tourism, recreation, waterfront businesses, and property values all depending on a healthy, stable coastal environment; and

WHEREAS, any federal navigation project that increases environmental risk must include robust mitigation, long-term monitoring, and adaptive management measures proportionate to both the scale of the project and the sensitivity of the affected ecosystems and communities; and

WHEREAS, the billion-dollar Savannah Harbor Expansion Project (SHEP) spent approximately 500 million on mitigation and included funding for post-construction monitoring and adaptive management, ensuring that resources would be available to modify or enhance mitigation if environmental conditions changed unexpectedly; and

WHEREAS, the non-federal sponsor for SHEP, acting through the Georgia Ports Authority, agreed to set aside, in advance, their cost-shared portion of the monitoring and adaptive

management funds in an escrow account upon approval of the project, guaranteeing rapid response capability and honoring the principle that those benefiting from the project must share responsibility for preventing or repairing environmental harm; and

WHEREAS, projects such as the Wilmington Harbor 403 effort must match or exceed this level of commitment by establishing a dedicated and adequately funded adaptive management program that extends over the full period of environmental risk, not only the construction phase or initial years of project operation; and

WHEREAS, safeguarding Southport's environment, wildlife habitats, and economic well-being requires that mitigation and monitoring measures be both enforceable and financially secure before any project authorization or construction proceeds;

NOW, THEREFORE, BE IT RESOLVED that the City of Southport urges state and federal decision-makers, including the U.S. Army Corps of Engineers and the North Carolina General Assembly, to require a **comprehensive, long-term, and fully funded environmental mitigation and adaptive management plan** for the Wilmington Harbor 403 Project, modeled on or exceeding the commitments made in the Savannah Harbor Expansion Project; and

BE IT FURTHER RESOLVED that the City of Southport calls for the establishment of a **dedicated adaptive management fund**, placed in escrow prior to construction and sized proportionally to the project's potential impacts, ensuring that corrective actions, ecological restoration, and shoreline protections can be implemented promptly whenever monitoring indicates environmental degradation; and

BE IT FURTHER RESOLVED that the City of Southport urges all agencies and project sponsors to protect Battery Island and the surrounding Cape Fear River islands as irreplaceable ecological assets, ensuring that mitigation measures fully safeguard the habitats supporting 30% of North Carolina's coastal shorebird population; and

BE IT FINALLY RESOLVED that copies of this Resolution be forwarded to the North Carolina General Assembly, the North Carolina Congressional Delegation, the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, the Brunswick County delegation, and other relevant agencies, urging their support in ensuring that environmental protection, community values, and economic resilience remain at the forefront of all decisions related to the Wilmington Harbor 403 Project.

Approved and adopted by the City of Southport Board of Aldermen on this 2nd of December 2025.

R. B. Alt

Mayor, City of Southport

ATTEST:

Jori Devinney

City Clerk, City of Southport

CITY OF SOUTHPORT CORPORATE SEAL 1792 NORTH CAROLINA

DCM-M...

Resolution # 2025-1207

A RESOLUTION OF THE VILLAGE OF BALD HEAD ISLAND COUNCIL URGING ROBUST MITIGATION, LONG-TERM MONITORING, AND ADAPTIVE MANAGEMENT FOR THE WILMINGTON HARBOR 403 PROJECT

WHEREAS, Bald Head Island is located at the confluence of the Cape Fear River and the Atlantic Ocean, a uniquely sensitive estuarine environment that supports diverse wildlife, coastal communities, and natural systems; and

WHEREAS, the proposed Wilmington Harbor 403 Project seeks to deepen, widen, or otherwise modify the federal navigation channel; and

WHEREAS, earlier Harbor deepening projects have caused extensive damage to Bald head Island and its protective shoals, requiring the Village of Bald Head Island to expend millions of dollars of public funds to alleviate the harm; and

WHEREAS, after consultation with respected experts, it appears highly probable that the Wilmington Harbor 403 Project will continue to significantly alter hydrodynamic patterns, sediment transport, and shoreline stability in the Lower Cape Fear River region and the ocean front at Bald Head Island, to the continuing detriment of the Village and Island; and

WHEREAS, these Project impacts are likely to increase erosion risk to sensitive shoals, shorelines, marsh platforms, and riverfront areas, and increase the likelihood of subsidence of adjacent shoreline areas into the dredge prism, particularly along the ocean beaches at Bald Head where severe erosion has been experienced from the prior projects, threatening natural buffers that protect homes, public spaces, cultural resources, and community infrastructure; and

WHEREAS, experience since the last deepening project has shown that the periodic maintenance dredging of the Channel likewise has deleterious impacts to the adjacent shoals, shorelines, beaches and dunes, such that Project impacts can be expected to persist for the full fifty-year life of the Project; and

WHEREAS, the region's waters and barrier and estuarine islands play a critical ecological role in supporting threatened and endangered species of sea turtles, fisheries, marsh nurseries, colonial waterbirds, and migratory shorebirds; and

WHEREAS, those sensitive areas provide important habitat for numerous species, including sea turtles and approximately 30% of North Carolina's nesting coastal waterbird population, and are highly vulnerable to erosion, sea level rise, and habitat loss that may be exacerbated by channel deepening activities; and

WHEREAS, the ocean environment, beaches, and dunes at Bald Head are an essential part of the Island's core values, contributing to residents' quality of life, recreational enjoyment, cultural heritage, and longstanding community identity rooted in conservation and stewardship; and

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WHEREAS, the economic resilience of the Village is directly connected to the integrity of its surrounding natural resources, with tourism, recreation, waterfront businesses, and property values all depending on a healthy, stable coastal environment; and

WHEREAS, any federal navigation project that increases environmental risk must include robust mitigation, long-term monitoring, and adaptive management measures proportionate to both the scale of the project and the sensitivity of the affected ecosystems and communities; and

WHEREAS, the billion-dollar Savannah Harbor Expansion Project (SHEP) spent approximately $500 million on mitigation and included funding for post-construction monitoring and adaptive management, ensuring that resources would be available to modify or enhance mitigation if environmental conditions changed unexpectedly; and

WHEREAS, the non-federal sponsor for SHEP, acting through the Georgia Ports Authority, agreed to set aside, in advance, their cost-shared portion of the monitoring and adaptive management funds in an escrow account upon approval of the project, guaranteeing rapid response capability and honoring the principle that those benefiting from the project must share responsibility for preventing or repairing environmental harm; and

WHEREAS, projects such as the Wilmington Harbor 403 effort must match or exceed this level of commitment by establishing a dedicated and adequately funded adaptive management program that extends over the full period of environmental risk—i.e., the life of the Project—not only the construction phase or initial years of Project operation; and

WHEREAS, following the last deepening project, the Village learned the expensive lesson that unfunded assurances of remediation for project impacts may not be legally enforceable, leaving the Village with the financial burden of funding the needed remediation; and

WHEREAS, safeguarding Bald Head's environment, wildlife habitats, and economic well-being therefore requires that mitigation and monitoring measures be both enforceable and financially secure before any project authorization or construction proceeds.

NOW, THEREFORE, BE IT RESOLVED that the Village of Bald Head Island urges state and federal decision-makers, including the U.S. Army Corps of Engineers and the North Carolina General Assembly, to require a **comprehensive, long-term, and fully funded environmental mitigation and adaptive management plan** for the Wilmington Harbor 403 Project, modeled on or exceeding the commitments made in the Savannah Harbor Expansion Project; and

BE IT FURTHER RESOLVED that the Village of Bald Head Island calls for the establishment of a **dedicated adaptive management fund,** placed in escrow prior to construction and sized proportionally to the Project's potential impacts, ensuring that corrective actions, ecological restoration, and shoreline protections can be implemented promptly whenever monitoring indicates environmental degradation; and

BE IT FURTHER RESOLVED that the Village of Bald Head Island urges all agencies and project sponsors to protect all Bald Head Island and Cape Fear River areas of environmental

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concern as irreplaceable ecological assets, ensuring that mitigation measures fully safeguard those resources; and

BE IT FINALLY RESOLVED that copies of this Resolution be forwarded to the North Carolina General Assembly, the North Carolina Congressional Delegation, the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, the Brunswick County delegation, and other relevant agencies, urging their support in ensuring that environmental protection, community values, and economic resilience remain at the forefront of all decisions related to the Wilmington Harbor 403 Project.

Approved and adopted by the Village of Bald Head Island Council on this 12th of December 2025.

Peter Quinn, Mayor

ATTEST:

Darcy Sperry, Village Clerk

VILLAGE OF BALD HEAD ISLAND
SEAL
NORTH CAROLINA

BROOKS PIERCE
FOUNDED 1897

2000 Renaissance Plaza
230 North Elm Street
Greensboro, NC 27401

T 336.373.8850
F 336.378.1001
www.brookspierce.com

November 17, 2025

Via U.S. Mail and Email

US Army Corps of Engineers
Wilmington District
ATTN: Wilmington Harbor 403
69 Darlington Avenue
Wilmington, NC 28403
WilmingtonHarbor403@usace.army.mil

Re: Wilmington Harbor 403 Draft Letter Report and Environmental Impact Statement, Wilmington Harbor Navigation Project, North Carolina

SUPPLEMENTAL COMMENTS SUBMITTED ON BEHALF OF THE VILLAGE OF BALD HEAD ISLAND REGARDING ECONOMIC ANALYSES:

This firm represents the Village of Bald Head Island ("**VBHI**") in connection with the proposed Wilmington Harbor Navigation Project ("**Project**") and the Notice of Draft Letter Report and Environmental Impact Statement ("**Notice**") for the Project issued by the United States Army Corps of Engineers ("**USACE**" or "**Corps**") on 19 September 2025. On 3 November 2025, we submitted comments ("**VBHI Comments**") on behalf of VBHI in response to the Notice.

On 27 Oct. 2025, the Corps granted VBHI an extension[1] until 17 Nov. 2025 to file comments, including those concerning the Draft Letter Report ("**DLR**") Attachment 5, Economic Considerations ("**2025 EC**"). At the same time, the Corps provided as additional background for the 2025 EC a PowerPoint, "403 Economic Considerations," attached as **Attachment L** ("**Corps PowerPoint**").[2] These **Supplemental Comments** incorporate by reference the earlier VBHI Comments and endeavor not to repeat their substance. It is our understanding that these Supplemental Comments will be shared with the Independent Expert Peer Review members.

I. OVERVIEW OF COMMENTS

The DLR's conclusion that this Project is feasible is unfounded and unsound. Considering the size of the projected expenditures ($1.36 billion), the environmental impacts, the

[1] *See* VBHI Comments, Attachment J.

[2] Attachment L is undated, but the pdf transmission labels the document as a November 2024 presentation. For clarity, VBHI continues the attachment lettering from the 3 November 2025 VBHI Comments, so that the first attachment to this letter is Attachment L.

prior criticisms of the ASA Review Assessment[3], and the time and expense of the new analysis ordered by the ASA, one would expect the 2025 EC to be thorough, well-documented, supported by available data, and based on sound, consistent analytical principles. It is none of those things, but instead:

- ignores the current market conditions, changes, and trends;
- applies inconsistent and contradictory analytical methods;
- relies on inaccurate, incomplete, and out-of-date data;
- relies on supposition and biased projections of interested parties; and
- fails to explain and support its analyses and conclusions.

These Supplemental Comments explore each of these deficiencies. In addition, VBHI retained Dr. Asaf Ashar, a well-known expert with extensive experience evaluating port projects and their impact on maritime traffic. Dr. Ashar has prepared a report: "Feasibility of Deepening the Port of Wilmington Channel (2025)" ("**Ashar Analysis**"), **Attachment M**. Dr. Ashar's relevant experience and education are summarized in **Attachment N**. The Ashar Analysis highlights the impact of the 2025 EC's deficiencies on the Project's benefit cost ratio ("**BCR**") and shows that the DLR and 2025 EC do not support a conclusion that the Project is "feasible."[4] Specifically, the BCR is not equal to or greater than 1.0.

Dr. Ashar's Analysis is limited to calculating Project *benefits*, which the 2025 EC overstates, thereby inflating the BCR above the feasibility threshold. The DLR[5] and Draft Environmental Impact Statement ("**DEIS**") also failed to consider all the Project *costs*—the impacts and mitigation therefor, which omission further inflates the BCR. Inclusion of these costs in the NED analysis will reduce the BCR even more, further showing that the Project is not feasible and that any final conclusion of feasibility would be arbitrary and capricious.

II. ANALYTICAL DEFICIENCIES

A. The 2025 EC ignores the current global market.

Fundamentally, the Corps fails to ground the 2025 EC in the real world by ignoring: (a) the current service patterns in Wilmington; (b) trends in service patterns globally that change how

[3] Assistant Secretary of the Army May 2020 Review Assessment of Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental (February 2020) ("**ASA Review Assessment**").

[4] The DLR Review is limited to technical feasibility, meaning the BCR must be >1, using FY 2025 Federal discount rate of 3.0%. 2025 EC, § 5.3.2.1, p. 48. As used herein, "feasible" refers to this technical standard and not the Corps' pragmatic funding policy standard, discussed below (Section IV), which applies a higher discount rate (7%) and was calculated at each previous analysis of this Project but curiously omitted in the DLR. The 7% discount rate reduces the BCR well below 1.0.

[5] Even costs resulting from the Project that do not *require* Corps DEIS mitigation are societal costs which the NED is required to include, discussed below in Section III A.

ports are being and will be served in the future; and (c) changes in global fleet composition.

1. Asian services

The 2025 EC forecast assumes Wilmington will be served by the four Asian shipping services that previously called there, despite the fact that all four services have, *for reasons unrelated to channel depth*, already stopped calling on Wilmington. Ashar Analysis IV.1-IV.5, pp. 11-14. Even the earlier 203 Report (Appendix C-Economics, Table 1-25, p. 32) recognized that only two Asian services were calling in 2020 (the base year selected by the Corps for its forecast, discussed below). The erroneous assumption that the prior level of Asian services reflects patterns that haven't been seen since 2019 is necessary to attain a BCR with a ratio greater than the feasibility threshold of 1.0. *Id*.,III.3, p. 9. Moreover, the 2025 EC does not analyze either the factors causing this change in service pattern or the reason for assuming they will revert to pre-2019 patterns. The impact on the DLR conclusion is significant: even assuming a 50% chance of a full return of four Asian services to Wilmington only raises the BCR to **0.65**. *Id*., IV.5, p. 14.

2. Feedering

Globally, maritime shipping is changing fundamentally in two way that the 2025 EC analysis does not take into account: (1) maritime shipping lines are commissioning ever-larger ships, which many ports cannot accommodate; and (2) as a result, feeder or hub-and-spoke operations ("**feedering**") are growing to facilitate distribution through ports that can accommodate the largest (i.e., newest) vessels. *Id*., IV.6-IV.7, pp. 14-16. Constraints in the Panama Canal and shifts to larger vessels using the Suez Canal serve only to increase this shift in service organization. *Id*., IX.2-3, p. 33. The increased reliance on feedering is already evident: 100% of Wilmington's Asian cargo is feedered (*id*., IV.8, p. 16)—a fact that the Corps' analysis ignores. As the Ashar Analysis explains (including through actual analysis of one other port already deepened), feedering provides significant benefits unrelated to depth that the 2025 EC ignores. But failing to account for feedering is both imprudent and contrary to rational economic planning. Indeed, the 2025 EC statistically assumes that feedering will not happen, even though it is plainly already happening. The Ashar Analysis tests the sensitivity of the BCR to this assumption by assuming fifty percent of Wilmington's future traffic will be feedered (even though 100% is currently feedered). Assuming only 50% feedering reduces the BCR to **0.65**. *Id*., IV.8, p. 16

3. Future fleet

The 2025 EC also assumes that, in the future, with or without the Project, Wilmington will be served by a substantial fleet of PPX1 vessels, the smallest class of post-Panamax vessels. *Id*., Table 4, p. 21. This assumption is critical to generating the benefit on which the inflated BCR depends, as the Ashar Analysis explains. *Id*., VI, pp. 21-26.

The PPX1 fleet assumption is factually unsupported and illogical. The PPX1 fleet has already stopped calling on Wilmington. *Id*., Figure 8, p. 23. And it is disappearing from the world fleet, probably due to its inefficiencies. *Id*.,VI.3, p. 24 and IX Appendix B, pp. 33-36. The 2025 EC provides no reason to conclude that this ghost fleet will reappear.

The 2025 EC (p.39) makes a single, unsupported statemen to justify including PPX1 in the forecast: "Significantly more PPX1 and PPX2 vessels would be required to fulfill the commodity forecast **without a project**." (emphasis added). This statement is contradicted in the ensuing EC Tables, which show that the number of PPX1 and PPX2 vessels in the **combined** fleet forecast (containerized plus commodity) (able 5.38, p. 48) is the same as the **containerized** cargo only forecast (Table 5.33, p. 44).[6] The combined forecast does not increase PPX1 (or PPX2) for the addition of commodity cargo. Nor does the explanation address why PPX1 will still comprise a significant part of the fleet in the With Project scenario, as shown in the 2025 EC.

Put simply, nothing shows that PPX1 vessels are currently or will become a market force. The 2025 EC offers no explanation for its assumption that they will return to service. Removing the assumption of the return of the ghost fleet lowers the BCR to **0.75**, **0.94**, or **1.1**, depending on other assumptions. *See* Ashar Analysis, VI.6, p. 26.

B. The 2025 EC applies inconsistent and unreliable methodologies.

The 2025 EC diverges from the usual Corps method of port project analysis without explanation. Perhaps as a result, it adopts unsound methods that systematically operate to inflate the BCR.

1. <u>Base data for forecasting</u>

The 2025 EC forecasts future East Asian containerized trade by starting with 2020 actual data as a base year. But 2020 historically is an outlier and an unrepresentative data point. *Id*., III.2, p. 8. Moreover, using a single year is analytically unsound: as the Ashar Analysis recommends, the forecast base should be either an average of recent historical data or a trend forecast, where a trend is evident. *Id*.

The Corps' PowerPoint (Attachment L), on p. 15, agrees: "5-year average of historical tonnage as a baseline for future projections--**Minimize effects of anomalies and fluctuations.**" (emphasis added). Without explanation, it employs the alternate suggested method (a trend forecast: linear regression) for the liquid and dry bulk forecasts. *Id.*, p. 16. The containerized *commodity* forecast applied "long-term growth rates" recognized for international seaborne trade, but don't discuss the base assumption. *Id.*, p. 17.

But when forecasting containership cargo—the sector that comprises almost all of the Asian import traffic creating the Project benefit—the Corps abandoned this analytical rigor and switched methods entirely. The 2025 EC reports five years of base data (2016-2020), showing high variability year-to-year, and calculates the five-year average, as recommended in the PowerPoint. EC Tables 5.16 and 5.17, p. 33. However, the 2025 EC rejects the 2016-2020 average and instead uses the final, highest year, 2020 "to represent the baseline form (*sic*) which forecasted commerce was conducted." 2025 EC, 5.3.1.1.1, p. 32. This is clearly an outlier data point: for Far East Imports (the largest category of potential Project benefits), 2020 was 38% higher than the

[6] The identical quoted statements and tables of fleet forecasts appear in the PowerPoint, Attachment L, pp. 21-22.

five-year average and 108% higher than the volume three years earlier. EC Table 5.16, p. 33. No methodological justification for this approach is offered, and it is not consistent with sound forecasting principles as described in the PowerPoint.

The sensitivity of the feasibility decision is significant: simply changing this calculation to the five-year average drops the BCR to **1.01**, even if all of the other 2025 EC assumptions remain the same. Ashar Analysis, III.2, p. 8.

2. Growth forecast assumptions

Perhaps most critical to the feasibility finding is the forecast projection of containerized imports growing at **25.5% annually** between 2030 and 2036. The starting point for the fifty-year benefit calculation (2036) was increased almost 4 times by this single assumption. *Id*., VIII.1, p. 27. Without this assumption, the BCR drops to **0.72**, and if both this assumption and the outlier base year assumption are rejected, the BCR drops to **0.55**. *Id*., III.6, p. 11.

This critical growth forecast assumption deviates from conventional and reliable forecasting norms in several ways: it assumes a sudden jump in imports because of an increased Port capacity, not import market forces; the actual market forces data contradict the assumption; the model rejects reliance on independently sourced economic projections analyzing market trends and, instead, adopts the Project sponsor's unverified "estimates."

a. 2025 EC explanation

The extraordinary six-year growth spurt from 2030 to 2036 is unexplained in the 2025 EC, beyond a vague reference (p. 34) to improved landside facilities. The PowerPoint provides more detail: "new or upgraded manufacturing and processing facilities" and "14 new storage and distribution facilities." Attachment L, p. 18. These facilities, the PowerPoint says, are then the basis for future TEU forecasts incorporating the extraordinary 2030-36 bump. *Id*. While the PowerPoint bases its growth spurt on $28.2 billion in landside improvements, the 2025 EC (p. 34) only cites $10 billion, but keeps the inflated forecast.

There is no evidence in the DLR, the 2025 EC, or the PowerPoint that imports are currently being restricted by the lack of those new facilities, which is the necessary inference that imports will jump dramatically when those facilities begin operations. Nor is there any explanation of how completion of these new facilities will result in dramatic and sudden increase in imports.

b. Empirical data contradict the 2025 EC's assumption

Dr. Ashar correctly observes that imports do not increase simply because a port builds facilities to handle them. *Id*., p. 31. He examined the literature and concluded the only logical source of a sudden increase in imports unique to Wilmington would be related to the EV batteries and vehicles market emerging in North Carolina. *Id*., VIII.6-VIII.12, pp. 31-32. However, he concludes that even the EV battery and vehicle market does not support a forecasted increase in imports, but rather a likely decrease. *Id.*

c. 2025 EC uniquely rejects independent economic principles

Instead of doing its own economic analysis of import trends and growth, the Corps relies entirely on the North Carolina State Ports Authority ("**NCSPA**"), which "estimated annual TEU volumes associated with each improvement." Attachment L, p. 18. NCSPA's economic forecasts were highly criticized by the ASA and ultimately shown to be unsound and biased.[7] Yet nearly the entire project benefit (Asian TEU imports) is based on those flawed NCSPA estimates.

As Dr. Ashar discusses, he has not seen another port project forecast depend almost entirely on an abrupt growth spurt based on a one-time development of a new industry. "The common methodology assumes a moderate and steady growth rate, derived from a national, macro-economic study by outside consultants." *Id.* VIII.3, p. 29. Indeed, the Corps' studies of seven other ports employed this method and applied growth rates similar to Wilmington's except for the extraordinary growth spurt attributable to a single industry. *Id.*, Table 8 and Figure 11, pp. 29-20. This distorting one-time jump is unique in Corps forecasting, compared to other ports. In addition, unlike the typical consideration of several forecast scenarios (low, moderate, high), the 2025 EC uniquely relies on only one forecast, as "estimated" by the Project sponsor. *Id.*, VIII.4, p. 30. The Corp here eschewed macro-economics, national trends, or independent analysis, and based its forecast on estimates made by the Project sponsor—NCSPA—which is not only not an independent consultant, but it was also the author of the 203 Report criticized in the ASA Review Assessment.

3. PPX1 call reduction versus larger vessels

Finally, the 2025 EC departs from the normal method of calculating benefit. Previous analyses of this Project assumed, like most port deepening projects, efficiencies stemming from reliance on larger vessels that the deepening will accommodate. *Id.*, VI.2, p. 23. The 2025 EC, without explanation, resurrects the PPX1 fleet and generates benefit by increasing the load per trip in a deeper channel and reducing the number of calls instead of the traditional vessel substitution analysis. The previous Wilmington analyses did not forecast *any* PPX1 usage. *Id.* Increased loads and call-dropping is a technique better suited to bulk shipping rather than containerized cargo, and has severe service implications which the EC does not address. *Id.*, V.4, pp. 20-21. Again, it appears that the Corps has employed a unique analytical construct to generate a project benefit, rather than conduct a rigorous analysis based in actual data and reasonable assumptions.

C. The 2025 EC relies on inaccurate and out-of-date information.

In addition to deviating from normal methodologies and utilizing unsound analytical tools, the Corps uses out-of-date data that ignores the most recent *actual* shipping activity and services at the Port. The 2025 EC does not incorporate current fleet composition data. It does not incorporate actual data about feedering in Wilmington and ignores the state of the current, evolving

[7] The BCR for this Project has dropped from the NCSPA original estimate of 5.4 to the current Corps estimate of 1.3, without considering the Ashar Analysis.

global maritime commerce market. As discussed below, it compounds these errors by also using unsupported supposition and biased preferences.

D. The 2025 EC relies on assumptions and biased conjecture.

1. Reliance on NCSPA estimates

As already discussed, the critical containerized cargo forecast is entirely based on NCSPA estimates. Returning to the flawed NCSPA analysis does not provide the independent and objective analysis that the ASA anticipated when he ordered a re-study of the unsupported economic justification proffered by NCSPA in the 203 Report.

2. Other biased input

At the public information session on 8 October 2025, Corps personnel explained that assumptions about port service patterns were based on USACE interviews with shipping representatives— interviews that are not available for review by the public.[8] Besides depriving the public of access to the basis for the critical analytical assumptions underlying 2025 EC (*see* Section II E, below), this approach has a built-in bias. The shipping lines are a sophisticated industry, and have faced many port deepening analyses. Any shipping line will prefer the flexibility of a deeper harbor, whether or not it always changes its future service choices. It may still choose to light-load or use a smaller vessel for any of a variety reasons (*e.g.*, feedering, frequency of service concerns, etc.), and it may do so on a regular basis for the market reasons discussed in the Ashar Analysis. But shipping lines will always prefer to have the option of large, fully loaded vessels in a deeper channel, and their forecast of how a deepening might affect future service choices is thereby inevitably colored. "Would you rather have more choice?" is hardly a question that will elicit reliably predictive answers about future conduct. Premising a fifty-year forecast on the preferences of shipping lines who cannot be harmed by the Project biases the analysis from the outset.

E. The 2025 EC fails to document support for its assumptions and conclusions.

As discussed in the VBHI Comments, Section IV B, pp. 14-16, the 203/403 process and the related NEPA review are required to be open to meaningful public involvement and disclosure of the bases for decisions. The NED analysis was originally done by NCSPA privately.[9] After the ASA Review Assessment severely criticized that analysis, USACE said it would revisit the

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[8] *Similarly, see* VBHI Attachment J (USACE extension email): "The author of our Economics Chapter and Appendix obtained the data used to create his forecasts from several subscription or proprietary sets of data, which he signed Non-Disclosure Agreements (NDAs) in order to access. … This data is not releasable subject to these non-disclosure agreements and licensure restrictions."

[9] The only avenue for public comment was via a website that NCSPA never activated. VBHI Comments, pp. 14-15.

analysis anew, and VBHI specifically asked that the public be involved in and informed of that new analytical approach, but that request was rejected. *Id.*, IV D, pp. 17-21. The 2025 EC is the first peek behind the curtain the public has had, and it is woefully short on detail or explanation. VBHI's comment extension and FOIA requests have produced only the Attachment J email explanation quoted above in footnote 7 and the PowerPoint, Attachment L. There is no background data or analysis supporting the 2025 EC critical assumptions discussed above. Under the Corps' own guidance, "The feasibility report should document the planning process **and all assumptions and rationale for decision making**." ER 1105-2-100 ("PGN"), Sec. 4-3(b)(2) (emphasis added). The 2025 EC report does not satisfy the PGN. Moreover, § 203 of WRDA requires the Secretary to review "whether or not the study, and the process under which the study was developed, each comply with Federal laws and regulations applicable to feasibility studies of water resources development projects." 33 U.S.C. § 2231(b). The DLR and 2025 EC fail to comply with these requirements.

F. Considering only Project benefits, the Project is not feasible.

The BCR is a ratio of the Project benefits to the Project costs. The Ashar Analysis considered only the benefit side of that calculation. Examining critical assumptions, it found that eight adjustments are necessary, five of which independently reduce the BCR below 1.0, and the other three reduce the BCR to near 1.0. Ashar Analysis, VII.1, pp. 26-27. As Dr. Ashar observes, because these factors are largely independent, combining any two of them by multiplying the discount factors together will reduce the BCR even farther—well below 1.0. *Id.*, VII.1, p. 27. For example, adjusting for the absence of Asian services, the outlier forecast base year, and the 25.5% six-year growth leap reduces the BCR to **0.25**.

Even these recalculations are generous. The stated BCR for this Project (1.3) has varied widely and is now marginal, meaning the conclusion of technical feasibility is highly sensitive to the underlying assumptions. *Id.*, II.2, pp. 6-7. Unlike large BCR projects, where forecasting errors or benefit estimates will not move the BCR below a feasibility ratio of 1.0, the opposite is true here: changing assumptions even slightly reverses the BCR feasibility decision, as demonstrated throughout the Ashar Analysis. In such circumstances, sensitivity testing (how does the outcome vary with adjustments to the assumptions) is critical and fundamental to sound economic analysis. The 2025 EC, however, includes no sensitivity analyses and is therefore arbitrary: it necessarily assumes that all assumptions (including those assumptions shown to be contradicted by facts) are correct **and** that, if any errors were made, they will not impact the final conclusion. The 2025 EC effectively applies a probability factor of 100% instead of some lower value—that would recognize uncertainty—for each assumption. Applying *any* reasonable reduction below certainty (100% probability) will necessarily reduce the BCR below 1.0.

As Dr. Ashar concludes:

> Altogether, I find the methodology, data, assumptions, and calculations of the BCR, the economic criteria employed by 2025 EC to assess Project feasibility,

> as **unreliable**. Moreover, based on my adjustments to the Project's BCR, I conclude that the Project, as presented in 2025 EC, is most likely **infeasible.**

Ashar Analysis, VII.2, p. 27 (emphasis in the original).

III. THE COSTS OMITTED FROM THE DEIS FURTHER DECREASE THE BCR

A. The DLR and 2025 EC Improperly Exclude Costs

In calculating the BCR, the DLR limits the costs to only "the total economic costs of constructing and maintaining the project." DLR p. 1, § 5.1. This formulation incorrectly excludes environmental and societal costs, contrary to the controlling Corps guidance:

> Calculations of NED are meant to include all environmental and social benefits and costs for which monetary values can be obtained.

ER 1105-2-103, p. 4, § 1-12(b)(1). *See also* ER 1105-2-100, App. D, Amendment #1, p. D-5, § D-3(d)(1): "Resources required or displaced to minimize adverse impacts and/or mitigate fish and wildlife habitat losses are also NED costs." While the Corps may dispute its NEPA mitigation obligation for many of the impacts identified below, they are nonetheless impacts that will fall on society and impact the NED, and therefore the BCR.

There are several categories of impacts which were either ignored, minimized, or explicitly deferred in the DEIS and DLR for later evaluation. The VBHI Comments and comments submitted by other members of the public[10] identify un-accounted for costs that should have been recognized in the DEIS and DLR, and would have impacted the BCR (if included). Some of the following costs may, individually, seem minor. But the BCR (even before considering Dr. Ashar's analysis) is marginal, and every dollar therefore matters. Those costs that cannot be immediately quantified with certainty call into doubt the feasibility conclusion, which is premised on it being absolutely certain that none of these costs will ever be incurred.

B. Sand and Beach Impacts

As discussed in the VBHI Comments, the DEIS failed to consider current and cumulative impacts on the sand transport system at the River mouth, directly impacting VBHI. A comprehensive study of that system is necessary, the cost of which has not been included. In addition, over the last twenty-five years, VBHI has spent an average of $2.87 million annually

[10] Filed in response to the Notice, the following public comments already filed with the Corps are cited herein: "**SELC Comments**," filed by the Southern Environmental Law Center on behalf of ten conservation and public interest organizations; "**Orton Comments**," filed by the owner of a historic property on the River directly invaded and impacted by the Project; "**Campbell Island Comments**," filed by the owners of an island damaged by past projects and threatened again; "**Audubon Comments**," filed by a conservation organization identifying species and habitat impacts.

addressing the prior project's impacts. *See* VBHI Comments, Attachment A, p. 3. Similar impacts are predicted (*see*, VBHI Comments, Attachment G), and over the fifty-year Project life would add $143.5 million in cost (present value $73.8 million, at 3% discount).

Additional sand impacts are identified in the SELC Comments, pp. 18-19, and the Audubon Comments, p. 8, ⁋⁋ 1, 2. If, as discussed in the VBHI Comments, any of those costs are required by WRDA as mitigation for impacts to fish or wildlife habitat, the cost therefor would have to be provided in advance and secured, negating the discount rate and adding the cost of the payment-security mechanism. *See* VBHI Comments, pp. 12-13, and 33 U.S.C. § 2283(a)(1).

C. BUDM

The DEIS includes discussion of the Corps' plans to employ beneficial use of dredge material ("**BUDM**") to reduce Project costs by using material in nearby marshes or to create islands. This method reduces disposal transport costs, thereby lowering the Project cost and, accordingly, raising the BCR. The Corps has not evaluated the suitability of the material, particularly the portions of the River where mud has accumulated for decades outside the traditional Channel maintained by annual dredging, despite specific concerns having been raised about this material. SELC Comments, pp. 9-11, 19-20. *See* Audubon Comments, p. 19, ⁋ 4, and pp. 19-33, regarding negative species impacts and other unsuitable uses. If the material is unsuitable, it could impact BUDM plans for the Project, increasing disposal cost and, where BUDM assists in meeting mitigation obligations, increasing the cost of such mitigation by requiring the Corps to adopt other mitigation plans.

D. Wetland impacts and mitigation

The DEIS understates the impact the Project will have on fresh and saltwater wetlands and the species dependent on them, and therefore understates the extent of necessary monitoring, mitigation, and the cost thereof. SELC Comments, pp. 16-17; Orton Comments; Audubon Comments, pp. 18-19, ⁋ 3; Campbell Island Comments.

E. Erosion

In addition to supporting VBHI's concerns about beach impacts, other commenters point out that the improper and incomplete analysis of wake impacts understates the shoreline impacts along the entire twenty-eight-mile channel. SELC Comments, pp. 18-19; Orton Comments, pp. 6-8 and attached expert reports; Audubon Comments, pp. 8-18, ⁋ 2; Campbell Island Comments (regarding historic cumulative impacts). Despite stating that "the consideration of localized impacts is crucial", B-294, the DEIS fails to specify the extent of those impacts even when they are identified: "the magnitude of bed shear stress exceeded the critical threshold at several observation areas" B-296 (§ B-11.3.7- River Lights). Thus, the DEIS finds that wake damage *will* occur, but does not "quantify" it, thereby avoiding quantification of the monetary impact on the affected shoreline owners. While observing generalized increased bed shear stress and water level increases ("observed bed shear stress suggests a potential for increased sediment resuspension and erosion" B-270; *see also* B-293-94), there is no recognition that even a slight increase in water

level or bed shear stress can have erosional impacts at specific shoreline segments. The cost of mitigating these impacts (living shorelines, revetments, bulkheads, etc.) are at least societal, if not Project mitigation, costs which should have been recognized.

The last deepening in 2000 demonstrated the extent of these impacts from passing ships. For example, the North Carolina Historic Site Brunswick Town/Fort Anderson ("BT?FA") experienced severe and sudden erosion caused by the primary wakes of the larger vessels transiting after completion of the 2000 WHP. BT/FA has expended $2 million to mitigation the impact.[11] The Campbell Island Comments and especially the Orton Comments, with their supporting expert analyses, demonstrate that the likelihood of the need for additional shoreline protection is high and will be expensive. The historic Orton site is directly threatened by this Project.

F. Groundwater

Groundwater impacts were incompletely and inadequately analyzed, and the mitigation costs therefore were not included. SELC Comments, pp. 21-22; Campbell Island Comments (regarding salt water intrusion impact on forestry); Orton Comments (impact of salt water intrusion on historic properties).

G. ESA and related issues

Inadequate analysis of the impacts to threatened and endangered species requires more thorough analysis and mitigation, including WRDA mitigation. SELC Comments, pp. 22-28, and Audubon Comments.

H. Cultural and historic properties.

Effects required to be analyzed under NEPA specifically includes historic and cultural effects. 40 CFR § 1508.1 (definition of effects). The DEIS fails to meet this requirement. Citing lack of time and money, the DEIS proposes to defer this mandated analysis until the pre-construction, engineering, and design phase, DEIS 3.21.3, p. 3-32 (2nd),[12] which presumes the Project is feasible. The result is elimination from cost analysis of any mitigation that may be identified and exclusion from the feasibility analysis.

The history of this navigation channel shows that such failures are inexcusable. Specifically, after the 2000 WHP, the historic BT/FA site was severely eroded, threatening pre-Revolutionary War structures. Orton is now similarly threatened. *See* Orton Comments, discussing the failure to examine that historic property and the threat presented by the Project. Even if NEPA provided the Corps with discretion to defer specific Project cost evaluation (i.e., where the feasibility decision could not be impacted because of the size of the BCR compared to the range of additional, deferred costs evaluations), there is no such license where the issue is evaluating the

[11] *See* Brooks Pierce letter for VBHI to USACE Wilmington District, 30 June 2023, discussion at p.8.

[12] The DEIS pagination re-starts after 3-90.

NED and assessing *all* costs of a marginal Project. Beyond the regulatory mandate, there is a demonstrated need here for such evaluation. *See* SELC Comments, pp. 28-29; Orton Comments.

I. Land, water, and mineral rights.

Comments show the Project will impact land, water, and mineral rights and the DEIS and DLR do not account for the associated costs, contrary to the specific guidance requirement to include these costs in the NED analysis. ER 1105-2-100, Appendix D, Amendment #1, Sec. D-3(e)(9), pp. D-7--8. The Orton Comments demonstrate how the Project not only directly invades Orton property, requiring an easement (for which compensation is due), it also threatens extensive damage to property the owners have invested millions to restore and protect. *See also* Campbell Island Comments.

J. Insufficient mitigation generally

There is no monitoring plan and woefully insufficient mitigation provided in the DEIS, considering the scope of actual and potential impacts, both analyzed and un-analyzed. Audubon Comments, P. 33, ⁋⁋ 5, 6. WRDA requires certain impacts to be assessed and provided as part of the Project costs, SELC Comments, pp. 30-33, but the 2025 EC fails to comply.

K. CZMA Concurrence Costs

As required by the Coastal Zone Management Act, 16 U.S.C. § 1456(c)(1)(A), the Corps has certified that this Project is consistent with North Carolina's Coastal Area Management Act ("CAMA"), DEIS App. N, p. 17, and has requested a consistency review by the North Carolina Department of Environmental Quality, Division of Coastal Management ("NCDCM"). That request was received by NCDCM on 17 Oct. 2025. Under 15 CFR 930.41, NCDCM has sixty days from receipt to complete its review and issue its concurrence or objections. On 7 Nov. 2025, NCDCM notified the public it would accept oral comments at a public meeting 17 November 2025 and written comments until 5 p.m., 5 Dec. 2025.

It is already clear the Project is not consistent with CAMA in several respects. *See,* Orton Comments, pp. 20-25 (specifically addressing CZMA). VBHI is still preparing its CZMA comments, but anticipates similar objections to those that it has raised to the Corps in the VBHI Comments. Specifically, VBHI anticipates noting the failure of the Project to evaluate and provide mitigation for impacts to important coastal and estuarine systems, particularly including the sand transport system and resulting threats to areas of environmental concern. These are largely identical to those concerns raised about the 2000 WHP. Indeed, NCDCM[13] also raised informal objections to the 2000 WHP, leading to the Corps' adoption of the 2000 Sand Management Plan ("SMP") and NCDCM's subsequent conditional CZMA concurrence—conditioned on the Corps complying with the SMP and its pledge to monitor and update it as needed. The Corps agreed to the conditions and incorporated them into the final FONSI. We now know that the Corps' pledge

[13] At that time the North Carolina Department of Environment and Natural Resources (NCDENR).

and FONSI conditions are not enforceable. *See* VBHI Comments, footnote 10, pp. 12-13. To protect North Carolina's interests, more will be required.

Ultimately, the Project presents the same risks that led to NCDCM's objections in 2000, plus new ones. If, as anticipated, NCDCM again raises these concerns, there will be additional costs necessary to address them: paper promises will not be sufficient. Some enforceable mechanism must be provided to assure the promises are caried out during the life of the Project. Such mechanisms entail additional costs that have not been accounted for so far.

L. Additional Costs will Further Reduce the BCR

Overlooking the foregoing costs is a DEIS deficiency and fails to satisfy the NEPA "hard look" requirement. In addition, it fails to satisfy the ASA mandate to re-examine the cost justification of this Project. In a Project with a large BCR, like Savannah, the foregoing costs may not materially affect the feasibility analysis. But where, as here, the BCR is at best marginal, it is arbitrary and capricious for the Corps to assume without investigation or data that such costs will not affect the final determination. And it is arbitrary and capricious for the Corps to conclude that the project is feasible when the margin is so close and so many costs have been simply ignored.

IV. THE IMPRACTICABILITY OF THIS PROJECT

As noted above and in Ashar Analysis, p. 7 footnotes 1 and 2, the prior analyses of this Project have always included an alternate BCR calculation applying a 7% annual present value discount. This is because under current Corps' guidance (EC 11-2-216, 31 Mar 18, D-2-2, Sub Appx. D-2), a funding recommendation requires a **BCR of 2.5, applying a 7% discount rate**. This Project only met this threshold in the NCSPA's initial Draft Report (2019), revised downward after the initial Corps critique to 1.3 (at 7%), before the ASA's additional criticism of the NCSPA economic assumptions in 2020. Now, the BCR has fallen to 1.3 using only a 3% discount, and the Corps has omitted the 7% discount calculation previously included. Mathematically, the BCR cannot exceed 1.0 (much less 2.5) if a 7% discount is applied[14] since the costs are almost entirely incurred initially (and hence not discounted) while the benefits are incurred gradually over fifty years and more steeply discounted at 7% than at 3%. Fiscally, this Project is irresponsible.

The context of this Project is also significant. The forecast of world maritime trade is that smaller, remote ports will continue to play a role, but an inevitably smaller and different role (feedering, instead of an alternate direct destination). Wilmington handles less than 1.5% of the containerized cargo on the East Coast.[15] By comparison, the Savannah deepening Project cost $973

[14] Precise recalculation is not possible by the public because the Corps' underlying documentation of calculations has not been included in the public materials or otherwise provided.

[15] 2025 EC, p. 14, Table 5.4 (East Coast Ports total 16.9 million TEU; Wilmington handles 231,452).

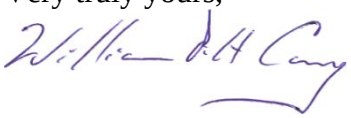
million and produced a BCR of **7.3**,[16] and Savannah handles 16 times more container cargo than Wilmington.[17] The disproportionate expenditure of public funds to impact efficiency at smaller ports like Wilmington, especially when premised on modeling extinct service paradigms, is not in the national economic interest.

Nor is this Project in the local, North Carolina, interest. Taxpayers in North Carolina apparently will bear twenty-five percent ($339 million)[18] of the Project cost. Contrary to the unsupported NCSPA assumption, which was the original premise for this Project, **the Project will have no impact on the volume of cargo moving through Wilmington**. 2025 EC, p. 32, Section 5.3.1.1. The entire project benefit is the supposed national benefit[19] of improved efficiency, which only the shipping lines will enjoy. Wilmington and North Carolina will receive no benefit for their $ 339 million contribution: no increased cargo, no increased jobs, and no increased revenue, either at the Port or in the State.

V. CONCLUSION

The decision that this Project is feasible is arbitrary and unsupported by the record.

Very truly yours,



William P. H. Cary
Counsel for Village of Bald Head Island

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Justin McCorcle, Wilmington District Counsel, U.S. Army Corps of Engineers
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Federal Consistency Coordinator,
Div. of Coastal Management, NC DEQ
Heather Coats, Beach & Inlet Management Project Coordinator,
Div. of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island

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[16] USACE Savannah Harbor Expansion Project Frequently Asked Questions (8 Dec. 2021). https://www.sas.usace.army.mil/Portals/61/docs/SHEP/SHEP%20FAQs%20-%2008%20Dec%202021.pdf

[17] *Id.*; 3,701,297 TEU (Savannah)/321,452 TEU (Wilmington).

[18] DLR Section 5,Table 5-1.

[19] And even this national benefit is suspect: Is there any evidence that the supposed savings enjoyed by the shipping lines handling less than 1.5% of the East Coast TEU cargo will impact the national prices charged by those shipping lines?

Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer
Dr. Asaf Ashar

VILLAGE OF BALD HEAD ISLAND SUPPLEMENTAL COMMENTS

17 NOV. 2025

ATTACHMENTS

Attachment L: Corps PowerPoint: 403 Economic Considerations

Attachment M: Feasibility of Deepening the Port of Wilmington Channel (2025) for the Village of Bald Head Island, by Asaf Ashar, PhD, Ports and Shipping Consultant, November 14, 2025 ("Ashar Analysis")

Attachment N: Summary of Education and Experience, Asaf Ashar, PhD

ATTACHMENT L

VILLAGE OF BALD HEAD ISLAND SUPPLEMENTAL COMMENTS

17 NOV. 2025

CORPS POWERPOINT:

403 ECONOMIC CONSIDERATIONS

403 ECONOMIC CONSIDERATIONS

Wilmington Harbor Section 403 Letter Report

Economic Analysis Overview

Prepared by Andrew Bazzle

Economist
Deep Draft Navigation
Planning Center of Expertise

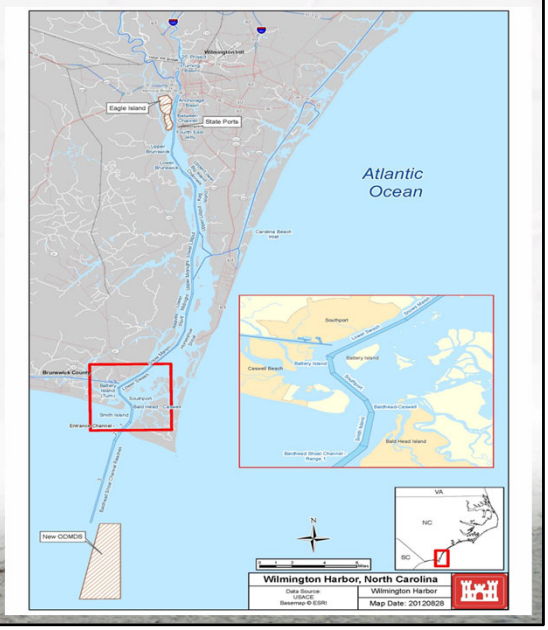
PRESENTATION AGENDA

- Existing Conditions overview
  - Channels and Port
  - Cargo Details
  - Vessel Fleet Details
- Future Without-Project Economic Conditions
  - Commodity Forecast
  - Vessel Fleet Forecast
  - Multiport Considerations
- Future With-Project Condition
  - Assumptions
  - HarborSym Modeling
  - Load Factor Analysis
- Transportation Cost Savings Benefit Calculations

403 STUDY ECONOMIC CONSIDERATIONS

Existing port conditions

- 38-mile federal channel
- - 42 feet MLLW up to Cape Fear Memorial Bridge
- 23 different channel segments (reaches) of varying width
- 12 deep draft docks for liquid bulk, dry bulk, container cargo, general cargo, Ro/Ro
- Use of harbor pilots and tugs throughout
- Inherent limitations on traffic volume (continued next slide)
  - Captured in HarborSym economic model
  - Carried forward into Environmental Impact Statement (EIS)



All inform economic modeling later

403 ECONOMIC CONSIDERATIONS

Inherent Limitations on Traffic Volume

- One-way channels
- Safe Speeds
- Terminal Berth space
  - Container berths =>
  - Bulker/Tanker berths
    - Typically, 3-6 berths/terminal
    - Rarely all used at once
- Cargo handling capacity
  - Based on Commodity Transfer Rates per terminal by vessel class

Terminal	Ship Berths	Total Length (ft.)	Ship Berths	Vessel Capacity	Dwell Time (hrs)**	Max Calls/Year*	Vessel Capacity	Avg TEUs (Un)Loaded	Max TEU
NCSPA 7-9	3	2,700	SPX-PX (<=106' Beam)	3	15	520	2,000	540	280,800
			PPX (106'>Beam<=144')	2	15	520	6,000	772	401,440
			Super PPX (>144' Beam)	1	15	520	12,000	686	356,720
								Total Estimate	1,038,960

Terminal	Crane Size	Cranes	Working Hours	Sustainable Hours (80%)	Crane Capacity (TEUs)
NCSPA 7-9	PPX (17-19 Across/6k+ TEU)	2	8,000	6,400	275,200
	Super PPX (20-24 Across/12k+ TEU	5	20,000	16,000	688,000
	Total	**7**	**28,000**	**22,400**	**963,200**

All must be modeled in HarborSym

- Reasonably model a port's capacity
- Not create "artificial" congestion
- Reasonably capture effects of a deepened channel (capacity unchanged with a project)

4

*Limited to 5 calls per week per berth (520 per terminal)
**explore.dot.gov/views/VesselDwellTimes

- 7 cranes @ max of 4,000 hrs/yr = 28,000 crane hours
- 80% = 22,400 sustainable crane hrs
- Max crane productivity of 35 containers per hr
- 80% = 28 cont./hr x 1.54 TEU/container = 43 TEU/hr
- Sustainable crane capacity = 43 x 22,400 = 965,888 TEU/yr

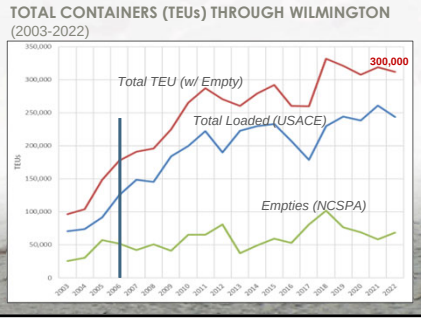
- Pilots prefer to keep speeds constant with deeper/wider channels and gain greater safety margin for environmental conditions and contingencies.

403 ECONOMIC CONSIDERATIONS

Commodity Movements

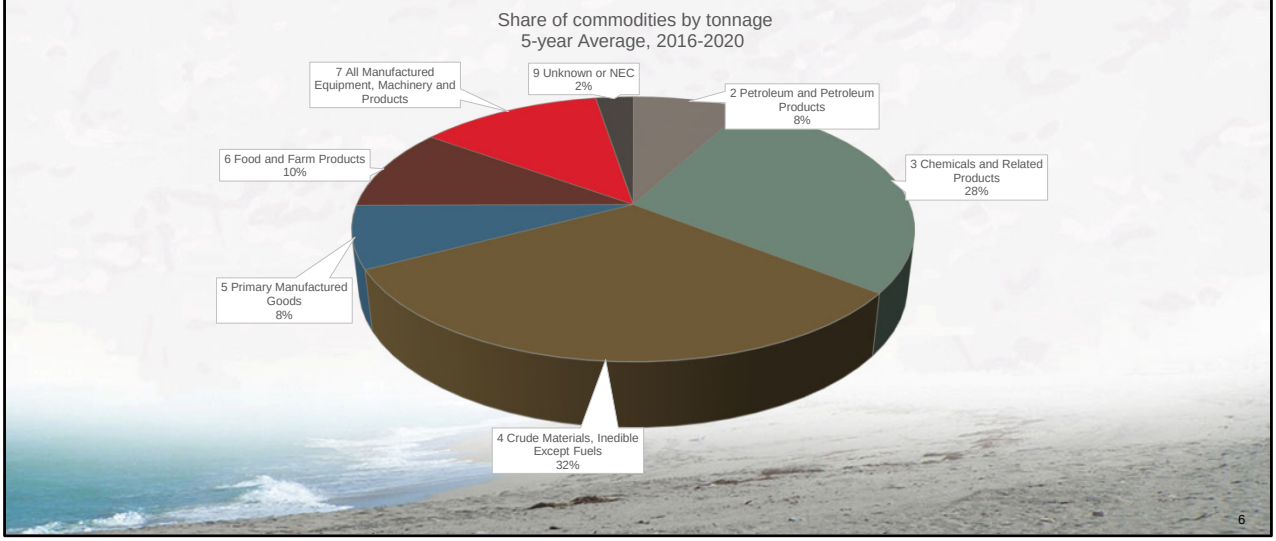
- 7.6 million tons throughput in 2022
  - 6.6 million tons foreign cargo
    - 3.7 million tons imports
      - 1.2 million tons containerized
    - 2.9 million tons exports
      - 1.1 million tons containerized
  - 1.0 million tons domestic cargo
- Total tonnage variable since 2004 (42-foot deepening complete in 2006)
  - Decline mainly due to petroleum products, coal changes
  - Containerized cargo climbed 2003-2011, plateaued since 2012





403 ECONOMIC CONSIDERATIONS

Commodity Distribution at Wilmington



- Petroleum products: gasoline (26%), kerosene (13%), residual fuel oil (9%), distillate fuel oil (22%), asphalt, tar and pitch (13%) and petroleum coke (14%). The port does not handle crude petroleum.
- Chemicals: alcohols (29%), nitrogenous fertilizers (32%) and sodium hydroxide (9%).
- Crude materials: fuel wood (43%), wood in the rough (14%), pulp and wastepaper (14%), lumber (5.0%), and gypsum (10%).
- Primary manufactured goods: paper and paperboard (14%), cement and concrete (15%), misc. mineral products (11%), fabricated metal products (19%), and iron and steel plates and sheets (10%).
- Food and farm products: soybeans (19%), animal feed (10%), and fresh and frozen meat (38%).

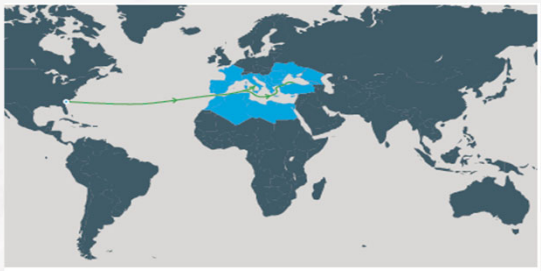
403 ECONOMIC CONSIDERATIONS

Commodity Movements

- Liquid Bulk (Tankers)
  - Origins: Europe, Middle East, India, Caribbean, S. Amer.
  - Destinations: U.S. ports via AIWW
- Dry Bulk (Bulkers)
  - Origins: Canada, S. Amer., Europe, Middle East
  - Destinations: Europe, U.S. ports, Asia, Africa
- Containers (Containerships)
  - Origins/Destinations (liner routes): Asia, Central America, Europe

Route distance X *vessel speed* = voyage time

Voyage time X *hourly operating cost* = transportation cost



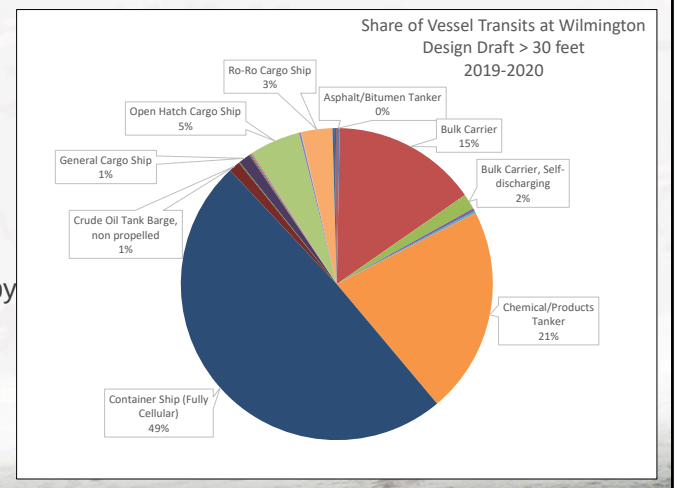


403 ECONOMIC CONSIDERATIONS

Vessel Fleet Operations

Multiple vessels transit with depth >38 feet, occasionally > 40 feet with tide

- Tankers:
  - Alcohols, fertilizers, sodium hydroxide hauled by small/medium tankers (< 35 feet)
  - Gasoline, kerosene, other chemicals hauled by larger tankers (< 44 feet)
- Bulkers:
  - Pulp, lumber, concrete, gypsum hauled by small/medium bulkers (< 37 feet)
  - Wood pellets, rough wood products hauled by larger bulkers (<50 feet)
- Containerships:
  - Raw materials, manufactured products, liquids, agricultural products, and refrigerated goods (38-51 feet)



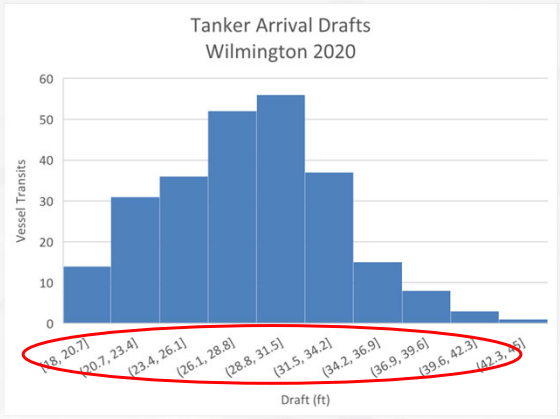
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The resulting distribution is approximately 50% containerships, 25% tankers, and 25% general cargo vessels, including bulkers.

403 ECONOMIC CONSIDERATIONS

Tanker Transits by class, 2016-2021

Tanker Class	Size (DWT)	Design Draft Range (ft)	2016	2017	2018	2019	2020	2021	Grand Total
General Purpose (GP)	10,000-24,999	22.2-33.5	52	55	34	76	86	108	411
Medium Range (MR)	25,000-44,999	30.2-44.0	145	103	88	113	107	101	657
Large Range 1 (LR-1)	45,000-79,999	39.5-43.9	44	68	22	41	38	48	261
Grand Total			**241**	**226**	**144**	**230**	**231**	**257**	**1,329**



Liquid bulk cargo percentage of tonnage by class, 2016-2020

Vessel Class	2016	2017	2018	2019	2020	Average
GP	67	50	65	72	61	62
MR	33	50	35	26	27	35
LR-1	0	0	0	2	12	3
Total	100	100	100	100	100	100

By 2020, 39% of liquid bulk volume is carried on tankers that could be loaded deeper than the current channel (42 feet), but aren't doing so

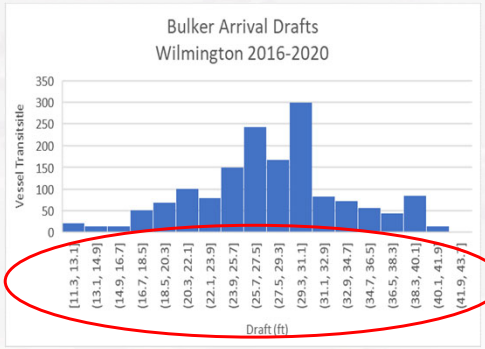
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Over the past 5 years, tonnage has begun to shift from smaller to larger tankers. The more efficient use of larger LR-1 class tankers (60,000-80,000 DWT) would reduce transportation costs for the petroleum firms operating at Wilmington. Larger vessels are not frequently used due to the depth constraint of the Federal navigation channel. If greater channel depth were available, petroleum firms would likely increase the shift of cargo onto larger vessels already in the fleet of vessels calling to take advantage of the economies of scale.

403 ECONOMIC CONSIDERATIONS

Dry bulk cargo percentage of tonnage by class, 2016-2020

Bulker Size	Capacity Range (DWT)	Design Draft Range (feet)	2016	2017	2018	2019	2020	Average
Very Small	3,000–20,000	25–30	1	1	2	1	2	1
Small	20,001–30,000	31–35	2	3	2	0	0	1
Medium Small	30,001–40,000	36–37	15	12	20	14	19	16
Medium Large	40,001-–50,000	38–40	24	18	12	13	10	15
Large	50,001–60,000	41–43	21	27	21	20	11	19
Very Large	60,001–105,000	44–50	37	39	43	52	57	47
Total			100	100	100	100	100	100



By 2020, 68% of dry bulk volume is carried on bulkers that could be loaded deeper than the current channel (42 feet), but aren't doing so

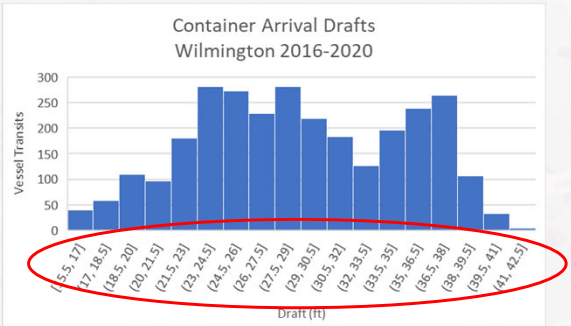
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Over the past 5 years, tonnage has begun to shift from smaller to larger tankers.
The more efficient use of Very Large Bulkers would be more efficient. It is likely they will shift to those more over time, given the width of the Panama Canal, and the shift in shipbuilding to these larger vessels.

403 ECONOMIC CONSIDERATIONS

Containership Transits by class, 2016-2021

Tanker Class	Capacity Range (TEU)	Design Draft Range (ft)	2016	2017	2018	2019	2020	2021	Grand Total
Subpanamax	< 2,800	< 38	173	185	140	120	162	163	943
Panamax (PX)	2,801-4,800	31-45	43	64	62	37	32	73	311
Post-PX Gen1	4,801-6,800	35-48	51	43	28	4	1	1	128
Post-PX Gen2	6,801-9,900	39-49	6	17	21	25	4	1	74
Post-PX Gen3	9,901-15,000	< 51	3	16	19	69	85	83	275
Grand Total			**276**	**325**	**270**	**305**	**284**	**321**	**1,731**



Container cargo percentage of tonnage by class, 2016-2020

Vessel Class	2016	2017	2018	2019	2020
Sub Panamax	33	32	26	30	22
Panamax	25	32	34	14	13
PPX Generation I	39	16	10	1	0
PPX Generation II	3	10	13	13	3
PPX Generation III	0	10	17	42	61
Total	100	100	100	100	100

By 2020, 77% of container volume is carried on containerships that could be loaded deeper than the current channel (42 feet), but aren't doing so

PANAMA CANAL

Max beam: 106.2 ft (Panamax), 168.14 ft (Post-Panamax)

Max draft: 40 ft (Panamax), 50ft (Post-Panamax)

11

Over the past 5 years, tonnage has begun to shift from smaller to larger containerships. PPX3 has a beam of 168 feet, the largest supported by the expanded Panama Canal.

In 2021, PPX Gen III made up about 10% of the In-Service total containership world fleet but accounted for 21% of newbuilding's in the Orderbook. Its relatively new age supports more growth in the forecast period by 2050; rather than being outpaced by scrapping's.

Deepening could eliminate some smaller vessels on Asian and South American routes, and lower total PPX3 calls needed

403 ECONOMIC CONSIDERATIONS

Problem statements:

- Existing cargo shippers are experiencing increased operating costs due to light loading, congestion delays, and tidal delays;

- Light loading, congestion delays, and tidal delays will increase as present harbor users increase their annual tonnage throughput and as larger ships that require deeper channels replace older, smaller ones.



403 ECONOMIC CONSIDERATIONS

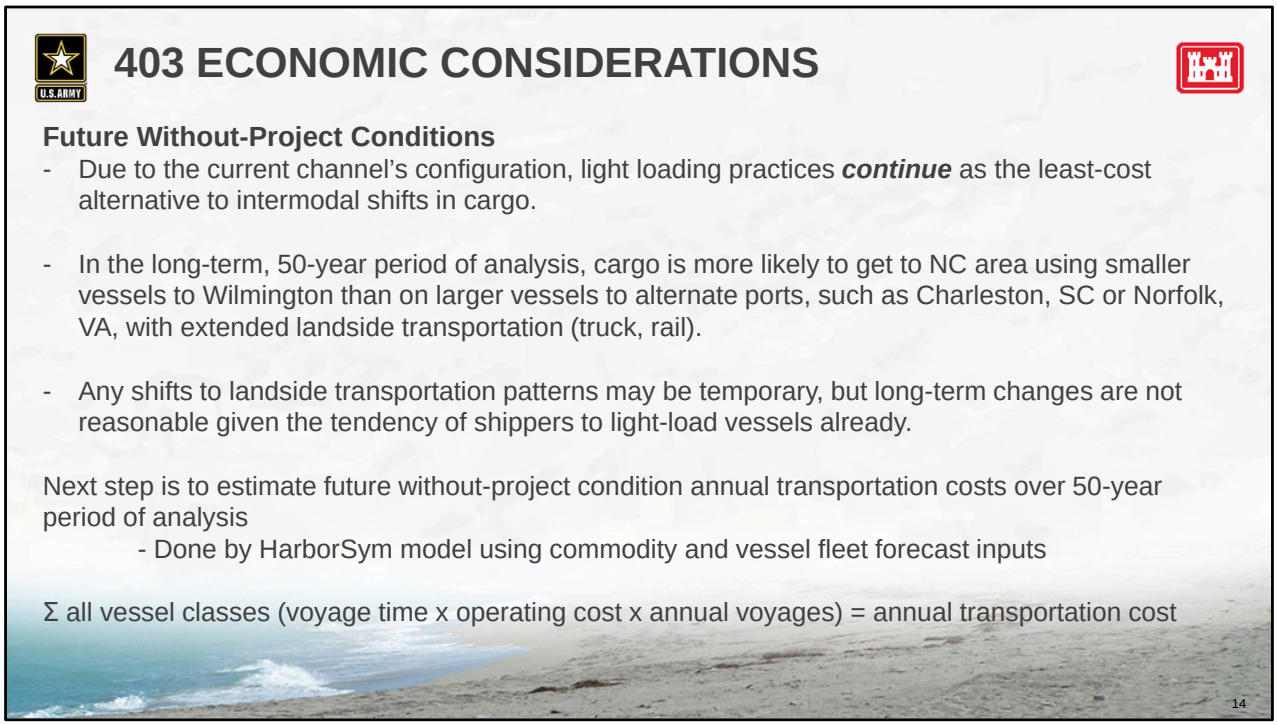
Future Without-Project Conditions

Future Port Conditions Assumptions

- Total cargo throughput is expected to increase in the future, according to overall economic trends visible at this point. *Detailed forecast to follow*

- The port will see an increase in vessel traffic to accommodate this increase in volume.

- Expansion projects at the port will be completed, adding needed capacity to handle vessel and cargo increases
  - NCSPA terminal has container handling capacity of 750K TEUs now and 1.1M with future projects completed.
  - Resurfacing and upgrade of multiple areas
  - Reefer Phase II (704 additional plugs)
  - On-dock Intermodal Yard Redesign to double daily rail capacity (4 x 1,250' working track)
  - Berth 9 Crane upgrade to Neo-Panamax capability



Market share between the Port of Wilmington and nearby regional ports like Charleston and Savannah is multi-faceted and very dynamic. Specific business relationships that drive the fluctuation of market share between them are the manufacturer-to-shipper relationships, shipper-to-port, or port-to-processor relationships. Some companies only ship to one port, others may ship to and from all three, depending on those involved. Given the relative closeness of these three ports geographically, it is likely that the market share will continue to fluctuate between the ports as capital improvements are made and the demand for goods change.

Ultimately, this economic analysis was conducted with the historical Wilmington cargo share remaining the same in both the future without-project and future with-project conditions. To restate the multiport considerations in another way, justification of the recommendation for this study is not based on the assumption that cargo will shift to Wilmington with deepening alone. The analysis assumes Wilmington receives the same share of regional cargo volumes with or without the widening of the waterway.

403 ECONOMIC CONSIDERATIONS

Commodity Forecast

- Forecasted benefiting commodities
  - Containerized cargo, liquid bulk, and dry bulk
  - Sets the requirement for future vessel fleet in modeling

- 5-year average of historical tonnage as baseline for future projections
  - Minimize effects of anomalies and fluctuations
  - Long-term forecast that captures economic prosperity and downturns

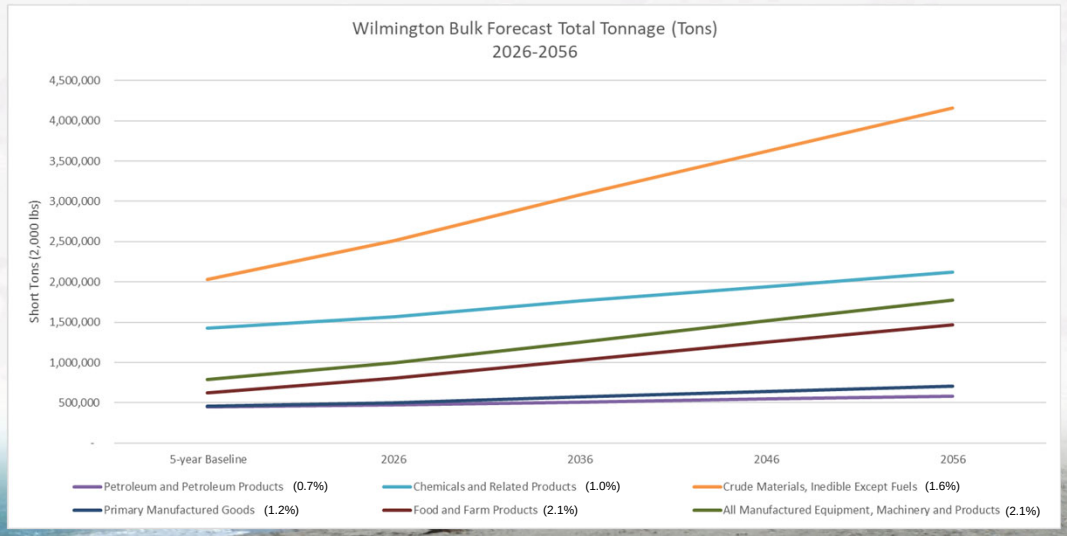
- Forecast period ran from Base Year of 2036 to 2056, or 20 years.

- Due to uncertainty in distant future, forecasted volumes and vessel traffic is held constant to the end of the 50-year period of analysis (2057-2085)



403 ECONOMIC CONSIDERATIONS

Liquid and Dry Bulk forecast



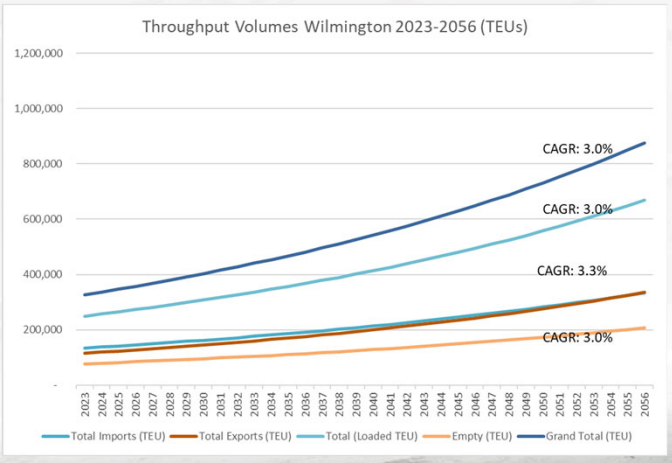
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- Future volumes of liquid and dry bulk cargo were projected over the forecast period using a linear regression of the empirical data from 2016-2020.
- In the cases of petroleum products receipts, Food and Farm receipts, chemical shipments, and Primary Manufacture shipments, trends in tonnage were negative. In these cases, tonnages were held constant from the baseline over the forecast period. These no growth forecasts kept overall growth rates fairly conservative.

403 ECONOMIC CONSIDERATIONS

Containerized cargo forecast (step 1)

	Route Group	2023	2025	2030	2035	2040	2045	2050	2055
Imports									
	Far East	3%	3%	3%	3%	3%	3%	3%	3%
	Europe	2%	2%	2%	2%	2%	2%	2%	2%
	Caribbean	3%	3%	3%	3%	3%	3%	3%	3%
Exports									
	Far East	4%	4%	4%	4%	4%	4%	4%	4%
	Europe	2%	2%	2%	2%	2%	2%	2%	2%
	Caribbean	3%	3%	3%	4%	4%	4%	4%	4%



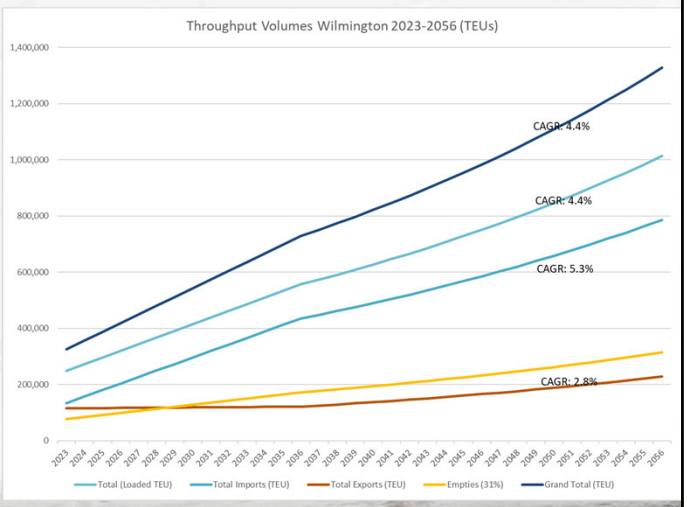
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- From the containerized baseline, future volumes of containerized cargo were projected over the forecast period using long-term growth rates established by S&P Global (formerly IHS Global Insight) for international seaborne trade by World region. To validate that these growth rates were appropriate for the Port of Wilmington, forecasted containerized cargo for 2022 using these rates was compared to actual 2022 containerized volumes provided by the NCSPA. The difference was about 1.5%, so the growth rates were acceptable.

403 ECONOMIC CONSIDERATIONS

Containerized forecast (step 2)

- Qualitative factors
  - Local landside facility growth
    - $2.2 Billion in new storage and distribution facilities
    - $28.2 Billion in new/upgraded manufacturing and processing facilities
  - Most of this is under construction
  - Assumed to be operational by base year of 2036
  - NCSPA-provided estimates of increased cargo volume added to appropriate world region in step 1 forecast
- Port's future landside container capacity assumed to be 1.3 Million TEUs per year
- Will reach capacity by 2056 with this forecast



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The last step of the forecast calculation is implementing qualitative factors, like COVID-19 impact factors, tariffs, infrastructure developments, and export/import restrictions. The area surrounding the Port of Wilmington is seeing significant growth in landside facilities. Over $28.2 Billion in new or upgraded manufacturing and processing facilities are planned over the next 10 years, as well as $2.2 Billion in the construction of 14 new storage and distribution facilities. In discussions with the NCSPA, about half these improvements are either permitted for construction, or currently under construction; therefore, the PDT assumed that most of those would be operational by the base year of the analysis. The NCSPA provided estimated annual TEU volumes associated with each improvement, based on discussions with the respective facility, or their own professional judgement. These estimates of new volumes were further grouped into their appropriate World region and direction (import/export) and added to the initial forecast.

The Port's landside container cargo capacity in the future without-project condition was estimated at 1.3 million TEUs per year, based on their planned facility upgrades as of the time of this report. As a result of the estimated additional volumes reported by the NCSPA as part of this forecast, that 1.3 million TEU capacity may be reached by 2056. Therefore, container growth was not capped for the remainder of the forecast period ending in 2056.

403 ECONOMIC CONSIDERATIONS

Bulker Vessel Fleet Forecast
- Using existing loading data from 2016-2020, developed an average tonnage per vessel, by vessel class.
- For the bulker fleet, loading practices were separated by commodity type; specifically crude materials (including wood pellets) from the rest of the dry bulk commodities, to accurately project future loading patterns for the bulker fleet.

- Bulk loading patterns small & sporadic
  Reasonable to assume patterns will continue; therefore, used to estimate the number of bulker vessel calls expected to move the forecasted levels of bulk commodities.

- Bulk Loading Tool (BLT) in HarborSym's Suite of Tools to estimate the number of bulker vessel calls needed to satisfy the commodity forecast, over the forecast period of 2036-2056

Commodity Type	**Crude Materials**		**Other Dry Bulk Cargo**	
Vessel Class	Receipts	Shipments	Receipts	Shipments
Very Small	9,792	0	10,338	0
Small	0	0	6,000	0
Medium	11,151	11,732	15,390	21,946
Large	0	27,394	19,844	27,394
Very Large	28,314	43,318	29,759	43,318

Vessel Class	**2036**	**2056**
Very Small Bulker	9	13
Small Bulker	1	1
Medium Bulker	71	93
Large Bulker	12	13
Very Large Bulker	71	97
Total Bulk Vessel Calls	**288**	**356**

403 ECONOMIC CONSIDERATIONS

Tanker Fleet Forecast

- Using existing loading data from 2016-2020, developed an average tonnage per vessel, categorized by vessel class.

– Only receipts were used in determining vessel calls effected by the depth of the channel.
  - Outbound tanker shipments are very small, domestic movements on AIWW, not modeled in this scenario.

– Additionally, the estimated share of liquid bulk cargo was adjusted over the forecast period from its existing share in 2020.
  - Shippers will continue to take advantage of available economies of scale in shipping by using an increasing share of LR-1 tankers to move their cargo. Given that most of the existing liquid cargo uses smaller, Medium Range tankers today, the most likely shift would be to the next larger class of Long-Range 1 tankers, and not all the way to Aframax class tankers, even with most of the world fleet containing Aframax tankers. This is reflected in a slight shift in cargo share over the forecast period.

– Bulk Loading Tool (BLT) in HarborSym's Suite of Tools to estimate the number of tanker vessel calls needed to satisfy the commodity forecast, over the forecast period of 2036-2056

		Share of liquid bulk cargo by vessel class		
Vessel Class	**2016-2020 Avg Receipts per call (metric tons)**	**2020 (existing)**	**2036**	**2056**
GP	6,353	18%	18%	18%
MR	15,990	49%	42%	32%
LR-1	29,085	33%	40%	50%

Vessel Class	2036	2056
General Purpose Tanker	49	57
MR Tanker	49	44
LR-1 Tanker	26	38

403 ECONOMIC CONSIDERATIONS

Containership Fleet Forecast

- Used an analysis of historical calls and forecasted share of capacity by vessel class to distribute forecasted tonnage.

– Considered new buildings and scrapping
  - Vessel Cascading

– Considered changes in the world containership fleet
  - Growth in Post-Panamax Generation III vessels(9k TEU+) is predicted to impact the Trans-Pacific trade (23-24,000 TEU vessels would impact the Asia to Europe trade, by contrast), and should provide significant additional capacity for services between the Far East and U.S. East Coast, such as the services currently calling the Port of Wilmington.

– Container Loading Tool (CLT) in HarborSym's Suite of Tools to estimate the number of containership vessel calls needed to satisfy the commodity forecast, over the forecast period of 2036-2056

FWOP Forecasted Shares of Containership Capacity

Route	Class	2036	2056
Far East	PPX1	24%	24%
Far East	PPX2	26%	26%
Far East	PPX3	50%	50%
Europe	SPX	53%	53%
Europe	PX	47%	47%
Caribbean	SPX	50%	50%
Caribbean	PX	50%	50%

World Containership Fleet by TEU band, 2013-2023

TEU Band	2013	2017	2023
0.1 - 1.3 k TEU	1,600	1,553	1,497
1.3 - 2.9 k TEU	1,352	1,476	1,634
2.9 - 3.9 k TEU	303	271	294
3.9 - 5.2 k TEU	762	656	643
5.2 - 7.6 k TEU	519	468	447
7.6 - 12 k TEU	379	670	665
12 k TEU +	151	422	570
TOTAL	**5,066**	**5,516**	**5,750**

FWOP Forecast of Containerized Vessel Calls over forecast period

Route Group	Vessel Class	Without Project Year 2036	Without Project Year 2056
Far East	PPX1	237	289
Far East	PPX2	157	186
Far East	PPX3	103	124
Europe	SPX	30	36
Europe	PX	102	111
Caribbean	SPX	29	34
Caribbean	PX	64	78
Total		**722**	**858**

As new, larger vessels become a greater percentage of the world fleet and are deployed to Wilmington, they replace smaller vessels which are redeployed to shorter routes, which may utilize the smaller vessels more efficiently

403 ECONOMIC CONSIDERATIONS

Combined FWOP Vessel Fleet Forecast

- Overall, vessel fleet is assumed to remain the same, burdened by the same set of problems and navigational constraints.
- Bulkers would shift towards larger sub-classes of Very Large Bulker vessels but remain draft constrained.
- Chemical tankers would shift cargo towards the larger classes of LR-1 tankers, away from smaller classes. LR-1 will continue to light-load because of the current channel depth.
- Containership calls will increase to accommodate the significant North Carolina landside development.
  - Since this will require more vessels than only a single class of container vessel can provide, the amount of liner services may increase from the two currently scheduled, and the fleet mix of vessels may grow to mirror those calling on other U.S. East Coast ports. Significantly more PPX1 and PPX2 vessels would be required to fulfill the commodity forecast without a project. These classes would continue to light-load over forecast period.

Vessel Class	2021	2036	2056
Sub-Panamax Containership (SPX)	163	59	70
Panamax Containership (PX)	73	166	189
Post-Panamax Containership 1 (PPX1)	1	237	289
Post-Panamax Containership 2 (PPX2)	4	157	186
Post-Panamax Containership 3 (PPX3)	83	103	124
GP Chemical Tanker	43	49	57
MR Chemical Tanker	54	49	44
LR Chemical Tanker	19	26	38
Very Small Bulker	5	9	13
Small Bulker	1	1	1
Medium Bulker	38	71	93
Large Bulker	12	12	13
Very Large Bulker	38	71	97
Total	**534**	**1,010**	**1,214**

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- New vessel classes are not assumed to arrive.
- 2036 and 2056 containership fleet mix is more like Charleston and Savannah than the 2021 fleet mix

403 ECONOMIC CONSIDERATIONS

Future With-project condition

- Navigation benefits generated from more efficient use of existing vessels and reductions in transit time
- By allowing deeper vessels, fewer voyages needed to move forecasted cargo
- Reducing delays for conditions makes existing voyages faster and more efficient

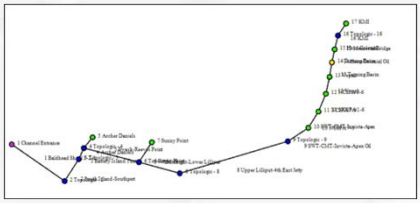
- **Multiport Analysis**
  - Assessed qualitatively as it relates to shifting of cargo from one port to another port based on deepening of a harbor. Wilmington will receive same cargo with or without a deepening.
  - Vessel loading alone does not drive growth for the harbor (see charts on slide 4)
  - Harbor dimensions are just one of many factors involved in determining growth and market share for a particular port. Other historical factors:
    - landside development and infrastructure
    - location of distribution centers for receipts
    - source locations for shipments
    - population and income growth and location
    - port logistics and fees
    - business climate and taxes
    - carrier preferences and business relationships
    - labor stability and volatility
  - Shipper inputs revealed that modifications at Wilmington alone will not be sufficient to change the vessel fleet servicing the U.S. (such as a shift to larger vessels).
    - Carriers visit multiple U.S. ports on a typical voyage. Even though Savannah and Charleston have completed large channel dredging projects in the last 20 years, more comprehensive change to the East Coast/ Gulf Coast port system would be needed to result in changes to the fleet (Panama Canal).

403 ECONOMIC CONSIDERATIONS

NED benefits were estimated by calculating the reduction in transportation cost at each alternative using the HarborSym Modeling Suite of Tools (HMST).

Capabilities:

- Incorporates existing traffic limitations and rules
- Creates forecasted vessel call lists with synthetic shipping based on fleet and commodity forecasts
  - Uses Bulk and Container Loading Tools (load factor analysis)
- Calculates vessel transiting time in harbor
- Captures inefficient delay times
- Calculates transportation cost from prior/next port and overseas distance
- Incorporates risk and uncertainty
  - discrete event Monte-Carlo simulation model (sampling)
- Transportation cost calculator
  - Hourly operating cost X vessel voyage duration = voyage transportation cost
  - Cumulative voyage transportation costs over a single simulated year
  - Sum of transportation costs over 50-year period of analysis



FWOP average annual transportation costs – FWP average annual transportation costs = Avg annual cost savings benefit

403 ECONOMIC CONSIDERATIONS

BLT/CLT Load factor analysis

- Commodity levels remain same as FWOP, load factors updated for deeper channels using:
  - Alternative depth
  - maximum loaded draft of each vessel class
  - the load factor percentage of each class
  - resulting increased capacity per their tons per inch immersion factor (BLT) or available container share (CLT)

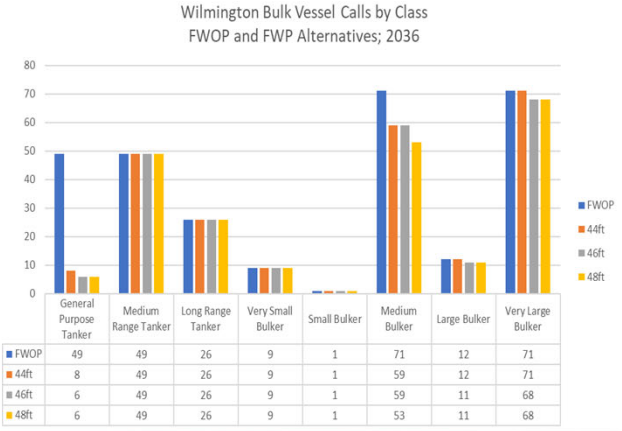
- Adjusts fleet's available capacity in each alternative scenario, then loads the largest vessel class completely, down to the smallest class, until the forecasted commodity volumes are satisfied.

Future Bulk Vessel Load Factors

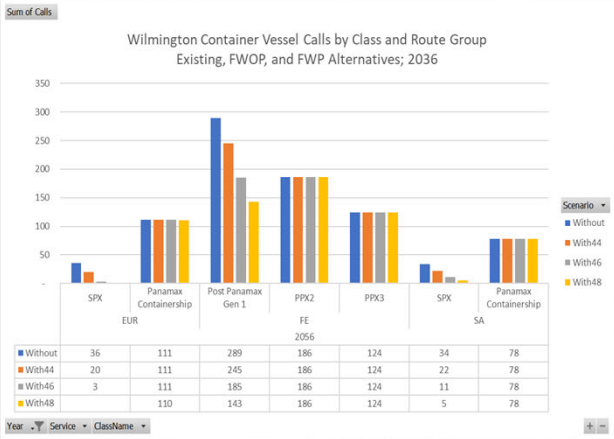
Vessel Class	FWOP Load factor Min/ML/Max	44 ft Load Factor	46 ft Load Factor	48 ft Load Factor
GP Tanker	10/50/90	10/55/90	10/55/90	10/55/90
MR Tanker	10/50/90	10/75/91	10/75/92	10/75/92
LR-1 Tanker	10/50/90	10/75/91	10/75/92	10/75/92
Very Small Bulker	63/71/90	63/75/91	63/75/91	63/75/91
Small Bulker	20/40/90	20/40/92	20/40/92	20/40/92
Medium Bulker	20/50/90	20/50/92	20/50/92	20/75/92
Large Bulker	20/40/90	20/55/90	20/55/92	20/75/92
Very Large Bulker	20/35/50	23/38/53	25/40/55	30/45/60

403 ECONOMIC CONSIDERATIONS

Vessel Calls Changes from BLT/CLT



	General Purpose Tanker	Medium Range Tanker	Long Range Tanker	Very Small Bulker	Small Bulker	Medium Bulker	Large Bulker	Very Large Bulker
FWOP	49	49	26	9	1	71	12	71
44ft	8	49	26	9	1	59	12	71
46ft	6	49	26	9	1	59	11	68
48ft	6	49	26	9	1	53	11	68

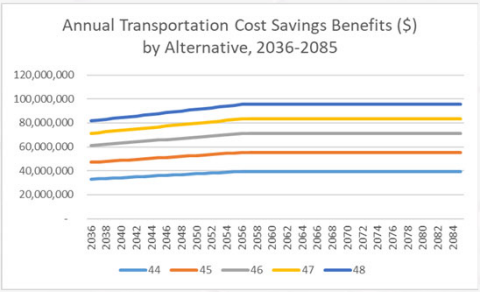


	EUR		FE			SA	
Without	36	111	289	186	124	34	78
With44	20	111	245	186	124	22	78
With46	3	111	185	186	124	11	78
With48		110	143	186	124	5	78



403 ECONOMIC CONSIDERATIONS

- Transportation cost benefits estimated by summarizing and annualizing HarborSym results from multiple simulations
- Commodity and transportation cost growth is held constant after 2056 due to the uncertainty surrounding such long-term forecasts.
  - Benefit levels remain constant through the remaining period of analysis (2056-2085)
- The net present value (NPV) was estimated using interpolation between the modeled years and adding remaining years
- Transportation costs were annualized to determine average annual equivalent (AAEQ) cost savings by discounting the cost stream from year 2036 to 2085 with the FY 2023 Federal Discount rate of 2.5 percent.



Alternative/ Depth	Total Benefits (NPV) ($1,000s)	AAEQ Benefits ($1,000s)
Without Project	$0	$0
44 feet	$959,859	$31,834
45 feet	$1,352,151	$44,832
46 feet	$1,744,443	$57,831
47 feet	$2,040,667	$67,648
48 feet	$2,336,890	$77,465

403 ECONOMIC CONSIDERATIONS

Preliminary Economic Results
- Focused array of alternatives for Environmental Impact Statement analyses

		ALTERNATIVES				
		-44 FEET	-45 FEET	-46 FEET	-47 FEET	-48 FEET
SECTION 403	AAEQ Benefits	$31,834,000	$44,832,000	$57,831,000	$67,648,000	$77,465,000
	AAEQ Costs	$24,099,000	$31,072,000	$38,860,000	$47,719,000	$56,174,000
	Net Benefits	**$7,735,000**	**$13,760,000**	**$18,971,000**	**$19,929,000**	**$21,291,000**
	Net Benefit diff (%)		38%		5%	7%
	BCR @ 2.5% (@7%)	1.3 (0.6)	1.4 (0.7)	1.5 (0.7)	1.4 (0.6)	1.4 (0.6)
SECTION 203	AAEQ Benefits	$44,791,000	$62,121,000	$75,291,000	$85,161,000	$94,131,000
	AAEQ Costs	$18,434,000	$23,426,000	$28,838,000	$33,890,000	$41,512,000
	Net Benefits	**$26,357,000**	**$38,695,000**	**$46,453,000**	**$51,271,000**	**$52,619,000**
	BCR @ 2.75%	2.43	2.65	2.61	2.51	2.27

Section 902 limit based on WRDA 20 Authorized Cost: $1,599,557,000
Latest Project Cost Estimate for 47-foot Alternative: $1,271,520,000

Future Capacity Limits Future Forecast

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Thank you!



ATTACHMENT M

VILLAGE OF BALD HEAD ISLAND SUPPLEMENTAL COMMENTS

17 NOV. 2025

FEASIBILITY OF DEEPENING THE PORT OF WILMINGTON CHANNEL (2025)

FOR THE

VILLAGE OF BALD HEAD ISLAND

BY

ASAF ASHAR, PHD

PORTS AND SHIPPING CONSULTANT

NOVEMBER 14, 2025

("ASHAR ANALYSIS")

Feasibility of Deepening the Port of Wilmington Channel (2025)

For the

Village of Bald Head Island

By

Asaf Ashar, PhD

Ports & Shipping Consultant

November 17, 2025

Feasibility of Deepening the Port of Wilmington Channel (2025)

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Feasibility of Deepening Port of Wilmington Channel (2025)

I Introduction

I.1 Purpose of the Report

The following is a summary of a study prepared for the Village of Bald Head Island by Dr. Asaf Ashar, a consultant and emeritus research professor for ports, shipping and intermodal transportation, University of New Orleans.

The purpose of my study is to review the USACE's reports on the economic feasibility of the Port of Wilmington (**Wilmington**), NC channel-deepening project **(Project**), from its current depth of 42 ft to 47 ft. For this, I intend to critically examine the reliability of the methodology, data, assumptions and calculations of the economic criterion used to determine this project's feasibility, the Project's **Benefit-to-Cost ratio (BCR).** More specifically, I intend to test the reliability of the Project's calculated BCR of 1.3: 1 and, along with it, the feasibility of Wilmington's Project. My study only discusses the benefit side of the BCR, assuming that costs side is kept unchanged.

I.2 Reviewed Documents

My study includes the review and examination of the following documents:

- USACE 2025 403 Draft Letter Report, Attachment 5 -- Economic Considerations – hereafter referred to as **2025 EC**
- Assistant Secretary of the Army May 2020 Review Assessment of Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental (February 2020) – hereafter referred to as **ASA Review Assessment**
- USACE 2025 403 Draft Letter Report – hereafter referred to as **2025 Letter**
- June 2024 USACE Virtual Presentation (Scoping Public Meeting), summarizing the Wilmington Harbor 403 Letter Report & Environmental Impact Statement – hereafter referred to as **2024 Presentation**
- 2024 USACE "Economic Considerations" PowerPoint provided by Corps to VBHI counsel – hereafter referred to as **2024 PowerPoint**
- 2020 North Carolina Ports Section 203 Study Economic C – hereafter referred to as **2020 NCP**.

In addition, and for comparison only, I briefly reviewed the USACE Section 203 Study Economic Appendices of the Ports of Charleston, Savannah, Jacksonville, Mobile, Norfolk, Oakland and Coose Bay.

2025 EC, recently submitted for comments by USACE, is the main document reviewed in my study.

I.3 Summary of Findings

My analysis concludes that both the Project's cargo forecast and the related Project's savings are incorrectly calculated in the 2025 EC report and, therefore, in **need of adjustment**. My study identifies a total of eight (8) different adjustments required to address the assumptions in the 2025 EC that I consider as unsupported. Five (5) of those adjustments result, independently, in turning the Project infeasible (BCR < 1); the other three (3), very close to it. Because these adjustments are statistically independent, any two (or more) of them can turn the Project infeasible.

II Methodology

II.1 Benefit Cargo

My examination of the Project's BCR focuses on the expected **savings** to Wilmington's cargo that can be directly **attributed to the channel-deepening projects**. This so-called **benefit cargo** is carried by shipping lines employing large vessels that can benefit from the deeper channel. In the case of Wilmington, as will be further discussed later, the benefit cargo is Asian imports & exports, carried by direct Asia/USEC services employing post-Panamax vessels.

II.2 Project Benefits = Savings in Shipping Costs

The savings in shipping costs of the benefit cargo are defined as project benefits (**benefits**). The calculation of benefits is based on a simple formula:

- **Benefits ($) = Benefit Cargo (TEUs) x Cost Savings ($/TEU)**

With,

- **Cost Savings ($/TEU) = Costs Without-Project ($/TEU) – Costs With-Project ($/TEU)**

My report critically examines **both** the forecast of benefit cargo (TEU) and cost savings by this cargo attributed to the deeper channel ($/TEU). The benefit cargo (TEU) is addressed in Sections III Cargo (Commodity) Forecast and Section III Asian Shipping Services and Section IV Asian Shipping Services; the savings ($/TEU) in Section V Benefits due to Deeper Channel. Again, my study only addresses the benefit side of the BCR, assuming that the Project costs and the cost side of the BCR, are kept unchanged.

II.3 Wide Variability in BCR Calculations Mandates Sensitivity Testing

The 2025 EC calculates the BCR of Wilmington's channel-deepening Project at 1.3 : 1 (or simply 1.3), and, based on it, determines that the Project is feasible. A BCR of 1.3 is relatively small, indicating that the feasibility of the Project, even prior to my suggested adjustments, is marginal. My review of BCRs of other project-deepening assessment by USACE found that in the case of Savannah, which had a similarly long channel, it was 7.3; Charleston 3.89; Jacksonville 3.3 and Mobile 3.1. The advantage of a large BCR is that it allows for a wide margin of errors in the forecast and benefits assumptions. For

example, in the case of Savannah, even a mistake of 100% in estimating benefits will still keep the BCR>1 (7.3 / 2 = 3.65), and the Project feasible. In the case of Wilmington's 1.3, a misestimate of only 23% (1 / 1.3 = 0.77) can turn the Project from feasible to infeasible. In other words, in Wilmington's case, the determination of feasibility is highly sensitive to assumptions, eight of which I found unsupported by historical and current industry data and in need of adjustment.

Moreover, even in the BCR calculations of Wilmington there is a wide variability as seen below:

Evolution of the BCR of Wilmington Channel Deepening Project

Date	BCR	Discount Rate %
June 2019[1]	5.4	2.875
Feb. 2020[2]	2.5	2.750
Aug. 2025[3]	1.3	3.000

There is no indication in the 2025 EC that the wide range in Wilmington's BCRs, 1.3 – 5.4, is due to changes on the cost side of the BCR. The construction cost is mostly incurred during the first years of the Project (and therefore not affected by changes in discount rates), and USACE has multi-year experience in estimating them. The benefits extend 50 years and are the BCR's component most affected by present value discounting. The wide range (5.4 / 1.3 = 4.15, 415%) of BCR results demonstrates the high **uncertainty** inherent in calculating benefits, considered the most critical part of the assessment of the economic feasibility of channel deepening projects. This uncertainty, which calls into question the Project's feasibility, is not reflected in the BCR calculations in 2025 EC, since it has **no sensitivity testing** to its main assumptions.

III Cargo (Commodity) Forecast

III.1 Same Forecast for With and Without Project

The channel-deepening Project is not expected to affect the volume of cargo (throughput) handled by Wilmington. More specifically, 2025 EC (p.32, top) assesses that local cargo using competitive, nearby ports, e.g., Charleston and Norfolk, will not be repatriated following the channel deepening. Interestingly, Savannah, presumably one of Wilmington's main competitors, is not even mentioned there. The report predicts that "*In the without and in the future with project conditions, **the same volume of cargo is assumed to move through Wilmington Harbor**"*. *Id*. (emphasis in the original). I agree with the economic reasoning for this prediction: the efficiency of maritime transport will continue to drive cargo through the Port of Wilmington regardless of whether its channel is deepened. Accordingly, there is a need to prepare only one forecast, which is applicable to both the With and

[1] NCSPA Integrated Main Report-28 June 2019 Draft, p. ES-14, Table ES-7; that Table also calculates a BCR of 2.6, using a 7% discount rate.

[2] NCSPA Integrated Main Report-February 2020, p. 304 (following review of the Draft by the Office of the Secretary of the Army for Civil Works. *Id*., pp. 6-7). It also calculates a BCR of 1.2, using a 7% discount rate.

[3] 2025 EC, which does not do a BCR calculation using 7%.

Without cases. The effect of the Project is limited to *"allow for more efficient vessel use." (Id.,* p. 32). Later, in the fleet forecast, the 2025 EC anticipates that the deeper channel will have a significant impact on fleet composition. 2025 predicts the reappearance of PPX1, the smallest category of Post-Panamax (**PPX**) vessels although, in 2020, the two Asian services calling at Wilmington were already provided by vessels belonging to the larger category, PPX2&3. As will be discussed later, the PPX1 assumption, although it is unsupported in the 2025 EC, is critically important for determining the Project's feasibility.

III.2 BCR Adjustment to Base Year Assumption

The forecasting method employed by 2025 EC has two components: (a) **base year**, or a starting point for calculation of growth (tons, TEUs); and (b) **annual growth** (or decline) factors (% / year). In the case of a stable situation, to avoid the influence of short-term fluctuations, the base year is commonly selected as the average of the most recent period of 3 or 5 years. Alternatively, if the data exhibits clear, up or down trends, a regression line is fitted. The 2025 EC reports "Receipts" (imports) and "Shipments" (exports) (Tables 5.16 & 5.17, 2025 EC, p. 33) for the years 2016 through 2020 computes the average for that time period. However, despite the wide variability in that data and the absence of a trend (up or down), the 2025 EC rejects this average and selects for base year the highest (most recent) year in those Tables, 2020 -- but not 2024, the most recent information as of the time of the issuance of 2025 EC (discussed below in Section IV).

Table 1 below, based on the Far East Trade[4] figures in 2025 EC Tables 5.16 & 5.17, compares the impact on BCR of basing the forecast on 2020 as base year, with using the 2016 – 2020 average.

Table 1 Adjustment to 2016 – 2020 average instead of 2020

Period	2020	Average 2016 - 2020
Imports (MT)	563,937	387,411
Exports (MT)	804,171	671,597
Total (MT)	1,368,108	1,059,008
Average 2016-2020 / 2020		**0.77**
Report BCR		1.30
Modified BCR		1.01

As seen in Table 1, selecting the average as base year, which seems logical in light of the fluctuations during these years, reduces the Total (MT) to 0.77 of the value selected by 2020 EC – and reduces the cargo forecast and Project benefits accordingly. The effect on the Project's BCR is to reduce its value from 1.3 to 1.01.

[4] The bulk of the projected savings relates to the Far East Trade, which is entirely containerized.

III.3 BCR Adjustment to Past Termination of Direct Asian Services

Another adjustment of the 2025 EC's use of 2020 as base year would be to replace 2020 with more **updated** cargo throughput data. The data in 2025 EC Tables 5.16 & 5.17 ends at 2020. The 2025 EC asserts (p. 59, bottom): *"Ultimately, this economic analysis was conducted with the **historica**l Wilmington cargo share remaining the same in both the future without-Project and future with-Project conditions." (emphasis added)*. Presumably, a study on the feasibility of a $1.4 billion investment, submitted for evaluation in 2025, should include data for the years 2021 – 2024, or, if unavailable(?), consider an indirect method of updating the historical data. In the case of Wilmington, inclusion of the most recent cargo throughput data is critical, since during this period, especially during 2023 and 2024, it seems that there was a significant decline in Asian cargoes handled by direct Asian services (benefit cargo) due to partial or complete termination of their Wilmington calls. Moreover, my recent review of Wilmington's berthing schedule revealed that the termination trend has continued. For most of this year, 2025, there are **no direct Asian services calling at Wilmington.** This recent service termination calls into further question the assumption underlying the supposition of the outlier year 2020, the highest throughput year reported in 2025 EC, as the base year for the forecast calculation.

The termination of Asian services is likely to have a dramatic effect on the Project's BCR. If the base-year is calculated as the average of 5 years, during one of which there is no Asian cargo handled by direct Asian services (benefit cargo), this average is reduced by 4 / 5, or 0.8 which, in turn, reduces the BCR from 1.3 to 1.04 (1.3 x 0.8); if there are a total of 2 years with no Asian services, the BCR will be further reduced to 0.78 (1.3 x 0.6).

The past and present termination of Wilmington's Asian services raises the prospect of **future years with no direct Asian services and no benefit cargoes**. The critical issue of no direct Asian services is further discussed in Section IV.

III.4 Unexplained Increase in Asian Imports

As noted above, the second component of the cargo forecast is the annual growth rate. **Table 2**, based on Table 5.22 in 2025 EC, (p. 35), shows the forecast for the Asian imports & exports (benefit cargoes) for 5-year intervals during the period of 2020 – 2056, with my calculation of the average 5-year annual growth rates (%).

Table 2 Cargo Forecast Growth Rates

Far East	2020	2025	2030	2036	2042
Import (MT)	536,937	625,485	728,635	2,840,505	3,411,517
Annual Growth (%)		3.1%	3.1%	**25.5%**	3.1%
Export (MT)	804,171	985,946	1,205,332	1,557,351	1,935,507
Annual Growth (%)		4.2%	4.1%	4.4%	3.7%
Import+Export (MT)	1,341,108	1,611,431	1,933,967	4,397,856	5,347,024
Annual Growth (%)		3.7%	3.7%	14.7%	3.3%

The 3.1% for imports and the 4.2% - 3.7% for exports are based on the long-range, average growth rate projected for the US East Atlantic ports as presented in 2025 EC Table 5.19 (p. 34). The assumption of regional growth rates, instead of a port-specific ones, is common in USACE's studies, reflecting its focus on national and not port-specific benefits. USACE attempt to stay away from port competition on market share, an approach that I consider reasonable for a federal agency. **Appendix A** further discusses the issue of growth rates assumed in USACE studies of 6 USEC ports.

The 2025 EC's assumption of a dramatically-higher **average** annual growth rate of 25.5% (Table 2, in red) for 2030 – 2036 is apparently based on a specific industrial development expected in the Port of Wilmington catchment area (p. 34, middle): "*Over $10.0 Billion in new or upgraded manufacturing and processing facilities are planned over the next 10 years, as well as $523 Million in the construction of 10 new storage and distribution facilities.*" However, there is no detailed listing of specific projects with their cargo-generation projections. This lack of specification seems baffling to me, considering that this development is expected to increase Wilmington's Asian imports almost 4 times (2.8 / 0.7). **Appendix A** summarizes my research of Wilmington's potential increase in imports generated by the "*new or upgraded manufacturing and processing facilities.*"

III.5 BCR Adjustment to Steady Future Growth

The gross estimate in Appendix A of future cargo growth attributed to the above-mentioned economic developments is in the range of 20,000 - 80,000 TEUs. This estimate is way below the 2025 EC forecasted growth in Asian imports of 2.1 million ton (2.8 – 0.7), which according to Table 5.22 is equivalent to 306,068 TEUs. Hence, for the sake of analysis, I adjust the imports projection to the more realistic (in my opinion) growth rate of the previous and following year. I assume a continuation of the 3.1% growth rate during the 2030-2036 period. **Table 3** shows the cargo forecast for 2036, the base year, with USACE 25.5% vs. my assumption of 3.1%.

Table 3 Adjustment to Steady Growth

Base Year	**2036**	
Scenario	USACE	Adjusted
Import (MT)	2,840,505	875,109
Export (MT)	1,557,351	1,557,351
Total (MT)	4,397,856	2,432,460
Adjusted / USACE		**0.55**
Report BCR		1.30
Modified BCR		0.72

As seen in this table, the explosive growth rate assumed by 2025 EC for the 2030 – 2036 period has a critical impact on the cargo forecast. My adjusted forecast is for 2.4 million tons vs. 4.4 million tons in 2025 EC. The project benefits are directly related to these tonnages of Asian cargo (benefit cargo). Adjusting the cargo forecast to align with the historical growth rate results in an adjustment factor for the benefit cargo of 0.55 which, in turn, reduces the BCR from 1.3 to 0.72 (1.3 x 0.55).

To recap, **The BCR is highly sensitive to 2025 EC 25.5% annual growth assumption (Table 2), and even minor deviations significantly affects the feasibility determination.** It is unprecedented, in my experience, to assume such a major forecast shift ("jump"), on which the ultimate feasibility finding hinges, without a detailed support.

III.6 Combining BCR Adjustments

The adjustments discussed above are unrelated, so two or more of them could happen simultaneously. For example, the two adjustments, the first for assuming the average 2016 – 2020 instead of 2020 as based year, and the second for assuming steady growth instead of a one-time "jump" in new imports, could both simultaneously happen. Accordingly, their combined adjustment impact will be multiplied, resulting in BCR of 0.43 (0.77 x 0.55).

IV Asian Shipping Services

IV.1 Shipping Services Assumed in the Cargo Forecast

The above discussion of cargo forecast disregards the type of shipping (liner) services and size of vessels projected to handle this cargo. The implicit assumption of 2025 EC is that ALL the Asian imports and exports included in the cargo forecast is, and continue to be till 2056, handled by direct Asian all-water services employing post-Panamax (**PPX**) vessels (the "vessel" is omitted hereafter). Currently, as will be elaborated later, there are 3 generations and sizes of PPX: PPX1, PPX2 and PPX3, along with a slightly larger design of PPX3 called PPX3Max. The emphasis is on PPX, since smaller vessels can be efficiently served by the existing 42-ft channel. Indeed, the main justification for the Wilmington's $1.4 billion channel-deepening Project is the savings generated by allowing PPX to sail with deeper draft and respective higher capacity utilization during their Wilmington call.

IV.2 No Direct Asian Shipping Services Presently at Wilmington

The PPX calling at Wilmington are deployed on Asia/USEC (**Asian**) shipping services. My review of Wilmington's berthing plan indicates that presently, October 2025, there are no direct Asian services and/or PPX calling at the port. In contrast, 2025 EC, Table 5.12 (p. 28), assuming 2021 as a base year for predicting long-term trends in shipping, shows 4 Asian services employing PPX2 and PPX3: EC2, TP10, Amberjack and ZCP. Interestingly, the earlier 2020 NCS, Table 1-25, only mentions 2 Asian services calling at Wilmington with direct services: ZCP and EC2. The discrepancy between the two documents indicates the instability in Asia/USEC service structure during these years. The difference between the assumptions of 4, 2 or no weekly Asian service calling at Wilmington as a basis for future projections is significant. The number of services defines the **level of service** by Asian services offered to Wilmington shippers, a key factor in their decision to prefer this ports over its nearby and much better served competitor ports.

IV.3 Shipping Alliances, Port Rotations and Service Patterns

My review of professional media on Asia/USEC direct services indicates that the last call at Wilmington of EC2 service of the THE Alliance was on October 13, 2024, by the vessel YM Warranty, a PPX3 with

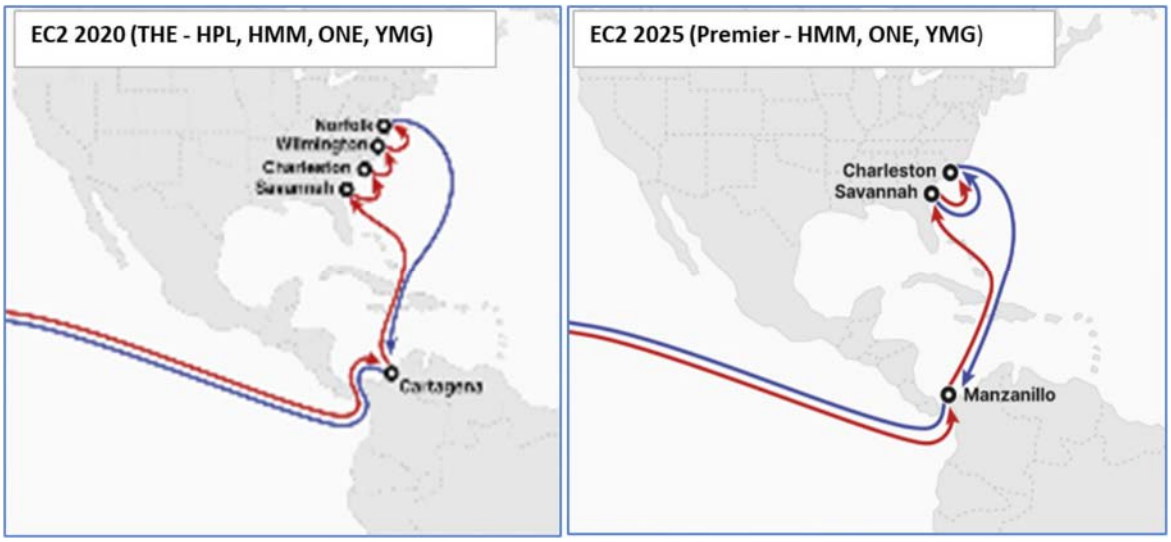
capacity of 14,220 TEU, operated by Yang Ming line. In 2024, the THE Alliance, the largest group at that time, was comprised of 4 lines: Hapag-Lloyd (HPL), HMM, Ocean Network Express (ONE), and Yang Ming (YMG). THE Alliance was restructured in February 2025, with HPL exiting to form the Gemini Cooperation with Maersk. The remaining members, ONE, HMM, and YMG, continued their cooperation under the name Premier Alliance. A parallel change was the dismantling of the 2M alliance of Maersk and MSC, leaving MSC, currently the largest line worldwide, as a standalone line. MSC, later on, began cooperation with Zim Line. **Figure 1** illustrates the profound restructuring in the world of liner shipping, which encompasses all the lines involved in Asia/USEC services (source: *https://market-insights.upply.com/en/the-recomposition-of-the-shipping-alliances-in-2025)*.

Figure 1 Restructuring Shipping Lines' Alliances



Following the restructuring, the Premier Alliance revised its network of Asian services, including the EC2 service that used to call at Wilmington. The updated EC2's port rotation dropped Wilmington and Norfolk, following a decline in the Asia/USEC trade route. **Figure 2** shows the route maps of the EC2 Asia/USEC service before and after restructuring. The service pattern of EC2 is through-Panama and it is operated by a mixture of PPX2 & 3 (see Table 9 in Appendix B).

Figure 2 Restructuring of Asia/USEC EC2 Service



The second Asian service that used to call Wilmington and is also mentioned in the 2020 NCS, is the ZCP, a joint service by Zim and the 2M alliance. The ZCP has a complicated history. My research yielded that in its final form, called Emerald, a joint service of MSC and Zim (also called Emerald/ZXB), ZCP dropped Wilmington in mid-2025. As is the case with EC2, Emerald presently only calls Savannah and Charleston in the South Atlantic. Unlike EC2, which was (and still) following a through-Panama service pattern, the pattern of Emerald is round-the-world (**RTW**), sailing through both Panama and Suez Canals. It also deploys PPX2 vessels. A third service pattern for the Asia/USEC is through-Suez. Unlike the two previous patterns, this service is not constrained by the Panama Canal and therefore can be provided by PPX4, the largest container vessel presently in service (see follow-up discussion).

IV.4 Temporary or Permanent Termination of Wilmington

Wilmington has gone from 4 direct Asian services in 2020 to none in 2025. During the 5-year, in-between period, there have been many "upheavals" in worldwide shipping and in the South Atlantic, including introduction and termination of Asian services in Wilmington. Will direct Asian services ever return to calling at Wilmington?

A more relevant question is whether the deepening project is critically important factor in shipping lines' decisions to renew direct Asian services in Wilmington. The main reasons given in professional media for the departure of Asian services in 2025 is a decline in local Asian cargo and restructuring of shipping alliances. It seems that the first reason, insufficient local generation of Asian cargo is the more critical. Would the deeper channel providing for the more efficient deployment of larger vessels enhance local generation of cargo? According to 2025 EC (p. 59, top): "*Larger vessels alone do not drive growth for the harbor…. Harbor dimensions are just one of many factors involved in determining growth and market share for a particular port.*" The report continues to list many factors that do drive growth.

Presently Wilmington does not generate sufficient Asian cargo to justify a weekly call by a PPX3, the vessels dominating Asia/USEC ports. What is the probability that Wilmington will reach the threshold volume of Asian cargo?

IV.5 BCR Adjustment to Future of No Asian Services

It is difficult to assess the probability of the decision by shipping lines to renew direct calls by Asia/USEC services at Wilmington following the channel-deepening project. It seems that the deeper channel will only have a limited effect, since PPX3 and even PPX3Max have already been calling Wilmington despite its 42-ft channel.

An indirect way to cope with the probability assessment is by defining the **minimum (threshold) probability** required to make the Project feasible. Accordingly, in order for the Project to be feasible, the probability of services return should exceed 77% (1/ 1.3 = 0.77); below 77% the Project is infeasible. The probability is for a **full return to the 2020 level-of-service**, the base year in the cargo forecast, or **4 weekly, direct services by PPX vessels** by 2036. In light of the never-ending changes in the shipping industry and the increase in vessel size (including PPX4, see later), a probability of 77% and higher seems to me an unrealistic expectation. A 50% chance of resuming 4 or more direct Asia/USEC services in Wilmington seems to me more realistic. In this case, the adjusted BCR is 0.65 (1.3 x 0.5).

IV.6 Feeder vs. Direct Services

There is a growing worldwide trend of converting the traditional liner shipping system based on direct calls to a hub & spoke (feedering, transshipment) model, based on a **network of feeder and mother (main) services.** Approximately 30 - 35% of the global containerized trade by volume (measured in TEUs) is currently transshipped worldwide, reaching 65 – 70% on the Asia/Europe trade lane, but still in its early stage on the Asia/USEC trade lane. The advantages of a hub & spoke system are: higher vessel utilization, shorter transit times, and wider coverage of regional ports; the disadvantage: extra port handling at the hub ports, and longer overall sailing distances, in case of a large deviation. Another advantage of the hub & spoke, often unmentioned, is the **savings in port investments** at smaller, regional ports that are only required to handle smaller feeder ships.

The hub & spoke system is expected to become more advantageous in the future due to the combination of increase in vessel size, enhanced port automation, growing pressure to reduce emissions, increased involvement of shipping lines in ports, and further consolidation in the shipping line industry.

Still, a hub & spoke system is difficult to develop. To facilitate a fast and efficient transfer of boxes between mother and feeder ships, a shipping line, or an alliance, needs to control feeder services and, especially, hub ports. While every shipping line already employs feedering system to a varying degree, for one alliance, Gemini, it is a declared strategy. Gemini owns or control 15 key hub terminals, giving it greater operational control to prioritize its vessels and manage capacity, which is crucial for making the hub-and-spoke model reliable. It is estimated that Gemini controls about 25% of the Asia/USEC

service capacity of which about 20% is feedered. MSC also is involved in feedering, but to a much lesser extent.

IV.7 Feeder & Regional Integrated Services

The geography of the Americas is especially supportive for feedering, since it provides for integrating the regional, inter-American trade with the Asian trade. Also, locating the hub ports outside the US significantly lowers the vessel-to-vessel transfer cost.[5] A case in point is Maersk's South Atlantic Express (SAE) service, operated by its regional brand Sealand, with vessels of 2,500 TEU. The SAE feeders the Asian trade of Wilmington, Port Everglades and Philadelphia and, in addition, serves the direct, Central American trade of these ports, and other USEC ports, including Savannah. The SAE's and Maersk use Manzanillo, at the northern entrance of Panama Canal, as its hub port. **Figure 3** shows the route map of SAE in the southbound direction. Other Maersk's feeder/regional services use Cartagena, Colombia as their hub.

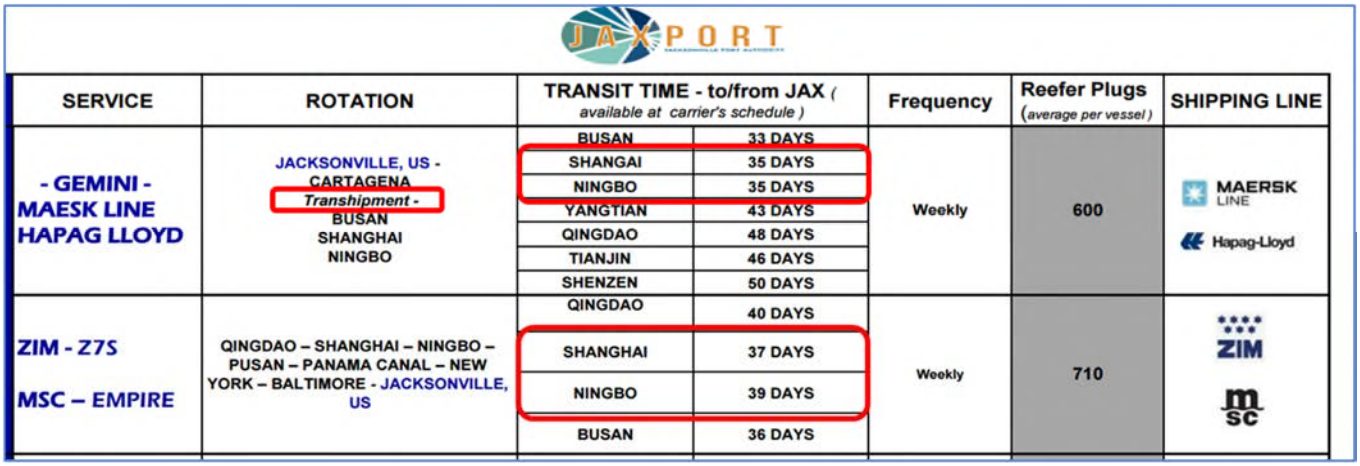
Figure 3 Maersk's South Atlantic Express (SAE)



The decision on feedering is not dependent on channel depth. One example is Jacksonville, already with a deepened channel to 47 ft. Jacksonville's Asian trade is served by one direct and one feeder service. **Figure 4** shows part of the service matrix published by the Port of Jacksonville (Jaxport).

[5] A feeder service between US ports has to be provided by US-flagged vessels, which are prohibitively costly. Also, a mother-feeder transfer of containers in a US port is much more costly than in foreign port.

Figure 4 Jacksonville's Asia/USEC Services



SERVICE	ROTATION	TRANSIT TIME - to/from JAX (available at carrier's schedule)		Frequency	Reefer Plugs (average per vessel)	SHIPPING LINE
- GEMINI - MAESK LINE HAPAG LLOYD	JACKSONVILLE, US - CARTAGENA *Transhipment* - BUSAN SHANGHAI NINGBO	BUSAN	33 DAYS	Weekly	600	MAERSK LINE, Hapag-Lloyd
		SHANGAI	35 DAYS			
		NINGBO	35 DAYS			
		YANGTIAN	43 DAYS			
		QINGDAO	48 DAYS			
		TIANJIN	46 DAYS			
		SHENZEN	50 DAYS			
ZIM - Z7S MSC – EMPIRE	QINGDAO – SHANGHAI – NINGBO – PUSAN – PANAMA CANAL – NEW YORK – BALTIMORE - JACKSONVILLE, US	QINGDAO	40 DAYS	Weekly	710	ZIM, msc
		SHANGHAI	37 DAYS			
		NINGBO	39 DAYS			
		BUSAN	36 DAYS			

Jacksonville's feeder, which also calls at Miami, uses Cartagena, Colombia as its hub. Interestingly, as seen in this figure (emphasized by red squares), Gemini's feeder service, despite the transshipment in Cartagena, has shorter transit times to Asia's main ports than Zim/MSC direct service. My estimate is that in addition to shorter transit times, the feeder provides a much wider coverage of Asian ports (through Cartagena) than the direct service. Apparently, **feeder services can provide as good and perhaps better service then direct services to local shippers**.

IV.8 BCR Adjustment to Future Feedering

Wilmington's only all-water shipping service to Asia at the present is the SAE feeder. Hence, 100% of the Asian trade is presently transshipped. How much of Wilmington's future Asian services will be provided by feeders? Figure 1 above showed the shipping-line's worldwide market structure, consisting of 3 alliances and 1 standalone line, MSC. Maersk/Hapag's **Gemini** Cooperation has fully embraced the hub-and-spoke architecture; **MSC** is reported to begin building its own, hub-centered east/west network; the **Ocean Alliance** and the **Premier Alliance** are reported to prefer a blended approach rather than a pure "every-port direct" model.[6]

As I already calculated, for a BCR > 1, 77% of Wilmington's past-2036 trade has to be handled by PPX-based **direct** Asian services. Put differently, a future market share of feeders at 23% or larger is sufficient to knock down the BCR below 1. In lights of the worldwide trend toward hub & spoke and, especially, considering the emergence of Suez-routed, PPX4-based Asia/USEC services (see below), my expectation is that the future share of feeders of the Asian containerized trade of Wilmington, as well as other smaller USEC ports, is likely to be 50% or higher, resulting in BCR of 0.65 (1.3 x 0.5). It is worth

[6] The largest shipping lines already have their own, in-house (subsidiary) port operators. Maersk has APM; MSC has TIL; Cosco has Cosco Ports; and CMA CGM, the CMA-Terminals (recently negotiating to acquire Eurogate, the largest terminal in Germany). Moreover, Maersk is reportedly interested in having its own hub terminal in Panama; MSC almost completed the acquisition of Freeport, Bahama. MSC already feeders Asian cargo to USEC ports, including Savannah(!) in order to take advantage of PPX3Max full draft, since Savannah is still 47 ft. CMA CGM, through its subsidiary Kingston Freeport Terminal Limited (KFTL), is the operator of the Kingston Container Terminal (KCT). In its latest publication, Maersk, attributed some of its strong financial results for the 2025 to the efficiency of the hub & spoke model.

noting that 2025 EC totally disregards the prospects of feedering Asian trends, as if it is unaware that presently 100% of Wilmington's Asian trade is feedered.

IV.9 PPX4-based Asia/USEC Services

PPX4, also referred to as Ultra Large Container Vessels (ULCV), is the largest category of post-Panamax vessels, with capacity of (up to) 24,000 TEU, 50% larger than the PPX3Max, presently with 16,000 TEU. Both vessels are expected to continue growing in size, with the PPX3 reaching by 2036 18,000 TEU[7], and the PPX4 28,000 TEU.

PPX4s are too large to fit through the expanded Panama Canal locks and therefore their deployment on Asia/USEC must be Suez-routed. While no PPX4s are deployed on present Suez-routed Asia/USEC services, they already dominate Asia/Europe trades, accounting for approximately 70-75% of this route's total capacity.

For efficient operations, PPX4 require 52-ft and desirably 55-ft channel depth and about 215-ft air-draft clearance. Currently, on the USEC, only Halifax and Norfolk have 55-ft, followed by Charleston with 52-ft and New York with 50-ft. Savannah, currently with 47-ft, is pursuing a second harbor deepening to 52 ft, expected to be completed by the Project base year of 2036. Both Savannah and Charleston have low bridges that have to be raised. New York is pursuing a 55-ft channel, at a cost of $4 billion, also expected to be completed by 2036.[8]

It seems, therefore, that by 2036 the main USEC ports will be ready for PPX4. The PPX4 are too wide and long for Panama's new locks, so these services will have to be Suez-routed. Suez-routed services will get a further boost due the trade shift from North Asia (China) to Southeast Asia (Vietnam) and, especially, South Asia (India). **Appendix** B discusses the limitations of Panama Canal and the possible changes in service patterns of Asia/USEC services.

Based on the analysis in Appendix B, it is reasonable to expect a significant **conversion of Panama-routed/PPX3 to Suez-routed/PPX4 services** by 2036, the Project's base year. This conversion is likely to increase **load-centering** in USEC, with the larger ports, those with big cargo-base, deep channels, modern port and expansive intermodal facilities that can efficiently handle PPX4, to become even larger – at the expense of the smaller ports. The deployment of PPX4 will also enhance the trend of feedering the Asian trade of smaller USEC ports. An assessment of the BCR adjustment due to these trends is beyond the scope of my study. As before, it is worth noting that 2025 EC disregards the long-term trends in shipping patterns and shift in vessel size of the Asia/USEC trade.

[7] The largest Neo-Panamax (PPX3Max) vessels dimensions are 366 x 51.25 m and the largest vessel that transited through the Panama thus far is the MSC Fatma-Class, with nominal capacity of 17,640 TEUs.
[8] USACE's feasibility studies of these channel-deepening projects have not been published yet.

V Savings due to Deeper Channel

V.1 Benefit Vessels

As stated at the outset, my study focuses on the benefits side of the Wilmington's channel-deepening Project, generally defined as the savings in vessel costs that can be directly attributed to the Project. In our case, these savings and respective benefits are solely generated by the vessels deployed on Wilmington's direct Asia/USEC container services provided by PPX. The rest of Wilmington's services (e.g., to Europe, South America, etc.) and vessels deployed on them are not expected to reach the PPX size during the life of the Project, and will benefit very little or not at all from the increase in channel depth. The PPX of the Asian services are therefore defined as **benefit vessels** and the cargo handled by them to/from Wilmington, **benefit cargo**.

V.2 Two Categories of Savings in Vessel Costs

The benefits generated by savings in vessel costs due to the Projects can be divided into two categories, depending on the Project's influence on shipping lines' decisions regarding vessel deployment and vessel operations. In response to deepening of a port channel, a shipping line serving Wilmington could decide to:

- **Replace** existing vessels with l**arger** and more economical ones; and/or
- **Keep** the same vessels, but **increase their capacity** utilizations.

The traditional USACE method of calculating savings relates to the first category, vessel replacement. Indeed, savings due to replacement are much larger than those due to draft increase during a port call, since they relate to the entire vessel voyage costs along the 12,000 nautical-mile route between the USEC and Asia. **Figure 5**, taken from 2020 NCS, p. 38, Table 2-4 and, presumably, originally from USACE sources), shows vessel operating cost of PPX as a function of their sailing draft in $/1,000 mile (probably nautical mile).

Figure 5 Vessel Operating Costs(

Table 2-4
Operating Costs per TEU per 1,000 miles at Various Vessel Drafts

	40	42	44	46	48
PPX1	$57.35	$51.52	$46.76	$43.91	$43.91
PPX2	$55.75	$50.37	$45.94	$42.23	$41.64
PPX3	$52.68	$48.03	$44.[illegible]	$40.84	$39.28
PPX3Max	$39.81	$36.46	$33.63	$31.20	$29.11
PPX4	$30.59	$28.34	$26.40	$24.71	$23.22

I will use the cost data in Figure 5 to demonstrate the two saving categories. The per-1,000-mile savings generated by replacing PPX1 sailing at 40-ft draft with PPXMax3 sailing at 44-ft draft[9] (the diagonal red arrow) is $ 23.72 (57.33 – 33.63). The vessel replacement is usually considered for the entire Asia/USEC (or vice versa) voyage, typically around 12,000 miles. Hence the total replacement generates savings of $284.64/TEU (12 x 23.72). This is a considerable amount which, indeed, generates sufficient benefits to justify the deepening of Savannah, Jacksonville, Charleston and the rest of the ports in the USACE feasibility studies that I reviewed.

Vessel replacement, however, is NOT the case in Wilmington. Wilmington is typically the smallest port on the Asia/USEC rotation, and the size of its vessels is usually determined by the larger ports on the rotations involving Wilmington, typically Savannah, Charleston and Norfolk. To restate, **since for Asia/USEC services Wilmington is a secondary port in terms of local generation of Asian cargo, Wilmington's channel depth has little or no effect on vessel size, and Wilmington's deeper channel will not trigger replacing present vessel with larger ones**. Hence, the benefits of the deeper channel are confined to the second and much smaller category, the increase in vessel capacity utilization due to the deeper draft enabled by the deepen channel. Moreover, the savings will only relate to the portion of voyage directly associated with the port call, or the short in/out navigation leg. These savings in navigation are a small fraction of the total vessel's voyage cost from/to Asia. Assuming a service provided by PPX1, the per-1,000-mile savings generated by increasing the draft of PPX1 sailing at 40-ft to 44-ft is $10.59 (57.33 – 46.76), and assuming 200 miles of additional navigation sailing distance (including deviation), the total cost savings will only amount to $2.12/TEU (0.2 x 10.59). The difference between $284.64 and $2.12 is one reason why the BCR of Savannah, which has an equally long channel to Wilmington was much higher than Wilmington's. Another reason is the much higher volume of Savannah's benefit cargo.

V.3 Increase in vessel Capacity due to Additional Draft

The 2025 EC agrees with my claim above, that the second category is the **only** savings that can be attributed to the channel-deepening Project of Wilmington. The Project allows vessels presently sailing light-loaded to/from Wilmington to increase their sailing draft and carry more containers onboard. However, the 2025 EC does not provide data and/or show the calculations of the additional capacity that each type of vessel can carry. More important, 2025 EC does not provide any **explanation of methods, data and assumptions employed for determining the composition of the fleet, by PPX size that is forecasted to call at Wilmington**.

Figure 6, taken from Table 2-3 of 2020 NCP, p. 38, shows data (probably taken from USACE sources) on vessel capacity as a function of its sailing draft, with the latter determined by the channel depth and underkill safety clearance.

[9] A 47-ft channel minus 3 ft under keel

Figure 6 Vessel Capacity by Draft

Table 2-3
TEUs on Board at Various Vessel Drafts

	40	42	44	46	48
PPX1	3,931	4,376	4,821	5,135	5,135
PPX2	5,039	5,577	6,115	6,653	6,747
PPX3	5,936	6,509	7,082	7,654	7,958
PPX3Max	7,337	8,012	8,687	9,361	10,036
PPX4	10,346	11,166	11,987	12,808	13,629

Let's take for example the PPX3, presently the dominant vessel category of Asia/USEC services, including those calling Wilmington in the past. PPX3, sailing at a draft of 40 ft provided by Wilmington's present 42-ft channel, has capacity of 5,936 TEU; its capacity increases to 7,082 TEU if it sails at 44 ft provided by the 47-ft deepened channel, assuming 3 ft under keel (the horizontal red arrow). The additional volume of 1,136 TEU, a capacity increase of 19%, is the basis for the cost reductions shown in Figure 5 above.

V.4 Reduction in Number of Port Calls

The benefits included in 2025 EC are based on the second category of savings, the increase in vessel capacity due to the deeper channel. But instead of using Figure 5 to calculate savings, 2025 EC selects a cost savings methodology based on the reduction in the number of port calls per annum, and this assumption provides main source of benefits attributed to Wilmington's deeper channel. This reduced-call methodology is better suited to bulk shipping. Unlike liner shipping, based on fixed schedules and multi-port rotation, bulk shipping is contract-based (e.g., for X tons/year) and a port-to-port rotation, with no fixed schedule. The number of voyages in bulk shipping is calculated by dividing the total contracted volume by vessel capacity. 2025 EC disregards the fact that liner shipping is based on a fixed schedule (mostly weekly), and assumes that the larger capacity of deeper-draft vessels (additional TEUs/call) will be utilized to **reduce the number of calls** (calls/year) for carrying the same volume of cargo (TEUs/year). Accordingly, the above-calculated 19% increase in the deeper-drafting PPX3 capacity allows a respective reduction of 16% in the number of calls (1 - 1 / (1 – 0.19)), resulting in a respective reduction in vessel and port costs. To re-emphasize, my understanding is that this reduction in calls/year is the **sole source of benefits** considered in the 2025 EC. Unfortunately, 2025 EC does not explain its methodology of savings calculation.

The report does not specify **how** this elimination of vessel calls would be implemented. All Asia/USEC services (and most container services worldwide) are provided on a weekly basis, whereby all vessels follow a fixed, multiport rotation. This also was the case in the past with Wilmington, which due to its location and relatively small cargo base, was typically included as a mid-port. Theoretically, a future weekly service could occasionally skip Wilmington by calling it only every two (or more) weeks, or on an ad hoc basis. However, the assumption of **occasionally dropping the Wilmington call** seems to me

impractical considering its impact on the level of service offered to Wilmington's shippers. They would likely prefer nearby ports which offer a much higher service level e.g. Savannah with 14 weekly call or Charleston with 11 weekly calls (in 2025, and much more in 2036). Another option is to eliminate an entire service, which is possible when a shipping line has several services with overlapping rotations. However, this option also is impractical in the case of Wilmington considering its small number of Asian services even in 2036.

To restate, reduction in number of calls in response to higher capacity vessels is common in bulk shipping, but uncommon in liner shipping. There are cases that due to delays a port is dropped or a voyage is declared "blank". However, the assumption in 2025 EC, of a permanent reduction in vessel calls of existing services is unfounded. I do not know how to quantify this impracticality that could undermine the entire calculation of savings in 2025 EC. Hence, I did not include an adjustment to the Project's BCR to account for it.

VI Fleet Forecast 2036 - 2056

VI.1 Future Reappearance of PPX1

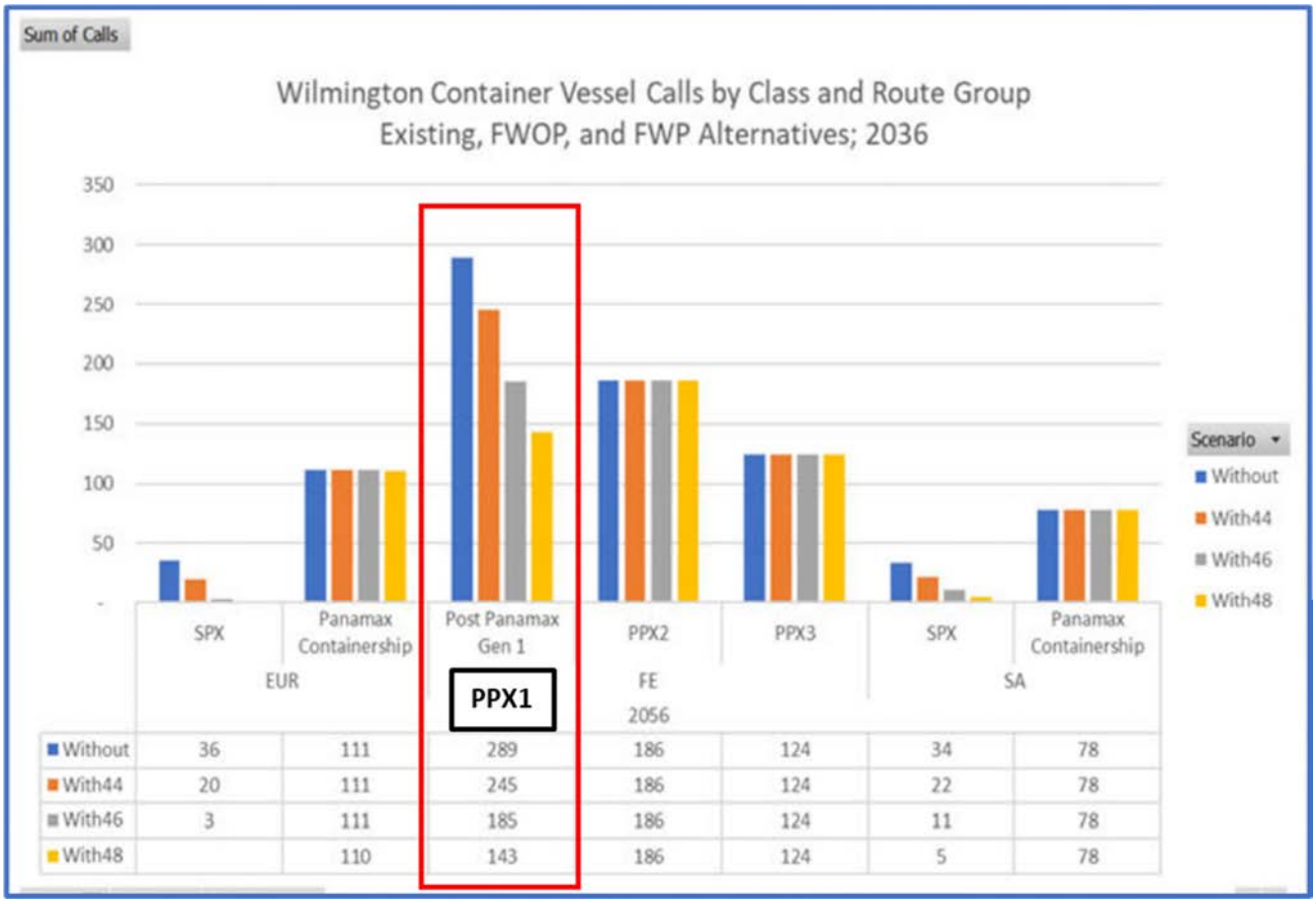
To calculate the future reduction in the number of calls, the report develops a fleet forecast for the years 2036 and 2056, using 2021 as a base year. The forecast relates to the number of calls of PPX1, PPX2 and PPX3 in the With and Without Project channel depths. PPX3Max are omitted, with no explanation given, although they are already deployed on Asia/USEC and have even called at Wilmington in the past. Moreover, this omission contradicts the fleet forecast in the earlier 2020 NCP report, which states: *"The future without-Project condition fleet forecast for vessels on the USEC-Asia services transiting the Panama Canal will consist of PPX3 and PPX3Max"* (p. 46).

As I already noted, 2025 EC does not present the method and the calculations in support of its fleet forecast. The report's Table 5.38 (2025 EC, p. 48) simply shows the distribution of ship calls by categories in the Without-Project base year (2021) and 2 forecast years (2036, 2056); and Table 5.41 (2025 EC, p. 55) shows the With-Project call distribution. **Table 4** summarizes these two tables and analyzes With/Without changes.

Table 4 Wilmington Calls Distribution by PPX Categories

Depth	Without 42 ft			With 46 ft		With 48 ft		48 ft -- 42 ft
Year	2021	2036	2056	2036	2056	2036	2056	2036
PPX1	1	237	289	148	185	115	143	**122**
PPX2	4	**157**	**186**	**157**	**186**	**157**	**186**	**0**
PPX3	83	**103**	**124**	**103**	**124**	**103**	**124**	**0**
Total	88	497	599	408	495	375	453	**122**

Figure 7 Wilmington's Calls Distribution by PPX Categories



	SPX	Panamax Containership	Post Panamax Gen 1	PPX2	PPX3	SPX	Panamax Containership
	EUR			FE		SA	
			PPX1	2056			
Without	36	111	289	186	124	34	78
With44	20	111	245	186	124	22	78
With46	3	111	185	186	124	11	78
With48		110	143	186	124	5	78

As seen in Table 4 and illustrated in Figure 7, the number of calls of PPX2 & 3 (in red) remained **unchanged,** despite the dramatic, 320% growth in cargo volume (Table 2) and the increase in channel depth in the With cases. **The only change is in the number of calls of PPX1**. It seems, that 2025 EC assumes that PPX1, which already in 2021 became extinct on Asia/USEC services, are expected to re-emerge 15 years later, in 2036 and remain fully deployed even in 2056. To re-emphasize, in 2021, the base year for the 2025 EC report, Wilmington had 2 Asian services: ZCP provided by PPX2 and EC2 PPX3 – **no PPX1**. Moreover, **Figure 8** below, taken from 2020 NCP, p. 29, shows that PPX1 had already become extinct in 2019 (red square).

Figure 8 Historical Composition of Wilmington's Fleet

Table 1-22
Vessel Class Distribution for Container Ships Asia Services Calling at the Port of Wilmington

Class	2009	2013	2018	2019
SPX	1%	1%	0%	0%
PX	99%	99%	33%	0%
PPX1	0%	0%	5%	0%
PPX2	0%	0%	41%	20%
PPX3	0%	0%	21%	74%
PPX3Max	0%	0%	0%	6%

Sources: www.lloydslistintelligence.con accessed 14Feb19; NCSPA Data; https://www.zim.com/schedules/schedule-by-port accessed 23Feb19; and https://www.one-line.com/ accessed 23Feb19

VI.2 No PPX1 in Previous Studies

2020 NCP also studies the future fleet composition of Wilmington stating: "*The future without-project condition fleet forecast for vessels on the USEC-Asia services transiting the Panama Canal will consist of PPX3 and PPX3Max vessels."* (p. 46) A follow up review of the existing (in 2020, EC2 & ZCP) Asian services indicates that "The *shift towards PPX3 Max vessels on the two Asia services in question is also supported by the historical trend in carriers reducing the transportation cost per TEU by shifting to larger more efficient vessels*" (p. 187). **Figure 9** taken from 2020 NCSPA Integrated Main Report, p. 124, Table 4-7, uses the USACE HaborSym to calculate the number of Wilmington's future vessel calls – **no PPX1 and PPX2, only PPX3 and PPX3Max.**

Figure 9 Fleet Forecast and Vessel Call

Table 4-7
Port of Wilmington Hinterland Asia Cargo Without-project Containership Fleet Forecast

Vessel Class	Port	2023	2028	2030	2040	2045-2076
PPX3 & PPX3Max	USEC Alternate	64	83	89	126	126

2020 NCP assumes that future fleet composition will be identical to the present (2020), i.e., PPX3 and PPX3Max. Hence, "*Deepening the existing channel would allow for deeper and more efficient loading of the existing fleet; and also allow for the efficient use of larger vessels which may not call on the Port under without project conditions*." NCSPA Integrated Main Report, p. 156, bottom. What is reason for the dramatic difference in future fleet composition between 2020 NCE and 2025 EC? What prompts the assumption of PPX1 reappearance in 2025 EC?

VI.3 Future World Fleet Has no PPX1

My review of professional literature did not yield any evidence supporting a future revival of PPX1, especially since PPX3 and PPX3Max already are the backbone of Asia/USEC services. PPX1 was an initial design, with capacity only slightly larger than Panamax. PPX were temporarily deployed on Asia/USEC services following the 2016 Canal expansion, and shortly after were replaced by PPX2. In fact, even the first, full-blown PPX-based Asia/USEC service, established in 2017, was already provided by PPX2 vessels of 10,000 TEU. Interestingly, this service's main East Coast port of call was Savannah, despite Savannah's constraining 42-ft channel. **Appendix B**, already mentioned above, shows the list of Asia/USEC services calling Charleston (and other USEC) – none of which is provided by PPX1. The Appendix also shows that PPX1 is likely to almost disappear in 2036 from the world's fleet. To recap, **2025 EC forecast of fleet composition, with PPX1 re-emerging to provide about third of Asia/USEC services, is evidently unfounded**.

VI.4 Call Reduction of PPX1 vs. PPX3Max

Table 4, already discussed above, summarizes Tables 5.38 & 5.51 of the 2025 EC report. The last column of this table shows the call reduction in 2036, assuming that the channel depth increases from 42 ft (the present depth) to 48 ft (the deepest in 2025 EC report). As noted above, the **ONLY change between the 2036 42-ft and the 48-ft cases is in the number of PPX1 calls**, 122 (237 – 115). In a more realistic case, all Asia/USEC services in 2036, and probably long before it, would be provided by PPX3Max. According to Figure 6 (vertical red arrow), at 44 ft, PPX3Max capacity is 1.83 that of PPX1 (8,867 / 4,821). If all the services in 2036 are based on PPX3Max, the equivalent reduction in the number of calls decreases from 122 to 66 (122 / 1.83). Because of scale economies of the larger vessel, this decrease in the number of calls also results in a reduction in savings as will be discussed below.

VI.5 Cost Savings due to Call Reduction for PPX1 and PPX3Max

Table 5 shows a rough estimate of vessel and port call costs of PPX1 and PPX3Max, based on published data.

Table 5 Port-Call Costs of PPX1 & PPX3Max

Vessel Category	Unit	PPX1	PPX3Max
Vessel Capacity	**TEU**	**5,800**	**12,450**
Vessel Cost			
OPEX	$/Day	47,000	68,000
Charter	$/Day	55,000	100,000
Total Vessel	$/Day	102,000	168,000
Port Costs			
Dockage	$/24-hr	12,300	14,950
Pilotage	$/Call	20,000	27,000
Tuggage	$/Call	30,000	42,500
Total Port	$/Call	62,300	84,450
Total Vessel + Port	$/Call	**164,300**	**252,450**
Calls Saved	Call/Year	122.00	56.84
Cost Savings	$/Year	20,044,600	14,348,082
PPX3Max / PPX1			**0.72**
Vessel Capacity 44 ft	**TEU**	**4,821**	**8,687**
Calls Saved	Call/Year	122.00	67.71
Cost Savings	$/Year	20,044,600	17,092,379
PPX3Max / PPX1			**0.85**

For simplicity, the assumption in the above comparative cost calculation is that a Wilmington call requires one vessel-day (24 hours), including channel navigation time. Accordingly, as seen in the Table 5, p. 25 above, the total call costs, including both the vessel and the port costs, are $164,300 and $252,450 for PPX1 and PPX3Max respectively. Vessel capacity (TEU) is calculated for two cases, the first assumes nominal vessel capacity and the second light-loading at 44 ft. In the nominal-capacity case, the ratio between the PPX3-based savings and PPX1-based savings is 0.72; in the light-loading case at 44 ft, the ratio is 0.85.

Another, indirect way to figure out the reduction in savings due to the replacement of PPX1 with PPX3Max, is to assume the vessel operating costs shown in Figure 5, based on Table 2-4 of 2020 NCS. My assumption is that the savings are directly proportional of the change in operating costs. **Table 6** shows the calculations. The per-TEU vessel cost figures in Table 6 are represented by the horizontal red arrows in Table 2-4. The PPX3Max costs reduction due to draft increase from 40 ft to 44 ft is about 0.58 of PPX1.

Table 6 Vessel TEU-1,000 Mile for PPX1 and PPX3Max

	$/ TEU-1,000 Mile	
Vessel Category	**PPX1**	**PPX3Max**
Vessel Draft		
40 ft	57.35	39.81
44 ft	46.76	33.63
Cost Difference	10.59	6.18
PPX3Max / PPX1		**0.58**

VI.6 BCR Adjustments to Future Asia/USEC Services by PPX3Max

The deeper channel in the With-Project case allows for better draft utilization for PPX vessels calling at Wilmington which, in turn, results in reduction in the number of vessel-calls and the respective costs. This cost reductions, or savings, are the Project benefits to be compared against its costs. 2025 EC assumes, that about one third of the vessels deployed on Wilmington service in the 2036 – 2056 period are PPX1, which is unfounded. A more realistic assumption is that future Asia/USEC will deploy PP3Max (and PPX4). Since 2025 EC does not provide data or explanation for the methods and assumptions underlying its calculation of savings, I resorted to three, indirect ways of estimating the **relative reduction** in savings caused by adjusting the fleet by replacing PPX1 with PPX3Max. My assumed deployment of PPX3Max instead of PPX1 is supported by: (a) Figure 7, showing that PPX1 was a bygone already in 2019, while the PPX3 was already dominant and PPX3Max just appeared; (b) Appendix B, showing that in 2025, most of the Asia/USEC employ PPX3, and none PPX1; and (c) the world's fleet composition. The benefit adjustment factors for fleet composition are 0.72, 0.85 and 0.58. Accordingly, the adjusted BCR should be 0.94, 1.10, and 0.75, meaning that at least in 2 scenarios, Wilmington's channel deepening Project is infeasible.

VII Summary Conclusion

VII.1 Adjusted BCRs

2025 EC determined that Wilmington's channel-deepening Project is feasibly based on its calculation of the Project's BCR as 1.3 > 1. However, a 1.3 BCR has a narrow, 23% margin of error. A relatively small downside change (risk) in the assumptions underlying the Project's benefits calculations can result in BCR < 1, turning the project status from feasible to infeasible. My study examines 8 such assumptions, for which I did not find a reliable basis in the 2025 EC. Therefore, for each assumption, I propose modifications and corrections based on my own study, resulting in adjustments to the benefits calculated in the 2025 EC.

Table 7 summarizes the impact of the modifications for the 8 assumptions along with their respective BCR's adjustment factors. The adjustment factors are, in fact, the risk factors of the Project, since they can determine the Project's feasibility.

Table 7 Summary of Adjusted BCRs

	Category	Risk Factor	Scenario Description	Adjustment Factor	Adjusted BCR
1	Benefit TEUs	Base Year	Based on Average 2016 - 2020 instead of just 2020	0.77	1.01
2		Base Year	Past Years with no Direct Asia/USEC Service	0.80	1.04
3		Growth Rate	Future Growth Rate Aligned with USEC Ports	0.55	0.72
4		Abandonment	Future Intermodal Replacing Direct Asia/USEC Services	0.50	0.65
5		Feedering	Future Feeder Replacing Direct Asia/USEC Services	0.50	0.65
6	Savings $/TEU	PPX3Max Instead of PPX1	Based on Call Cost at Nominal Capacity	0.72	0.94
7			Based on Call Cost at 44 ft	0.85	1.11
8			Based on Vessel Cost per 1,000 TEU-mile	0.58	0.75

As seen in Table 7, the 8 scenarios (each related to one assumption/risk factor) are grouped into two categories, according to their main impact, on benefit cargo (TEUs), and on savings ($/TEU). Then, in each category, the Table includes a description of the scenarios mandating adjustments, along with their respective adjustment factors and adjusted BCRs. The adjusted BCRs of 5 scenarios is negative (BCR<1), while the remaining 3, are very close to 1. Put differently, in 5 scenarios the Project is infeasible; in 3 barely feasible.

VII.2 Combining Risk Factors

The adjustment factors in Table 7 are mostly unrelated and therefore their combined effect can be calculated by multiplying them. For example, 50% of future Wilmington's Asian trade could be served by feeders (instead of direct services assumed in 2025 EC), while the other 50% provided by direct services employing PPX3Max (instead of PPX1 assumed in 2025 EC). The combined effect on the adjusted BCR is 0.47 (1.3 x 0.5 x 0.72). In addition, and at the same time, the cargo forecast could also be adjusted due to aligning Wilmington's growth rate with the rest of USEC ports (instead of the one-time "jump" assumed in 2025 EC), the resulting BCR due to the three adjustments is 0.25 (0.47 x 0.55).

Altogether, I find the methodology, data, assumptions, and calculations of the BCR, the economic criteria employed by 2025 EC to assess Project feasibility, as **unreliable**. Moreover, based on my adjustments to the Project's BCR, I conclude that the Project, as presented in 2025 EC, is most likely **infeasible.**

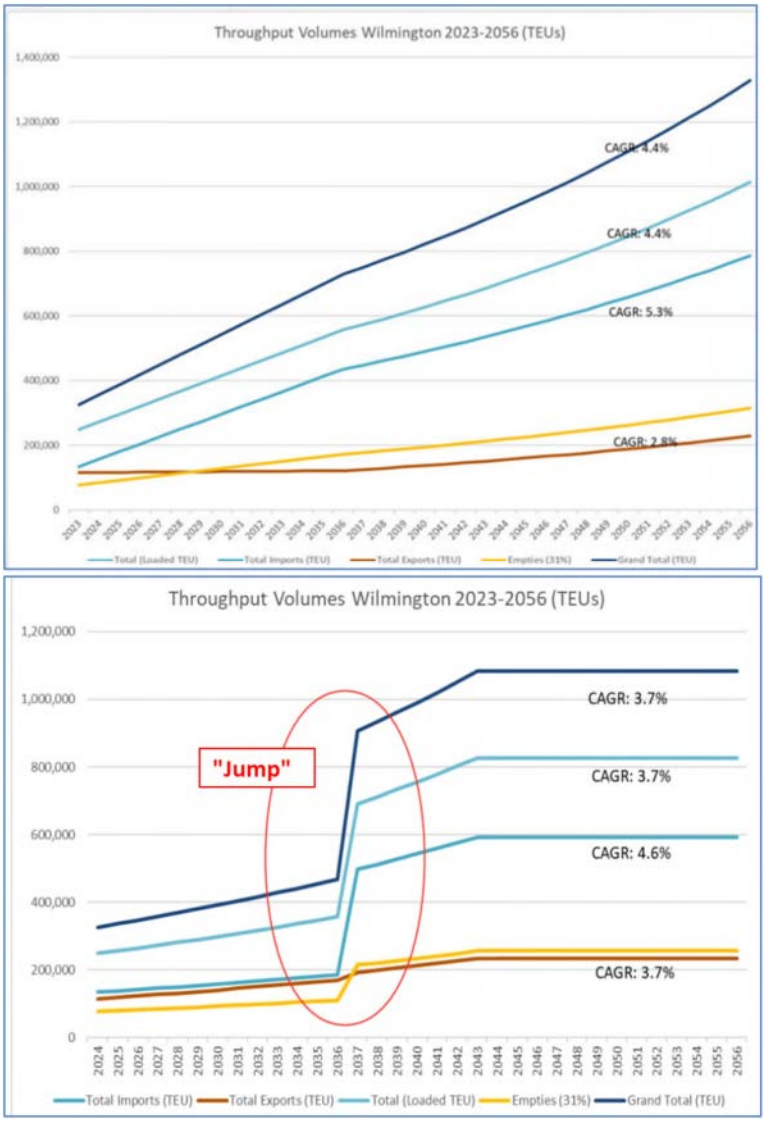
VIII Appendix A – The Forecasted Growth of Asian Container Imports

VIII.1 Sudden Increase in Asia Imports (2030 – 2036)

The cargo forecast presented in Table 2, based on Table 5.22 in 2025 EC (p. 35), shows a huge, one-time "jump" in Wilmington's imports during the 6-year period 2030 – 2036. This jump, which apparently ends right in 2035, the base year of the evaluation of the Project, is quite dramatic; the 2.8 million tons in 2036 is almost 4 times(!) the 0.7 million tons of 2030 (2.8 / 0.7). To facilitate the

discussion, I will convert the tonnage figures to TEUs. Accordingly, assuming the 6.9 tons/TEU used in 2025 EC, the increase in imports is by 306,000 TEUs, from 106,000 TEUs in 2030, to 412,000 TEUs in 2036. **Figure 10** shows two different growth charts, the upper one, taken from the 2024 PowerPoint, and the lower one from 2024 Presentation.

Figure 10 The "Jump" in Wilmington's Forecast



The upper part shows gradual and stable growth rates, with no bumps and no jumps, similar to the one presented below for the Port of Oakland in the following Figure 11, and similar to the many USACE channel studies I have reviewed in recent years. The lower part of Figure 8 shows the "jump" (red circle added by me). Interestingly, both charts were prepared and presented in 2024, perhaps by two separate researchers.

As I noted in Section II, 2025 EC does not offer an explanation for the "jump" or the emergence of these 306,000 TEUS, except for indicating, somewhat causally, that it is presumably the result of *"$10 billion investments planned for the next years"*. 2025 EC does not provide a list of the planned, new or expanded, local industries, and for each an estimate of tonnage and TEUs projections for each. There is also no reference to studies that discuss and explain this unusual growth in imports. In this appendix, I attempt to provide my own, although rough, estimate of Wilmington's expected growth in Asian imports, resulting from the above-mentioned investments.

VIII.2 Growth is Unrelated to Deeper Channel

2025 NC explicitly states that the growth in Asian imports is unrelated to the deeper channel, i.e., not the result of repatriating of Wilmington cargoes presently handled intermodally by nearby USEC ports. Accordingly, 2025 EC only includes one cargo forecast, unrelated to the channel depth. Put differently, the With and Without Project forecasts are the same.

To assess the "net" impact on Asian imports of the above investment, I deduct from the total growth the portion attributed to the "natural growth" of existing cargo. To calculate the natural growth of Wilmington's cargo, I assume that the growth rate of 3.1% during the period 2025 – 2030 remains unchanged in the following period 2030-2036, resulting in the addition of about 20,000 TEUs. Hence the net addition attributed to the above investment is about 286,000 TEUs (306,000 – 20,000).

VIII.3 Forecasting Methodology

The forecasting methodology applied by USACE in Wilmington is different from that assumed in the many USACE's channel studies that I have reviewed. That is, I do not recall a case of a long-term, 36-year forecast (2020 – 2056) prepared for a public container port, where the forecast is almost entirely driven by a one-time development of a new industry. The common methodology assumes a moderate and study growth rates, derived from a national, macro-economic study by outside consultants. This also is the assumption in 2025 EC, for the periods before and after the "jump".

Table 8 shows a compilation of growth rates taken from USACE port-channel studies of 6 USEC ports. As seen there, the growth rates are very similar among ports, and also are similar to those applied for Wilmington, except for the 2030 – 2036 one-time "jump".

Table 8 Growth Rates of USEC Ports

Port	Forecast Period		Annual Growth Rates		
	Begin	End	Low	Moderate	High
Boston	2020	2060	1.6%	2.7%	4.3%
New York/New Jercey	2020	2045	1.7%	2.8%	4.1%
Norfolk	2025	2065	1.9%	3.2%	4.7%
Charleston	2020	2050	1.8%	3.0%	4.5%
Savannah	2025	2030	2.1%	3.4%	4.8%
Jacksonville	2015	2050	2.0%	3.1%	4.6%

Figure 11 shows the Port of Oakland's forecast for 40 years, taken for USACE study of Oakland, CA. This figure shows steady growth rates similar also for a USWC port. Why does 2025 EC apply a different forecasting methodology to Wilmington?

Figure 11 Cargo Forecast for the Port of Oakland

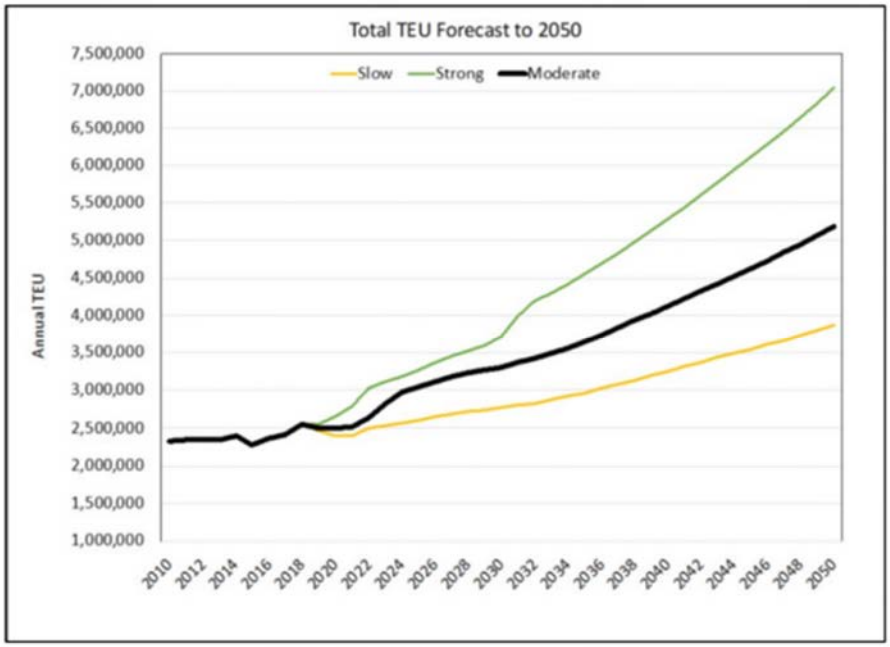


Figure 3-2. Total TEU Forecast to 2050

VIII.4 Forecasting Scenarios

In both Table 8 and Figure 11, the forecast includes 3 growth scenarios, low, moderate and high. This also is the case in Figure 10, upper part, that shows Wilmington's forecasts in 2024 PowerPoint. However, 2025 EC provides **only one scenario**, presumably the moderate growth, with no explanation given. As will be seen in the following sections devoted to a discussion of the specifics of the "jump", there also are no scenarios there. It seems that this avoidance of scenario-based assessment is in line with the overall analytical approach of 2025 EC, which for unknown reasons excludes sensitivity testing of its assumptions.

VIII.5 New and Expanded Industries

The four-fold jump in Asian cargo claimed in 2025 EC is because "*The area surrounding the Port of Wilmington is seeing significant growth in landside facilities. Over **$10.0 Billion** in new or upgraded manufacturing and processing facilities are planned over the next 10 years, as well as $523 million in the construction of 10 new storage and distribution facilities*" (p. 34, bottom). The earlier 2024 PowerPoint includes much larger investment figures, stating: *"The area surrounding the Port of Wilmington is seeing significant growth in landside facilities. Over **$28.2 Billion** in new or upgraded manufacturing and processing facilities are planned over the next 10 years, as well as $2 .2 billion in the construction of 14 new storage and distribution facilities."* (p. 18, bottom). The gap seems too wide, implying problems with the reliability of the data.

Storage and distribution facilities do not generate **new** cargo, but handle existing one, presumably more efficiently. Any new cargo which will be attracted to Wilmington because of these more efficient facilities, investments is presumably presently handled by adjacent ports and, accordingly, its diversion to Wilmington should not count as a new benefit cargo, from the national point of view (NED). Hence, my goal here is to identify and quantify only the new cargo generated by the new manufacturing and processing facilities above.

VIII.6 Toyota Battery Manufacturing (TB)

My review of public media indicates that the "jump" in Asian imports is likely related to planned investments in the production of EV batteries and vehicles. The main EV investors are 4 companies: Toyota Battery Manufacturing NC (Liberty), Epsilon Advanced Materials' graphite anode plant (Brunswick County, near Wilmington), VinFast EV manufacturing plant (Chatham County), and an unnamed EV battery factory (Brunswick).

A detailed assessment of the expected generation of Asian containerized imports of each of the above-mentioned companies, as well as many smaller ones, is beyond the scope of my study. I also assume that there is much similarity among them regarding Asian-imports generation. Hence, I chose to only assess the potential Asian imports of Toyota, being the largest by far and seemingly the more likely to follow on its investment plans.

According to Toyota publications, TB produces lithium-ion batteries. TB plant is located in Liberty, a small city in central NC. The total investment is $13.9 billion and the expected employment 5,100 people. The plant began production in April 2025. In its final, 2030 phase, TB's production will reach 2030 30 GWh, to be installed in 300,000 – 800,000 vehicles, pending on battery size.

VIII.7 Containerized Portion of Raw Materials

The raw materials of TB (and other battery manufacturers) include typical battery components such as: lithium (hydroxide/carbonate), nickel (sulfate), cobalt (sulfate), and related chemicals/precursors. The common method of estimating the volume of raw material is by using indicators of tons/GWh for each of the raw materials. This method is somewhat rough, since indicators have a wide range based on type and size of EV.

EV materials are transported in a mix of containerized and non-containerized cargo forms, optimized for density, value, and perishability. My understanding is that most of the imports are non-containerized, in bulk and breakbulk. For example, it seems that most of lithium will be imported in bulk, as brine (liquid) and hard-rock. The containerized portion includes processed lithium hydroxide/carbonate, nickel/cobalt sulfates, synthetic graphite powder, and battery chemicals/APIs.

VIII.8 Asian, Non-Asian and Domestic Sourcing

EV battery imports originate from geopolitically diverse sources, influenced by U.S. tariffs (e.g., 25% on Chinese batteries, 100% on EVs) and Foreign Entity of Concern (FEOC) rules under the Inflation Reduction Act, which restricts China-sourced materials for tax credits. China still dominates global

production (72% lithium hydroxide, 77% graphite), but diversification favors US allies like Australia, Chile, and Indonesia.

I reviewed 3 separate assessments of TB expected Asian containerized imports for full production level. The first assessment estimated that the Asian share of raw materials ranges 50 – 70%, resulting in a projected volume of 20,000 - 40,000 TEUs/year. The second assessment came up with a much smaller estimate, based on production batteries for 500,000 vehicles and 45% of raw materials sourced in Asia, resulting in 10,000 – 20,000 TEUs/year. Some of the imports include finished cells and packs. The third assessment was between the first two, at 26,000 – 30,000 TEUs/year.

All three assessments indicated that **future imports are likely to gradually decline** due to domestic sourcing, including a proposed Piedmont Lithium mine and Redwood Materials recycling.

VIII.9 Slowdown in EV

The development of the EV industry in the US, and especially in NC, is heavily dependent on a broad range of product subsidies and public investments, beginning with consumer incentives ($7,500 federal tax credit per EV), federal funding for charging stations, production incentives, etc., most of which have been terminated, adding to the cost of EVs. Another addition caused by tariffs on imported raw materials and components, particularly from Asian countries. The lower demand for EV and removal of incentives are reported to cause a reassessment of EV manufacturers' plans. A relevant example is the above-mentioned VinFast, that delayed the opening of its 2024-planned NC factory to 2028.

VIII.10 Competing USEC Ports

There are 4 gateway ports that compete on handling TB's Asian imports. Land distances from TB's location in Liberty to these ports are: Wilmington (210 miles), Norfolk (235 miles), Charleston (278 miles), and Savannah (320). Most TB's imported materials will be shipped by rail using Greensboro inland rail terminal, about 30 miles away from Liberty, presently served by both CSX and NS. These two Class I railroads connect to all 4 ports, and the differences in distances among them are not considered significant (for rail). Moreover, Wilmington's competitors are much larger and offer a much wider selection of Asian (and non-Asian) shipping services. Also, these ports have better rail connection to the Midwest, especially Savannah. It is reasonable to assume, that while Wilmington is the main gateway port for TB's imports, some of it will be using other ports. Perhaps this is the reason why Toyota hasn't yet announced a specific port of entry for its Asian imports.

VIII.11 Difficulties in Forecasting Methodology

As seen above, the methodology for forecasting Wilmington TB-related Asian container imports is based on the examination and estimation of 6 (at least) factors:

TB's Asian Imports through Wilmington =

f (Annual Production (GWh/year) x Raw Materials per unit (tons/GWh) x % sourced in Asia x % in containers x Stowage Factor (tons/TEU) x % through Wilmington gateway)

Accordingly, there is a wide uncertainty in calculating the Asian imports of TB. This probably is the reason for the wide range of results of the 3 above-mentioned assessments, from 10,000 – 40,000 TEUs, or 400% (!). This wide range only relates to TB, the manufacturer for which there is the most accurate information. It is much wider for the other manufacturers.

VIII.12 Wilmington's EV Forecast

TB is by far the largest EV manufacturer, and the one for which there is more detailed and reliable information than the other manufacturers. Nevertheless, for the sake of analysis, I assume that TB's Asian imports are equal to that of the rest of the planned NC plants. I also assume the highest forecast for TB, 40,000 TEUs. Accordingly, the forecast of total Wilmington's imports attributed to the EV industry is around 80,000 TEUs (40,000 x 2). This 80,000 TEU has to increase 3.5 times to reach the 285,000 TEUs (see first section) that 2025 NC ascribes to the EV-related, imports growth in the 2030 – 2036. For comparison, again, the BCR = 1.3 indicates that a downward deviation of 23% is sufficient to turn the project infeasible.

IX Appendix B – Asia/USEC Services with PPX1

IX.1 Current Asia/USEC Services

Table 9 shows a recent (October 2025) listing of Asia/USEC services published by the Port of Charleston. Charleston is the closest USEC to Wilmington, located only 134 nautical miles away or 8 sailing hours. The USEC port rotation of the direct Asian services that called in the past at Wilmington, also called at Charleston (see the EC2 rotation in Figure 2).

Table 9 Port of Charleston Asian Services

ade Route	Rotation	Alliance	Service	Participating Carriers	Avg TEU Size	First In	Last Out	Vessel Category	Routing Pattern
ASIA	Singapore / Cai Mep / Haiphong / Yantian / Kaohsiung / Cartagena / **CHARLESTON** / Savannah / NY/NJ / Boston / Singapore		Emerald / ZXB	MSC / ZIM	7,400	X		PPX2	RTW-EB
ASIA	Yantian / Xiamen / Ningbo / Shanghai / Busan / Manzanillo Mex / Kingston / Savannah / **CHARLESTON** / Norfolk / Kingston / Busan		Amberjack / ZCP	MSC / ZIM	14,600	X		PPX3Max	Panama
ASIA	Singapore / Haiphong / Ningbo / Shanghai / Lazaro Cardenas / **CHARLESTON** / Savannah / NY/NJ / Singapore	Gemini	TP11 / US1	Maersk / Hapag-Lloyd	13,100	X		PPX3Max	Panama
ASIA	Nansha / Yantian / Vung Tau / Tanjung Pelepas / Colombo / NY/NJ / Norfolk / Baltimore / **CHARLESTON** / Savannah / Colombo / Nansha	Gemini	TP16 / US4	Maersk / Hapag-Lloyd	13,100			PPX3Max	Suez
ASIA	Qingdao / Shanghai / Ningbo / Busan / Colon / Savannah / **CHARLESTON** / Boston / NY/NJ / Colon / Qingdao	OCEAN	Vespucci / NUE / AWE1 / ECC2	CMA CGM / COSCO / Evergreen / OOCL	11,200			PPX2	Panama
ASIA	Laem Chabang / Cai Mep / Hong Kong / Yantian / Xiamen / Shanghai / NY/NJ / Savannah / **CHARLESTON** / Laem Chabang	OCEAN	SAX / AWE4 / ECX1	CMA CGM / COSCO / Evergreen / OOCL	13,500		X	PPX3Max	Panama
ASIA	Kaohsiung / Yantian / Cai Mep / Singapore / Port Kelang / Colombo / Halifax / NY/NJ / Norfolk / Savannah / **CHARLESTON** / Port Kelang / Singapore / Laem Chabang / Cai Mep / Yantian / LA / Oakland / Kaohsiung / Yantian	OCEAN	Columbus JAX (CJX) / PE1 / AWE5 / SEA2 / SEAP	CMA CGM / COSCO / Evergreen / OOCL	14,000		X	PPX3Max	RTW-WB
ASIA	Port Kelang / Haiphong / Yantian / Ningbo / Shanghai / Busan / Yokohama / Norfolk / Savannah / **CHARLESTON** / Miami / Port Kelang	OCEAN	CBX / AWE7 / ECC3	CMA CGM / COSCO / Evergreen / OOCL	8,500			PPX2	RTW-EB
ASIA	Xiamen / Yantian / Ningbo / Shanghai / Busan / Manzanillo / Savannah / **CHARLESTON** / Manzanillo / Busan / Xiamen	Premier	EC2	HMM / ONE / Yang Ming	13,500		X	PPX3Max	Panama
ASIA	Laem Chabang / Cai Mep / Singapore / Colombo / Halifax / NY/NJ / Jacksonville / Savannah / **CHARLESTON** / Norfolk / NY/NJ / Halifax / Singapore / Laem Chabang	Premier	EC3	HMM / ONE / Yang Ming	14,000			PPX3Max	Suez
ASIA	Shanghai / Ningbo / Taipei / Yantian / Shekou / Cai Mep / Singapore / Colombo / NY/NJ / Norfolk / **CHARLESTON** / Savannah / Cristobal Panama / Shanghai		AA7	Wan Hai / Hapag-Lloyd	13,000			PPX3Max	RTW-WB

I have divided Charleston's 11 services first according to their vessel-size category and second, their service (routing) patterns. As seen in Table 9, **none of the present Asia/USEC services is provided by PPX1**. For comparison, 2025 NC assumes, as seen in the above Table 4, that PPX1 will be the largest vessel category (by the number of calls/year) in 2036, although in 2021, the base year for fleet projection in this Table, there was only 1 call of PPX1 in Wilmington.[10] The categorization by routing pattern is important since it affects vessel-size. As seen in Table 9, last column, out of 11 Asia/USEC services, 5 are routed through-Panama (**Panama),** 2 through-Suez **(Suez)** and 4 round-the-world (**RTW).** Due to the hostility at the entrance to the Red Sea, the actual routing of some of the Suez is around the Cape of Good Hope, which adds 2,100 nautical miles. Also, because of the hostility, some Suez services switched to Panama. Hence, it is quite likely that once the hostility ends, there will be shift of Panama back to Suez. The shift to Suez will be further boosted by Panama Canal's constraints as discussed below.

IX.2 Panama Canal Constraints

The first constraint of Panama Canal (**Panama**) is its lock's dimensions. The largest current vessel that can transit through the Canal is about 16,000 TEU, which will probably grow to 18,000 TEU in the future, while the dominant vessels already deployed on Asia/Europe trade are 24,000 TEU.

The second and rarely-mentioned constraint is the number of daily transits. The third lock (neo-lock) was designed specifically for post-Panamax vessels, both container and non-container (mainly tankers). It is estimated that the current utilization of the neo lock already reaches 60 – 70%. The combined effect of future increase in maritime trade and increase in vessel size is likely to increase the demand for this lock. Accordingly, the utilization in 2036 is expected to reach the range of 80 – 90%. At such a high utilization, vessel delays are unavoidable. While delays are common in bulk shipping, they disrupt operations of liner shipping, whereby vessels follow a strict schedule, including fixed berthing windows at ports. Panama also has problems with seasonal shortage in the supply of fresh water, resulting in draft limitations, which are expected to get worse in the future. The construction of a 4th lock is a very long and expensive prospect. In contrast to the Panama, the Suez Canal is a sea-level and sea-water canal, with no locks, no capacity constraints and no problems with water shortage.

IX.3 Future Shift from Through-Panama to Through-Suez Services

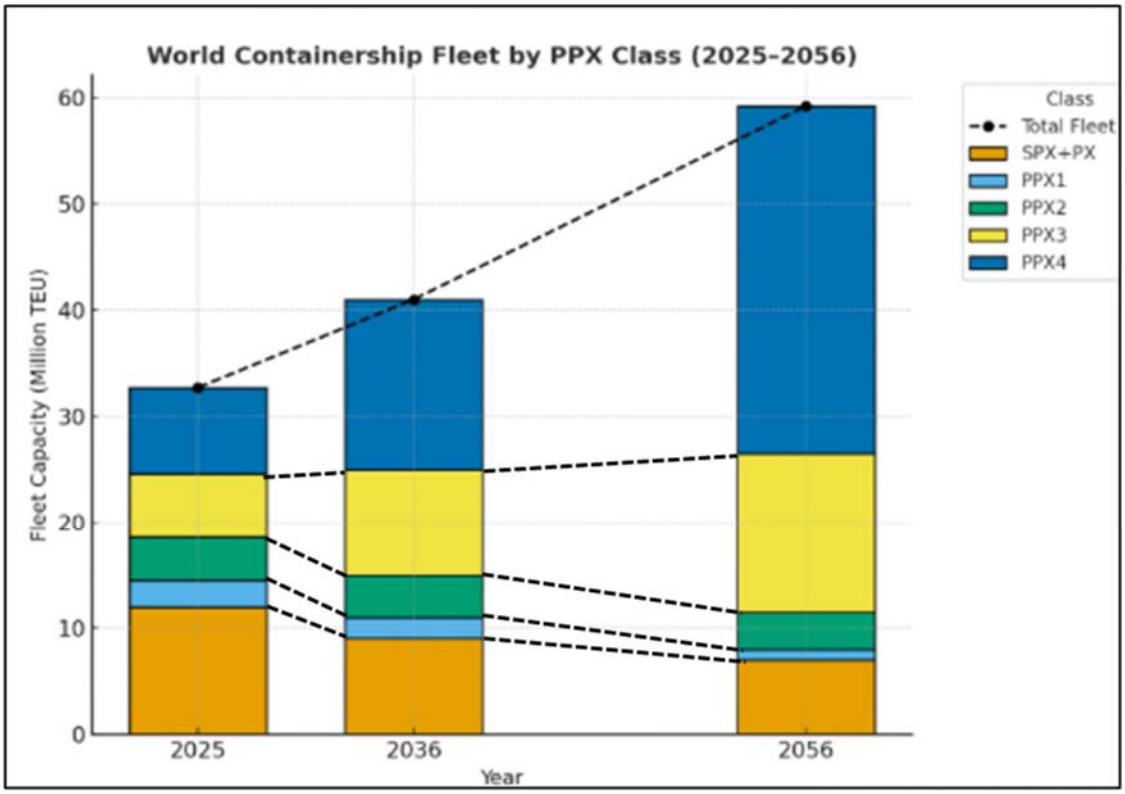
The first driver for a shift (or conversion) of Asia/USEC services from through-Panama to through-Suez pattern is the increase in vessel size, from 18,000 to 24,000 and eventually 28,000 TEU, as discussed in Section IV.9 on PPX4. The second driver, also mentioned in that section, is the shift of trade from North Asia to Southeast and South Asia. The third driver is the operational constraints of Panama Canal as discussed above. The combined effects of these drivers may take some time, but considering that the Project's first year is 2036 and extends till 2086, it certainly has to be taken into considerations. 2025 EC does not include an assessment of the above drivers and their possible impact on future fleet composition.

[10] It seems that the PPX1's 1 call in Table 4 is a typo or one-time event, since shipping services usually call on a weekly basis.

IX.4 Future Fleet Composition

Figure 12 shows the present (2025) and future (2036, 2056) fleet composition of container vessels by size category, based on public sources. The years 2036 and 2056 are selected to accord with Table 4, which shows the future fleet composition of Wilmington Asian services.

Figure 12 World Fleet by PPX Categories



As seen in Figure 12, PPX1, the dominant vessel in 2025 EC, and the main source of savings due to the predicted reduction in the number of calls, is bound to almost disappear. The largest category of the PPX in 2025, PPX3, is expected to further grow, while PPX2 remains unchanged. Another trend is the tremendous growth in PPX4. These 24,000-TEU vessels, already dominating the Asia/Europe trade are likely, eventually (2036?), following the next round of USEC-ports' deepening, to also dominate Asia/USEC services, which by then will mostly be through-Suez.

Another trend that favors larger newbuildings is decarbonization. Only 8% of the present fleet uses alternative fuels. However, most newbuildings, especially the ULCV, are dual-fuel. It is quite likely that carbon pricing will accelerate scrapping of older, dirtier vessels, including the first-generation of PPX, the PPX1.

IX.1 Special PPX1-Based, Asia/USEC Services for Secondary Ports

How can one predict the reappearance of PPX1-based services in 2036, when most of them are already bygone as seen in Figure 12?

It seems that there is confusion regarding the rejuvenation of PPX1-based Asian services in the various USACE publications. For example, the most recent one, 2024 PowerPoint, attempting to justify taking PPX3 as a design vessel, states: "*Deepening could eliminate some smaller vessels on Asian and South American routes, and lower total PPX3 calls needed" (p.11, bottom).* Then, apparently unaware of this statement, makes a contradictory prediction that *"**In the long-term**, 50-year period of analysis, cargo is more likely to get to NC area using **smaller vessels to Wilmington than on larger vessels to alternate ports, such as Charleston, SC or Norfolk, VA**, with extended landside transportation (truck, rail)*." (p.14, bottom). Put differently, a key assumption in the benefit calculation is the future emergence of Wilmington-special, Asia/USEC services based on PPX1. Presumably, according to USACE prediction, for some reason, in 2036 (Figure 12) there will be an "evolutionary split" in the Asia/USEC service pattern into big-port and small- port services. Let me examine this possibility.

USEC ports can roughly be categorized into main and secondary ports. To justify a call by a 15,000-TEU, PPX3 vessel with a USEC rotation of 4 ports, each of the main ports should generate about 5,000 TEUs in/out. This apparently is already the case since, as seen with Charleston above, the main ports are already served by PPX3 and PPX3Max vessels and, in 10 or so years, by PPX4. The smaller, secondary ports presumably can only generate 2,500 TEUs in/out, which is only sufficient to justify a call by PPX1. A hypothetical rotation of such a PPX1-based service could include Port Everglades, Wilmington NC, Wilmington DE and Philadelphia. However, the cost disadvantages of using PPX1 vs. PPX3Max are significant. As seen in Figure 5, at 44 ft, the PPX1 is 39% (46.76 / 33.63); at 48 ft, **PPX1 is 50% (43.91 / 29.11) more expensive than the PPX3**. The 48 ft is the more likely case since by 2030 the main ports' channel are likely to be deepen to 50+ ft. **In light of this huge cost disadvantage, a 2036 emergence of PPX1, small-port services is unlikely.**

Another hurdle for such a service is a severe shortage in PPX1. As seen in Figure 12 above, the availability of smaller PPXs will sharply decline in the future. The reason is simple, there is and will be a limited worldwide use for this historical, small-capacity vessel design.

As to the secondary USEC ports, the more reasonable prediction for their Asian services pattern is the hub & spoke model, or feedering, which already is the practice worldwide, including Wilmington.

ATTACHMENT N

VILLAGE OF BALD HEAD ISLAND SUPPLEMENTAL COMMENTS

17 NOV. 2025

SUMMARY OF EDUCATION AND EXPERIENCE

ASAF ASHAR, PHD

Summary of Education and Experience

Asaf Ashar, PhD

Research Professor (emeritus) and Independent Consultant, Ports, Shipping and Intermodal Transportation

Dr. Ashar is Research Professor (emeritus) with the National Ports & Waterways Institute (NPWI), USA, and independent consultant. NPWI is a maritime research program of The University of New Orleans and, previously, Louisiana State University, with offices in New Orleans, LA and Washington D.C. Dr. Ashar had been with NPWI for 30 years (1985 - 2015). Before that he was Senior Port Planner and Transportation Analyst with the Port of Seattle, WA, USA (1981 - 1985), and Senior Advisor for Operations with the Port and Rail Authority of Israel, Ports of Haifa & Ashdod (1972 - 1980). His academic background includes degrees in Industrial Engineering & Management (Technion, Israel, 1967), Marine System Management (Massachusetts Institute of Technology, USA,1982), and Maritime Studies and International Transport (University of Cardiff, United Kingdom,1993).

Relevant Assignments:

***Expert Witness, Port Concession Assessment**, for White and Case LLP (2021).*

***Expert Witness, Home Port vs. Port of Registration in Cruise Shipping,** for Palter, Stokley & Sims LLC, Houston, TX (2018).*

***Expert Witness, Prospect of Ferry Services in New York,** for Emery, Celli, Brinckerhoff & Abady LLP (2015).*

***Expert Witness, Patent Application for Ship Handling System, USA,** for Mintz, Levin, Cohn, Ferris, Glovsky & Popeco, P.C. (2015).*

Expert Witness, Port of Savannah's Channel Deepening, for Natural Resources Defense Council, Inc., New York, USA (2012).

Expert Witness, Port of Miami's Channel Deepening, for Natural Resources Defense Council, Inc., New York, USA (2012).

Expert Witness, Maher Terminals, Elizabeth, NJ, USA, for Winston & Strawn LLP, Washington DC, USA (2012).

***Expert Witness, Private Ports in USA and UK and their Relationships with Surrounding Communities,** for the Port of Los Angeles and Kaye Scholer LLP (2009).*

Expert Witness, Costs of Coal Shipping and Port Handling in Florida, for Michael Twomey Law Office, Gainesville, FL, USA (2004).

Executive Summary- Village of Bald Head Island CZMA Comments

Bald Head Island sits at the mouth of the Cape Fear River. Effects caused by the existing U.S. Army Corps of Engineers navigation channel have damaged the island considerably since the year 2000, costing the Village of Bald Head Island over $70 million in unreimbursed expenses to mitigate those damages over the past twenty-five years. The proposed channel deepening/widening is a fifty-year project that could cause the Village to incur at least $150 million or more in mitigation costs.

Prior to the Corps project in 2000, which deepened, widened, and moved the channel closer to the Island, the Island's coastal engineer conducted a detailed study of how the navigation projects were impacting the island and shared it with both DCM and the Corps. He predicted the 2000 project would result in devastating impacts to the Island (and those predictions came true). As a result of his studies, DCM objected to the project during the CZMA consistency review and proposed specific conditions that would protect the sand sharing system and beaches at the mouth of the river, which are CAMA AECs (areas of environmental concern).

The Corps agreed to those conditions and adopted the Sand Management Plan ("SMP"), which provides a schedule for depositing maintenance dredged sand on BHI and Caswell Beach. The stated purpose of the SMP was to protect the AECs by retaining sand in the same littoral cell by not removing it to non-adjacent beaches or offshore sites. In other words, everyone understood that sand will erode from those beaches back into the Channel and should be returned to the beach during periodic maintenance dredging. The proposed sharing ratio was 2/3 BHI, 1/3 Caswell Beach, but more than twenty years of monitoring have shown the ratio is closer to 7:1, meaning BHI is experiencing a significant recurring deficit under the 2:1 sharing ratio. The Corps agreed to monitor the actual erosion rates and adjust that ratio, but the sharing ratio has never been adjusted and the resulting deficit to BHI has cost the Village over $70 million to offset.

The proposed Wilmington Harbor Project would cause further damage and continues to ignore the predicted erosion. The shoal that supports BHI beaches and the beaches themselves are clearly AECs protected under CAMA. The Draft Environmental Impact Statement ("DEIS") did not study the impacts to these AECs despite specific requests to do so and years of specific monitoring data, which were rejected by the Corps' consultant. The studies that were done by the Corps' consultant are inaccurate and unreliable. The DEIS does not assure compliance with the State's coastal management policies or protection of its AECs.

In 2000, DCM was the only stakeholder who could get the Corps to discuss meaningful mitigation to protect AECs. After the 2000 deepening was constructed, the Corps abandoned its assurances to DCM and took the position in court that it could not be forced to honor them. The court agreed. The Corps is now removing

sand from the Channel and placing it outside the littoral cell. The result is the AEC protections sought by DCM in 2000 have been abandoned.

Mitigation for these valuable AECs is therefore imperative and they must be structured in a way that is legally enforceable.

BROOKS PIERCE
FOUNDED 1897

2000 RENAISSANCE PLAZA
230 NORTH ELM STREET
GREENSBORO, NC 27401

T 336.373.8850
F 336.378.1001
WWW.BROOKSPIERCE.COM

November 3, 2025

Via U.S. Mail and Email

US Army Corps of Engineers
Wilmington District
ATTN: Wilmington Harbor 403
69 Darlington Avenue
Wilmington, NC 28403
WilmingtonHarbor403@usace.army.mil

Re: Wilmington Harbor 403 Draft Letter Report and Environmental Impact Statement, Wilmington Harbor Navigation Project, North Carolina

COMMENTS SUBMITTED ON BEHALF OF THE VILLAGE OF BALD HEAD ISLAND:

This firm represents the Village of Bald Head Island ("**VBHI**") in connection with the proposed Wilmington Harbor Navigation Project ("**Project**"). These comments are submitted on behalf of VBHI in response to the Notice of Draft Letter Report and Environmental Impact Statement ("**Notice**") for the Project issued by the United States Army Corps of Engineers ("**USACE**" or "**Corps**") 19 September 2025. It is our understanding that these comments will be shared with the Independent Expert Peer Review members as well.

I. Overview of Comments

The Draft Letter Report ("**DLR**") and the Draft Environmental Impact Statement (**DEIS**") interrelate so that flaws in the DEIS affect the analysis and conclusions of the DLR, and vice versa. For example, the DEIS's failure to identify all impacts and the costs related thereto understates the Project's cost and results in the DLR overstating the Benefit Cost Ratio ("**BCR**"), on which a feasibility determination hinges. In addition, both documents suffer from defects in procedure and substance. The 203 process, on which both the DLR and DEIS depend, fundamentally violated the controlling statute. Despite comments repeatedly pointing this out,[1]

[1] VBHI letter to ASA(CW), 28 Aug. 2019, with attachment; Brooks Pierce letter for VBHI to USACE Wilmington District, 11 Oct. 2019; Southern Environmental Law Center letter to USACE Wilmington District, 11 Oct. 2019; North Carolina Coastal Federation letter to USACE Wilmington District, 11 Oct. 2019; Brooks Pierce letter for VBHI to USACE Wilmington District, 30 June 2023; Southern Environmental Law Center letter to USACE Wilmington District, 30 June 2023; North Carolina Coastal Federation letter to USACE Wilmington District, 30 June 2023; Brooks Pierce letter for VBHI to USACE Wilmington District, 22 July 2024; Southern Environmental Law Center letter to USACE Wilmington District, 22 July 2024.

the 403 and NEPA proceedings did not address[2] or cure the resulting flaws but instead compounded them. These procedural defects led directly to substantive errors in both documents.

Broadly speaking, the DEIS fails to take the requisite "hard look" at the environmental consequences of the Project.

1. It fails to consider the **cumulative impacts** of this and previous projects, in particular the 2000 Wilmington Harbor Project ("**2000 WHP**"), and thus trivializes the devasting impacts caused by continuing to maintain and now expand the Wilmington Harbor Federal Navigation Channel ("**Channel**"). *See Nat'l Audubon Soc'y v. Dep't of Navy*, 422 F.3d 174, 185, 196 (4th Cir. 2005) (citing prior CEQ regulations substantively identical to the version of regulations applicable here); *see* 40 CFR 1508.1(g)(3) (version eff. May 20, 2022 to April 10, 2025). *See* III C, below.

2. It fails to correctly identify and evaluate the impact of "**connected actions**," most particularly the annual maintenance dredging that will be necessary, thereby failing to identify and account for additional required mitigation. *See Seven County Infrastructure Coalition v. Eagle County, Colorado*, 145 S.Ct. 1497, 1516 (2025) (reasoning that when there is a "reasonably close causal relationship" between the project at hand and the environmental effects of related work, the effects of the related work should be considered in the EIS). *See* III D, below.

3. It disregards the express conditions and environmental safeguards built into the 2000 WHP and thus inflicts harms previously addressed (incompletely) through the Sand Management Plan incorporated into the 2000 WHP and compounds that harm with the new harms from the currently proposed Project. *See* III E, below.

Similarly, the DLR continues to follow a flawed process and reaches unreliable conclusions regarding the issues identified in the May 2020 ASA(CW) Assessment Review ("**ASA Assessment**").

4. It fails to implement the required procedural safeguards for developing a Report compliant with Corps guidance, as required by statute. *See* IV B, below.

5. Because the Corps' sand modeling and related analyses were not open to the public, the results reached were flawed and demonstrably unreliable. *See* IV C, below.

6. The NED analysis failed to include the public, resulting in Project Planning Objectives (DLR p. 2-3) that are incorrectly limited to examination of alternatives at the Port of Wilmington instead of addressing the broader stated National Purpose and Need (ES-2). *See* IV D, below. Substantive comments regarding the Economic

[2] DLR Appendix O ("Public Comment Summary") details the Corps' review process and generalizes categories of comments but does not address how they were resolved. Nor does the main DLR document or any part of the DEIS.

Considerations (DLR Attachment 5) will be submitted separately, pursuant to an extension of time graciously granted by the Corps. *See* IV D 1, below.

Ultimately, the DEIS fails to identify the full range of impacts and the costs necessary to mitigate them. As a result, the DLR conclusion of feasibility is erroneous, since the borderline BCR declines further with the omitted costs included. Accordingly, the final feasibility decision for the Project is not supported or accurate.

II. Interests of Party Submitting Comments

Bald Head Island sits at the mouth of the Cape Fear River and is immediately adjacent to the Corps-constructed and -maintained Wilmington Harbor Federal Navigation Channel ("**Channel**") which is the subject of the Project. VBHI performs the responsibilities of a municipality in areas of public safety, utilities, and public works for the island and, representing the interests of its property owners, public, and the thousands of visitors to the island. VBHI and those it represents are vitally interested in, invested in, and affected by the health of the entire Cape Fear River ("**River**") and the near-shore it directly affects. While VBHI property owners and visitors utilize vast stretches of the River, the Channel's most direct historical impacts on VBHI relate to the sand transport systems at the River's mouth, which is adjacent to VBHI. The Channel's disruption of natural sand transport systems impacts the integrity and health of VBHI's beaches, their related fish and wildlife habitats, and their resilience against storms, which protects VBHI's infrastructure.

The last deepening and widening (hereinafter "deepening") of the Channel, the 2000 WHP, resulted in extreme, harmful effects to the Island's beaches, roads, homes, infrastructure, and habitat for endangered and threatened species of sea turtles, birds (including the Rufa Red Knott, Piping Plover and Wilson's Plover), and other wildlife. Since 2000, VBHI has spent more than $ 70 million in public funds to address these direct impacts from the 2000 WHP and prior Corps projects. *See* Bald Head Island Mitigation Costs of Navigation Channel Impacts (**Attachment A**). Informed by the experience of the 2000 WHP, as well as through consultation with experts discussed below, our review of the documents related to the new proposed project indicates that the harms to VBHI will be at least comparable to that experienced since 2000. Those harms are not adequately addressed by the DLR and DEIS. In addition, VBHI believes there will be other synergistic, harmful effects to the River and adjacent environs, habitats, residents, and visitors.

III. DEIS Substantive Deficiencies

The following comments focus on the DEIS's failure to consider current and cumulative impacts on the **sand transport system** at the River mouth, directly impacting VBHI.

A. The applicable standard of review requires reasonable analysis by the Corps.

Agencies are afforded substantial deference in NEPA cases, and a reviewing court will look to whether the agency's decision was "reasonable and reasonably explained." *Seven County Infrastructure Coalition v. Eagle County, Colorado*, 145 S.Ct. 1497, 1511 (U.S. 2025). The Court in *Seven County* explained that it is an agency's job to determine the scope of environmental

effects, but that NEPA itself mandates that this scope is the "proposed action" or "the project at hand." *Id.* at 1512. When a court is reviewing the scope of an agency's NEPA analysis, "[s]o long as the EIS addresses environmental effects from the project at issue, courts should defer to agencies' decisions about where to draft the line. . . ." *Id.* at 1513. Thus, a prerequisite to granting an agency review under the substantial deference standard is a determination that an agency has accurately defined the "proposed action" and its scope.

B. Prior deepening projects have negatively impacted the stability of Bald Head Island ("BHI").

Before examining the deficiencies in the DEIS's scope of analysis, it is important to understand the history of the Corps' navigation projects leading up to the current proposed project.

1. Historic dredging has impacted BHI.

Historically, the Channel entrance severed the inlet's ebb tidal shoal, causing the eastern lobe (Bald Head Shoal) to migrate shoreward and resulting in the western shoreline of BHI to advance seaward 1500 to 2000 feet by the mid-1920s. *See* Ex. 2, Olsen letter to USACE Wilmington District, 21 July 1999 (**Attachment B**). The shoreline remained stable until about 1974. *Id.* Between 1881 and 1970, navigation projects nearly doubled the depth of the Channel, from 20 feet to 38 feet.[3] These projects and their periodic maintenance dredging interrupted the easterly sand drift, eroding the submerged portions of the shoal and resulting in rapid BHI shoreline collapse and retreat (60' per year) beginning in 1974. *Id.* In 1989, the Corps investigated VBHI claims (as asserted by Olsen), and disagreed with those conclusions, but agreed that placement of beach quality sand was feasible to address the deteriorating shoreline. *Id.* Olsen rebutted those Corps' conclusions but concurred in the plan to place sand on the beach on pragmatic grounds.

2. The 2000 WHP leads to 2000 Sand Management Plan.

The 2000 WHP as proposed and later implemented expanded the Channel dimensions and reoriented it closer to the BHI. VBHI's consultant Erik Olsen[4] again raised concerns about the proposed Project's impacts on BHI. *Id.* This, together with similar concerns raised by North Carolina's Division of Coastal Management and others during the CZMA review, led to creation of the Sand Management Plan ("**SMP**") (**Attachment C**), which later became a condition of the CZMA concurrence and the Corps' FONSI for NEPA purposes.

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[3] Lower Cape Fear River and Estuary: History and Summary of the Proposed Port Deepening Issue Roger D. Shew, Table 1, https://eaglesislandnaturepark.org/wp-content/uploads/2024/07/Cape-Fear-River-A-Little-History-and-Information-on-Port-Deepening.pdf

[4] Erik Olsen is a former (now retired) consultant to VBHI. Mr. Olsen obtained a Bachelor of Science and Master of Engineering degree in coastal engineering, and accumulated more than 50 years of experience as a professional coastal engineer.

a. Corps studies confirm the importance of littoral cell integrity.

Responding to the concerns articulated by Mr. Olsen, the Corps conducted studies of the rate of longshore sediment transport moving toward the Cape Fear River entrance. *Id.*, ⁋ 21, p. 10. Relying on those studies, the SMP re-confirmed the importance of maintaining sand within the active littoral system.

> Natural supplies from rivers and streams are not replenishing littoral sediments, particularly on the East Coast of the United States. Thus, the **removal of a cubic yard** of littoral sediment from a tidal entrance or inlet with deposition outside the active littoral zone of the beach **will ultimately cause a cubic yard deficit** somewhere within the sand sharing system affected by that particular entrance or inlet.

SMP, ⁋ 20, pp. 9-10 (emphasis added). Removal of sand from the system was identified by the Corps as "a major cause of man-induced erosion." *Id.*

> From an engineering perspective, the primary requirement for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to **prevent project induced erosion of the adjacent beaches** by conserving the limited resource, sand, **through deposition directly on the adjacent beaches.**

Id. (emphases added).

*b. Placement of dredged material on **adjacent** beaches is critical to avoid Corps-induced harm.*

As recognized in the SMP, the forecasted (and later realized) Project-induced harm was because the "Federal Standard" for maintaining navigation projects "has not included the disposal of littoral sands on the adjacent beaches or in the active littoral zone" and "did not consider the overall impact of removing littoral sediment from the littoral system." SMP ⁋⁋ 19, 20, p. 9. To address this, the SMP states:

> In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel **will be placed back on the beach from whence it came.**

SMP, ⁋ 20, pp. 9-10 (emphasis added). A Corps study found that 66% of the sediment shoaling at the Channel entrance comes from Bald Head Island, and 34% from Caswell Beach. *Id.*, ⁋ 22, p. 10.

c. In the Delony Letter, the Corps adopted the SMP findings and pledged to use conforming disposal practices.

In response to Olsen's memo and similar concerns raise by North Carolina in its CZMA review, the Corps Wilmington District Chief Engineer, Col. James DeLony, sent a letter assuring the local mayors that sand placement will be "according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to [VBHI]...." DeLony Letter, 9 June 2000, p. 2 (**Attachment D**). More specifically, he stated:

> The disposal of **all beach quality dredged material** will be accomplished in **accordance with** the Environmental Assessment [...dated February 2000] and its **Sand Management Plan**....
>
> The Corps will conduct a monitoring program ... [and] will use this monitoring data to **evaluate and adjust** the Sand Management Plan, as determined necessary, after coordination with the parties.

Id. p. 3 (emphases added).

d. North Carolina conditioned its CZMA concurrence on the DeLony Letter's assurances.

The final State CZMA determination states:

> **Based upon** our review of **the EA** [Environmental Assessment] **and the Corps of Engineers' response to comments [the DeLony Letter]**, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, **provided that the project is performed according to the EA (including the Sand Management Plan** and other appendices)...and that the conditions below are met.

Letter from Donna Moffitt, Director, NCDENR/DCM, 15 June 2000 to Col. DeLony, USACE District Engineer, p. 2 (emphasis added) (**Attachment E**). Among the other conditions then listed are: "impacts of this multifaceted project will be well documented in order to evaluate the effects on these resources on the overall coastal environment," including an "integrated monitoring plan" [Condition # 1]; adherence to the SMP [Condition # 3]; Corps request for review (supported by impact documentation) for any modification in future maintenance practices [Condition 4]; and, a separate consistency review of any proposal to place maintenance dredged material outside the locations established in the SMP [Condition 5]. *Id.*, pp. 3-4.

e. The 2000 WHP FONSI adopted the Moffitt letter and the SMP.

Following the CZMA concurrence, the Corps issued its Finding of No Significant Impact (FONSI), relying specifically on the Moffitt Letter and its incorporation of the assurances in the

DeLony Letter: "We will comply with the indications in the [Moffitt] letter." FONSI, § 3.00, p. 5, final bullet point (**Attachment F**). The final EA adopts the SMP goal that displaced "sand should be retained within the active coastal sand system." EA, §1.03, p. 3.

> The sand management plan (Appendix A [to the EA]) for the deepened Wilmington Harbor project **requires** that **all** beach-quality maintenance material **be returned to the adjacent beaches**. This will result in enhancement of the regional sediment budget.

Id., §5.01, p. 27 (emphasis added).

Accordingly, the final 2000 North Carolina CZMA consistency determination and the EA-FONSI were **specifically conditioned** on the Corps complying with the Moffit letter Conditions, including the SMP, to maintain sand in the littoral system by placing it on the **adjacent** beaches—BHI and Caswell Beach—and not in the Ocean Dredge Disposal Site or other beaches beyond the littoral cell. The SMP is a 2000 WHP project "condition," and violating its specific conditions and purpose would "remove . . . material composing such works" and impair "the ability of the project to function as authorized," contrary to 33 USC § 408(a). It is a baseline condition of the new proposed Project.[5] Without that protection, the damage from the 2000 WHP and associated maintenance dredging will be amplified and added to the new damage from the proposed Project.

3. Post-2000 WHP Impacts show continued disruption of the sand transport system that supports BHI.

Once implemented, the 2000 WHP continued to disrupt the sand transport system, undermining the BHI shoreline and causing an annual sand deficit despite periodic beach renourishment associated with Channel maintenance dredging. *See* Foth Review[6] (**Attachment G**). VBHI has expended over $ 70 million addressing the damages caused directly by the navigation project since 2000. *See* Attachment A. The DeLony letter stated the Corps would monitor and adjust the placement volumes if the actual sharing ratio resulted in imbalance with the demonstrated impacts. No adjustment has been made despite the subsequent 20 years of monitoring data showing a significant sand deficit at BHI and excess sand at Caswell Beach and the correct ratio (BHI to Caswell) closer to 7:1 instead of 2:1. *See* Foth Review, (Attachment G), p. 11. In addition, the 2025 maintenance dredging project proposes to deposit sand dredged from the Channel on Oak Island beaches east of Caswell Beach and thus outside the recognized River

[5] Although a particular method for establishing baseline conditions is not required by NEPA, "baseline conditions must be based on accurate information and defensible reasoning." *Western Watersheds Project v. Schultz*, 2025 WL 2410283 at *5 (D. Mont. Mar. 27, 2025) (quoting *Great Basin Resource Watch v. Bureau of Land Mgmt.*, 844 F.3d 1095, 1101 (9th Cir. 2016)).

[6] The "Foth Review" critically analyzes the DEIS with respect to sand transport and was prepared by Foth Infrastructure, LLC of Jacksonville, FL, who serve as consultants to VBHI and are well-recognized experts in coastal engineering.

mouth littoral cell, despite VBHI's objections[7] and in violation of the Conditions in the Moffitt letter (Attachment E, Conditions 3 and 5). And the DEIS proposes to continue these practices. DEIS p. 2-18, Table 2-7. The proposed Project will thus perpetuate and exacerbate the damage to BHI and the sand that forms it. Foth Review (Attachment G), p. 10, ⁋⁋ 1 and 2.

C. Sand impacts are cumulative impacts that the DEIS fails to consider.

1. CEQ regulations and extensive case law require analysis of cumulative impacts.

NEPA requires the Corps to take a "'hard look' at an action's environmental impacts." *Nat'l Audubon*, 422 at 185. The Corps' "obligations under NEPA are case-specific" and the requisite "'hard look' is necessarily contextual." *Id.* at 186. But no matter that context, the "hallmarks of a 'hard look' are thorough investigation into environmental impacts and forthright acknowledgement of potential environmental harms." *Id.* at 187. The document memorializing that "hard look" is the EIS which "shall provide full and fair discussion of significant environmental impacts." 40 C.F.R. § 1502.1 (version eff. Sept. 14, 2020).

NEPA and the operative CEQ regulations "specify that the EIS should contain," among other items, "the environmental effects and impacts of the proposed action . . . and **the cumulative impacts of it combined with other past, present, or foreseeable future actions**." *Nat'l Audubon*, 422 F.3d at 185, 196 (citing prior CEQ regulations substantively identical to the version of regulations applicable here[8]) (emphasis added); *see* 40 CFR 1508.1(g)(3) (version eff. May 20, 2022 to April 10, 2025) ("Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time."). "Cumulative environmental impacts are, indeed, what require a comprehensive impact statement." *Kleppe v. Sierra Club*, 427 U.S. 390, 413 (1976). As CEQ noted in a 2005 guidance memorandum:

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[7] Correspondence from the Corps regarding the 2025 O&M dredging focuses on areas where the SMP uses general language ("Oak Island") and does not address the overall specifically articulated goal of littoral cell protection, which does not encompass all of Oak Island. *See* **Attachment K**.

[8] Oddly, the DEIS states it is applying the "2020 Council of Environmental Quality NEPA regulations." ES-1. But the Corps' March 10, 2023 withdrawal of its September 12, 2019 Notice of Intent indicated that a **separate** environmental review process would be implemented. *See* Withdrawal of Notice of Intent, 88 Fed. Reg. 14993 (Mar. 10, 2023). Nothing in the June 7, 2024 Notice of Intent indicated the Corps would be applying CEQ regulations from 2020 instead of the then-applicable version—restating NEPA's cumulative effects requirement—which remained in place from May 20, 2022 to April 10, 2025. *See* 89 Fed. Reg. 48602 (June 7, 2024). It would be particularly troubling if the Corps is attempting to avoid analyzing the cumulative impacts of the Project by applying a short-lived and highly questionable version of CEQ regulations. In any event, judicial interpretation of NEPA to require evaluation of cumulative effects necessarily controls over conflicting regulatory pronouncements. *See, e.g.*, National Environmental Policy Act Implementing Regulations Revisions, 87 Fed Reg. 23453, 23466 (April 20, 2022) ("[R]estoring language on direct, indirect, and cumulative effects better promotes NEPA's statutory purposes and is more consistent with the extensive NEPA case law. *See* 42 U.S.C. 4321-4332.")

> [I]nformation about the effects of past actions that were similar to the proposed action may be useful in describing the possible effects of the proposed action. In these circumstances, agencies should consider using available information about the effects of individual past actions that help illuminate or predict the direct or indirect effects of the proposed action and its alternatives.

Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (June 24, 2005), available at: https://www.energy.gov/nepa/articles/guidance-consideration-past-actions-cumulative-effects-analysis-ceq-2005.

Failure of an EIS to comprehensively evaluate cumulative impacts is a fatal flaw. *League of Wilderness Defs.-Blue Mountains Biodiversity Project v. U.S. Forest Serv.*, 549 F.3d 1211, 1218 (9th Cir. 2008) ("[T]he Forest Service's almost complete failure to include the relevant past-timber-sale inputs in the FSEIS itself fails to survive arbitrary and capricious review."); *N. Carolina All. for Transp. Reform, Inc. v. U.S. Dep't of Transp.*, 151 F. Supp. 2d 661, 698 (M.D.N.C. 2001) ("Failing to perform a cumulative impact analysis with no explanation for why such an analysis was not performed fails to examine an important aspect of the environmental issues involved with the [Project]. As a result, Defendants violated NEPA by inadequately addressing cumulative impacts in the FEIS.") (awarding attorneys' fees to challengers to inadequate EIS); *Georgia River Network v. U.S. Army Corps of Engineers*, 334 F. Supp. 2d 1329, 1338–39 (N.D. Ga. 2003) (FONSI case) ("Even a slight increase in adverse conditions that form the existing environmental context may threaten significant harm: '[o]ne more factory . . . may represent the straw that breaks the back of the environmental camel.'" (quoting *Hanly v. Kleindienst,* 471 F.2d 823, 831 (2nd Cir.1972)).

Failing to acknowledge—and then analyze—cumulative impacts of the Project will render the final EIS inadequate as a matter of law. "If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and publish a supplemental draft of the appropriate portion." 40 C.F.R. § 1502.9(b) (version eff. Sept. 14, 2020); *see also* 33 C.F.R. § 230.13(b) (version eff. until July 2, 2025) ("A supplement to the draft or final EIS should be prepared whenever required as discussed in 40 CFR 1502.09(c).").

For example, the Fourth Circuit affirmed that the Navy's assessment of cumulative impacts for an outlying landing field was inadequate when the Navy failed to offer "any analysis of the possible cumulative effects of the proposed action." *Nat'l Audubon*, 422 F.3d at 196. "The critical omission [was] the failure to discuss the potential cumulative effects of" the landing field. *Id.* at 197.

2. The DEIS does not evaluate the cumulative effect of the Corps' navigation projects impacting BHI.

The DEIS only uses the word "cumulative" eleven times, in the context of sea-level change, bed shear stress from vessel passage, flooding, and blast pressure. Nowhere does the DEIS address the Project's cumulative impact on the shoal that supports BHI. The 2000 SMP and experience gained over more than 20 years of its implementation require the Corps to consider the Project's

incremental change and impact **in addition** to the historic impacts on the BHI shoal from the past channel deepening projects and other causes (sea level rise, storm intensity, etc.). Here, the Corps has decades of experience with the impacts of dredging on the shoal that supports BHI. It cannot satisfy its NEPA obligations by ignoring that experience, readily available data, and the cumulative impact of the Project on the stability of VBHI and its shoreline.

The DEIS includes no comprehensive modeling of the adjacent beaches as an integrated, dynamic system. VBHI offered Stantec (the Corps' consultant) 20 years of *actual* shoreline monitoring (some which was conducted pursuant to a 2005 settlement agreement with the Corps) which confirms the ongoing beach erosion directly related to the Channel and its annual re-dredging and the recurring, persistent sand deficit, as predicted by Olsen in 1999. That data offer was never accepted nor the data considered in the DEIS analyses. The importance of monitoring 2000 WHP's actual impacts, and adjusting for them, was anticipated in the Moffitt letter (Attachment E) when it included Conditions to that effect. The DEIS again ignores this.

Instead, the DEIS again mis-analyzes the Project impact and ignores relevant data, repeating—and indeed amplifying—errors from prior Channel projects. The model used under-predicts the impacts actually observed over the last 20 years by a factor of **more than five-and-a-half times**. Foth Review, (Attachment G), p. 8. The model used is so deficient that the Foth Review, after pointing out its many deficiencies, concludes: "As presented in the DEIS, GenCade is not capable of accurately computing sediment transport in this setting and should not be relied upon for impact assessment or project design decisions affecting the Bald Head Island shoreline." *Id.*, p. 3. In other words, **the Project's impact on BHI was not analyzed in the DEIS, despite a demonstrated history of adverse effects**. The Corps must acknowledge and comprehensively study impact on the near-shore sand systems from: (a) the natural effects of the River; (b) historical deepening projects; and (c) the proposed Project. *See* III E, below.

3. Lack of adequate documentation defeats NEPA's purpose of public involvement.

The DEIS documentation is rife with unclear and undocumented procedures, as noted throughout the Foth Review. Without an evaluation of cumulative impacts, the Corps' analysis is incomplete. NEPA regulations require that relevant "incomplete but available information" must be included in the EIS. *See* 40 C.F.R. § 1502.21(b) (version eff. from Sep. 14, 2020 to June 30, 2024). The Fourth Circuit has held that "agencies violate NEPA when they fail to disclose that their analysis contains incomplete information." *N. Carolina Wildlife Fed'n v. N. Carolina Dep't of Transp.*, 677 F.3d 596, 601–02 (4th Cir. 2012). Lack of information ultimately raises the question of whether the public was afforded its "opportunity to play a role in the decision-making process." *Id.* at 604.

D. Annual maintenance dredging is a "connected action," which must be assessed in this EIS.

The DEIS fails to identify and therefore evaluate important "connected actions," most significantly annual maintenance dredging.

1. CEQ regulations and case law required analysis of connected actions in an EIS.

"Connected actions" must be identified and their impacts evaluated as part of the DEIS:

> To determine the scope of environmental impact statements, **agencies shall consider**:
>
> (1) Actions (other than unconnected single actions) that may be **connected actions**, which means that they are **closely related** and therefore should be discussed in the same impact statement. Actions are connected if they:
>
> (i) **Automatically trigger other actions** that may require environmental impact statements.
> (ii) **Cannot or will not proceed unless other actions are taken** previously or simultaneously; or
> (iii) **Are interdependent parts of a larger action and depend on the larger action for their justification.**
>
> (2) Alternatives, which include the no action alternative; other reasonable courses of action; **and mitigation measures** (not in the proposed action).
>
> (3) Impacts.

40 CFR § 1501.9(e) (emphases added) (version eff. Sep. 14, 2020 to June 30, 2024). This is reinforced by the requirement to discuss in the environmental evaluation "any irreversible and irretrievable commitments of Federal resources which would be involved in the proposed agency action should it be implemented." " 42 U.S.C. § 4322(C)(v); *see also* 40 CFR § 1502.16(a)(4) (version eff. Sep. 14, 2020 to June 30, 2024).

As the Supreme Court explained in *Seven County*, if there is a "reasonably close causal relationship" between the project at hand and the environmental effects of related work, then the effects of the related work should be considered in the EIS. *See* 145 S.Ct. at 1516. Generally, the Court explained that "other future or geographically **separate projects** that **may** be built (or expanded) as a result of or in the wake of the immediate project under consideration" are not included within the scope of a project for NEPA purposes. *Id.* at 1515 (emphasis added). However, the Court clarified that "environmental *effects* of the project at issue may fall within NEPA even if those *effects* might extend outside the geographical territory of the project or might materialize later in time . . . ." *Id.* at 1515 (emphasis in original).

2. Annual re-dredging of the Channel is a connected action.

Here, the proposed deepening project has an integrated and close causal relationship with the effects of the planned maintenance dredging. The Corps would not recommend spending $ 1.4

billion of public funds to deepen and widen the Channel, only to then ignore it and allow it to revert (through natural sloughing and siltation) to its natural, shallower state, rendering the Channel useless for its intended Project purpose. Maintenance dredging is neither hypothetical nor geographically distinct from the Corps' proposed Project. Rather, it is planned, necessary, and **will** occur within the same Project footprint as the deepening work studied in the Corps' DEIS. For these reasons, maintenance dredging is a connected action the impacts of which should be included in the Corps' NEPA analysis. Relatedly, the long-term costs associated with these connected actions must be included in the DLR's NED evaluation.

When maintenance is necessary and foreseeable, "the effects of such maintenance must be addressed within [an] EIS." *Sierra Club v. Bosworth*, 199 F.Supp.2d 971, 985 (N.D. Cal. 2002). While the DEIS accounts for the future cost of maintenance dredging, **it does not consider and evaluate the environmental impact of that activity**, as required for a connected action. *See, e.g.*, *Seven County,* 145 S. Ct. 1497, 1516, (U.S. 2025) ("In this case, the Uinta Basin Railway was the relevant project. NEPA therefore required the Board to consider the environmental effects of that 88-mile railroad line's construction **and operation**." (emphasis added)).

At the 8 Oct. 2025 Corps Open House, several representatives mentioned that there are current discussions and tentative plans to conduct environmental studies (EAs or EISs) of the contemplated maintenance dredging plans. While laudable, those studies are required now,[9] as part of this Project. The impacts identified should be included **here** because that is what is required for a connected action.

3. <u>The DEIS fails to analyze the impact of the projected maintenance dredging schedule and deposition plan.</u>

The DEIS ignores the SMP principles of protecting the littoral cell at the River's mouth and violates Conditions 3 and 5 in the Moffitt letter (Attachment E) by proposing deposition of dredged material beyond the adjacent beaches in that cell. *See* Foth Review, p. 10, ¶ 2 and Corps correspondence (Attachment K). In addition, the new Channel design will reduce the frequency of necessary maintenance dredging, thus reducing the frequency and quantity of regular renourishment of the adjacent beaches, further exacerbating the deleterious effects on the beaches and their dependent habitats and infrastructure. Foth Review, ¶ 1. These factors, plus the cumulative impact of maintenance dredging, renders the failure to consider this connected action in this DEIS arbitrary and capricious.

4. <u>Failure to analyze impacts of maintenance dredging reduces mitigation requirements and could impact the BCR.</u>

If impacts requiring mitigation are identified, then a plan of mitigation is also required, which cannot be relegated to reliance on annual maintenance, which is a discretionary Corps activity.[10] Further, if that mitigation is required for impacts to fish or wildlife or their habitat

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[9] *See, e.g.*, 40 C.F.R. § 1501.9(e)(1) (version eff. Sep. 14, 2020 to June 30, 2024).

[10] When the Corps failed to follow the dredging schedule in the SMP adopted as a condition of the FONSI for the 2000 WHP, the VBHI sued, but the Fourth Circuit Court of Appeals ruled that "the

requiring mitigation (and that won't be known until the analysis is performed), WRDA requires that such mitigation be provided **at the time** of the Project's construction. 33 U.S.C. § 2283(a)(1). Although annual dredging is currently included as a Project maintenance cost, it is discounted over the Project life, thus deflating the BCR impact. If beach nourishment is a required WRDA mitigation, future mitigation projects (like annual beach renourishment) must be provided through an **up-front and enforceable** mechanism. The DEIS would have to identify that assurance mechanism, the additional cost of which must be added. The financial assurance **and** cost of that mitigation must be provided at the Project beginning, eliminating the future discounting of this expense, and increasing the BCR Project cost, decreasing the BCR ratio.

VBHI and the Bald Head Island Conservancy have both alleged that the former 2000 WHP *and* the annual re-dredging degrade the beach and nearshore habitat utilized by various species, some endangered. *See* footnote 1, above. The annual re-dredging will continue under the Project, and the on-going effects will continue. If the Corps were to properly consider the impacts of annual re-dredging to beach and nearshore habitat, then periodic beach renourishment should be considered a required mitigation measure under WRDA, rather than an O&M annual maintenance expense (which is how the Corps has classified this cost in the past).

E. The SMP, as a base condition, informs a thorough sand transport analysis and shows the need for mitigation of continuing impacts.

Since the 2000 WHP, the inadequacy of the SMP to ameliorate the Wilmington Harbor Navigation Project's impacts have been clear: VBHI has expended more than $70 million since the last 2000 WHP Channel deepening project. It has consulted with recognized experts who, while acknowledging the natural impacts on an island at the mouth of a river, also opine (based on detailed scientific study) that the historic Channel deepening projects are having, and will continue to have, major exacerbating effects on the sand that creates and supports BHI, increasing the expenses for VBHI to mitigate the impacts caused by the Corps. *See* Olsen History, above and Foth Review, (Attachment G), p. 10 ¶ 1.

Without a holistic appraisal of these dynamic forces, the true impact of the proposed Project cannot be adequately judged, and the Corps' analysis cannot satisfy the NEPA requirement to analyze the cumulative impacts (detailed above). As the Foth Review demonstrates, the DEIS failed to analyze the integrated sand transport system at the mouth of the River and therefore ignored the impacts to the adjacent beaches there, including BHI. Using an overly simplistic model, the Corps projects impacts more than five-and-a-half times less than those **actually** observed based on historical data. When the DEIS's methodology is parsed, it shows that shoaling of the actual shorelines was not studied. And the DEIS simply ignores demonstrated cumulative impacts (based on over 20 years of actual data). Thus, the DEIS fails to recognize and analyze the at forces at work and thus the true impact of the Project.

Corps' continuing implementation of the Wilmington Harbor Project, as revised, does not constitute final agency action that is subject to judicial review under the APA." *Vill. of Bald Head Island v. U.S. Army Corps of Eng'rs*, 714 F.3d 186, 196 (4th Cir. 2013). Thus, the Corps could not be forced to follow the SMP schedule.

The new design for the Channel will reduce the frequency of necessary maintenance dredging, thus reducing the frequency and quantity of regular renourishment of the adjacent beaches. This changed maintenance regime will further exacerbate the deleterious effects on the beaches and their dependent habitats and infrastructure.

These errors are significant—beyond agency analytical discretion—and therefore arbitrary and capricious. Specifically, commenters (VBHI and BHI Conservancy) pointed out the model inadequacies in advance and requested a more accurate analytical approach. The understanding of the negative cumulative impacts of the Project finds support in 20 years of observations and data. But the retained consultant for the DEIS ignored such data, which was offered to it (and was known to the Corps, as a participant in the post-2000 WHP monitoring studies). Moreover, the DEIS entirely disregards the SMP and its underlying principles of protecting littoral cell integrity. *See, e.g.*, Foth Review (Attachment G). Accordingly, in its current form, the DEIS fails to satisfy the applicable NEPA requirements.

IV. DLR Deficiencies

The Project arises from a public notice on June 12, 2018 by the North Carolina State Ports Authority ("**NCSPA**") of its initiation of a WRDA Section 203 Feasibility Study. Section 203 provides a mechanism by which "[a] non-Federal interest may undertake a federally authorized feasibility study of a proposed water resources development project and submit the study to the Secretary." 33 U.S.C. § 2231(a)(1).

A. The APA provides the standard of review for the 203 WRDA analysis.

The DLR is part of completing the § 203 review under WRDA, and the Corps' compliance with the requirements of WRDA are reviewable under the APA. 5 U.S.C. § 704. When reviewing agency action under the APA, courts will consider whether the agency acted in a way that was "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the law." 5 U.S.C. § 706(2)(A); *see also Environmental Defense v. U.S. Army Corps of Engineers*, 515 F.Supp.2d 69 (D.C. Dist. 2007) (applying this standard of review in a WRDA case).

B. Required procedural safeguards were not followed.

Under Section 203, the Secretary "shall issue guidelines for feasibility studies of water resources development projects to provide sufficient information for the formulation of the studies." 33 U.S.C. § 2231(a)(2). The Secretary has issued such guidelines, or "Engineer Regulations," for a proper feasibility study, including ER 1105-2-100: Planning Guidance Notebook (April 22, 2000) ("**PGN**"). "Planning for Federal water resources projects constructed by the Corps of Engineers... is based on the Principles and Guidelines (P&G) adopted by the Water Resources Council." *Id.* at ¶ 1-1, p. 1-1. *See* DLR p. 1-9. WRDA Section 203 directs the Secretary to review "whether or not **the study, and the process** under which the study was developed, **each** comply with Federal laws and regulations applicable to feasibility studies of water resources development projects." 33 U.S.C. § 2231(b) (emphasis added).

The process undertaken by NCSPA to develop the NCSPA 203 Report did **not** comply with the congressionally directed guidelines. The many deficiencies have been pointed out to the Corps on several occasions.[11] Section 203 requires the Secretary to certify that "**the process**" complied with Federal laws and regulations. In the ASA Assessment, the process deficiencies pointed out in the comment letters were not addressed, and the subsequent 403 Review Plan and NEPA process have likewise failed to cure them. Therefore, it would violate § 203 for the Secretary to certify this Project to Congress.

Full public involvement was required throughout the 203 process at **each** stage. PGN at 2-15 and Appendix B, B-1 through B-4. None of the Guidance's public involvement requirements were observed. As detailed in our letter dated 29 August 2019, **the public was excluded by NCSPA from involvement in the preparation of the 203 Report at every stage, and public comment was foreclosed**. NCPSA held one open house, euphemistically called a workshop, consisting only of several posters depicting portions of the proposed project. There were no presentations or speakers. The only vehicle for submitting public comment or input was a website, which NCSPA never activated. As a result, contrary to the PGN § 2-3, the public was excluded from every step of the Planning Process, including the Purpose and Need analysis, formulation of planning objectives, and consideration of alternatives other than deepening the Cape Fear River. **The entire 203 Report and the analyses by the NCSPA consultants were created in private, and it was wrong for the Corps to rely on them in the subsequent DLR and DEIS preparation.**

The 403 process did not cure these defects. In response to a 13 September 2019 Corps Notice (later withdrawn) requesting public comment on "initial scoping" for the Project, VBHI pointed out,[12] *inter alia*, the deficiencies in the 203 process and specifically requested that:

- the Draft 203 Report be disregarded and reopened;
- the Corps create active stakeholder groups to allow the required public participation;
- the Corps make the underlying data publicly available;[13] and
- the Corps reopen consideration of: (a) federal purpose and need; (b) impacts to sand systems, estuarine erosion, and salinity; (c) sea-level rise (SLR); and (d) mitigation assurance mechanisms.

When the Corps published the subsequent Notice of Early Scoping Public Comment Period, VBHI again raised the same process and substance concerns,[14] making specific suggestions and requests for public involvement and again highlighting the areas of purpose and need, economics analysis, prior project failures, sand transport impacts, and other impacts.

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[11] *See* footnote 1 above.

[12] Brooks Pierce letter, 11 Oct. 2019. *See also* NC Coastal Federation letter, 11 Oct. 2019.

[13] NCSPA has systematically refused to comply with public records request regarding this Project, as noted in previous Brooks Pierce comment letter and never rebutted by NCSPA.

[14] Brooks Pierce letter, 30 June 2023.

The 403 Review Plan[15] and the NEPA process (which starts with and is built on the flawed 203 Report) do not cure these failures. As a result, **the DLR cannot be certified as complying with § 203**. The DEIS, where it relies on and incorporates DLR conclusions, is likewise flawed. Two areas deserve specific mention—the analysis for sand modeling and the National Economic Development ("NED") interest

C. The sand modeling analyses were biased and improperly closed to the public.

VBHI requested that: (a) the sand analysis be opened to public involvement; (b) the Corps include VBHI in any new sand analyses; and (c) the Corps conduct additional, comprehensive sand transport studies.[16] The Corps ignored these requests.

Instead, the Corps, through its consultant Stantec, continued to rely on the closed 203 studies. Appendix B to the DEIS recites the development of the models that purportedly analyze shoreline and sand impacts as part of the NEPA analysis. § B-1.2.2. Model development included the transfer of the 203 Report data and analyses developed by Moffatt and Nichol ("M&N") for NCSPA and a three-day closed door "In-Person Workshop" with M&N. *Id.* Other consultants, including VBHI's consultant Erik Olsen, were not invited despite the specific requests to open this process. Recall that Mr. Olsen's work was central to the development of the SMP incorporated into the 2000 WHP. Moreover, M&N is an active advocate for views adverse to VBHI: it was not only the consultant that prepared the 203 Report for NCSPA (denying any impacts to BHI), it is the regular consultant to the Town of Oak Island, which has, over VBHI's objections, been advocating for shifting dredged sand outside the Channel littoral cell onto non-adjacent beaches at the east end of Oak Island, to the permanent detriment of the beaches on BHI and Caswell Beach.[17] The O&M Channel maintenance for 2025 has, in a proposal guided by Oak Island and M&N, adopted this disposal strategy, and it appears to be perpetuated in the DEIS. *See* Attachment K and DEIS, p. 2-18, Table 2-7.

The analytic approaches favored by M&N in its 203 Report, and adopted by the Corps' consultant in the DEIS, have again been demonstrated to be inadequate and inaccurate. *See* Foth Review (Attachment G). Inexplicably, the DEIS analyses refused to employ **actual** monitoring data that shows large discrepancies between the model's predictions and known results. They refused to include input from other consultants, including the one most involved in creation of the

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[15] The 403 Review Plan was previously posted on the Wilmington District website as provided for in that Plan (⁋ 6 A 7).

[16] Brooks Pierce Letters to USACE, 11 Oct. 2019 and 30 June 2023.

[17] On 15 Feb. 2024, Public Notice SAW-2018-02230 was issued by the Corps of an application by the Town of Oak Island, with M&N acting as its agent, seeking (not as a part of the annual maintenance dredging) to remove 3 million yds.^{3} of sand from the Channel and place some of it outside the SMP littoral cell confines on western beaches of the Town. VBHI opposed the application, and the Town subsequently withdrew the part of the M&N plan to deposit Channel sand on Town western beaches. The DEIS will now accomplish the original M&N plan.

SMP, despite specific requests. They also ignore specific criticism of the 1D tools previously selected by M&N. For example:

> Erosion of BHI beaches and sediment movement from east to west (from BHI's south and west beaches to the river channel) were severely underestimated during the 2000 channel realignment. Sediment fluxes along BHI's incredibly dynamic south and west beaches need to be carefully measured, and **a fine-scale 3D model of sediment movement at the river mouth should be constructed**, using **current** and **location-specific** data.

Bald Head Island Conservancy Initial Scoping Comments (a 501(c)(3) focused on sea turtle nesting and barrier island conservation), 30 June 2023, pp. 1-2 (emphasis in original) (**Attachment H**).

In contrast to the notably "closed-door" sand impact analysis, other DEIS mitigation planning embraced the public involvement requested,[18] as did beneficial use planning.[19] The Corps should consider whether the potential conflicts of interest inherent in the M&N sand impacts analysis taint its outcomes and, as VBHI has previously urged, conduct a new, fulsome, and public analysis of this crucial issue, using the open processes employed elsewhere in the DEIS.

D. The national economic development ("NED") analysis followed an improper analytical process.

1. The NED analysis should have been transparent and open to public input.

The ASA Assessment was expansive in its criticism of the 203 Report's NED analysis because of its lack of realistic or well-documented support. *See* Comments A1-4, C3-9. The June 2024 public information session conducted by the Corps immediately prior to the issuance of the NOI stated that the NCSPA assumptions would be largely disregarded and new assumptions would be used by the Corps. VBHI specifically asked what the new NED analysis would entail—a process that should have included the public. But, a month after that request and immediately **after** the close of the NOI comment period, the Corps responded saying the process would remain closed. *See* Email Correspondence (**Attachment I**). As a result, there has never been the opportunity for meaningful public engagement in the analysis of the NED need for this Project:

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[18] "Two interagency technical working groups (TWG) made up of state and federal resource agencies met throughout the project. The TWGs contributed expertise and information to support the identification of impacts and the development of compensatory mitigation plan alternatives. The views of resource agencies, including the U.S. Fish and Wildlife Service and National Marine Fisheries Service, and others were considered in the development of the draft plan and the final recommended plan. These organizations will be offered an opportunity to continue to play a role in the design and implementation phases of the mitigation work when the project is authorized and funded." Appendix M, p. M-3.

[19] "USACE Wilmington District developed a working group of stakeholders, local and federal agency members, and beneficial use specialists to conceptualize potential beneficial use applications in the Spring of 2024." Appendix D, p. D-12.

the NCSPA 203 process and the subsequent Corps Review Plan have been conducted behind closed doors. The NOI's offer to accept public comment, when the process to be used is not revealed, does not afford meaningful public involvement.

In addition, the DLR Economic Considerations document (DLR Attachment 5) does not fully explain the details of the economic assumptions supporting the analysis and its conclusions, contrary to the guidance requirements, which require the following:

> Provide adequate supporting documentation to allow reviewers to understand the models and assumptions used to estimate benefits and costs. For commercial navigation studies, the systems models used in the estimates of navigation benefits are to be fully described and their strengths and limitations presented.

PGN, Appendix G, Ex. G-1, § 3b, p. G-7. VBHI made a FOIA request for additional information underlying DLR Attachment 5 (Economic Considerations) and has obtained from the Corps a two-week extension to 17 Nov. 2025[20] for submitting comments on the substance of the Economic Considerations. VBHI has retained a maritime transportation expert[21] for those comments and **will therefore reserve its substantive critique of the Economic Considerations until it files supplemental comments.**

2. The NED analysis did not follow the PGN procedural guidance.

Because the 203 process was controlled by NCSPA and the public was excluded, the development and formulation of problems and opportunities, which drives selection of the planning objectives, ignored the National interest and focused exclusively on Wilmington Harbor, thereby precluding consideration of alternatives.

The first step in which the public was excluded was consideration of the **Federal** objective, which "is to contribute to national economic development (NED) consistent with protecting the Nation's environment...." PGN ⁋ 2-2, p. 2-1. The potential **problems and opportunities** must be evaluated **before** the project-specific **planning objectives** are formulated. Most importantly: "Problems and opportunities should be defined in a manner that does not preclude the consideration of alternatives to solve the problems and achieve the opportunities." PGN ⁋ 2-3, p. 2-2. Finally, "the next task is to define the study **planning objectives** and the constraints that will guide efforts to solve these problems and achieve these opportunities." PGN ⁋ 2-3(a)(4), p. 2-3 (emphasis added). These steps were not followed.

The Federal need identified in the DEIS as follows:

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[20] *See* **Attachment J** (email granting extension).

[21] Dr. Asaf Ashar, emeritus research professor of ports, shipping, and intermodal transportation, University of New Orleans.

> The purpose of the proposed action is to contribute to the consideration of national economic development (NED) by addressing transportation inefficiencies for the forecasted vessel fleet, consistent with protecting the Nation's environment. Contributions to the NED are increases in the net value of the national output of goods and services. The need for the proposed action is to address the constraints that contribute to inefficiencies in the existing navigation system's ability to safely serve forecasted vessel fleet and cargo types and volumes.

DEIS, § 1.4, p. 1-8. The 203 Report defines the problems and opportunities (the second analytical step) exclusively in terms of Wilmington impacts instead of first considering the National need (the first analytical step). As noted earlier, this was an NCSPA private analysis. The problems and opportunities were never re-examined publicly except in the context of the Planning Objectives (discussed below), which is backwards under the PGN.

The Federal problem is the emergence of larger container ships challenging the capacity of many ports (not just Wilmington) and limited Federal funds to assist all ports in accommodating the challenges these vessels present. The Federal opportunity is the coordination of a national maritime transportation strategy that makes the best and least environmentally damaging use of the facilities of **all** east coast ports, and targets Federal dollars for port enhancements in a way that advances that overall strategy in a rational manner. The relevant Federal interest NED analysis is not the Wilmington Harbor impact on NED but the total impact on NED of the strategy that best addresses these new challenges. Less than 1.5% of containerized cargo on the East Coast passes through Wilmington Harbor.[22] Savannah handles 16 times more than Wilmington, Norfolk 10 times more, and Charleston 7.9 times more. *Id.* As a result, **by defining the problems as Wilmington problems instead of National problems, alternatives were eliminated in the formulation of the Planning Objectives.**

3. The Planning Objectives were pre-determined, **before** the NEPA process.

The Planning Objectives are critical: they control the scope of alternates considered. Contrary to the statement in the DLR (p.2-2), the "NEPA scoping process" was **not** "used to develop objectives": **the Planning Objectives were developed BEFORE the NEPA process began—before the public was allowed in.** The final Planning Objectives are:

> Planning Objective 1: Contribute to National Economic Development (NED) by reducing origin to destination transportation costs, at the Port of Wilmington from 2037 to 2086.
>
> Planning Objective 2: Contribute to NED by reducing waterborne transportation costs at the Wilmington Harbor Federal navigation project by accommodating the transit of larger and more efficient vessels, from 2037 to 2086.

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[22] DLR Attachment 5-Economic Considerations, p. 14, Table 5.4 (East Coast Ports total 16.9 million TEU; Wilmington handles 231,452).

DLR, p. 2-3; DEIS § 2.1.5, p. 2-4. Both objectives are identical to those the Corps posted on boards in the June 2024 public meetings immediately **before** the NOI for the current DEIS. https://www.saw.usace.army.mil/Portals/59/siteimages/Public%20Affairs/403/Public%20Meeting%202024/Final_Boards_PIM_June_2024.pdf. Both objectives are also identical to those stated in the 203 Report four years earlier (p. 146, Objectives 1 and 3, with date adjustments), generated privately by NCSPA.[23]

4. The Planning Objectives prevented consideration of other alternatives.

Selection of Wilmington-specific planning objectives eliminated consideration of other viable alternatives:

(1) North Carolina has another port in Morehead City, which also serves key nearby military installations that could benefit from improvements to that port. The water-side constraints there are significantly less than Wilmington's 28-mile river approach, but its land-side constraints are greater. Solving the land-side constraints would significantly reduce future O&M costs compared to the annual $14 million O&M budget in Wilmington, but no exploration was done of how the $1.4 billion budgeted for this Project might have been used in Morehead City to better long-term effect.

(2) The Federal nature of the problem is highlighted by the emergence of Supermax vessels, with drafts up to 66 feet. There will be few ports that can accommodate these vessels in the near future. Off-loading at major ports will either concentrate delivery ports further, reducing the flow of goods through secondary ports, or re-vitalize the need for inter-port transportation to distribute this cargo to other points of distribution, or some combination. Federal expenditures at those ports to facilitate this inter-port alternative might better address the long-term Federal needs. Any 50-year analysis of the need for deepening the River Channel to accommodate NeoPanamax vessels should have included this alternative to future distribution needs.

---

[23] Similarly, the objectives stated in the Corps' presentation at the Early Public Scoping meeting in June 2023, prior to the beginning of the NEPA process, are Wilmington specific and mirror the 203 Report. "OBJECTIVES. Developed from the Purpose & Need Statement Contribute to national economic development to: 1. Reduce total costs to transport import and export cargo through Wilmington Harbor 2. To address physical constraints that induce navigation safety-related operating practices that contribute to delays, including limited passing and one-way traffic in some reaches."

https://www.saw.usace.army.mil/Portals/59/siteimages/Public%20Affairs/403/WH%20403%20Early%20Public%20Engagement%20Presentation_06_15_2023.pdf. The Notice pursuant to which that meeting was held was subsequently withdrawn. https://www.govinfo.gov/content/pkg/FR-2023-03-10/pdf/2023-04904.pdf.

Consideration of these alternatives (and possibly others) was eliminated by the actual process of selecting Objectives without any public input.

If the original 203 process had been conducted in accordance with the law, or if the Project had received traditional federal agency analysis, the NED analysis would have been completed **with** public participation **before** the NEPA process. Alternatives to deepening 28 miles of the Cape Fear River could have been suggested and explored. The public should have had the benefit of knowing the 203 required findings, and their supporting analyses, **before** being asked to comment on the NEPA process for this Project, especially since this was the last opportunity for public comment before presentation of the completed DEIS.

V. Conclusion

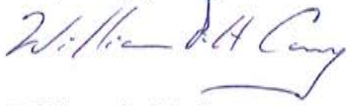
The harm to Bald Head Island and the VBHI caused by the past and on-going Wilmington Harbor Navigation projects is beyond dispute. In 2000, the Corps denied that the 2000 WHP would have any adverse effect on BHI, but, to resolve the State of North Carolina's CZMA Consistency objection, agreed to the SMP. Twenty-five years and over $ 70 million dollars of damages later, the effects of Channel realignment, deepening, and widening on the immediately adjacent BHI are documented by decades of shoreline monitoring data. The inadequacy of maintenance dredging beach renourishment has been demonstrated. Despite these facts, the DEIS's purported "analysis" of impacts to BHI:

- ignored the actual historical data;
- relied exclusively on a closed-to-the-public process by a single consultant;
- ignored the criticisms of the tools selected and favored by that consultant, including that the consultant's tools produced predictions inconsistent with observed history;
- ignored the principles embraced by the SMP, which was a condition of the FONSI in the 2000 WHP; and,
- failed to consider cumulative impacts and connected actions, as required by law.

These failures violate NEPA and WRDA and constitute an abuse of agency discretion.

We believe that if the Corps were to comply with NEPA and properly consider the cumulative impacts and connected actions of the proposed project as described above, the Corps would recognize its mitigation obligations under NEPA and WRDA and create a mitigation plan that would place sand on BHI with greater frequency and in greater quantity, resulting in significantly higher Project cost and lower BCR. Finally, ff those analyses were opened to meaningful public involvement, the statutory requirements of § 203 could also be, for the first time, actually addressed.

Very truly yours,



William P. H. Cary
Counsel for Village of Bald Head Island

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Justin McCorcle, Wilmington District Counsel, U.S. Army Corps of Engineers
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Federal Consistency Coordinator,
Div. of Coastal Management, NC DEQ
Heather Coats, Beach & Inlet Management Project Coordinator,
Div. of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

ATTACHMENTS

Attachment A:	Bald Head Island Mitigation Costs of Navigation Channel Impacts
Attachment B:	Olsen Letter to USACE 21 July 1999
Attachment C:	Sand Management Plan
Attachment D:	DeLony Letter 9 June 2000
Attachment E:	Moffitt Letter 15 June 2000
Attachment F:	Finding of No Significant Impact Wilmington Harbor 2000 (excerpt)
Attachment G:	Foth Review of Wilmington Harbor DLR and DEIS for VBHI
Attachment H:	Bald Head Island Conservancy Initial Scoping Comments-30 June 2023
Attachment I:	E-Mails Regarding Public Participation in NED
Attachment J:	E-Mails Regarding Comment Period Extension
Attachment K:	Correspondence with USACE Regarding 2025 Maintenance Dredging

ATTACHMENT A

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

BALD HEAD ISLAND

MITIGATION COSTS OF NAVIGATION CHANNEL IMPACTS

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

Previous Projects

• Engineered Beach Project 2009/2010		
• Dredging Contract	$	14,800,000
• Interest Expense	$	1,536,000
• Permitting – *Land Management Group, Inc., Olsen Associates, Inc., Legal*	$	1,000,000
• Sand Filled Geotextile Groinfield		
• 1995	$	320,000
• 2005	$	850,000
• 2009/2010	$	1,150,000
• Road Overwash		
• South Bald Head Wynd Road Repair 2004	$	250,000
• Sandbag Revetment Wall	$	250,000
• Sandpiper Trail Sandbag Wall + 2009 Repairs	$	65,000
• 2007 Sand Placement (Assist USACOE- limited funds)	$	900,000
• Periodic Beach Profile Monitoring	$	595,000
• Required Jay Bird Shoal Biological Monitoring per Permit	$	50,985
• Required Beach Front Biological Monitoring per Permit	$	30,030
• Install Emergency Sandbag Revetment at the Point	$	230,000
• Repair & Maintenance of Revetment at the Point	$	8,000
• BH Creek 2006 dredging Project w/ sand placed on West Beach	$	737,858
Total	$	**22,772,873**

Additional Expenditures Reimbursed through FEMA Public Assistance Funds

• Bald Head Creek Dredging Project (Emergency Sand Source to mitigate Erosion due to Hurricane Irene)	$	1,230,000
• Sand-filled Tube Groin Field Repairs due to Hurricane Irene	$	650,000
	$	**1,880,000**

Additional Expenditures Reimbursed through State of NC/DENR Water Resources Development Grant Funds

• Bald Head Creek Dredging Project 2006 (Southwind Construction Co.)	$	**260,000**

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

The Terminal Groin Project (2015)

- Terminal Groin GO Bond Expenditures @ 2-28-18 (2015 Project)
  Engineering/Design/Modeling/NEPA EIS costs $ 1,177,000
  (Phase I Construction/Orion w/ Corps 2015 O&M Sand)
  - Terminal Groin Construction, part of the T6 project, placing approximately 1 million for the fillet sand to place behind the T6 structure $ 7,876,858
  - Harbor Jetty Extension w/ Spurs $ 1,456,316
  - West Beach and Row Boat Row (Bald Head Creek Dredging) $ 1,261,026
    - Army COE Reimbursement $ 105,341
    - MECA Reimbursement 830,514
    - Contract Reimbursements 140,363
    - Total $ 1,076,218 $ (1,076,218)

  Total Cost, Phase I $ **9,517,982**

- Breakwaters Project:
  - Construction of two detached rock breakwaters located north of the Marina
    - Intercoastal Maine, LLC $ **895,052**

Sand Re-nourishment / Groin Tube Project (2018-19)

- Sand Re-nourishment / Groin Tube Replacements (2019 Project)
  (Phase II Construction/ SJ Hamill Construction, Bradley Textile Tubes)
  - Beach Nourishment 1million cubic yards, including mobilization $ 11,767,000
  - Groin Tube manufacture and installation 1,514,429
  - Engineering Costs 445,000
  - Legal Costs $ 62,500

  Total Cost, Phase II $ **13,788,929**

Marina Channel Maintenance Program

(Grant received from Department of Environmental Quality Resource Development Project to reimburse the Village for 66% of the cost, current expiration of Grant May 2019.)

- Village portion of expenses paid for Dredging the Channel:
  2017 – 2023: $ **289,140**

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

Sand Re-nourishment / Groin Tube Project (2024-25)

- Sand Re-nourishment / Groin Tube Replacements (2025 Project)
  Beach Fill Construction/Marinex, Flint Textiles Geotubes, McPherson Marine Service
  - Beach Nourishment 1 million cubic yards, including mobilization $ 16,175,000
  - Groin Tube Installation $ 1,517,430
  - Tube manufacturing (Flint) $ 446,425
  - Engineering Costs – JBS Borrow Site Permitting $ 230,200
  - Beach Fill Design/Construction Document (including groins) $ 350,000
  - Construction Management/observation $ 425,000
  - Legal – Construction Contracts Review/Bid $ 7,500

  Total Cost $ **19,151,555**

Beach Monitoring

Annual Shoreline Monitoring Program Expenses (last 10 years): **$2,000,000**
(Includes spring/fall surveying and aerial imagery documentation w/ final report from Coastal Engineer)

Total Accumulated Costs Associated with the Mitigation of the Navigation Channel **$69,303,391**

Overall Total To Date - $71,732,531

(25-year average expenditure annually - $2.87M)

ATTACHMENT B

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

OLSEN LETTER TO USACE 21 JULY 1999



Coastal Engineering

July 21, 1999

District Engineer
U.S. Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

Attn: Mr. John Meshaw, (CESQW-TS-PE)

Re: Wilmington Harbor Navigation Project - Ocean Bar Channel Realignment
Comments To The File

Dear Mr. Meshaw:

This letter is submitted to the District on behalf of the Village of Bald Head Island and constitutes a second response to your Request-For-Comments dated June 22nd, 1999 regarding the above-referenced project improvements. This information serves to augment both our comments dated July 2, 1999 (see Exhibit No. 1) and a "Position Paper" dated March, 1999 (see Exhibit No. 2). The comments presented herein address both the selected entrance channel alignment, which will directly impact the existing Bald Head Island shoreline, and our ongoing request to the District regarding long-term project mitigation, appropriately placed beach disposal, and the placement of sand at Bald head Island during sea turtle nesting season of Year 2000. Accordingly, please consider the following additional information submitted to the file:

1.) **Project Impacts**

a.) **Sediment Budget** - The proposed entrance channel realignment proposes to excavate well in excess of 6M cy of high quality sand from the existing *sand sharing system* directly seaward of Bald Head Island (BHI). For purposes of discussion, the latter can be considered to be all offshore portions of the seabed eastward of the existing Wilmington Harbor entrance channel centerline. In addition, project construction will remove several million cubic yards of "mixed quality" sand, (i.e., materials with greater than 10% fines) from existing shoals directly seaward of BHI.

It is reliably predicted that the adjacent shoal system seaward of BHI will adjust to the new channel alignment -- thereby resulting in the requirement for the continued removal of sand by maintenance dredging from the channel fairway as well as from project wideners. Within the first 10 years, or more, following entrance channel reconfiguration, the continuing loss of material from the BHI sand sharing system due to maintenance will be significant.

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associates, inc.

4438 Herschel Street
Jacksonville, FL 32210
(904) 387-6114
(Fax) 384-7368

It is the position of the Village of Bald Head Island that the cumulative removal of material from the adjacent seaward sand-sharing system of Bald Head Island must be adequately mitigated by the project sponsor and the Wilmington District, COE.

b.) **Alongshore Sediment Transport Potential** - A 2nd source of anticipated impact to Bald Head Island as a result of entrance channel construction is a modification of alongshore littoral transport potential. Although the District staff is performing analyses of this phenomenon, it is acknowledged that it's quantification is often difficult -- particularly, with the type of bathymetric conditions under consideration. Hence, predicted positive or negative changes in littoral transport potential often result in non-conclusive opinions regarding impacts, or the lack thereof.

It is the position of the Village of Bald Head Island that any identification of project related mitigation predicated solely upon variations in littoral transport at BHI will be unacceptable. The Village will be satisfied with nothing less than mitigation based upon readily identified and easily quantified sediment budget impacts as discussed in item "a" above.

c.) **Current Flow Field Modification** - The impinging hydraulic flow of the existing navigation channel along West Beach at BHI is considered to be a factor contributing to existing shoreline erosion at that location. Proposed channel modifications within the Jay Bird shoals segment of work could exacerbate existing West Beach impacts by way of increased flow magnitude. Moreover, the reorientation of the channel seaward of BHI from sta.90+00 seaward could result in a meander phenomenon type impact along the West Beach shoreline between sta. 0+00 and sta. 60+00. The District has not performed any level of numerical hydrodynamic modeling to address such impacts.

It is the position of the Village of Bald Head Island, that the District must recognize, monitor and directly mitigate, as necessary, any reconfiguration of the West Beach shoreline resulting from entrance channel reorientation. Such mitigation could potentially require structures necessary to restrict channel migration in the future.

2. **Timing of Mitigation**

It is relatively clear that no landform adjacent to the Wilmington Harbor Entrance Channel has been more adversely affected over time than BHI. Similarly, it is reasonable to assume that due to the reorientation of the entrance channel from sta. 90+00 seaward, BHI will experience substantial immediate and long term impacts to its sand sharing system. Hence, the timing of beach disposal operations at Bald Head is extremely important with respect to the mitigation of project impacts.

It is the position of the Village of Bald Head Island that the Wilmington District should initiate a contract sufficient to allow for beach disposal at Bald head Island at as early a date as possible during Year 2000. It is the opinion of the Village that a favorable Section 7 Consultation can be achieved in order to sufficiently protect sea turtle nesting at Bald Head Island during summer construction. The Village has volunteered to assist the District in this regard.

3. **Brunswick Beaches Consortium (BBC)**

The Wilmington District has formulated a tentative broad-based, countywide beach disposal program utilizing the 8M cy+ of beach quality sand to be excavated as a result of the Entrance Channel improvements. As discussed above, the vast majority of that sand will be derived solely from the sand sharing system of BHI and as such must be ultimately mitigated for (by the District and the project sponsor) at that location.

Although the Village of Bald Head Island is a contributing member of the BBC, neither the potential lack of fiscal resources nor the global interests of that entity, or its individual members, should influence in any way the Wilmington District's beach disposal scheduling or mitigation requirements for Bald Head Island. The Village of BHI has the resources, expertise and intentions of assisting the District in the construction of a suitably sized beach disposal project at as early a date as possible next year. Based upon the total length of shoreline along South Beach and West Beach at BHI subject to sand placement, the District proposal of an initial disposal of 1.5M cy of sand at that location is considered to be insufficient to meet current needs and potential near term impacts of entrance channel realignment.

The Village of Bald Head Island does not object to the initial construction of beach disposal projects at other Brunswick County locations which seek to maximize public benefits associated with channel construction. It is the position of the Village of BHI, however, that such disposal efforts must not reduce the direct mitigation commitments which need to be obligated at BHI for purposes of addressing both project construction and future maintenance.

4. **Legal Action(s)**

As of this date, the Village is laboring under the assumption that the Environmental Assessment (EA) and other studies, or analyses, being prepared by the Wilmington District, COE will both adequately and equitably address the mitigation requirements of BHI. Those mitigation considerations should address a Beach Disposal Plan at that location which obligates both an adequately sized initial effort as well as the continued disposal of future maintenance material that consists of sand, at no cost to local interests.

Without an appropriate finding and adequate assurances required to provide comprehensive project mitigation at BHI, the Village will consider legal recourse to protect its interests. Although it is not our intent, such legal action could unfortunately delay the proposed entrance channel improvement project.

The Village of Bald Head Island appreciates the District's consideration of this submittal in your formulation of the final EA and attendant project formulations necessary to allow for construction of the reconfigured Wilmington Harbor Entrance Channel.

Thank you.

Sincerely,

Erik J. Olsen, P.E.

EJO:lfm

Enc:

cc: Kitty Henson, Mayor
Wade Horne, Village Manger
Tom Jarrett, P.E.
W. Bissett, P.E.

EXHIBIT No.1



Coastal Engineering

July 2, 1999

District Engineer
US Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

Attn: Mr. John Meshaw, (CESAW-TS-PE)

Re: Wilmington Harbor Navigation Project - Ocean Bar Channel Realignment

Dear Mr. Meshaw:

This letter is submitted to the District on behalf of the Village of Bald Head Island and is in response to your solicitation of June 22nd, 1999 regarding the above-referenced project improvements. As the District files will show, the Village has requested beach disposal along the entirety of both West Beach and South Beach. Similarly, the Village is prepared to accommodate 3M cy or more of sand (in-place) in a design configuration (see attached correspondence dated June 14, 1999 to D. Wayne Bissette, P.E.).

As a result of chronic beach erosion, the Village of Bald Head Island requests an initiation of sand placement at as early a data as possible in Year 2000. Accordingly, we strongly urge the District to initiate a Section 7 Consultation for purposes of allowing beach fill placement during the turtle nesting season next year. I have both personally met and discussed this recommendation with various District staff. Accordingly, we are gratified that the District is presently considering this option by way of soliciting public comment.

It is our opinion that a favorable Section 7 Biological Opinion can be rendered by the U.S.F.& W.S. sufficient to allow oceanfront construction during turtle nesting season at Bald Head Island next year. We are relatively confident in that regard for the following reasons:

- The beaches of Bald Head Island are sufficiently eroded such that large scale nest relocation is presently necessary in order to protect the species,

- The local Bald Head Island Conservancy is well skilled at implementing a suitable *Sea Turtle Protection Plan* during the period of construction. Note - the Village is presently seeking the support of the Conservancy's Board in this regard.

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Jacksonville, FL 32210
(904) 387-6114
(Fax) 384-7368

- The placement of sand at Bald Head Island beginning in April of 2000 will advance both the Navigation Project construction schedule as well as the attendant COE beach disposal plan for other locations within Brunswick County, and

- The allowance of sand placement during turtle nesting season in areas where impacts can be avoided will allow for the preservation and beneficial use of over 8M cy of beach quality sand. Conversely, the placement, or transfer, of this resource to the ODMDS or other non-beach locations, due to scheduling constraints, would constitute an extremely significant adverse physical and economic impact to Brunswick County.

For the record, we would note that the Village formally objects to the potential placement of sand on their beaches where disposal is "limited to the area below the high tide line," as described in the District's Request For Information dated June 22, 1999. It is our position that the placement of disposal material in an appropriate beach nourishment design configuration will render the greatest level of protection to both existing development and endangered species. With regard to future turtle nesting habitat, it should be intuitively obvious that the highest level of benefit will be achieved through the construction of a wide, dry beach berm which exhibits longevity after restoration. The latter would be expected to provide the longest duration of nesting habitat, thereby offsetting the continuing need to relocate nests along any section of erosional shoreline so improved. Furthermore, we do not know of any scientific data, or turtle impact studies, which argue for sand placement below the MHWL. Our firm's collective personal observation is that sand placement at that location to either avoid Easement requirements, or to placate environmental "concerns," ultimately compromises nesting habitat. That is to say, such placement techniques commonly result in a saddle, or low area, in the beach between the existing dune or upland and the outer limit of sand fill. Such low areas can subject nests to inundation -- as well as obscure turtle crawl processes both during nesting and hatchling return to the ocean. Hence, such fill placement techniques should be avoided due to potential adverse impacts to the species.

In summary, the Village supports the placement of beach compatible materials, but only in a strategic design configuration. It is the Village's intent to provide the District with a preferred design plan to be incorporated into project contract documents. The Village opposes the placement of beach quality sand within the ODMDS or in the nearshore littoral zone. The Village does not object to the placement of non-beach compatible material within the old ocean bar channel; however, it is requested that the Wilmington District develop a protocol for the definition of non-sandy sediments mutually acceptable to the Brunswick Beaches Consortium. The reconfiguration of the Cape Fear River Ocean Bar channel will necessitate both initial *and* long term mitigation at Bald

Head Island. Hence, a disposal plan for sand derived from future channel maintenance is of significant interest to the Village of Bald Head Island.

Thank you for your consideration in these matters.

Sincerely,

Erik J. Olsen, P.E.

EJO:lfm

Enc:
cc: Wade Horne, Village Manager
Bald Head Island Nature Conservancy, Inc.

EXHIBIT No.2

POSITION PAPER

OPINIONS AND RECOMMENDATIONS REGARDING THE CAPE FEAR RIVER ENTRANCE CHANNEL AND BEACH EROSION AT BALD HEAD ISLAND, N.C.

Village of Bald Head Island
March, 1999

HISTORICAL PERSPECTIVE AND EXISTING CONDITIONS

Since about 1974, beach erosion along Bald Head Island has been manifest as chronic and severe shoreline recession along the South Beach (most particularly the western portion) and selected reaches of the West Beach (ref. Figure 1). Most recently, erosion stress has accelerated along central South Beach. Long-term shoreline retreat has averaged over 30-ft per/yr at the former Inn location, 10 to 25 ft/yr elsewhere along the western portion of South Beach, and 3 to 5 ft/yr along the West Beach.

The island's erosion is the apparent result of several combined factors: (1) divergent alongshore sediment transport gradients, (2) tidal currents and proximity to the Cape Fear River Entrance, and (3) impacts of the adjacent federal navigation project.

Along South Beach, the net alongshore transport potential diverges at a nodal point between Sea Oats Trail and Silversides Trail. To the west, transport accelerates rapidly westward due to both wave and tidal current forces. To the east, transport accelerates rapidly eastward. Simplisticly, this means that sand is stripped off of central South Beach and transported to the west and east. Toward the west, it deposits as a spit and/or is lost from the island to the Cape Fear River Entrance. To the east, predicted deceleration in the transport potential within 3000 ft west of the Point allows some deposition of this sand (and therefore local beach stability or periodic accretion), though most of the sand is ultimately lost to Frying Pan Shoals at Cape Fear.

Likewise, sand is lost from West Beach via wave stress that transports sand *northward* toward the marina entrance and marshes, and via ebb tidal currents that transport sand *southward* toward the spit between the South and West Beach. These ebb currents, in addition to the flood currents along South Beach, episodically "trim" the spit and ultimately move sand from the island toward the adjacent, deep navigation project channel. The proximity of West Beach to the federal navigation channel provides little width upon which to create (or enhance) a stable beach along much of the West Beach shoreline. The latter is similarly adversely affected by the orientation of the Smith Island Range navigation channel segment and the resultant directionality and impingement of ebb tidal flow upon the West Beach shoreline.

It is submitted that the construction and maintenance of the Cape Fear River Federal Navigation Project, at its current location, permanently interrupted the pre-existing natural sand bypassing system between Caswell Beach and Bald Head Island. Initially, the entrance channel severed the inlet's ebb tidal shoal, causing the eastern lobe (Bald Head Shoal) to migrate shoreward and onshore toward Bald Head Island. As a result, the western shore of the island responded by advancing some 1500 to 2000 feet between the late 1800's and the mid 1920's.

Between about 1925 and 1971, the net shoreline location remained relatively stable; however, during the same period, the submerged portions of the offshore shoal that had led to the previous unprecedented accretion were eroding as a result of the navigation project channel's interruption of easterly sand drift. Beginning in about 1974, the shoreline abruptly responded to the eroding seabed and commenced a trend of rapid retreat -- reaching 60 feet per year along portions of the recently developed Bald Head Island oceanfront.

It appears, therefore, that the island's present day beach erosion trend results predominantly from ongoing "deflation" (recession) of the beach growth that occurred in the early 1900's when Bald Head Shoal migrated onshore. That migration was associated with the early navigation project's severance of the natural ebb tidal shoal. The island's oceanfront was developed when the shoreline was at the anomalously advanced location that had resulted from the onshore movement of the severed shoal. The existing navigation project's continued interruption of the Cape Fear River sand bypassing system, including the historic removal of sand from the system by maintenance dredging, has led to the retreat of this "advanced" shoreline location and is expected to continue to contribute to beach erosion and shoreline recession in the future. It is likely that proposed navigation project improvements, and in particular realignment of the existing entrance channel, could further exacerbate the condition.

PRIOR FEDERAL ACTIONS

In 1989, the Wilmington District, US Army Corps of Engineers, performed a Section 111 Reconnaissance Report at the request of the Village of Bald Head Island. The purpose of this preliminary study was to make an initial determination as to whether or not continued dredging of the Cape Fear River entrance channel was causing or accelerating erosion on the Island. Authority for the investigation was provided by Section 111 of the Rivers and Harbors Act of 1968.

The District concluded at the time that "no evidence exists to connect the severe erosion of the west end of Bald Head Island with maintenance dredging in the Cape Fear entrance channel." Hence, mitigation of the erosion under Authority of Section 111 was not determined to be warranted.

The District, however, did favorably determine that placement of beach quality, dredged material recovered from the Cape Fear River entrance channel on the westward end of Bald Head Island was feasible and satisfied the criteria necessary for 50-50 cost sharing under the provisions prescribed by Section 933 of WRDA (1996).

Likewise, in 1989, the coastal engineering firm of Olsen Associates, Inc. as consultant to the Village, rendered a contradictory opinion regarding the probability of a cause and effect relationship between ongoing erosion trends at Bald Head Island and the construction and maintenance of the adjacent navigation channel. Pragmatically, however, the firm noted that Section 111 of the Rivers and Harbors Act of 1968 held virtually no promise as a potential mechanism for seeking federal mitigation, solely on the basis that it requires a concurrent congressionally authorized Shore Protection Project. Accordingly, even if the federally constructed navigation works were definitely proven to have had a large scale quantifiable adverse impact on Bald Head Island, Section 111 expenditures by the Wilmington District to resolve the problem could, in all probability, not be made due to Policies implemented by Higher Authority.

As a result, Olsen Associates, Inc. supported the District's finding that beach disposal via Section 933 constituted the most advantageous (and timely) opportunity for initiating a program of erosion control along South Beach at Bald Head Island. Since that date, two Section 933 projects have been constructed: 350,000 cy in 1991 and 450,000 cy in 1997.

PROPOSED NAVIGATION PROJECT MODIFICATIONS

Initial plan formulation of modifications to the Wilmington Harbor Navigation Project has resulted in a recommended increase in the authorized channel depth for the ocean entrance channel from -40 ft to -44 ft, MLW. Actual depths constructed would exceed the authorized depth by 2 to 3 feet. Unfortunately, geotechnical studies have shown substantial quantities of rock to exist above elevation -40 MLW, within portions of the existing entrance channel alignment.

Subsequent Value Engineering analyses by the Wilmington District have recommended for the adoption of an alternate ocean entrance channel alignment for purposes of avoiding the substantial additive costs of rock removal. Similarly, portions of the outer channel extension were found to have seabeds which include hard corals. Accordingly, several alternate alignments are presently under consideration. As shown by **Figure 2**, the channel alignments under evaluation all turn easterly directly seaward of Bald Head Island. Several alternatives likewise include modifications westward of BHI in the vicinity of Jay Bird Shoals. The latter would result in a more shore perpendicular alignment of ebb tidal flow from the Cape Fear River in the vicinity of Bald Head Island.

As of January 1999, Wilmington District staff were evaluating issues regarding potential post-construction shoaling; navigability; environmental impacts and construction costs for each alternative channel alignment.

CONSIDERATIONS TO BALD HEAD ISLAND

Long term impacts of the existing navigation project channel alignment and authorized dimensions are expected to be occurring at Bald Head Island as a result of:

a.) the elimination of natural pre-project sand bypassing phenomena associated with shoal migration at the mouth of the Cape Fear River;

b.) the fixation of the navigation channel alignment at one location in extremely close proximity to the Bald Head Island shoreline;

c.) continuous and long-term impacts to the sediment budget of the local sand sharing system extending from the Cape Fear Shoals to portions of Oak Island;

d.) resultant significant long-term deflation of the ebb tidal shoals seaward of Bald Head Island;

e.) the accentuation of the hydraulic gradients of flood tidal flows along the South Beach and West Beach shorelines of Bald Head Island and the increase in magnitude and frequency of occurrence of a major nearshore marginal flood tidal channel at the western extremity of South Beach, and

f.) The directionality of ebb tidal flow directly toward West Beach resulting from the artificially maintained alignment of the Smith Island Range.

All of these phenomena exist today; and it is abundantly clear that most (if not all) of these phenomena will be exacerbated by the implementation of a channel realignment within the corridor under consideration (see Figure 2). It is therefore altogether reasonable to expect that the shoreline of Bald Head Island will react both adversely and concurrently with both initial construction of a channel re-alignment -- as well as its continuing maintenance into the future at a new location within the existing, undisturbed portions of the ebb tidal shoal platform.

PROPOSED MITIGATION BY FEDERAL INTERESTS

For purposes of offsetting anticipated navigation project impacts associated with channel realignment and project deepening, three (3) mitigation elements should be implemented as part of *both* project construction and future project maintenance. The work should be performed integrally with the federal navigation project at 100% federal cost. The mitigation elements are as follows:

a.) *Beach Fill* - At a *minimum*, some 2-3 Mcy of beach quality sand should be placed along the South Beach shoreline on Bald Head Island as advance fill. The fill should address the entire 16,000 ft. of shoreline and should be placed in accordance with a rational design based upon both existing and anticipated future littoral transport trends. Depending upon the condition of the shoreline at the time of project construction and the channel alignment selected by the Wilmington District, additional limited advance filling of West Beach should likewise be performed as a mitigation measure.

b.) *Fill Maintenance* - Continuing maintenance of both the South Beach and West Beach shorelines should be performed utilizing beach quality sand excavated during annual channel maintenance. The *minimum* initial equivalent annualized requirement is presently estimated at 350,000 cy/yr. An updated maintenance requirement should be continually computed in the future based upon the best available data. The stipulated volume should be updated annually based upon a comprehensive monitoring program of both affected shorelines on Bald Head Island. All fill should be placed in such a manner that it results in the greatest spatial and temporal benefit to the affected shorelines, both developed and undeveloped.

c.) *Nearshore Disposal* - Should beach quality sand in excess of initial or annual fill requirements become available, preference should be given to additional beach width enhancement. Should annualized beach filling be restricted due to permitting conditions, or other extenuating circumstances, nearshore disposal of "excess" material below the MLWL should be considered in the immediate vicinity of Bald Head Island. All such material placement should be strategically performed *only* in the more dynamic portions of the nearshore zone where direct benefit to the active littoral system can be assured via onshore transport by natural forces.

d.) *Damages* - In the event that mitigation via item "a" through "c" above prove insufficient to offset project related impacts to Bald Head Island, the District must commit to the construction of additional structural or non-structural alternatives. Such mitigation must be provided at no expense to local interests, although the consent of local interests must be obtained in the selection of a preferred alternative.

Just as various federal agencies have determined that rock removal during project construction is uneconomical and that associated resource impacts are environmentally unacceptable, the Village of Bald Head Island feels similarly compelled to be adequately considered in the issue of ongoing and future erosional impacts due to navigation channel modifications. As a stakeholder in the process of "resource" impact evaluation, the Village believes that partnering with the District is possible, assuming that an adequate comprehensive Mitigation Plan between the two parties is reached. To that end, the Village is of the opinion that existing North Carolina Statutory requirements, as well as the necessity to be consistent with the State's Coastal Zone Management Plan, provide ample justification for the implementation of the mitigation elements discussed herein.

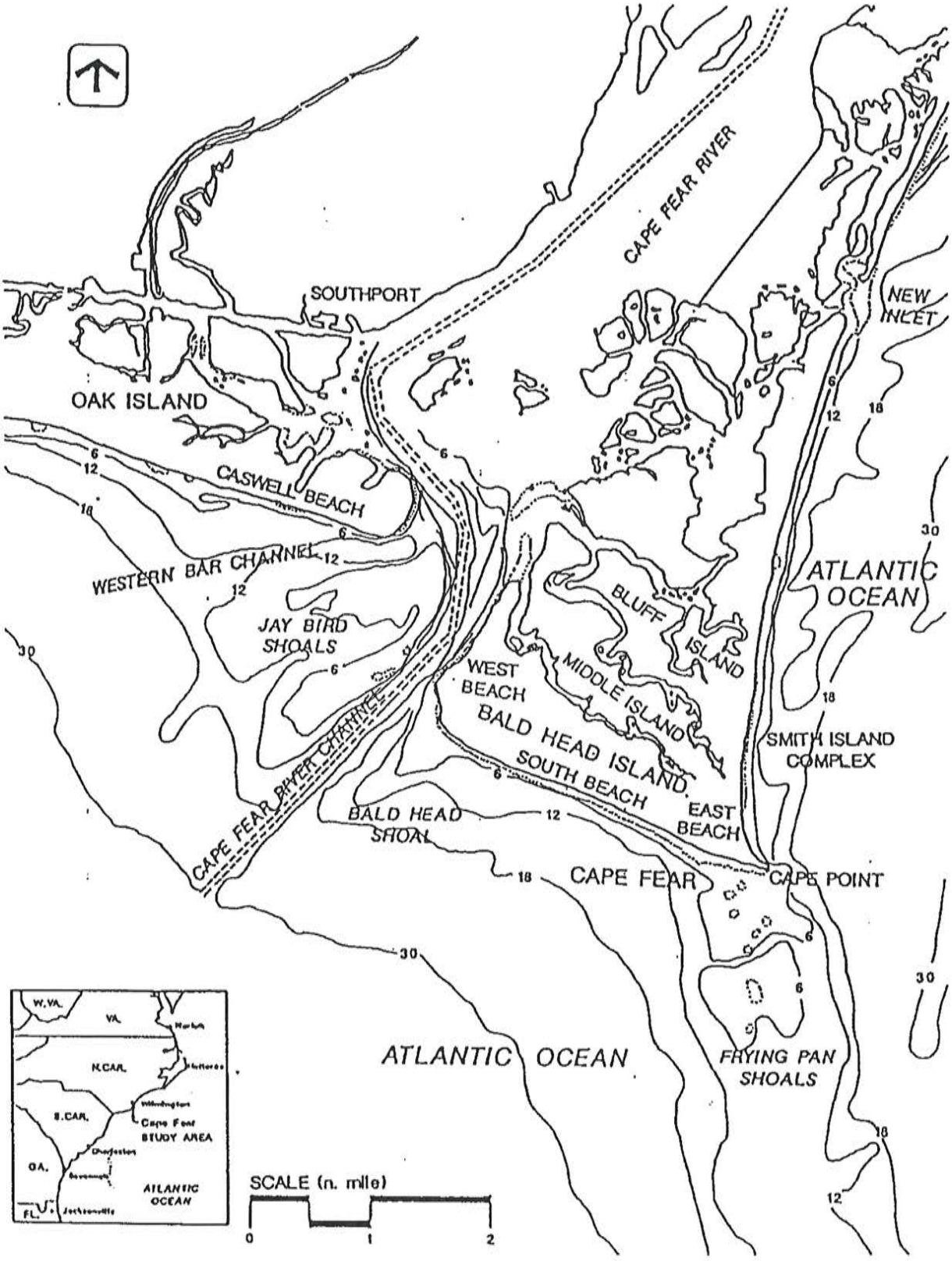
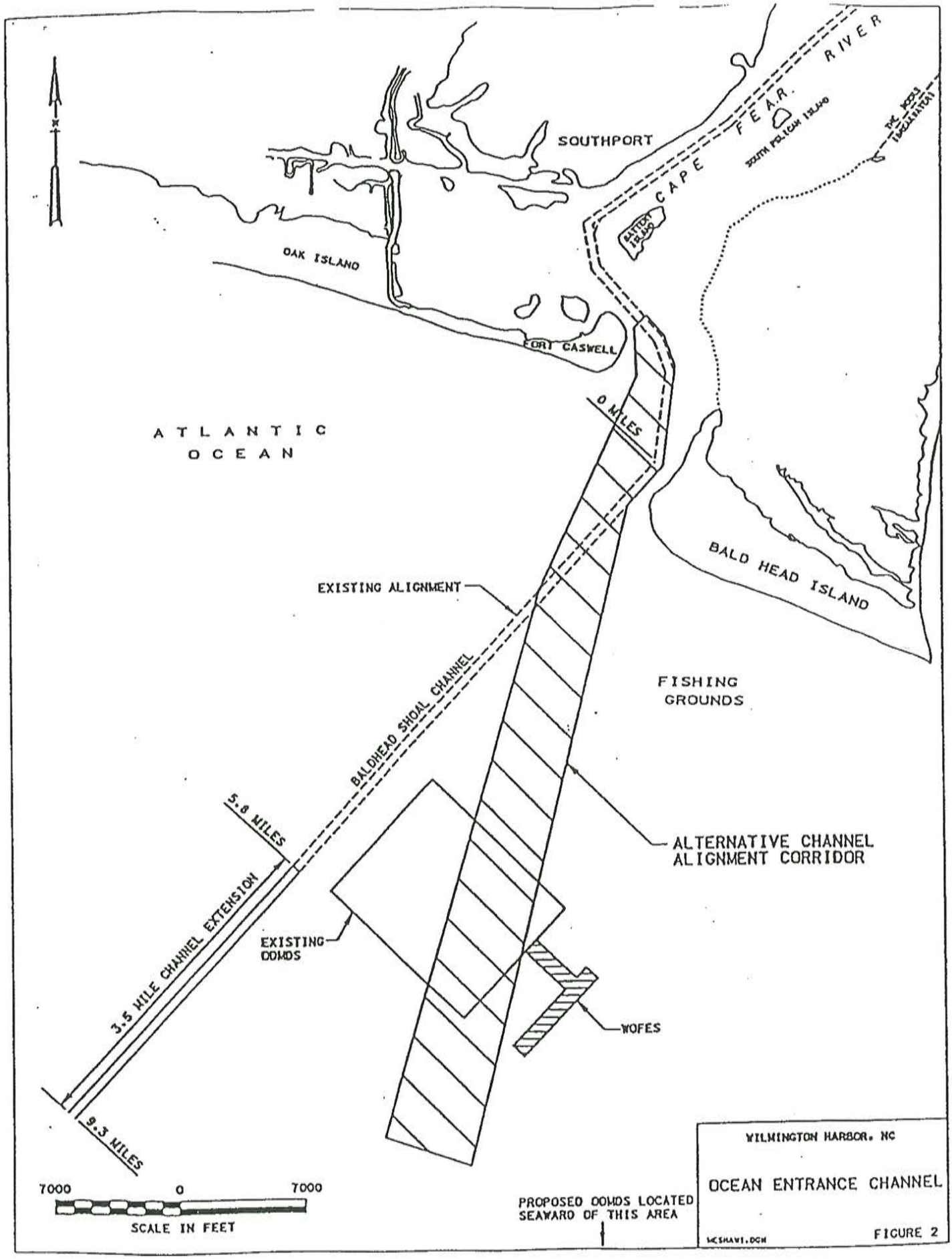


FIGURE 1 Vicinity map of Bald Head Island, North Carolina, USA.


SOUTHPORT
CAPE FEAR RIVER
OAK ISLAND
FORT CASWELL
ATLANTIC OCEAN
0 MILES
BALD HEAD ISLAND
EXISTING ALIGNMENT
BALDHEAD SHOAL CHANNEL
FISHING GROUNDS
5.8 MILES
3.5 MILE CHANNEL EXTENSION
ALTERNATIVE CHANNEL ALIGNMENT CORRIDOR
EXISTING ODMDS
WOFES
9.3 MILES
7000 0 7000
SCALE IN FEET
PROPOSED ODMDS LOCATED SEAWARD OF THIS AREA
WILMINGTON HARBOR, NC
OCEAN ENTRANCE CHANNEL
MCSHAV1.DGN
FIGURE 2

ATTACHMENT C

VILLAGE OF BALD HEAD ISLAND COMMENTS

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SAND MANAGEMENT PLAN

WILMINGTON HARBOR

SAND MANAGEMENT PLAN
OCEAN ENTRANCE CHANNELS AND INNER HARBOR FROM SNOWS MARSH THROUGH HORSESHOE SHOAL CHANNELS

1. **General.** Deepening of Wilmington Harbor will involve the removal of large quantities of material including beach quality sand. Most of the beach quality material to be removed during deepening will come from the Ocean Entrance Channels consisting of the following ranges: Baldhead Shoal; Smith Island; Baldhead – Caswell; Southport; Battery Island, and Snows Marsh seaward of station 10+00. These ranges are shown on *Figure 1*. Beach quality sands will also be removed from portions of the Inner Harbor channel extending from the upper 1000 feet of the Snows Marsh Range through the Horseshoe Shoal Range. These Inner Harbor channel ranges are also shown on *Figure 1*. A maximum of 6.0 million cubic yards of beach quality material will be removed from the lower portion of the Snows Marsh Range seaward through the Baldhead Shoal Range. Approximately 0.6 million cubic yards of beach quality material will be removed from the upper Snows Marsh Range through the Horseshoe Shoal Range. Sand management plans for these two segments of the harbor are developed below for both the new work material; i.e., the beach quality material to be removed during deepening; and future maintenance of these harbor segments that will involve the removal of littoral shoal material.

Ocean Entrance Channels – Sand Management Plan

2. **Introduction.** The sand management plan for the ocean entrance channels addresses dredging and disposal issues associated with the realigned Baldhead Shoal Channel as well as the Smith Island, Baldhead – Caswell, Southport, Battery Island, Lower Swash, and Snows Marsh Channels. Construction of the ocean entrance channels into Wilmington Harbor will entail the removal of approximately 15.5 million cubic yards of material, up to 6.0 million cubic yards of which is beach quality sand. Beach quality sand exists throughout all of the entrance channel except the new Baldhead Shoal Channel. Within the Baldhead Shoal Channel, beach quality sand is located between stations 0+00 and 120+00. Between station 0+00 and approximately 66+00, the entire channel prism is considered to be beach quality material. Between station 66+00 and 120+00, beach quality material is layered with the material lying above elevations ranging from -30 to -41 feet MLLW. Material below these depths contains a high percentage of clay and silt and is not suitable for beach disposal. Seaward of station 120+00, the new work material contains high concentrations of silt and clay and is not suited for placement on the beach. The beach quality material will be dredged primarily from the portion of Jay Bird Shoal which overlays the west side of the realigned bar channel and from Baldhead Shoal. Baldhead Shoal forms the east boundary of the existing channel, however, the realigned bar channel will cut across the seaward portion of this shoal. The present alignment of the ocean bar channel and that of the new bar channel are shown on *Figure 1*. As shown on *Figure 1*, the new bar channel passes through the eastern side of the existing Ocean Dredged Material Disposal Site (ODMDS).

3. The Brunswick County beach towns of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach have expressed an interest in receiving the beach quality material. Under Section 933 of the Water Resources Development Act of 1986 (Public Law 99-662), the Federal Government can cost share up to 50 percent of the added cost of depositing the material on the beach providing certain criteria are met. The primary requirement for Federal participation is that any added cost for placing sand on a particular beach segment must be economically justified. A base disposal plan associated with the least costly means of placing the beach quality material and a Section 933 disposal plan are discussed in the following paragraphs. In addition, a disposal plan for the annual maintenance material is presented following the disposal plan for the new work material.

4. **Plan Formulation – Ocean Entrance Channels New Work Material Disposal Plan.** The disposal plan for the new work material contained in the 1996 project feasibility report had all of the material from the Lower Big Island Range through the existing Baldhead Shoal Channel going to the ODMDS. It should be mentioned that the disposal plan in the feasibility report did not include consideration of the realigned Baldhead Shoal Channel. The alignment of the new Baldhead Shoal Channel came from a recommendation contained in a Value Engineering Study that demonstrated significant construction cost savings could be realized by avoiding rock in the existing Baldhead Shoal Channel. In any event, increased utilization of the existing ODMDS for disposal of maintenance and new work material has resulted in the existing ODMDS for Wilmington Harbor approaching full capacity. This combined with the passage of the realigned Baldhead Shoal Channel through the existing ODMDS has necessitated the development of a new ODMDS. The new ODMDS, which is being developed in cooperation with the Environmental Protection Agency (EPA), is located approximately 5 miles offshore of the existing ODMDS as shown on *Figure 1*. The new ODMDS is expected to be available for use by the end of 2001; consequently, the existing ODMDS must have sufficient capacity to accommodate the new work and maintenance material expected to be removed though the year 2001.

5. The remaining capacity of the existing ODMDS was estimated assuming that the area could be filled to an average elevation of 26 feet below mean lower low water (mllw). All future placement of dredge material in the existing ODMDS will take place west of the new channel alignment. In addition, no material would be placed in a 2,500-foot wide corridor parallel to and west of the new entrance channel in order to reduce the chance deposited material will move into and shoal the new channel (see *Figure 1*). The size of the corridor through the ODMDS is needed to prevent the return of deposited material into the channel and was based on the distance between the western toe of the existing ODMDS and the existing ocean entrance channel, which, as shown on *Figure 1*, is about 2,500 feet. Based on these assumptions, the remaining capacity of the existing ODMDS is approximately 17.8 million cubic yards.

6. Deepening of the Wilmington Harbor project is scheduled to begin in May 2000 with the award of a contract to construct the offshore portion of the Baldhead Shoal Channel seaward of station 120+00. The material to be removed from this segment of the new channel, which totals about 6.6 million cubic yards, contains significant quantities of silt and clay and will have to be deposited in the existing ODMDS. The contract for the

landward segment of Baldhead Shoal Channel and the other ocean entrance channels, which will include up to 6.0 million cubic yards of beach quality sand and 2.8 million cubic yards of material not suited for placement on the beach, will be awarded near the end of calendar year 2000. Work on the inner portions of the project from upper Snows Marsh Range to Horseshoe Shoal Range that contains 0.6 million cubic yards will also be performed in early 2001. The economic and engineering viability of options for the disposal of the beach quality material to be removed from upper Snows Marsh to Horseshoe Shoal is presented later in the section of this report entitled " Inner Harbor – Sand Management Plan." Finally, a contract for removal of rock and other sediments from the Big Island Range will be awarded in 2000 as a test to help determine contract scopes for rock removal from other sections of the harbor. All of the material from the Big Island Range (approximately 2.2 million cubic yards) will be deposited in the ODMDS. In summary, construction of the deeper channel between 2000 and 2001 will involve the removal of approximately 18.2 million cubic yards of material with all of this material scheduled to be placed in the existing ODMDS.

7. During the new ocean entrance channel construction period, periodic maintenance of the existing ocean entrance channel will have to continue as will the maintenance of the interior portions of the harbor. This maintenance material, which averages around 800,000 cubic yards per year from the entrance channel and 300,000 cubic yards from the interior channels, is normally placed in the ODMDS. In addition to the Wilmington Harbor maintenance material, material removed for maintenance of the Military Ocean Terminal at Sunny Point (MOTSU) is also normally placed in the ODMDS. Maintenance of MOTSU averages 1 million cubic yards per year. Thus, the combined volume of new work and maintenance material to be removed from Wilmington Harbor and MOTSU between 2000 and 2001 could total 22.4 million cubic yards, exceeding the remaining capacity of the existing ODMDS by more than 4.6 million cubic yards.

8. **Base Disposal Plan-New Work Material.** With the capacity of the existing ODMDS insufficient to accommodate the dredged material disposal volume requirements through 2001, the logical solution is to place up to 6.0 million cubic yards of beach quality material on adjacent beaches. The only other option would be to delay the construction of the harbor deepening project by at least one year which is not acceptable to the State of North Carolina, the project sponsor. Placement of up to 6.0 million cubic yards of new work material on the beach would reduce the volume of material to be placed in the existing ODMDS through the year 2001 to 16.4 million cubic yards, effectively depleting the remaining capacity of the existing ODMDS. Once the new ODMDS becomes operational, all future dredge material requiring ocean disposal will be placed in the new area.

9. The disposal of up to 6.0 million cubic yards of new work beach quality material would be distributed along 16,000 feet on Bald Head Island and 25,000 feet on Oak Island-Caswell Beach. Deposition on Bald Head Island would occur along 2,000 feet of West Beach, which faces the Cape Fear River Entrance, and along 14,000 feet of South Beach. Disposal on Oak Island-Caswell Beach would begin at the west boundary of the Fort Caswell Baptist Assembly grounds and proceed west. The 25,000-foot disposal area on Oak Island-Caswell Beach would extend the fill to the east end of the sea turtle habitat area

on Oak Island. These disposal areas are shown on Figure 2. The sea turtle habitat, which is basically a beach fill with a small dune feature to prevent nesting sea turtles from crossing into the ocean front road, will be constructed under authority of Section 1135 of the Water Resources Development Act of 1986. Construction of the sea turtle habitat will be completed in April 2001. The combined total of new work material to be deposited on Bald Head Island under the base plan would be 2,580,000 cubic yards. The balance of the new work beach quality material (up to 3,420,000 cubic yards) would be equally distributed along the 25,000-foot disposal area on Oak Island-Caswell Beach. The base plan beach fill placement characteristics associated with placement of up to 6.0 million cubic yards of new work material are presented in *Table 1*. Based on the characteristics of the sediment to be removed, about 83 percent of the dredged material is expected to remain in place. The lower placement rates used on West Beach and at the west end of South Beach are intended to reduce the possibility of increased sediment transport from the disposal area back into the navigation channel. Following initial adjustments, the deposited material will begin to erode at a rates comparable to or slightly faster than the erosion rates experienced on the existing beach. The base disposal plan addresses provisions for the disposal of up to 6.0 million cubic yards of beach quality material, however, the maximum volume may be reduced by 20 to 30 percent depending on the final quantitative and qualitative sand analysis and actual dredging operations associated with the dredging contractors decisions to obtain the total allowable overdepth.

Table 1
Base Plan Beach Disposal Characteristics

Location	Length along Shoreline (feet)	Disposal Rate (cubic yds per ft)	Initial Placement Width Range (feet)	Adjusted Placement Width Range (feet)	Initial Placement Volume (cubic yds)	Net In-place Volume (cubic yds)
Bald Head Island	16,000				2,580,000	
West Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	12,000	175	280 to 300	140 to 150	2,100,000	1,734,000
Oak Is - Caswell Beach	25,000	137	220 to 240	110 to 120	3,420,000	2,839,000
Totals	41,000				6,000,000	4,973,000

10. **Section 933 Disposal Plan – New Work Material.** The Brunswick County beach towns of Bald Head Island, Caswell Beach, Oak Island, Holden Beach, Ocean Isle, and Sunset Beach formed the Brunswick County Consortium for the purpose of working together to assure that the beach quality material is placed on the beach. Since Ocean Isle has received approval for a Federal Storm Damage Reduction Project, it is not vying for any of the Wilmington Harbor material. Construction of the Ocean Isle project is scheduled to begin in 2000. As mentioned above, a segment of Oak Island, lying between East 26th Street and East 58th Street, has been approved for a Section 1135 sea turtle habitat. The length of shoreline included in the sea turtle habitat consist of an 8,900-foot main section and 1,600-foot transitions on each end of the main fill. Construction of the sea turtle habitat will involve the removal of about 1.6 million cubic yards of material from an existing upland dredged material disposal area located adjacent to the Atlantic Intracoastal Waterway (AIWW). The expected in place volume resulting from this project is 1.34 million cubic yards. Within the main portion of the sea turtle habitat, the placement rate will be approximately 130 cubic yards/foot of beach. Accordingly, no material from the Wilmington Harbor project will be placed in the main portion of the sea turtle habitat. Some harbor material will be placed in the habitat transition areas to make up the difference in the volume that will be placed under Section 1135 and the rate of fill proposed under Section 933. This volume difference is around 25,000 to 30,000 cubic yards. As discussed below, disposal of material from the Wilmington Harbor project along Oak Island could occur at rates varying from 78 to 110 cubic yards/foot of beach. While these placement rates are less than the placement rate within the main portion of the Sea Turtle Habitat project, the relative protrusion in the shoreline resulting from the sea turtle project would be less than that which would have been produced in the absence of the harbor material. The reduction in the relative seaward protrusion of the shoreline within the habitat area resulting from the placement of the harbor material on the beach would also reduce the expected rate of loss from the habitat project due to end losses.

11. The shoreline segments that could receive material from Wilmington Harbor as a result of the Section 933 study include: 16,000 feet on Bald Head Island; 25,000 feet on Caswell Beach and the east end of Oak Island; 25,600 feet on the west end of Oak Island lying west of the sea turtle habitat; and 10,600 feet on the east end of Holden Beach. This represents a total shoreline length of 77,200 feet. These shoreline segments are shown on *Figure 2*. The distribution of available beach quality sand along the Brunswick County beaches will depend on the final results of the Section 933 study, analysis of project engineering and economic constraints, and the desires of the project sponsor and the Brunswick County consortium. To account for variations in sand placement along the Brunswick County beaches under the section 933 authority, *Table 2* presents the maximum beach fill disposal characteristics associated with the maximum beach fill for each beach segment resulting from the various possible distributions of beach quality material. Although the final distribution of the beach quality material for the Section 933 work along the Brunswick County beaches has not been determined, the total placement will not exceed 6.0 million cubic yards. Six million cubic yards of beach quality material to be removed from the channel equates to 5.0 million cubic yards of in place sand on the beach based on a retention rate of 83 percent discussed previously. Following the initial adjustments, erosion of the fill material will occur at rates equal to or slightly higher than the historic erosion

rates. The Section 933 disposal plan addresses provisions for the disposal of up to 6.0 million cubic yards of beach quality material, however, the maximum volume may be reduced by 20 to 30 percent depending on the final quantitative and qualitative sand analysis and actual dredging operations associated with the dredging contractors decisions to obtain the total allowable overdepth.

Table 2
MAXIMUM
Section 933 Disposal Characteristics

Location	Length along Shoreline (feet)	Disposal Rate (cubic yds per ft)	Initial Placement Width Range (feet)	Adjusted Placement Width Range (feet)	Initial Placement Volume (cubic yds)	Net In-place Volume (cubic yds)
Bald Head Island	16,000				2,200,000	1,826,000
West Beach	2,000	120	190 to 210	95 to105	240,000	200,000
South Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	12,000	143	220 to 240	110 to 120	1,720,000	1,426,000
Oak Island	50,500				4,740,000	3,933,000
East Oak Island - Caswell Beach	25,000	110	170 to 190	85 to 95	2,750,000	2,283,000
West Oak Island - Caswell Beach	25,600	78	120 to 140	60 to 70	1,990,000	1,650,000
Holden Beach	10,600	78	120 to 140	60 to 70	830,000	690,000

Inner Harbor – Snows Marsh Range to Horseshoe Shoal Range Sand Management Plan

12. **Introduction.** The sand management plan for the inner harbor addresses dredging and disposal issues associated with the Snows Marsh and Horseshoe Shoal channels. An estimated 0.6 million cubic yards of beach quality material will be removed from this

portion of the project. Disposal islands 3 and 4, located near the intersection of Horseshoe and Snows Marsh channels, are at maximum capacity and contain an estimated 1.3 million cubic yards of beach quality material. Maintenance material removed from this area is predominately sand of beach quality. Existing maintenance dredging operations in this area utilizes the offshore disposal area. The removal of the existing material from disposal islands 3 and 4 in conjuction with the new work dredging will facilitate placement of future maintenance material in islands 3 and 4. Future maintenance material placed in islands 3 and 4 would be used to nourish adjacent beaches.

13. **Plan Formulation.** The disposal plan for material presented in the June 1996 Cape Fear-Northeast Cape Fear Rivers project feasibility report proposed the placement of all dredge material from these channel reaches in the offshore disposal area. Subsequent investigations of material characteristics have shown that this material is of beach quality and this valuable resource would be best utilized to meet nourishment needs of the nearby beaches. Placement options for the 0.6 million cubic yards of new work material from the navigation channel includes potential placement of this material on Carolina Beach, Kure Beach, or Fort Fisher for 7,000 feet south of the southern terminus of the rock revetment. Placement options for the new work material from the navigation channel combined with pump out of islands 3 and 4 includes provisions for placement of 1.9 million cubic yards of material on adjacent beaches including Carolina Beach, Kure Beach, the Fort Fisher area, Bald Head Island , or Caswell Beach. Final placement decisions for the new work and maintenance material associated with the inner harbor from the Snows Marsh reach through the Horseshoe Shoal reach will assure that the dredge material disposal occurs in the least costly, environmentally acceptable manor, consistent with engineering requirements established for the project.

Maintenance Material Disposal Plan

14. **Plan Formulation.** Maintenance of the Wilmington Harbor Entrance Channel has historically required the removal of between 850,000 to 1,000,000 cubic yards of material each year. The maintenance material has normally been deposited in the ODMDS. Of the total volume removed each year, about 300,000 to 400,000 cubic yards has been littoral material derived from the adjacent beaches on Oak Island and Bald Head Island. This volume of littoral sediment constitutes 40 to 50 percent of the gross littoral transport along the Brunswick County beaches. Littoral material deposits in the bar channel primarily as a result of the eastward movement of Jay Bird Shoal and the westward movement of Bald Head Shoal into the channel area. The littoral sands generally deposit in channel reaches between channel stations 0+00 and 120+00. Seaward of station 120+00, the shoal material consist primarily of riverine silts and clays. While the new ocean bar channel will have an alignment different from the existing bar channel, shoaling patterns in the new channel, particularly in the vicinity of Jay Bird Shoal and Bald Head Shoal, are expected to be similar to the existing channel. The rate of shoaling of littoral sand in the new channel is estimated to be 545,000 cubic yards per year. The higher rate of deposition of littoral material in the new bar channel compared to the existing is due to channel modifications that would widen the channel to the west along the Smith Island Range and portions of the Baldhead Shoal range and cut across the seaward portions of Bald Head Shoal, as shown

on *Figure 1*. The volume of riverine silts and clays that will shoal the seaward portions of the new entrance channel are projected to be 538,000 cubic yards per year or about the same as that which occurs in the existing entrance channel.

15. The dredged material disposal plan for the entrance channel maintenance material was developed in accordance with U.S. Army Corps of Engineers policy with regard to the disposal of dredged material from Federal navigation channels. The Corps policy is contained in 33 CFR Parts 335-338 reads as follows:

> **"It is the Corps' policy to regulate the discharge of dredged material from its projects to assure that dredged material disposal occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project."**

The policy further states:

> **"The least costly alternative, consistent with sound engineering practices and selected through the 404(b)(1) guidelines or ocean disposal criteria, will be designated the Federal standard for the proposed project."**
>
> (Note: Section 404 guidelines of the Clean Water Act apply to beach nourishment, island creation, or construction of underwater berms whereas ocean disposal is covered by the Ocean Dumping Act.)

Finally, with specific reference to the disposal of maintenance material, the policy sates (33 CFR Part 337.9):

> **"(a) District engineers should identify and develop dredged material disposal management strategies that satisfy the long-term (greater than 10 years) needs for Corps projects. Full consideration should be given to all practicable alternatives including upland, open water, beach nourishment, within banks disposal, ocean disposal, etc."**

16. The Federal policy notwithstanding, the State of North Carolina adopted a set of policies in 1992 designated to insure that beach quality sand not be removed from the active beach system. The U.S. Department of Commerce, pursuant to the Federal Coastal Zone Management Act of 1972, has incorporated these policies into the North Carolina Coastal Management Program. As a result, the State of North Carolina includes these policies in its consistency review of Federal activities. In 1993, the North Carolina General Assembly enacted a statute that put the coastal management policy into law. While there is continuing legal debate over the applicability of the State Law to Federal projects, the Federal Government is required to be consistent with the State's coastal management program to the maximum extent practicable. Accordingly, the disposal plan for the maintenance material removed from the Wilmington Harbor entrance channel will attempt to satisfy these State requirements.

17. Based on the Corps policy given above, three factors were considered in the development of a dredged material disposal plan for maintenance of the harbor entrance, namely; engineering requirements of the project, environmental impacts, and cost. These factors are discussed below.

18. **Engineering Requirements.** The construction and maintenance of a deep ocean entrance channel through a tidal inlet will have the same impact on the movement of littoral sediment past the entrance as stabilizing structures such as jetties. However, the impacts of a dredge channel on the adjacent shorelines are generally more subtle than the impacts associated with stabilizing structures. In the case of stabilizing structures, there is usually a visible build-up of material adjacent to the updrift structure with corresponding erosion downdrift of the opposite structure. These impacts are normally clearly visible and measurable within distances of thousands of feet of the structures. Navigation projects that include stabilizing structures are generally formulated to include some means to bypass sand from one side of the entrance to the other in order to prevent project induced erosion on the adjacent beaches. Dredged channels, on the other hand, do not cause material to build-up on one side of the inlet or the other, rather, the impact of sediment removal from the dredged channel tends to be diffused throughout the impacted area. Since this diffusion process can extend over miles of shoreline, the erosive impact of the sediment removed from the navigation channel and its deposition outside the active littoral zone is difficult to detect in the short term since the magnitude of the impact may be of the same order as normal temporal fluctuations in the shoreline position. Also, where stabilizing structures generally have a well-defined impact on the predominant downdrift beach, channel projects affect both sides as material is deposited in the navigation channel from both the updrift and downdrift beaches.

19. The Wilmington Harbor project, historically, has not included the disposal of littoral sands on the adjacent beaches or in the active littoral zone. This has been primarily due to the maintenance practices that were established with the inception of the project over 100 years ago. Dredging technology that existed during the early history of the project dictated maintenance procedures and dredged material disposal practices. In this regard, hopper dredges, with hopper doors that opened by swinging down, were highly efficient in removing shoal material from channels but were restricted by their loaded drafts and swinging hopper doors to depositing the dredged material in relatively deep water. As a result, the "Federal Standard" for maintaining navigation projects, like Wilmington Harbor, became the cost and impacts associated with hopper dredging and ocean disposal of the dredged material in water depths of 30 feet or more.

20. The early establishment of the "Federal Standard" for maintenance of Wilmington Harbor did not consider the overall impacts of removing littoral sediment from the littoral system. This was due in part to the limited coastal development that existed when the projects were first constructed, but also due to lack of sufficient scientific understanding of coastal processes and the sand sharing system associated with tidal inlets and adjacent beaches. Years of research by the U.S. Army Corps of Engineers and practical knowledge gained from the operation of the numerous coastal navigation projects around the country has resulted in the realization that littoral material must be conserved. Natural supplies

from rivers and streams are not replenishing littoral sediments, particularly on the East Coast of the United States. Thus, the removal of a cubic yard of littoral sediment from a tidal entrance or inlet with deposition outside the active littoral zone of the beach will ultimately cause a cubic yard deficit somewhere within the sand sharing system affected by that particular entrance or inlet. The impact of the removal of littoral sediment from the active littoral zone through channel maintenance is identified as a major cause of man-induced erosion in the U.S. Army Corps of Engineers Shore Protection Manual. From an engineering perspective, the primary requirement for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to prevent project induced erosion of the adjacent beaches by conserving the limited natural resource, sand, through deposition directly on the adjacent beaches.

21. Wave transformation/sediment transport studies were conducted by the Coastal and Hydraulics Laboratory (CHL), U.S. Army Corps of Engineers, Engineer Research and Development Center, for the Wilmington District, to determine the theoretical rate of longshore sediment transport moving toward the Cape Fear River Entrance. The results of this study are reported in reference 3.

22. The results of the sediment transport analysis for the existing condition near the Cape Fear River entrance found that sediment transport potential to the east off Caswell Beach is 270,000 cubic yards per year while a comparable rate to the west off Bald Head Island is about 527,000 cubic yards per year. Combining these two transport rates results in a gross transport of littoral sediment moving into the entrance of 797,000 cubic yards per year. In terms of percentages, approximately 66 percent of the sediment shoaling the entrance channel comes from Bald Head Island while 34 percent is derived from Caswell Beach. In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel will be placed back on the beach from whence it came. Accordingly, two out of every three cubic yards of littoral shoal material removed from the entrance channel will be placed back on Bald Head Island and the remaining cubic yard placed on East Oak Island-Caswell Beach. The disposal locations on each island will be based on the results of annual beach profile monitoring surveys. In general, the material will be placed primarily along portions of South Beach and West Beach on Bald Head Island and on East Oak Island-Caswell Beach beginning at a point just east of the Carolina Power and Light Company cooling water discharge canal.

23. The distribution of littoral shoal material between Bald Head Island and East Oak Island – Caswell Beach given above will be accomplished by placing material from two consecutive maintenance operations on Bald Head Island with the third operation involving placement on Oak Island-Caswell Beach. Historically, littoral sediment shoaling in the entrance channel has been the highest in the Smith Island Range as a result of the eastward encroachment of Jay Bird Shoal into the channel. In 1991, a 50-foot channel widener was constructed along the west side of the Smith Island Range and was effective in trapping east moving sediment off of Jay Bird Shoal but was not large enough to significantly increase the time between maintenance dredging operations. In 1996, the widener was increased to 100 feet, which increased the maintenance cycle for this segment of the entrance channel to approximately every two years. The design of the deeper

channel into Wilmington Harbor includes a 150-foot channel widener west of the Smith Island Range, as shown on *Figure 1*. Consequently, maintenance dredging of the Smith Island Range and the landward end of the Baldhead Shoal Range should only be required every two years. Based on a two year maintenance cycle, 1,090,000 cubic yards of littoral material will be placed on Bald Head Island in year 2 and year 4 following the initial deepening of the harbor with this same volume placed on Oak Island-Caswell Beach during the 6th year following channel deepening. This disposal cycle is planned for the life of the project. The equivalent annual deposition of material would be 363,000 cubic yards per year to Bald Head Island and 182,000 cubic yards per year to Oak Island-Caswell Beach.

24. **Environmental Impacts.** The dredged material disposal plan for the new work material and that for the sandy maintenance material would not only improve the condition of the beaches adjacent to the harbor entrance but would maintain the beaches in a more stable condition. The wider more stable beaches, particularly along Bald Head Island and the East Oak Island-Caswell Beach disposal areas, would provide improved sea turtle nesting habitat compared to the present condition of these beaches. Even in their present state, the shorelines of East Oak Island, Caswell Beach, and Bald Head Island provide some of the most important sea turtle nesting habitat in North Carolina. In this regard, statistics compiled by the North Carolina Wildlife Resources Commission over the last 6 years (1994 to 1999 inclusive) show that approximately 33 percent of the sea turtle nest in North Carolina occurred on these three beaches. This relative high percentage of the total statewide nests is even more impressive given that these beaches constitute only 5 percent of the entire shoreline of North Carolina.

25. The disposal of material on the beach will have some short term negative impacts including the temporary increase in turbidity during the disposal operation and the smothering or otherwise displacement of organisms that live in or near the beach foreshore. Turbidity caused by the disposal operation normally does not persist more than one or two tidal cycles (12 to 24 hours) following the cessation of the disposal operation. With regard to the smothering or displacement of the nearshore organisms, studies by the University of Virginia for the U.S. Fish and Wildlife Service on Pea Island have shown that the organisms generally return to the area in about one year. The disposal plan for the maintenance material discussed above would involve the placement of material on Bald Head Island in intervals of 2, 4, and 8 years while disposal on Oak Island-Caswell Beach would occur in 6 year intervals. Thus, the nearshore organisms would not be completely eliminated from the area as a result of the disposal operation. In summary, the positive environmental impacts associated with the deposition of the littoral shoal material on the beach versus depositing it in an ocean disposal site far outweigh the negative impacts.

26. **Cost.** The "Federal Standard" for constructing and maintaining navigation channels focuses on the least costly method of disposing the material, even though policy dictates that the environmental and engineering requirements must also be considered. With respect to the disposal plan for the new work entrance channel material, the limited capacity of the existing ODMDS dictates that the beach quality material be placed on the adjacent beaches, otherwise, the construction of the deeper project would have to be

delayed by about a year. Even if the project were to be delayed a year to allow ocean disposal of the beach quality material, cost comparisons indicate that beach disposal would still be the most cost effective disposal option.

27. **Maintenance Material Disposal.** Even if beach disposal of the maintenance material resulted in some additional cost, the Corps of Engineers, under authority of Section 207 of the Water Resources Development Act of 1996, can elect to use a slightly more costly disposal method if there are overriding environmental and erosion control benefits associated with the more costly disposal scheme.

28. Future disposal of maintenance material in the ocean will be in the new ODMDS located 5 miles farther offshore than the existing ODMDS. This additional haul distance almost doubles the cost of ocean disposal. As a result, beach disposal of the beach quality maintenance material becomes the least costly option, particularly if maintenance of the beach quality material is only required every two years. While the intent of the sand management plan is to return littoral material to the beach, the primary purpose of the project is to provide safe navigation through the ocean entrance into Wilmington Harbor. In this regard, there may be occasions during the life of the project when problem shoals occur in the entrance channel between normal 2-year maintenance cycle. In order to prevent disruption of navigation, these shoals must be removed in an expedient manner. If the size of these problem shoals are small (for example less than 100,000 cubic yards), mobilization and demobilization of an ocean certified pipeline dredge may not be economical. Therefore, on these occasions, removal of the shoals could be accomplished with a hopper dredge with disposal of the material in the ODMDS. In any event, a comparison of the cost for ocean disposal versus beach disposal of the littoral material is provided in *Table 3*. This cost comparison is made over a 6 year period which corresponds to the time period associated with the sand sharing formula between Bald Head Island and Oak Island-Caswell Beach.

29. **Summary**. The sand management plan developed for the new work beach quality material and maintenance material to be removed from the entrance channels into Wilmington Harbor includes the following:

(a) Disposal of the new work beach quality material on Bald Head Island and Oak Island-Caswell Beach.

(b) In the absence of Section 933, up to 2,580,000 cubic yards of the new work material would be placed on Bald Head Island and up to 3,420,000 on Oak Island-Caswell Beach.

(c) Under Section 933, the material would be distributed along Bald Head Island, Caswell Beach, Oak Island, and Holden Beach.

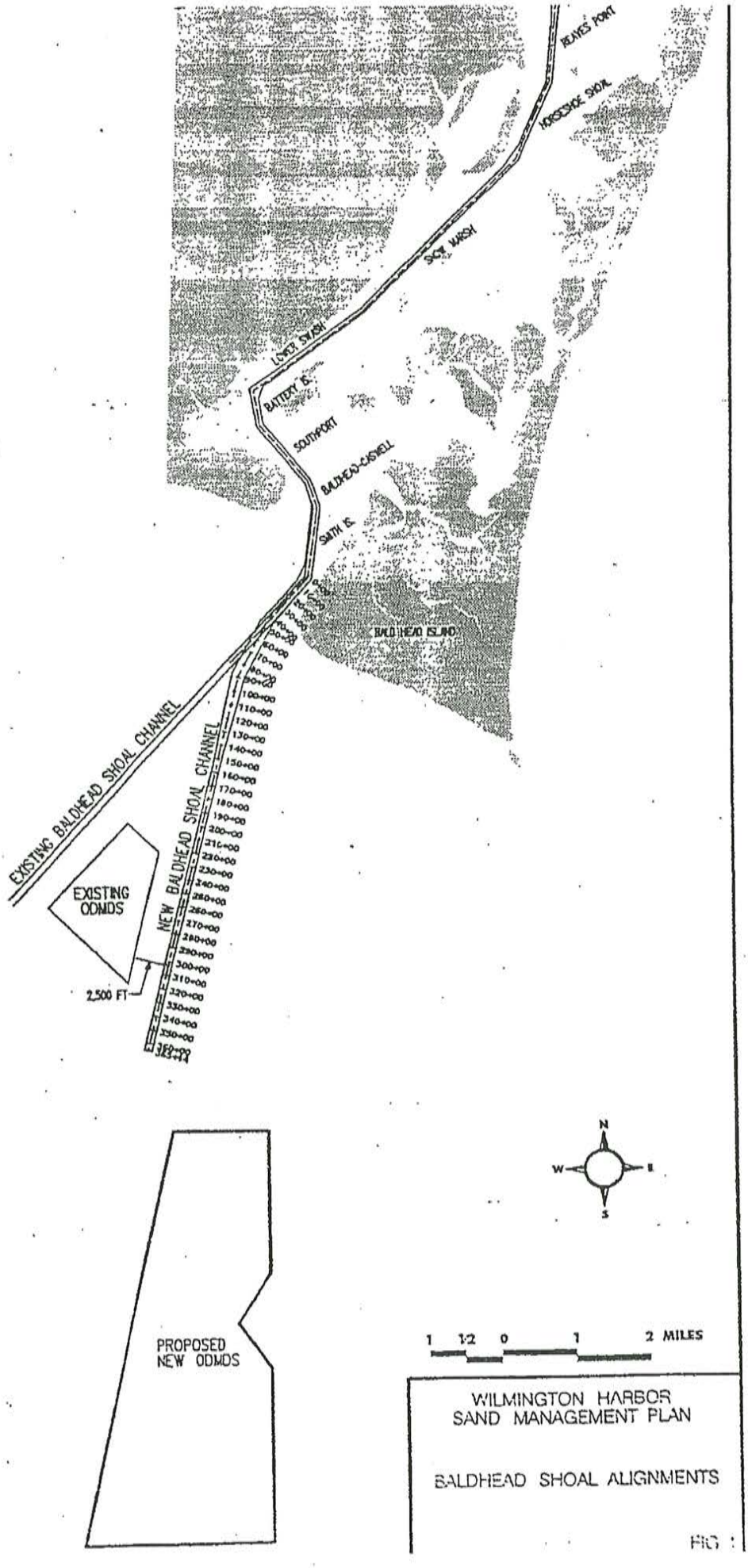
(d) Beach quality maintenance material will be deposited directly on Bald Head Island and Oak Island-Caswell Beach with Bald Head Island receiving 2 yards for every yard placed on Oak Island-Caswell Beach.

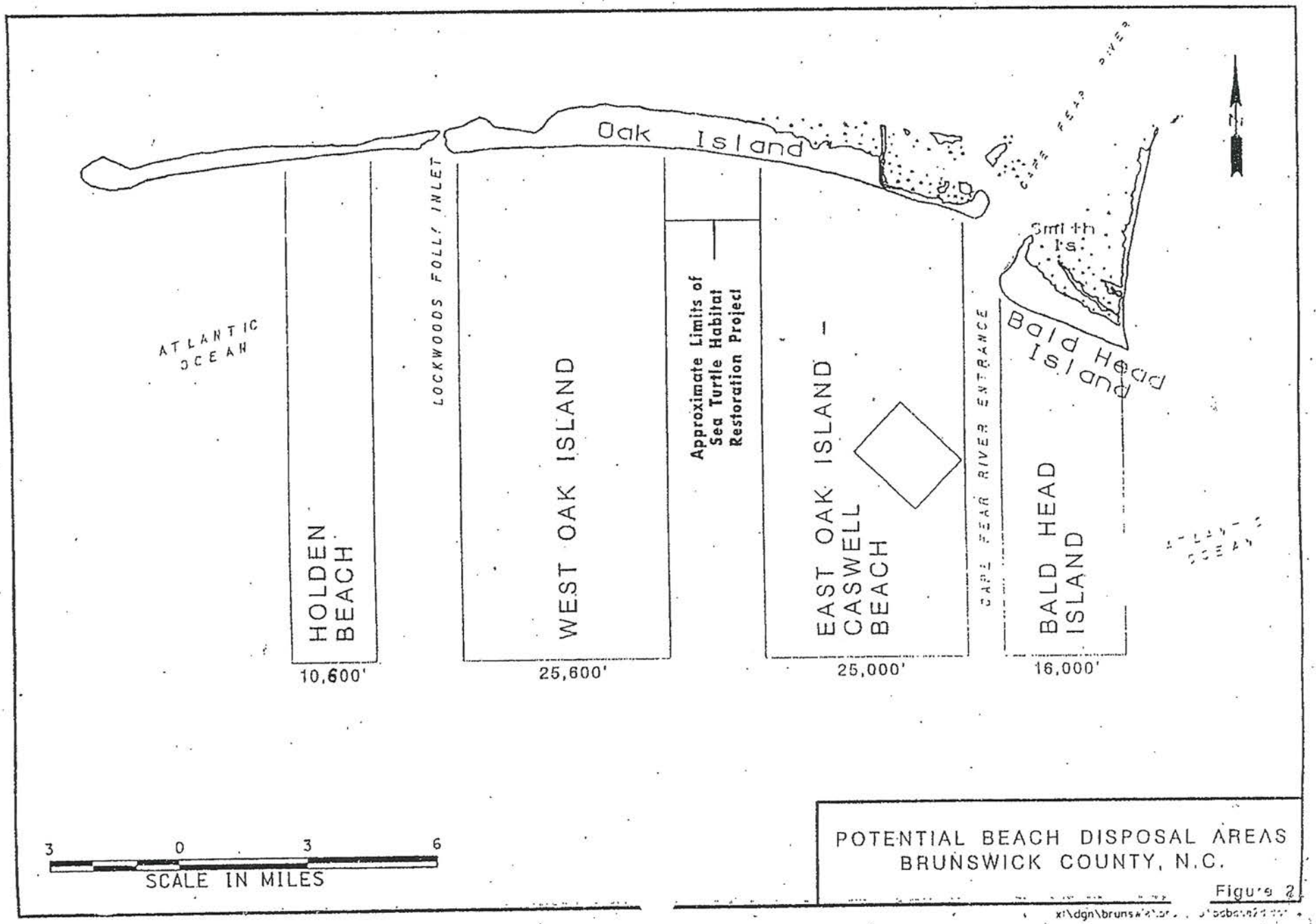
Table 3
Cost Comparison – Ocean Disposal versus Beach Disposal
Ocean Entrance Channel Maintenance Material

Item	Quantity	Unit	Unit Cost	Cost
Beach & Ocean Disposal – Maintenance Material				
Year 1: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Total Year 1 Dredging Cost				**$2,483,000**
Year 2: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Mob & Demob Pipeline Dredge	1	job	$948,000	$948,000
Dredging-Disposal on Bald Head	1,090,000	CY	$3.10	$3,379,000
Total Year 2 Dredging Cost				**$6,810,000**
Year 3: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Total Year 3 Dredging Cost				**$2,483,000**
Year 4: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Mob & Demob Pipeline Dredge	1	job	$948,000	$948,000
Dredging-Disposal on Bald Head	1,090,000	CY	$3.10	$3,379,000
Total Year 4 Dredging Cost				**$6,810,000**
Year 5: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Total Year 5 Dredging Cost				**$2,483,000**
Year 6: Hopper Dredge Silt & Clay				
Mob & Demob Hopper	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	538,000	CY	$4.00	$2,152,000
Mob & Demob Pipeline Dredge	1	job	$1,275,000	$1,275,000
Dredging-Disposal on Oak Island-Caswell	1,090,000	CY	$4.60	$5,014,000
Total Year 6 Dredging Cost				**$8,772,000**
Total 6-Year Dredging Cost				$29,841,000

Ocean Disposal of All Maintenance Material				
Yearly Hopper Dredge Cost for Ocean				
Disposal of all Maintenance Material				
Mob & Demob	1	job	$331,000	$331,000
Dredging w/ Ocean Disposal	1,083,000	CY	$4.40	$4,765,200
Total Annual Dredging Cost				$5,096,200
Total 6-Year Dredging Cost				$30,577,200

Date Revised: 02/04/00-sv


REAVES POINT
HORSESHOE SHOAL
SNOW MARSH
LOWER SWASH
BATTERY IS.
SOUTHPORT
BALDHEAD-CASWELL
SMITH IS.
BALD HEAD ISLAND
EXISTING BALDHEAD SHOAL CHANNEL
NEW BALDHEAD SHOAL CHANNEL
EXISTING ODMDS
2,500 FT
PROPOSED NEW ODMDS
N
W
E
S
1 1-2 0 1 2 MILES
WILMINGTON HARBOR
SAND MANAGEMENT PLAN
BALDHEAD SHOAL ALIGNMENTS
FIG 1



POTENTIAL BEACH DISPOSAL AREAS
BRUNSWICK COUNTY, N.C.

Figure 2

x:\dgn\brunsw[illegible]

ATTACHMENT D

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

DELONY LETTER 9 JUNE 2000

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO
Project Management Branch

June 9, 2000

Honorable Freeman A. Berne
Mayor of the Village of Bald Head Island
Post Office Box 3009
Baldhead Island, North Carolina 28461

Honorable Harry Simmons
Mayor of Caswell Beach
707 Caswell Beach Road
Caswell Beach, North Carolina 28465

Honorable Joan Altman
Mayor of Oak Island
4601 East Oak Island Drive
Oak Island, North Carolina 28465

Honorable James W. Lowell
Mayor of Holden Beach
110 Rothschild Street
Holden Beach, North Carolina 28462

Dear Mayors:

After years of effort by many, it is a pleasure to see the various elements of the Wilmington Harbor Navigation project (hereinafter the "Project") coming together. As we approach the decision point for the Finding of No Significant Impact (FONSI), I want to bring everyone up to date on the status of our plan to place beach quality sand excavated for the project on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach.

As you know, the details of our plan are presented in the Environmental Assessment, in particular, Appendix A - Sand Management Plan, in the Wilmington Harbor Monitoring Plan, and in the Section 933 Evaluation Report. The shoreline segments recommended to receive sand are the Village of Bald Head Island (up to 16,000 linear feet), Caswell Beach (up to 25,000 linear feet), Oak Island (up to 25,600 linear feet), and Holden Beach (up to 10,600 linear feet). This represents a maximum shoreline length of 77,200 linear feet.

Bald Head Island will be the site of initial beach disposal associated with construction. This site, along with the easternmost 25,000 linear feet of Caswell Beach-Oak Island, represents the least cost alternative of disposal available to the Project; accordingly, placement will be accomplished at Project cost and at no cost to the Village of Bald Head Island.

Placement will be according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to the Village of Bald Head Island referencing the Village of Bald Head Island Beach Disposal Plan (2000/2001) (enclosed and incorporated by reference) to the U.S. Army Corps of Engineers, Wilmington District (hereinafter "Corps").

Once disposal has begun at the Village of Bald Head Island, fill operations will continue until the estimated minimum of 1,536,000 cubic yards of sand in the channel prism allocated to the Village of Bald Head Island (based on channel surveys conducted in October and December 1999) have been dredged and placed on the beach in accordance with the March 31, 2000 memorandum. Assuming a potential effective reduction of 20 percent in the gross fill dredged, the final in-place fill volume is expected to range between 1,228,000 cubic yards and 1,536,000 cubic yards.

Project construction beach disposal operations at the Village of Bald Head Island will be performed along both West Beach and South Beach, as indicated by the March 31, 2000 memorandum. The Village of Bald Head Island will provide all requisite easements necessary to construct the template(s) provided for by the March 31, 2000 memorandum.

Once the placement of beach quality sand at the Village of Bald Head Island is complete, placement along approximately 25,000 linear feet of shoreline at the easternmost end of Caswell Beach-Oak Island will be accomplished. Placement will be made in accordance with the template agreed to by the Corps, NCDENR, and the communities of Caswell Beach and Oak Island. The final in-place fill volume is expected to range between 1,451,000 cubic yards and 1,814,000 cubic yards. Since this reach comprises the balance of the least cost alternative for disposal available to the Project, placement will be at Project cost and at no cost to those communities. All requisite easements will be provided by the communities at no cost to the Project.

Under the provisions of the draft Section 933 report, the remaining beach quality sand will be placed along approximately 25,600 linear feet of the westernmost shoreline of Oak Island and along approximately 10,600 linear feet of the eastern shoreline of Holden Beach. Placement will be made in accordance with the template agreed to among the Corps, NCDENR, and the affected beach communities and cost shared at the rate of 65 percent Federal (currently estimated at $6,500,000) and 35 percent non-Federal (currently estimated at $3,500,000). The final in-place fill volume along the cost shared reach of Oak Island is expected to range between 1,272,000 cubic yards and 1,590,000 cubic yards. The final in-place fill volume along the cost shared reach of Holden Beach is expected to range between 528,000 cubic yards and 660,000 cubic yards. The communities will provide all required easements at no cost to the Project.

After construction of the Smith Island and Bald Head Island Shoal portions of the project, the U.S. Army Corps of Engineers will conduct periodic maintenance dredging of the navigation channels. The disposal of all beach quality dredged material will be accomplished in accordance with the Environmental Assessment of Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 2000 and its Sand Management Plan (Appendix A), and the Wilmington Harbor Monitoring Plan (enclosed and incorporated by reference). The associated disposal will be as called for therein, namely:

Year 2: Placement at Bald Head Island (estimated @ 1Mcy)
Year 4: Placement at Bald Head Island (estimated @ 1 Mcy)
Year 6: Placement at Caswell Beach and easternmost end of Oak Island (estimated @ 1 Mcy).

This disposal cycle is planned for the life of the project. As provided on page 8 of the Environmental Assessment and on page 12 of the sand management plan, in some cases problem shoaling involving small quantities of sand may develop in the channel between regular dredging events, making use of a pipeline dredge unfeasible and the sand may need to be deposited in the ocean disposal area.

Prior to each disposal operation at either the Village of Bald Head Island, or Caswell Beach, or the easternmost shoreline of Oak Island, the community receiving the sand may provide advance guidance to the Corps regarding placement distributions and fill template design. The Corps will follow that guidance to the maximum extent practicable.

The Corps will conduct a monitoring program as referred to in the Environmental Assessment and Sand Management Plan, and as set out in the Wilmington Harbor Monitoring Plan, which is enclosed and incorporated by reference. An annual report will be prepared, as described in the Monitoring Plan. The Corps will use this monitoring data to evaluate and adjust the Sand Management Plan, as determined necessary, after coordination with interested parties.

All initial and future disposal activities at the Village of Bald Head Island, Caswell Beach, and easternmost Oak Island, (as described in the Environmental Assessment and its Sand Management Plan, and in the Wilmington Harbor Monitoring Plan) will be at no cost to either community.

If the Project causes significant adverse effects on adjacent beaches, the Corps and the Sponsor will respond by adjusting the Sand Management Plan, after consultation with interested parties. If the Project causes significant adverse effects that cannot be dealt with by

modifications to the Sand Management Plan, the Corps and the Sponsor will promptly seek and use their best efforts to implement appropriate corrective measures, such as additional nourishment, subject to consistency review.

Our current schedule for execution of the FONSI is June 14, 2000. Our current schedule for our higher headquarters approval of the draft Section 933 Evaluation Report is July 31, 2000. We expect to award a contract to construct the inshore reaches of the Ocean Bar entrance channel on or about November 15, 2000. We are moving prudently but aggressively to make this important Project a reality.

The support of the members of the Brunswick Beaches Consortium and our Project sponsor represented by Mr. John Morris in optimizing this unique opportunity for nourishing your beaches has been wise, energetic, and timely. We salute your efforts and look forward to continued close coordination through to the successful completion and operation of the Project and the associated beneficial use of beach quality sand.

Sincerely,

James W. DeLony
Colonel, U.S. Army
District Engineer

Enclosures

Copies Furnished:

Mr. John N. Morris, Director
Division of Water Resources
North Carolina Department of Environment
and Natural Resources
1611 Mail Service Center
Raleigh, North Carolina 27699-1611

Ms. Donna D. Moffitt, Director
Division of Coastal Management
North Carolina Department of
Environment and Natural Resources
1638 Mail Service Center
Raleigh, North Carolina 27699-1638

ATTACHMENT E

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

MOFFITT LETTER 15 JUNE 2000

CDENR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF COASTAL MANAGEMENT

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

DONNA D. MOFFITT
DIRECTOR

RECEIVED
EXECUTIVE OFFICE
2000 JUN 26 A 11:03

June 15, 2000

Action: PM-C
CF: DE
DX
DP
TS
OC

Colonel James W. DeLony
District Engineer
U.S. Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

REFERENCE: DCM00-14 EA and CD - Preconstruction Modifications of Authorized Improvements, Wilmington Harbor 96 Project

Dear Col. DeLony:

On May 17, 2000 the State of North Carolina completed its review, pursuant to 15 CFR 930 Subpart C - Consistency for Federal Activities, of the referenced document describing proposed modifications to the authorized Wilmington Harbor 96 Project in New Hanover and Brunswick Counties, North Carolina. The Corps of Engineers submitted the document to the state on February 17, 2000, and the project was assigned the number DCM00-14 for our review purposes.

During the course of our review several environmental concerns were raised by state agencies regarding potential impacts on the resources of the coastal zone. These comments were forwarded to the Corps for its consideration. As the consistency deadline was approaching, we extended our original consistency deadline 15 days, pursuant to 15 CFR 930.41, at the end of March. On April 10, 2000, our review was again extended to allow concerned state agencies to review the Corps' responses to comments on the Environmental Assessment (EA). The Division of Coastal Management received the Corps' responses on May 3 and again solicited comments from concerned state agencies.

The modifications that the Wilmington District Corps of Engineers seeks authorization for are as follows:

1. Construction and maintenance of the Wilmington Harbor entrance channel along a new alignment across the ocean bar.
2. Backfilling the abandoned channel length with dredged material not suited for beach or littoral zone disposal.

MAILING: 1638 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1638
PHYSICAL: 2728 CAPITAL BLVD., RALEIGH, NC 27604
PHONE: 919-733-2293 FAX: 919-733-1495
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3. Placement of material dredged from the new channel alignment and other portions of the project on area beaches in New Hanover and Brunswick Counties.
4. Establishment of a comprehensive plan for dredging and disposal operations for each portion of the harbor, including hopper dredge with overflow.
5. Utilization of blast pressure criteria to measure impacts of blasting on aquatic resources and the elimination of the bubble curtain during blasting operations.
6. Placement of dredged material that does not go to the old channel, the littoral zone, the beaches, or other existing disposal sites, into the Offshore Dredged Material Disposal Site (ODMDS).

The Corps proposes to construct the new entrance channel alignment and place all suitable material on the nearby beaches over an approximately eighteen month period covering two winter seasons and one summer season. Turtle monitoring and shorebird surveys of affected beaches will be conducted. Details of the disposal operations for construction and maintenance of the channel are documented in a Sand Management Plan (SMP). In addition, the Corps has clarified details of the placement, timing, costs, and amount of sand to be deposited on the beaches of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach in a letter dated June 9, 2000from Colonel James W. DeLony, District Engineer, to the mayors of the respective beach towns. We understand that disposal of dredged material from construction and maintenance of the project will be conducted according to the SMP and letter, as agreed to by the NC Division of Water Resources, the Brunswick County beach communities and the Corps of Engineers. We also understand that the use of hopper dredge with overflow will be limited to times of year and reaches of the project in which impacts on coastal resources will be minimized.

Based upon our review of the EA and the Corps of Engineers' response to comments, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, provided that the project is performed according to the EA (including the Sand Management Plan and other appendices) and the Corps' responses to comments from the EA, and to Colonel DeLony's letter of June 9, 2000 (including attachments), and that the conditions below are met.

1. Principal amongst the issues raised were potential impacts on sea turtles, shore and water birds, beach and benthic infauna, fisheries, and water quality parameters. It is extremely important that the impacts of this multifaceted project be well documented in order to evaluate the effects on these resources and on the overall coastal environment. The Corps of Engineers will pursue an integrated monitoring plan to address the resources noted in the first sentence of this paragraph, and will coordinate all monitoring efforts with the appropriate state agencies. This will include but not be limited to the North Carolina Division of Coastal Management, the Wildlife Resources Commission, the Division of Marine Fisheries, and the Division of Water Quality. We understand that the Corps intends to initiate monitoring coordination with the resource agencies in June of 2000.
2. As additional mitigation for impacts on fisheries resources, a fish passage structure will be constructed at Lock and Dam 1 on the Cape Fear River. In addition, fish passage alternatives for Lock and Dams 2 and 3 will be investigated. The Corps of Engineers and, as the Wilmington Harbor Project Sponsor, the State of North Carolina, have agreed to these actions.
3. The placement, timing, costs, and amount of sand to be deposited on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach, both during construction and future maintenance; monitoring; and response to impacts shall be in accordance with Col. DeLony's letter of June 9, 2000, to the mayors of the respective towns receiving the sand (attached and incorporated by reference). If the towns, Corps, and project sponsor's representative mutually agree to modifications to the SMP or Col. DeLony's June 9, 2000 letter, those modifications shall be submitted to the North Carolina Division of Coastal Management for a determination of whether another consistency review is necessary on the modifications.
4. The state must have the opportunity to review the project, including monitoring results, to determine if it continues to be consistent with the North Carolina Coastal Management Program in two situations: 1) After five years from the date of this letter, and 2) before any subsequent modifications for future maintenance or other requests to modify the Wilmington Harbor 96 Project are considered. The Corps shall request this review and provide documentation of impacts (or lack thereof) on the coastal resources of concern.

5. If in the future the Corps considers requesting authorization to conduct hopper dredging with over flow or to place maintenance dredge spoil on a beach, outside of the established time periods or locations, a separate consistency review will be required for each of these activities.

While the State of North Carolina supports beach nourishment and the placement of suitable spoil material on the beaches, we remain concerned about the short term and long term impacts on the biologic and ecologic resources of the coast. We maintain that the best time for such beach nourishment and renourishment is outside of the period of peak impacts on infauna, sea turtles, and fisheries. The State discourages individuals and agencies from seeking authorization to perform work outside established moratoria, and caution that our response is not to be interpreted as a precedent assuring authorization for future renourishment or disposal of sand on beaches outside of established dredging and disposal moratoria. We understand that summer beach disposal is necessary only during the construction phase of the project and that maintenance of the harbor channels will be conducted within established biological time frames.

Finally, with the increasing number of beach disposal and renourishment projects, much of the state's southern coast beaches will be in the placement or recovery phases in any given year. To this end, the Division of Coastal Management requests that the Corps consider combining the monitoring studies and environmental considerations of this project, the Wrightsville Beach, Carolina Beach, Kure Beach projects, and all of the Brunswick County Beaches projects to achieve a more comprehensive and cumulative impact analysis. Although these projects are separate in authorization and funding, we feel that concurrent studies could provide beneficial insights on impacts to resources from beach disposal and nourishment along this extended reach of shoreline.

If you have any questions regarding our findings, conditions, or recommendations, please contact Ms. Caroline Bellis, Division of Coastal Management, at (919) 733-2293. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Donna D. Moffitt

Donna D. Moffitt

Attachment

cc: Bob Stroud, Division of Coastal Management, Wilmington
Franklin McBride, NC Wildlife Resources Commission
Bennett Wynne, NC Wildlife Resources Commission
Ruth Boettcher, NC Wildlife Resources Commission
Fritz Rohde, NC Division of Marine Fisheries
Mike Street, NC Division of Marine Fisheries
John Dorney, Division of Water Quality
Frank Yelverton, US Army Corps of Engineers
John Meshaw, US Army Corps of Engineers

ATTACHMENT F

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

FINDING OF NO SIGNIFICANT IMPACT

WILMINGTON HARBOR 2000 (EXCERPT)



US Army Corps of Engineers®
Wilmington District

FINDING OF NO SIGNIFICANT IMPACT

PRECONSTRUCTION MODIFICATIONS OF AUTHORIZED IMPROVEMENTS

WILMINGTON HARBOR
NORTH CAROLINA

August 2000

and about $20 million for elimination of the air curtains. Environmentally the new ocean bar channel would avoid live coral bottom. The air curtains are eliminated because they did not provide the environmental protection anticipated, and environmental impacts in their absence are anticipated to be minor.

3.00 PUBLIC AND AGENCY COORDINATION: On February 7, 2000, the EA referenced above was mailed to Federal and State agencies and the interested public for a 30-day review and comment period. Based on a request from the North Carolina Clearinghouse and others, the response date was extended about 2 weeks until April 3, 2000. Everyone providing comments on the EA will be mailed a copy of the Finding of No Significant Impact (FONSI). A notice of availability of FONSI will be mailed to others on the project mailing list. Comments on the EA were received from the following:

Federal Agencies

- US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
- US Environmental Protection Agency, Region IV
- US Department of the Interior, Fish and Wildlife Service

State Agencies

- North Carolina Ports
- NC Department of Environment and Natural Resources
- NC Division of Coastal Management
- NC Department of Cultural Resources
- NC Division of Water Quality
- NC Department of Commerce
- NC Wildlife Resources Commission
- NC Division of Marine Fisheries

Local Agencies

- Brunswick Beaches Consortium

Elected Officials

- New Hanover County Board of Commissioners
- Representative Daniel F. McComas
- Mayor Harry Simmons, Town of Caswell Beach
- Mayor Joan L. Altman, Town of Oak Island

Conservation Groups

- National Audubon Society

Interested Businesses, Groups, and Individuals

- Burlington Industries, Inc.
- H. Spalding Craft
- Star Shipping, Inc.
- Solar International Shipping Agency, Inc., General Agent for Yang Ming Line
- Andrew Koeppel

- OxyChem
- Morehead City Terminals, Inc.
- Hanjin Shipping Company, Ltd.
- North Carolina Citizens for Business and Industry
- Frank S. Conlon
- Laela S. Sayigh
- Brooks, Pierce, McLendon, Humphrey & Leonard, L.L.P, firm representing Village of Bald Head Island

In addition, all the required environmental clearances or coordination documents have been received for the proposed action. They were received after April 3, 2000, the end of the EA comment period, and are as follows:

- Water Quality Certification No. 3085 issued October 17, 1996, was modified by letter dated April 10, 2000 to cover the proposed action.
- Supplement to the Final Fish and Wildlife Coordination Act Report, Wilmington Harbor, North Carolina, 96 Act, New Hanover and Brunswick Counties, North Carolina, April 2000, transmitted by letter dated April 28, 2000. Responses to recommendations are indicated in Paragraph 5.06 above.
- US Fish and Wildlife Service Biological Opinion for the Proposed Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, May 3, 2000. We will comply with the incidental take statement, associated reasonable and prudent measures, and terms and conditions implementing them.
- Environmental Protection Agency letter of May 1, 2000, indicating concurrence with our Tier 1 evaluation under the Ocean Dumping Act that the new work and maintenance dredged material is acceptable for ocean disposal in the Wilmington ODMDS.
- National Marine Fisheries Service Biological Opinion for the Proposed Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, August 3, 2000. We will comply with the incidental take statement, associated reasonable and prudent measures, and terms and conditions implementing them.
- NC Division of Coastal Management letter of June 15, 2000, providing a statement of concurrence that the proposed action is consistent with the NC Coastal Management Program. We will comply with the conditions indicated in the letter.

4.00 RESPONSES TO COMMENTS ON THE EA AND RESOLUTION OF ISSUES: All comments received on the EA and other correspondence indicated above were considered in making the decision to sign a FONSI. Copies of the letters commenting on the EA are included in Attachment 1. Pertinent comments from each commentor are summarized and addressed below. All comments received on the EA have been resolved either through providing additional information in this FONSI or agreeing to develop appropriate monitoring as indicated in paragraph 11 of this FONSI. As indicated in paragraph 1.00 above, monitoring is proposed for limited aspects of the project where some uncertainty exists regarding project impacts. However, the results of this monitoring are not anticipated to alter the **Corps** position that the proposed modifications will not significantly affect the quality of the human environment.

ATTACHMENT G

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

FOTH REVIEW OF WILMINGTON HARBOR DLR AND DEIS FOR VBHI

MEMORANDUM

Foth Infrastructure & Environment, LLC
2618 Herschel Street
Jacksonville, FL 32204
(904) 387-6114

October 30, 2025

TO: The Village of Bald Head Island

FROM: Chris Creed, P.E.
Steve Howard, P.E.

RE: Review of Wilmington Harbor 403 Letter Report and Draft Environmental Impact Statement for the Village of Bald Head Island

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Foth Infrastructure & Environment, LLC has reviewed the Wilmington Harbor 403 Letter Report and Draft Environmental Impact Statement (DEIS) and identified deficiencies in engineering analyses and conclusions therein. Our review focused on potential effects from channel deepening and subsequent channel use by commercial ship traffic to areas of the Village of Bald Head Island's shoreline. Our specific concerns are related to shortcomings in the numerical modeling approach and an underestimation of the proposed project's contributions to shoreline erosion. In summary, several important points discussed in detail in this report are noted below:

1) The version of the Delft3D model applied in this study was not clearly stated in the DEIS, nor whether the same version was used consistently across all phases of the modeling effort.

2) According to the DEIS, wave-driven suspended and bedload sediment transport in Delft3D were disabled reducing total transport to only current components. Waves play a critical role in shaping morphology along the ocean-facing sandy beaches like those of Bald Head Island bounding the Cape Fear River Entrance. The omission of all explicit wave-related sediment transport terms in the Delft3D model was not explained and the calibration/verification procedures used to justify this decision was not detailed in the DEIS.

3) The model calibration and evaluation appear to emphasize channel shoaling, which may not represent sediment dynamics on adjacent shorelines unless sediment sources and alongshore transport rates for Bald Head and Oak Islands were explicitly computed and

used in the calibration. There is no clear documentation in the DEIS if this was performed.

4) The DEIS attributes channel shoaling variability largely to differences in dredge quantities. The DEIS also acknowledges that dredged quantities and measured shoaling rates are not directly comparable. There is no apparent attempt to distinguish between actual shoaling rates and one-off dredge events, and this conflation complicates interpretation of the model's predictive capabilities.

5) Based upon tabulated comparisons in the DEIS for the Inner Ocean Bar Channels in the vicinity of Bald Head Island, the model significantly overpredicts shoaling in the Smith Island reach and underpredicts shoaling in the Bald Head Island reaches—by as much as 2.9 times while the overall total shoaling volumes are similar. This indicates that similar total shoaling volumes may be coincidental rather than evidence of model accuracy. Such discrepancies risk misrepresenting the real-world sand distribution with significant inlet management implications.

6) The gravity-driven process of slope avalanching is of critical importance to the Village of Bald Head Island, given the proximity of the planned channel deepening to the shoreline. According to the DEIS, this functionality was implemented by using default values for the critical subaqueous slope parameter and time-dependent function. However, if this functionality was activated, one would expect significant slope modifications throughout model results, including along the navigation channel side slopes. Such slope modifications are not readily apparent in the DEIS results, as such it is not apparent if this functionality was correctly implemented in the model.

7) A primary objective of the DEIS was to quantify potential impacts to adjacent shorelines. However, the DEIS states *"Higher observed bed shear stresses suggest a potential for increased sediment resuspension and erosion, but no quantification of erosion rates or shoreline change is presented in this report."*, suggesting the investigation is incomplete.

8) The median grain size parameter (D50) is highly influential to morphological model results. However, different values for D50 were applied in the morphological model (0.22 mm) while significantly higher values were used for the evaluation of secondary ship wakes (e.g. 0.38 mm at "Bald Head Shoal 1"). This discrepancy for such an influential and easily verifiable model parameter was not explained.

9) The DEIS predicts shoreline impacts adjacent to the inlet using the one-line GenCade model. However, the application of GenCade in this context represents a severe oversimplification of the physical processes governing sediment transport in the areas of concern to the Village of Bald Head Island. Furthermore, the DEIS mischaracterizes prior work by other consultants to support a poorly

calibrated GenCade model. Specifically, sediment transport rates computed by GenCade are more than five and a half times lower than both the works cited and those derived from long-term beach profile monitoring. This discrepancy underscores the model's inability to reliably estimate sediment transport along Bald Head Island.

As presented in the DEIS, GenCade is not capable of accurately computing sediment transport in this setting and should not be relied upon for impact assessment or project design decisions affecting the Bald Head Island shoreline.

10) Additional observations on the DEIS which are not specifically related to numerical modeling are also included.

Wave-related Sediment Transport

According to the DEIS, the calibrated non-cohesive sediment transport model applied values of zero (0.0) to both the susW and bedW parameters. In a Delft3D coastal morphology model, setting these parameters to zero disables the wave-related components of suspended load (susW) and bed load (bedW) sediment transport. These parameters normally scale the magnitude of wave-induced transport formulations, where waves influence sediment dynamics through enhanced bed shear stress, orbital velocities, asymmetric effects, and interactions with currents. Under this calibration, the model ignores these processes and reduces total transport to current-only components, controlled by the analogous parameters sus and bed, which were each set to their default values of 1.0.

The coastlines bounding the Cape Fear River Entrance are ocean-facing sandy beaches where waves play a critical role in shaping morphology. With the published calibration, bed-level changes driven by wave propagation would be absent or substantially diminished. Instead, morphological updates rely solely on current-driven processes, making the simulations potentially suitable for current-dominated cases but inaccurate for combined wave-current systems. This approach may affect depth-integrated mass conservation and bed updating equations, potentially producing stable but unrealistic bed compositions or elevations over time.

The appropriateness of omitting all explicit wave-related sediment transport terms from modeling the physics governing morphological changes along Bald Head and Oak Islands was not explained in the DEIS. Additionally, a description of how the calibration and verification procedures justified this decision was not provided in the DEIS. It is unclear in the DEIS if wave-current interactions were represented through alternative mechanisms (e.g., eddy diffusivity or other coupling approaches) and how sensitivity analyses of these settings influenced predicted sediment transport along the beaches adjacent to the inlet.

Channel Shoaling

It appears that the model calibration and evaluation were focused primarily on shoaling rates within the navigation channel. However, depending on the origin of the shoal material, these rates may or may not reflect sediment dynamics along the adjacent islands. It is unclear in the DEIS if sediment transport rates along the shorelines of Bald Head and Oak Islands were computed or otherwise considered during calibration and verification.

The cited variability in channel shoaling is largely attributed in the report to differences in dredge quantities. By extension, model skill is assessed relative to these uncertainties. Yet, as acknowledged in Section B-9.5.2 (*Data Uncertainty*), dredged volumes and measured shoaling rates are not directly comparable metrics. Table 9-11 does not attempt to distinguish between actual shoaling rates and one-off dredge volumes, which complicates interpretation of model skill.

Further, based on Table 9-8 alone, the model significantly overpredicts shoaling in the Smith Island reach and, except for one data point, underpredicts shoaling in the Bald Head Island reaches—by as much as 2.9 times (Bald Head Shoal 2, relative to the 2015/16 condition survey). These discrepancies could lead to serious misinterpretations regarding sand distribution and inlet management, suggesting that similarities in total shoaling volumes may be more coincidental than indicative of model accuracy.

Finally, page B-207 states: *"The extents of the polygon used to extract sedimentation volumes should be carefully considered when interpreting modeled output."* How should a reviewer interpret this statement in the context of evaluating the polygon selection described in the report? Clear guidance on this point is essential for assessing the reliability of the reported sedimentation volumes.

Slope Avalanching

The Village has repeatedly requested that the modeling effort accurately consider the effects of slope avalanching resulting from dredging of the nearshore beach platform. The gravity-driven process of slope avalanching is of critical importance to the Village of Bald Head Island, given the proximity of the planned channel deepening to the shoreline. The most recent response to this request indicated slope avalanche was considered and directed us to review the relevant appendix in the DEIS document. Based on the information provided there, it appears the modelers attempted to activate subaqueous dune-front slumping within Delft3D.

According to the DEIS, this was implemented by specifying a critical subaqueous slope using the parameter WetSlope and a time function for resolving slope adjustments using AvalTime. Default values were applied, establishing a critical slope of 1V:10H (i.e., 0.2V:1H per the DEIS) and an AvalTime of one day (86,400 seconds).

These settings create a threshold in the model whereby wet slopes steeper than 1V:10H are automatically adjusted to the critical slope. If this functionality was active, one would expect significant slope modifications throughout the model domain, including along the navigation

channel side slopes. However, such erosion and sedimentation patterns are not readily apparent in the DEIS results. To initiate dune-slumping functionality in Delft3D, the parameter DuneAvalan must be specified in the input ".mor" file. The DEIS does not provide the full input files; therefore, evaluation of the incorporation of slope avalanche is hampered.

It is unclear in the DEIS if dune slumping was initiated nor what if any calibration and sensitivity-testing procedures were performed for these parameters. Specifically, missing was an explanation of how the default values were determined to be suitable for use, as they do not appear appropriate for the slopes present in the model domain or for the time frame required to resolve avalanching. There was no clarification as to the extent to which the critical slope criteria were applied to non-dune portions of the model. Sectional views of the modeled bathymetry were not provided which would illustrate both the calibration results and any slopes that were automatically adjusted based on these parameters.

Vessel Wake

Per page B-270, the report states: *"Higher observed bed shear stresses suggest a potential for increased sediment resuspension and erosion, but no quantification of erosion rates or shoreline change is presented in this report."* One of the essential objectives of this study was to quantify potential impacts to adjacent shorelines. This admission suggests the investigation is incomplete. The DEIS is unclear as to how discrete, project-related increases in bed shear stress predicted to influence sediment transport on the adjacent beaches.

The median grain size parameter (D50) is identified in the DEIS as being highly influential to morphological model results. Even small changes in median grain size are reported to significantly alter predicted sediment transport volumes. A D50 of 0.20 mm was selected for the morphological model, yet Table 11-22 applies higher values of D50 when evaluating erosion from secondary ship wakes (e.g., 0.38 mm at "Bald Head Shoal 1"). For reference, the median grain size of sand placed in the 2025 renourishment project was 0.36 mm. The DEIS does not explain why such substantial differences exist in a key and easily verifiable model parameter, and to what extent do larger D50 values reduce predicted erosion in the wake model.

Section B-11.3 concludes: *"These findings suggest the consideration of localized impacts is crucial when evaluating the feasibility and environmental implications of the alternative channel modifications."* It also states: *"Certain model domains, such as Fort Caswell and Bald Head Island, exhibit minimal differences in bed shear stress increases along shorelines, with small clusters of higher shear stress in specific regions where wave energy might be expected to concentrate."* These increases are described in the text as being on the order of 17% (p. B-266), although Table 11-5 indicates potential for larger increases at Bald Head 2 and Fort Caswell. If location matters in quantifying impacts, the report should not summarily dismiss all impacts as minimal without providing a clear, technical, and unbiased basis for that determination.

Moreover, Section 11.3 asserts without basis that impacts are minimal because increases in shear stress are less than 0.5 lbf/ft². However, Table 11-17 cites critical shear stress values ranging from 0.003 to 0.006 lbf/ft² for grain sizes used in the morphological and wake models.

The predicted changes exceed these critical values by more than two orders of magnitude, yet no quantification of erosional potential is provided. There is no explanation in the DEIS for the rationale for describing these predicted increases as minimal and quantify the resultant erosion. The investigation is incomplete without these results.

Use of GenCade

The DEIS evaluates potential impacts to the oceanfront shorelines of Oak Island, Caswell Beach, and Bald Head Island using the one-dimensional shoreline change model GenCade. While GenCade accounts for changes in the incident wave climate, it does not incorporate several critical physical processes that govern sediment transport along Bald Head Island. These omitted processes include:

- Inlet morphodynamics
- Wave-current interactions
- Sediment scour, resuspension, and deposition within the channel
- Morphological feedback mechanisms

The exclusion of these processes represents a significant oversimplification of the sediment transport system in this region.

Additionally, the GenCade model calibration utilized a median sediment grain size of 0.25 mm, which differs from the values used in other modeling efforts: 0.20 mm in the Delft3D model and 0.38 mm in the ship wake analysis. The DEIS does not provide a rationale for this inconsistency in a key model parameter. The GenCade model was subsequently used to estimate sediment transport rates along Bald Head Island and reported the following (DEIS p. B-163):

> *"Based on the modeling, there is a net westerly transport of 50,000 cubic yards per year toward the Cape Fear River and a net easterly transport of 300,000 cubic yards per year."*

These results are presented in Figure 8-6 of the DEIS, reproduced below. Based on the narrative in the DEIS (partially quoted above), positive values represent westerly directed transport while negative values reflect easterly directed sediment transport. The magnitude and direction of sediment transport shown in the graph appear to be consistent with the referenced narrative from the DEIS.

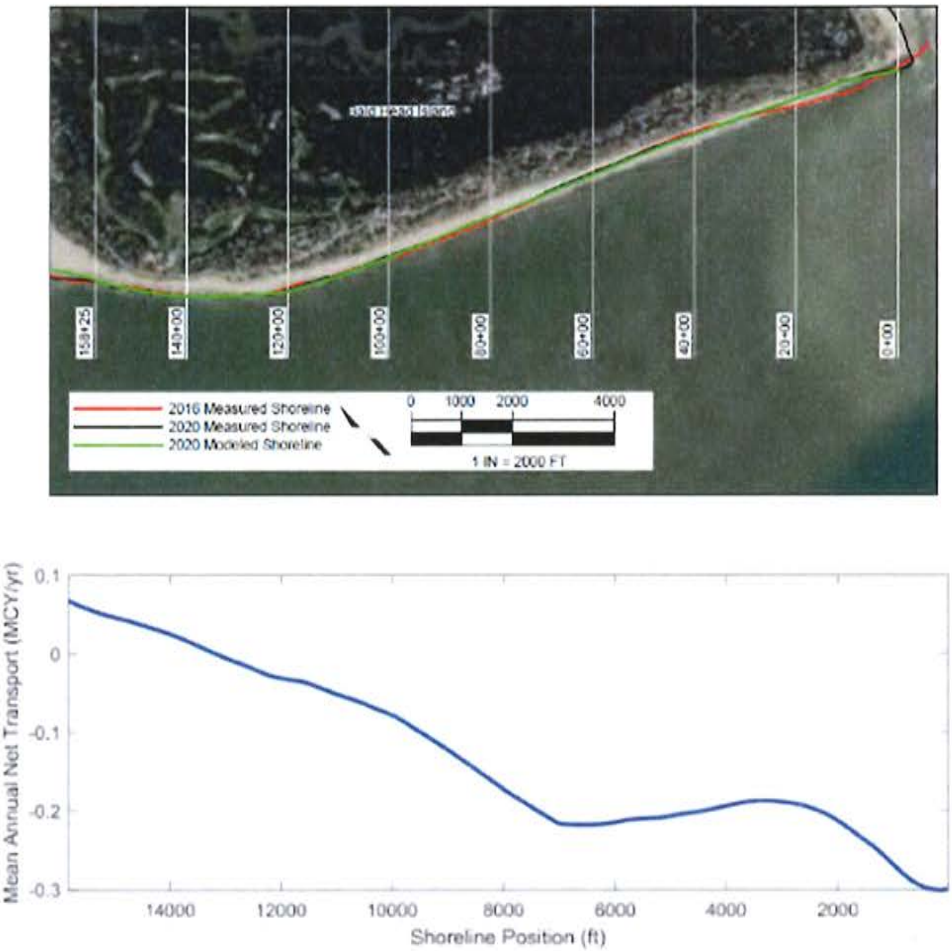


Figure 8-6 Modeled net annual sediment transport along BHI.

Location map from DEIS Fig 8-5 (above) and sediment transport from DEIS Fig 8-6 (below).

The DEIS references a prior study by Olsen Associates, Inc. (2012[1]) as supporting this magnitude and pattern of transport. However, this citation is inaccurate. The Olsen report describes measured sediment transport along the western portion of Bald Head Island as being directed westward, with rates "*ranging between -278,200 and -355,600 cy/yr, based on best-fit analysis of available data* (Olsen Associates, 2012, p. 95)". These

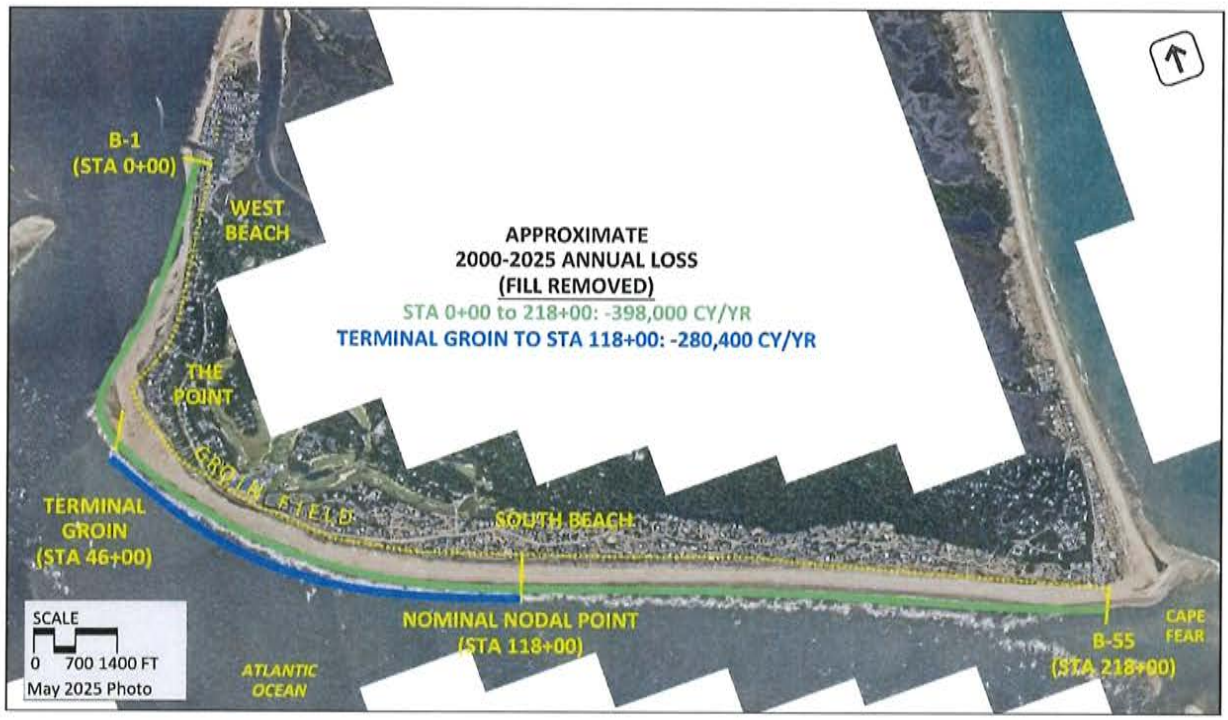
[1] Olsen Associates, Inc. (2012). Calibration of a Delft3D model for Bald Head Island and the Cape Fear River Entrance, Phase I. Prepared for the Village of Bald Head Island, North Carolina.

estimates do not account for the influence of the terminal groin, yet they still differ significantly from the published GenCade result of 50,000 cy/yr directed westward.

Further, the 2025 Physical Monitoring Report for the Bald Head Island renourishment project, prepared by Foth Infrastructure & Environment, LLC[2], provides updated long-term sediment transport estimates. Using survey data from November 2000 through May 2025, the report concludes that measured net transport along western Bald Head Island averages 280,400 cy/yr over the last 25 years. For reference, the following figures are excerpted from the 2025 monitoring report. The blue dashed line represents measured sediment transport rates from the terminal groin to STA 118+00, while the black line reflects the full monitored shoreline.

The sediment transport rates computed by GenCade are more than five and a half times lower than those derived from long-term beach profile surveys. As presented in the DEIS, the GenCade model is not capable of accurately computing sediment transport along Bald Head Island and should be deemed unreliable in terms of assessing impacts to said shoreline.

[2] Foth (2025). "Village of Bald Head Island; Beach Monitoring Program, Report No. 23 (April 2024 to May 2025)", Report Prepared for Village of Bald Head Island. Foth Infrastructure & Environment, LLC, 2618 Herschel St., Jacksonville, FL 32204. 62 pp plus app. (November 2025, not yet published).



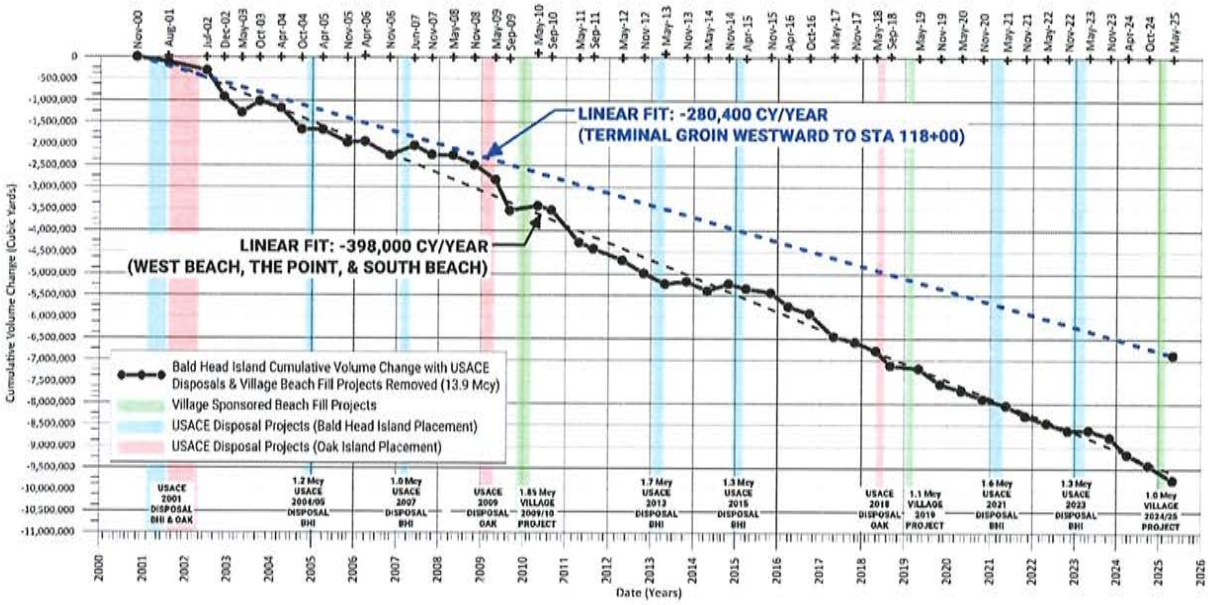


Figure 1: Cumulative volume change along Bald Head Island West Beach, the Point, and South Beach shorelines (above -16 ft-NGVD) through time relative to November 2000 conditions, excluding nourishment events.

Location map (above) and sediment transport rates (below) along Bald Head Island as reported in Foth (2025, to be published).

Additional DEIS Observations Not Directly Related to Numerical Modeling

1. Channel width expansions have been incorporated into the proposed next deepening project that expand federal navigation channel into naturally deeper waters. For example, the Smith Island Range will be expanded from 650 ft to 900 ft. This was an obvious shortcoming of the last deepening project which resulted in additional annual maintenance dredging. This will likely reduce both the frequency and volume of sand periodically dredged from the channel to maintain authorized conditions. This will potentially reduce the quantity of sand available for distribution to the adjacent island beaches.

2. Coincident with the probability of reduced dredge volumes and/or less frequent maintenance dredging for the 3 inner bar channel reaches of interest, the DEIS does not speak to how this will impact the tenets of the existing Wilmington Harbor Sand Management Plan ("WHSMP"). Rather, it generally speaks to sand disposal placement along the adjacent shorelines being "similar" to existing practices following Project implementation. However, the DEIS designated disposal area on Oak Island continues to extend beyond the western limit of the Town of Caswell Beach, or the littoral drift nodal point on Oak Island (ref: Appendix D, page 36). Sand placement west of the nodal point will be detrimental to the Cape Fear River Inlet sediment budget. This is a continuation of the District's current operational plan for sand placement on Oak Island which is not consistent with the intent and tenants of the WHSMP. As such, this approach defeats the mitigation aspect of the Federal Project by not ensuring that sand placed on the two barrier island beaches moves back toward the mouth of the Cape Fear River. Rather, sand placed beyond the nodal point will move westward away from the river mouth and not be available for future mitigative sand placement along the VBHI and CB shoreline, which is contrary to the WHSMP.

3.During the 2000 channel deepening & widening project which included realignment through Jay Bird Shoal, significant beach quality sand was encountered and placed on the two barrier island beaches. Although the DEIS cites the predicted project related to dredging of some 5.8M cy of beach quality sand, it is expected that only 2.3 M. cy is available for beach disposal (Ref: Appendix D, page 36). Where the bulk of the remaining sand goes is not explained. It is noted that the District is modifying the WH ODMDS to now include a corner segment to be used for the dumping of "beach quality" sand for future possible access and reuse via hopper dredge (Ref. Appendix P, pages 54-55). This potentially implies that quantities of beach quality sand will not necessarily be returned to the barrier island beaches but rather dumped offshore by hopper dredge and possibly available as beach fill along beaches that are not directly adjacent to the Cape Fear River Inlet. This would violate the intent and agreement of the SMP. Moreover, this could impact future maintenance material, further reducing sand available for placement along the VBHI and CB shorelines.

4. In Appendix B it is acknowledged that the USACE consultant Stantec interfaced with M&N (the prior Section 203 Report author and consultant to the W.H. Port Authority) and essentially adopted the M&N model setups, grid files, bathymetry, spatial parameters, boundary conditions, etc. This is tantamount to their utilizing the same DELFT3D hydraulic model, ship wake model, etc. Most protocols analyzing project impacts, or lack thereof, were similarly adopted. Hence, the DEIS report findings are anything but independently derived.

Stantec likewise adopted the results of the simplistic GENCADE 1-D shoreline evolution model performed by the District several years ago which were shown to be erroneous when compared to the more sophisticated littoral transport modeling. The latter VBHI sponsored DELF3D modeling was associated with the permitting of a terminal structure on BHI bordering the subject navigation project— and as such included detailed site-specific littoral transport analyses of sand transport rates toward the Cape Fear River at both Caswell Beach and South Beach at Bald Head Island. Interestingly those analyses computed the ratio of annual littoral contributions from the two barrier islands to the inlet at a ratio of 4.7:1. This finding contrasts with the 2:1 ratio adopted by the Wilmington District in the WHSMP in approximately 1999, at which time the District Commander also said that the Plan would be adjusted as necessary, based on monitoring results. No adjustments have been made. The discrepancy between an appropriate and equitable ratio of sand management viz. disposal of beach quality maintenance material has been well substantiated. More recently, a more current estimate (based upon recent comprehensive beach surveys) of the ratio between littoral contributions could be as high as 7:1.

The adopted 2:1 ratio for the location of episodic disposal of dredged channel maintenance sand from the 3 inner ocean entrance channel segments has been a subject of debate since its inception. That is to say, the littoral transport rates proffered by the federal feasibility study prior to construction in 2000 (ref: Tech Report CHL 99-18) are clearly technically unsupportable and contrary to ongoing dredge records, as well as observed shoreline erosion rates at Caswell Beach and BHI.

The net result of this inequity has manifested itself in an ongoing lack of appropriate mitigation of the channel project's historical impacts and the requirement for the VBHI to expend over $70M for beach erosion control since the 2000 Harbor Deepening Project. Conversely, the Town of Caswell Beach at the eastern end of Oak Island has expended zero dollars on inlet related impacts over the same period of time. This ongoing fiscal discrepancy is directly attributable to the imbalance of maintenance sand sharing erroneously codified and subsequently implemented by the District's interpretation of the original Wilmington Harbor Sand Management Plan.

References

Foth (2025), "*Village of Bald Head Island; Beach Monitoring Program, Report No. 23 (April 2024 to May 2025)*", Report Prepared for Village of Bald Head Island. Foth Infrastructure & Environment, LLC, 2618 Herschel St., Jacksonville, FL 32204. 62 pp plus app. (November 2025).

USACE (1999), "*Wave Climate and Littoral Sediment Transport Potential, Cape Fear River Entrance and Smith Island to Ocean Isle Beach, North Carolina*" Technical Report CHL-99-18, U.S. Army Corps of Engineers (September 1999).

ATTACHMENT H

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

BALD HEAD ISLAND CONSERVANCY

INITIAL SCOPING COMMENTS

30 JUNE 2023



Bald Head Island Conservancy
PO Box 3109
700 Federal Road
Bald Head Island, NC 28461

June 30, 2023

Ms. Chrisa Waite, Public Involvement Specialist
USACE Wilmington District
69 Darlington Avenue
Wilmington, NC 28403
Attn: Wilmington Harbor 403

Dear Ms. Waite,

We are writing on behalf of Bald Head Island Conservancy, a 501(c)(3) nonprofit organization on Bald Head Island, NC (BHI), to relay concerns and share information about the Wilmington Harbor Port Expansion Project during this Scoping Period of the 403 Process. Our organization has focused on our mission to Discover, Learn, Conserve, and Preserve Bald Head Island for 40 years. We specialize in sea turtle nesting biology and barrier island conservation, and conduct a number of environmental monitoring projects and studies on behalf of the Village of Bald Head Island. Our staff includes specialists in marine and environmental science (3 PhD level, 1 MS, 1 BS), and we collaborate closely with state and federal conservation organizations and academic institutions throughout North Carolina and the region. Our education and outreach programs serve the Brunswick and New Hanover county populations beyond just BHI; for example, all sixth graders in Brunswick County (~1,000 students) experience a field trip to BHI each year, and overnight summer science camps are offered to underserved Wilmington youth.

The goal of this letter is to share potential impacts of the Port Expansion project that should be considered fully during the 403 process, and to also offer data and resources to the project as needed. Bald Head Island, at the mouth of the Cape Fear River adjacent to the current Cape Fear channel, is in a vulnerable location relative to this proposed project. Bald Head Island also consists of rare and special ecosystems that should be preserved and protected at all costs. We are also concerned about river-wide impacts that have been more broadly discussed already, which would undoubtedly affect the natural resources throughout the entire watershed, including BHI.

Specifically, our concerns include:

- **Impacts of channel deepening to sediment dynamics at the river mouth.** Erosion of BHI beaches and sediment movement from east to west (from BHI's south and west

beaches to the river channel) were severely underestimated during the 2000 channel realignment. Sediment fluxes along BHI's incredibly dynamic south and west beaches need to be carefully measured, and a fine-scale 3D model of sediment movement at the river mouth should be constructed, using *current* and *location-specific* data. This is a complex and vulnerable area and great care should be taken to be as accurate as possible with predicted impacts. Further impacts of erosion include:

a. Loss of beach nesting habitat for listed species of concern, including Loggerhead, Green, and Kemps Ridley sea turtles, and shorebirds such as Least Terns, American Oystercatchers, and Wilson's Plovers. Tides/storms have been the largest threats to BHI sea turtle nests over the past 5 years, and these impacts are also expected to increase with climate change and sea level rise.
b. Impacts of erosion and beach loss to individual home and business owners and the local and state economy
c. Increasing vulnerability of barrier islands (BHI, Oak Island) and other coastal communities to climate change related sea level rise and predicted increased storminess
d. Impacts of erosion and sediment dynamics on back-barrier creeks and marshes, including tidal flushing and water quality

- **Impacts of channel deepening to the freshwater aquifer.** A location-specific 3D model of aquifer-surface water dynamics should be created, including scenarios for channel deepening/widening at different potential depths, and the impacts of sea level rise. This model should include impacts to the Castle Hayne aquifer, but also interactions with specific semi-confined aquifers on barrier islands. Model should also include scenarios for changes to riverine tides and salinity that will result from changes to the hydrogeography.
    a. Saltwater intrusion is already occurring on BHI's west and south beaches. Further encroachment of salinity caused by channel deepening/widening will reduce the size of BHI's only freshwater source to island ecosystems
    b. BHI's maritime forest (Bald Head Woods Coastal Reserve) is fed by this aquifer, is the second-largest maritime forest in the state, is considered a globally-imperiled forest subtype, and is protected by the NC Natural Heritage Program. Several listed plant species are found on BHI.
    c. Loss of a drinking water resource to the public. Most of BHI's drinking water is groundwater-derived. The Village of BHI has invested in careful environmental monitoring and study of responsible water use to not impact natural resources on the island.
    d. Loss of/salinization of freshwater wildlife habitat. The freshwater ponds and lagoons fed by the aquifer are home to one of the largest breeding populations of protected American alligators in the state, and also provide important roosting and feeding grounds for a variety of waterbird species.

- **Impacts of dredging and increased shipping on wildlife and fisheries.** The initial impacts of increasing channel depth and width will be substantial. It is currently unknown how often channel maintenance dredging will occur, but we expect that it will need to occur more often and for longer periods than currently.

a. Already, channel maintenance dredging kills or injures numerous sea turtles and shorebirds each year. BHI Conservancy leads emergency wildlife response on the island, and we spend hundreds of hours each year transporting and providing care for animals hit by boats or caught in dredging equipment (those that survive the initial injury). These animals are also cared for by nonprofit organizations such as Sea Biscuit Wildlife Shelter and the Karen Beasley Sea Turtle Hospital, who rely solely on donations for support.
b. The lights and noise from dredging equipment can disturb and change behavior of foraging and nesting sea turtles. We have observed this directly causing false crawls and misorientation of emerging hatchlings.
c. Dredging has immediate impacts on the benthic environment, including benthic invertebrates that provide the forage base for sea turtles and important fisheries species. Increasing the magnitude, geographic scale, and frequency of this dredging will have longer-lasting effects throughout the food chain, and impacts on the fisheries economy in the Cape Fear watershed.

- **Impacts throughout the Cape Fear River and watershed.** The Port of Wilmington is 28 miles from the Atlantic Ocean, which is 28 miles of direct impact to the river. Other regional ports such as Savannah (18 miles) and Charleston (5.5 miles) have shorter distances to the open sea. The scale of hydrodynamic impacts of a project of this size cannot be underestimated. Our concerns include:
  a. An estimated 32 million cubic yards of dredge material will need to be transported and disposed of, not including maintenance dredge materials.
  b. Placement location of dredge spoil material and quality of the material
  c. Potential contamination of dredge spoil and impacts of this on water quality (heavy metals, methyl mercury, PFAS)
  d. Large scale of perturbations and fluidization of the seabed, and impacts on biogeochemical cycling
  e. Exacerbation of existing acceleration of sea level rise in the Cape Fear Watershed
  f. Erosion, flooding, and salinization impacts to marshes and wetlands, including the Bald Head Island/Smith Island Complex. Eroding marshes bordering developed areas will have no space to migrate, and marsh loss due to sea level rise may be accelerated. Marshes provide buffer to storm surge, habitat to wildlife and fisheries species, water filtration, and carbon sequestration benefits.
  g. Increased flooding impacts to vulnerable areas and resources which have already been stressed by Hurricane Florence, PFAS contamination, and are not fully recovered (e.g., residential areas in downtown Wilmington and Brunswick County, wastewater treatment facilities).

We urge you to fully consider the potential impacts of this proposed project by collecting the necessary scientific data and allowing adequate input from local and regional experts and the public to make an informed decision. We would be glad to provide data we have already collected if it can be of use, or partner with the USACE to collect future data or samples on Bald Head Island as part of the NEPA process.

Available datasets:

- Bald Head Island Sea turtle nesting (1983-present), including annual trends, locations, and impacts of erosion/washover/disturbance on nesting and hatching
- Bald Head Island aquifer volume (2009-present) and water quality (2014-present)
- Bald Head Island aquifer modeling study (Dr. Peter Zamora, 2021)
- Bald Head Creek water quality (2012-present)
- Bald Head Island Bird monitoring (2015-present)
- Bald Head Woods Coastal Reserve maritime forest study (Dr. Jodi Forrester, 2020)
- Bald Head Island alligator population monitoring (2007-present)
- Bald Head Creek siltation and sediment characteristics (2018-2019)
- Bald Head Island wildlife emergency response (2020-present)

Thank you for considering our concerns.

Sincerely,

Elizabeth S. Darrow, Ph.D.
Chief Scientist
Bald Head Island Conservancy
910-338-0942
darrow@bhic.org

G. Christopher Shank, Ph.D.
Executive Director
Bald Head Island Conservancy
910-338-0910
shank@bhic.org

ATTACHMENT I

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

E-MAILS REGARDING PUBLIC PARTICIPATION IN NED

Bill Cary

From: Walters, Bret L CIV USARMY CESAW (USA) <Bret.L.Walters@usace.army.mil>
Sent: Monday, July 22, 2024 5:20 PM
To: Bill Cary
Cc: Hill, Suzanne CIV USARMY CESAS (USA); Charles S. Baldwin, IV; Chris McCall; Stolba, Andrea M CIV USARMY CESAW (USA)
Subject: RE: Wilmington Harbor 403
Attachments: 10-R-4_NED_DeepDraft.pdf

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Mr. Cary,

Thank you for your message and the conversation at the meeting last month. We have considered your request for detailed information. The information you are asking for is too preliminary to share at this stage of the process. The analysis and documentation currently being developed will be refined substantially over the next several months and incorporated into the draft report and provided for public review, with a public comment period in the Fall of 2025 (a little over a year from now).

Please see the attached US Army Corps of Engineers' Institute for Water Resources' National Economic Development Manual for Deep Draft Navigation. This manual describes accepted economic analysis procedures for deep draft navigation projects and describes the fundamentals of containership analysis. The analysis for the Wilmington Harbor 403 Letter Report and Environmental Impact Statement will follow the guidance in this manual.

I hope this helps.

Bret Walters
Chief, Planning and Environmental Branch
Wilmington District, US Army Corps of Engineers
(910) 251-4505 (desk)
(910) 690-0852 (cell)

From: Bill Cary <BCARY@brookspierce.com>
Sent: Thursday, June 27, 2024 2:02 PM
To: Walters, Bret L CIV USARMY CESAW (USA) <Bret.L.Walters@usace.army.mil>
Cc: Hill, Suzanne CIV USARMY CESAS (USA) <Suzanne.Hill@usace.army.mil>; Charles S. Baldwin, IV <CBaldwin@BrooksPierce.com>; Chris McCall <cmccall@villagebhi.org>
Subject: [Non-DoD Source] Wilmington Harbor 403

I am writing on behalf of the Village of Bald Head Island to ask that the more detailed Project economic justification and analyses currently being prepared can be shared prior to the July 22. 2024 deadline for NEPA initial comments. I note that the ASACW Review Assessment (A-4, C-4, C-6, and C-8) is critical of the 203 assumptions and analysis and requires a new analysis, which your team is apparently undertaking, and you have shared some initial observations in the public sessions. If the 203 had originally done a thorough and well-founded analysis, the NEPA public comments would be informed and could focus on analytical concerns and make suggestions for additional study, but we are currently shooting largely in the dark. Our (the Village of Bald Head Island) 203 Scoping Comments specifically asked that this

process be opened up to public involvement (since the public was unable to meaningfully participate in the 203, as explained in those comments), but that was apparently not feasible.
We ask that the new analyses be shared in detail now (even if still in draft) so that meaningful comments can be made prior to the current deadline for consideration during the NEPA process, **before** the Draft EIS is prepared. Alternatively, we ask that once the analyses are available, they be provided and an additional comment period be allowed. Meaningful public comment, which will require study and review of the analysis, should be received before the Draft EIS is prepared. Thank you for your consideration to this request.

Bill

Bill Cary

BROOKS PIERCE

t: 336.271.3115
f: 336.232.9115

2000 Renaissance Plaza
230 North Elm Street
Greensboro, NC 27401
P.O. Box 26000 (27420)

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ATTACHMENT J

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

E-MAILS REGARDING COMMENT PERIOD EXTENSION

Bill Cary

From: McCorcle, Justin P CIV USARMY CESAW (USA) <Justin.P.Mccorcle@usace.army.mil>
Sent: Monday, October 27, 2025 4:23 PM
To: Bill Cary; Daniel F. E. Smith; Charles S. Baldwin, IV; Jayant Joshi
Cc: Nygren, John T CIV (USA); Stolba, Andrea M CIV USARMY CESAW (USA); Fiocchi, Elizabeth C CIV USARMY CESAW (USA); Morgan, Brad A COL USARMY CESAW (USA); Walters, Bret L CIV USARMY CESAW (USA)
Subject: FOIA Interim Response and Comment Extension
Attachments: WH 403 Public Econ IPR Nov 2024 - Presentation with Notes.pdf

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Messrs. Cary, Baldwin, Smith, and Joshi,

This is an interim response to FOIA request 26-012, related to the economic data supporting the Wilmington Harbor 403 Draft EIS and Letter Report. Much of that data is derived from others and likely will not be able to be made available, as further detailed below:

1. We have in our possession seven documents derived from the NC State Ports Authority, potentially exempt under Exemption 4, which covers trade secrets and commercial or financial information obtained from a person or corporation that is privileged or confidential. Four of those appear to be economic forecasts for industries which may utilize waterborne commerce, two are documents related to port expansion or re-design, and one is a set of notes from interviews held with the Ports and its customers. We have sent these documents to the NCSPA for its review and potential objection to release.
2. The author of our Economics Chapter and Appendix obtained the data used to create his forecasts from several subscription or proprietary sets of data, which he signed Non-Disclosure Agreements (NDAs) in order to access. These include documents from our license agreements with IHS-Fairplay, Lloyds Registry-Fairplay, and S&P Global, as well as government databases or applications to include commerce statistics from the US Census Bureau, the USACE Waterborne Commerce Statistics Center, and the Institute of Water Resources (IWR) Deep Draft Vessel Operating Cost (DDVOC) database. This data is not releasable subject to these non-disclosure agreements and licensure restrictions. We are working with our Deep Draft Navigation Center of Expertise (DDNPCX) and our respective experts at the IWR to more thoroughly describe these restrictions, but it appears unlikely at this time that there will be much releasable data.

I have attached to this request a presentation prepared by our Economist to help explain his analysis. The presentation was accurate as of the date it was made, but we caveat that the report will continue to evolve as the data evolves.

As you have also requested an extension of time for comments on the DEIS, I wanted to extend to you on behalf of the Commander an extension for comments for your client, the Village of Bald Head Island, commensurate with the time your request was under review up to this point. Accordingly, **we will extend the comment period for your client two weeks, until November 17, 2025.** It is recommended that you seek some of the subscription/license services listed above for your own access to their data, as it does not appear to be within our authority to grant it to you.

Respectfully,

Justin P. McCorcle
District Counsel
USACE, Wilmington District
69 Darlington Avenue, Wilmington NC 28403
Office: (910) 251-4699
Cell: (910) 366-3822

ATTACHMENT K

VILLAGE OF BALD HEAD ISLAND COMMENTS

3 NOV. 2025

CORRESPONDENCE WITH USACE REGARDING 2025 MAINTENANCE DREDGING

Attachment	Description
K-1	Letter dated June 20, 2025, to Corps and Contractor regarding Contract No. W912PM25CA005.
K-2	Letter dated June 30, 2025, from Justin P. McCorcle.
K-3	Letter dated July 18, 2025, to Justin P. McCorcle regarding Dredging Contract.
K-4	Letter dated September 4, 2025, from Justin P. McCorcle responding to WPHC

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2000 Renaissance Plaza
230 North Elm Street
Greensboro, NC 27401

T 336.373.8850
F 336.378.1001
www.brookspierce.com

June 20, 2025

Colonel Brad A. Morgan
District Commander
Wilmington Regulatory Field Office
69 Darlington Avenue
Wilmington, NC 28403
brad.a.morgan@usace.army.mil

Norfolk Dredging Company
110 N. Centerville Turnpike
Chesapeake, Va. 23220
Attn: Michael Haverty
mhaverty@norfolkdredging.com

Re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

Dear Colonel Morgan and Mr. Haverty,

As counsel for the Village of Bald Head Island ("VBHI"), we have been asked by our client to submit this letter in light of the recent Notice of the above Contract, which Notice indicates that sand from this year's maintenance dredging of the Wilmington Harbor Chanel will "be strategically placed to nourish the beaches of Oak Island (Town Caswell Beach and Town of Oak Island)." *See* Attachment 1. **Placement of such sand on any beaches other than Caswell Beach or VBHI would be a violation of the existing terms of the Wilmington Harbor Project (WHP), authorized in 2000**. The purpose of this letter is to alert you to the existing restrictions on sand placement and to seek assurance that the Contract's Placement Plan (Section 1.7.2) will comply with the WHP.

A. Summary

VBHI opposes any placement of sand dredged pursuant to the Contract on the beaches of the Town of Oak Island (TOI), west of Caswell Beach, as indicated in the Notice. The placement of sand removed from the Cape Fear River Wilmington Harbor Channel onto TOI beaches will remove that sand from its natural sand-sharing system and place it in a different littoral cell, to the permanent harm of VBHI as part of the originating system and in violation of the terms of the WHP's underlying Environmental Assessment (EA), discussed below. In particular, the EA addressed concerns over the WHP's adverse effects to the **adjacent** beaches and incorporated a Sand Management Plan (SMP) to assure displaced sand would remain in the same littoral system. The ultimate Finding of No Significant Impact (FONSI) specifically relied on and affirmed the SMP as an integral part of the necessary conclusion of no significant environmental impact. The proposed recipient TOI beaches are outside that littoral system and are not part of the SMP. Moreover, the proposed work will endanger VBHI infrastructure, will disrupt the regular maintenance schedule and re-nourishment of the beaches impacted by the WHP, and will exacerbate damage to those beaches and the VBHI infrastructure.

B. Background and VBHI Interest

1. Geography

VBHI is situated on Bald Head Island, North Carolina, at the mouth of the Cape Fear River. Bald Head Island is directly adjacent to and eastward of the Wilmington Harbor Channel, a federally maintained navigation channel that connects the port city of Wilmington to the Atlantic Ocean. Immediately to the west of the Channel at this point is the eastern tip of Oak Island, on which is situated Fort Caswell and Caswell Beach. The central and western portion of Oak Island, abutting Lockwood Folly to the west, is the Town of Oak Island (TOI). A stretch of the Channel is situated directly between Bald Head Island (to the east) and Caswell Beach (to the west). As the stretch of the Channel between Bald Head Island and Caswell Beach is periodically dredged, it gradually is refilled with sand eroding from those two **adjacent** beaches in what is sometimes referred to as a sand sharing system between two littoral cells. Caswell Beach and Bald Head Island, being immediately adjacent to the Channel, are directly affected by the dredging and maintenance of that Channel and are integral components of that littoral system. The TOI beaches comprise a distinct littoral cell and are not part of the Bald Head Island-Caswell Beach sand sharing system.

2. Historical Impacts

VBHI has a long history of having to endure and respond to the impacts of the Corps' historical deepening and realignment of the Channel. The Channel was deepened in 1976 and several times subsequently. As part of the 2000 WHP, the section of the Channel directly adjacent to Bald Head Island was reoriented closer to the Island, widened, and deepened by approximately four feet (40 to 44 feet).

Since those Channel alterations, Bald Head Island's beaches have experienced accelerated erosion, which has resulted in destabilization of the Island's nearshore environs and increased incident wave energy immediately adjacent to the Island. In effect, the sand of Bald Head Island shores is both sliding into the Channel and being swept away by increased tidal forces. Despite the assurances in the Environmental Assessment (EA) of the WHP, the Channel alterations have caused dramatic increases in erosion and sand volume loss on and near Island beaches—as VBHI's consultant had projected. Faced with an ongoing sand budget deficit, VBHI has taken a number of actions to mitigate or minimize impacts of the prior Channel alterations and protect its beaches, critical habitats,[1] infrastructure, and residents. VBHI's actions since 1995 have included permitting and constructing a terminal groin at the point of the Island (adjacent to the Channel); constructing and periodically replacing the sand-filled geotextile tubes in the groin field behind the terminal groin; and, undertaking two storm mitigation re-nourishment projects to replenish lost sand on the Island's western and southern beaches. The costs incurred by VBHI to plan, permit, and implement mitigation measures are over $69 million, as shown on Attachment 2 hereto—and are ongoing.

While the SMP designates the Town of Caswell Beach as the recipient of the sand dredged in this year's cycle, VBHI is nevertheless harmed if, instead, sand is diverted to any other beach, as documented in the EA and SMP.

C. The EA and the SMP

Sand losses from the adjacent beaches were anticipated during the planning and implementation of the 2000 WHP, and the SMP was incorporated into the project's required Environmental Assessment (EA). The goal of the SMP was that the displaced "sand should be retained within the active coastal sand system". EA, §1.03, p. 3.

> The sand management plan (Appendix A [to the EA]) for the deepened Wilmington Harbor project **requires** that **all** beach-quality maintenance material **be returned to the adjacent beaches**. This will result in enhancement of the regional sediment budget.

[1] The subject beaches are nesting areas for endangered turtles and birds, as discussed in the EA.

Id., §5.01, p. 27 (emphasis added). This requirement is the result of the fact that:

> Natural supplies from rivers and streams are not replenishing littoral sediments, particularly on the East Coast of the United States. Thus, the **removal of a cubic yard** of littoral sediment from a tidal entrance or inlet with deposition outside the active littoral zone of the beach **will ultimately cause a cubic yard deficit** somewhere within the sand sharing system affected by that particular entrance or inlet.

SMP, ¶ 20, pp. 9-10 (emphasis added). Such removal has been identified by the Corps as "a major cause of man-induced erosion." *Id.*

> From an engineering perspective, **the primary requirement** for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to **prevent project induced erosion of the adjacent beaches** by conserving the limited resource, sand, **through deposition directly on the adjacent beaches**.

Id. (emphasis added). The SMP finds that 66% of the sediment shoaling at the Channel entrance comes from Bald Head Island, and 34% from Caswell Beach. *Id.*, ¶ 22, p. 10.

> In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel **will be placed back on the beach from whence it came**.

Id. (emphasis added). To be clear, the placement will be on "Bald Head Island" and "on East Oak Island-Caswell Beach beginning at a point just east of the Carolina Power and Light cooling water discharge canal." *Id.* TOI is west of the canal.

These protections for the Bald Head Island-Caswell Beach littoral system did not happen accidentally. VBHI had engaged a coastal and oceanographic engineering expert, Erik J. Olsen, to study the historical effects of Channel deepening projects and the potential impact of the 2000 WHP. His analyses, as well as the Corps' studies as part of the Environmental Assessment of the WHP, concluded there would be severe impacts to the beaches adjacent to the Channel.

In response to the concerns raised, the Corps Wilmington District Chief Engineer, Col., James DeLony, sent a letter assuring the local mayors that sand placement will be "according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to [VHBI]...." DeLony Letter, June 9, 2000, p. 2. Attachment 3. More specifically, he stated:

> The disposal of **all beach quality dredged material** will be accomplished in **accordance with** the Environmental Assessment [...dated February 2000] and its **Sand Management Plan....**"

Id. p. 3. Because the WHP required the State of North Carolina to conduct its own consistency review under the Coastal Zone Management Act, the NC Department of Environment and Natural Resources (now, NC Department of Environmental Quality), Division of Coastal Management, conducted that review and raised serious concerns about impacts to the sand systems. The final State determination states:

> **Based upon** our review of **the EA** [Environmental Assessment] **and the Corps of Engineers' response to comments [the DeLony Letter]**, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, **provided that the project is performed according to the EA (including the Sand Management Plan** and other appendices)...[and other conditions stated therein].

Letter from Donna Moffitt, Director, NCDENR/DCM, June 15, 2000 to Col. DeLony, USACE District Engineer, p. 2 (emphasis added). Attachment 4.

The Corps then issued its Finding of No Significant Impact (FONSI), relying specifically on the Moffitt Letter and its incorporation of the assurances in the DeLony Letter: "We will comply with the indications in the [Moffitt] letter." FONSI, § 3.00, p. 5.

Thus, the final North Carolina consistency determination, the EA, and the FONSI were *specifically conditioned* on the Corps complying with the SMP to maintain sand in the littoral system by placing it on the **adjacent** beaches—Bald Head Island and Caswell Beach.

D. Proper Use of Contract-dredged Sand

To meet the goals of the SMP, sand should not be placed westward of the "nodal point" on Caswell Beach, where the directionality of net littoral transport changes from east to west. As defined by the Corps and as validated by Delft 3-D modeling, that point has historically been understood to be approximately at the nuclear Powerplant channel and outfall. Because erosion experienced at Caswell Beach has been less than been forecast by the SMP (and greater at Bald Head Island), the sand this year is apparently not needed at Caswell Beach and hence the suggestion to place it on TOI beaches. If the current dredging Contract will produce more sand than Caswell Beach needs or can accept, the alternative contemplated in the SMP, as

stated in Colonel DeLony's letter, is to adjust the placement to reflect the actual impacts by placing excess sand on the VHBI beaches. The sand from the Smith Island range (closest to Caswell Beach) could be placed on Caswell Beach while the sand from the remaining two sections closest to Bald Head Island could be placed on Bald Head Island. Because of the immediate proximity, there should be no incremental cost. If there is, VBHI is open to discussing bearing that cost.

E. The Contract As Described in the Notice Would Violate 33 USC § 408

The 2000 WHP, including on-going maintenance of the Channel to assure efficacy of that Project (*i.e.*, navigability), is an "authorized project" which cannot be interfered with:

> It shall not be lawful for **any person ... to take possession of** or make use of for any purpose, or ... alter, deface, destroy, move, injure, ... **or in any manner whatever impair the usefulness of any ... work built by the United States**, ... in whole or in part, for the preservation and improvement of any of its navigable waters or to prevent floods, or as boundary marks, tide gauges, surveying stations, buoys, ... **nor remove for ... other purposes any stone or other material composing such works** ....

33 USC § 408(a) (emphasis added). The proposed removal of sand to a TOI beach violates this provision in several ways. First, the SMP is a Project "condition," and violating its specific conditions and purpose will impair "the ability of the project to function **as authorized**" (emphasis added).

Second, sand is an element of the WHP which cannot be removed from the Project *or* received by anyone not a part of the Project. The beaches of TOI are not included in the disposal plan in the SMP for the simple reason that they are in a different littoral cell and are not part of the Channel entrance littoral system being impacted by the WHP[2] and its on-going need for maintenance dredging. The TOI beaches are not part of the WHP of deepening and maintaining the Wilmington Harbor Channel. Therefore, the sand being deposited in the Channel by the natural and anticipated consequences of the WHP, and its planned use on the adjacent beaches as part of the Project, is "stone or other material composing such work" and may **not** be removed from the system *and* may not be received by TOI. 33 USC § 408(a).

[2] The pre-WHP studies confirmed that the littoral transport of sand along most of the TOI beaches is westward, away from the Cape Fear Channel entrance, and hence not a part of the that littoral system.

F. VBHI is a named, intended third-party beneficiary of the SMP.

As discussed above, the SMP, and the Corps' commitment to comply with it, were specifically because of the projected negative impacts to VBHI, which was forecast to suffer 2/3rds of the sand loss caused by the WHP. The SMP protects the public interest from the detrimental effects of the WHP on the adjacent beaches, as explained above, and any proposed deviation from it will therefore negatively impact the public interest as well as VBHI's interests.

Even with the SMP maintenance of adjacent beaches, the negative impact of the WHP has been significant, as detailed above. The on-going, necessary projects are costing VBHI millions of dollars. Permanent removal of significant quantities of beach quality sand from this littoral system will further exacerbate these damages, including: conservation and environment (the eroded beaches negatively impact nesting habitat for endangered birds and turtles, as detailed in the EA), flood hazards (storm resilience), economic development (the on-going and increasing financial burden on VBHI in protecting its residents' properties), recreation (usability of beaches), residual risk, induced damages, and shore erosion. Accordingly, deviating from the SMP to benefit TOI interferes with VHBI's rights.

G. Allowing Deviation from the SMP Undermines Credibility in Corps Permitting

In 2000, the Corps evaluated the WHP and its environmental consequences. It undertook to assuage the public by assurances of protective measures, specifically adherence to the SMP as a method of protecting the adjacent beaches from project-induced erosion. *See* assurances in DeLony Letter, including implementation of the SMP and even enhancing it with additional nourishment if it is inadequate.

> From an engineering perspective, **the primary requirement** for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to **prevent project induced erosion of the adjacent beaches** by conserving the limited resource, sand, **through deposition directly on the adjacent beaches**.

SMP ¶ 20, p. 10. "We will comply with the indications in the [Moffitt] letter [conditioning North Carolina CZMA concurrence on Col. DeLony's assurances of adherence to the SMP]." EA, § 3.00, p. 5.

The Corps is currently evaluating a new Wilmington Harbor project, which would further deepen and widen the Cape Fear Channel. The impacts of that proposed project are currently being studied and plans for mitigation of the effects are being drawn and vetted. **Now** is the time to demonstrate that this evaluation of

project impacts and the Corps' commitment to fairly evaluating and offsetting project impacts is not ephemeral and its promises of mitigation are not illusory.

H. Conclusion

Dredging the Cape Fear River to ensure and enhance its navigability comes at a price beyond the financial cost: it affects the transport of sand within that immediate littoral system, which in turn impacts the systems (beaches) on which that sand depends. Recognizing those impacts, and mitigating those damages, is part of the price of the Project. The displaced sand is not a bonus to be applied where convenient. It is owed to the communities whence it came. TOI has a legitimate need for beach sand, but the Channel sand is not a legitimate source. The system described in the EA and SMP—where every cubic yard of sand removed from the littoral system results in a cubic yard deficit on the adjacent beaches—demonstrates that the sand in this littoral system is a constituent part of the system, migrating to and from the Channel. The proposal to use Channel sand at TOI is equivalent to directly removing the sand from the beaches at VBHI and Caswell Beach and trucking it to TOI. It should not be allowed, under any conditions.

Accordingly, we ask the Norfolk Dredging Company to confirm it will not submit a Placement Plan that places sand anywhere other than on Caswell Beach or VBHI beaches, and we ask the Corps to confirm that it will not approve any Plan other than one that is confined to Caswell Beach and VBHI beaches.

We look forward to hearing from you on the intending Placement Plan. Please feel free to contact me if you have any questions.

Brooks, Pierce, McLendon, Humphrey, and Leonard, LLP,

Attorneys for the Village of Bald Head Island

By: 

William P. H. Cary
bcary@brookspierce.com
(336)-271-3115

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Justin McCorcle, Wilmington District Counsel, U.S. Army Corps of Engineers
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Federal Consistency Coordinator,
Div. of Coastal Management, NC DEQ
Heather Coats, Beach & Inlet Management Project Coordinator,
Div. of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer
Rosalind M. Shoemaker, Contracting Officer
USACE Wilmington Regulatory Field Office

ATTACHMENT 1

NOTICE OF CONTRACT AWARD

Contract award: maintenance dredging of the Wilmington Harbor Inner Ocean Bar will benefit Oak Island beaches

Published May 19, 2025

WILMINGTON, N.C. --

WILMINGTON, N.C. (May 19, 2025) – The U.S. Army Corps of Engineers (USACE) Wilmington District has awarded an $18.6 million contract to Norfolk Dredging Company for the crucial maintenance dredging of the Wilmington Harbor Inner Ocean Bar. With the inclusion of all options, the total contract value is estimated at $25.3 million.

This essential project will remove approximately 1.3 million cubic yards of beach-compatible material, which will be strategically placed to nourish the beaches of Oak Island (Town of Caswell Beach and Town of Oak Island). To protect sea turtle nesting, this work is scheduled to be completed within the current beach placement window, from November 16th to April 30th.

Maintaining the navigability of Wilmington Harbor is vital to the economic health of the region. This dredging project will ensure safe and efficient passage for commercial vessels while also providing the valuable benefit of beach nourishment for Oak Island.

Maintenance dredging is a necessary process to remove accumulated sediment from the Inner Ocean Bar, ensuring the harbor maintains its authorized depth. The USACE Wilmington District remains dedicated to its mission of maintaining the nation's waterways and supporting the economic vitality of the region through projects like this.

--30--

U.S. ARMY CORPS OF ENGINEERS –WILMINGTON DISTRICT

69 DARLINGTON AVE, WILMINGTON, N.C. 28403

WWW.SAW.USACE.ARMY.MIL

Contact
David Connolly
910.251.4626

Release no. 25-005

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

15 May 2025

REPLY TO:
Contracting Division

VIA EMAIL

SUBJECT: Award of Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Inner Ocean Bar

CONTRACTOR:
Via Email mhaverty@norfolkdredging.com
Norfolk Dredging Company
ATTN: Mr. Michael Haverty
110 N Centerville Turnpike
Chesapeake, VA 23320

Mr. Haverty:

Congratulations on your award of the subject contract. Attached is a copy of the signed contract for your records. Award was made on 15 May 2025, in the amount of **$18,645,765.00**, for Line items 0001-0004, (funded base line items).

I, **Rosalind M. Shoemaker,** will be the Contracting Officer on your contract. In my absence, the following Contracting Officer may sign actions under this contract: Ms. Jenifer M. Garland and Mr. Troy D. Small. We will be working with you and your team on this contract until completion. The Administrative Contracting Officers for this project will be Mr. Jeremiah L. Smith.

Rosalind M. Shoemaker, Contracting Officer	910-251-4436
Jenifer M. Garland, Contracting Officer	910-251-4134
Troy D. Small, Contracting Officer	910-251-4650
Jeremiah L. Smith, Administrative Contracting Officer	910-241-4642

This letter is not a notice-to-proceed. Notice to Proceed will be issued as part of the preconstruction meeting.

It is emphasized that only a warranted Contracting Officer (either a Contracting Officer or an Administrative Contracting Officer (ACO)), acting within their appointed limits, has the authority to issue modifications or otherwise change the terms and conditions of this contract. If an individual other than the Contracting Officer attempts to make changes to the terms and conditions of this contract, you shall not proceed with the change and shall immediately notify the Contracting Officer. Proceeding with any work not authorized by the Contracting Officer will be at the Contractor's own risk.

SUBJECT: Award of Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Inner Ocean Bar

Timely and successful completion of this project is critical to the mission of the Wilmington District, U.S. Army Corps of Engineers. Accordingly, we are looking forward to a great partnership with your company, as you perform this important work. If you have any questions, do not hesitate to contact me. I look forward to working with you to meet the needs of our nation.

Sincerely,

Rosalind M. Shoemaker

Digitally signed by Rosalind M. Shoemaker
Date: 2025.05.15 06:58:52 -04'00'

Rosalind M. Shoemaker
Contracting Officer

Copy Furnished
Official Contract file/Contracting Division

ATTACHMENT 2

VBHI MITIGATION COSTS

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

Previous Projects

• Engineered Beach Project 2009/2010		
• Dredging Contract	$	14,800,000
• Interest Expense	$	1,536,000
• Permitting – *Land Management Group, Inc., Olsen Associates, Inc., Legal*	$	1,000,000
• Sand Filled Geotextile Groinfield		
• 1995	$	320,000
• 2005	$	850,000
• 2009/2010	$	1,150,000
• Road Overwash		
• South Bald Head Wynd Road Repair 2004	$	250,000
• Sandbag Revetment Wall	$	250,000
• Sandpiper Trail Sandbag Wall + 2009 Repairs	$	65,000
• 2007 Sand Placement (Assist USACOE- limited funds)	$	900,000
• Periodic Beach Profile Monitoring	$	595,000
• Required Jay Bird Shoal Biological Monitoring per Permit	$	50,985
• Required Beach Front Biological Monitoring per Permit	$	30,030
• Install Emergency Sandbag Revetment at the Point	$	230,000
• Repair & Maintenance of Revetment at the Point	$	8,000
• BH Creek 2006 dredging Project w/ sand placed on West Beach	$	737,858
Total	$	22,772,873

Additional Expenditures Reimbursed through FEMA Public Assistance Funds

• Bald Head Creek Dredging Project (Emergency Sand Source to mitigate Erosion due to Hurricane Irene)	$	1,230,000
• Sand-filled Tube Groin Field Repairs due to Hurricane Irene	$	650,000
	$	**1,880,000**

Additional Expenditures Reimbursed through State of NC/DENR Water Resources Development Grant Funds

• Bald Head Creek Dredging Project 2006 (Southwind Construction Co.)	$	**260,000**

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

The Terminal Groin Project (2015)

- Terminal Groin GO Bond Expenditures @ 2-28-18 (2015 Project)
  Engineering/Design/Modeling/NEPA EIS costs — $ 1,177,000
  (Phase I Construction/Orion w/ Corps 2015 O&M Sand)
  - Terminal Groin Construction, part of the T6 project, placing approximately 1 million for the fillet sand to place behind the T6 structure — $ 7,876,858
  - Harbor Jetty Extension w/ Spurs — $ 1,456,316
  - West Beach and Row Boat Row (Bald Head Creek Dredging) — $ 1,261,026
    - Army COE Reimbursement $ 105,341
    - MECA Reimbursement 830,514
    - Contract Reimbursements 140,363
    - Total $ 1,076,218 — $ (1,076,218)

  Total Cost, Phase I — $ **9,517,982**

- Breakwaters Project:
  - Construction of two detached rock breakwaters located north of the Marina
    - Intercoastal Maine, LLC — $ **895,052**

Sand Re-nourishment / Groin Tube Project (2018-19)

- Sand Re-nourishment / Groin Tube Replacements (2019 Project)
  (Phase II Construction/ SJ Hamill Construction, Bradley Textile Tubes)
  - Beach Nourishment 1million cubic yards, including mobilization $ 11,767,000
  - Groin Tube manufacture and installation 1,514,429
  - Engineering Costs 445,000
  - Legal Costs $ 62,500

  Total Cost, Phase II $ **13,788,929**

Marina Channel Maintenance Program

(Grant received from Department of Environmental Quality Resource Development Project to reimburse the Village for 66% of the cost, current expiration of Grant May 2019.)

- Village portion of expenses paid for Dredging the Channel:
  2017 – 2023: $ **289,140**

Bald Head Island
Mitigation Costs of Navigation Channel Impacts

Sand Re-nourishment / Groin Tube Project (2024-25)

- Sand Re-nourishment / Groin Tube Replacements (2025 Project)
  Beach Fill Construction/Marinex, Flint Textiles Geotubes, McPherson Marine Service

• Beach Nourishment 1 million cubic yards, including mobilization	$	16,175,000
• Groin Tube Installation	$	1,517,430
• Tube manufacturing (Flint)	$	446,425
• Engineering Costs – JBS Borrow Site Permitting	$	230,200
• Beach Fill Design/Construction Document (including groins)	$	350,000
• Construction Management/observation	$	425,000
• Legal – Construction Contracts Review/Bid	$	7,500
Total Cost	$	**19,151,555**

Beach Monitoring

Annual Shoreline Monitoring Program Expenses (last 10 years): **$2,000,000**
(Includes spring/fall surveying and aerial imagery documentation w/ final report from Coastal Engineer)

Total Accumulated Costs Associated with the Mitigation of the Navigation Channel **$69,303,391**

Overall Total To Date - $71,732,531

(25-year average expenditure annually - $2.87M)

ATTACHMENT 3

DELONY LETTER

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO
Project Management Branch

June 9, 2000

Honorable Freeman A. Berne
Mayor of the Village of Bald Head Island
Post Office Box 3009
Baldhead Island, North Carolina 28461

Honorable Harry Simmons
Mayor of Caswell Beach
707 Caswell Beach Road
Caswell Beach, North Carolina 28465

Honorable Joan Altman
Mayor of Oak Island
4601 East Oak Island Drive
Oak Island, North Carolina 28465

Honorable James W. Lowell
Mayor of Holden Beach
110 Rothschild Street
Holden Beach, North Carolina 28462

Dear Mayors:

After years of effort by many, it is a pleasure to see the various elements of the Wilmington Harbor Navigation project (hereinafter the "Project") coming together. As we approach the decision point for the Finding of No Significant Impact (FONSI), I want to bring everyone up to date on the status of our plan to place beach quality sand excavated for the project on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach.

As you know, the details of our plan are presented in the Environmental Assessment, in particular, Appendix A - Sand Management Plan, in the Wilmington Harbor Monitoring Plan, and in the Section 933 Evaluation Report. The shoreline segments recommended to receive sand are the Village of Bald Head Island (up to 16,000 linear feet), Caswell Beach (up to 25,000 linear feet), Oak Island (up to 25,600 linear feet), and Holden Beach (up to 10,600 linear feet). This represents a maximum shoreline length of 77,200 linear feet.

Bald Head Island will be the site of initial beach disposal associated with construction. This site, along with the easternmost 25,000 linear feet of Caswell Beach-Oak Island, represents the least cost alternative of disposal available to the Project; accordingly, placement will be accomplished at Project cost and at no cost to the Village of Bald Head Island.

Placement will be according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to the Village of Bald Head Island referencing the Village of Bald Head Island Beach Disposal Plan (2000/2001) (enclosed and incorporated by reference) to the U.S. Army Corps of Engineers, Wilmington District (hereinafter "Corps").

Once disposal has begun at the Village of Bald Head Island, fill operations will continue until the estimated minimum of 1,536,000 cubic yards of sand in the channel prism allocated to the Village of Bald Head Island (based on channel surveys conducted in October and December 1999) have been dredged and placed on the beach in accordance with the March 31, 2000 memorandum. Assuming a potential effective reduction of 20 percent in the gross fill dredged, the final in-place fill volume is expected to range between 1,228,000 cubic yards and 1,536,000 cubic yards.

Project construction beach disposal operations at the Village of Bald Head Island will be performed along both West Beach and South Beach, as indicated by the March 31, 2000 memorandum. The Village of Bald Head Island will provide all requisite easements necessary to construct the template(s) provided for by the March 31, 2000 memorandum.

Once the placement of beach quality sand at the Village of Bald Head Island is complete, placement along approximately 25,000 linear feet of shoreline at the easternmost end of Caswell Beach-Oak Island will be accomplished. Placement will be made in accordance with the template agreed to by the Corps, NCDENR, and the communities of Caswell Beach and Oak Island. The final in-place fill volume is expected to range between 1,451,000 cubic yards and 1,814,000 cubic yards. Since this reach comprises the balance of the least cost alternative for disposal available to the Project, placement will be at Project cost and at no cost to those communities. All requisite easements will be provided by the communities at no cost to the Project.

Under the provisions of the draft Section 933 report, the remaining beach quality sand will be placed along approximately 25,600 linear feet of the westernmost shoreline of Oak Island and along approximately 10,600 linear feet of the eastern shoreline of Holden Beach. Placement will be made in accordance with the template agreed to among the Corps, NCDENR, and the affected beach communities and cost shared at the rate of 65 percent Federal (currently estimated at $6,500,000) and 35 percent non-Federal (currently estimated at $3,500,000). The final in-place fill volume along the cost shared reach of Oak Island is expected to range between 1,272,000 cubic yards and 1,590,000 cubic yards. The final in-place fill volume along the cost shared reach of Holden Beach is expected to range between 528,000 cubic yards and 660,000 cubic yards. The communities will provide all required easements at no cost to the Project.

After construction of the Smith Island and Bald Head Island Shoal portions of the project, the U.S. Army Corps of Engineers will conduct periodic maintenance dredging of the navigation channels. The disposal of all beach quality dredged material will be accomplished in accordance with the Environmental Assessment of Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 2000 and its Sand Management Plan (Appendix A), and the Wilmington Harbor Monitoring Plan (enclosed and incorporated by reference). The associated disposal will be as called for therein, namely:

Year 2: Placement at Bald Head Island (estimated @ 1Mcy)
Year 4: Placement at Bald Head Island (estimated @ 1 Mcy)
Year 6: Placement at Caswell Beach and easternmost end of Oak Island (estimated @ 1 Mcy).

This disposal cycle is planned for the life of the project. As provided on page 8 of the Environmental Assessment and on page 12 of the sand management plan, in some cases problem shoaling involving small quantities of sand may develop in the channel between regular dredging events, making use of a pipeline dredge unfeasible and the sand may need to be deposited in the ocean disposal area.

Prior to each disposal operation at either the Village of Bald Head Island, or Caswell Beach, or the easternmost shoreline of Oak Island, the community receiving the sand may provide advance guidance to the Corps regarding placement distributions and fill template design. The Corps will follow that guidance to the maximum extent practicable.

The Corps will conduct a monitoring program as referred to in the Environmental Assessment and Sand Management Plan, and as set out in the Wilmington Harbor Monitoring Plan, which is enclosed and incorporated by reference. An annual report will be prepared, as described in the Monitoring Plan. The Corps will use this monitoring data to evaluate and adjust the Sand Management Plan, as determined necessary, after coordination with interested parties.

All initial and future disposal activities at the Village of Bald Head Island, Caswell Beach, and easternmost Oak Island, (as described in the Environmental Assessment and its Sand Management Plan, and in the Wilmington Harbor Monitoring Plan) will be at no cost to either community.

If the Project causes significant adverse effects on adjacent beaches, the Corps and the Sponsor will respond by adjusting the Sand Management Plan, after consultation with interested parties. If the Project causes significant adverse effects that cannot be dealt with by

modifications to the Sand Management Plan, the Corps and the Sponsor will promptly seek and use their best efforts to implement appropriate corrective measures, such as additional nourishment, subject to consistency review.

Our current schedule for execution of the FONSI is June 14, 2000. Our current schedule for our higher headquarters approval of the draft Section 933 Evaluation Report is July 31, 2000. We expect to award a contract to construct the inshore reaches of the Ocean Bar entrance channel on or about November 15, 2000. We are moving prudently but aggressively to make this important Project a reality.

The support of the members of the Brunswick Beaches Consortium and our Project sponsor represented by Mr. John Morris in optimizing this unique opportunity for nourishing your beaches has been wise, energetic, and timely. We salute your efforts and look forward to continued close coordination through to the successful completion and operation of the Project and the associated beneficial use of beach quality sand.

Sincerely,

James W. DeLony
Colonel, U.S. Army
District Engineer

Enclosures

Copies Furnished:

Mr. John N. Morris, Director
Division of Water Resources
North Carolina Department of Environment
and Natural Resources
1611 Mail Service Center
Raleigh, North Carolina 27699-1611

Ms. Donna D. Moffitt, Director
Division of Coastal Management
North Carolina Department of
Environment and Natural Resources
1638 Mail Service Center
Raleigh, North Carolina 27699-1638

ATTACHMENT 4

MOFFITT LETTER

CDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

DONNA D. MOFFITT
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF COASTAL MANAGEMENT

RECEIVED
EXECUTIVE OFFICE
2000 JUN 26 A 11: 03

June 15, 2000

Action: PM-C
CF: DE
DX
DP
TS
OC

Colonel James W. DeLony
District Engineer
U.S. Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

REFERENCE: DCM00-14 EA and CD - Preconstruction Modifications of Authorized Improvements, Wilmington Harbor 96 Project

Dear Col. DeLony:

On May 17, 2000 the State of North Carolina completed its review, pursuant to 15 CFR 930 Subpart C - Consistency for Federal Activities, of the referenced document describing proposed modifications to the authorized Wilmington Harbor 96 Project in New Hanover and Brunswick Counties, North Carolina. The Corps of Engineers submitted the document to the state on February 17, 2000, and the project was assigned the number DCM00-14 for our review purposes.

During the course of our review several environmental concerns were raised by state agencies regarding potential impacts on the resources of the coastal zone. These comments were forwarded to the Corps for its consideration. As the consistency deadline was approaching, we extended our original consistency deadline 15 days, pursuant to 15 CFR 930.41, at the end of March. On April 10, 2000, our review was again extended to allow concerned state agencies to review the Corps' responses to comments on the Environmental Assessment (EA). The Division of Coastal Management received the Corps' responses on May 3 and again solicited comments from concerned state agencies.

The modifications that the Wilmington District Corps of Engineers seeks authorization for are as follows:

1. Construction and maintenance of the Wilmington Harbor entrance channel along a new alignment across the ocean bar.
2. Backfilling the abandoned channel length with dredged material not suited for beach or littoral zone disposal.

MAILING: 1638 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1638
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3. Placement of material dredged from the new channel alignment and other portions of the project on area beaches in New Hanover and Brunswick Counties.
4. Establishment of a comprehensive plan for dredging and disposal operations for each portion of the harbor, including hopper dredge with overflow.
5. Utilization of blast pressure criteria to measure impacts of blasting on aquatic resources and the elimination of the bubble curtain during blasting operations.
6. Placement of dredged material that does not go to the old channel, the littoral zone, the beaches, or other existing disposal sites, into the Offshore Dredged Material Disposal Site (ODMDS).

The Corps proposes to construct the new entrance channel alignment and place all suitable material on the nearby beaches over an approximately eighteen month period covering two winter seasons and one summer season. Turtle monitoring and shorebird surveys of affected beaches will be conducted. Details of the disposal operations for construction and maintenance of the channel are documented in a Sand Management Plan (SMP). In addition, the Corps has clarified details of the placement, timing, costs, and amount of sand to be deposited on the beaches of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach in a letter dated June 9, 2000from Colonel James W. DeLony, District Engineer, to the mayors of the respective beach towns. We understand that disposal of dredged material from construction and maintenance of the project will be conducted according to the SMP and letter, as agreed to by the NC Division of Water Resources, the Brunswick County beach communities and the Corps of Engineers. We also understand that the use of hopper dredge with overflow will be limited to times of year and reaches of the project in which impacts on coastal resources will be minimized.

Based upon our review of the EA and the Corps of Engineers' response to comments, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, provided that the project is performed according to the EA (including the Sand Management Plan and other appendices) and the Corps' responses to comments from the EA, and to Colonel DeLony's letter of June 9, 2000 (including attachments), and that the conditions below are met.

1. Principal amongst the issues raised were potential impacts on sea turtles, shore and water birds, beach and benthic infauna, fisheries, and water quality parameters. It is extremely important that the impacts of this multifaceted project be well documented in order to evaluate the effects on these resources and on the overall coastal environment. The Corps of Engineers will pursue an integrated monitoring plan to address the resources noted in the first sentence of this paragraph, and will coordinate all monitoring efforts with the appropriate state agencies. This will include but not be limited to the North Carolina Division of Coastal Management, the Wildlife Resources Commission, the Division of Marine Fisheries, and the Division of Water Quality. We understand that the Corps intends to initiate monitoring coordination with the resource agencies in June of 2000.
2. As additional mitigation for impacts on fisheries resources, a fish passage structure will be constructed at Lock and Dam 1 on the Cape Fear River. In addition, fish passage alternatives for Lock and Dams 2 and 3 will be investigated. The Corps of Engineers and, as the Wilmington Harbor Project Sponsor, the State of North Carolina, have agreed to these actions.
3. The placement, timing, costs, and amount of sand to be deposited on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach, both during construction and future maintenance; monitoring; and response to impacts shall be in accordance with Col. DeLony's letter of June 9, 2000, to the mayors of the respective towns receiving the sand (attached and incorporated by reference). If the towns, Corps, and project sponsor's representative mutually agree to modifications to the SMP or Col. DeLony's June 9, 2000 letter, those modifications shall be submitted to the North Carolina Division of Coastal Management for a determination of whether another consistency review is necessary on the modifications.
4. The state must have the opportunity to review the project, including monitoring results, to determine if it continues to be consistent with the North Carolina Coastal Management Program in two situations: 1) After five years from the date of this letter, and 2) before any subsequent modifications for future maintenance or other requests to modify the Wilmington Harbor 96 Project are considered. The Corps shall request this review and provide documentation of impacts (or lack thereof) on the coastal resources of concern.

5. If in the future the Corps considers requesting authorization to conduct hopper dredging with over flow or to place maintenance dredge spoil on a beach, outside of the established time periods or locations, a separate consistency review will be required for each of these activities.

While the State of North Carolina supports beach nourishment and the placement of suitable spoil material on the beaches, we remain concerned about the short term and long term impacts on the biologic and ecologic resources of the coast. We maintain that the best time for such beach nourishment and renourishment is outside of the period of peak impacts on infauna, sea turtles, and fisheries. The State discourages individuals and agencies from seeking authorization to perform work outside established moratoria, and caution that our response is not to be interpreted as a precedent assuring authorization for future renourishment or disposal of sand on beaches outside of established dredging and disposal moratoria. We understand that summer beach disposal is necessary only during the construction phase of the project and that maintenance of the harbor channels will be conducted within established biological time frames.

Finally, with the increasing number of beach disposal and renourishment projects, much of the state's southern coast beaches will be in the placement or recovery phases in any given year. To this end, the Division of Coastal Management requests that the Corps consider combining the monitoring studies and environmental considerations of this project, the Wrightsville Beach, Carolina Beach, Kure Beach projects, and all of the Brunswick County Beaches projects to achieve a more comprehensive and cumulative impact analysis. Although these projects are separate in authorization and funding, we feel that concurrent studies could provide beneficial insights on impacts to resources from beach disposal and nourishment along this extended reach of shoreline.

If you have any questions regarding our findings, conditions, or recommendations, please contact Ms. Caroline Bellis, Division of Coastal Management, at (919) 733-2293. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Donna D. Moffitt

Donna D. Moffitt

Attachment

cc: Bob Stroud, Division of Coastal Management, Wilmington
Franklin McBride, NC Wildlife Resources Commission
Bennett Wynne, NC Wildlife Resources Commission
Ruth Boettcher, NC Wildlife Resources Commission
Fritz Rohde, NC Division of Marine Fisheries
Mike Street, NC Division of Marine Fisheries
John Dorney, Division of Water Quality
Frank Yelverton, US Army Corps of Engineers
John Meshaw, US Army Corps of Engineers

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

CESAW-OC

June 30, 2025

SUBJECT: Response to VBHI Letter of June 20, 2025, re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

William P.H. Cary, Esq.
Attorney for the Village of Bald Head Island
bcary@brookspierce.com

VIA EMAIL ONLY

Dear Mr. Cary,

This correspondence is in reference to your letter to Wilmington District Commander COL Brad A. Morgan, dated June 20, 2025, asserting that "[p]lacement of [Wilmington Harbor] sand on any beaches other than Caswell Beach or VBHI would be a violation of the existing terms of the Wilmington Harbor Project (WHP), authorized in 2000." It is the position of the Wilmington District, Corps of Engineers that the Wilmington Harbor Inner Ocean Bar Contract, Contract No. W912PM25CA0005, is consistent with the Environmental Assessment (EA), the Sand Management Plan (SMP), COL DeLony's letter of June 9, 2000, and the relevant Coastal Zone Management Act Consistency concurrence.

In the SMP, incorporated as Appendix A of the EA dated February 2000, the Corps addressed its intent as it related to the Maintenance Material Disposal Plan, and noted as follows:

> In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel will be placed back on the beach from whence it came. Accordingly, two out of every three cubic yards of littoral shoal material removed from the entrance channel will be placed back on Bald Head Island and the remaining cubic yard placed on **East Oak Island-Caswell Beach**. The disposal locations on each island will be based on the results of annual beach profile monitoring surveys. **In general,** the material will be placed primarily along portions of South Beach and West Beach on Bald Head Island and on **East Oak Island-Caswell Beach** beginning at **a point just east of the Carolina Power and Light Company cooling water discharge canal**. [Emphasis added] See SMP, Page 10.

SUBJECT: Response to VBHI Letter of June 20, 2025, re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

On page 4 of your letter, you opine that the westerly limit on our placement is "on East Oak Island-Caswell Beach beginning at a point just east of the Carolina Power and Light cooling water discharge canal." However, given the estimated quantities of future maintenance dredging and the short distance between the cooling water discharge canal and the North Carolina Baptist Assembly property (approximately 8,000 feet), it is not reasonable to interpret our placement area to be so limited in size.[1] Additionally, your position that the Town of Oak Island is not to receive sand because it is west of the canal is inconsistent with the EA and the SMP. Both documents contain the following diagram that clearly identifies the extent of "East Oak Island-Caswell Beach". See Figure 4 of the EA; and Figure 2 of the SMP.

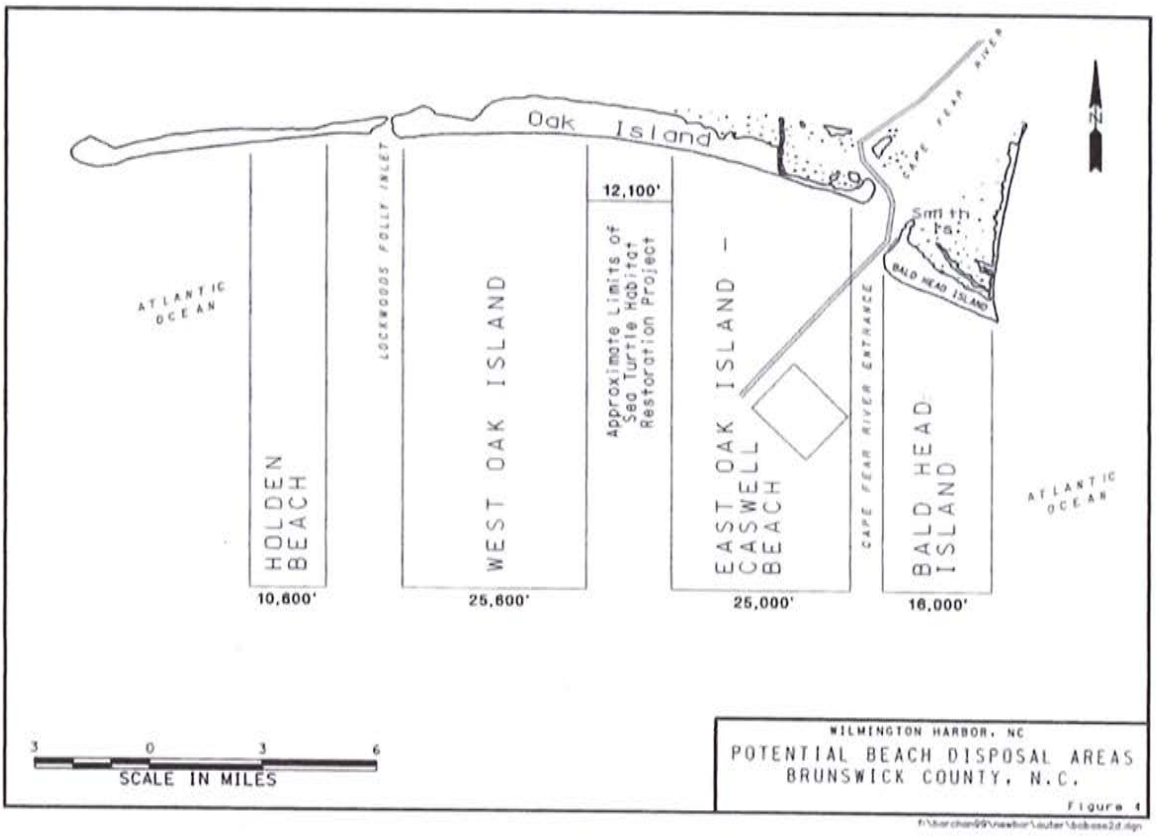


Figure 4 of the EA (the same figure is identified as Figure 2 of the SMP)

This figure shows that "East Oak Island-Caswell Beach" refers to the 25,000 feet of beach extending all the way to the Turtle Habitat Restoration Project boundary, an area that clearly extends into the Town of Oak Island. The text of the SMP also makes it clear that the cooling water discharge canal is not the western limit of the disposal area, as it states:

[1] By way of comparison, the placement area on VBHI is approximately 16,000 feet on South Beach, with some area on West Beach also authorized.

> Disposal on **Oak Island-Caswell Beach** would begin at the west boundary of the Fort Caswell Baptist Assembly grounds and proceed west. The 25,000-foot disposal area on **Oak Island-Caswell Beach** would extend the fill to the east end of the sea turtle habitat area on Oak Island. [Emphasis added] See SMP, Page 3.

While this referenced text is contained in the section talking about initial construction, references to both "East Oak Island-Caswell Beach" and "Oak Island-Caswell Beach" are echoed in the section discussing the Maintenance Material Disposal Plan. See SMP Page 10 ("[t]he distribution of littoral shoal material between Bald Head Island and **East Oak Island - Caswell Beach** given above will be accomplished by placing material from two consecutive maintenance operations on Bald Head Island with the third operation involving placement on **Oak Island-Caswell Beach**") and Page 11 ("[b]ased on a two year maintenance cycle, 1,090,000 cubic yards of littoral material will be placed on Bald Head Island in year 2 and year 4 following the initial deepening of the harbor with this same volume placed on **Oak Island-Caswell Beach** during the 6th year following channel deepening.")

A review of COL DeLony's letter dated June 9, 2000 also reveals that sand was intended to be placed within the same approximately 25,000 linear foot portion of Oak Island that includes portions of both the Town of Caswell Beach and the Town of Oak Island, as described in the SMP. The letter states as follows:

> After construction of the Smith Island and Bald Head Island Shoal portions of the project, the US Army Corps of Engineers will conduct periodic maintenance dredging of the navigation channels. The disposal of all beach quality dredged material will be accomplished in accordance with the Environmental Assessment of Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 2000, and its Sand Management Plan (Appendix A), and the Wilmington Harbor Monitoring Plan (enclosed and incorporated by reference). The associated disposal will be as called for therein, namely:
>
> Year 2: Placement at Bald Head Island (estimated@ 1 Mcy)
> Year 4: Placement at Bald Head Island (estimated@ 1 Mcy)
> Year 6: Placement at **Caswell Beach and easternmost end of Oak Island** (estimated @ 1 Mcy). [Emphasis added] See DeLony letter, Page 3.

The North Carolina consistency concurrence from the North Carolina Department of Environment and Natural Resources, Division of Coastal Management (NCDENR, DCM) dated June 15, 2000, states as follows:

> We understand that disposal of dredged material from construction and maintenance of the project will be conducted **according to the SMP and letter**, as agreed to by the NC Division of Water Resources, the Brunswick County beach communities and the Corps of Engineers. [Emphasis added] See Consistency, Page 2

With this understanding, NCDENR, DCM provided their concurrence with the Corps' Consistency Determination as follows:

> Based upon our review of the EA and the Corps of Engineers' response to comments, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable provided that the project is performed according to the EA (including the Sand Management Plan and other appendices) and the Corps' responses to comments from the EA, and to Colonel DeLony's letter of June 9, 2000 (including attachments), and that the conditions below are met. See Consistency, Page 2

While the intent of the sand management plan is to return littoral material to the beach, the primary purpose of the project is to provide safe navigation through the ocean entrance into Wilmington Harbor. SMP page 12. The Corps routinely receives appropriated funds that are allocated to the maintenance dredging of the Wilmington Harbor Federal Navigation Project, a portion of which are intended to dredge the portion of the channel identified as the Inner Ocean Bar. The Town of Oak Island expressed an interest in providing non-federal funding to enable the Corps to dredge an additional amount of material from within the authorized project dimensions. Since this is a benefit to the federal navigation mission, the Corps entered into a memorandum of agreement with the Town to fund work identified in optional bid items. The Village of Bald Head Island is very familiar with this process, as it has requested and received the same consideration. Since the additional work funded by the Town of Oak Island merely supplements the work performed by the Corps in this iteration of the Inner Ocean Bar Contract, the Corps performing the work funded accordingly is not a violation of 33 U.S.C. 408.

In conclusion, the Wilmington District, Corps of Engineers has reviewed your correspondence and determined that the Wilmington Harbor Inner Ocean Bar Contract, Contract No. W912PM25CA0005, is consistent with the Environmental Assessment (EA), the Sand Management Plan (SMP), COL DeLony's letter of June 9, 2000 and the Consistency concurrence. However, we do intend to verify that the placement of material will be limited to East Oak Island-Caswell Beach, and will modify the contract to the extent necessary to ensure that the placement does not extend into the turtle habitat restoration area.

SUBJECT: Response to VBHI Letter of June 20, 2025, re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

Sincerely,

Justin P. McCorcle
District Counsel

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Michael Haverty, Norfolk Dredging Company
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Division of Coastal Management, NC DEQ
Heather Coats, Division of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer

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July 18, 2025

Via Email **(justin.p.mccorcle@usace.army.mil)**

Justin P. McCorcle
District Counsel
Wilmington Regulatory Field Office
69 Darlington Avenue
Wilmington, NC 28403

Re: Contract No. W912PM25CA005, Maintenance Dredging, Wilmington Harbor Bar

Dear Justin:

Thank you for your letter dated June 30, 2025. My client, the Village of Bald Head Island (VBHI), respectfully disagrees with the conclusions reached in that letter for the reasons stated below.

When the Sand Management Plan was prepared, it addressed two issues, as alluded to but conflated in your letter: first was the initial construction of the project, and the second was the maintenance dredging of the channel, which is the subject of our current concern. Disposal of beach quality sand during the initial construction phase was pursuant to a Section 933 study and plan, under which the 25,000 feet of East Oak Island-Caswell Beach referred to in the SMP was scheduled to receive over 2,750,000 yd.^{3} of sand at a disposal rate of 110 yd.^{3}/foot. Table 2. Assuming it was distributed evenly along the 25,000 feet, the section east of the canal (8,000 feet) would have received 880,000 yd.^{3}

The Maintenance Material Disposal Plan section of the SMP, beginning at section 14, first recognizes that North Carolina policy has established that "beach quality sand not be removed from the active beach system." SMP § 16. As a result, the US Dept. of Commerce incorporated these policies into the NC Coastal Zone Management Program and the NC legislature enacted this Program. "Accordingly, the disposal plan for maintenance material removed from the Wilmington Harbor

entrance channel will attempt to satisfy these State requirements." *Id.* Recognizing that the Wilmington Harbor project "historically, has not included the disposal of littoral sand on adjacent beaches or in the active littoral zone", the SMP explains this as "maintenance practices that were established with the inception of the project over 100 years ago", based on then-existing dredge technology, the lack of coastal development, and "a lack of sufficient understanding of coastal processes and the sand sharing system associated with tidal inlets and adjacent beaches." SMP §§ 19-20. The SMP goes on to address and attempt to correct these historical mistakes by applying facts and science as the Corps then understood them[1] (2000) to the conditions at the channel entrance, emphasizing the importance of maintaining sand within the impacted littoral system. SMP §§ 20-22. It finds that it is "Caswell Beach" (270,000 yd.^{3}/yr.) and Bald Head Island (527,000 yd.^{3}/yr.) that are suffering the sand loss into the channel as part of that littoral system. SMP § 22. As the SMP points out, removal of sand from this littoral system is equivalent to removing it directly from the affected beaches. Hence, the SWP states: "In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel will be **placed back on the beach from when it came**." *Id.* (emphasis added). It is here that the section of Caswell Beach east of the canal is identified. *Id.* **There is no evidence in the SMP or your letter that the littoral system extends further west.** The intention to place sand outside the bounds of the littoral system impacted by the Project is a deviation from the SMP without an evidentiary basis.

The 8,000 feet of Caswell Beach east of the canal is more than adequate to accept the annual amounts (538,000 yd.^{3}) projected in the SMP, which is only 63% of the amount deposited there during initial construction. If the amount to be deposited this year exceeds that amount, or if the section of Caswell Beach east of the canal does not need the amount of sand available this year, the intent of the SMP is clearly to maintain that sand within the impacted littoral system and hence it should be placed on Bald Head Island. The VBHI stands ready to cooperate in that placement, which should be at no incremental cost to the contractor, given the proximity of the beaches. If there is claimed to be a cost impact, the VBHI is equally ready to address that. In addition, the DeLony Letter (June 9, 2000) committing the Corps to comply with the SMP also provides for adjustments to the SMP if monitoring determines it necessary, which would appear to apply, especially in light of the historical monitoring data showing the sand loss ratios between Bald Head Island and Caswell beach are approximately 4:1.

Therefore, we reiterate that placement of sand pursuant to this Contract west of the canal would violate the SMP and 33 USC § 408(a) and would undermine the

[1] Subsequent events, as discussed in our earlier letter, have demonstrated that the beach impacts of the WHP have been significantly greater than projected, and even the maintenance practices under the SMP have been insufficient—hence our concern that its protections not be eroded even further.

Corps's assurances that it will protect the impacted littoral system from the effects of this project and thereby comply with State law and the CZMA Program. We again ask the Norfolk Dredging Company to confirm it will not submit a Placement Plan that places sand anywhere other than on Caswell Beach east of the canal or VBHI beaches, and we ask the Corps to confirm that it will not approve any Plan other than one that is confined to Caswell Beach east of the canal and VBHI beaches.

We look forward to hearing from you on the Placement Plan. Please feel free to contact me if you have any questions or to discuss placement on Bald Head Island.

Brooks, Pierce, McLendon, Humphrey, and Leonard, LLP,

Attorneys for the Village of Bald Head Island

By: _____

William P. H. Cary
bcary@brookspierce.com
(336)-271-3115

Cc: Colonel Brad A. Morgan, District Commander
Michael Haverty, Norfolk Dredging Company
Peter Quinn, Mayor, Village of Bald Head Island
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Federal Consistency Coordinator,
Div. of Coastal Management, NC DEQ
Heather Coats, Beach & Inlet Management Project Coordinator,
Div. of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
The Honorable Thom Tillis
The Honorable Ted Budd
The Honorable David Rouzer
Rosalind M. Shoemaker, Contracting Officer
USACE Wilmington Regulatory Field Office

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

CESAW-OC

September 4, 2025

SUBJECT: Response to VBHI Letter of July 18, 2025, re: Contract No. W912PM-25-CA-005, Maintenance Dredging, Wilmington Harbor Bar

William P.H. Cary, Esq.
Attorney for the Village of Bald Head Island
bcary@brookspierce.com

VIA EMAIL ONLY

Dear Mr. Cary,

The Wilmington District has reviewed your correspondence dated July 18, 2025, and we are still of the opinion that the placement of sand on East Oak Island as part of the FY26 Wilmington Inner Ocean Bar Contract is proper, and we will continue as planned. While I understand your desire to assert the Village of Bald Head Island's (VBHI's) entitlement to sand within the channel, I must remind you that the Sand Management Plan (SMP) is merely a plan for disposing of material dredged from a portion of the Wilmington Harbor federal navigation channel. The SMP is not an independent beach nourishment plan or project, and confers no rights on VBHI, Oak Island, or Caswell Beach. In operating our navigation project, we try to balance various concerns, as acknowledged in the SMP as follows: "*[w]hile the intent of the sand management plan is to return littoral material to the beach, the primary purpose of the project is to provide safe navigation through the ocean entrance into Wilmington Harbor.*"

During each maintenance operation, there is more sand in the federal navigation channel than we have available funding to dredge. Therefore, decisions related to the work conducted are made on the basis of navigation needs and available funding. The local communities of VBHI and Oak Island have often provided non-federal funding to pay for additional dredging with placement of material on their respective beaches, which is in the interest of the federal navigation mission. The maintenance dredging project continues to be consistent with the enforceable policies of the NC Coastal Management Plan. As stated in detail in my last correspondence, this contract also is in complete compliance with the Environmental Assessment (EA), the Sand Management Plan (SMP), and applicable environmental and project commitments.

A goal of the SMP, as you have noted, is to return littoral material to the beaches from whence it came in a proportion commensurate with the loss rates identified. These rates historically worked out to approximately 2/3 of the losses to the channel experienced on

the Bald Head Island side, and 1/3 on the Oak Island side. The SMP states that "[b]ased on a two year maintenance cycle, 1,090,000 cubic yards of littoral material will be placed on Bald Head Island in year 2 and year 4 following the initial deepening of the harbor with this same volume placed on Oak Island-Caswell Beach during the 6th year following channel deepening." While funding has not always allowed us to dredge every two years, we have maintained this basic cycle, now in its third full iteration. VBHI has received material on six occasions, including each of the two most recent events. It is now Oak Island/Caswell Beach's turn, and this placement will successfully complete another cycle.

Your letters seek to constrain our placement of material on the Oak Island/Caswell Beach side of the channel, ostensibly to limit our placement of material there and maximize the amount of material VBHI will receive either now or in the future. In your more recent letter, you point to the volumes placed on Oak Island during initial construction as an indication that this small stretch of beach can hold large volumes of material, up to 880,000 cy in the estimation of your engineer. Actual volumes were not placed in this amount. Under the initial deepening contract, on the order of 5 million cubic yards of sediment (in-place beach volume measurement) were placed on Brunswick County beaches. Of this total and within the limits of the sand management zone, Bald Head Island received 1,849,000 cubic yards between February-July 2001. Oak Island/Caswell Beach then received a total of 1,181,800 cubic yards between July-August 2001, extending to station 294+00, an area of approximately 23,000 feet with a 4,000-foot gap. As indicated in the table, the balance of new work dredged material went to western Oak Island (1,269,800 cubic yards) and Holden Beach (501,400 cubic yards).

LOCATION	PLACEMENT LIMITS			PLACEMENT DATES		BEACH VOLUME (INPLACE)
	APPROX BL STA	NORTHING (ft, NAD83)	EASTING (ft, NAD83)	START	STOP	
Bald Head Island	41+60	43,692.25	2,300,542.01	2/23/2001		1,849,000
	205+50	35,750.21	2,314,236.42		7/4/2001	
Caswell Beach	60+00	52,126.62	2,295,138.57	7/5/2001		133,200
	80+00	52,847.44	2,292,954.85			
Oak Island East	121+00	53,711.05	2,289,255.43			1,048,600
	294+00	58,418.34	2,272,322.77		8/12/2001	
Oak Island West	415+00	60,332.24	2,260,537.66	8/13/2001		1,269,800
	665+50	59,778.68	2,235,486.44		4/25/2002	

Holden Beach	84+00	60,092.96	2,222,254.95	12/9/2001		501,400
	195+00	58,820.26	2,211,433.72		2/20/2002	

Table 1 – Initial Construction

Historical placement of material on both the VBHI side and the Oak Island side in the past two cycles has ranged between roughly 1.1M-1.5M cy of material in total, a larger volume of material than good engineering would support being placed on the small stretch of beach in Caswell Beach that you wish to constrain us to.

You also state as evidence for the constrained placement area the language from the SMP discussing losses of sand to the channel from Caswell Beach, which you apparently take to imply that Oak Island is not also suffering losses toward the channel. I find this to be an unduly narrow reading of the language and context of the SMP. Because Caswell Beach sits next to the channel, *only* Caswell Beach can suffer losses *directly to the channel*. That does not mean that losses experienced on Oak Island, with the sand moving east toward the channel, are not also important to the littoral system. It is important to note that the SMP consistently references Oak Island *and* Caswell Beach as the placement area. For example, the SMP states: "[t]he distribution of littoral shoal material between Bald Head Island and **East Oak Island - Caswell Beach** given above will be accomplished by placing material from two consecutive maintenance operations on Bald Head Island with the third operation involving placement on **Oak Island-Caswell Beach**." [Emphasis added] I do not find that the SMP language that you cited states, either explicitly or implicitly, that Oak Island/East Oak Island is not in the littoral system, and I cannot support an artificial restriction of the placement area that does not fit with the general context of the project, the plan, and navigational needs.

In both of your letters, you claim that the United States, through issuance of a dredging contract which includes placement of dredged material in a location to which you object, is in violation of 33 USC § 408. This allegation is misplaced; the United States cannot be considered a "person" under § 408. The law protects the United States from injuries to navigation or civil works projects from persons operating outside our permission. Courts have consistently applied a presumption that the term "person" in federal statutes does not include the sovereign unless there is some clear evidence to the contrary, which is not found in this instance.

Finally, I must respectfully request that that you direct your communications to the District rather than our contractor. Such communications directed toward the contractor could constitute improper interference with the contract, potentially resulting in adverse effects to the economic interests of the Corps and disruption of the operation and maintenance of the federal navigation project. Our contractor has no independent ability to alter the placement area for the contract.

SUBJECT: Response to VBHI Letter of July 18, 2025, re: Contract No. W912PM-25-CA-005, Maintenance Dredging, Wilmington Harbor Bar

While we appreciate the partnership we have shared with VBHI in previous dredging and placement events, we respectfully but firmly state that we are operating within our established and approved plans, and plan to proceed as indicated in the fall.

Sincerely,

Justin P. McCorcle
District Counsel

Cc: Peter Quinn, Mayor, Village of Bald Head Island
Michael Haverty, Norfolk Dredging Company
Tancred Miller, Director, Division of Coastal Management, NC DEQ
Cameron Luck, Division of Coastal Management, NC DEQ
Heather Coats, Division of Coastal Management, NC DEQ
George Kassler, Mayor, Town of Caswell Beach
Elizabeth White, Mayor, Town of Oak Island
Mike McIntyre, Ward & Smith
Charles S. Baldwin IV, Brooks Pierce

From: bobaccordino@yahoo.com
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 18, 2025 3:07:39 PM

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As a river front homeowner I am concerned that deepening and widening Wilmington Harbor will increase tidal reach, storm surge, and flooding risks upriver, especially when combined with sea level rise. These compounding impacts must be fully evaluated.

Wetlands are essential for flood protection, water quality, and wildlife habitat. The proposed project risks significant wetland loss, and mitigation plans appear inadequate.

As a Wilmington resident and given known PFAS contamination in the Cape Fear River, dredged sediments should be tested before any determination is made. The project should not proceed without safeguards to protect public health.

Flooding and environmental impacts disproportionately affect vulnerable and low-lying communities. These impacts must be fully considered in the state's consistency review.

As a river front homeowner I feel a project with enormous environmental costs and limited local benefit should not be deemed consistent with North Carolina's coastal policies.

Bob Accordino
3604 Watercraft Ferry Ave
Wilmington, NC 28412
910-233-5686

From: Brinson Leigh Kresge
To: DEQ-SVC_DCM.federalconsistencycomments
Cc: bill.saffo@wilmingtonnc.gov; chakema.clinton-quintana@wilmingtonnc.gov; jc.lyle@wilmingtonnc.gov; cassidy.santaguida@wilmingtonnc.gov; kevin.spears@wilmingtonnc.gov; salette.andrews@wilmingtonnc.gov; david.joyner@wilmingtonnc.gov
Subject: [External] For the Trees: Strong Opposition to Proposed Deepening of the Cape Fear River
Date: Friday, December 19, 2025 12:34:20 PM

You don't often get email from leigh.brinson@gmail.com. Learn why this is important

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Dear North Carolina Department of Environmental Quality,

I am writing to formally oppose the proposed plan to dredge and deepen the Cape Fear River near Wilmington. This project presents serious, long-term risks to the ecological health, climate resilience, and cultural heritage of the Lower Cape Fear region, and I urge NC DEQ to deny or significantly revise any permits associated with this effort.

Ecological Context: A System Already Under Stress

The Cape Fear River estuary is not a blank slate. It is already experiencing significant stress from sea-level rise, saltwater intrusion, habitat loss, and the cumulative impacts of past and ongoing dredging projects. Channel deepening has repeatedly altered hydrology and salinity regimes in ways that push saltwater farther upriver, undermining freshwater wetlands and forests that evolved under very different conditions. Additional dredging would accelerate these processes, compounding damage rather than addressing it.

One visible and alarming consequence of these changes is the rapid expansion of ghost forests—areas where once-thriving coastal forests have died due to increased salinity and altered water levels. I documented this phenomenon in a recent article for *Coastal Review*, which explains how dredging and other human interventions intensify saltwater intrusion and forest loss in the Cape Fear watershed:

https://coastalreview.org/2025/10/cape-fear-ghost-forests-tell-tale-of-ever-saltier-water-upriver/

Peer-reviewed research reinforces these concerns. A study by Kendra Devereaux, Dr. Monica Rother, and colleagues provides direct scientific evidence from the Wilmington area showing how even subtle shifts in hydrology and salinity can kill mature, long-established forests:

https://onlinelibrary.wiley.com/doi/10.1002/ece3.71677

The Irreplaceable Value of Trees—Especially Old-Growth Bald Cypress

Of particular concern is the threat this project poses to forested wetlands and old-growth bald cypress stands. These trees are not interchangeable units of "green infrastructure." Many are centuries old, serving as living archives of regional history while providing critical ecosystem services: carbon storage, flood attenuation, water filtration, wildlife habitat, and shoreline stabilization.

The proposed mitigation measures do not—and cannot—replace these forests. Planting saplings (which is not part of the current mitigation plan) or restoring wetlands elsewhere does not compensate for the loss of mature bald cypress systems that took hundreds of years to develop. Once these trees are killed by saltwater intrusion, they are effectively gone within any meaningful human or planning timeframe.

Mitigation Promises and the Need for Accountability

Equally troubling is the reliance on mitigation plans that assume future compliance without enforceable accountability. The U.S. Army Corps of Engineers has, in past projects, failed to fully follow through on mitigation commitments, leaving local communities and ecosystems to absorb the consequences. Any project of this scale should include binding, transparent, and independently monitored mechanisms to ensure mitigation is not only promised, but completed, maintained, and effective.

Without such safeguards, mitigation becomes a paper exercise rather than a real offset to ecological harm. NC DEQ should not approve permits based on mitigation assurances that lack enforceability or a clear track record of success.

Contaminants and Public Health: PFAS Concerns

Another critical issue is the disturbance of contaminated sediments. As discussed in a subsequent article I published with WHQR, dredging the Cape Fear River raises serious concerns about PFAS and other persistent pollutants that are already present in the river system. Resuspending these contaminants threatens downstream ecosystems, drinking water sources, and public health:

https://www.whqr.org/local/2025-11-15/the-proposed-plan-to-dredge-the-cape-fear-river-balancing-progress-and-preservation

Any environmental review that does not fully account for PFAS risks—and the long-term costs of spreading them further through the watershed—is incomplete.

Conclusion

The Cape Fear River is a living system, not simply a navigation channel. Its forests, wetlands, and waters support communities, economies, and ecosystems that cannot be easily repaired once damaged. Proceeding with this dredging plan would prioritize short-term industrial convenience over long-term environmental stability and public trust.

I respectfully urge NC DEQ to reject the proposed dredging plan or require a fundamentally different approach—one that prioritizes climate resilience, protects irreplaceable old-growth forests, fully addresses contamination risks, and includes enforceable accountability for mitigation commitments.

Sincerely,

Brinson (Leigh) Kresge

Writer | Freelance Editor | Interdisciplinary Artist | brinsonleigh.com

Adjunct Faculty | MFA | University of North Carolina Wilmington

Sarus Festival for Site-Specific and Experimental Art | Co-Director | sarusfestival.weebly.com



From: Bruce Piggot
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Dredging Project
Date: Saturday, December 6, 2025 7:52:07 PM

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To: Federal Consistency Coordinator
NC DEQ Division of Coastal Management
400 Commerce Ave.
Morehead City, NC 28557

Subject: Federal Consistency – USACE Wilmington Harbor 403 Dredging Project

To All Concerned,

I am submitting my objections to a consistency finding for the Wilmington Harbor 403 Dredging Project. In my view, this project violates the public trust placed in our state and federal agencies to protect people and coastal resources from rising seas, stronger storms, and worsening flooding, and is inconsistent with North Carolina's coastal management laws and policies.

1. Violation of North Carolina's public-trust and constitutional obligations
North Carolina's Constitution (Article XIV, Section 5) states that it is the policy of the State to *"conserve and protect its lands and waters"* and to preserve wetlands, estuaries, beaches, and other places of beauty as part of our common heritage.
By destroying hundreds of acres of wetlands that buffer storm surge, absorb floodwaters, and protect downstream communities, this project undermines that constitutional commitment and the common-law public trust doctrine, which requires the State to safeguard public waters and trust resources for present and future generations.

2. Inconsistency with CAMA and Coastal Resources Commission rules
The Coastal Area Management Act (CAMA), N.C. Gen. Stat. §113A-100 et seq., and the Coastal Resources Commission (CRC) rules require protection of "areas of environmental concern" (AECs), including wetlands, estuarine shorelines, and public trust areas that are easily destroyed by erosion or flooding or have high environmental and social value.
By widening and deepening the channel in a way that:

- Permanently removes large swaths of riverine and estuarine wetlands that function as natural flood control and storm buffers, and
- Increases erosion and bank instability along the Cape Fear River,

the project is contrary to CAMA's purpose to manage coastal resources "without destroying the natural systems around us or putting our lives in danger," as DEQ itself describes in its CAMA guidance.

3. Failure to support North Carolina's coastal resilience policies
The Division of Coastal Management and Coastal Resiliency programs explicitly promote

planning that *reduces* exposure to sea-level rise, storm surge, flooding, and erosion, and that makes coastal communities and habitats more resilient to climate change.
By:

- Allowing more storm energy and higher water levels to push farther upriver,
- Eliminating wetlands that store floodwaters, and
- Increasing wave action and shoreline erosion,

the project does the opposite of resilience planning. It clearly increases risk to downtown Wilmington and adjacent communities from rising tides and storms instead of reducing that risk, conflicting with DEQ's own resiliency goals and tools.

4. Questionable consistency with federal and state water-quality and wetlands protections
Large-scale dredging, placement of dredged material on beaches, and destruction of wetlands raise serious questions under the Clean Water Act §404(b)(1) guidelines (least-damaging practicable alternative, avoidance, minimization, and mitigation of wetlands loss) and North Carolina's Dredge and Fill Law, both of which DCM helps implement as part of the state Coastal Management Program.
These concerns are heightened by:

- The likely spread of PFAS/PFOS-contaminated sediments into public recreation areas and beaches, and
- The documented water-quality issues and beach closures already occurring in the region.

Approving disposal of potentially contaminated dredge material onto public beaches would be inconsistent with the duty to "control and limit the pollution of our air and water" under Article XIV, Section 5 of the NC Constitution.

5. NEPA / DEIS deficiencies affecting federal consistency
Under the Coastal Zone Management Act's federal consistency provisions, DCM must consider whether federal actions are consistent with the *enforceable policies* of North Carolina's Coastal Management Program.
The Draft Environmental Impact Statement (DEIS) appears deficient in ways that directly bear on consistency, including:

- Understating future sea-level rise, storm surge, and coastal flooding risk in light of the State's own Sea Level Rise Science Update and resilience planning tools;
- Minimizing the cumulative loss of wetlands and the resulting increase in flood risk to Wilmington and upriver communities;
- Failing to fully evaluate the environmental and public-health risks of spreading PFAS/PFOS-laden sediments onto beaches and nearshore waters; and
- Failing to demonstrate any clear public necessity, given that the Corps' own analysis indicates the same cargo volumes can be handled without deepening and that the primary economic benefits accrue to international shipping interests, not to the people and communities of North Carolina.

In short, the DEIS does not provide the robust, science-based analysis needed to show that this project is in the public interest or consistent with North Carolina's enforceable coastal policies.

6. Breach of public trust and lack of net public benefit
When a project increases flooding, storm risk, and contamination for coastal residents—while providing little or no demonstrated public benefit—our agencies risk breaking faith with the people they are sworn to protect. Approving deeper and wider navigation channels that will push storm surge and high tides farther inland, destroy natural flood buffers, and expose the public to “forever chemicals” in dredged material is fundamentally at odds with the public-trust responsibilities of both the State and the federal government.

For these reasons, I respectfully urge the Division of Coastal Management to find that the Wilmington Harbor 403 Dredging Project is **inconsistent** with North Carolina’s Coastal Management Program, public-trust obligations, and constitutional duty to conserve and protect our lands and waters, and to deny federal consistency for this project.

Thank you for your consideration and for your service in protecting North Carolina’s coast and its people.

Sincerely,

Bruce Piggot

Concerned Citizen Sunset Beach NC

Docusign Envelope ID: B8365F8E-07C2-45F3-BA42-0815DD2C86A4

November 3, 2025

BY ELECTRONIC SUBMISSION

US Army Corps of Engineers
Wilmington Corps
Attn: Wilmington Harbor 403
69 Darlington Avenue
Wilmington, NC 28403
WilmingtonHarbor403@usace.army.mil

Dear Sir or Madam:

On behalf of the three undersigned owners of Campbell Island, we respectfully submit these comments in response to the Section 403 Draft Letter Report and Draft Environmental Impact Statement (collectively the "Draft EIS") prepared by the United States Army Corps of Engineers, Wilmington District (the "Corps") for the Wilmington Harbor Navigation Project (the "Project"). We request that these comments be included in the administrative record for the Project.

Background on Campbell Island

Since the 1970s, Campbell Island (also known as Big Island) has been directly or indirectly owned by one or more members of the Trask family of Wilmington, North Carolina. Today ownership of Campbell Island is held in two limited liability companies and a trust, each associated with members of that family.

Campbell Island is designated by Brunswick County as Parcel Identification Number 10100002, and per the County comprises 252.60 acres. It sits in the Cape Fear River just east of the confluence of Town Creek. In relation to the federal navigation channel, Campbell Island sits just to the west of the Keg Island and Lower Big Island reaches, and just to the southwest of the Upper Big Island reach.

Campbell Island's Proximity to the Current and Proposed Navigation Channel

Other than Orton Point, Campbell Island is closer to the existing navigation channel than any privately-owned property downstream of the Port of Wilmington. At present, at its closest point, Campbell Island is only about 540 feet from the western edge of the bottom of the 42-foot deep, 500-foot wide navigation channel, with the side slopes of the channel being even nearer to the island.

To the extent the proposed Project goes forward, the Corps' proposed symmetrical widening of the Keg Island and Lower Big Island reaches to (generally) 600 feet wide will decrease the distance between the bottom of the (up to) 50-foot navigation channel and the island by 50 feet to approximately 490 feet, with the additional 8 feet of deepening (including allowable rock

Docusign Envelope ID: B8365F8E-07C2-45F3-BA42-0815DD2C86A4

over-dredging) further decreasing the distance between the dredging limits and the island by up to 24 more feet at a 3:1 slope.

Historical Effects of River Dredging on Campbell Island

We believe the available evidence demonstrates that the deepening of the navigation channel adjacent to Campbell Island has caused significant erosion to the eastern edge of the island. This erosion has resulted in the (likely permanent) loss of both uplands and high-quality estuarine wetlands.

We do not have access to high-quality aerial imagery of the island from prior to 1993 at this time. However, available aerial images from 1993 (Figure 1), 2002 (Figure 2) and 2025 (Figure 3) show the dramatic loss of land on the eastern side of Campbell Island, particularly since the Corps' last major deepening project was completed in 2002. Figure 4 shows the estimated perimeter of Campbell Island as of 1993 (green), 2002 (yellow) and 2025 (red).



Figure 1 – 1993



Figure 2 - 2002

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Figure 3 – 2025



Figure 4 – 1993, 2002, 2025

These images suggest that since 1993 approximately 37 acres have been lost to erosion on the eastern side of the island adjacent to the navigation channel. This land loss calculates to about 13% of the total area of the island based on its 1993 estimated area of 293 acres. Given that the vast majority of the uplands on Campbell Island have historically been located on the eastern edge of the island, the total percentage of uplands lost to erosion during this time period is likely an even larger percentage.

Note that the loss of land during this period would probably have been even greater but for the Corps' apparent historical dumping of dredge spoils on portions of the eastern edge of the island. To the best of our knowledge, the Corps does not have any spoils easement or other right to dump spoils on Campbell Island, but nonetheless this has occurred over the years. We reserve all rights with respect to any unlawful deposit of spoils or other unauthorized use of Campbell Island by the Corps and/or its contractors, agents or representatives.

We believe that the federal navigation channel and its associated vessel traffic and wakes – and not other factors such as sea-level rise – are primarily responsible for the land loss on the eastern edge of the island. We believe this is self-evident based on the fact that the location of the

Docusign Envelope ID: B8365F8E-07C2-45F3-BA42-0815DD2C86A4

western edge of the island – which is consistently a very low elevation and would therefore be much more subject to being affected by rising water levels – has remained consistent throughout the 1993-2025 time period. It also appears that the rate of land loss has accelerated since the Corps' last major deepening project in 2000-2002.

Concerns Regarding Proposed Project's Effects on Campbell Island

In the Draft EIS, the Corps does not adequately address – and in actuality, does not address at all – the near-certain negative effects of the Project on Campbell Island.

The Draft EIS not satisfy the mandatory requirements of the National Environmental Policy Act ("NEPA") as articulated by the U.S. Supreme Court, and prescribed in the Corps' binding NEPA regulations, in that it fails to disclose the obvious direct and indirect impacts of the Project on Campbell Island, and it fails to identify practicable mitigation measures to avoid these effects. *See Seven Cnty. Infrastructure Coal. v. Eagle Cnty., Colorado*, 145 S. Ct. 1497, 1512-13 (2025); 33 C.F.R. § 333.61(d), (n).

Additionally, Campbell Island is located in a portion of the Cape Fear River which is downstream from the Cape Fear Memorial Bridge, and as such, is located in an area which has been designated as an "area of environmental concern" by the N.C. Coastal Resources Commission. N.C.G.S. § 113A-113; 15A NCAC 7H.0206, .0209; 15A NCAC 3Q.0202(18). The Draft EIS does not satisfy the Corps' mandatory, non-discretionary obligation under the Coastal Zone Management Act ("CZMA") to ensure that the Project will be carried out in a way that is "consistent to the maximum extent practicable" with North Carolina's Coastal Area Management Act ("CAMA"). As a result, the Draft EIS is deficient.

Further Land Loss Associated with a Deeper, Wider Channel

As noted above, prior deepening of the federal navigation channel and the use of the deeper channel by larger and larger vessels has almost certainly been the primary cause of portions of Campbell Island to be irrevocably lost to erosion along the eastern side of the island. It seems beyond reasonable debate that further deepening and widening the navigation channel will only exacerbate these problems.

First, the Draft EIS failed to consider obvious alternatives to the proposed symmetrical widening of the channel within its Lower Big Island and Keg Island reaches. For example, it appears that no consideration was given to either (i) widening the channel asymmetrically to the east (only) or (ii) shifting the entire channel eastward away from the Campbell Island. We believe that in the Final DEIS, the Corps must analyze these and other alternatives which might cause less damage to Campbell Island.

Second, the Draft EIS failed to address the obvious negative consequences to Campbell Island which will result from the Project deepening the navigation channel to 47 feet, plus an additional allowance for over-dredging of an additional 3 feet. Despite the close proximity of Campbell Island's eastern edge to the downslope leading to the proposed (up to) 50 foot channel depth, the Draft EIS includes no discussion regarding the effect that that this new depth will have on Campbell Island's ability to retain its dry land.

Docusign Envelope ID: B8365F8E-07C2-45F3-BA42-0815DD2C86A4

Third, we understand that the primary economic justification for spending close to $1 billion to widen and deepen the Cape Fear River's federal navigation channel is to allow larger, Post-Panamax type vessels to access the Port of Wilmington more frequently. However, in modeling the vessel wakes that will result in the widen, deeper river channel, we also understand that the Draft EIS assumes the use of a small container vessel, one that is smaller than many of the larger Post-Panamax vessels already calling on the Port. We believe this modeling assumption significantly undermines the credibility of any conclusions reached by the Corps regarding how the Project's vessel wakes will affect nearby submerged lands, wetlands and uplands generally, and Campbell Island specifically.

The Draft EIS makes no attempt to identify and assess these foreseeable effects of the Project on Campbell Island. It makes no attempt to evaluate potential alternatives to a symmetrical widening of the Lower Big Island and Keg Island reaches adjacent to Campbell Island. And it also makes no attempt to identify options for avoiding or minimizing the negative effects of the Project and/or whether any of those options, if implemented, would be effective.

These are not our only concerns with the Draft EIS and the Project related to future land loss. But these are the concerns which we believe if not adequately addressed in the Final EIS would render the Final EIS insufficient and defective under applicable law, including without limitation NEPA and CZMA.

Further Forest Resource Loss Associated with a Deeper, Wider Channel

The Draft EIS also ignores the historical effects of dredging on saltwater intrusion in the Cape Fear River. We are aware of recent peer-reviewed scientific studies which confirm that the historical channel deepening of the Cape Fear River has led to widespread saltwater intrusion, loss of forested wetlands, and the expansion of so-called "ghost forests" of dying bald cypress. It stands to reason that further deepening and widening of the federal navigation channel will exacerbate this problem, and yet, the Draft EIS does not sufficiently identify and address these known impacts.

For example, in "A Multi-Decadal Investigation of Tidal Creek Wetland Changes, Water Level Rise, and Ghost Forests" (*Remote Sensing*, 2020), UNC Wilmington researchers Jessica Magolan and Joanne Halls found that that ~18% of tidal-forest wetlands along Town Creek converted to emergent marsh or open water between the 1980s and 2010s, and that this transition accelerated following the Corps' last Cape Fear River deepening project in 2000-2002. Other academic research reaches similar conclusions. See, for example, Deveraux, K. et al., "Tree- Ring and Sediment Analyses Reveal Processes of Bald Cypress Ghost Forest Formation From Dredging in the Cape Fear River, North Carolina, USA," *Ecology and Evolution*, 2025.

Campbell Island has limited forest resources, but given its location, it would be highly susceptible to any additional forces tending to cause the further conversion of freshwater wetlands to emergent marsh or open water. Additionally, the owners of Campbell Island are also directly or indirectly the owners of additional parcels in the vicinity of Campbell Island adjacent to either the river or Town Creek, including Brunswick County PIN 08600025 (upstream of Campbell Island on the west bank of the river), and PINs 11400002 and 07100002 (on Town Creek, upstream of its confluence with the Cape Fear River at Campbell Island).

Docusign Envelope ID: B8365F8E-07C2-45F3-BA42-0815DD2C86A4

We believe all of these parcels have been negatively affected by previous channel deepening projects and are concerned that the Corps is not adequately assessing and addressing the Project's potential to cause further conversion of their riparian lands and resources in the future.[1] The Draft EIS is deficient in that it does not analyze what steps, if any, could be taken to avoid or minimize the foreseeable negative effects of the Project on Campbell Island.

These are not our only concerns with the Draft EIS and the Project related to future loss of forestry resources. But these are the concerns which we believe if not adequately addressed in the Final EIS would render the Final EIS insufficient and defective under applicable law, including without limitation NEPA and CZMA.

Conclusion

The duties imposed on the Corps under NEPA, the CZMA, and the Corps' own binding policy are mandatory, non-discretionary obligations. The Draft EIS demonstrates that the Corps has not fulfilled its obligations under those statutes and policies. The Project poses obvious risks to the Campbell Island that, if the adverse consequences occur, will cause great damage to Campbell Island and its unique environment.

The Corps must describe the obvious negative impacts of the Property on Campbell Island in the Final EIS. The Final EIS must disclose the adverse impacts of the Project on Campbell Island and its ecological resources. In the Final EIS, the Corps should identify and adopt measures to protect Campbell Island against the adverse impacts.

We look forward to learning how the Corps proposes to avoid protect privately-owned Campbell Island from the reasonably foreseeable negative impacts of this public project.

[signatures on following page]

[1] Brunswick County PIN 08600025 is owned by Sebrell C. Singleton, Trustee Under The Rudolph G. Singleton III Revocable Living Trust Dated July 22, 2024 and Howard W. Coupland, Jr. (on the Cape Fear River), and PINs 11400002 and 07100002 (on Town Creek) are owned by TF Holdings Limited Partnership. Please accept these comments as comments made on behalf of these affected property owners as well.

Docusign Envelope ID: B8365F8E-07C2-45F3-BA42-0815DD2C86A4

OFSC Properties, LLC

By: DocuSigned by: Howard Waff Copland, Jr. 534778FE949E49B...

Its: Manager

Ammo Dump/Lake+9, LLC

By: Signed by: Bruce A. Chappell, Jr. 364CDE4A3736413...

Its: mgr

D. Webster Trask, Trustee of the D. Webster Trask Revocable Trust Dated September 26, 2016, and Any Amendments Thereto

By: DocuSigned by: 4430359E184B43D...

Its: general partner

Reply Address:

6336 Oleander Drive, Suite 1
Wilmington, North Carolina 28403

From: Carl Middleton
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Reject the proposed dredging plan
Date: Friday, December 19, 2025 9:18:15 PM

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Dear North Carolina Department of Environmental Quality,

I am writing to formally *oppose the proposed plan* to dredge and deepen the Cape Fear River near Wilmington. This project presents serious, long-term risks to the ecological health, climate resilience, and cultural heritage of the Lower Cape Fear region, and I urge NC DEQ to deny or significantly revise any permits associated with this effort.

The Cape Fear River is a living system, not simply a navigation channel. Its forests, wetlands, and waters support communities, economies, and ecosystems that cannot be easily repaired once damaged. Proceeding with this dredging plan would prioritize short-term industrial convenience over long-term environmental stability and public trust.

I respectfully urge NC DEQ to reject the proposed dredging plan or require a fundamentally different approach—one that prioritizes climate resilience, protects irreplaceable old-growth forests, fully addresses contamination risks, and includes enforceable accountability for mitigation commitments.

Sincerely,

Carl Middleton

Wilmington, NC 28412

From: Carla Duarte
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Tuesday, November 18, 2025 7:18:20 AM

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Please please please do not stir up and disrupt the toxic sludge in the river! Please go with the option of regular maintenance.
Carla Duarte
Carolina Beach resident

From: Carla Murray
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Proposed Wilmington Harbor Expansion
Date: Wednesday, December 10, 2025 6:30:42 PM

You don't often get email from clmurray2252@gmail.com. Learn why this is important

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The proposed Wilmington Harbor expansion would cause irreversible harm to the Cape Fear River, its wildlife, and surrounding communities, all without a proven public need. Deeper dredging would push saltwater farther up the Cape Fear River, killing forests and wetlands. A UNC Wilmington study found that earlier dredging caused permanent damage to riverfront forests — and this would make it worse.
Please oppose this project to protect Wilmington and its ecosystem.

From: Carly Klinedinst
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] USACE Wilmington Harbor 403 Navigation project
Date: Sunday, November 16, 2025 12:48:17 PM

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To Whom it May Concern,

I am writing to express my strong opposition to the USACE Wilmington Harbor 403 Navigation Project. As a lifelong Wilmingtonian I care deeply for my city and in reviewing the plans and projected impacts, I have deep concerns about the environmental harm, increased flood risk, and the broader implications for North Carolina taxpayers.

Firstly, this project has potential for significant and irreversible environmental damage. Deepening and widening the channel will disrupt fragile coastal and estuarine ecosystems, degrade water quality, and place additional stress on already vulnerable species ,to include multiple species of sea turtles as well as sturgeon populations. These ecosystems are essential to the environmental resilience of our coastal communities, which are already suffering at the hands of unsustainable development in the region. I believe our efforts should focus on dampening impact, not increasing it and our choices in policy should focus on cushioning our already fragile infrastructure in this town.

Also, the project potentiates a major increase in flooding in the surrounding areas. Altering the harbor can intensify storm surge impacts and increase the vulnerability of nearby neighborhoods to both routine and severe flooding events. With climate change already magnifying flood risks across the state, moving forward with a project that further elevates these hazards is deeply concerning and irresponsible.

Lastly, this project represents an extremely disheartening misuse of taxpayer funds. North Carolinians should not be expected to subsidize an initiative that primarily benefits private commercial interests while shifting the financial and environmental burdens onto local communities. It is unacceptable that public resources are being allocated to a project that puts citizens, ecosystems, and coastal infrastructure in harm's way.

For these reasons, I urge the Department to reject this project and prioritize the protection of our environment, communities, and public trust resources. North Carolina deserves solutions that promote resilience, not projects that amplify risk and sacrifice our ecosystems.
Thank you for your attention to this serious matter.
Sincerely,

Carly Klinedinst

Sent from my iPhone

From: Chris Wade
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, November 17, 2025 1:29:53 PM

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I support the project to deepen and widen the channels to Wilmington Harbor. I believe for the economy of the region and the vibrancy of the Port of Wilmington, this project should be undertaken.
Thank you
Captain Chris Wade
Hanover Docking Pilots, LLC

City of Wilmington Formal Comments on Proposed Port Dredging Project

The City of Wilmington recognizes the desirability of expanding port operations and acknowledges that such expansion may generate direct and indirect benefits for commerce, the State of North Carolina, and the United States. At the same time, the City is concerned that the proposed port dredging could result in adverse impacts to the City of Wilmington and its residents, who would bear the consequences of changes to both the built and natural environment resulting from this work. The City's specific concerns are outlined below.

1. Insufficient Analysis of a -51 Elevation Dredge Depth

The City is concerned that the report does not include an analysis of dredging to elevation -51. The report acknowledges that shipping companies are transitioning to larger, deeper-draft vessels, many of which require a draft of approximately elevation -51. While the report indicates that certain operational efficiencies could support the project under a shallower depth, the absence of an evaluation of a -51 dredge depth limits the ability to assess long-term competitiveness.

Without this analysis, the report does not adequately compare the economic impacts of continued vessel light-loading versus allowing vessels to operate at full draft, nor does it fully evaluate the Port of Wilmington's ability to remain nationally and globally competitive.

2. Understated Cost and Schedule Risk Contingency (CSRA)

The current Cost and Schedule Risk Analysis (CSRA) identifies a contingency of 24 percent. Recent USACE policy requires planning studies to advance to approximately 35 percent design to reduce project risk; however, several key elements necessary to support that level of confidence have not been fully addressed. These include, but are not limited to, completion of cultural resource surveys, PFAS soil testing and mitigation planning, assessing erosion impacts during wetland transitions, and potential reductions in upstream freshwater flow associated with interbasin transfer agreements.

The City's position is that the absence of these considerations introduces additional uncertainty that is not adequately reflected in the current CSRA. As a result, the City believes the contingency should be increased, potentially to 30 percent or higher, to more accurately reflect project risk. Many of the outstanding issues identified would directly affect project costs and, in turn, the cost-benefit ratio.

3. Incomplete Cultural Resource Surveys and Mitigation Planning

The City is concerned that cultural resource surveys and associated mitigation planning are not adequately addressed in the current report. USACE guidance typically requires all necessary surveys to be completed at the 35 percent design stage to reduce project risk. Failing to conduct these surveys during the planning phase, due to cost or schedule considerations, would be a disservice to the local community.

Omitting cultural surveys at this stage increases the risk of high cost and schedule overruns that are not reflected in the current cost-benefit analysis and heightens the potential for unintended impacts to cultural resources due to insufficient planning. USACE has documented numerous instances in which failure to complete required surveys during planning resulted in substantial delays and cost increases, in some cases preventing projects from moving forward altogether.

4. Lack of PFAS Planning, Testing, and Mitigation Consideration

The City is deeply concerned about the lack of planning, testing, and consideration of per- and polyfluoroalkyl substances (PFAS) within the project area. Extensive documentation confirms the presence of PFAS throughout the Cape Fear River Basin, resulting from historical pollution. There is significant concern that dredging activities could disturb PFAS-contaminated sediments, reintroducing elevated concentrations into the water column and increasing exposure risks to residents, as well as to local flora and fauna.

While the U.S. Environmental Protection Agency does not currently have enforceable regulatory thresholds applicable to this project, it would be imprudent to advance the project without a defined strategy to assess and address PFAS-related risks. These considerations are not currently reflected in the cost-benefit analysis and could materially impact overall project costs on federal and state interests.

5. Increased Flooding and Sea Level Impacts

The report indicates that dredging would result in an approximate two-inch increase in water levels during normal high tides. While USACE characterizes this increase as negligible, the City maintains that any incremental increase in flooding risk for residents and businesses along the Cape Fear River could have meaningful consequences, including

impacts to the local economy, property values, and flood insurance costs in an area already vulnerable to flooding and storm events.

The potential costs associated with additional flood protection or property impacts are not fully reflected in the project's cost-benefit analysis.

6. Transportation Infrastructure Constraints

The current report does not adequately account for existing transportation bottlenecks along vehicular routes serving the Port of Wilmington. Without an evaluation of the capacity and performance of local and state highway systems in the immediate vicinity of the port, it is unclear whether existing infrastructure constraints could limit or cap the benefits anticipated under the proposed plan.

The City is concerned that projected efficiencies and the stated federal interest may not be fully realized if local and state transportation infrastructure is not expanded to support increased port throughput.

7. Long-Term Maintenance Dredging and Placement Capacity

The City is concerned that the current analysis does not adequately address long-term maintenance dredging needs and associated budget allocations that are likely to increase throughout the Cape Fear River Basin as a result of channel deepening. While Eagle Island currently serves as a primary placement area for dredged material, upgrades would be required to accommodate increased volumes and long-term impacts.

Although the USACE plan discusses potential beneficial use of dredged material at multiple locations, it also acknowledges that beneficial use is currently uneconomical in many cases. These long-term maintenance and placement considerations are not fully reflected in the current cost-benefit analysis and could materially affect the project's economic assumptions.

8. Impacts to City-Owned Infrastructure Near the Cape Fear Memorial Bridge

The City is concerned about potential impacts to City-owned infrastructure located immediately upstream of the proposed final dredging limits near the Cape Fear Memorial Bridge, including a publicly accessible boat ramp and retaining wall. Upstream propagation

of the proposed elevation -47 dredge depth could affect the structural integrity and long-term performance of this infrastructure, resulting in direct costs to the City of Wilmington.

In addition, increased high-tide levels and flooding elevations of approximately two inches could further compound these impacts. These potential infrastructure risks and associated costs are not fully reflected in the current cost-benefit analysis.

Requested Actions

Accordingly, the City of Wilmington respectfully requests that USACE:

1. Revise the report to include an evaluation of dredging to elevation -51 to compare the economic impacts of continued vessel light-loading versus allowing vessels to operate at full draft.
2. Complete the necessary planning and mitigation analyses for identified risk factors or appropriately account for those risks within the CSRA, and update the cost-benefit ratios accordingly.
3. Conduct required cultural resource surveys and develop appropriate mitigation plans, with associated costs, and include this information in all analyses.
4. Work collaboratively with the City of Wilmington and the Cape Fear Public Utility Authority to establish PFAS testing thresholds and develop preliminary mitigation measures should elevated PFAS levels be identified.
5. Evaluate and implement additional flood protection measures for affected areas or, where appropriate, acquire flood easements, and assess whether existing protections require modification to accommodate increased water levels.
6. Evaluate the capacity and performance of local and state highway systems near the port to determine whether infrastructure constraints could limit project benefits, and document those limitations within the overall analysis.
7. Reassess the need for upgrades to the Eagle Island placement area and/or identify potential new placement areas, clearly defining associated cost and schedule impacts.
8. Acknowledge and evaluate potential impacts to City-owned infrastructure near the Cape Fear Memorial Bridge and ensure any resulting costs and risks are reflected in the project's cost-benefit analysis.

Due to timing constraints, City Council did not have the opportunity to formally review these comments prior to the close of the NCDEQ comment period. The recommendations outlined herein reflect staff review and analysis and will be presented to City Council for consideration in January 2026. Any resolution adopted by Council will be forwarded accordingly.

Please provide notice of the determination to Justin.Carter@wilmingtonnc.gov.

From:	Clark Freise
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date:	Thursday, December 18, 2025 12:54:33 PM

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Dear Sir/Madam,

I do not see how the proposed project can be consistent with protection of the coastal environment. According to the Corps of Engineers analysis, the same tonnage of cargo will be delivered through Wilmington harbor whether the project is performed or not. I believe that the state's economic gain is the taxes per ton collected. Since the same tonnage will be delivered, the state's benefit is the same. The economic gain, if there actually is one, is the profitability of unknown future shippers of goods. Since there is a clear environmental impact, and significant environmental risk while there is unclear economic benefit to the state I believe the DEQ should deny that the proposed project is consistent with coastal preservation.

Sincerely,
Clark Freise
Southport, NC
Sent from my iPad

From: Clayton DeConte
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project.
Date: Thursday, December 4, 2025 9:22:16 PM

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Subject: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project

Dear North Carolina Department of Environmental Quality,

I am submitting this comment to formally oppose the USACE Wilmington Harbor 403 Navigation Project.

This project poses serious risks of environmental harm to the already stressed coastal and estuarine ecosystems of the greater Wilmington area. Channel deepening and expansion threaten water quality, habitat stability, and marine life. Wilmingtonians already are suffering the consequences of negligent treatment of the Cape Fear resulting in forever chemicals in our water supply, not to mention the habitat and natural life destruction that is a direct result of continued development and commercialization of the area.

The project also increases the risk of flooding and storm surge. Altering natural sediment movement and harbor dynamics can worsen flooding during both routine storms and major weather events, placing homes and infrastructure at greater risk. Coastal communities already deal with the constant threat of flooding due to the nature of where we live and should not have to bear the brunt of the proven additional flood risk of this project.

In addition, this project represents an unjustified use of taxpayer funds. Public resources should not be used to support a project that largely benefits private commercial interests while transferring environmental and financial risks to local residents and communities.

For these reasons, I urge NCDEQ to deny approval of this project . Please include this comment in the public record.

Thank you for your time and consideration.

Clay De Conte
claydeconte@gmail.com
(408) 656-3716

From: Emily Donovan
To: Luck, Cameron A
Subject: Re: [External] Re: Form Submission - New Form - Looking for POC for Clean Cape Fear
Date: Thursday, January 8, 2026 4:06:25 PM
Attachments: CCF Port Expansion_DCM Consistency Determination_12.19.2025.pdf

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Hi Cameron,

Yes, we did try and submit comments. I'm not sure why they didn't go through. Would you please accept this letter?

With gratitude,

Emily Donovan
Co-Founder
Clean Cape Fear
FB/IG/X/TikTok/BlueSky/YouTube: @CleanCapeFear
www.cleancapefear.org

"Above all, maintain constant love for one another, for love covers a multitude of sins." 1 Peter 4:8

On Thu, Jan 8, 2026 at 1:39 PM Luck, Cameron A <Cameron.Luck@deq.nc.gov> wrote:

> Hi Emily,
>
> NCDEQ sent the Division of Coastal Management a query regarding Clean Cape Fear's comments on the USACE Federal Consistency Determination for the Wilmington Harbor 403 FNS Dredge project. I am contacting you all to confirm comments were not submitted to DCM as we have no record of receipt. The public comment period closed December 20th. If Clean Cape Fear did in fact attempt to submit comments for this project, please let me know.
>
> Thanks,
>
> ---
>
> **From:** Emily Donovan <esdonovan@gmail.com>
> **Sent:** Thursday, January 8, 2026 1:26:34 PM
> **To:** Luck, Cameron A <Cameron.Luck@deq.nc.gov>
> **Subject:** [External] Re: Form Submission - New Form - Looking for POC for Clean Cape Fear

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Hi Cameron,

Happy to help you. I'm co-found of Clean Cape Fear

With gratitude,

Emily Donovan
Co-Founder
Clean Cape Fear
FB/IG/X/TikTok/BlueSky/YouTube: @CleanCapeFear
www.cleancapefear.org

"Above all, maintain constant love for one another, for love covers a multitude of sins." 1 Peter 4:8

On Thu, Jan 8, 2026 at 12:55 PM Squarespace <form-submission@squarespace.info> wrote:

> Sent via form submission from *Clean Cape Fear*
>
> **Name:** Cameron Luck
>
> **Email:** cameron.luck@deq.nc.gov
>
> **Subject:** Looking for POC for Clean Cape Fear
>
> **Message:** Good Afternoon,
>
> I am looking for a point of contact for your organization to follow up with via email regarding a NC Department of Environmental Quality query. Please follow up with me via email at your earliest convenience.
>
> Cameron Luck
> Policy Analyst | Federal Consistency Coordinator, Division of Coastal Management
> Department of Environmental Quality
>
> Manage Submissions
>
> Does this submission look like spam? Report it here.

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CLEAN CAPE FEAR

Cameron Luck
Federal Consistency Coordinator
Division of Coastal Management
North Carolina Department of Environment Quality
400 Commerce Avenue
Morehead City, NC 28557
Federalconsistencycomments@deq.nc.gov
cameron.luck@deq.nc.gov

December 19, 2025

RE: USACE Federal Consistency Determination for the Wilmington Harbor 403 FNS Dredge project

Dear Mr. Luck:

I am writing on behalf of Clean Cape Fear, an all-volunteer grassroots community group grounded in the simple principle that any conversation about per- and polyfluoroalkyl substances ("PFAS" or "forever chemicals") should begin and end with the communities most impacted.

We submit these comments regarding the Division of Coastal Management's (DCM) determination of whether the U.S. Army Corps of Engineers Wilmington Harbor 403 Navigation Project is consistent with the North Carolina Coastal Management Program. We support the comments submitted by the Southern Environmental Law Center, and would like to specifically elevate further concerns regarding PFAS contamination of the lower Cape Fear region.

For more than half a century, industries like DuPont and Chemours, as well as numerous others, including military installations and locations using aqueous-film-forming foam laden with toxic PFAS, have treated the lower Cape Fear River as a PFAS sacrifice zone. Despite this well-documented history, the Army Corps' Environmental Impact Statement omits PFAS entirely. There has been zero PFAS sediment testing for the stretch of river proposed for dredging. It's been over eight years since the public first learned about GenX and other PFAS in our drinking water supply. We are shocked that no federal or state agency, academic institution, nonprofit, or state legislature through legislative funding has commissioned or publicly released a PFAS sediment study for this portion of the lower Cape Fear River. This is a river known for legacy and ongoing PFAS contamination. We find this omission by the Army Corps of Engineers alarming and cause for concern.

The omission of PFAS testing and possible spread is particularly troubling given that PFOA and PFOS were formally designated as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) by the U.S. Environmental Protection Agency in 2024.[1] That designation reflects a federal determination that these chemicals pose significant risks to human health and the environment and require investigation, remediation, and liability when disturbed. Proceeding with dredging activities absent PFAS sediment characterization, fate, transport, and remediation measures directly contradicts the intent of CERCLA.

In 2025, Clean Cape Fear co-authored peer-reviewed research showing seafoam along the shoreline of the Cape Fear River and surrounding beaches, specifically in Brunswick County, contained some of the highest PFOS concentrations ever reported in scientific literature to date.[2] Our community has repeatedly had to request or independently facilitate PFAS testing when agencies failed to proactively do so. We believe putting this high burden of proof on already severely contaminated PFAS communities infringes on our basic human rights.

---

[1] 89 Fed. Reg. 39124, May 8, 2024

[2] Enders et al., *Environmental Science & Technology*, August 2025

Failures to include and consider the impacts this dredging project would have on the fate and transport of decades of PFAS pollution raises serious business-related human rights concerns. In 2024, United Nations human rights experts specifically called out North Carolina environmental regulators for "[undermining] community's right to information and their right to an effective remedy."[3]

We are deeply concerned that dredging without PFAS sediment characterization and relocating potentially hazardous substances would negatively impact the quality of our region's seafoam, seaspray, estuaries, aquatic and marine life. This project should in no way re-mobilize highly toxic, persistent "forever chemicals" in a community already overexposed for decades. If PFAS are not being monitored, tested, and meaningfully addressed in this project, then coastal communities are not being protected.

We urge DCM to reject the Army Corps' environmental impact statement as incomplete and the determination as incompatible with North Carolina's Coastal Management Plan.

With gratitude,

Emily Donovan, co-founder
Clean Cape Fear

[3] https://www.ohchr.org/en/press-releases/2024/02/us-companies-dupont-and-chemours-generated-extensive-contamination-toxic

From: Colleen Esposito
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Sunday, November 16, 2025 11:44:21 AM

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To Whom it May Concern,

As a lifelong Wilmingtonian, I am writing to formally express my strong opposition to the USACE Wilmington Harbor 403 Navigation Project. After reviewing the plans and projected impacts, I have serious concerns about the environmental harm, increased flood risk, and the broader implications for North Carolina taxpayers.

First and foremost, the project threatens to inflict significant and irreversible environmental damage. Deepening and widening the channel will disrupt fragile coastal and estuarine ecosystems, degrade water quality, and place additional stress on species that are already vulnerable, including multiple species of sea turtles as well as sturgeon populations. These ecosystems are essential to the environmental resilience of our coastal communities, which are already suffering at the hands of unsustainable development in the region. Efforts to mitigate impact, not amplify it, should be at the forefront of policy.

Additionally, the project poses a substantial risk of exacerbating flooding in surrounding areas. Altering the harbor can intensify storm surge impacts and increase the vulnerability of nearby neighborhoods to both routine and severe flooding events. With climate change already magnifying flood risks across the state, moving forward with a project that further elevates these hazards is deeply irresponsible.

Finally, this project represents a troubling misuse of taxpayer funds. North Carolinians should not be expected to subsidize an initiative that primarily benefits private commercial interests while shifting the financial and environmental burdens onto local communities. It is unacceptable that public resources are being allocated to a project that puts citizens, ecosystems, and coastal infrastructure in harm's way.

For these reasons, I urge the Department to reject this project and prioritize the protection of our environment, communities, and public trust resources. North Carolina deserves solutions that promote resilience, not projects that amplify risk and sacrifice our ecosystems.

Thank you for your attention to this serious matter.

Sincerely,

Colleen Esposito

CPCG Director
Andy Wood

CPCG Board
Dr. Larry Cahoon, Ph.D.; Wilmington, NC
Mr. Marcus Rich, Wilmington, NC
Mr. Gene Williamson; Seal Rock, OR
Dr. John Dindo, Ph.D.; Dauphin Island, AL
Dr. Mike Spranger, Ph.D.; Gainesville, FL
Ms. Terri Hathaway, M.A.Ed.; Manteo, NC
Dr. Rick Tinnin, Ph.D.; Port Aransas, TX

Coastal Plain Conservation Group

Date: 16 July 2024

To: US Army Corps of Engineers
Wilmington District
ATTN: Wilmington Harbor 403
69 Darlington Avenue
Wilmington, NC 28403

From: Andy Wood, Director
Coastal Plain Conservation Group
PO Box 1008
Hampstead, NC 28443
awood@coastalplaincg.org
910-742-2675
www.coastalplainconservationgroup.org

Will Harlan
Center for Biological Diversity
338 Merrimon Avenue
Asheville, NC 28801
828-230-6818
wharlan@biologicaldiversity.org
www.biologicaldiversity.org

Re: WILMINGTON HARBOR 403 LETTER REPORT AND ENVIRONMENTAL IMPACT STATEMENT WILMINGTON HARBOR NAVIGATION PROJECT, NORTH CAROLINA (WH403)

This letter provides comments from COASTAL PLAIN CONSERVATION GROUP, and the CENTER FOR BIOLOGICAL DIVERSITY regarding the WILMINGTON HARBOR 403 LETTER REPORT AND ENVIRONMENTAL IMPACT STATEMENT WILMINGTON HARBOR NAVIGATION PROJECT, NORTH CAROLINA ((WH403).

Coastal Plain Conservation Group (CPCG) is a nonprofit organization dedicated to protecting North Carolina's imperiled coastal plain species and their habitats, regardless of glamour, size, or obscurity. CPCG's activities support its mission to conserve forests, marshes, and other coastal plain ecosystems that support communities of plants and wildlife and enrich the lives of people.

The Center for Biological Diversity ("Center") is a national nonprofit, public interest environmental organization dedicated to protecting imperiled species and the habitat and climate they need to survive through science, law, and policy. The Center is supported by more than 1.7 million members and supporters and works to secure a future for all species, great or small, hovering on the brink of extinction.

Comments in this letter are meant to draw attention to concerns we think need to be included in the Wilmington Harbor 403 Letter Report and Environmental Impact Statement (WH403), with particular attention to the following substantive concerns:

1. North Carolina needs to do more in its efforts to prepare for and adapt to inevitable consequences of climate change and subsequent global change;
2. The lower Cape Fear River has lost thousands of acres of bottomland swamp forest and continues to lose more swamp acres due to downstream saltwater drowning resulting from decades of dredge-deepening efforts on behalf of the Wilmington State Port Authority;
3. North Carolina's natural coastal plain swamp and wetland forests are being recklessly clearcut to convert whole trees into wood pellets for export, via the Wilmington State Port, to Europe where the pellets are burned with coal to inefficiently generate electricity;
4. The species richness (biodiversity) of Cape Fear River swamp forests is declining due to saltwater intrusion;
5. Expanded Cape Fear River Dredging further imperils the endangered Magnificent Ramshorn snail and the WH403 needs to be updated to reflect this fact.

The following is from the USACE website [USACE Mission]:

"A primary goal of the Regulatory Program is to protect the nation's aquatic resources, particularly wetlands.

In some cases, projects will have an unavoidable impact on wetlands. In these instances, USACE requires replacement of the wetlands. Although USACE issues permits that affect wetlands, the Regulatory Program also requires that those effects are offset by wetlands were restored, created, enhanced or preserved wetlands. In many cases, several small, separate, low value wetlands were replaced with more environmentally beneficial large wetland complexes. The regulatory program also plays a key role in protecting endangered species."

For background, Cape Fear River communicates directly with the Atlantic Ocean. With river dredging and deepening, ocean saltwater intrudes upstream into tidal creeks that meander through tidal freshwater bottomland hardwood and cypress swamps. With each high tide ocean saltwater repeatedly intrudes into swamp creeks and streams and infiltrates into the swamp's organic soil, harming the soil's community of freshwater bacteria and other microorganisms that help consolidate otherwise hydric soil particles.

A previous Cape Fear River channel deepening project, conducted in the late 1990s, was promoted with the false claim that 'modeling' showed the estuary would become fresher after dredging. This was obviously wrong, and demonstrably led to acceleration of wetland alteration, soil subsidence, ghost tree formation, and displacement of freshwater and oligohaline (brackish) species.

Peer-reviewed research on the effects of sulfate and other seawater ions on microbial communities proves that saltwater intrusion into freshwater wetlands increases the availability of sea salt sulfate ion ($SO4=$), which supports the metabolism of anaerobic sulfate-reducing bacteria (SRB). These bacteria in turn metabolize the organic matter in wetland soils, which causes those wetlands to subside as their organic carbon content literally dissolves, becoming greenhouse gases $CO2$ and methane. The salt water does not so much kill the freshwater microbiome as favor an alternative microbiome. Similar effects are now well known in Dare and Hyde counties, where ditching has allowed sea water intrusion farther inland, causing soil subsidence and drowning what used to be productive farm fields, killing obligate freshwater vegetation, and generating large masses of standing dead vegetation that provide fuel for wildfires that, in turn, contribute $CO2$ and other pollutants to our planet's atmosphere.

Repeated saltwater inundation kills freshwater-adapted plant root hairs, severing the important plant root-soil connection and eventually exposing swamp tree roots in the process. To this point, existing plants adapted to freshwater are relegated to drown in salty water while freshwater-adapted wildlife are forced to shift, along with their host plants, in advance of saltwater intrusion inexorably hastened by dredging a river that communicates directly with the Atlantic Ocean.

To be clear, habitat shifting is a slow process historically measured in geologic timeframes tied to historic climate changes. Anthropogenic dredging and deepening of Cape Fear River is a problem for the river's habitats and associated plants and wildlife because the resultant changes happen too quickly for natural communities that evolved with geologic climate change to respond by shifting location or adapting to new environmental changes driven by increased concentrations of the greenhouse gases Carbon Dioxide (CO_2) and Methane (CH_4) in Earth's atmosphere, resulting from human activities including combustion of carbon-based fossil fuels.

In short, swamp forests cannot shift fast enough to outpace the current rate of saltwater intrusion resulting from anthropogenic changes to Cape Fear River's depth and width. This makes upstream swamps more imperative to protect against ocean expansion for the long term, and especially in response to hastened saltwater intrusion resulting from Cape Fear River dredging and deepening.

Concurrent with wetland harms resulting from anthropogenic river deepening are the associated activities conducted by the wood pellet industry worsen the future opportunity for species that must shift upstream to escape saltwater. It's worth noting here that this forest extraction scheme is an environmental justice issue for all people because the forests being destroyed are our most important tool for mitigating climate change. Plus, burning wood contributes CO2 to the atmosphere, and 30-40% of the potential energy in each pellet is lost through the harvesting, drying, packing, and shipping processes.

Few endeavors are so inefficient and detrimental as the wood pellet to electricity scheme, as regards climate and energy, and is mentioned here to connect the dots between river dredging, the State Port, and the wood pellet scheme that depends on the State Port to shuttle NC trees to Europe where they are burned to generate fleeting amounts of electricity for a small percentage of Great Britain's populace.

Cape Fear River supports rare, imperiled, and endangered species within and upstream of the zone proposed for river dredging and deepening, including the endangered Magnificent Ramshorn (Planorbella magnifica), a Pulmonate aquatic snail known-only from ponds and streams located in the lower Cape Fear River zone that will be negatively impacted by increased saltwater intrusion resulting from expanded river dredging. This saltwater intolerant snail received Endangered Species status in August 2022 because the US Fish and Wildlife Service concluded it had been extirpated from its natal habitats due to saltwater intrusion, unarguably hastened by river dredging and deepening: Magnificent ramshorn proposed listing and critical habitat | U.S. Fish & Wildlife Service (fws.gov).

The Wilmington Harbor 403 Letter Report and Environmental Impact Statement Wilmington Harbor Navigation Project does not include reference to the Magnificent Ramshorn and the impacts this project will have on the snail and its historic habitats.

It is well known that Cape Fear River dredging has brought broad and sweeping changes to the river's lower reaches, including associated streams, swamps, and freshwater marshes. Impacts of saltwater intrusion to the aforementioned snails and their habitats, as a consequence of river dredging, were highlighted in the US Fish & Wildlife Service Endangered Species Bulletin, released on 23 July 2014:

"The magnificent ramshorn is North America's largest air-breathing freshwater snail. Its brown coiled shell resembles a ram's horn and grows to the size and weight of a dollar coin. The snail is adapted to still or slow flowing aquatic habitats, where it eats submerged aquatic plants, algae, and detritus. While small and seemingly insignificant, this snail is an integral part of a complex food web found in freshwater swamps along coastal North Carolina.

The magnificent ramshorn was first described in 1903 by Henry Pilsbry, a prolific naturalist. The snail is unique to southeastern North Carolina, occurring nowhere else in the world. According to Bill Adams, a former biologist with the U.S. Army Corps of Engineers, the snail was likely once common throughout the lower Cape Fear River basin, especially in the numerous antebellum rice plantations, when the river was still shallow and fresh nearly to its mouth. The snail disappeared from the Cape Fear area after the river was dredged to make passage for big ships in the early 1930s. Tidal fluctuations in the lower Cape Fear changed from several inches to over four feet (1 meter). As the lower river was manipulated, salt water flowed farther upriver. And, salt is the one thing the snails cannot tolerate."

This above excerpt is included for purposes of brevity, and to demonstrate that a respected US Corps of Engineers biologist (retired) has acknowledged the fact that saltwater intrusion, resulting from dredging in the Cape Fear River, has led to the decline and likely extirpation of Magnificent Ramshorn. CPCG's work indicates the same saltwater intrusion has also apparently brought about the extirpation of Greenfield Ramshorn (*Helisoma eucosmium*), another salt-intolerant aquatic Pulmonate snail.

With this as background, CPCG and the Center respectfully request the USCOE to update the "Wilmington Harbor 403 Letter Report and Environmental Impact Statement Wilmington Harbor Navigation Project" to include salient information regarding negative impacts that this river dredging project will impose on this endangered species. This species is endangered by habitat loss exacerbated by dredging the Cape Fear River.

Without exaggeration, the expanded dredging in Cape Fear River makes extinction more likely for the endangered Magnificent Ramshorn (Planorbella magnifica); an aquatic Pulmonate (lunged) snail, known-only from freshwater habitats connected to the river's lower reach via tributary streams. Prior to modern dredging and deepening activities, this snail's habitats supported lush and vibrant cypress swamp forests.

These same freshwater wetland forests are now observably languishing and dying amid salty water as evidenced by the skeletal remains of dead cypress trees—sentinels alerting us to increased and expanded saltwater intrusion and drowning of freshwater swamp forests, streams, and ponds connected to Cape Fear River.

Given the river's post-colonial history, which includes freshwater rice cultivation that halted with the end of the Civil War, it is understood that recent swamp forest decline in the river's lower reach has come as a consequence of dredging a river that directly communicates with the Atlantic Ocean (part of the Great Ocean).

Other Cape Fear River species needing special consideration in the WH403 include, but are not limited to, the Rare Skipper (Problema bulenta), a butterfly inhabiting oligohaline marsh habitat found near the Navassa railroad bridge, about seven river-miles upstream of the Wilmington State Port. This imperiled butterfly requires a variety of obligate wetland plants that will be harmed by increased salinity caused by downstream deepening of Cape Fear River;

The Diamondback Terrapin (Malaclemys terrapin) is an obligate brackish water turtle that nests in soils threatened by the effects of sulfate and other seawater ions on microbial soil communities. This reptile is listed as a NC Special Concern Species and listed as a threatened species by the World Conservation Union and the WH403 should investigate impacts of this dredging project on this imperiled species;

Cape Fear Spatterdock (Nuphar sagittifolia), is an unusual riverine waterlily known only from a few riverine systems including freshwater zones of the lower Cape Fear River is and is harmed by salty water. The WH403 dredge and deepen project will predictably increase salinity in this uncommon plant's known aquatic habitat, where its vegetative leaves and stems provide refuge and food for a great diversity of aquatic life including, but not limited to, arthropods, mollusks, fishes, amphibians, reptiles, birds, and mammals. These animals are, in turn, also imperiled by the changes in water chemistry that will predictably result from deepening a freshwater river that communicates directly with the ocean.

While CPCG and the Center understand the important economic impact of shipping to and from the Wilmington State Port, via the Cape Fear River's dredged channel, we are requesting that consideration be given to the full costs of continued and expanded river dredging, as outlined in the Draft Integrated Feasibility Report and Environmental Assessment – Wilmington Harbor Navigation Improvements (2020).

Related to structural benefits provided by the Wilmington State Port to the State's economy, CPCG and the Center request USACE and USEPA consider the economic benefits of biodiversity in the Cape Fear River ecosystem. Just as it is unwise to lose nuts, bolts, and rivets holding together the State Port's infrastructure, it is unwise, metaphorically-speaking, to lose the living nuts and bolts of an ecosystem—the biodiversity that, in turn, supports our own species. It is unwise to lose biodiversity, including snails that consume algae and plants, in turn producing fecal matter that gets consumed by tiny organisms that are in turn eaten by small fishes, that are in turn eaten by large fishes, and so-on, thus helping power our multi-billion-dollar fishing economy. Yes, freshwater snails are that measurably important.

Before approving further dredging and deepening efforts in Cape Fear River, CPCG and the Center respectfully request USACE and USEPA to account the full economic and ecologic costs of increased dredging to include consequential impacts to Cape Fear River swamps, marshes and tributary streams and creeks, with emphasis on addressing wetland mitigation to allow habitat shifting to occur into upstream areas as a conservation strategy to protect Cape Fear River endemic and migratory species, notably candidate, endangered, and other listed species.

The following, quoted from the USCOE website section, USACE-Regulatory-Environmental-Benefits "*Regulatory: Environmental Benefits*," unequivocally states:

"*A primary goal of the Regulatory Program is to protect the nation's aquatic resources, particularly wetlands.*

In some cases, projects will have an unavoidable impact on wetlands. In these instances, USACE requires replacement of the wetlands. Although USACE issues permits that affect wetlands, the Regulatory Program also requires that those effects are offset by wetlands were restored, created, enhanced or preserved wetlands. In many cases, several small, separate, low value wetlands were replaced with more environmentally beneficial large wetland complexes. The regulatory program also plays a key role in protecting endangered species."

This USACE admission binds their own actions to the same standards that other entities are required to follow. CPCG and the Center therefore request the USCOE mitigate freshwater wetland losses resulting from hastened saltwater intrusion as a consequence of dredging and deepening Cape Fear River. If USCOE questions the veracity of the claim that dredging Cape Fear River will increase wetland harms, we respectfully ask USCOE to prove their dredging activity will not harm freshwater wetlands.

The following is quoted from the USEPA website [https://www.iwr.usace.army.mil/Missions/Value-to-the-Nation/Regulatory/Regulatory-Environmental-Benefits/] and included here because the USEPA has governing authority over wetland protection:

"*Types of Mitigation under CWA Section 404: Avoidance, Minimization and Compensatory Mitigation Overview*

The White House Council on Environmental Quality (CEQ) has defined mitigation in its implementing regulations for the National Environmental Policy Act to include avoiding, minimizing, rectifying, reducing over time, and compensating for impacts. The Clean Water Act Section 404(b)(1) Guidelines, developed by EPA in coordination with the U.S. Army Corps of Engineers and issued in 1980, establish substantive environmental criteria which must be met for activities to be permitted under Clean Water Act Section 404. The types of mitigation enumerated by CEQ are compatible with the requirements of the Guidelines; however, as a practical matter, they can be combined to form three general types of mitigation: avoidance, minimization, and compensatory mitigation.

As discussed in their 1990 Memorandum of Agreement on the mitigation requirements of the Guidelines, the Department of the Army and EPA agree that these mitigation types are generally applied sequentially in the following order:

Avoidance means mitigating an aquatic resource impact by selecting the least-damaging project type, spatial location and extent compatible with achieving the purpose of the project. Avoidance is achieved through an analysis of appropriate and practicable alternatives and a consideration of impact footprint.

Minimization means mitigating an aquatic resource impact by managing the severity of a project's impact on resources at the selected site. Minimization is achieved through the incorporation of appropriate and practicable design and risk avoidance measures.

Compensatory Mitigation means mitigating an aquatic resource impact by replacing or providing substitute aquatic resources for impacts that remain after avoidance and minimization measures have been applied, and is achieved through appropriate and practicable restoration, establishment, enhancement, and/or preservation of aquatic resource functions and services."

CPCG and the Center also consider the WH403 to be an environmental justice issue because it has potential to reduce the thickness of the confining layer between the bottom of the river and the freshwater aquifer that supplies drinking water to the lower Cape Fear region's Gullah Geechee, and other communities of color, along with low-wealth and other white populations. Given the predictable likelihood that an anticipated or unintended breach in the confining layer separating salty river water from fresh aquifer water, we respectfully ask the USCOE to conduct an updated objective and comprehensive accounting of economic and hydrologic impacts that the WH403 project will impose on this region's critically important freshwater aquifer drinking water supply that thousands of our region's residents require for their wellbeing.

We remind all parties involved with the Wilmington Harbor Navigation Project that this endeavor is an economic want and not an ecological need; the latter being of greater importance to the long-term safety of this region's human residents and visitors. We highlight the distinction between wants and needs because this project is prioritized to support private for-profit endeavors at the expense of public trust resources, in addition to taking public funding that could otherwise fund efforts to clean and improve the river's water quality.

With this letter and supporting documentation from the US Army Corps of Engineers and US Environmental Protection Agency, CPCG and the Center hereby stress the need for USCOE to be held accountable for harms inflicted to Cape Fear River wetlands, and consequential harms to the river's underlying aquifer, resulting from river dredging and deepening activities associated with the Wilmington Harbor Navigation Project. conducted for the purpose of facilitating shipping enterprises to conduct private, for-profit activities that may or may not provide public benefit.

Thank you for your consideration of these comments and we are glad to provide more information regarding this matter.

Sincerely,

Andy Wood, Director
Coastal Plain Conservation Group

Will Harlan
Southeast Director
Center for Biological Diversity

From: Sandy Mitchell
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] deepening the Cape Fear River shipping channel
Date: Thursday, December 4, 2025 7:30:17 PM

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As a retired American merchant mariner living in Southport, I have always enjoyed watching the ships go by; a little nostalgia for us old folks. However, the proposal to deepen the shipping channel goes against some of the things that I hold dear: primarily, the environment. The dead cypress trees all the way up the river are clear evidence that deepening the channel is anathema to the natural environment. The fact that Savannah and Charleston are so far ahead of us in cargo handling already, reinforces my feeling that Wilmington Ports Authority, while wanting to play catchup, is ignoring environmental concerns.

Just say no to the deepening of the channel.

David S Mitchell
Southport NC

From: David Thorsen
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 8:50:54 PM

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To whom it may concern:

I worry about the *USACE Wilmington Harbor 403 Navigation Project* for the following reasons.

Increased flooding risk: Deepening the river would allow more water and storm surge to move upriver, increasing flooding — especially when combined with sea-level rise.
Wetlands loss: Thousands of acres of wetlands could be lost or converted, weakening natural flood protection and water filtration.
PFAS contamination: Dredged sediments have not been tested for PFAS ("forever chemicals"), despite known contamination in the Cape Fear River.
Questionable public benefit: The project would cost over $1 billion, while providing limited local benefit and primarily serving international shipping interests.
Incomplete analysis: Flooding, sediment contamination, and cumulative impacts are not fully evaluated.

A project with such enormous environmental costs and limited local benefit should not be deemed consistent with North Carolina's coastal policies.

David Thorsen
Wilmington, NC

From: Durham, Dennis (GE Vernova, GCCH)
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Wilmington Harbor
Date: Friday, December 5, 2025 5:22:39 AM

You don't often get email from dennis.durham@gevernova.us. Learn why this is important

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Good morning,

I haven't been keeping up with the Wilmington Harbor 403 Navigation Project, so please excuse me if I'm repeating issues already brought to your attention. My name is Dennis Durham. I am born and raised here in Wilmington and have witnessed the irresponsible growth that is overwhelming the local area. If this project were to be completed ,it would be logical to expect more vehicles transporting goods through town and highways every week. The infrastructure in New Hanover County is already stressed as our politicians approve every rezoning / project the large developers propose. This project does nothing to benefit the residents living here commuting to work daily.

One of the largest environmental catastrophes in the area was the dredging of the river years ago. The Cape Fear River has been completely transformed with the huge influx of salt water from past dredging projects. The river historically grew rice in the fields on the west bank when the river had a lower salinity. The banks of the river were lined with cypress trees. You can look at Smith creek and see the graveyard of dead trees still standing killed from saltwater intrusion. When the river gets dredged, more saltwater encroaches north destroying the ecosystem. The Cape Fear River historically displayed sandy banks, now covered in sediment mud smothering shellfish from the large waves generated from the ships. I used to rake clams as a kid up the river.(They are gone now) What impact does this have on the sturgeon? Take a trip to River Road Park on low tide and watch what happens when a large ship passes through. The ship first pulls several feet of water off the banks, and the washes the banks out with large waves as it passes. This is with the current sized ships. Will the larger ships damage all the family docks lined down the river? Wash out the banks, eroding personal property?

If this project moves forward, can we guarantee the aquifer isn't breached? What is the impact if it is? They had to use explosives to blast rock the last deepening project temporally shutting down local boat traffic. This would most likely continue for the new proposal.
This project should be a hard pass as it improves nothing for the residents and has potentially dangerous consequences not easily remedied without the taxpayers picking up the bill with some form of bond referendum.

No Thanks, the taxpayers living here don't want this.

Thanks, Dennis Durham

From: Edward Irvine
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Wednesday, December 17, 2025 11:53:49 AM

You don't often get email from ecirvine@att.net. Learn why this is important

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To whom it may concern:

I am emailing to share my concerns about the proposed USACE Wilmington Harbor 403 Navigation Project, as follows.

This project will increase flooding risks. Deepening the river will allow more water and storm surges to move upriver and increase flooding.

In light of salt water encroachment already affecting wetlands and estuaries, this will exacerbate that problem. Thousands more wetland acres could be lost or converted, weakening natural flood protection and water filtration. This is not a trivial

There are years of PFAS sediment that will be disturbed and reintroduced in concentrated form to the water supply where many thousand rely on for their drinking water.

The economic benefit would not worth the cost of the environmental impact.

Thank you,
Edward Irvine
109 Church Street
Wilmington, NC
28401

From: Elli Klein
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, November 20, 2025 2:31:17 PM

You don't often get email from elli_klein@yahoo.com. Learn why this is important

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Decision Makers:

The proposed deeper dredging of the Cape Fear River near and in Wilmington, NC is bad for the area, bad for the environment, and will have a disproportionately small increase in the economy compared to the huge bad impact (killing or making sick) on the people, sea life, birds, and fauna of the area. I request that you Stop the idea of deepening the port.

The dredging will poison the water with toxins such as PFAS and taking the dredged soil and putting it in other areas such as landfills and developments will poison that land and make people sick. It also will further allow ocean water seep/rush into river water and increase the destruction of needed trees and increase the ghost trees (tree cemeteries) becoming more common near downtown Wilmington.

You already have heard about more bad impacts than what I wrote above. You don't need more studies (which the corp refuses to do any way). Further, this will be a hugely expensive project,and we could use those hundreds of millions of dollars elsewhere in the area with a better economic impact.

You just need to be smart and reasonable and listen to the people and organizations opposed to this deep dredging and Stop the project!

Elli Klein, Wilmington NC
Founding Administrator, SE North Carolina Women Forward
Founding Administrator of SE North Carolina Women Forward

From: Emily Esposito
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Strong Objection on Environmental Justice Grounds – Federal Consistency Review of Cape Fear Harbor Deepening
Date: Friday, December 19, 2025 7:40:29 AM

You don't often get email from emily.espo315@icloud.com. Learn why this is important

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Dear Federal Consistency Review Team,

I am submitting this comment in **strong opposition** to the proposed **Cape Fear River Harbor Deepening Project**, which would deepen the shipping channel from **42 feet to 47 feet**.

This project is fundamentally **inconsistent with North Carolina's Coastal Management Program** because it places disproportionate environmental and public health burdens on downstream communities—many of which already face cumulative pollution impacts and limited access to safe drinking water. Increasing the depth of the channel will exacerbate **saltwater intrusion**, mobilize **legacy contaminants** trapped in river sediments, and further degrade a river system that has already been subjected to decades of industrial harm.

The Cape Fear River is a primary drinking water source for hundreds of thousands of people. Communities along this river—particularly lower-income and historically marginalized populations—should not be forced to bear additional risks so that private industry can benefit from expanded shipping capacity. Environmental justice demands that these communities are not treated as expendable or subjected to avoidable contamination in the name of economic development.

Approving this project would directly contradict state coastal policies intended to protect water quality, public trust resources, and human health. The long-term costs of degraded drinking water, increased treatment burdens, and ecological damage far outweigh any claimed economic benefit of deepening the channel.

For these reasons, I urge the Federal Consistency Review to **deny consistency** for the Cape Fear River Harbor Deepening Project. At a minimum, the project should not move forward without a full, transparent assessment of its cumulative impacts on environmental justice communities and enforceable protections for drinking water sources.

Thank you for considering this comment and for upholding the responsibility to protect North Carolina's coastal resources and the people who depend on them.

Sincerely,
Emily Esposito

From: laserlady132
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Subject: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project – Objection to Proposed Deepening and Widening
Date: Friday, November 14, 2025 4:29:26 PM

You don't often get email from laserlady132@gmail.com. Learn why this is important

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Date: November 14, 2025
Dear Federal Consistency Coordinator,
I am writing to submit formal comments opposing the U.S. Army Corps of Engineers' proposed Wilmington Harbor 403 Navigation Project, as described in the Draft Environmental Impact Statement, and to urge the North Carolina Division of Coastal Management to find the project inconsistent with the enforceable policies of the North Carolina Coastal Management Program.
While I recognize the stated goal of accommodating larger vessels to improve port efficiency, the potential environmental, ecological, and public health harms far outweigh any short-term economic benefits, especially in light of ongoing contamination issues in the Cape Fear watershed, and disproportionate impacts to environmental justice communities. Key concerns include:
Exacerbation of Saltwater Intrusion
Deepening the channel from its current depth to 47 feet (or even 46 feet) will allow greater tidal exchange and push the salt wedge farther upstream into the Cape Fear River and Northeast Cape Fear River. This will worsen saltwater intrusion into freshwater wetlands, creeks, and groundwater resources that coastal communities and ecosystems depend on. In an era of accelerating sea-level rise, this irreversible alteration threatens drinking water supplies, agriculture, and the long-term viability of freshwater habitats.
Loss and Degradation of Critical Wetlands and Fish Habitat
The project acknowledges impacts to freshwater forested wetlands and aquatic habitats, even with proposed mitigation. Past experience shows that compensatory mitigation rarely fully replaces the functions of lost wetlands. Deepening and widening will permanently alter hydrology, destroy benthic communities, and block or degrade spawning and nursery grounds for commercially and recreationally important fish species.
PFAS and Legacy Contaminant Mobilization
The Cape Fear River basin is already heavily contaminated with PFAS ("forever chemicals") from upstream industrial sources, including Chemours. Dredging and disposal/reuse of millions of cubic yards of sediment risk resuspending and redistributing these toxic compounds into the water column, ocean disposal sites, or beaches used for nourishment. Current testing protocols and disposal standards are inadequate for PFAS, creating unacceptable public health and ecological risks. Ocean dumping or beneficial reuse of potentially contaminated material should not proceed without comprehensive PFAS screening and clear safe-disposal pathways.
Disproportionate Impacts on Environmental Justice Communities
Low-income and minority communities along the Cape Fear River have borne the brunt of industrial pollution for decades. Further degradation of water quality, fisheries, and wetlands will compound existing inequities and violate principles of environmental justice.
Climate Resilience and Long-Term Sustainability
Investing over a billion dollars (much of it taxpayer-funded) in a deeper channel assumes

static or slowly changing conditions. With sea-level rise projections for North Carolina exceeding 1 meter by 2100, this project could become a costly stranded asset while simultaneously making the region more vulnerable to storm surge and flooding.
The no-action alternative (maintaining current channel dimensions) or far less invasive improvements would better align with North Carolina's coastal management policies protecting water quality, wetlands, fisheries, and public trust resources.
I respectfully request that DCM determine the proposed project inconsistent with the North Carolina Coastal Area Management Act until these significant risks are fully mitigated or the project is substantially scaled back.
Thank you for considering these comments and for your work protecting North Carolina's coast.

Sincerely,
EmilyTew
600 Old Farm
Erwin, NC 28339
Laserlady132@gmail.com

From: Eric Swanson
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, November 22, 2025 9:34:44 AM

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To whom it concerns

I believe the proposed deepening of the Cape Fear river is fraught with problems, to the environment, area infrastructure, high investment cost for expected returns to name a few. It was not long ago we completed a similar project, and I fear this could be a recurring event with diminishing expected benefit.

I further believe, if indeed the project is needed, the same benefit could be attained at less cost, less impact and better long-term return by revisiting development of the 600 acres near Southport already owned by the port authority. This would result in more efficient long term infrastructure improvements, less travel time for larger ships while allowing the existing port to handle smaller ships with reduced negative impact on the rapidly expanding urban Wilmington area . This site is in close proximity to the already industrialized Sunny Point and Brunswick nuclear power plant, which would benefit from the improved infrastructure. Local employment opportunities and road improvements would be beneficial to the community and are already needed.

Respectfully

Eric Swanson
Wilmington NC

Consistency Determination Comments
Wilmington Harbor Navigation Improvement Project
Erin Carey
Wilmington, NC

Good Evening,

First, many thanks to the staff of Division of Coastal Management for taking time out of their week to hold this public hearing. We are all grateful for the opportunity to provide input on this project and the dramatic and consequential impacts it would have on our community and natural environment.

My name is Erin Carey; I am here as a representative of the Wilmington community, one that I have been a member of for 30 years.

My comments this evening are in objection to the proposed harbor deepening project. In the end, what this project is contemplating is the irreversible alteration, or even destruction, of an ancient, vast, and interdependent riverine habitat, all in the name of modest gains in shipping efficiency. There is no demonstrated need for this project, but the destruction it would reap is undeniable.

North Carolina's coastal management plan demands that actions be taken to make our coastal habitats and species "more resilient" to the impacts of climate change. This project is inconsistent with that mandate. The DEIS fails to consider the cumulative effects of sea level rise, storm surge, and a deeper channel on communities along the river, as well as the natural environments that provide resiliency, particularly during storm events. Thousands of acres of freshwater wetlands would be destroyed by increasing salinity, erasing that habitat, and the wildlife that depend on it, from the map.

The dredging itself raises other concerns. The DEIS reveals that we don't have a full understanding of what pollutants are contained within riverbed

sediments; the same sediments that will be suspended in the water column; flushed into our estuaries to contaminate our fisheries, even discharged onto beaches and preserves. There are, however, some things we know for certain are there. We are all well aware of the new and legacy compounds accumulating in the Cape Fear after decades of discharge. And though GenX and thousands of other PFAS are not yet regulated, a growing body of research indicates they are by no means safe; not for humans, and not for the environment. The dredge sediment from this project has the potential to be dangerous, with no appropriate beneficial use and, importantly, no meaningful consideration in the DEIS.

From my experience in daily environmental advocacy work, I can confidently report that we are living in unprecedented times of deregulation and environmental destruction. The legislative leadership in our state has ceded its regulatory authority to the federal government on critical issues like wetland protection, water quality standards, and stormwater regulations; this has handcuffed our collective ability to protect the health of our communities and the health of our environment. The consistency review, however, provides the state the ability to protect its resources, and its communities, against the destructive impacts of this misguided and ill-conceived project. For the reasons outlined this evening, and those included in technical comments submitted by the Southern Environmental Law Center, this proposed project falls well short of the consistency Standard ~~requirements.~~

Thank you for your time.

From:	KRE
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date:	Thursday, December 18, 2025 1:14:01 PM

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We are long time residents and tax payers of New Hanover county and my family and I strongly oppose the proposed deepening of the Cape Fear River channel. The environmental impact is much too great with immeasurable, unknown negative future impacts.
Do not proceed with this reckless project!

The Esposito Family
5224 Masonboro Harbour Dr
Wilmington, NC 28409

From: fernbugg@gmail.com
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Wilmington Harbor Expansion
Date: Wednesday, December 17, 2025 2:39:55 PM

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I am against the expansion of the Wilmington Harbor because of environmental, wetlands, and PFAs concerns. Please register my opposition.

Fern Bugg
910-777-9296
2325 Waverly Drive
Wilmington, NC 28403



Fern Bugg
Evolution Talent Agency-Charlotte

Scott Cooper (point)
www.evolutionmt.com
704-375-9797 phone

https://pro.imdb.com/name/nm15716448?s=8cc7fa77-6775-224e-ba4c-c607e083be0e&site_preference=normal

From: Fred Bingham
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Wilmington Harbor 403 Dredging Project
Date: Sunday, December 7, 2025 11:24:51 AM

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Please see below for comments on the draft EIS for the Wilmington Harbor Dredging project

Frederick Bingham

Sea level at the State Port gauge has been rising at a rate of ~7.5 mm/year since about 2005 (15 cm in 20 years). The previous rate of SLR at Wilmington Harbor has been 2.79 mm/yr (https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8658120). The background rate of SLR is ~3.5 mm/yr (sealevel.colorado.edu). The connection seems clear. The previous harbor deepening project, which took place in 2000-2005 may have caused a more-than-doubled increase in the rate of SLR in the Cape Fear River. Your staff seemed to think that this was normal, but other tide gauges up and down the east coast do not show nearly this rate of acceleration of SLR (e.g. https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8661070). So, in the previous project, was this acceleration of SLR predicted? If not, why was the prediction off? What did the previous EIS miss?

The project uses the Delft-3D model suite to simulate flow in the river under different scenarios (Section B-1.3) and project future changes in salinity in the river. Some attempt at model validation was done using in situ data collected by the NCSPA under their "Section 203 Study" (B-1.4). This study apparently lasted about one month in the summer of 2017 (Section B-6.2.1.1.4), plus about 5 days in the spring of 2017. Even this tiny amount of validation shows a large discrepancy between the measured and modeled values (Figures B-1-1 and B-1-2) on the order of a few psu during spikes at high tide. Despite this, the section concludes that "the model reliably captured the underlying trends and patterns observed in the actual data, indicating that it correctly reflects the physical dynamics of the Cape Fear River estuary system" (Section B-6.2.3). The validation study, with one month plus a few days of continuous observations and several years of monthly observations from the LCFRP, seems inadequate to capture the evolution of the CFR system under a variety of conditions. I would strongly urge the USACE to solicit evaluation of the details of this study, including the Section 203 Report, and the validation of the Delft-3D model, by independent outside experts. Without this outside review, the conclusions drawn cannot be trusted.

Speaking of Figure B-1-1, this figure purports to show a comparison between salinity values given by the Delft model (in red, I guess) and values measured by the Section 203 study (in blue) at a single location in the river. The data collection ran for a full month (Section B-6.2.1.1.4). However, only two weeks of data are shown here, including only one week of model output in the bottom panel. Why such a limited comparison is shown is not explained. The figure shows peaks in salinity at, one assumes, high tide in both the model and observations for the first half of the comparison. For the second half of the comparison, only peaks in the observations are seen, not peaks in the model.

An additional comparison is done using one CTD cast (Fig. B-1-2) on 10 August 2017. Why this particular one is not stated. Where this cast was taken is not clear either (It's from station "CTD_09"). The model and observations become more different with increasing depth, getting to about 5 PSU different near the bottom. This implies the model does better simulating salinity, and thus the hydrodynamics of the river, at the surface than it does at the bottom, and has trouble determining the extent of intrusion of the estuarine salt wedge.

I can only comment on the one pair of time series plots, as that is all the DEIS includes (did I miss any more?). The first plot, Fig. B-1-1, shows that salinity is close to zero most of the time. There are large differences during short time periods at high tide. It's these largest differences that will be important for determining the extent of changes in ecosystems along the river. The plot includes statistics such as mean square difference. These statistics, while easy to compute, do not tell the whole story. I would urge the USACE to use statistical measures that may be more appropriate for determining the impact of its work and thus evaluating the validity of its model, for example, the maximum difference between model and observations over a tidal cycle.

It is notable that a long-term study was done, under USACE contracts (e.g. Contract No W912HN-05-D-0014 for 2009-10), during the 2000-2010 period before and after the previous harbor deepening (Hackney & Avery, 2015). The comparison between model and observation could have been done using this extensive dataset, collected under a much more heterogeneous set of conditions. However, the USACE decided not to do this. In fact, at the recent public information meeting, USACE staff did not seem to even be aware that this previous study existed.

Hackney, C.T., Avery, G.B. Tidal Wetland Community Response to Varying Levels of Flooding by Saline Water. Wetlands 35, 227–236 (2015). https://doi.org/10.1007/s13157-014-0597-z

To summarize, the results from the Delft-3D model are difficult to believe, because the comparisons with observational data are sketchy and inappropriate. The model is validated using a set of in situ observations that are not suitable for the purpose. The characterization of the model-observation comparison "showing minimal discrepancies" (page B-6) is unsupported from the evidence shown in Appendix B.

One component of a complete EIS would be a thorough literature search for papers relevant to the proposed project. In a very cursory literature search, I found there was a series of reports written about the previous deepening project. An example is this one

Hackney, C. et al (2002) Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 1: August 1, 2000 – July 31, 2001. Report Prepared for the U.S. Army Corps of Engineers, Wilmington District. Contract No DACW 54-00-R-0008.

This report, and 9 subsequent similar ones, are readily available to the USACE as they were prepared under contract for them. Yet none of these reports are cited in the EIS, or in Appendix B (maybe they are cited in a different appendix, or maybe I just missed them?).

Another paper in the open literature but not cited in the EIS is this one:

Familkhalili, R., and S. A. Talke (2016), The effect of channel deepening on tides and storm surge: A case study of Wilmington, NC, Geophys. Res. Lett., 43, 9138–9147, doi:10.1002/2016GL069494.

The fact that these publications were unearthed as a result of my own quick search indicates that the USACE expended very little time and effort to research past studies to really understand what the impact of their work has been on the CFR estuary.

From: Gary Robertson
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External]
Date: Saturday, December 20, 2025 4:06:07 AM

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This objection asserts that the Draft EIS is insufficient under NEPA and the North Carolina Coastal Area Management Act (CAMA). It fails to model the resuspension of ultrashort-chain PFAS (TFA) found in December 2025 sediment studies. Without this data, "beneficial use" on public beaches constitutes an unpermitted discharge of hazardous substances.

From: George Townsend
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington 403 Navigation Project
Date: Tuesday, December 9, 2025 2:03:23 PM

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Dear Federal Consistency Coordinator

Included below are my comments on the proposed navigation project for the port of Wilmington.

The draft EIS greatly understates the impacts of the project in a number of areas, including:

1) Saltwater intrusion caused by the project will have a significant environmental impact. It will kill thousands of bald cypress trees continuing the creation of ghost forests. Previous projects killed thousands of these trees and disrupted the ecology of large areas. The bald cypress trees are slow growing and form a critical component of the ecology of the area. Important fisheries and migratory birds will also be impacted.

2) Saltwater intrusion caused by the project will disrupt the groundwater of the area and result in areas losing their source of drinking water.

3) I live near the Wilmington waterfront. The project will result in increased flooding along Water Street in Wilmington due to changes in the hydrology. This increase in flooding will have a major impact on the businesses located on Water Street and on the general economy of the Wilmington area due to fewer tourists coming to the area.

The need for this project has been greatly exaggerated. Wilmington is a niche port and any potential benefit of bringing in larger ships does not justify the impacts.

The cost of the project has been underestimated and there will be a negative return on investment (ROI). No serious businessman would make such an investment. The U.S. government must stop wasting money on such projects.

Please stop this project. I would like to be informed of any and all future developments related to this project.

Thank you for considering these comments.

George Townsend
120 Nun Street
Wilmington, NC 28401
571-216-9815

From: Ginger Connett
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] federal consistencey:USACEWilmington Harbor 03 navigation
Date: Wednesday, December 17, 2025 10:12:01 PM

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I am concerned about the proposed deepening and widening of the Wilmington Harbor. We already have a very navigable harbor that accommodates the current sizes of ships this port handles. Increasing the depth is expensive, unnecessary and will severely negatively impact our protective wetlands and environmentally sensitive habitats. Dredging an already polluted river in itself will cause tremendous negative impact; especially in areas already continuously affected by industry and flooding.
Ginger Connett

From: Glenda Dennis
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Cape Fear River Channel Deepening Project
Date: Saturday, December 6, 2025 2:23:12 PM

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I am writing to express my concern about the deepening of the Cape Fear River. Concerns include drawing more salt water up the river and the impact it will have on the fish & wildlife of that area. Also concerns on stirring up the PFAS that may have settled to the bottom of the river.

For years my neighbor was the Captain on many of the container ships that came up the river, and often because of the size of the ship he had to go into other ports on the east coast and fly home, so I know there are other ports that can already accept these ships.

Why should our area take a chance on damaging our beautiful area and the lives of fish & wildlife for the all mighty dollar.

I have lived on the ICW for over 40 years and have seen what more boat traffic has done to it, and can just imagine what these larger ships will do to the Cape Fear River.

Glenda Dennis
Oak Island, NC

From: gwen behen
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, December 8, 2025 12:02:14 PM

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Ladies and Gentlemen;

I am writing to oppose the plan to dredge the port in Wilmington, Researchers have shown that this will impact our local wetlands in a most harmful way, incur salt water incursion and finally stir up the forever chemicals lodged in the sediment, from our friendly upstream neighbors, Chemour.

I urge that this project not be supported or approved.

Thank you,
Gwen Behen
Wilmington, NC 28403

From:	Isabelle Shepherd
To:	DEQ-SVC_DCM.federalconsistencycomments
Cc:	Laura McCabe; Margee Herring
Subject:	[External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date:	Wednesday, November 26, 2025 10:06:42 AM
Attachments:	ACFT Response to USACE Wilmington Harbor 403 Navigation Project [Submitted 112625].pdf

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Dear Federal Consistency Coordinator,

On behalf of the Alliance for Cape Fear Trees (ACFT), I am submitting the attached public comment regarding the proposed Wilmington Harbor 403 Navigation Project.

As detailed in the attached statement, ACFT respectfully urges the Division of Coastal Management to withhold federal consistency certification unless stronger safeguards are adopted to protect tidal freshwater forests and wetlands in the lower Cape Fear region. Our comments focus in particular on:

- The role of past channel deepening in accelerating ghost-forest formation and freshwater forest loss in tributaries such as Smith Creek, Town Creek, and areas around Eagles Island;
- The need to prioritize navigation alternatives that reduce saltwater intrusion risk, rather than system-wide deepening that would increase salinity, tidal range, and storm-surge impacts on forested wetlands;
- Requiring robust hydrologic modeling, estuary-wide monitoring, a true “no net loss” standard for tidal freshwater forests and wetlands, and an adaptive management framework tied to measurable forest-health thresholds.

We appreciate DCM's decision to extend the public comment period and your continued work to balance coastal economic activity with long-term environmental stewardship. Please let me know if any additional information, clarification, or supporting materials would be helpful as you complete your review.

Thank you for your consideration of our comments and for your service to the coastal communities and ecosystems of North Carolina.

With gratitude,
Isabelle Shepherd (*she/her/hers*)
Executive Director
Alliance for Cape Fear Trees
7 Beauregard Drive, Suite 2 | Wilmington, NC 28412
304.813.4587 (cell) | 910.506.8371 (office)
allianceforcapefeartrees.com

Follow us on Facebook (**@capefeartrees**) and Instagram (**@capefeartrees**) for updates on tree giveaways, plantings, advocacy, and more!

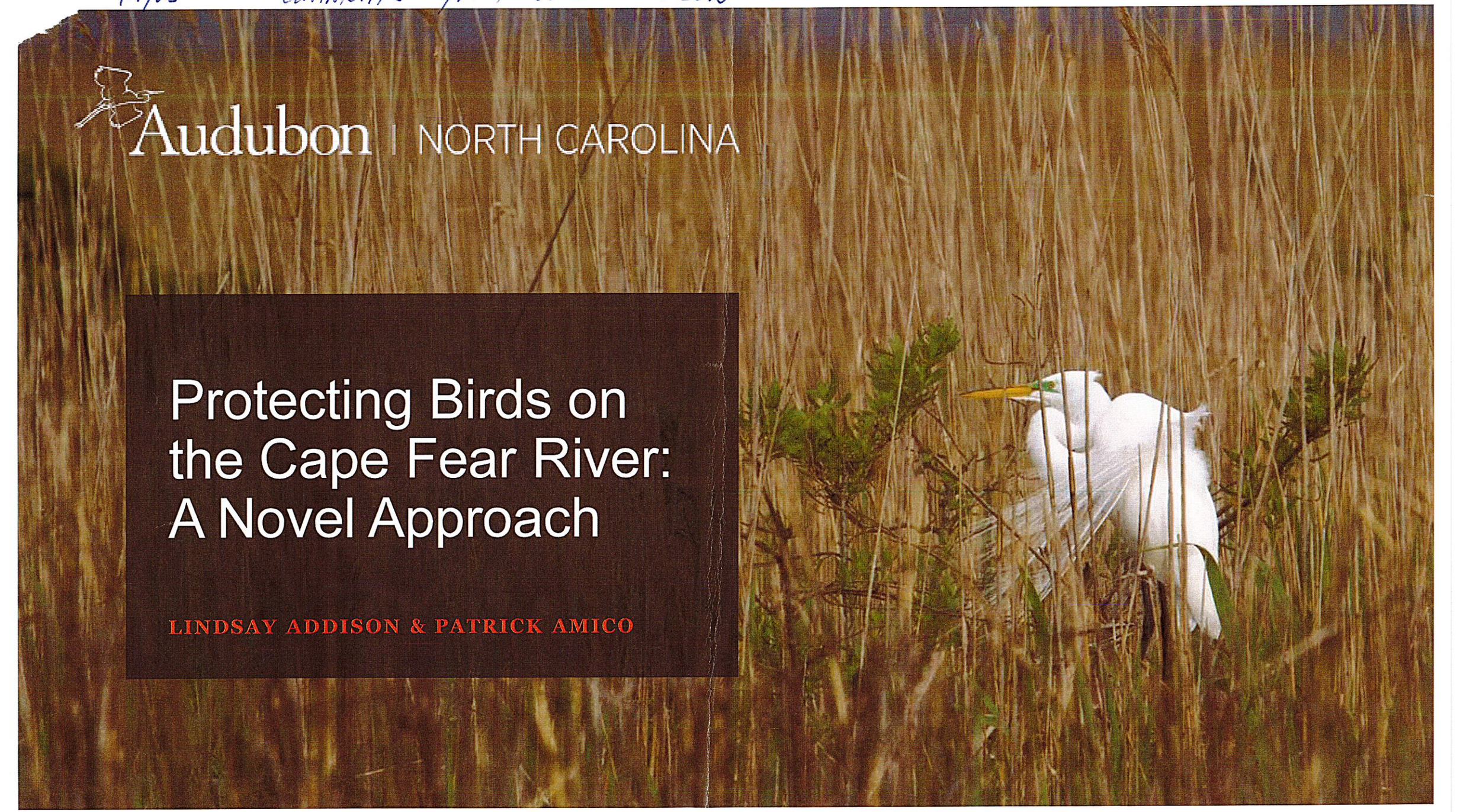
Founded in 2015, the Alliance for Cape Fear Trees preserves, protects, and plants trees to enhance quality of life and health in the Lower Cape Fear area.

11/17/25 Comments from Jan LaFrancois

Audubon | NORTH CAROLINA

Protecting Birds on the Cape Fear River: A Novel Approach

LINDSAY ADDISON & PATRICK AMICO







Audubon

Audubon North Carolina manages 10 island sites on the Cape Fear River. Together they support

30%

of the nesting coastal waterbirds in the state. Battery Island is the largest of these sites.

Audubon

Percent of NC population nesting on the Cape Fear River



Audubon

Battery Island

Ibis, egrets, and pelicans

Nest in vegetation, from shrubs to mature trees



Audubon

Shellbed, Striking, and Other Marsh Islands

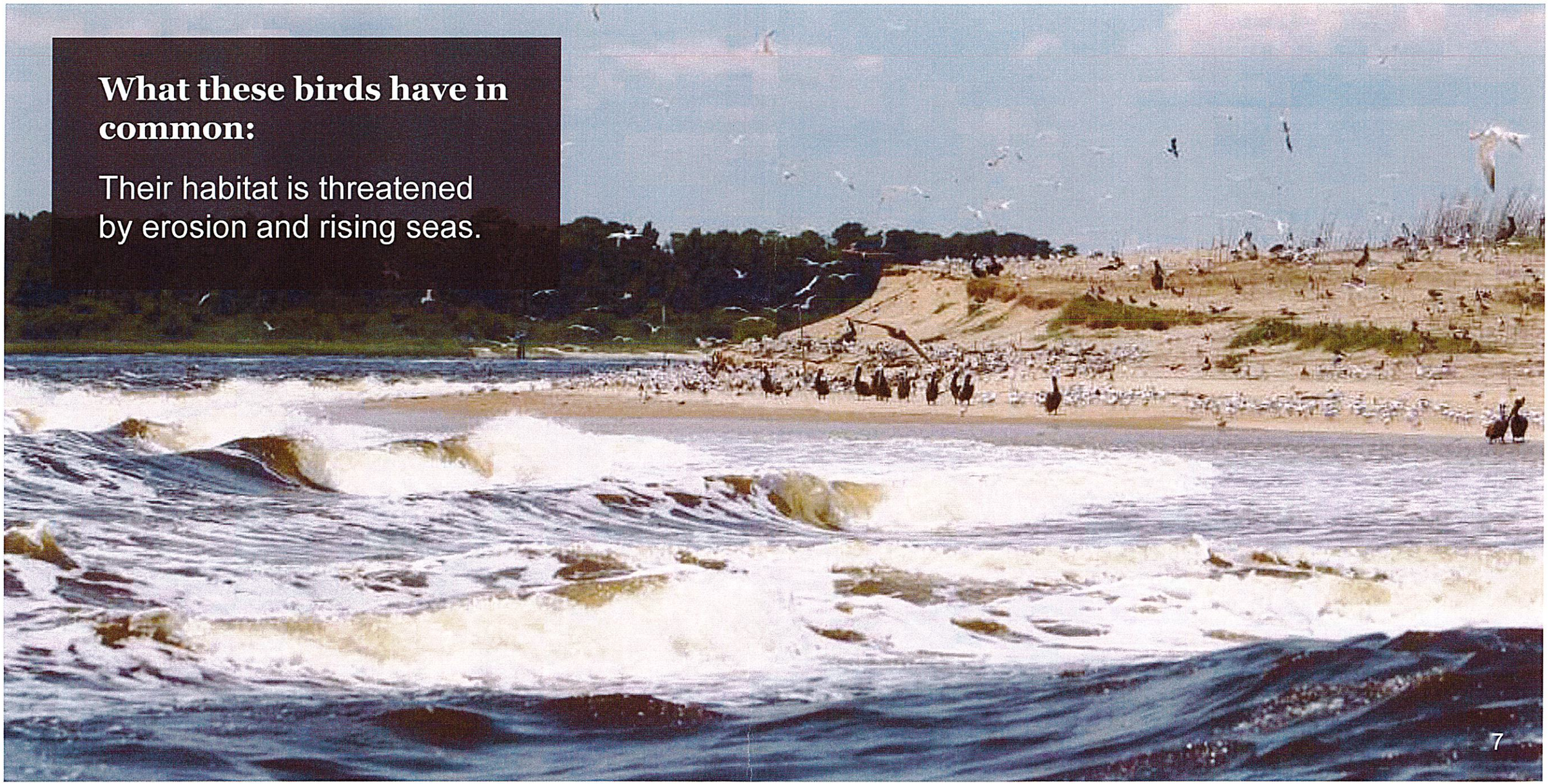
American Oystercatchers

Nest primarily on open sand or shell

About half of the oystercatchers on the Cape Fear River nest on shell rakes like this one



Audubon



What these birds have in common:

Their habitat is threatened by erosion and rising seas.

Audubon

Impacts on Battery Island



Impacts on marsh islands with shell rakes





How we address these threats:

- Dredge material placement
- Oyster reef restoration
- Advocacy on the proposed Port of Wilmington expansion
- But what else??

Audubon

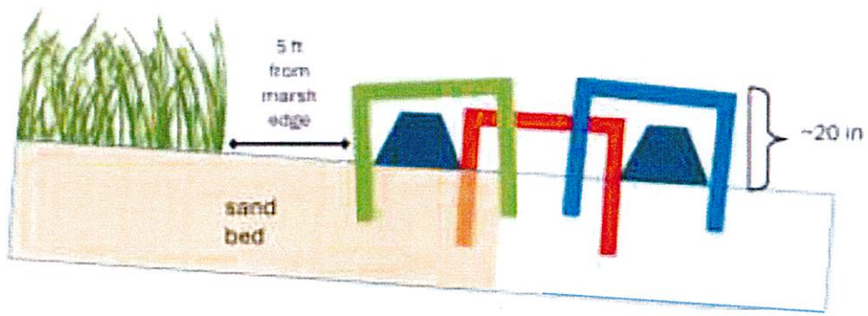
Can a novel approach to growing oysters, building oyster reefs, and protecting shorelines work on the Cape Fear River?



SANDBAR
OYSTER COMPANY | Shellfishly Motivated®

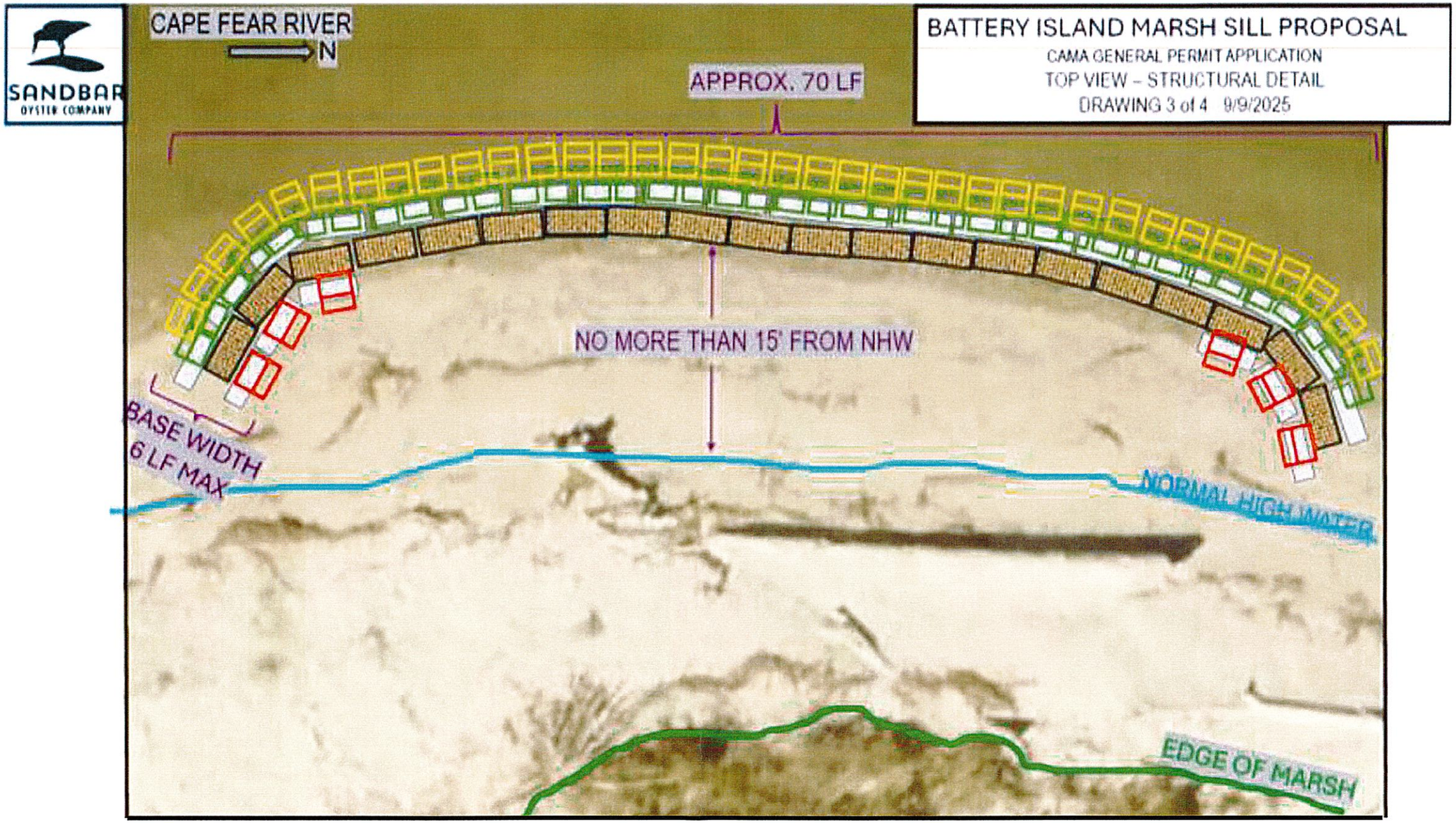


Battery Island Living Shoreline



A 70’ test section of living shoreline/marsh sill will be installed in the most challenging location on the island




SANDBAR
OYSTER COMPANY
CAPE FEAR RIVER
N
BATTERY ISLAND MARSH SILL PROPOSAL
CAMA GENERAL PERMIT APPLICATION
TOP VIEW – STRUCTURAL DETAIL
DRAWING 3 of 4 9/9/2025
APPROX. 70 LF
NO MORE THAN 15' FROM NHW
BASE WIDTH
6 LF MAX
NORMAL HIGH WATER
EDGE OF MARSH

From: Jane Craven
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Tuesday, December 9, 2025 9:19:37 AM

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Dear USACE Administrators,

Please DO NOT deepen/widen the Cape Fear to accommodate larger cargo ships.

The Wilmington area has faced brutal onslaughts on the environment that have dramatically accelerated over the past few years.

We must do everything we can to protect what is left of bird nesting areas and the shoreline itself. Not to mention the thousands of acres that would suffer from salt water incursion with this project.

Now is the time to draw the line. Don't spend the money. Protect the environment. Leave the existing harbor as is.

With sincere thanks,

Jane Craven
Bill Kwapil
919 Bradshaw Terrace
Wilmington, NC

From: Jean Brick
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project.
Date: Sunday, November 23, 2025 4:14:08 PM

You don't often get email from jeanpbrick@gmail.com. Learn why this is important

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My name is Jean Brick, and I am a resident of Leland, North Carolina. I am writing to express my concerns regarding the proposed deepening of the Cape Fear River.

Dredging to expand the port could have devastating environmental impacts, such as further damaging our region's wetlands, which protect our communities from flooding and offer wildlife habitats; disturbing and unleashing so-called "forever chemicals"; disrupting salinity levels upriver, in turn killing trees; and worsening storm surge during hurricanes and other weather events.

This project would likely damage our coastal ecosystems in ways that would reverberate for decades. Please help us protect the Cape Fear River from this reckless expansion.

Thank you,
Jean Brick
2128 Talmage Drive
Leland, North Carolina

From: Jeanne Fisher
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Cape fear river dredging
Date: Thursday, December 18, 2025 7:06:12 PM

You don't often get email from jleef54@gmail.com. Learn why this is important

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Please reconsider new dredging for the lower Cape Fear River. I'm concerned for our trees near the river, also birds and wildlife. Additionally I worry about stirring up the pfaffs that are certainly in the sediment . Sometimes it's not about the money.....

Respectfully yours, Jeanne Fisher Sunset Park Wilmington NC

From: Heber-Brown, Jennifer E
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Comment on EIS re Cape Fear River plans
Date: Thursday, December 4, 2025 10:15:17 AM

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To whom it may concern:

The current Draft Environmental Impact Statement (EIS) ignores the region's most urgent threat: PFAS contamination. It is deeply concerning that the EIS contains no PFAS analysis at all, despite years of documented upstream pollution and clear science showing that dredging can release buried contaminants. The Corps studied turbidity and fish habitat but skipped the very chemicals driving enforcement actions in this watershed.

Even more troubling, no agency, university, or nonprofit has tested PFAS sediment levels in the precise stretch of river targeted for excavation—an area that sits downstream of decades of legacy and replacement PFAS discharges. Without baseline data, the public cannot know whether dredging will disturb concentrated PFOS or PFOA "hotspots," both now classified as CERCLA hazardous substances. If high levels are found, this section of the Cape Fear could qualify for Superfund designation, contradicting claims that impacts will be minor. And under the current plan, any contaminated sediment would be relocated directly offshore of beaches already battling PFAS-laden sea foam washing ashore.

Please reconsider plans to deepen and widen the Cape Fear River. The health of people and the environment is more important than the minimal economic gains associated with bringing larger cargo ships into the port.

Regards,

Jennifer Heber-Brown (she/her)
Program Coordinator
Osher Lifelong Learning Institute at UNCW
www.uncw.edu/olli
910.962.3644



From: Jessica Cargile
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 4, 2025 11:48:58 AM

You don't often get email from jessicamcargile@gmail.com. Learn why this is important

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I am writing to echo the points already brought to your attention during the open house meeting in November.

Deepening the Wilmington Harbor would disperse PFAS now mingling in the riverbed's sediment into marshes and onto public beaches, accelerate erosion, exacerbate flooding, destroy habitat, and is not economically justified.

With everything in the world seeming to deteriorate in front of our eyes at a rapid pace, I would hope we can all agree that having safe water should be a bare minimum. As a family we already cannot experience the nature around us without fear of toxic chemicals in our water. We live in constant fear of flooding even before this proposal and that will just worsen.

I will quote some people that I agree with that are more informed on the topic.

"This project is a poor economic decision given the massive cost compared to the miniscule benefits. The cost of deepening the harbor and the channel is projected to be over $1 billion. However, the only noted benefit of this project are cost savings to international shipping companies who use the port, not North Carolina or local communities. This project provides little benefit to the Wilmington area and North Carolinians while also threatening significant damage to the coastal region." Jessica Hardee

Thank you for your time and attention to this matter.

Jessica Cargile
Wilmington, NC resident

From: Joe Kugler
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Tuesday, December 9, 2025 8:18:04 AM

You don't often get email from kuglerjt@hotmail.com. Learn why this is important

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My name is Joseph Kugler. I have been a North Carolina resident for 9 1/2 years. I live at 8536 N Shoreside Way NE, Leland, NC 28451 and my cell is 484-432-8439. I am an avid fisherman and bicyclist.

I am vehemently opposed to deepening the Cape Fear River shipping channel from the current 42 feet to 47 feet for a whopping $1.35 billion. It would not surprise me if the cost would balloon to $3-5 billion and completion date extend out to 8-10 years.

Wilmington is a small port that handles only 5-10% of the containers of our neighboring ports. I rarely see ships being unloaded and the cranes sit idle on many days. The roads and rails make for a difficult path out of the city. So even with a deepening of the channel, there is no guarantee the port will handle more ships and containers as shippers may still favor ports with easier to access and better rail and road facilities.

Wilmington is growing rapidly and our infrastructure cannot handle the increasing population and a significant increase in container traffic. Wilmington already ranks high on the frequency of pedestrian and bicycle accidents and fatalities. An increase in the number of container shipments must be accompanied by billions of dollars of road and rail improvements. And in the ten years it will take to complete this project (2 years to get started and 8 years duration), cargo ships will be even larger and still not able to access the port when fully loaded.

The funds can be better spent on a replacement for the Cape Fear memorial bridge which affects tens of thousands of people every day. The funds could be used to improve roads and rails to accommodate an exploding population and the current port traffic. The funds could also be used to add pedestrian and bike paths to improve safety, encourage less traffic and less pollution, and create recreational opportunities in a land-locked city with very limited green space.

Dredging equipment is in short supply and this equipment and the funds can be better used to refurbish Brunswick County and New Hanover beaches to benefit tourism which has 10-100x more economic impact than the port and shipping industry. And this

dredging can be done in selective locations to limit environmental impact.

The funds are also better used for infrastructure projects to address rising ocean levels in Wilmington, on the beaches, and in the port. By the completion of this project, ocean levels could have risen by a foot or more.

The fish, shrimp, oyster, and crab populations are already under severe stress due to over-fishing and trawling inshore and near shore. This dredging project will further negatively impact a marine environment that is struggling.

The dredging also has the potential to stir up PFAs that have settled in the river bed over decades and severely affect the safety of our drinking supply.

In short, this dredging project is only potentially beneficial to the port and shipping industry and may have only a limited economic benefit, far below what is projected. Other ports will also be making improvements in this 10-year time period, and they are more attractive because ships do not need to navigate a narrow 20+ mile shipping channel and they have better rails and roads. There are many other uses for these funds that would have a much greater and more certain benefit for 100 times the number of people and industries. And the negative environmental and safety consequences due to the dredging itself, increased traffic and drinking water supply far outweigh the potential benefit.

This ill-conceived dredging project that benefits a relatively small constituency should be cancelled and the funds used on projects that have a much larger and more certain benefit. I would be glad to address my concerns in person if that would help. Please contact me if you want to discuss.

From a concerned citizen,

Sincerely,

Joseph Kugler

Get Outlook for iOS

From: john scott
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency; USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 9:53:03 AM

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To the N.C. Division of Coastal Management,

We attended the November 17 public hearing meeting and all the speakers had very valid points concerning environmental and economic impacts. I do not think there is a need to reiterate them again.

My opinion is a very personal one due to living on the Cape Fear River for the last 50 years at 8214 River Road in Wilmington. Both my wife and I are native Wilmingtonians and have seen how this area has changed in the last 75 years. We have dealt with PFAS in our well for many years which we were not aware that it was dangerous. Our trees on our 3 acre lot have mostly become ghost trees due to salt intrusion. When the big ships pass by they push more salt water up the river. Even boats in the Castle Hayne area have barnacles on them. Deepening the channel will only hasten the impacts that have occurred so far. It will help the shipping companies and will cost the taxpayers a billion dollars. Please consider all the impacts of deepening the shipping channel on your recommendation to the Army Corps of Engineers.

Thanks for your consideration on this matter. If you have any questions please contact:

John and Vicki Scott
8214 River Road
Wilmington, NC 28412ß
johnvickiscott@gmail.com
910 791-5398

From:	holden3@ec.rr.com
To:	DEQ-SVC_DCM.federalconsistencycomments
Cc:	Charles.Miller@ncleg.gov; Bill.Rabon
Subject:	[External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date:	Thursday, December 18, 2025 6:26:54 PM

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Dear Federal Consistency Coordinator,

I believe the proposed USACE Wilmington Harbor 403 Navigation Project is inconsistent with our state's coastal management plan. The costs, including environmental costs, will far outweigh any benefits of the project. Deepening and widening the Cape Fear River channel most likely will increase shoreline erosion on Oak Island, Bald Head Island, and along the river. It will increase the risk of flooding along the river, including the Wilmington waterfront. More salt water intrusion will damage the river ecosystem.

It is time for the ports of the world to unite and tell the shipping industry that they will not accommodate larger ships. The environmental and dredging costs of accommodation exceed any additional shipping efficiency, not to mention the cost of disasters like the destruction of the Francis Scott Key Bridge, or the six days the Suez Canal was blocked when an excessively large container ship got stuck there.

Thank you,

John M. (Jay) Holden

111 Dunescape Drive

Holden Beach, NC 28462

From: John Jones
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Harbor Deepening
Date: Tuesday, December 16, 2025 10:03:10 AM

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I am concerned about deepening the harbor for the following reasons:

Flooding & Resilience

> I am concerned that deepening and widening Wilmington Harbor will increase tidal reach, storm surge, and flooding risks upriver, especially when combined with sea level rise. These compounding impacts must be fully evaluated.

Wetlands & Natural Infrastructure

> Wetlands are essential for flood protection, water quality, and wildlife habitat. The proposed project risks significant wetland loss, and mitigation plans appear inadequate.

PFAS & Water Quality

> Given known PFAS contamination in the Cape Fear River, dredged sediments should be tested before any determination is made. The project should not proceed without safeguards to protect public health.

Community Impacts

> Flooding and environmental impacts disproportionately affect vulnerable and low-lying communities. These impacts must be fully considered in the state's consistency review.

Public Benefit

> A project with enormous environmental costs and limited local benefit should not be deemed consistent with North Carolina's coastal policies.
>
> Thank you for your time and attention.
>
> John Tom Jones

From: JJ Looney
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 18, 2025 11:51:02 PM

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To: Federal Consistency Co-Ordinator,
NC DEQ Division of Coastal Management
400 Commerce Ave., Morehead City, NC 28557
Subject: Federal Consistency: USACE Wilmington Harbor 403 Dredging Project
Executive Summary: The Draft Environmental Impact Study (DEIS) of the proposed Wilmington harbor expansion as submitted by the US Army Corps of Engineers (USACE) does not address the full impact this project will have on the lower Cape Fear environment. The absence of detailed, scientific references supports the argument that the proposed project is inconsistent with NC's coastal management charter.
NC law states "among NC's most valuable resources are it's coastal lands and waters…..which should be preserved and enhanced." The proposed Wilmington Harbor 403 project will severely, adversely, affect both.
Loss of vital wetlands that currently mitigate flooding in downtown Wilmington.
The proposed widening of the Wilmington port channel will destroy a large swath of wetland. Preliminary estimates indicate over a 1000 acres (over 1.5 sq miles) of wetland on both shores of the Cape Fear river will be lost as a result of widening parts of the Wilmington navigation channel from 100ft to 300ft. Currently this wetland serves as a sponge during heavy rainfall in the Cape Fear river watershed, and as a sponge and filter during periods of high tide.
Coupled with a predicted rise in sea level, downtown Wilmington and adjacent riverside communities will be exposed to more frequent and severe flooding. This is already a problem, why compound it?
Loss of wildlife and estuarine habitat.
While acknowledging that saline (sea) water will migrate further up river due to the deepening
of the ship channel (from 44 to 49ft at the entrance, and 42 to 47ft at the port) the DEIS posits that freshwater wetland will transition into another type of wetland. This will come at a price, thousands of cypress trees have already been lost due to migration of salt water upstream. There is a reason beachfront sand dunes expand inland. The existing reeds and grasses that flourish in freshwater wetland are vital wildlife habitat. Similarly the marine ecosystem in this estuarine environment supports small organisms that in turn provide a nursery for larger species of fish and crustaceans. In addition, this unique estuarine ecosystem is the 'classroom' for UNCW scientists and students as well as an ecotourism 'hot spot' for all who appreciate it's value in the NC coastal plain.
River bank erosion due to increased wave action and dredging.
Existing ship traffic is steadily eroding the Cape Fear river shoreline. Bald Head Island, at the river mouth, alone has already spent over $90 million to preserve their shoreline. Ships of greater displacement will generate proportionately larger waves which accelerate shoreline erosion; it follows that this will require more frequent dredging of the navigation channel, thereby creating an ongoing, vicious cycle. The projected $18 million annual port maintenance costs (mostly for dredging) will increase as a result, and local and regional NC

residents will inevitably be burdened accordingly.
Regards,
John Looney
6046 Shiloh drive wilmington, NC 28409

From:	John McCorkle
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] “Federal Consistency: USACE Wilmington Harbor 403 Navigation Project”
Date:	Friday, December 5, 2025 6:28:57 AM

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YES, please . . . . Wilmington needs the economic impact that deepening the Cape Fear River to our port will provide.

The preliminary report by the Army Corps of Engineers is favorable and it is a known fact that the port is certainly capable of handling more containers.

Any perceived environmental impact can be mitigated with minimal long term impacts, however, the benefits of deepening the access to our ports will contribute to the local economy for many years to come.

With regards,
John McCorkle

From: johnreilly1000@yahoo.com
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project"
Date: Tuesday, December 9, 2025 8:59:32 AM

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To whom this may concern:
It appears the financial impact of dredging does not seem fiscally possible to yield enough revenue through the ports to justify spending 1500,000,000 dollars to dredge. Wilmington has no where near the roadway infrastructure, population density or surrounding territory of developed property around it unlike Charleston & Savannah. The economic impact from the deeper river does not seem justifiable. Also the job will probably go over budget.
More importantly are the forever chemicals. They will re-pollute the area once again, again and again.
The enviromental impact is devastating to nature. How would you like your homes destroyed.
It's as if enough trees have not been destroyed, the dredging will cause stress on trees, animal & plant.
Let's live and let live!
Go find some other river or land to destroy.

From: Jonathan D"Amico
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 4, 2025 7:20:09 AM

You don't often get email from damico.jc@gmail.com. Learn why this is important

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Good morning,

I am vehemently opposed to the deepening project proposed for the Cape Fear River.

The obvious incursion of further salt water into the river basin will have an incredible impact into the already growing "ghost forests" and freshwater habitats, potentially destroy soft bottom habitat which could further harm an already damaged ecosystem and the fishing industry that relies upon it, not to mention the always looming increased flood risks which are growing worse every day from over development- we do not need further flood risks piled on. And lastly- we KNOW what is in the Cape Fear River in regard to PFAS. Do we really believe stirring up anything that has settled is a wonderful idea for anyone or anything? Perhaps the DEQ should focus on making the water in the Cape Fear not kill its local residents.

And all of this, for what? A VASTLY undersized port that if disappeared tomorrow from operation, workload would easily be picked up by the many full size operational ports in our region to the north and south. This is a horribly unnecessary cost to benefit ratio, both financially and for the life of the many inhabitants- both human and otherwise- in the region.

Please terminate this plan.

Thank you,

Jonathan Damico
Brunswick County Resident

From: Jonathan Lee
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Friday, December 12, 2025 7:09:27 PM

You don't often get email from jonathan.patrick.lee@gmail.com. Learn why this is important

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Dear Federal Consistency Coordinator,

My name is Jonathan Lee, and I am a resident of Wilmington, North Carolina. I am writing to submit a public comment in opposition to the proposed Wilmington Harbor 403 Navigation Project as currently designed. While I understand the economic motivations, I am concerned the project will accelerate saltwater intrusion in the Cape Fear River system and cause irreversible harm to tidal freshwater forests and wetlands in Brunswick and New Hanover counties.

We are already seeing visible and documented forest decline and ghost-forest expansion in the Cape Fear watershed. Deepening and widening the navigation channel increases the risk of higher tidal range, upstream migration of the salt wedge, and more frequent saline inundation of freshwater wetlands. Once forested wetlands convert to ghost forest and then to marsh or open water, the ecosystem services are permanently lost, including long-term carbon storage, floodwater buffering, and critical wildlife habitat.

I urge the Division of Coastal Management to withhold federal consistency certification unless the following safeguards are required:

1. Prioritize alternatives that avoid ecological harm, including operational changes and limited targeted improvements rather than system-wide deepening and widening.

2. Require robust hydrologic and salinity modeling, paired with estuary-wide monitoring focused on tributaries and forested wetlands (including areas like Smith Creek, Town Creek, and Eagles Island).

3. Treat tidal freshwater forest loss and ghost-forest expansion as significant adverse impacts, not generic wetland acreage.

4. Require true no-net-loss mitigation for tidal freshwater forests and wetlands within the Cape Fear River watershed.

5. Implement adaptive management with enforceable forest-health thresholds that trigger review, project modification, and additional mitigation when impacts exceed defined limits.

Thank you for extending the public comment period and for carefully evaluating whether this project is consistent with North Carolina’s Coastal Management Program.

Sincerely,

Jonathan Lee

Wilmington, NC

From: Jonathan Merhige
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 4, 2025 6:00:53 PM

You don't often get email from jonathan.grey987@gmail.com. Learn why this is important

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Hello,

I hope this finds you well and is something I hope others are feeling as well.

I fully support making the river deeper. I have a trucking company and we used to get on average 30-40 containers a week out of the Wilmington port sometimes more where there's too much work to handle; but in 2025 after tariffs were put into place the freight has significantly dwindled in wilmington where this is the worst ive ever seen it. Its to the point we are lucky to see containers out of Wilmington, I've had to send my drivers who used to only pull out of Wilmington to pull out of other ports simply because there's nothing in Wilmington. The shortage of freight in Wilmington has led smaller trucking companies to close because they didnt have the funds to keep going or send their trucks elsewhere. Also with the little freight there is has lead to pay rates for loads going down and everyone is getting beat up on rates so when you have limited freight and now you are making less money per load its not viable in the long run. There is only one steam ship line that goes to east Asia and pacific countries out of Wilmington after tariffs hit and that is Maersk which since its the on streamline it gets fully booked fast on vessels with limited space and alot of the freight out of Wilmington went to those countries so I don't know how the Wilmington Port will survive if things continue how they are, so I pray to God we can make the river deeper and things change so people and truckers and their families in Wilmington can continue to survive and I'd love to see it where the Wilmington Port can thrive again. I'd hate to see things continue how they are and have Wilmington feel the results of Wilmington losing its freight.

Thank you,
Jonathan

From:	Jennifer London
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project)
Date:	Sunday, November 23, 2025 9:18:39 AM

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I am opposed to the proposed deepening and widening of the river- salt water intrusion has been a very real and this will likely make it worse. We do not need larger ships coming into our port the reward does not outweigh the risk of continued erosion or other potential damage this may cause.

Thank you- Josh London
104 Coral DR Wrightsville Beach
Sent from my iPhone

From: jshay68@earthlink.net
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, November 24, 2025 12:05:36 PM

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I am concerned about the potential for impact to our waterways and wildlife if the Wilmington Harbor is expanded. This project, which would deepen and widen the Wilmington Harbor, could have lasting impacts on our rivers, wetlands, fisheries, and nearby communities.

Please consider:

North Carolina law declares that “among North Carolina’s most valuable resources are its coastal lands and waters…which should be preserved and enhanced.” To protect and preserve our coastal resources, the Division of Coastal Management must ensure that projects occurring at the coast are consistent with the State’s coastal management plan.

Given the devastating impacts of the project, the Division of Coastal Management must deem the Wilmington Port Expansion **inconsistent** with the coastal management plan.

There is no compelling need for deepening the harbor. The Corps claims that the same amount of cargo will go through the port with or without the deepening, and Wilmington Harbor already accommodates the large ships that the project is designed to handle.

Yours truly,

Judy Shay
1615 Airlie Forest Court
Wilmington, NC 28403

From: Ms Julia B
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Wilmington Harbor 403 dredging project
Date: Saturday, December 6, 2025 1:41:53 PM

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I believe that this project will irreparably harm the fragile ecosystem that barely exist now around the harbor. I don't feel it's necessary and I feel it's the impact will negatively impact the wetland surrounding it. Can we just stop ruining everything that I used to love about this place? You drive the Wildlife away and you want to build build build. It does no good. You've ruined it you've polluted it and I'm I'm just over it. Thank you

Sent from Yahoo Mail for iPhone

From: jlnbusinessmail@gmail.com
To: DEQ-SVC_DCM.federalconsistencycomments; noah.tart@mail.house.gov
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Friday, November 28, 2025 1:00:15 PM

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Dear Legislators and Environmental Officials:

As a resident of New Hanover County NC, I have been concerned with our water quality, overdevelopment, lack of sound infrastructure, and harbor, wetland, and river issues. I realize you receive a lot of emails stating why people either prefer or do not prefer the harbor widened and deepened so I will make this succinct.

I am *not* in favor of the Wilmington Harbor deepening nor widening for many reasons. I am an independent voter so I am not always voting strictly Republican or Democrat. Most of the time, my voting habits center around my concern for the environment, good drinking water/air, overdevelopment, harm to wildlife habitats and other common sense issues. To destroy our habitat for extremely wealthy industries/people to get richer does not make good common sense for the good of all.

As long as I am stating that, I will also state that I prefer we stop dredging the coastline. People should never have been allowed to build those huge homes. Having taxpayers pay for the dredging and insurance increases for the extremely wealthy beach mansion and hotel owners needs to end. Not good common sense. Let's get back to the old timey beach shacks, even if owned by the state and rented out to the public. Private development along the coastline needs to have large setbacks. Please start somewhere.

Am I against being wealthy? NO. Am I against wealthy corporations abusing citizens, wildlife and the environment? YES. Let's just use common sense. We don't need this extra huge harbor in NC.

Thanks for listening,

Julie Lynn Neill
6200 Inland Greens Dr, Wilmington NC 28405
JLNBusinessMail@gmail.com

To: Director, North Carolina Division of Coastal Management
North Carolina Department of Environmental Quality

Speaker: Karen Dunn, 622 Waynick Blvd., Wrightsville Beach, NC 28480

Good evening. My name is **Karen Dunn**, and I've been a certified land-use planner and landscape designer for more than 30 years. In my profession, we have an ethical obligation to speak for "silent clients"—those without power or voice. Sometimes that means underserved communities. Always, it means the natural systems that sustain us but cannot advocate for themselves.

The NC Division of Coastal Management shares this same responsibility.
DCM is—by law and by purpose—the voice for North Carolina's environment during coastal project reviews. Your charge is not to facilitate development at any cost, but to ensure that any project affecting our coast is consistent with the State's coastal management plan and its foundational principle: that our coastal lands and waters are among the state's most valuable resources and must be *preserved and enhanced*.

The proposed **Wilmington Harbor Expansion** is fundamentally **inconsistent** with that mandate.

1. No Demonstrated Need

The Corps has not shown a compelling need to deepen or widen this channel. Even their own analysis admits the same volume of cargo will move through Wilmington with or without this expansion. The port already accommodates the larger vessels in question.

If the economic goals of shipping companies can be met **without** threatening North Carolina's coastal resources, then the coastal plan requires us to choose the protective path.

2. Costs Outweigh Benefits

This is a **billion-dollar project** whose primary benefits flow not to North Carolina communities, not to the NC Ports Authority, and certainly not to our coastal ecosystems, but to international shipping companies.

Worse, those projected benefits rely on flawed and untested assumptions. If the Corps is wrong—and more ships use the port than anticipated—our state could suffer **greater environmental damage and no meaningful economic return.** The coastal management plan does not permit sacrificing irreplaceable natural resources for speculative or private gain.

3. Sea Level Rise and Compound Flooding

The coastal management plan requires actions that make our habitats and species **more resilient** to climate change. Yet the Corps underestimates future vulnerability from sea level rise and fails to assess compound flooding from storm surge plus a deepened channel.

Instead of improving resilience, the project amplifies climate impacts—putting communities, wetlands, and wildlife at greater risk. Approving a project that increases climate vulnerability directly contradicts the plan DCM is responsible for enforcing.

4. Severe Natural Resource Impacts

This project will damage exactly what the coastal management plan is designed to protect.

- It increases erosion and demands perpetual, expanded maintenance dredging.
- It threatens over **16,000 nesting pairs of waterbirds**—the largest concentration in the state—on islands already vulnerable to wake and wave energy. Many of these species are of conservation concern. Flooded nests and destroyed chicks are not hypothetical; they are predictable outcomes.
- It will destroy more than **1,000 acres of freshwater wetlands**, eliminating flood protection and habitat that cannot simply "transition" as the Corps suggests.
- It risks exposing wildlife to **PFAS-contaminated sediments**, deepening long-term ecological harm.
- It heightens threats to endangered and threatened species, including sea turtles, especially as more maintenance dredging becomes necessary.

These impacts are not minor. They are profound, foreseeable, and preventable—and they run counter to the Coastal Area Management Act's requirement to **protect wildlife habitat.**

Conclusion

DCM is the guardian of North Carolina's coast. You are the voice for the natural resources that cannot speak in this room but that define who we are as coastal communities.

Given the lack of need, the absence of public benefit, the increased climate vulnerability, and the irreversible environmental damage, the Wilmington Harbor Expansion **cannot** be found consistent with the state's coastal management plan.

I urge DCM to uphold its duty to the people, the environment, and the future of our coast by deeming this project inconsistent.

Thank you,
Karen H Dunn, AICP

From: Karen Dunn
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, November 17, 2025 1:25:31 PM
Attachments: 11-18-25 K Dunn DCM Public Hearing Comments - email submission.pdf

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To Federal Consistency Coordinator,

Please see attached comments regarding USACE Wilmington Harbor 403 Navigation Project.
Thank you,
Karen H Dunn

--
Karen H. Dunn, AICP
Resilient Land Planning and Design
622 Waynick Blvd Unit 102
Wrightsville Beach, NC 28480
704-560-1500 (cell)
khdnc1@gmail.com

From: Karen Pittman
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal consistency: USACE Wilmington harbor 403 navigation project
Date: Thursday, December 4, 2025 11:24:17 AM

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Please do not allow this to pass!

North Carolina Coastal Federation member,

Karen Pittman

From: Katalin Kluge
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Friday, December 19, 2025 10:53:09 PM

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I am reaching out as a concerned Wilmington citizen. Studies have shown that deepening and widening Wilmington Harbor would cause changes in tidal range, storm surge, salinity and flooding. It would have devastating consequences for natural habitat, including primary nursery grounds – causing irreparable damage to the fishing and shellfish industry that supports jobs and coastal communities. Fooding upriver is also a serious concern, especially when combined with sea level rise.

Our wetlands are essential for flood protection, water quality, and wildlife habitat. The proposed project would lead to significant wetland loss, as increasing saline waters will lead to breakdown of organic soils/peat and cause subsidence. Mitigation plans are inadequate.

In addition, given known PFAS contamination in the Cape Fear River, dredged sediments should be tested before any determination is made. The project should not proceed without safeguards to protect public health.

Flooding and environmental impacts disproportionately affect vulnerable and low-lying communities. These impacts must be fully considered in the state's consistency review.

The USACE Wilmington Harbor 403 Navigation Project has enormous environmental costs and limited local benefits. It should not be deemed consistent with North Carolina's coastal policies.

Katalin Kluge
1731 Fairway Drive
Wilmington, NC

From: Kate Goodenough
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, November 17, 2025 3:24:32 PM

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To whom it may concern:
My name is Dr. Katharine Goodenough, and I have been conducting research in the Lower Cape Fear River System (Carolina Beach south to Fort Caswell) since 2018. My research focuses upon coastal, waterbird nesting species that include American Oystercatchers, Black Skimmers, and a suite of tern species using the natural and spoils dredge islands in the Lower Cape Fear River.

The Cape Fear River nesting islands host about 30 percent of the state's nesting coastal waterbirds, including American Oystercatchers, Brown Pelicans, and White Ibis. Nearly all of the 25+ species at risk from this project are state species of greatest conservation need, meaning they are already in danger of serious decline and need more conservation support, not less. Low-lying islands in the river that provide bird nesting habitat are already eroding due to wakes from container ships, storms and rising seas. In fact, there is an ongoing study by UNCW researchers to evaluate ship wake influences on Battery Island, an estuarine island adjacent to Southport and the current shipping channel.

Wilmington Harbor can already accommodate the large vessels the project is designed for, and the amount of cargo coming into the port is not predicted to change. The port proposal would deepen the river channel from 44 to 49 feet at its entrance and from 42 to 47 feet at the port, widen some parts of the channel by as much as 560 feet, and extend the entrance about 9 miles further offshore.

The proposed expansion at the Port of Wilmington would do irreversible harm to birds and their habitat on the Lower Cape Fear River, while bringing no economic benefits to the community.

The proposed project would worsen these impacts by:
1- introducing heavier ships, larger wakes and deepening the channel into the river, which will increase overall wave energy leading to increased erosions rates on bird nesting islands
2- increasing overwash of nests that leads to lower nesting productivity for State Species of Conservation Concern
3- increasing coastal flooding for human communities and the destruction of over 1,000 acres of wetlands that support bottomland forest birds, fisheries, water quality, and recreational opportunities.
4- The project also has the potential to expose birds and people to dangerous PFAS/PFOS ("forever chemicals") through dredging and disposal of sediment that has been contaminated with these toxins for the last 50 years. There is NO PFAS/PFOS sediment testing for the areas of the river that would be dredged for the port expansion. We (scientific community) already are aware that there are high levels of PFAS in the area and dredging activities would resuspend buried contaminants back into the water column. For example, Sunny Point has been identified as a massive PFOS hotspot, yet there has been no testing by the ACOE to

determine the impacts of dredging on water toxicity levels for the Cape Fear River communities.

The navigation channel already accommodates the large ships this project is designed for and the amount of cargo coming into the port is not predicted to change. The only economic savings identified in the draft environmental assessment benefits private shipping companies, not the North Carolina Port Authority, coastal economies, or the people of North Carolina. The proposed Wilmington Harbor expansion would cause irreversible and costly harm to the Lower Cape Fear River, its wildlife, and surrounding communities, all without a proven public need.

The ACOE has failed to fully evaluate the project's long-term costs, including the need for more frequent maintenance dredging and flood mitigation for human communities. I urge you to consider the impacts that I have highlighted and vote no to the proposed USACE Wilmington Harbor 403 Navigation Project.

Respectfully,
Dr. Katharine Goodenough
Lead Ecologist
Larid Research and Conservation

From: Kelsey Anderson
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 18, 2025 4:56:58 PM

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To: Federal Consistency Co-Ordinator,
NC DEQ Division of Coastal Management
400 Commerce Ave., Morehead City, NC 28557
Subject: Federal Consistency: USACE Wilmington Harbor 403 Dredging Project

Executive Summary: The Draft Environmental Impact Study (DEIS) of the proposed Wilmington harbor expansion as submitted by the US Army Corps of Engineers (USACE) does not address the full impact this project will have on the lower Cape Fear environment. The absence of detailed, scientific references supports the argument that the proposed project is inconsistent with NC's coastal management charter.

NC law states "among NC's most valuable resources are it's coastal lands and waters…..which should be preserved and enhanced." The proposed Wilmington Harbor 403 project will severely, adversely, affect both.

Loss of vital wetlands that currently mitigate flooding in downtown Wilmington.

The proposed widening of the Wilmington port channel will destroy a large swath of wetland.

Preliminary estimates indicate over a 1000 acres (over 1.5 sq miles) of wetland on both shores of the Cape Fear river will be lost as a result of widening parts of the Wilmington navigation channel from 100ft to 300ft. Currently this wetland serves

as a sponge during
heavy rainfall in the Cape Fear river watershed, and as a sponge and filter during periods of
high tide.
Coupled with a predicted rise in sea level, downtown Wilmington and adjacent riverside
communities will be exposed to more frequent and severe flooding. This is already a problem,
why compound it?

Loss of wildlife and estuarine habitat.

While acknowledging that saline (sea) water will migrate further up river due to the deepening
of the ship channel (from 44 to 49ft at the entrance, and 42 to 47ft at the port) the DEIS posits
that freshwater wetland will transition into another type of wetland. This will come at a price,
thousands of cypress trees have already been lost due to migration of salt water upstream.
There is a reason beachfront sand dunes expand inland. The existing reeds and grasses that
flourish in freshwater wetland are vital wildlife habitat. Similarly the marine ecosystem in this
estuarine environment supports small organisms that in turn provide a nursery for larger
species of fish and crustaceans. In addition, this unique estuarine ecosystem is the
'classroom' for UNCW scientists and students as well as an ecotourism 'hot spot' for all who
appreciate it's value in the NC coastal plain.

River bank erosion due to increased wave action and dredging.

Existing ship traffic is steadily eroding the Cape Fear river shoreline. Bald Head Island, at the
river mouth, alone has already spent over $90 million to preserve their shoreline. Ships of
greater displacement will generate proportionately larger waves which accelerate shoreline

erosion; it follows that this will require more frequent dredging of the navigation channel,
thereby creating an ongoing, vicious cycle. The projected $18 million annual port
maintenance costs (mostly for dredging) will increase as a result, and local and regional NC
residents will inevitably be burdened accordingly.**Return on investment (ROI)**
The initial cost of this project is estimated to be $1.3 billion. However, with projected startup
only likely to occur several years from now, this figure will inevitably increase, indeed
estimates based on projected future costs indicate costs may actually result in a *net loss in*
terms of ROI. Additionally the USACE notes that only international shipping companies will
benefit, not the NC Ports Authority nor local communities, based on their projection that
shipping companies will transport more cargo on fewer ships.
I**t's notable that there is no demonstrated need for harbor expansion.**
The Corps claims that the same amount of cargo will go through the port with or without
deepening the ship channel, and the port already accommodates the large ships that the
project is designed to handle.
Why threaten North Carolina's natural, coastal resources if economic and transportation
needs currently in place already meet future goals?
The project does not offer resiliency to climate change.
NC's coastal management plan demands that actions be taken to make our coastal habitats
and species "more resilient" to the impacts of climate change.
But the Corps' analysis of the Wilmington Port Expansion understates the future vulnerability
of the Wilmington area and its coastal resources due to predicted

sea level rise, storm surge
and coastal flooding.
The Corps does not adequately evaluate flood risks caused by the deepening, harm to
wetlands, wildlife habitat. On the other hand, scientific projections, based on experience,
confirm that this project will make Cape Fear River coastal habitat less resilient.

Relocating dredged sediment.

NC state has not yet accepted that exposure to PFAS and PFOS are a potential health
hazard, even though this of growing, national concern and some states are already
implementing the necessary restrictions and precautions to address it. The USACE ignores
this potential health hazard (to all living organisms) and therefore plans to deposit dredged
material along local beach front to counter ongoing erosion. Samples of this material are
recorded to contain large amounts of PFAS/PFOS and more. Brunswick County beaches
have already been closed due to incidents of sewage contamination, high concentrations of
PFAS/PFOS have already been found in samples of sea foam. The impact on quality of life in
the lower Cape Fear region, to residents and visitors, cannot be understated when these
'forever chemicals' are finally accepted by NC officials as being hazardous to our health.

**Numerous letters were submitted to the USACE in reference to all of the above
prior to release of the Draft Environmental Impact Study. These letters described
in far more detail, applying science and proven practices, the pitfalls of the
proposed project. It is most unfortunate that this thoroughly**

researched
information was overlooked by the USACE when they prepared their DEIS.

Sent from my iPhone

From: Kelly Esposito
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 4:43:34 PM

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To the N.C. Division of Coastal Management and the U.S. Army Corps of Engineers:

I am writing to formally submit my opposition to the Wilmington Harbor Navigation Improvement Project. As a lifelong resident of Wilmington and a practicing physician, I have watched our community navigate significant growth—but I cannot support growth that comes at the expense of our fundamental right to clean water and a stable ecosystem.

Because of the well-documented PFAS ("forever chemical") contamination in the Cape Fear River and our public water supply, my family can no longer trust the infrastructure provided by the city. We have been forced to rely on a private well and a third-party supplier, Culligan, just to ensure the water in our home is safe for consumption. It is deeply concerning that while residents are spending their own resources to filter out industrial toxins, the state and the USACE are considering a project that will actively resuspend millions of cubic yards of contaminated sediment back into the water column.

Professional Concerns Regarding Carcinogenic Risk In my medical practice, I am guided by the principle of "first, do no harm." I believe our regulatory bodies should be held to the same standard. The clinical evidence linking PFAS exposure to various malignancies—specifically **kidney, testicular, and thyroid cancers**—is robust and growing.

Dredging the riverbed to a depth of 47 feet will inevitably disturb "legacy" PFAS that has settled in the sediment. This isn't just an environmental theory; it is a direct threat to the health of our patients and our neighbors. We should be focused on remediation and dredging *removal* of toxins, not deepening a channel in a way that recirculates them.

Concerns as a Lifelong Resident:

- **Loss of Coastal Buffers:** Having lived here my entire life, I have seen the increasing intensity of storm surges. Deepening the channel allows saltwater to push further inland, killing the cypress swamps and wetlands that act as Wilmington’s natural storm surge protection.
- **Irreversible Habitat Loss:** The creation of "ghost forests" upriver is a permanent scar on our landscape. Once these freshwater ecosystems are lost to saltwater intrusion, they are gone for my generation and all those that follow.
- **Public Health Safety Margins:** Our community is already at a "tipping point" regarding environmental stressors. Adding the burden of increased wake erosion and potential toxin resuspension is a risk we cannot afford to take.

I urge you to prioritize the health of Wilmington’s citizens over the logistical convenience of

ultra-large container ships. Please deny the consistency certification for this project.

Sincerely,

Kelly Esposito

142 Middle Oaks Drive

Wilmington NC 28409

Kelly Esposito, MD, MBA
Hand and Upper Extremity Surgery
(910) 612-6317 ▪ kelly.r.esposito@gmail.com

From: Kelsey Kiser
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Sunday, November 23, 2025 10:33:08 AM

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Hello,

My name is Kelsey Kiser, and I am a resident of Wilmington, North Carolina. I am writing to express my concerns regarding the proposed deepening of the Cape Fear River.

Dredging to expand the port could have devastating environmental impacts, such as further damaging our region's wetlands, which protect our communities from flooding and offer wildlife habitats; disturbing and unleashing so-called "forever chemicals"; disrupting salinity levels upriver, in turn killing trees; and worsening storm surge during hurricanes and other weather events.

This project would likely damage our coastal ecosystems in ways that would reverberate for decades. Please help us protect the Cape Fear River from this reckless expansion.

Thank you,

Kelsey Kiser

5001 Blue Grass Court

Wilmington, North Carolina

From: KJ Barnwell
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 18, 2025 4:41:18 PM

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To whom it may concern:

Executive Summary: The Draft Environmental Impact Study (DEIS) of the proposed Wilmington harbor expansion as submitted by the US Army Corps of Engineers (USACE) does not address the full impact this project will have on the lower Cape Fear environment. The absence of detailed, scientific references supports the argument that the proposed project is inconsistent with NC's coastal management charter.

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thousands of cypress trees have already been lost due to migration of salt water upstream.
There is a reason beachfront sand dunes expand inland. The existing reeds and grasses that
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'classroom' for UNCW scientists and students as well as an ecotourism 'hot spot' for all who
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erosion; it follows that this will require more frequent dredging of the navigation channel,
thereby creating an ongoing, vicious cycle. The projected $18 million

annual port
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terms of ROI. Additionally the USACE notes that only international shipping companies will
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deepening the ship channel, and the port already accommodates the large ships that the
project is designed to handle.
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and species "more resilient" to the impacts of climate change.
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of the Wilmington area and its coastal resources due to predicted sea level rise, storm surge
and coastal flooding.
The Corps does not adequately evaluate flood risks caused by the

deepening, harm to
wetlands, wildlife habitat. On the other hand, scientific projections, based on experience,
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Relocating dredged sediment.

NC state has not yet accepted that exposure to PFAS and PFOS are a potential health
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this potential health hazard (to all living organisms) and therefore plans to deposit dredged
material along local beach front to counter ongoing erosion. Samples of this material are
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the lower Cape Fear region, to residents and visitors, cannot be understated when these
'forever chemicals' are finally accepted by NC officials as being hazardous to our health.

**Numerous letters were submitted to the USACE in reference to all of the above
prior to release of the Draft Environmental Impact Study. These letters described
in far more detail, applying science and proven practices, the pitfalls of the
proposed project. It is most unfortunate that this thoroughly researched
information was overlooked by the USACE when they prepared their DEIS.**

Thank you for reviewing these concerns with proposed project.

Kevin Barnwell
10229 Zane way
Elk Grove, CA 95757

Sent from my iPhone

From: Kris Atlas
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] federal consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, December 15, 2025 3:47:46 PM

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Protect Wilmington Harbor

NO Widening
NO Deepening

Thank you
Dr. Susan Mitchell
112 Aspen Rd
HampsteaD, nc 28443

From: Kyle McCool
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 4:30:32 PM

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To the N.C. Division of Coastal Management and the U.S. Army Corps of Engineers:

I am writing to express my firm opposition to the proposed deepening of the Wilmington Harbor shipping channel from 42 feet to 47 feet. As a resident of Wilmington and an avid fisherman who spends significant time on the Cape Fear River, I have a deep personal investment in the health of this waterway.

However, my opposition is also driven by my professional responsibility as a **radiation oncology physician**. I am gravely concerned that the massive resuspension of sediment required for this project will exacerbate an existing public health crisis by reintroducing sequestered toxins into our environment and food chain.

The Risk of PFAS Resuspension As a physician, I am acutely aware of the strong and growing body of clinical evidence linking Per- and polyfluoroalkyl substances (PFAS) exposure to a range of malignancies. Epidemiological studies and toxicological data have increasingly associated these "forever chemicals" with an elevated risk of:

- **Kidney and Testicular Cancers**
- **Thyroid Cancers**
- **Endocrine Disruption** (linked to breast and prostate cancers)

By dredging 35 million cubic yards of sediment—much of which acts as a "sink" for historical PFAS contamination—we risk a massive re-contamination of the water column. This poses an unacceptable risk to our drinking water and to the local fish populations that I, and many others in our community, catch and consume.

Additional Environmental and Structural Concerns: Beyond these critical health concerns, I am opposed to the project for the following reasons:

- **Destruction of Wetlands:** Deepening the channel will increase the tidal prism, forcing saltwater further upriver and accelerating the death of freshwater forested wetlands ("ghost forests").
- **Impact on Fisheries:** The increased salinity and loss of habitat will devastate the primary nurseries that support the Atlantic sturgeon and our local recreational fishing economy.
- **Increased Erosion and Flooding:** A deeper channel creates a "highway" for storm surges to penetrate deeper into Wilmington’s residential areas while larger vessel wakes

accelerate bank erosion.

The Cape Fear River is the lifeblood of Wilmington, not a sacrifice zone for industrial expansion. To move forward with this project without exhaustive, independent testing of the sediment for PFAS—and a full accounting of the carcinogenic risks posed to the public—would be a failure of oversight and a danger to the citizens of North Carolina.

I urge the N.C. Division of Coastal Management and the U.S. Army Corps of Engineers to deny the consistency certification for the Wilmington Harbor Deepening Project.

Sincerely,

Kyle McCool

--

John Kyle McCool, M.D.
Radiation Oncology
Coastal Carolina Radiation Oncology
1988 S. 16th Street
Wilmington, NC 28401
(910) 442-5150
kmccool@nhroc.com

From: Laura Padgett
To: DEQ-SVC_DCM.federalconsistencycomments
Cc: Kerri Allen; Bill Saffo
Subject: [External] Wilmington Harbor 403 Navigation Project
Date: Friday, December 5, 2025 1:37:43 PM

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The proposed Wilmington Harbor expansion would cause irreversible harm to the Cape Fear River, its wildlife, and surrounding communities, all without a proven public need.
This project has been moved rapidly forward in spite of obvious negative impacts, skipping steps/approvals, from the beginning. Please do not approve this project.
The deepening and widening are not necessary as the Port can already handle ships carrying 14,000+ TEUs. Since about 10% of ship loads are offloaded in Wilmingon, that is 1400+ trucks entering our traffic system. Only a small proportion leave WIlmington by train due to lack of infrastructure and lack of support or participation by the Port to increasing railroad capacity that does not further damage local community traffic. It is unreasonable to expect that in the future a Port the size of Wilmington's will ever need to manage ships that are bigger and carrying more TEUs. Shipping is changing worldwide and climate change has created low water levels at the Panama Canal making Wilmington's Port even more unlikely to benefit from this project. This benefits no one in actuality, costing enormous public funds and damage for an unlikely reward.
The widening and deepening of the channel in 2006 created significant saltwater intrusion to the area around downtown WIlmington and Brunswick County as shown by the vistas from the Cape Fear Memorial Bridge connections of dead trees in the area. Reports have blamed this 2006 project for overwhelming flooding in downtown that occurred during Hurricane Florence in 2018 and those reports predict increasing damage due to the 2006 deepening and especially if there is further deepening. This project will do irreparable harm to Downtown Wilmington, the City of WIlmington and our surrounding area in every way - to wildlife, to community health, to the economy, and to physical structures and the built community as it undermines the bottom of the Cape Fear River.
Thank you for your consideration.

Laura W. Padgett
Member of Wilmington City Council 1994-2015, former chair of the WMPO, Project Advocate/co-founder of Wilmington's Railroad Realignment Project
Laura.lwpadgett@gmail.com
Cell: 910-262-4025

From:	Lauren Rust
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date:	Thursday, December 18, 2025 6:07:11 PM

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I am extremely concerned about this project and the detrimental impact it will have on my home. Our wetlands are already slowly slipping away and this will destroy even more of them. In a town that has already has so much exposure to chemicals in our water supply this will only expose us to more chemicals. Not to mention the increase in exposure to PFAS this will significantly increase not only ours but our wildlife's exposure. This will also destroy fishing habitats and very important habitats our wildlife depend on to survive.

This project will cause so much damage which shouldn't be tolerated in our already struggling environment. Especially when the project is unnecessary. The harbor already accommodates ships large enough for what The Corps wants. Also the long term costs and frequent need for maintenance will likely be higher than expected and cause more flooding if not appropriately maintained.

Bottom line is that the proposed Wilmington Harbor expansion would cause irreversible harm to the Cape Fear River, its wildlife, and surrounding community, all for a project without a proven public need.

Please protect not only my home but the home of so many unique species of birds, fish, plants, and other animals and block this unnecessary project.

Lauren Rust, MD
209 N 7th St.
Wilmington, NC 28401

From:	Addison, Lindsay
To:	DEQ-SVC_DCM.federalconsistencycomments; Luck, Cameron A
Cc:	Smalling, Curtis; Wallace, Zach; Graham, Ben; Sargent, Dana
Subject:	[External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date:	Friday, December 19, 2025 4:56:02 PM
Attachments:	Wilmington Harbor consistency comments - Audubon NC - 19 Dec 2025.pdf

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Hello,

Attached please find our comments on the consistency for the Wilmington Harbor 403 Navigation Project. We sincerely appreciate the opportunity for public input.

Best,

Lindsay

Lindsay Addison
coastal biologist

Audubon North Carolina
239.784.2251
nc.audubon.org

From: Liz Rogers
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 11, 2025 4:31:49 PM

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To whom it may concern:

Having served on a task force involved in Water Quality for the State of North Carolina and having kept abreast of the Cape Fear area since 1972, as well as being a North Carolina native owning property in Brunswick county and New Hanover County, I do not support the deepening of the Cape Fear river shipping channel at this time. The environmental impact will be great including erosion while the cost to taxpayers will not be recouped.

Please do your part to keep Wilmington uniquely special as a tourist attraction while being an environmentally friendly small, landlocked port town.

Thank you.

Liz Rogers
336-906-7224
lizrogersbeach@gmail.com

From: Lois Galligan
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 11:35:22 AM

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My husband and I are opposed to the deepening and widening of the Cape Fear River in order to accommodate larger vessels based on environmental concerns, particularly the impact on wildlife. This area is an extremely important one for birds and it is critical, given the dramatic decline in the overall bird population, particularly songbirds and shorebirds, to provide resources for birds to thrive, including nesting and foraging sites and adequate food sources.

While we appreciate the importance of a healthy local economy for the area, Wilmington appears to have a healthy economy, a brisk port business and a rapidly expanding population, so we find it hard to justify further degrading the environment for an uptick in port business.

Lois and Tom Galligan
Southport, NC

From: Lora Sharkey
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Wilmington Harbor project draft EIS comments
Date: Thursday, November 20, 2025 3:46:28 PM

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Thank you for accepting my comments on the proposed action. I am opposed to the proposal to deepen/widen the existing shipping channel. The current depth and width of the channel is accommodating the largest cargo ships already, so expanding the river's existing parameters makes little sense when the environmental harm would be significant. The Army Corps of Engineers draft EIS for the proposed Wilmington Harbor Improvement project acknowledges multiple detrimental environmental impacts that would result from a deepening/widening of the Cape Fear River shipping channel. Increased water salinity of freshwater marshes would destroy existing vegetation and conditions necessary for freshwater marine life. Increased erosion rates at the southern end of the Cape Fear River would endanger nesting seabirds on dedicated bird sanctuary islands. Higher erosion would also increase water sedimentation which would be detrimental to sea turtles and fish. The process to deepen the channel would involve removal of rock and dredged materials, seriously disrupting fish habitat, and nursery areas. That in turn would have a negative impact on the recreational fishing industry for the coastal towns of Brunswick County. Alteration of the river would result in long lasting negative environmental impacts and no stated environmental improvements for the coastal landscape. These anticipated outcomes conflict with the goal of the NC Coastal Area Management Act which is to preserve and manage the state’s natural ecological estuarine conditions with conservation, preservation and protection stated as key actions required of the Coastal Resources Commission.

Lora Sharkey
432 Cades Trail
Southport, NC

From: Lou Vaickus MD FACP
To: DEQ-SVC_DCM.federalconsistencycomments
Cc: Lou Vaickus MD FACP
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Friday, December 5, 2025 9:29:40 AM

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Hello,

Thanks for taking my comments.

For once, let's not abandon beauty, homeowners, and other coastal economies for the almighty dollar with a project that has no surety that significant damage will not ensue because as we all know, projections and models can only predict so much.

The proposal to increase the depth of the channel is fighting mother nature in that the sand will collapse, damage surrounding shorelines, and coast millions in annual maintenance, particularly after storms.

What will you do if coastal homes start collapsing into the water ala the Outer Banks or experience a loss in property value? Will homeowners have compensation to replace the irreplaceable? Or will they, as has been the case before, be on the hook for their losses and relocation? Will the commission or those who stand to profit from this set aside money to help homeowners and coastal communities when the inevitable occurs? Already, I have heard from those who wish to relocate to our area that they do not want to deal with the coastal and environmental impact of these large ships. Too, coastal home insurance has gone up quite a lot and will go up further with the unknown, or likely best-case scenario, pay de minimis for any damages with carefully worded parlance in the insurance riders that this type of damage will not be covered.

While it may be good for the Wilmington economy, all of us oceanside

to that lovely town will be put at risk. It’s just like dumping chemicals upstream on the Cape Fear River system but this time with government approval.

LOU VAICKUS MD FACP | **CHIEF EXECUTIVE OFFICER**
akta Pharmaceutical Development (aktaPD®)

DIRECT LINE: +1.617.313.7730 | MOBILE: +1.857.919.2493
OFFICE: +1.919.845.0900 ext. 605 | FAX: +1.919.845.0939

www.aktaPD.com | L.Vaickus@aktapd.com

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From: Mariah Jacobs
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Friday, December 19, 2025 12:04:45 AM

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To: Federal Consistency Co-Ordinator,
NC DEQ Division of Coastal Management
400 Commerce Ave., Morehead City, NC 28557
Subject: Federal Consistency: USACE Wilmington Harbor 403 Dredging Project
Executive Summary: The Draft Environmental Impact Study (DEIS) of the proposed Wilmington harbor expansion as submitted by the US Army Corps of Engineers (USACE) does not address the full impact this project will have on the lower Cape Fear environment. The absence of detailed, scientific references supports the argument that the proposed project is inconsistent with NC's coastal management charter.
NC law states "among NC's most valuable resources are it's coastal lands and waters.....which should be preserved and enhanced." The proposed Wilmington Harbor 403 project will severely, adversely, affect both.
Loss of vital wetlands that currently mitigate flooding in downtown Wilmington.
The proposed widening of the Wilmington port channel will destroy a large swath of wetland. Preliminary estimates indicate over a 1000 acres (over 1.5 sq miles) of wetland on both shores of the Cape Fear river will be lost as a result of widening parts of the Wilmington navigation channel from 100ft to 300ft. Currently this wetland serves as a sponge during heavy rainfall in the Cape Fear river watershed, and as a sponge and filter during periods of high tide. Coupled with a predicted rise in sea level, downtown Wilmington and adjacent riverside communities will be exposed to more frequent and severe flooding. This is already a problem, why compound it?
Loss of wildlife and estuarine habitat.
While acknowledging that saline (sea) water will migrate further up river due to the deepening of the ship channel (from 44 to 49ft at the entrance, and 42 to 47ft at the port) the DEIS posits that freshwater wetland will transition into another type of wetland. This will come at a price, thousands of cypress trees have already been lost due to migration of salt water upstream. There is a reason beachfront sand dunes expand inland. The existing reeds and grasses that flourish in freshwater wetland are vital wildlife habitat. Similarly the marine ecosystem in this estuarine environment supports small organisms that in turn provide a nursery for larger species of fish and crustaceans. In addition, this unique estuarine ecosystem is the 'classroom' for UNCW scientists and students as well as an ecotourism 'hot spot' for all who appreciate it's value in the NC coastal plain.
River bank erosion due to increased wave action and dredging.
Existing ship traffic is steadily eroding the Cape Fear river shoreline. Bald Head Island, at the river mouth, alone has already spent over $90 million to preserve their shoreline. Ships of greater displacement will generate proportionately larger waves which accelerate shoreline erosion; it follows that this will require more frequent dredging of the navigation channel, thereby creating an ongoing, vicious cycle. The projected $18 million annual port maintenance costs (mostly for dredging) will increase as a result, and local and regional NC residents will inevitably be burdened accordingly.

Return on investment (ROI)
The initial cost of this project is estimated to be $1.3 billion. However, with projected startup only likely to occur several years from now, this figure will inevitably increase, indeed estimates based on projected future costs indicate costs may actually result in a net loss in terms of ROI. Additionally the USACE notes that only international shipping companies will benefit, not the NC Ports Authority nor local communities, based on their projection that shipping companies will transport more cargo on fewer ships.
It's notable that there is no demonstrated need for harbor expansion.
The Corps claims that the same amount of cargo will go through the port with or without deepening the ship channel, and the port already accommodates the large ships that the project is designed to handle.

Why threaten North Carolina's natural, coastal resources if economic and transportation needs currently in place already meet future goals?
The project does not offer resiliency to climate change.
NC's coastal management plan demands that actions be taken to make our coastal habitats and species "more resilient" to the impacts of climate change.
But the Corps' analysis of the Wilmington Port Expansion understates the future vulnerability of the Wilmington area and its coastal resources due to predicted sea level rise, storm surge and coastal flooding.
The Corps does not adequately evaluate flood risks caused by the deepening, harm to wetlands, wildlife habitat. On the other hand, scientific projections, based on experience, confirm that this project will make Cape Fear River coastal habitat less resilient.
Relocating dredged sediment.
NC state has not yet accepted that exposure to PFAS and PFOS are a potential health hazard, even though this of growing, national concern and some states are already implementing the necessary restrictions and precautions to address it. The USACE ignores this potential health hazard (to all living organisms) and therefore plans to deposit dredged material along local beach front to counter ongoing erosion. Samples of this material are recorded to contain large amounts of PFAS/PFOS and more. Brunswick County beaches have already been closed due to incidents of sewage contamination, high concentrations of PFAS/PFOS have already been found in samples of sea foam. The impact on quality of life in the lower Cape Fear region, to residents and visitors, cannot be understated when these 'forever chemicals' are finally accepted by NC officials as being hazardous to our health.
Numerous letters were submitted to the USACE in reference to all of the above prior to release of the Draft Environmental Impact Study. These letters described in far more detail, applying science and proven practices, the pitfalls of the proposed project. It is most unfortunate that this thoroughly researched information was overlooked by the USACE when they prepared their DEIS.

Thank you please

Sent from my iPhone

From: Mark Haworth
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Tuesday, November 25, 2025 6:07:51 PM

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To whom it may concern:

The Wilmington Port Expansion would deepen the Wilmington channel from 44 to 49 feet at the entrance and from 42 to 47 feet at the Port, widen parts of the channel by 100-300 feet, and extend the entrance further offshore. The project poses many threats to the Lower Cape Fear region, which is rife with wildlife and natural resources, boasting spectacular barrier islands, tidal creeks, salt marshes, and wetlands.

North Carolina law declares that "among North Carolina's most valuable resources are its coastal lands and waters…which should be preserved and enhanced." To protect and preserve our coastal resources, the Division of Coastal Management must ensure that projects occurring at the coast are consistent with the State's coastal management plan.

Given the devastating impacts of the project, the Division of Coastal Management must deem the Wilmington Port Expansion **inconsistent** with the coastal management plan.

Lack of Demonstrated Need for the Harbor Expansion

- There is no compelling need for deepening the harbor. The Corps claims that the same amount of cargo will go through the port with or without the deepening, and Wilmington Harbor already accommodates the large ships that the project is designed to handle.
- There is no reason to threaten North Carolina's coastal resources if economic and transportation goals can be accommodated without the deepening project.

Costs May Outweigh Benefits

- The project is expected to cost more than **$1 billion** and the only benefits identified are cost savings to international shipping companies, not the N.C. Ports Authority, North Carolina communities, or coastal resources.
    - The Corps expects that shipping companies will transport more cargo on fewer ships resulting in cost-savings, an assumption the Corps does not justify
- To calculate cost-savings, the Corps relies on many flawed assumptions; the true project costs may actually result in a net loss. If the Corps's assumptions are inaccurate and more vessels use the Port than expected, the environmental damage will be more severe.
- The lack of economic benefits means the far-reaching threats to coastal resources are entirely unjustified and inconsistent with the coastal management plan.

Sea Level Rise and Compound Flooding

- The state's coastal management plan demands that actions be taken to make our coastal habitats and species "more resilient" to the impacts of climate change.
- But the Corps' analysis of the Wilmington Port Expansion underestimates the future vulnerability of the Wilmington area and its coastal resources due to sea level rise and coastal flooding.
    - The Corps fails to consider the compound effects of sea level rise, storm surge, and deepening the harbor.
    - The Corps does not adequately evaluate flood risks caused by the deepening.
    - The Corps does not adequately evaluate how the project will harm wetlands, wildlife habitat, and species by exacerbating the impacts of climate change.
- Far from making our coastal resources more resilient, this project will likely increase the devastating effects of climate change.

Natural Resource Impacts

- The Wilmington Port Expansion will threaten the very resources our coastal management plan was designed to protect:
    - The expansion will threaten wildlife habitat and coastal towns, increase erosion rates, and increase the need for maintenance dredging.
    - The expansion will destroy more than a thousand acres of freshwater wetlands. The Corps unjustifiably assumes that freshwater wetlands will transition into other types of wetlands without accounting for the loss of habitat and storm protection that freshwater wetlands would provide.
    - The expansion could expose wildlife to extreme PFAS ("forever chemicals") pollution through dredging and disposal of contaminated sediment.
    - Deepening the harbor will adversely impact threatened and endangered species, including sea turtles, especially through the consequent increased amount of regular maintenance dredging.

Bottom line:

The proposed Wilmington Harbor expansion would cause irreversible harm to the Cape Fear River, its wildlife, and surrounding communities, all without a proven public need.

From:	Meggie Lou
To:	DEQ-SVC_DCM.federalconsistencycomments
Cc:	wilmingtonharbor403@saw.usace.army.mil; governor.cooper@nc.gov
Subject:	[External] URGENT OBJECTION – Wilmington Harbor 403 Draft EIS – Immediate Sediment Testing Required Under CAMA & NEPA
Date:	Thursday, December 4, 2025 12:23:27 PM

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December 4, 2025

Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

Re: Public Comment – Draft Environmental Impact Statement for Wilmington Harbor Section 403 Navigation Improvement Project (Brunswick & New Hanover Counties) – Deadline December 5, 2025

Dear Coordinator,

I strongly object to a finding of consistency for the proposed deepening and widening of Wilmington Harbor to 47 feet. Dredging in this known PFAS- and GenX-contaminated waterway will re-suspend decades of toxic sediments and directly threaten the drinking water, fisheries, and health of over 800,000 downstream residents — including my own family.

The Draft EIS fails to adequately address the following documented contamination:
Cape Fear River is a national PFAS hotspot from Chemours/DuPont discharges (300 % violations documented in DEQ Laserfiche files).
Source: https://edocs.deq.nc.gov/WasteManagement/DocView.aspx?id=1634183&dbid=0&repo=WasteManagement
Helene (Sep 2024) and Debby (Aug 2024) already re-mobilized these toxins; levels spiked dramatically and remain elevated.
DEQ Advisory: https://deq.nc.gov/news/press-releases/2024/09/10/deq-issues-advisory-about-pfas-cape-fear-river-following-hurricane-helene

Harbor sediments contain legacy PFOA, GenX, 1,4-dioxane, heavy metals, and industrial waste from Colonial Pipeline, DuPont, and port operations — none of which have been fully remediated.

No comprehensive pre-dredge sediment testing or funded remediation plan is included in the Draft EIS, in direct violation of the Coastal Area Management Act (CAMA) anti-degradation policy and the National Environmental Policy Act (NEPA).

Under CAMA (§ 113A-120) and NEPA (40 CFR § 1502.9), the state and Corps are legally required to fully evaluate and mitigate significant environmental impacts before certifying consistency. Dredging without immediate, independent sediment testing constitutes an

unacceptable risk to public health and the environment.

I demand that North Carolina deny federal consistency certification until:
1.) Full, independent sediment testing for all 29 PFAS compounds, GenX, 1,4-dioxane, and heavy metals is completed and made public.
2.) A funded remediation plan is in place before any dredge material is disturbed.
3.) Continuous third-party monitoring is required during and after the project.

Failure to require these safeguards will expose the state to liability for foreseeable harm to drinking water and public health.

This comment must be entered into the official record.

Sincerely,

Megan Elizabeth Teachey
Wilmington resident & mother of two young children who drink Cape Fear water every day

From:	MICHAEL RECTOR
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] Harbor dredging
Date:	Saturday, November 22, 2025 2:01:32 PM

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I think the harbor should be dredged deeper.

IMHO,
Michael Rector
5241 US Highway 117 S
Burgaw NC 28425
828-612-6309

Sent from my iPhone

From: Michele Ann Dean
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, December 15, 2025 7:18:24 PM

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Please don't! Please don't deepen our river! NC law states "among NC's most valuable resources are it's coastal lands and waters.....which should be preserved and enhanced." The proposed Wilmington Harbor 403 project will severely, adversely, affect both.

Loss of vital wetlands that currently mitigate flooding in downtown Wilmington. We need and want our wetlands!

Loss of wildlife and estuarine habitat. Save our wildlife homes and habitat!

River bank erosion due to increased wave action and dredging.

I**t's notable that there is no demonstrated need for harbor expansion.**
The Corps claims that the same amount of cargo will go through the port with or without deepening the ship channel, and the port already accommodates the large ships that the project is designed to handle.
Why threaten North Carolina's natural, coastal resources if economic and transportation needs currently in place already meet future goals?

Thank you in advance for your urgent attention to this matter. Please protect our lands!!

Michele Ann Dean

From: Michele Rivest
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Oppose the Wilmington Harbor expansion project
Date: Friday, December 12, 2025 1:14:05 PM
Attachments: PastedGraphic-1.png

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Conserve the Point-Topsail (CTP-T) endorses the position of the North Carolina Audubon organization opposing the Wilmington Harbor dredging proposal. CTP-T vehemently opposes the proposed Wilmington Harbor expansion project. The proposed expansion at the Port of Wilmington would do irreversible harm to birds and their habitat on the Cape Fear River, while bringing no economic benefits to the community.

Audubon monitors and manages a network of low-lying bird nesting sanctuaries on the lower portion of the Cape Fear River. These islands already suffer from erosion caused by rising seas and ship wakes, which crash strongly against on the shore. The port expansion would dramatically worsen these impacts—while also damaging habitat for birds.

The Cape Fear River nesting islands host about 30 percent of the state's nesting coastal waterbirds, including American Oystercatchers, Brown Pelicans, and White Ibis. Nearly all of the over 25 species at risk from this project are state species of greatest conservation need, meaning they are already in danger of serious decline and need more conservation support, not less.

North Carolina law declares that "among North Carolina's most valuable resources are its coastal lands and waters…which should be preserved and enhanced." In order to protect and preserve our coastal resources, the Division of Coastal Management in legally bound to ensure that projects occurring at the coast are consistent with the State's coastal management plan.

Low-lying islands in the river provide nesting habitat for many bird species, but they are already eroding due to wakes from container ships, storms and rising seas. The port proposal would worsen the erosion by deepening the river channel from 44 to 49 feet at its entrance and from 42 to 47 feet at the port, widening some parts of the channel by as much as 560 feet, and extending the entrance further offshore.

The project would worsen these impacts by:

- introducing heavier ships and larger wakes into the river, which erode nesting islands
- increasing over-wash of nests, which happens when large wakes rush up shore and wash away eggs and chicks
- deepening the channel, which increases overall wave energy in the river, making erosion worse
- increasing the threat of coastal flooding for human communities which could destroy over 1,000 acres of wetlands that support bottomland forest birds, fisheries, water quality, and recreational opportunities. Bottomland swamps that support birds like Prothonotary Warblers are at particular risk of being converted to brackish or saltwater marshes, destroying their already scarce habitat.

The project also has the potential to expose birds and people to dangerous PFAS ("forever chemicals") through dredging and disposal of sediment that has been contaminated with these toxins for the last 50 years.

The navigation channel already accommodates the large ships this project is designed for and the amount

of cargo coming into the port isn't predicted to change. **The only economic savings identified in the draft environmental assessment benefit private shipping companies, not the NC Ports Authority, coastal economies, or the people of North Carolina**.

In conclusion, the proposed Wilmington Harbor expansion would cause irreversible and costly harm to the Cape Fear River, its wildlife, and surrounding communities, all without a proven public need. That's why we are urging the Division of Coastal Management to protect instead of allowing the deepening and widening the Cape Fear River.

Thank you for your consideration of our position.

Sincerely yours,

Michele Rivest
President, Board of Directors
Conserve The Point - Topsail

wild pristine serene
CONSERVE THE POINT
Topsail Island, North Carolina

From: Michelle Donahue
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Opposition to Proposed Cape Fear Dredging
Date: Friday, December 19, 2025 8:29:35 AM

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Dear North Carolina Department of Environmental Quality,

I am writing to formally oppose the proposed plan to dredge and deepen the Cape Fear River near Wilmington. This project presents serious, long-term risks to the ecological health, climate resilience, and cultural heritage of the Lower Cape Fear region, and I urge NC DEQ to deny or significantly revise any permits associated with this effort.

Ecological Context: A System Already Under Stress

The Cape Fear River estuary is not a blank slate. It is already experiencing significant stress from sea-level rise, saltwater intrusion, habitat loss, and the cumulative impacts of past and ongoing dredging projects. Channel deepening has repeatedly altered hydrology and salinity regimes in ways that push saltwater farther upriver, undermining freshwater wetlands and forests that evolved under very different conditions. Additional dredging would accelerate these processes, compounding damage rather than addressing it.

One visible and alarming consequence of these changes is the rapid expansion of ghost forests—areas where once-thriving coastal forests have died due to increased salinity and altered water levels. I documented this phenomenon in a recent article for *Coastal Review*, which explains how dredging and other human interventions intensify saltwater intrusion and forest loss in the Cape Fear watershed:

https://coastalreview.org/2025/10/cape-fear-ghost-forests-tell-tale-of-ever-saltier-water-upriver/

Peer-reviewed research reinforces these concerns. A study by Kendra Devereaux, Dr. Monica Rother, and colleagues provides direct scientific evidence from the Wilmington area showing how even subtle shifts in hydrology and salinity can kill mature, long-established forests:

https://onlinelibrary.wiley.com/doi/10.1002/ece3.71677

The Irreplaceable Value of Trees—Especially Old-Growth Bald Cypress

Of particular concern is the threat this project poses to forested wetlands and old-growth bald cypress stands. These trees are not interchangeable units of "green infrastructure." Many are centuries old, serving as living archives of regional history while providing critical ecosystem services: carbon storage, flood attenuation, water filtration, wildlife habitat, and shoreline stabilization.

The proposed mitigation measures do not—and cannot—replace these forests. Planting saplings (which is not part of the current mitigation plan) or restoring wetlands elsewhere does

not compensate for the loss of mature bald cypress systems that took hundreds of years to develop. Once these trees are killed by saltwater intrusion, they are effectively gone within any meaningful human or planning timeframe.

Mitigation Promises and the Need for Accountability

Equally troubling is the reliance on mitigation plans that assume future compliance without enforceable accountability. The U.S. Army Corps of Engineers has, in past projects, failed to fully follow through on mitigation commitments, leaving local communities and ecosystems to absorb the consequences. Any project of this scale should include binding, transparent, and independently monitored mechanisms to ensure mitigation is not only promised, but completed, maintained, and effective.

Without such safeguards, mitigation becomes a paper exercise rather than a real offset to ecological harm. NC DEQ should not approve permits based on mitigation assurances that lack enforceability or a clear track record of success.

Contaminants and Public Health: PFAS Concerns

Another critical issue is the disturbance of contaminated sediments. As discussed in a subsequent article I published with WHQR, dredging the Cape Fear River raises serious concerns about PFAS and other persistent pollutants that are already present in the river system. Resuspending these contaminants threatens downstream ecosystems, drinking water sources, and public health:

https://www.whqr.org/local/2025-11-15/the-proposed-plan-to-dredge-the-cape-fear-river-balancing-progress-and-preservation

Any environmental review that does not fully account for PFAS risks—and the long-term costs of spreading them further through the watershed—is incomplete.

Conclusion

The Cape Fear River is a living system, not simply a navigation channel. Its forests, wetlands, and waters support communities, economies, and ecosystems that cannot be easily repaired once damaged. Proceeding with this dredging plan would prioritize short-term industrial convenience over long-term environmental stability and public trust.

I respectfully urge NC DEQ to reject the proposed dredging plan or require a fundamentally different approach—one that prioritizes climate resilience, protects irreplaceable old-growth forests, fully addresses contamination risks, and includes enforceable accountability for mitigation commitments.

Sincerely,

Dr. Michelle Donahue

From: Michael Minutelli
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Dredging for Wilmington Port
Date: Monday, November 24, 2025 10:00:34 AM

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Hello, hope this finds you well.

My name is Mike, Minutelli. Im a local business owner and avid fisherman in the wilmington and Brunswick county area. I often take the ferry to baldhead island to work on the island and see these huge ships pass going to unload in wilmington. I think this idea of deepening the cape fear to accommodate different ships is futile and a waste of money. The port already runs at capacity and dredging to accommodate different ships, not MORE ships is a waste of time, money and will have a massive environmental impact. I have a special view of this as a plumber, I have been installing pfas filters on city water all over wilmington and Brunswick county because of the contamination of the river. People are terrified of this, stirring up the bottom and spreading it downstream is going to cause a massive issue that will not look good for the city. This could turn into the worst environmental catastrophe this area has ever seen. Cleanup will be impossible and the environment will never recover because pfas never breakdown. Beaches will be vacant, homes will sell for dirt cheap and nobody will move in. Business will fail and the area will esentially be a ghost town. If you feel you must continue please do a pfas assessment of the silt under the river before spreading it everywhere. Think of the fishing tourism dollars that will be lost, the neighborhoods that will sit vacant the animals that will forever be contaminated, the cancer this area will be forced to deal with... all so we can accept different ships at the port, not more. Wake up, this is unnecessary and unacceptable. Thanks for listening

-Mike Minutelli

From: Nancy Patton
To: SAS-SAC SAM.federalconsistency@noaa.gov
Subject: [External] Federal consistency comments: USACE Wilmington Harbor/403 Navigation Project
Date: Saturday, December 20, 2025 3:42:52 PM
Attachments: CE1.2 The Lower Cape Fear River public comment 12.20.25.SCP.docx

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Dear Sirs,

Attached is my letter voicing strong opposition to the Wilmington Harbor
expansion project.

Please oppose this project!

Sincerely,

Nancy Patton

1414 Ocean Blvd. Topsail Beach, NC 28445

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url=http%3A%2F%2Fwww.avast.com%2Fsig-email%3Futm_medium%3Demail%26utm_source%3Dlink%26utm_campaign%3Dsig-email%26utm_content%3Demailclient&data=05%7C02%7Cfederalconsistencycomments%40deq.nc.gov%7C457322189624457f62ad0bde40084bcf%7Ca76814cfe9d1d4e0a85c1ecc26cd7ed19%7C0%7C0%7C639018601721836535%7CUnknown%7CTWFpbGZsb3d8eyJFbXBteU1heGlsZmxkIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C60000%7C%7C%7C&sdata=wBvDlSukqlOhAkb5lYWDyHPEYfyeDUfTrbqm5wWY%3D&reserved=0

North Carolina Conservation Network

234 Fayetteville Street
5th Floor
Raleigh, NC 27601
919.857.4699

December 18, 2025

Division of Coastal Management
ATTN: Federal Consistency Coordinator
400 Commerce Avenue
Morehead City, NC 28557

Re: Wilmington Harbor 403 Draft EIS

Dear Mr. Luck,

Please see the attached petition signed by 568 North Carolina urging you to find that the proposed Wilmington Harbor deepening project is NOT consistent with North Carolina's coastal management plans and policies.

As outlined in the attached materials, the proposed project would damage coastal wetlands and forested habitats, increase flood and storm surge risks, threaten public trust uses such as fishing, and impose long-term economic and environmental costs on the state. These impacts conflict directly with North Carolina's coastal policies and goals.

For these reasons, we respectfully request that you find the proposed Wilmington Harbor deepening project inconsistent with North Carolina's coastal management plans and deny approval.

Thank you for your consideration.

Thank you,
Brittany

Brittany Williams, Digital Campaigns Manager
NC Conservation Network

We are writing to urge you to find that the proposed Wilmington Harbor deepening project is NOT consistent with North Carolina's coastal management plans and policies.

The proposed project is inconsistent with state policies in several ways:

- North Carolina coastal policies are expressly intended to 'safeguard and perpetuate' the 'biological, social, economic, and aesthetic values' of coastal habitats (15A NCAC 07H .0203). But deepening the navigation channel will damage wetlands and forests along the river, threatening habitat for birds and fish. The project will increase annual dredging costs, a burden on the economy that will stretch indefinitely into the future.
- Deepening the channel will accelerate saltwater intrusion, worsen storm surge, and heighten flood risks for residents and businesses along the river. A UNC Wilmington study has already linked previous dredging to long-term die-offs of bald cypress forests.
- State policy says activities must not jeopardize public trust uses of coastal waters, including fishing (15A NCAC 07H .0208(a)(2)(G)). But the proposed project will stir up and release sediment that almost certainly has high concentrations of toxic PFAS, threatening nearby Atlantic Ocean beaches and contaminating fish and shellfish.

All of these impacts would be inconsistent with North Carolina's coastal management plans even if the project were economically lucrative. But the Corps' own estimates suggest this expensive investment will not benefit North Carolina's economy.

Please protect North Carolina's coastal resources and communities and tell the Corps that the draft Wilmington Harbor proposal is not consistent with state coastal management goals or policies.

Thank you.

Sincerely,

	First Name	Last Name	Address	City	State	Zip
1.	Peter	Cook	PO BOX 1567	Andrews	NC	28901-1567
2.	Adam	Matar	59 Cedar Hill Rd	Asheville	NC	28806-9624
3.	Anne	Lanzi	34 Montana Ave	Asheville	NC	28806-4116
4.	Pat	Cole	6 Galahad Pl	Asheville	NC	28806-2006
5.	Tonya	Clark	19 1/2 W Oakview Rd	Asheville	NC	28806-1409
6.	Barbara	Sloss	5 Wagon Rd	Asheville	NC	28805-2613
7.	Randy	Bernard	18 Plateau Rd	Asheville	NC	28805-1955
8.	Shannon	Simpson	87 Maple Dr	Asheville	NC	28805-1138
9.	Pamela	Culp	42 River Walk Dr	Asheville	NC	28804-4405
10.	Terry	Faulkner	160 Chatham Rd	Asheville	NC	28804-3339
11.	Peter	Lourekas	31 Lorraine Ave	Asheville	NC	28804-2528
12.	Howard	Yarborough	14 Beaver Valley Rd	Asheville	NC	28804-1802
13.	Marla	West	81 Wild Cherry Rd	Asheville	NC	28804-1726
14.	Miriam	Sexton	18 Cedarwood Trl Unit B	Asheville	NC	28803-8822
15.	Edward	Roberts	22 Saint Giles Pl	Asheville	NC	28803-3444
16.	Marion	Danforth	26 Wesley Dr Apt H	Asheville	NC	28803-2095
17.	Marilyn	Bollinger	28 Forestdale Dr	Asheville	NC	28803-1850
18.	Alyx	Perry	24 Ridge Ave	Asheville	NC	28803-1432
19.	Chris	Watenpool	100 Brookstone Ct	Hendersonville	NC	28792-8553
20.	Karen	Waltman	517 Burge Mountain Rd	Hendersonville	NC	28792-8225
21.	Walter	Kross	32 Imperial Dr	Hendersonville	NC	28792-8105
22.	Brian	Blackwell	128 N Main St	Hendersonville	NC	28792-5065
23.	Mary	McQueen	171 Inglenook Rd	Hendersonville	NC	28792-0097
24.	Liston	Smith	1512 Ridgewood Blvd	Hendersonville	NC	28791-2247
25.	Linda	Camp	522 Woodfield Ln	Hendersonville	NC	28791-1993
26.	Laura	Bannister	11 Surrey Run	Hendersonville	NC	28791-1653
27.	Cathy	Nieman	312 Ivy Hill Rd	Weaverville	NC	28787-9652
28.	Jamie	Patterson	37 Ballard Rd	Weaverville	NC	28787-9418
29.	Joe	Nowak Jr.	38 Morningside Dr	Weaverville	NC	28787-9100
30.	Ann	Cadle	132 Macdougall Ln	Weaverville	NC	28787-7704
31.	Henry	Mancuso	5 Gale Kelly Ct	Weaverville	NC	28787-6802
32.	Evelyn	Coltman	90 Evergreen Cir	Waynesville	NC	28786-7508

33.	Annemarie	Pelliccia	697 Hall Top Rd	Waynesville	NC	28786-2563
34.	Kaaren	Stoner	2225 Coleman Mountain Rd	Waynesville	NC	28785-8424
35.	Langdon	Long	36 Hunting Country Trl	Tryon	NC	28782-9763
36.	Kimberly	Adams	516 Melrose Avenue Ext	Tryon	NC	28782-3374
37.	Clark	Pearson	1128 Kitchens Branch Rd	Sylva	NC	28779-7760
38.	Sean	Oâ€™Connell	74 Garret Ln	Sylva	NC	28779-2906
39.	Thomas	Sweeny	266 Quail Run	Pisgah Forest	NC	28768-9908
40.	Jeanie	Cook	3280 Laurel Valley Rd	Mars Hill	NC	28754-6781
41.	Laura	Boggess	501 Bailey St	Mars Hill	NC	28754-6209
42.	Patricia	Momich	7839 NC 208 Hwy	Marshall	NC	28753-7536
43.	Deborah	Dobson	840 Rackley Pl	Hendersonville	NC	28739-8808
44.	John	Mahan	1224 Pinebrook Cir	Hendersonville	NC	28739-5146
45.	Allison	Perrett	524 Ehringhaus St	Hendersonville	NC	28739-4118
46.	Julie	Shoemaker	1569 Folly Rd	Hendersonville	NC	28739-2544
47.	Sharon	Van Horn	45 Pine Hill Rd	Franklin	NC	28734-3708
48.	Andreana	Galanos	291 Brickton Village Cir Unit 203	Fletcher	NC	28732-8804
49.	Michael	Roche	7 Briarwood Ln	Fletcher	NC	28732-8417
50.	Christopher	Berg	6 Rosemary Trl	Flat Rock	NC	28731-9532
51.	Andrea	Thompson	55 Farm View Rd	Fairview	NC	28730-8532
52.	Michelle	Nelson	243 Pioneer Ridge Rd	Canton	NC	28716-8080
53.	Rob	Allyn	59 Luther Cove Rd	Candler	NC	28715-9696
54.	Sarah	Gilliam	69 English Dr	Candler	NC	28715-9631
55.	John	Graham	13 Oak Ct	Candler	NC	28715-9454
56.	Hildegarade	Polasky	8 Dixon Ter Unit Nc	Candler	NC	28715-9342
57.	Faith	Ferris	12 Enka Oak St	Candler	NC	28715-7904
58.	Lenore	Madeleine	700 Vista Lake Dr Apt 308	Candler	NC	28715-7191
59.	Teal	Chimblo	99 Riddle Branch Rd	Burnsville	NC	28714-6136
60.	Teal	Chimblo Fyrberg	99 Riddle Branch Rd	Burnsville	NC	28714-6136
61.	Jan	Ross	262 Circle E Ranch Rd	Burnsville	NC	28714-1368
62.	Jennifer	Harper	192 Ole Looney Coon Rd	Brevard	NC	28712-5112
63.	D	Rosengrant	385 Purple Finch Rd	Brevard	NC	28712-5087
64.	Carrie	Blair	PO Box 1008	Brevard	NC	28712-1008
65.	John	Bromer	255 Lakey Gap Acres	Black Mountain	NC	28711-9647

66.	Martha	Johnson	4 Daniel Ln	Black Mountain	NC	28711-8712
67.	Katherine	Tharp	906B Montreat Rd	Black Mountain	NC	28711-3228
68.	Robert	Swett	301 Montreat Rd	Black Mountain	NC	28711-3119
69.	Roberta	Rosell	219 Pine St	Black Mountain	NC	28711-3021
70.	Justin	Landry	119 Chestnut Pl	Arden	NC	28704-2902
71.	Debbie & Jeff	Long	PO BOX 808	West Jefferson	NC	28694-0808
72.	Richard	Vultaggio	1404 Drexel Rd	Valdese	NC	28690-9008
73.	Rose	Shulman	346 Piney Grove Church Rd	Traphill	NC	28685-8735
74.	Bonnie	Zotos	2223 Whiterock Ct	Sherrills Ford	NC	28673-7295
75.	Michael	Genovese	1355 Twogreen Ln	Newton	NC	28658-8872
76.	Susan	Greive	2312 Land Hbr	Newland	NC	28657-7905
77.	Sam	Hay	108 Wildwood Dr	Morganton	NC	28655-9091
78.	Mary	Pasquill	1149 Hidden Lake Dr	Granite Falls	NC	28630-8592
79.	SB	PASS	115 Hill St	Elkin	NC	28621-2415
80.	Jeffery and Pamela	Mastin	417 Hawk Ridge Rd	Deep Gap	NC	28618-9337
81.	robert	schlagal	18723 NC Highway 88 W	Creston	NC	28615-9562
82.	Zola	Ferraby	614 Howard St	Boone	NC	28608-0020
83.	Marna	Napoleon	250 Yarrow Ln	Boone	NC	28607-9691
84.	Edie	Tugman	216 Cherry Dr	Boone	NC	28607-3717
85.	Fredrick	Milano	201 Smokey Mountain Rd	Boone	NC	28607-0076
86.	Charlotte	Preswood	631 Shawneehaw Ave	Banner Elk	NC	28604-0284
87.	Alan	Linn	2115 Derby St	Hickory	NC	28602-9420
88.	Diane	Arbour	3409 6th Street Dr NW	Hickory	NC	28601-9092
89.	Derek	Chase	55 40th Avenue Dr NE	Hickory	NC	28601-9088
90.	Lynn B.	Spees	280 28th Avenue Pl NE	Hickory	NC	28601-1120
91.	William	Kenneke	402 Holly St	Emerald Isle	NC	28594-2819
92.	Linda	Jacoby	116 Lousan Dr	Cape Carteret	NC	28584-9722
93.	Judith	Utley	111 Halls Creek Dr	Swansboro	NC	28584-9675
94.	Terry	Halpern	306 Whittaker Point Rd	Oriental	NC	28571-9662
95.	Captain	Mark	113 Gull Harbor Dr	Newport	NC	28570-9436
96.	Teresa	Rice	105 S 28th St	Morehead City	NC	28557-3310
97.	Riley	Kay	233 N Shore Dr # 1	Morehead City	NC	28557-2647
98.	Sarah	Simmons	605 Aztee Rd	Jacksonville	NC	28540-6701

99.	Misha	Cheema	401 Marshas Way	Havelock	NC	28532-3839
###	Darlene	Houston	2812 Alison Rd	Kinston	NC	28504-7827
###	Amy	Kelly	7047 Bloomsbury Ct SW	Ocean Isle Beach	NC	28469-3653
###	Craig	Brown	670 Kings Trl	Sunset Beach	NC	28468-5316
###	Julia	Martinelli	8918 Landing Dr SW	Sunset Beach	NC	28468-4628
###	Rick	MUTZABAUGH	15 Gate 12	Carolina Shores	NC	28467-2622
###	Donna	Murphy	129 Oceangreens Ln	Caswell Beach	NC	28465-8457
###	George	Czerw	703 Alyssum Ave	Caswell Beach	NC	28465-8425
###	Julia	Bishop	84 Cherry Rd UNIT 2	Southport	NC	28461-8899
###	Judith	Marcum	258 Bonnet Way	Southport	NC	28461-3067
###	Suzanne J	Dickson	PO Box 1081	Sneads Ferry	NC	28460-1081
###	Marcia	Kramarz	2111 Talmage Dr	Leland	NC	28451-9340
###	Leonard	Gregorio	1332 Cape Fear National Dr	Leland	NC	28451-6477
###	Donna	Walters	2449 Compass Pointe South Wynd NE	Leland	NC	28451-6438
###	Joseph	Fudge	3826 Lemon Drop Ln NE	Leland	NC	28451-4802
###	Shannon	Harper	511 Old Mill Rd	Castle Hayne	NC	28429-5926
###	Robert	Ponzoni	1201 Canal Dr	Carolina Beach	NC	28428-6042
###	SUZANNE	DRAKE	4 Sand Dollar Ln	Carolina Beach	NC	28428-6013
###	Currin	Bender	407 South Carolina Ave UNIT 1	Carolina Beach	NC	28428-5732
###	Sherry	Wibberley	1609 Zion Hill Rd SE Unit 2	Bolivia	NC	28422-8297
###	Carla	Murray	939 Wharton Ave	Wilmington	NC	28412-8296
###	Tracey	Laszloffy	4414 Worthylake Run	Wilmington	NC	28412-7084
###	Elizabeth	Wood	1415 Barouche Ct	Wilmington	NC	28412-5122
###	Joan	Zelinski	4312 Fireside Ct	Wilmington	NC	28412-5119
###	Ro	Mentesana	1134 Matteo Dr	Wilmington	NC	28412-5013
###	John	Herrmann	403 The Cape Blvd	Wilmington	NC	28412-3325
###	Seth	Butler	1314 Element Way	Wilmington	NC	28412-1624
###	Sondra	Vitols	8208 Bald Eagle Ln	Wilmington	NC	28411-9307
###	Esther	Murphy	7235 Darden Rd Apt 127	Wilmington	NC	28411-5101
###	Kasha	Sears	7407 Privet Ct	Wilmington	NC	28411-1016
###	Andy	Sefton	4937 Crosswinds Dr	Wilmington	NC	28409-8944
###	Peggy	Fry	115 Pine Cone Rd	Wilmington	NC	28409-5113
###	Gail	Weeks	202 Holiday Hills Dr	Wilmington	NC	28409-3514

###	Peter	Schulz	2616 Hargate Ct	Wilmington	NC	28405-7454
###	Mercedes	Hyman	6832 Main St	Wilmington	NC	28405-4167
###	Rachel	Magallon	713 Clearwater Ct Apt F	Wilmington	NC	28405-3558
###	Jason	Rooker	4707 Cedar Ave	Wilmington	NC	28403-4403
###	Karen	Langelier	3613A Saint Johns Ct	Wilmington	NC	28403-4171
###	Jada	Tuffin	601 S College Rd	Wilmington	NC	28403-3201
###	Wendie	Schneider	111 S 6th St	Wilmington	NC	28401-4601
###	Daniel	Spilman	1102 N 8th St	Wilmington	NC	28401-3112
###	Joanne	Thornton	PO Box 2162	Southern Pines	NC	28388-2162
###	Cathleen	Pritchard	4 Georgia Ct	Pinehurst	NC	28374-9647
###	Amanda	Brewer	735 Ann Rd	Orrum	NC	28369-9758
###	JANET	GRAY	216 Range Rd	Hope Mills	NC	28348-9704
###	Cindy	Grimes	6317 Rustic Rdg	Hope Mills	NC	28348-2712
###	Kathy	Wright	620 Lighthorse Cir	Aberdeen	NC	28315-3774
###	shaun	Murphy	4613 Dow Ct	Fayetteville	NC	28314-2441
###	C	Fisher	4604 Fen Ct	Fayetteville	NC	28314-2413
###	Edward	Dillon	2108A Dillon Dr	Fayetteville	NC	28306-2154
###	Melissa	Daniels	907 Hemlock Dr	Fayetteville	NC	28304-4122
###	Michael	Minnick	3016 Wedgewood Dr	Fayetteville	NC	28301-7600
###	EDWARD	TURNER	11226 Coachman Cir	Charlotte	NC	28277-9173
###	Shannon	Ryan	15046 Deshler Ct	Charlotte	NC	28273-6950
###	Barry	Goldfarb	2420 Lynbridge Dr	Charlotte	NC	28270-7773
###	Andrea	Thunem	10824 Eddings Dr APT 103	Charlotte	NC	28270-1191
###	Charlotte	Moulton	3320 Nancy Creek Rd	Charlotte	NC	28270-0440
###	Hope	Hockaday	9431 Glenwater Dr	Charlotte	NC	28262-8468
###	Martha	Todd	8801 Brigadier Ln	Mint Hill	NC	28227-9731
###	Dane	Bowen	8740 Blair Rd	Mint Hill	NC	28227-7640
###	Ralph	Benfield	1133 Dooley Dr	Charlotte	NC	28227-4012
###	Fred	Martin	3215 Ravencliff Dr	Charlotte	NC	28226-7332
###	Bill	Staton	2431 Hartmill Ct	Charlotte	NC	28226-6463
###	Warren	Tadlock	6322 Kiftsgate Ct	Charlotte	NC	28226-5576
###	Brandon	Williams	7239 Lockmont Dr	Charlotte	NC	28212-6451
###	Deb	Douglas	3800 Smooth Rock Ct	Charlotte	NC	28210-6910

###	Elizabeth	Whitt	1116 Scaleybark Rd Apt 116B	Charlotte	NC	28209-4509
###	Ray	Owens	531 Manning Dr	Charlotte	NC	28209-3439
###	Rebecca	Barham	516 E Woodlawn Rd	Charlotte	NC	28209-2804
###	Ellyn and Neil	Kirschner	326 Tranquil Ave	Charlotte	NC	28209-2116
###	Mary	Bowman	1612 Myers Park Dr	Charlotte	NC	28207-2670
###	Carolyn	Bentley	2232 Shade Valley Rd APT A	Charlotte	NC	28205-8312
###	Janet	Palmer	5326 Silabert Ave	Charlotte	NC	28205-7869
###	Christie	Driscoll	2327 Laburnum Ave	Charlotte	NC	28205-6045
###	Mary	Tuma	4020 Larkspur Ln	Charlotte	NC	28205-4972
###	Tina	Shull	2800 Temple Ln	Charlotte	NC	28205-4128
###	Karen	Hodges	2641 Palm Ave	Charlotte	NC	28205-2239
###	Pamela	Thomas	119 Oakleaf Ln	Wingate	NC	28174-6717
###	Courtney	Ashley	419 Webb Road	Shelby	NC	28152-9000
###	Frank	Corvino	2715 Enon Church Rd	Salisbury	NC	28147-9722
###	Arthur	Firth	1011 Emerald Bay Dr	Salisbury	NC	28146-1586
###	Linda	Sufficool	405 Lake Dr	Salisbury	NC	28144-3452
###	Kathy	Nance	990 Piney Knob Rd	Rutherfordton	NC	28139-8521
###	Christi	Dillon	175 Forest Ridge Rd	Mooresville	NC	28117-6519
###	Mary Beth	Lemon	5023 Revelation Way	Monroe	NC	28110-7894
###	Frank	Stroupe	329 Raintree Dr	Matthews	NC	28104-7319
###	Eric	Innes	9185 Myrna Dr	Gastonia	NC	28056-9531
###	Kelsey	Lecky	4425 Huntington Dr	Gastonia	NC	28056-8275
###	Samuel	Henriquez	4107 Greenhaven Ln	Gastonia	NC	28056-7032
###	Christine	B.	726 Longford Dr	Gastonia	NC	28056-3900
###	Steven	Tracy	1118 Heatherloch Dr	Gastonia	NC	28054-6442
###	AYESHA	IMAM	918 Nottingham Dr	Gastonia	NC	28054-5615
###	Richard	McCrary	1759 Yellowstone Ct APT I	Gastonia	NC	28054-1772
###	Cynthia	Bernett	10636 Rippling Stream Dr NW	Concord	NC	28027-8264
###	William	Austin	3700 Taylor Glen Ln NW APT 217	Concord	NC	28027-3437
###	Jim	Mitchem	154 Old Spring Rd	Belmont	NC	28012-9707
###	Carrie	Goodykoontz	2206 Jackson St	Belmont	NC	28012-2195
###	Dave	Garber	700 Skip Jack Ln Apt C3	Kill Devil Hills	NC	27948-9250
###	Dorothy		109 Reddes River Ct	Hertford	NC	27944-9511

###	Cheryl	Hopkins	50092 Treacher Ln	Buxton	NC	27920-1569
###	Suzanne	Evans	3400 Wetherly Dr N	Wilson	NC	27896-1290
###	Aaron	Ellis	909 Gold St N	Wilson	NC	27893-2509
###	Bridget	Butler	107 Anderson Pl	Washington	NC	27889-4752
###	Michael	Fleming	2910 Mulberry Ln Unit D	Greenville	NC	27858-7824
###	Meghan	Croll	1609 Wimbledon Dr Apt 24	Greenville	NC	27858-5382
###	Gillian	Iery	608 Short Spoon Cir	Rocky Mount	NC	27804-6412
###	Diane	Jackson	123 Applecross Ct	Durham	NC	27713-9333
###	Nancy	Hanley	4611 Dolwick Dr	Durham	NC	27713-6527
###	Carol	Young	5808 Williamsburg Way	Durham	NC	27713-2636
###	Tracy	Feldman	5306 Pelham Rd	Durham	NC	27713-2532
###	Shelley	Frazier	1200 East Oak Dr	Durham	NC	27712-3213
###	Christian	Slack	1817 Grady Dr	Durham	NC	27712-2618
###	mf	solomon	2 Stillwater Park	Durham	NC	27707-6125
###	Rene	Merwin	2201 Wise Pl	Durham	NC	27707-4441
###	Elsa	Woods	24 Glenmore Dr	Durham	NC	27707-3975
###	Karla	Brown	3208 Waterbury Dr	Durham	NC	27707-2416
###	keith	levene	405 Carolina Cir	Durham	NC	27707-2252
###	Simon	Gregg	1301 Arnette Ave	Durham	NC	27707-1601
###	Vicky	Brandt	3318 Coachmans Way	Durham	NC	27705-6027
###	Diane	Thomas	110 Pinecrest Rd	Durham	NC	27705-5813
###	Priscilla	Wald	2605 Mcdowell Rd	Durham	NC	27705-5810
###	Diane	Allen	2622 Pickett Rd	Durham	NC	27705-5641
###	Thomas	Struhsaker	2953 Welcome Dr	Durham	NC	27705-5555
###	Marian	Dessent	10 Macgregor Ct	Durham	NC	27705-5446
###	Gary	Gartner	6 Scotland Pl	Durham	NC	27705-5440
###	David	Buchwalter	3010 Harriman Rd	Durham	NC	27705-5426
###	Coleman	Churchill	1700 W Markham Ave	Durham	NC	27705-4243
###	Susan	Cates	910 Constitution Dr	Durham	NC	27705-2895
###	Cynthia	Cooper	9 Marigold Pl	Durham	NC	27705-1958
###	David	Lines	1112 Millspring Dr	Durham	NC	27705-1325
###	Rosemary	Dineen	1021 Millspring Dr	Durham	NC	27705-1324
###	Carol	Rist	1 Barratts Chapel Ct	Durham	NC	27705-1311

###	Jeffrey	Nicolaisen	2528 Perkins Rd	Durham	NC	27705-1020
###	Bonnie	Hamby	1106 W Murray Ave	Durham	NC	27704-3040
###	Ellen	Granger	1006 Branwell Dr	Durham	NC	27703-9864
###	Tom C	Dowd	808 Gaston Manor Dr	Durham	NC	27703-8108
###	Jerry	Northington	1055 Steinbeck Dr	Durham	NC	27703-6496
###	Andrew	Hefner	709 Pleasant Dr	Durham	NC	27703-5135
###	Kayla	Igo-Kneasel	1710 Fletchers Chapel Rd	Durham	NC	27703-2814
###	Michael	Eisenberg	1015 Athena Dr	Durham	NC	27703-0409
###	Hannah	Cullen	922 Dacian Ave Apt 315	Durham	NC	27701-1756
###	Robert	Smith	814 Demerius St Apt R2	Durham	NC	27701-1671
###	John	Compton	404 W Knox St	Durham	NC	27701-1638
###	pam	watkins	926 W Markham Ave	Durham	NC	27701-1514
###	Zialliah	Ascalon	7703 Cape Charles Dr	Raleigh	NC	27617-8321
###	Rick	Jones	7215 Terregles Dr	Raleigh	NC	27617-6713
###	Gregory	Hargraves	8870 Elizabeth Bennet Pl	Raleigh	NC	27616-9039
###	Nancy	Bradley	3528 Castlegate Dr	Raleigh	NC	27616-8552
###	Addison	acker	4609 Kresson Pl	Raleigh	NC	27616-5221
###	Timothy	THRONDSON	7437 Capstone Dr	Raleigh	NC	27615-5711
###	John	Franklin	11504 Hyde Pl	Raleigh	NC	27614-9626
###	Karen	Bearden	1809 Lakepark Dr	Raleigh	NC	27612-6516
###	Donald	Fuchs	4609 Wee Burn Trl	Raleigh	NC	27612-6369
###	Jeff	Kulp	5417 Oldtowne Rd	Raleigh	NC	27612-6111
###	PAUL	KIM	4009 City of Oaks Wynd	Raleigh	NC	27612-5310
###	Sally	Migliore	4613 Grenadine Ct	Raleigh	NC	27612-4142
###	Chico	Scott	PO BOX 25982	Raleigh	NC	27611-5982
###	Jim	Smith	4620 Mial Plantation Rd	Raleigh	NC	27610-8510
###	Doris	Jackson	5405 Wheatcross Pl	Raleigh	NC	27610-2152
###	Jessica	Heironimus	1225 Somerset Rd	Raleigh	NC	27610-1136
###	Ken	Bosch	4404 Quail Hollow Dr	Raleigh	NC	27609-6018
###	Jeff	Grimes	2402 Bedford Ave	Raleigh	NC	27607-7306
###	JEFF	MCDERMOTT	1021 Bianco Dr	Raleigh	NC	27607-4861
###	Shoshana	Serxner-Merchant	705 Dixie Trl	Raleigh	NC	27607-4154
###	Doris	Bolt	3340 Harden Rd	Raleigh	NC	27607-3304

###	Catherine	Marie	3612 Morningside Dr	Raleigh	NC	27607-3027
###	Kay	Reibold	4108 Yates Mill Pond Rd	Raleigh	NC	27606-9488
###	Carrie	Strom	1013 Avent Hl APT B9	Raleigh	NC	27606-8041
###	John	Gerwin	1008 Ravenwood Dr	Raleigh	NC	27606-1638
###	Valerie	Moyer	5252 Vann St	Raleigh	NC	27606-1532
###	Helen	Gray	1020 W Peace St Apt U8	Raleigh	NC	27605-1430
###	Jenafur	Maher-Bernard	4323 Mantua Way	Raleigh	NC	27604-3689
###	Chris	Conley	4800 Walden Ct Apt B	Raleigh	NC	27604-2703
###	Mollie	Gaines	2716 Upper Dry Falls Ct	Raleigh	NC	27603-5952
###	Todd	Fields	1628 Pond Spg	Wendell	NC	27591-1709
###	Katherine	Seligmann	1900 Mountain High Rd	Wake Forest	NC	27587-9595
###	Julie	Brooks	1196 Old Still Way	Wake Forest	NC	27587-5904
###	Lisa	Lambert	1136 Mauldin Cir	Wake Forest	NC	27587-4420
###	Emanuel	Martinez	230 Stone Park Dr	Wake Forest	NC	27587-3629
###	Kenneth	Crews	3589 W Thollie Green Rd	Stem	NC	27581-9596
###	Julie	Nye	407 River Trace Dr	Rougemont	NC	27572-6500
###	Glen	Cotten	705 Keystone Park Dr	Morrisville	NC	27560-6100
###	George Ann	Ricks	1001 Barmkin Pl	Knightdale	NC	27545-7907
###	Catherine	Sims	624 Juniper Berry Rd	Knightdale	NC	27545-6212
###	Lynne	C.	6032 Kentworth Dr	Holly Springs	NC	27540-7670
###	Jacob	Panici	2619 Brighton Bluff Dr	Apex	NC	27539-7978
###	Catherine	Byrd	600 E Forest Hill Dr	Goldsboro	NC	27534-1820
###	Rachel	Wendel	920 Open Field Dr	Garner	NC	27529-7043
###	Lesia	Mills	PO Box 1183	Clayton	NC	27528-1183
###	Steven	Downs	163 Wethergate Dr	Clayton	NC	27527-3387
###	mae	basye	501 Quest Ridge Dr	Fuquay Varina	NC	27526-8719
###	Anne	Miller	517 Cardena School Rd	Fuquay Varina	NC	27526-6928
###	Gregory	Thorpe	505 E Vance St	Fuquay Varina	NC	27526-2341
###	Michelle	Trajanovska	3813 Woodridge Ct	Clayton	NC	27520-8148
###	Wendell	Zee	225 Quinter Dr	Cary	NC	27519-7244
###	elisabeth	kos	601 Preston Village Way	Cary	NC	27519-5082
###	Sandi	Spier	2127 Bluff Oak Dr	Cary	NC	27519-0105
###	Tom	Everly	118 Ripplewater Ln	Cary	NC	27518-9765

###	Shelley	Tsuji	157 Springberry Ln	Chapel Hill	NC	27517-8652
###	Maria	Salgado	1 Carolina Mdws Apt 307	Chapel Hill	NC	27517-8508
###	Robert	Campbell	1711 Purefoy Dr	Chapel Hill	NC	27516-9263
###	Patty	Daniel	1904 Jo Mac Rd	Chapel Hill	NC	27516-7816
###	Bryna	Rapp	6819 Morrow Mill Rd	Chapel Hill	NC	27516-7370
###	Suzy	Lawrence	8622 Ryan Rd	Chapel Hill	NC	27516-4899
###	Alexia	Civit	1019 Dawes St	Chapel Hill	NC	27516-3009
###	Lesley	North	222 Ridge Trl	Chapel Hill	NC	27516-1641
###	Frank	Moore	52 Hill Creek Blvd	Chapel Hill	NC	27516-0380
###	A.	Bleyman	1818 Martin Luther King Jr Blvd PMB 146	Chapel Hill	NC	27514-7415
###	Stephanie	Faucette	201 S Elliott Rd	Chapel Hill	NC	27514-5831
###	Kaselehlia	Sielken	136 Kingston Dr	Chapel Hill	NC	27514-1644
###	Burwell	Ware	126 Kingston Dr	Chapel Hill	NC	27514-1630
###	John	Hinnant	750 Weaver Dairy Rd Apt 143	Chapel Hill	NC	27514-1440
###	Lena	Gallitano	750 Weaver Dairy Rd APT 123	Chapel Hill	NC	27514-1439
###	Jessica	Dotson	205 Pocono Ln	Cary	NC	27513-5317
###	Faraha	Brewer	105 N McLean Ct	Cary	NC	27513-2912
###	Colleen	Payne	131 Skipwyth Cir	Cary	NC	27513-2415
###	Susane	Boukamel	200 Fox View Pl	Cary	NC	27511-7223
###	Rick	Savage	101 Bonner Ct	Cary	NC	27511-5768
###	Jason	Cashwell	314 Fairfield Ln	Cary	NC	27511-5408
###	Harriet	Bartnick	1111 Ashford Ln	Cary	NC	27511-4837
###	Mickey Jo	Sorrell	313 Waldo St	Cary	NC	27511-3537
###	Susan L	Stone	112 Rock Spring Ct	Carrboro	NC	27510-4105
###	Stephen	Boletchek	1106 Elbury Dr	Apex	NC	27502-2250
###	Debbie	Kenyon	509 Gablefield Ln	Apex	NC	27502-1361
###	Heidi	Uhlenberg	1009 Macabee Ct	Angier	NC	27501-5018
###	Chelsea	Brooks	6061 Old Oak Ridge Rd	Greensboro	NC	27410-9240
###	Scott	Walker	712 Leawood Dr	Greensboro	NC	27410-4225
###	Anne	Jones	6100 W Friendly Ave Apt 3104	Greensboro	NC	27410-4055
###	Aaron	Beversdorf	1509 Seminole Dr	Greensboro	NC	27408-8623
###	Keith	Ward	1403 Whilden Pl Apt B	Greensboro	NC	27408-2069
###	Carol	Carlson	801 Freemasons Dr	Greensboro	NC	27407-1861

###	Kathron	Griffin	2506 Wright Ave	Greensboro	NC	27403-1468
###	Jessica	Oberlies	903 Courtland St	Greensboro	NC	27401-1711
###	Tracy	OBrien	3381 Rebecca Dr	Summerfield	NC	27358-7215
###	Cathy	Way	4133 Old Way Rd	Sophia	NC	27350-8871
###	Laurinda	Reinhart	8773 Holman Mill Rd	Snow Camp	NC	27349-9308
###	Susan	Abken	136 Rebecca Ln	Siler City	NC	27344-8099
###	Laura	Eklund	3692 Swanns Station Rd	Sanford	NC	27330-7424
###	Tim	Mengel	6118 Branson Davis Rd	Randleman	NC	27317-7110
###	Jami	Haigler	249 Blalock Dr	Prospect Hill	NC	27314-9442
###	James	Bengel	72 Bingham Ridge Dr	Pittsboro	NC	27312-8888
###	Ellen	Cohen	363 Fearrington Post	Pittsboro	NC	27312-8517
###	Susan	Clayton	101 W Smith Rd	Pittsboro	NC	27312-7987
###	Alicia L.	Berry	495 Buck Branch Rd	Pittsboro	NC	27312-5711
###	Thelma Sharon	Garbutt	595 Pokeberry Ln	Pittsboro	NC	27312-5408
###	Kicab	Castaneda-Mendez	878 Fearrington Post	Pittsboro	NC	27312-5037
###	EARLENE	GENTRY	10620 NC Highway 700	Pelham	NC	27311-8150
###	Linda	Anderson	1518 Reynard Dr	Kernersville	NC	27284-9426
###	William	Reavis	1105 Piney Grove Rd	Kernersville	NC	27284-7216
###	Elizabeth	Chappell	7217 Bobby Jean Rd	Julian	NC	27283-9232
###	Jayse	Sessi	1812 Steadfast Rd	Hillsborough	NC	27278-9664
###	Kenneth	Phares	7005 Bowater Xing	Hillsborough	NC	27278-9057
###	Don	Wells	308 Mitchell St	Hillsborough	NC	27278-2130
###	Micah	Moody	6121 Hedgecock Cir Apt 2D	High Point	NC	27265-2639
###	Devon	Seltzer	1719 Oberlin Dr	High Point	NC	27260-4204
###	Alexis	LaMere	3265 Northwest Trce	Elon	NC	27244-9518
###	Louisa	Dang	1236 Jamestowne Dr	Elon	NC	27244-8322
###	Anne	Tooley	4402 Bradford Ridge Rd	Efland	NC	27243-9473
###	Jakop	Nazaretyan	3240 Mill Creek Rd	Efland	NC	27243-9353
###	Diane	Clark	4115 Castleford Dr	Colfax	NC	27235-9704
###	Phil	Langley	1833 Basin Creek Rd	Burlington	NC	27217-7908
###	Claude	Morris	4627 Springbrook Dr	Burlington	NC	27215-7023
###	Teresa	Ibarra	1531 Melody Ln	Burlington	NC	27215-2064
###	Kristiana	Van Eyk	632 Mountain Rd	Asheboro	NC	27205-4222

###	Rea	Richardson	1554 Danny Bell Rd	Asheboro	NC	27205-2026
###	Kim	Brower	440 Tall Pine St	Asheboro	NC	27205-0981
###	Carol	Keeser	1976 Tiger Eye Ct	Winston Salem	NC	27127-8008
###	Christine	Payden-Travers	108 E Devonshire St	Winston Salem	NC	27127-3035
###	Kenneth	Hoglund	5037 Cobblestone Rd	Winston Salem	NC	27106-9618
###	Charles	Wheeler	2720 Spring Garden Rd	Winston Salem	NC	27106-5714
###	Willie	Hinze	1825 Faculty Dr	Winston Salem	NC	27106-5239
###	Anthony	Masciello	4224 Saddlewood Forest Dr	Winston Salem	NC	27106-3576
###	Richard	Marter	3250 Midkiff Rd	Winston Salem	NC	27106-3030
###	Ruby	Coughenour	5725 Antietam Dr	Winston Salem	NC	27106-2704
###	Rebecca	Williams	3880 Whitehaven Rd	Winston Salem	NC	27106-2554
###	Bonnie	Smith	5224 Old Plantation Cir	Winston Salem	NC	27104-5417
###	GERALD	HOOTS	3627 Dewsbury Rd	Winston Salem	NC	27104-1749
###	Jackie	Abourizk	3959 Quilling Rd	Winston Salem	NC	27104-1505
###	Kenneth	Patridge	529 Cherbourg Ave	Winston Salem	NC	27103-6257
###	Tom	Adkisson	1398 Hannaford Rd	Winston Salem	NC	27103-2906
###	Sally	Kayser	1101 Nauvoo Ridge Dr	Tobaccoville	NC	27050-9186
###	Katherine	Williams	2102 Bryant St	Madison	NC	27025-9701
###	Gary	Purgason	711 Massey Creek Rd	Madison	NC	27025-7804
###	Christine	Becker	9730 Concord Church Rd	Lewisville	NC	27023-8106
###	Mary S	Myers	950 Crafton Creek Dr	Lewisville	NC	27023-7632
###	Lauren	Beard	164 Riverview Townhouse Dr	Advance	NC	27006-7651
###	Daniel	Dickhaus	240 Wild Blueberry Way	Murphy	NC	28906
###	Gloria	Shen	40 Rocking Porch Ln	Asheville	NC	28805
###	Cecil	Bothwell	15 Lookout Rd	Asheville	NC	28804
###	Adrienne	Ferriss	27 Pheasant Dr	Asheville	NC	28803
###	Kathryn	Fidati	29 Westover Dr	Asheville	NC	28801
###	James	Schall	31 Elizabeth St	Asheville	NC	28801
###	Tina	Vazquez	1 Battle Sq.	Asheville	NC	28801
###	Anne	Mosser	120 Water Leaf Dr	Weaverville	NC	28787
###	Dennis	Brown	5 E Rolling Meadows Ln	Weaverville	NC	28787
###	Anthony	Scardaci	298 East St	Waynesville	NC	28786
###	Janet	Clark	416 Park Dr	Waynesville	NC	28786

###	Clara	Coates	190 Trout Cove Rd	Waynesville	NC	28785
###	Shelly	Whiteside	218 Markham Rd	Tryon	NC	28782
###	Ann	Green	740 Three Mile Knob Rd	Pisgah Forest	NC	28768
###	paul	mower	217 Pilgram Dr	Leicester	NC	28748
###	Anne & Marshall	McLaughlin	771 Soaring Mountain Rd	Hot Springs	NC	28743
###	jerry Allen	Starr	2851Fulton Rd	Franklin	NC	28734
###	Deborah	Swanson	568 Garren Creek Rd	Fairview	NC	28730
###	Megan	Jones	1 University Drive	Cullowhee	NC	28723
###	George	Rector	947 Bo Cove Rd	Cullowhee	NC	28723
###	Martha	Spencer	988 Henry Mountain Rd	Brevard	NC	28712
###	Joyelle	Wiemer	PO Box 27	Zionville	NC	28698
###	Patricia	English	313 Deer Creek Ln	Wilkesboro	NC	28697
###	Iris	Carman	327 Lakewood Dr	Wilkesboro	NC	28697
###	Dana	Albanese	8199 Lake Norman Pl Apt 310	Sherrills Ford	NC	28673
###	DONNA	THOMPSON	14591 ELKIN HWY 268	Ronda	NC	28670
###	J.	Mitchell	Private	Morganton	NC	28655
###	Helen	Fisher	506 Jefferson Ct	Lenoir	NC	28645
###	Chrissy	Sass	216 First St	Elkin	NC	28621
###	Ginger	White Almeida	115 Long St Apt 7	Boone	NC	28607
###	Bradley	Brown	227 Community Rd	Newport	NC	28570
###	Carissa	Story	100 Leana Ln	Havelock	NC	28532
###	Walter	Wood	304 Hedrick St	Beaufort	NC	28516
###	Randall	Dail	495 River Bluff Dr Unit 3	Shallotte	NC	28470
###	Doug	Vanluvender	1051 Fayetteville Ave	Calabash	NC	28467
###	Ann	Cullen	3616 Gleneagle Dr	Southport	NC	28461
###	Donna	Fullwood	807 Cape Harbor Drive	Southport	NC	28461
###	Arianna	Rosales	76 Capstone Ln	Rocky Point	NC	28457
###	Jack	Balsinger	1312 Taswell Ct	Leland	NC	28451
###	Richard	Haas	1006 Timbergrass Ln	Leland	NC	28451
###	Cathy	Cummins	2994 Pine Bloom Way	Leland	NC	28451
###	Randall	Geehring	1148 Slater Way	Leland	NC	28451
###	sheila	cole	2517 EMPIE DR	Leland	NC	28451
###	Jean	Williams	3619 Minerva Lane	Castle Hayne	NC	28429

###	Jason	Miller-Villegas	1213 Big Field Dr	Castle Hayne	NC	28429
###	Raven	Wright	706 Saint Andrews Drive	Wilmington	NC	28412
###	Claire	Brorold	1857 Dusty Miller Ln, Apt 5307	Wilmington	NC	28412
###	Joan	Bradley	1033 Bradshaw Ter	Wilmington	NC	28412
###	Chris	Skinner	636 McGinnis Ln	Wilmington	NC	28412
###	Clarice	Reber	7919 Blue Heron Dr #305	Wilmington	NC	28411
###	mary ann	ford	8123 Blue Heron Dr E # 1111	Wilmington	NC	28411
###	Kayligrace	Moody	301 Country Haven Drive	Wilmington	NC	28411
###	Esther	Murphy	7235 Darden Rd Apt 127	Wilmington	NC	28411
###	Monica	Rolquin	8205 Winding Creek Cir	Wilmington	NC	28411
###	Tamara	Agnelli	6428 Old Fort Rd	Wilmington	NC	28411
###	Marie	Montemurro	1319 Military Cutoff Road	Wilmington	NC	28405
###	Stephen	Roberts	3625 Caswell St Apt 208	Wilmington	NC	28403
###	Terri	Lefler	305 Martin St	Wilmington	NC	28401
###	Alexis	Olmstead	214 Jamaica Dr	Wilmington	NC	28401
###	Kelly	McConnell	19 Harnett Street	Wilmington	NC	28401
###	Jacquelyn	Hawkins	305 Andrews Road	Red Springs	NC	28377
###	Ryuu	Nishikawa	2900 Freedom Dr	Lumberton	NC	28358
###	Roland	Conway	315 Stephanie St	Linden	NC	28356
###	Paula	McPhail	2122 Clinchfield Drive	Fayetteville	NC	28304
###	Laura	Faber	6346 Pawling Ct	Fayetteville	NC	28304
###	Pablo	Comino	6813 Red Maple Dr	Charlotte	NC	28277
###	Monika	Klein	5206 Misty Oaks Dr	Charlotte	NC	28269
###	Nikita	Williams	1915 Lamm Drive	Charlotte	NC	28262
###	Amelia	Knab	310 Northbend Dr	Charlotte	NC	28262
###	Kaitlyn	Beck	4017 Hay Meadow Dr	Mint Hill	NC	28227
###	Rhetta	Schmidt	3927 Colony Crossing Dr	Charlotte	NC	28226
###	Debora	Hilton	4701 Carberry Ct	Charlotte	NC	28226
###	Linda	Buckel	7732 Hammond Dr	Charlotte	NC	28215
###	Philip	Strickland	9200 UNIVERSITY CITY BLVD	Charlotte	NC	28213
###	Dennis	Meehan	4018 Highview Rd	Charlotte	NC	28210
###	Gerard	Peer	7035 Marching Duck Dr Apt E308	Charlotte	NC	28210
###	Brittany	Rousseau	1913 Meadowlark Ln Unit 50	Charlotte	NC	28210

###	Jeana	Borman	7388 S Little Egypt Rd	Stanley	NC	28164
###	PAUL	PETROV	117 Prestwick Ct	Shelby	NC	28152
###	Charles	DelForge	524 Hamilton Dr	Salisbury	NC	28147
###	Wendy	Shelby	1255 Leonard Rd	Salisbury	NC	28146
###	Irene	Radke	150 Hideaway Ln	Mooresville	NC	28117
###	Mary	Kapitan	708 Chambwood Rd	Monroe	NC	28110
###	Beth	Rubino	468 Secretariat Dr	Iron Station	NC	28080
###	Song	Kinnamon	248 Portrait Way	Indian Trail	NC	28079
###	Mark	Sullivan	4016 Logan Cir	Indian Trail	NC	28079
###	Blake	Glasser	14928 Laura Michelle Rd	Huntersville	NC	28078
###	Tanya	Walter	6312 Muir Ct.	Huntersville	NC	28078
###	Suzanne	Lydon	1134 E Franklin Blvd	Gastonia	NC	28054
###	Gary	Andrew	319 N Downing St	Davidson	NC	28036
###	Chrishelle	Micolucci	20811 ISLAND FOREST DR	CORNELIUS	NC	28031
###	Cynthia	Bernett	10636 Rippling Stream Dr NW	Concord	NC	28027
###	Pamela	Martin	5119 Wood Lake Dr	Belmont	NC	28012
###	Julie	Frey	5285 Courtyard Ln	Belmont	NC	28012
###	Nova	M		Albemarle	NC	28001
###	William	Woody	1713 Heisser Ln	Fuquay-Varina	NC	27952
###	Ken	Goldsmith	504 First Flight Run	Kitty Hawk	NC	27949
###	Alicea	Easthope-Frazer	112 Radcliff Circle	Durham	NC	27713
###	Claudia	Kaplan	4911 Victoria Dr	Durham	NC	27713
###	Susan	McFall	1718 Grady Dr	Durham	NC	27712
###	Beth	Livingston	1105 Trails End Rd	Durham	NC	27712
###	Beth	Harvat	3607 Cole Mill Rd	Durham	NC	27712
###	Ethel	Simonetti	2611 Vesson AV	Durham	NC	27707
###	Evelyn	Lilly	130 Brenrose Cir	Durham	NC	27705
###	Debra	Teplin	2211 Hillsborough Road	Durham	NC	27705
###	Mike	Benson	4921 Hope Dr.	Raleigh	NC	27616
###	Sarah	Jackson	6004 Chelray Ct	Raleigh	NC	27616
###	Cindy	Levey	8012 Clear Brook Dr	Raleigh	NC	27615
###	Penny	Slusaw	8620 Paddle Wheel Dr	Raleigh	NC	27615
###	Larry	Horning	217 Claflin Ct	Raleigh	NC	27614

###	Brianna	Howard	11411 Colbert Creek Loop	Raleigh	NC	27614
###	Elizabeth	Kearse	2113 Oakcrest Ct	Raleigh	NC	27612
###	Nancy	Mollenauer	4711 Shannonhouse Drive, Bldg 9, Apt 208	Raleigh	NC	27612
###	Grace	Fuchs	2337 Bernard St	Raleigh	NC	27608
###	erik	Schreiner	423 Chesterfield Rd	Raleigh	NC	27608
###	Rachel	Kane	Wolf Village	Raleigh	NC	27607
###	Sarah	Jeffers	301 dixie tr	Raleigh	NC	27607
###	WJ	Richardson	3712 Bryn Mawr Ct	Raleigh	NC	27606
###	Emily	Smirlock	307 Wolf Creek Cir	Raleigh	NC	27606
###	Auroni	Hashim	2820 Avent Ferry Rd	Raleigh	NC	27606
###	Kimberly	Diaz	600 Bilyeu St Apt 207	Raleigh	NC	27606
###	Robert	Hearn	1082 Nichols Dr	Raleigh	NC	27605
###	Joey	Casadonte	706 E Franklin St	Raleigh	NC	27604
###	Brittany	Williams	600 W. Cabarrus St, Apt 742	Raleigh	NC	27603
###	Michael	Welke	3849 Rosebush Drive	Zebulon	NC	27597
###	James	Knott	34 Sawyer Ct	Wendell	NC	27591
###	Robert	Moore	1022 South Main Street Apt A	Wake Forest	NC	27587
###	Stephen	Welgos	1081 WOODLAND CHURCH RD	WAKE FOREST	NC	27587
###	Genevieve	Myers	111 Fortress Dr	Morrisville	NC	27560
###	Jackie	Kosnik	1208 Amber Acres Ln	Knightdale	NC	27545
###	Elizabeth	Scherrer	8616 Burnside Dr	Apex	NC	27539
###	Stacey	Amodeo	107 Binford Ct	Garner	NC	27529
###	Lisa	Lewis	112 Carrington Dr	Garner	NC	27529
###	Jon	Pitt	2011 ford gates dr.	GARNER	NC	27529
###	Kari	Fowler	2129 Water Marsh Trl	Fuquay Varina	NC	27526
###	Peggy	Wilson	640 Hogan Farm Rd	Apex	NC	27523
###	Pam	Solomon	320 Shotwell Rd APT 324	Clayton	NC	27520
###	Lilia	Nagy	106 Saint Lenville Dr	Cary	NC	27518
###	Douglas	Evans	105 Summerwalk Ct	Cary	NC	27518
###	Don	Enichen	104 Lochwood East Dr	Cary	NC	27518
###	Ellen	Moul	224 Galway Dr	Chapel Hill	NC	27517
###	Eli	Celli	407 Legends Way	Chapel Hill	NC	27516
###	Leslie	Stewart	414 Dark Forest Dr	Chapel Hill	NC	27516

###	Johnny	Mayall	86A Willow Way	Chapel Hill	NC	27516
###	Michele	Clark	109 Shadowood Dr Apt V	Chapel Hill	NC	27514
###	McLean	Brown	2525 Booker Creek Rd	Chapel Hill	NC	27514
###	Lynda	Prediger	100 Summey Ct	Cary	NC	27513
###	Jennifer	Fortuny	516 Sherwood Ct Apt C	Cary	NC	27511
###	Edward	Stelli	200 Fox View	Cary	NC	27511
###	Karen	Ferguson	402 Greenwood Cir	Cary	NC	27511
###	Steven	Gordon	124 Fidelity St	Carrboro	NC	27510
###	Herminio	Vega	40 terrace ridge drive	AncNgier	NC	27501
###	Bonnie	Parsons	1502 Nathan Hunt riad	Greensboro	NC	27410
###	David	Stubbs	3705 Brown Bark Dr	Greensboro	NC	27410
###	Thomas	Beebe	3900 Cotswold Ave Apt 109D	Greensboro	NC	27410
###	Rocky	Reuter	214 Robbins St	Greensboro	NC	27406
###	Karen	Mallam	810 Buckner Springs Rd	Siler City	NC	27344
###	Keith	Johnson	810 Buckner Springs Road	Siler City	NC	27344
###	Harry	Phillips	PO Box 361	Saxapahaw	NC	27340
###	Anne	Kachergis	575 Stone Wall Rd	Pittsboro	NC	27312
###	Teresa	Ladd	601 Jamestown Rd	Pittsboro	NC	27312
###	Victoria	Childers	8718 Morrow Mill Road	Mebane	NC	27302
###	Martha	Morton	1704 Hargrove Dr	Mc Leansville	NC	27301
###	Wanda	Buckmaster	3895 Randolph Church Rd	Liberty	NC	27298
###	Diane	Wallace	2503 NC Highway 66 S	Kernersville	NC	27284
###	marcia	broskey	4393 crosspointe lane	Kernersville	NC	27284
###	Isabella	Barger	504 Gwen Rd	Hillsborough	NC	27278
###	Diane	Kelly	2315 Wyngate Drive	Hillsborough	NC	27278
###	Judith	West	339 Gregg St	Archdale	NC	27263
###	Sandra	Cooke	937 Baker Dr	Haw River	NC	27258
###	Corinne	Benbow	2736 Cedar Falls Rd	Franklinville	NC	27248
###	Tom	Riggins	3400 Monadnock Ridge Rd	Efland	NC	27243
###	Noelle	Fogg	2929 Amherst Ave	Burlington	NC	27215
###	Patsy	Lyons	1209 Motor Rd	Winston Salem	NC	27105
###	Aidan	Coomer	1160 Strathmore Cir	Winston Salem	NC	27104
###	Kimberly	Nelson	501 Commonwealth Dr	Winston Salem	NC	27104

###	Kelvin	Thorne	2017 Bromley Park Court	Winston Salem	NC	27103
###	John	Calhoun	1416 Brookstown Avenue	Winston Salem	NC	27101
###	Carly	Diaz	200 Tanners Mill Ct	Winston-Salem	NC	27101
###	Larry	Williams	1884 Anderson Rd	Siloam	NC	27047
###	Thomas	Mutton	9671 Lissara Camp Court	Lewisville	NC	27023
###	Grace	Hepler	1879 Harper Rd	Clemmons	NC	27012
###	G	Frazier	6447 Bluestone Pk Dr	Clemmons	NC	27012
###	Vincenzo	Marsella	455 Kingsmill Drive	Advance	NC	27006

From:	Kitchin, Henry L. Jr
To:	DEQ-SVC_DCM.federalconsistencycomments
Cc:	Goebel, Christine A; Dillon Epp; Zeke Williams
Subject:	[External] Wilmington Harbor 403 Draft EIS: Comments of Orton Plantation Holdings on State"s Review of Corps" Consistency Determination
Date:	Monday, November 24, 2025 6:48:07 PM
Attachments:	OPH Wilmington Harbor L DCM re CZMA CAMA consistency 11242025.pdf Orton Comments on State"s Review of Corps Consistency Determination.pdf

CAUTION: External email. Do not click links or open attachments unless verified. Report suspicious emails with the Report Message button located on your Outlook menu bar on the Home tab.

Good evening. On behalf of our client Orton Plantation Holdings LLC, we are submitting the attached documents in connection with the above-referenced matter. Please let us know if you have any trouble with the attachments. We will also be sending hard copies of the attached letters, as well as a USB drive, to your Morehead City office as well. The hard copies and the USB drive will include Exhibits 1 through 6.

Thank you.

Hal Kitchin

Henry L. Kitchin Jr
Partner
McGuireWoods LLP

300 North Third Street
Suite 320
Wilmington, NC 28401-4099
T: +1 910 254 3822
F: +1 910 254 3823

501 Fayetteville St.
Suite 500
Raleigh, NC 27601
hkitchin@mcguirewoods.com
Bio | VCard | LinkedIn | www.mcguirewoods.com

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McGuireWoods

McGuireWoods LLP
300 N. Third Street
Suite 320
Wilmington, NC 28401
Phone: 910.254.3800
Fax: 910.254.3900
www.mcguirewoods.com

Henry L. Kitchin, Jr.
Direct: 910.254.3822
hkitchin@mcguirewoods.com
Fax: 910.254.3823

November 24, 2025

BY ELECTRONIC MAIL (WITHOUT ATTACHMENTS)
AND OVERNIGHT COURIER (WITH ATTACHMENTS AND USB DRIVE)

Federal Consistency Coordinator
400 Commerce Avenue
Morehead City, North Carolina 28557

Re: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Comments of Orton Plantation Holdings, LLC

Dear Sir or Madam:

Enclosed please find comments of our client, Orton Plantation Holdings, LLC, on the consistency submission made to Division of Coastal Management by the U.S. Army Corps of Engineers with respect to the Wilmington Harbor 403 Navigation Project. While the electronic copies of this letter and our client's letter are being transmitted without attachments, the hard copies of this letter and our client's letter are being sent with attachments, both in paper form and also on an accompanying USB drive.

If you have any difficulty opening or viewing any of the transmitted documents, please do not hesitate to let us know.

With kind regards, I remain

Very truly yours,

McGuireWoods LLP

Henry L. Kitchin, Jr.

HLKjr/

Enclosures

Orton Plantation Holdings, LLC

November 24, 2025

Submitted via Fed Ex and Electronically

Cameron Luck, Federal Consistency Coordinator
North Carolina Department of Environmental Quality
Division of Coastal Management
400 Commerce Avenue, Morehead City, NC 28557
Federalconsistencycomments@deq.nc.gov

Re: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project

Dear Mr. Luck,

Orton Plantation Holdings, LLC ("Orton") submits these comments on the federal consistency submission from the U.S. Army Corps of Engineers, Wilmington District (the "Corps") for the proposed Wilmington Harbor 403 Navigation Project (the "Project"). Orton submitted extensive comments on the Draft EIS for the Project. Orton's comments on the Draft EIS accompany this letter.

Orton urges the North Carolina Department of Environmental Quality, Division of Coastal Management (the "Division") to object to the Corps' consistency determination because the Project is not consistent with the North Carolina Coastal Area Management Act ("CAMA").

The Orton Property is an Area of Environmental Concern ("AEC") and is protected by the North Carolina CAMA. The Project threatens the failure of the 250-year old earthen dike at Orton, flooding 350 acres of historic rice fields and hundreds of acres of exceptional freshwater wetlands with saltwater, destroying them. The earthen dike and the freshwater rice fields it supports are irreplaceable historic resources documented by the North Carolina Department of Cultural Resources and listed on the National Register of Historic Places. The freshwater wetlands at Orton are classified as "exceptional" by the Division. The wetlands provide important habitat for a diverse range of coastal birdlife.

The historic and ecological resources at Orton are in AECs and are protected by the CAMA. A project that will destroy resources protected by the North Carolina CAMA is not consistent to the maximum extent practicable with the program as required by 16 U.S.C. § 1456(c)(1)(A).

Please add these comments to the administrative record for the Division's consistency determination.

ORTON'S INTEREST IN THE CONSISTENCY DETERMINATION

Orton has a unique, concrete, and material stake in the Division's decision in response to the Corps' consistency determination. The Orton Property is an AEC. The North Carolina CAMA protects the Property's irreplaceable historic and ecological resources. The Project threatens to damage and even destroy these resources in violation of the CAMA. The Corps' consistency determination does not satisfy federal law or North Carolina's CAMA.

The Orton Property is located on the western shore of the Cape Fear River, just north of the historic Brunswick Town. Orton Point sits at the eastern edge of the Property.

The Orton Property is widely regarded as one of North Carolina's and the River's most historically significant and intact sites. Roger Moore founded the Property in the early 1720s. It anchored the first wave of settlement associated with nearby Brunswick Town. The Property predates North Carolina's statehood by more than half a century.

Today, the Orton Property is approximately 14,000 acres. Over 830 acres of the Orton Property are listed on the National Register of Historic Places ("NRHP"). The NRHP Boundary includes 350 acres of historic freshwater rice fields, a historic earthen dike that has been in place since the 1700s, and the historic designation extends 500 feet into the Cape Fear River to protect underwater archeological resources.

I purchased the Orton Property in 2010. I am a lineal descendant of Roger Moore, the founder of the Orton Property. Through Orton Plantation Holdings, LLC, I have endeavored to protect, preserve, enhance, and restore the Property and its significant cultural, historic, and environmental resources. I take seriously my role as custodian of the Orton Property's rich cultural and natural heritage.

In 2012, at our request, the Division and the Corps authorized Orton to undertake a comprehensive restoration project at the Property.[1] Orton invested more than $29 million to restore 350 acres of the last-remaining, fully intact freshwater rice field systems in North Carolina, and the historic earthen dike, revetments, and water control structures that protect and support the rice fields. Orton restored and repaired about 6,800 feet of earthen dike, protected about 2,000 feet of the shoreline with a rip-rap revetment, and restored and repaired 13 water control structures. We worked closely with the Division, the State Historic Preservation Office, and the North Carolina Department of Cultural Resources throughout the restoration process. In addition to the restoration cost, Orton has incurred more than $5 million to maintain the unique and historic rice fields built by enslaved African Americans over 250 years ago.

As a condition of approval for the restoration project, Orton preserved 187.5 acres of high-quality freshwater wetlands, and additional lands, through the grant of a conservation easement covering a total of 256 acres to the North Carolina Coastal Land

[1] *See generally* Dept. of Army Permit, Permit No. SAW-2011-00624 (Nov. 2012) ("2012 Permit"), attached as Exhibit 4.

Trust, irrevocably transferring some of its property rights in furtherance of the Corps and Division-approved restoration plan. The Orton dike sustains and protects these wetlands. The wetlands are classified as "exceptional" by the Division's North Carolina Coastal Region Evaluation of Wetland Significance. The wetlands provide important foraging habitat and support populations of aquatic bird species important to North Carolina's coastal shoreline ecosystem, for example the Eastern Black Rail and the Wood Stork, both of which are listed as threatened by the U.S. Fish and Wildlife Service under the Endangered Species Act have been spotted in the wetlands.

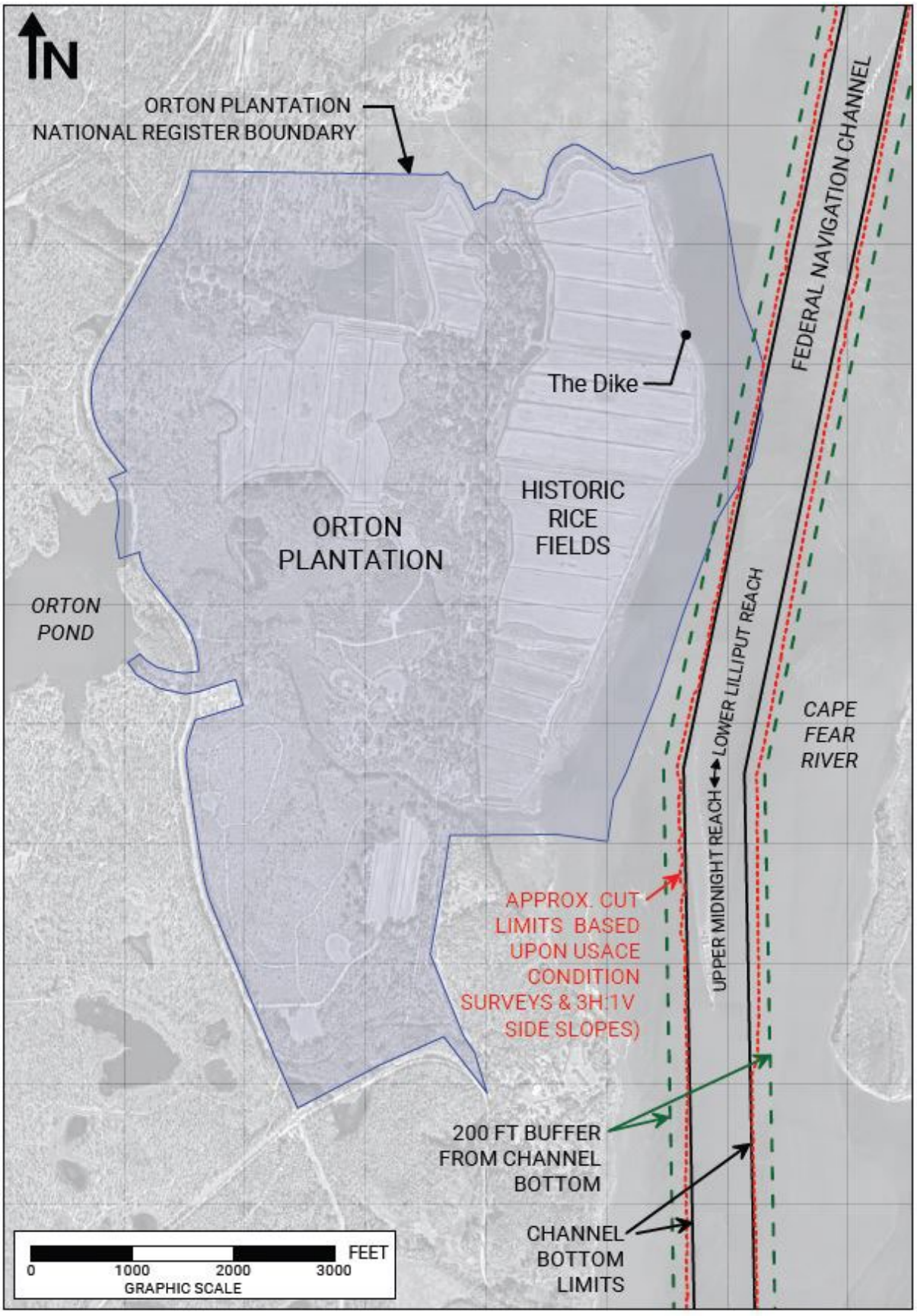
Orton's restoration and protection of the historic rice field system, the dike, and the water control systems recognize and honor the important cultural history of enslaved African Americans working in the antebellum and postbellum period in the South, and whose backbreaking labor created these structures previous to the era of modern machinery. Orton continues to actively support ongoing archaeological field work and research with the University of North Carolina Wilmington into the cultural importance and heritage of enslaved African Americans working in the antebellum and postbellum freshwater wetland rice fields.

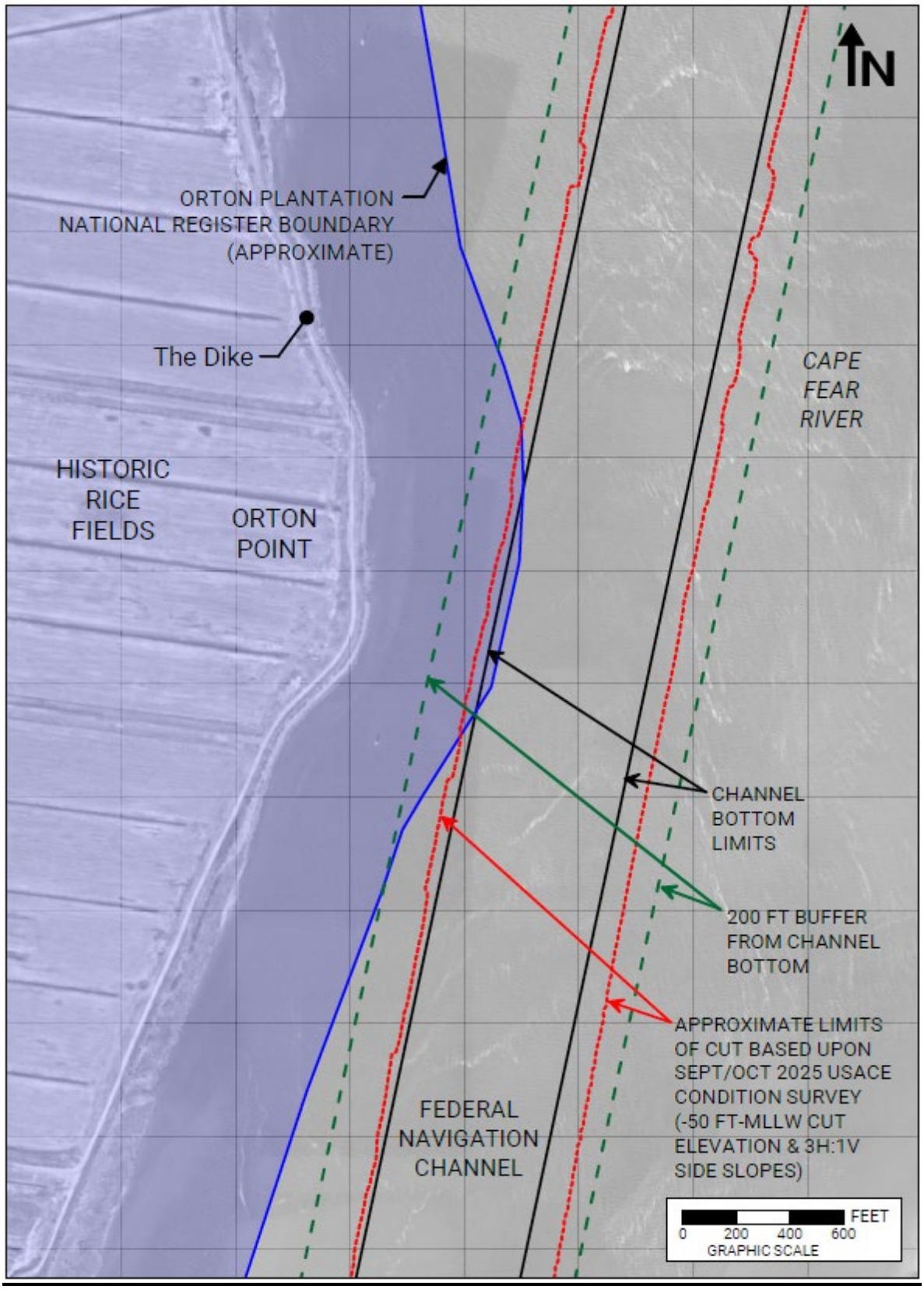
The Orton Property is an AEC protected by North Carolina's CAMA. The earthen dike, rice fields, and freshwater wetlands are incomparable historic and ecological resources that embody the past, present, and – hopefully – future legacy of North Carolina. Yet the Project poses obvious irreversible damage to the Orton Property, a consequence prohibited by the CAMA.

The maps on the following pages show that Project dredging will occur **inside** the NRHP Boundary for the Property and adjacent to the listed historic dike at the Orton Property. The coastal engineers that restored the historic earthen dike at great expense to Orton have expressed, in the enclosed Foth Report, that the Project creates an unacceptable risk of causing the same earthen dike to fail.

The preserved historic rice fields, earthen dike and revetment system, underwater archeological resources, and freshwater water systems and wetlands are the historic and cultural landscape of the Orton Property. But the Corps has failed to acknowledge in the federal consistency determination the obvious irreversible damage and adverse impacts the Project will have on those CAMA-protected resources. Nor has the Corps acknowledged the unacceptable risk that the Project will cause the failure of the dike that Orton restored. Failure of the dike will flood the rice fields and freshwater ponds with saltwater, erasing what stands today as a preserved monument to enslaved African Americans dating back centuries.

The Division's decision on the Corps' consistency determination is critical to Orton. The Coastal Zone Management Act ("CZMA") gives North Carolina, through the Division, a federal statutory decisionmaking role to determine whether the Project is consistent with North Carolina's CAMA. The Project is not consistent with North Carolina's CAMA. Orton urges the Division to object to the Corps' federal consistency determination and prevent the Project from damaging the significant and irreplaceable historic and ecological resources at the Orton Property.


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UPPER MIDNIGHT REACH
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CAPE
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UPON USACE
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SURVEYS & 3H:1V
SIDE SLOPES)
200 FT BUFFER
FROM CHANNEL
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GRAPHIC SCALE


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(APPROXIMATE)
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OF CUT BASED UPON
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SIDE SLOPES)
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GRAPHIC SCALE

SUMMARY OF ORTON'S COMMENTS

The Division should object to the Corps' consistency determination. The Corps has not fulfilled its mandatory, non-discretionary obligation under the CZMA to ensure the Project "shall be carried out in a manner which is consistent to the maximum extent practicable" with North Carolina's CAMA. 16 U.S.C. § 1456(c)(1)(A).

The Corps certified to the Division that the Project is consistent with North Carolina's coastal management program. DEIS, Appendix N at 17. That determination does not bear scrutiny. The Orton Property is an AEC. 15A N.C.A.C. §§ 7H.0209(a)(1), 7H.0206(a). The CAMA protects the listed historic resources at the Orton Property from irreversible damage and it protects the Property's significant ecological resources from adverse impacts. 15A NCAC §§ 7H.0208(d), 7H.0208(a)(2)(C), 7H.0209(d)(7). The Project will damage the CAMA-protected resources at Orton. The Draft EIS does not disclose these obvious impacts. In fact, the Corps admits that it has not yet even determined the Project's effects on historic and cultural resources. DEIS, Appendix N at 14.

The Corps cannot certify that the Project is consistent with the CAMA when it has not actually analyzed whether the Project is consistent with the North Carolina CAMA at the Orton Property. The Corps must demonstrate that the Project will "be carried out in a manner which is consistent to the maximum extent practicable with" North Carolina's CAMA. 16 U.S.C. § 1456(c)(1)(A). The Project must be "fully consistent with the enforceable policies of [the CAMA]." 15 C.F.R. § 930.32(a)(1). The Corps cannot demonstrate full consistency with the CAMA when the Corps failed to identify any avoidance measures to prevent the irreversible damage the Project will cause to the earthen dike, historic rice fields, and listed archeological resources at Orton, and to prevent the Project's obvious adverse impacts to the freshwater wetlands at the Orton Property.

Orton retained Foth Infrastructure & Environment, LLC and Lynker Corporation to review the Corps' Draft EIS and the Project record, and to assess the Project's anticipated effects on the Orton Property. The reports accompany these comments and the content of each report is part of, and incorporated into, these comments.

The findings from the Forth and Lynker Reports demonstrate that the Project will cause irreversible damage to the historic and cultural resources at the Orton Property and adverse impacts to ecological resources at the Orton Property, all of which are protected under the North Carolina CAMA. The findings from the Forth and Lykner Reports include, but are not limited to, the following.

1. Foth Report (Exhibit 1)

- The coastal engineers that prepared the Foth Report restored and repaired the 250-year old earthen dike for Orton. They concluded that the proposed dredging activity adjacent to the Orton Property carries "a high risk of destabilizing the slope" supporting the historic dike system, and creates the

potential for a “deep-seated, global failure” of the river bed slope currently supporting the dike. Foth Report at 14.

- The Project poses an “unacceptable risk” of catastrophic failure of the earthen dike that protects Orton’s historic freshwater rice fields. Foth Report at 3.

- The Draft EIS fails to model slope stability within the Lower Lilliput reach, which includes Orton Point and the Orton Property. Foth Report at 12 Available geotechnical data demonstrates that the soils in the vicinity of Orton’s historic dike system do not support the construction of a 3H:1V slope. Foth Report at 14.

- The proposed 3:1 side slope for the navigation channel will cut into the toe of the slope supporting the historic Orton dike. Foth Report at 12. The removal of toe material from the existing slope carries significant risk to the earthen dike. *Id.*

- The Draft EIS does not analyze the obvious and foreseeable impacts of vibrations during the dredging process on the sensitive soil structure supporting the historic dike system at Orton. Foth Report at 14-15.

- The Blasting Mitigation Plan for the Project fails to address the “structural effect of vibrations on coastal and upland structures,” including the Orton Property’s historic system of dikes and revetments. Foth Report at 15.

- The Draft EIS ignores binding, non-discretionary, agency policy that requires the Corps to conduct site-specific geotechnical analyses to prevent failure of slopes and infrastructure such as the Orton dike. Foth Report at 17.

- The Project will also adversely impact the Orton shoreline through longterm erosion. The modeling results presented in the Draft EIS predict an increase in wave heights, a known contributor to marsh shoreline instabilities and erosion, along the Orton shoreline.” Foth Report at 2.

2. <u>Lynker Report (Exhibit 2)</u>

- The Draft EIS ignores and grossly underestimates the Project’s adverse impacts on the historic rice fields and freshwater wetlands at the Orton Property from increased saltwater intrusion. Lynker Report at 3-5, Appendix II-III. The Draft EIS ignores the scientifically established historical effects of dredging on saltwater intrusion and propagation in the Cape Fear River and uses a groundwater model that is “grossly oversimplified, relying on static model states and regionally averaged conditions that ignore the complex hydrogeology of the project area and the Cape Fear River system more broadly.” Lynker Report at 3-5, Appendix II-III.

- The Draft EIS ignores the scientifically established historical negative effects of dredging on saltwater intrusion in the Cape Fear River. Recent numerous peer-reviewed scientific studies confirm that the historical channel deepening of the Cape Fear River "has led to widespread intrusion of saltwater, loss of forested wetlands, and the rapid expansion of 'ghost forests' of dying bald cypress." Lynker Report at 4. These impacts were not accurately assessed in the Corps' prior environmental reviews, and the Draft EIS continues to discount these known impacts. Lynker Report at 4-5.

- The Draft EIS relies on flawed regional groundwater modeling that underestimates the frequency and magnitude of salinity intrusion events, and the localized impact of those events on the freshwater wetlands and historic rice fields at the Orton Property. Lynker Report at 4-5, Appendix II-III. The Corps' groundwater model is "grossly oversimplified, relying on static model states and regionally averaged conditions that ignore the complex hydrogeology of the project area and the Cape Fear River system more broadly." Lynker Report at 4.

- The Draft EIS's flawed analysis of increased wave and wake energy, and failure to accurately account for the compound effects of wind events, storms, tides, and sea-level rise. Lynker Report at 2, 5. "This approach fails to capture the energetic, real-world interactions that can produce rapid water level surges and drive overtopping at the Orton Plantation dike." Lynker Report at 3.

- The Draft EIS contains "methodological deficiencies, questionable assumptions, and internal inconsistencies that undermine the DEIS's conclusions regarding impacts to coastal processes, bank stability, and estuarine habitats." Lynker Report, Appendix 1 at 1.

- The Draft EIS reaches two contradictory conclusions on the Project's erosive impacts. Lynker Report, Appendix I at 1. On the one hand, the Draft EIS concludes that the Project will have "a net beneficial effect from reduced vessel traffic." *Id.* Other analysis in the Draft EIS, however, demonstrates "increased erosive forces from larger vessels." *Id.* The Draft EIS fails to reconcile these conflicting conclusions.

- The Draft EIS arbitrarily concludes the Project will have a net beneficial impact on shoreline erosion. Lynker Report, Appendix I at 1. The Draft EIS incorrectly relies on the average, annualized change in wave and wake energy to reach this conclusion. *Id.* Erosion, however, "is a threshold-dependent process driven by peak forces from individual vessel transits, not annual averages." *Id*.

- The Draft EIS relies on a single design vessel size to model the wake and erosional energy of future vessel traffic. Lynker Report at 1. That vessel, at

12,400 TEUs, is smaller than the larger vessels using the port today. *Id.* The Corps' reliance on this vessel size is directly contradicted by the stated purpose of the Project to allow the port to accommodate "larger, deeper-draft vessels," as the "number and size of Post-Panamax vessels at the port are expected to increase." Draft EIS at 1-8; Lynker Report, Appendix I at 7-8. "This discrepancy leads to a systemic underestimation of future bank erosion, habitat loss, and required mitigation." Lynker Report, Appendix I at 1.

- The Corps' hydrodynamic modeling wrongly assumes sustained "flat water" conditions, and fails to account for compounding real-world conditions, including wind and tidal influences, that exacerbate wake and wave energy. Lynker Report at 3.

Orton engaged Foth and Lynker and prepared these comments to aid the Division's review of the consistency determination. Orton has a longstanding partnership with the Division and a unique and significant stake in the consistency determination. Orton submits these comments to urge the Division to object to the federal consistency determination and prevent the obvious adverse effects of the Project on the CAMA-protected resources at the Orton Property.

DETAILED COMMENTS OF ORTON ON FEDERAL CONSISTENCY DETERMINATION

1. The Orton Property is a culturally rich and historically significant property that merits protection.

The Orton Property is nationally recognized as a historic place worthy of preservation. The National Parks Service first listed the house and gardens at the Orton Property in the NRHP in 1973. U.S. Dept. of Interior, National Parks Service, NRHP Ref. No. 73001294 (1973).[2] In 2013, the North Carolina Department of Cultural Resources certified the nomination to request that the historic rice fields, earthen dike, and other areas at the Property be included in the NRHP listing. U.S. Dept. of Interior, National Parks Service, NRHP Ref. No. 13000698, 1 (2013).[3] In response, the National Parks Service expanded the listed boundary for the Orton Property to include an additional 826 acres in recognition of the Property's historical significance.

The 2013 NRHP Designation is enclosed with this comment letter. It provides over 100 pages of descriptions, pictures, and maps detailing the rich cultural and historic heritage of the Orton Property and its historic significance to North Carolina, Brunswick County, and the Cape Fear Region.

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[2] *Available at*: https://s3.amazonaws.com/NARAprodstorage/opastorage/live/97/7190/47719097/content/electronic-records/rg-079/NPS_NC/73001294.pdf ("1973 NRHP Designation").

[3] *Available a*t: https://files.nc.gov/historic-preservation/nr/BW0717.pdf ("2013 NRHP Designation").

The NRHP Boundary includes the Orton Property's historic rice fields located along the Cape Fear River. The historic rice fields stand as a preserved monument to centuries of enslaved African Americans. The boundary of the historic designation extends 500 feet into the Cape Fear River to protect identified underwater archaeological resources. 2013 NRHP Designation at 3; *id.* at 107-109 (designation boundary maps). The Cape Fear River Shipping Channel sits only 450 feet from the historical dike and revetment structures that protect the rice fields along the eastern edge of the NRHP Boundary. *Id*. at 11-12.

The NRHP Boundary includes the historically significant rice fields dating back to 1820. *Id.* at 11. The rice fields are "evocative reminders of Orton's statewide significance in the history of rice production in North Carolina." *Id*. at 54.

The rice fields at the Orton Property are iconic. The Orton Property is "visually dominated by its historic rice fields, which exhibit the forms and patterns extant during the period of significance." *Id.* at 4. The historic rice fields provided an economic boom for the plantation in the nineteenth and early twentieth centuries. *Id.* at 3. Orton was the first rice plantation in the Lower Cape Fear Region and one of the largest in North Carolina. Orton and other Lower Cape Fear plantations were key factors in maintaining the development and success of the southern-based rice economy.[4]

The water management system of canals, dikes, roads, dams, ditches, and control structures are in and around the rice fields. The water management system itself "survives from the period of significance, having been continuously maintained by a succession of owners," with replacement of more modern materials over time to protect the integrity of the system. 2013 NRHP Designation at 11. Along the eastern side of the NRHP Boundary are the front rice fields separated from the Cape Fear River by an earthen dike initially constructed over 250 years ago. *Id*. At the time of construction, an expansive and stable marsh separated and protected the dike system from the open water of the river. *Id*.

The marsh flat has since become unstable and largely disappeared due to the "increased wave action coming from ships in the shipping channel." *Id.* at 11-12. The Orton Property's historic earthen dike is now directly exposed to the river's hydraulic forces and the increased wave action coming from the shipping channel. *Id.* at 11-12.

Owners of the Orton Property have endeavored to maintain the dike and structures that protect the rice fields from the Cape Fear River. *Id.* at 5, 12. The restoration project that Orton initiated, funded, permitted, and implemented in 2012 is the most significant of these efforts. Orton restored and repaired 6,800 feet of earthen dike, about 2,000 feet of rip rap revetment, 13 water control structures, and 12 field access points, and restored over 350 acres of historic rice fields. *See* Exhibit 4 (2012 Corps Permit authorizing restoration project).

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[4] Island Life NC Magazine, Orton Plantation: A Legacy of the South. *Available at*: https://islandlifenc.com/orton-plantation-a-legacy-of-the-south/.

Orton invested $29 million in the restoration effort and continues to incur on average $1 million per year to maintain the structures. And as a condition of its approval, to offset the loss of wetlands as part of the rice field restoration, Orton executed a permanent conservation easement on the Property to preserve an additional 187.5 acres of high-quality riverine swamp forest wetlands. 2012 Permit at 9.

Orton's restoration efforts, conducted in coordination with the Division and the Corps, demonstrate Orton's steadfast commitment to restore and protect the rich historic and cultural heritage of the Orton Property. The Project threatens to cause irreversible damage to the significant cultural, historic, and natural resources at the Orton Property. The Division should exercise its authority under the CZMA, object to the Corps' consistency determination, and request that the Corps implement all feasible and practicable measures to prevent irreversible damage to the CAMA-protected resources at the Orton Property.

Summary of Historic Resources at Orton

- The North Carolina Department of Cultural resources nominated and the National Park Service listed 830 acres of the Orton Property on the National Register of Historic Places.
- The 350 acres of rice fields, earthen dike, and water control structures are listed, protected historic and cultural resources.
- The NRHP Boundary extends 500 feet into the Cape Fear River to protect identified underwater archaeological resources.
- Orton, in coordination with the Division and the Corps, restored and repaired the historic protected earthen dike, rice fields and water control structures at the Property.
- The Project threatens irreversible damage to the earthen dike, rice fields, water control structures and preserved cultural legacy at the Orton Property.

2. The Project will cause irreversible damage and have foreseeable adverse impacts to the Orton Property.

The Foth and Lynker Reports demonstrate that the Project will irreversibly damage the listed historic resources at Orton and adversely impact the ecological integrity of the Orton Property. *See* Exhibits 1 and 2.

a. The Project threatens a high risk of catastrophic dike failure.

The proposed design slope for the Project is 3H:1V. Foth Report at 2. Available geotechnical data demonstrates that the river bed soils in the vicinity of Orton's historic dike system do not support the construction of a 3H:1V slope. Foth Report at 2, 14.

The proposed dredging activity carries "a high risk of destabilizing the slope" supporting the historic dike system, and creates the potential for a "deep-seated, global failure" of the slope currently supporting the dike. Foth Report at 14.

The proposed dredging, within 450 feet of the historic dike, threatens to "damage lateral support, increasing the risk of slope instability or localized failure, especially in zones with high silt and organic content." Foth Report at 15-16.

The planned dredging design plan presents a high risk of direct, acute failure of the dike and a long-term risk of instability, and ultimately failure, as the foundation and dike soils are eroded and "the effects of water intrusion, surface sluffing, and flow forces become cumulatively more detrimental and accelerate the rate of structural destabilization." Foth Report at 11-15.

Failure of the dike will flood the Orton Property with saltwater and destroy the historic rice fields and the ecologically significant wetlands and species that depend on them.

b. The Corps proposes dredging within the Orton Property NRHP Boundary.

The NRHP Boundary for the Orton Property extends 500 feet into the Cape Fear River to protect historically significant underwater archaeological resources. 2013 NRHP Designation at 3, 16, 115. Underwater and shoreline investigations conducted in and along the Cape Fear River identified 32 objects of historical significance in this area. *Id.* at 16. The contributing objects include breakwater pilings, dock pilings, ballast piles, and features associated with Orton Point Light—a former lighthouse representing the maritime heritage of the Lower Cape Fear River and the Orton Property. *Id*. at 16, 66.

The Cape Fear River Shipping Channel sits less than 500 feet from Orton Point. *Id.* at 12. The dredging footprint for the Project includes the Channel and a 200-foot lateral buffer to either side of the Channel. DEIS, Appendix E at 27. The dredging footprint overlays and includes the Orton Property NRHP Boundary and the listed underwater archaeological resources protected by that boundary. *See* above, pages 4-5 (Figures showing shipping channel and 200-foot lateral dredging boundary overlaying NRHP Boundary).

c. Increased wake activity from larger vessels will adversely affect the Orton Property's historic dike and water control structures.

The Draft EIS expressly states that the purpose of the Project is to allow the port to accommodate "larger, deeper-draft vessels," as the "number and size of Post-Panamax vessels at the port are expected to increase." Draft EIS at 1-8. The economics supporting the Project are "predicated on accommodating a 'forecasted vessel fleet' of larger, more efficient vessels." Lynker Report, Appendix I at 2 (citing Draft EIS, ES-2, 1-8).

These larger vessels will necessarily increase wake and wave energy that will increase erosion of the Orton Property's historic dike and revetment system threatening the sustainability of the Property's historic rice fields. Lynker Report, Appendix I at 7-10. Scientifically-sound wave and wake modeling that accounts for real-world conditions from wind, tides, storms, and sea-level rise demonstrate that the increased wakes from larger vessels will be amplified even further. Lynker Report at 2–3, Appendix I at 7-10. The result is a significant adverse increase in the erosion rate at Orton. Lynker Report, Appendix I at 11-12.

d. The Project will increase saltwater intrusion in the historic rice fields and exceptional freshwater wetlands at the Orton Property.

The channel deepening will continue the troubling historical trend of saltwater intrusion into the historic rice fields and ecologically significant wetlands that Orton protected at the Orton Property. Lynker Report, Appendix III-IV. The Orton Property is a "particularly vulnerable area for saltwater intrusion." Lynker Report, Appendix II at 1. The Orton wetlands are classified as "Exceptional" under the Division's North Carolina Coastal Region Evaluation of Wetland Significance ("CREW"). Lynker Report, Appendix III at 9.

The Division established CREW because North Carolina's coastal "wetlands are of great ecological importance, in part because they occupy so much of the landscape and are significant components of virtually all coastal ecosystems, and also because of their relationships to coastal water quality, estuarine productivity, wildlife habitat, and the overall character of the coastal area." *See* Division Guidance on North Carolina Coastal Region Evaluation of Wetland Significance.[5] The "management and protection" of these wetland ecosystments "is a major component of the North Carolina Coastal Management Plan." *Id.*

The "exceptional" rating of the Orton Property wetland confirms that the wetlands adjacent to Orton's rice fields "are among the most highly valued and functionally important freshwater wetlands in coastal North Carolina," emphasizing "the significance of any potential impact or conversion." Lynker Report, Appendix III at 6. The freshwater wetlands at Orton provide important foraging habitat for a broad spectrum of coastal aquatic birdlife. The American Bittern, threatened Eastern Black Rail, Green Heron, Tricolored Heron, White Ibis, threatened Wood Stork and many others forage in and rely on the wetlands at Orton. Exhibit 5 to this letter lists coastal birds that depend on the Orton wetlands for habitat. Any "[l]oss or degradation of these wetlands would be a disproportionate harm to regional ecological health and the resilience of Orton's historic rice-field landscape." Lynker Report, Appendix III at 10.

[5] *Available at* https://www.deq.nc.gov/documents/pdf/wetlands/nccrewsguidanceweb/download#:~:text=NC%2DCREWS%2C%20or%20the%20North,hydrologic%20functions%20of%20individual%20wetlands.

Sodium content in the soils of the rice fields "is elevated and worsening, likely due to their proximity to the coast of Cape Fear River" and its increasing salinity level near Orton Point. Lynker Report, Appendix IV at 1. Peer-reviewed scientific studies confirm that the historical channel deepening of the Cape Fear River "has led to widespread intrusion of saltwater, loss of forested wetlands, and the rapid expansion of 'ghost forests' of dying bald cypress." Lynker Report at 4. Available groundwater data suggests that salinity levels are increasing in the aquifer that feeds the Orton Pond, "and any project-induced changes to this hydrological relationship could accelerate saltwater intrusion to levels that render the pond unusable as an irrigation source for the historic rice fields." Lynker Report, Appendix I at 4.

The foreseeable increased wave and wake energy will increase the frequency of saltwater overtopping the dike events that already occur at the Orton Property. Lynker Report at 2, 5, Appendix IV at 2. This increased saltwater intrusion threatens the ecologically significant wetlands and historic freshwater rice fields at Orton. Lynker Report, Appendix III at 9-10.

Summary of Foreseeable Adverse Effects at Orton

- The Project's dredging design threatens the near-term and long-term stability of the slope supporting Orton's historic dike and revetment system.
- The Project has a high risk of causing the deep-seated global failure of the restored 250-year old Orton earthen dike.
- Failure of the earthen dike will flood the historic rice fields and exceptional freshwater wetlands with saltwater, destroying them.
- Impairment or destruction of the preserved freshwater wetlands at Orton will impact significant numbers of aquatic birds.
- Increased vessel size will increase erosion from the wake energy caused by ship traffic in the channel.
- Increased wave size caused by increased vessel size when combined with wind, tides, storms, and sea-level rise will exacerbate this erosive effect.
- The channel deepening will worsen impacts from saltwater intrusion to Orton's historic rice fields and exceptional freshwater wetlands.

3. The Project is not consistent with the North Carolina CAMA.

The Corps must ensure that the Project is consistent to the maximum extent practicable with the North Carolina CAMA and its implementing regulations. 16 U.S.C. § 1456(c)(1)(A). The Corps' CZMA consistency obligation is both procedural and substantive.

The CZMA procedural requirement mandates that the Corps evaluate the Project's "reasonably foreseeable direct and indirect effects on any coastal use or

resource." 15 C.F.R. § 930.33(a)(1). Agency action that "has minimal or no environmental effects may still have effects on a coastal use," including "protection of historic property," if the "activity initiates an event or series of events where coastal effects are reasonably foreseeable." *Id.*

The CZMA substantive requirement mandates that the Corps "shall" carry out the Project "in a manner which is consistent to the maximum extent practicable with the enforceable policies" of the North Carolina CAMA. 16 U.S.C. § 1456(c)(1)(A); 15 C.F.R. § 930.30 (same). Federal law requires the Corps to demonstrate that the Project is "fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency." 15 C.F.R. § 930.32(a)(1) (emphasis added). The Corps must "consider the enforceable policies of [the CAMA] as requirements to be adhered to in addition to existing Federal agency statutory mandates." 15 C.F.R. § 930.32(a)(2).

a. The CAMA prohibits development that causes irreversible damage to historic resources located in AECs and adverse impacts to ecological resources located in AECs.

North Carolina's CAMA prohibits development within coastal shoreline and estuarine water AECs that will cause "irreversible damage to documented archaeological or historic resources" or adverse impacts to wetland ecosystems within the AEC. 15A N.C.A.C. §§ 7H.208(a)(2)(C), 7H.209(d)(7), 7H.208(a)(2)(A), 7H.209(d)(4). The cited regulations are part of North Carolina's federally-approved coastal zone management program, and are "enforceable policies" within the meaning of 16 U.S.C. § 1456(c)(1)(A).[6]

The CAMA regulations expressly prohibit development within both coastal shoreline and estuarine water AECs that will cause "irreversible damage to valuable, historic architectural or archaeological resources" located within the AEC. 15A N.C.A.C. §§ 7H.0209(d)(7). The prohibition is not ambiguous or flexible. The regulations state: "Development shall not cause irreversible damage to valuable, historic architectural or archaeological resources as documented by the local historic commission or the North Carolina Department of Natural and Cultural Resources." (emphasis added). 15A N.C.A.C. §§ 7H.0209(d)(7) (emphasis added), 7H.0208(a)(2)(C) (same).

The CAMA further prohibits development activities within coastal shoreline AECs that will be "detrimental to the . . . biological and physical functions of the estuarine and ocean system." 15A N.C.A.C. § 7H.0209(d). The CAMA requires project proponents to make "[e]very effort . . . to avoid or minimize adverse impacts of development to

[6] NOAA, Office for Coastal Management, Program Change Request, File No. NC-2001-2 (Sept. 6, 2001), a*vailable at*: https://coast.noaa.gov/czmprogramchange/#/public/change-view/638 (NOAA approval of 15-A N.C.A.C. § 7H.0209); NOAA, Office for Coastal Management, Program Change Request, File No. NC-2021-1 (Jan. 20, 2022), a*vailable at*: https://coast.noaa.gov/czmprogramchange/#/public/change-view/1226 (NOAA approval of 15-A N.C.A.C. § 7H.0208).

estuarine and coastal systems through the planning and design of the development project." *Id.* The CAMA regulations provide that development within a coastal shoreline AEC "shall not have a significant adverse impact on estuarine and ocean resources," including "development that would directly or indirectly . . . increase shoreline erosion." 15A N.C.A.C. § 7H.0209(d)(6).

b. The Orton Property is an AEC protected by the North Carolina CAMA.

The Orton Property is subject to, and protected by, the North Carolina CAMA. The Orton Property lands are classified under the CAMA as coastal shoreline and estuarine water AECs. 15A N.C.A.C. §§ 7H.0209(a)(1), 7H.0206(a). The 2012 CAMA permit issued in connection with the 2012 Corps permit for Orton's restoration of the earthen dike confirms that the CAMA applies to, and protects, the Orton Property. *See* Exhibit 4 at 21 (includes CAMA Permit No. 83-12 issued to Orton for development inside AEC). That permit expressly acknowledges that the Orton Property is an "Area of Environmental Concern" and is protected by North Carolina's CAMA. Exhibit 4 at 21.

The AEC lands at the Orton Property contain historic resources documented by the North Carolina Department of Cultural Resources. *See* 2013 NRHP Designation at 1 (N.C. Department of Cultural Resources nomination to include the Orton Property in the NRHP as an area worthy of historic preservation). The historic resources include the earthen dike, revetment, rice fields, and water control structures. The CAMA protects these historic resources. N.C.G.S.A. § 113A-102(b)(4)(e). The 2012 CAMA permit, for example, specifically required that Orton avoid the submerged archeological resources within the Orton Property boundary and protect the historic integrity of the rice fields and water management system. *See* Exhibit 4 (CAMA Permit No. 83-12, Conditions 16 and 17).

The AEC lands at the Orton Property also contain "exceptional" wetlands. Lynker Report at 5. The Orton wetlands "are among the most highly valued and functionally important freshwater wetlands in coastal North Carolina." Lynker Report, Appendix III at 6. The "loss or degradation" of these wetlands "would be a disproportionate harm to regional ecological health." Lynker Report, Appendix III at 10.

Under the CZMA and the CAMA, the Corps must demonstrate that the direct and indirect effects of the Project will not cause irreversible damage to the documented historic resources, including the historic rice fields, earthen dike, and underwater archaeological resources, or adverse impacts to the exceptional wetlands within the Orton Property AEC lands. 16 U.S.C. § 1456(c)(1)(A); 15A N.C.A.C. §§ 7H.208(a)(2)(C), 7H.209(d)(7), 7H.208(a)(2)(A), 7H.209(d)(4).

c. The Corps has not analyzed whether the Project is consistent with North Carolina's CAMA.

The Corps has not analyzed whether the Project is consistent with the CAMA's requirements to prevent "irreversible damage to valuable historic and archaeological

resources" at the Orton Property or avoid adverse impacts to the exceptional freshwater wetlands at Orton.

Despite the Project's obvious direct and indirect effects on the Orton Property, the Corps admits that it has not conducted the required CZMA analysis. Simply put, the Corps has made no attempt to analyze the effects of the Project on the historic or wetland resources at Orton that the North Carolina CAMA protects. There is no analysis in the Draft EIS about the effects of the Project on the Orton Property or the CAMA-protected resources at Orton. None. The Corps admits it has not done the work. It explained in its September 17, 2025 Letter to the Division that it chose to defer that analysis to an unidentified future point. The Corps admitted that it failed to "sufficiently identify and evaluate cultural resources, fully determine adverse effects of the action alternative on historic properties, or establish methods to avoid, minimize, or mitigate those adverse effects, prior to completion of the DEIS" due to "[t]ime and budgetary constraints." DEIS, Appendix N at 14.

This analysis cannot be deferred. The Corps' consistency determination must be supported by "comprehensive data and information." 15 C.F.R. § 930.39(a). The Corps cannot demonstrate consistency if "the information it relie[s] on to make th[e] determination [is] insufficient." *Ocean Mammal Inst. v. Gates*, 546 F. Supp. 2d 960, 982 (D. Haw. 2008); *see also SLPR, LLC v. San Diego Unified Port Dist*., No. 06 CV 1327 MMA (POR), 2009 WL 10672895, at *9 (S.D. Cal. Aug. 4, 2009) (finding the Corps' consistency determination incomplete because the submission failed to mention the adverse impact of ship wakes on coastal erosion).

Perceived time and budgetary constraints do not excuse the Corps from its CZMA consistency duty. The CZMA regulations specify that "[f]ederal agencies shall not use a general claim of a lack of funding or insufficient appropriated funds or failure to include the cost of being fully consistent in Federal budget and planning processes as a basis for being consistent to the maximum extent practicable with an enforceable policy of a management program." 15 C.F.R. § 930.32(a)(3). "A Federal agency cannot avoid any State requirement that it finds burdensome simply by not funding the required action." 65 Fed. Reg. 77,124, 77,134 (Dec. 8, 2000) (preamble to the final rule adopting CZMA regulations); *see also City of Sausalito v. O'Neill*, 386 F.3d 1186, 1222–1223 (9th Cir. 2004) (National Parks Service consistency determination was "based on improper ground" because the agency relied on lack of funds—which is "explicitly forbidden as a criterion for finding consistency").

The Corps' failure to undertake the necessary analysis is the simplest reason the Division should object to the consistency determination. 15 C.F.R. § 930.43(b) (providing for state agency objection "upon a finding that the Federal agency has failed to supply sufficient information . . . to determine the consistency of the Federal agency activity with the enforceable policies of the management program"). The Corps cannot logically satisfy its duty under the CZMA to demonstrate full consistency with the CAMA based on work it admits it has not performed. The Division, Orton, and the public are unable to determine whether the Project is fully consistent with the historical preservation requirements of the CAMA at sites like Orton, within designated AECs.

unless the Corps first provides an analysis of the Project's direct and indirect effects on those same resources. The Corps' failure to provide this analysis – while claiming it has satisfied it in its September 17, 2025 Letter to the Division – cannot satisfy the CZMA consistency obligation.

This letter and accompanying Foth and Lynker Technical Reports demonstrate that the direct and indirect effects of the Project will cause irreversible damage to the Orton Property's historically significant rice fields, earthen dike, and underwater archaeological resources and significant adverse impacts to the Property's exceptional freshwater wetlands. *See* Exhibits 1 and 2. Those Orton Property resources are located within coastal shoreline and estuarine water AECs and are protected by the CAMA.

To provide a rational predicate to demonstrate consistency with the CAMA, and satisfy its obligation under the CZMA, the Corps first must identify the direct and indirect effects of the Project on the Orton Property. The Draft EIS has not done so. The Corps has not identified the obvious impacts that the Project will have on the historic resources and exceptional wetlands at the Orton Property. This falls short of the Corps' binding duty under the CZMA to evaluate the Project's "reasonably foreseeable direct and indirect effects on any coastal use or resource" as part of the analysis to determine whether the Project will be carried out in a manner which is "consistent to the maximum extent practicable" with the CAMA. 15 C.F.R. § 930.33(a)(1); 16 U.S.C. § 1456(c)(1)(A).

d. The Corps has not satisfied its non-discretionary duty to carry out the Project in a manner that is fully consistent with the CAMA's requirement to prevent irreversible damage to historic resources at Orton and adverse impacts to the ecological resources at Orton.

The CZMA requires more than procedural analysis of direct and indirect effects of the Project at Orton. The Project must be "fully consistent with the enforceable policies of [the CAMA]." 15 C.F.R. § 930.32(a)(1). The binding federal regulations confirm that the CZMA "was intended to cause substantive changes in Federal agency decision making within the context of the discretionary powers residing in such agencies." 15 C.F.R. § 930.32(a)(2).

The CAMA, in turn, requires the Corps to identify specific avoidance and protection measures to ensure the Project will not cause "irreversible damage" to the protected historic resources within the Orton Property or adverse impacts to protected ecological resources within the Orton Property. 15A N.C.A.C. §§ 7H.208(a)(2)(C), 7H.209(d)(7), 7H.208(a)(2)(A), 7H.209(d)(4). The Corps has made no attempt to do so in the Draft EIS or its September 17, 20225 consistency determination.

Development in coastline shoreline and estuarine waters AECs must be consistent with the directives and objectives of CAMA. 15A N.C.A.C. §§ 7H.0209(d); 7H.0206(d). The CAMA prohibits development within coastal shoreline and estuarine water AECs that will cause irreversible damage to documented archaeological or

historic resources or adverse impacts to wetland ecosystems within the AEC. 15A N.C.A.C. §§ 7H.0209(b), (d)(4), (7); 7H.0208(a)(2)(A), (C). The Project will adversely impact and even destroy the irreplaceable historic and ecological resources at Orton in violation of the CAMA.

i. The Project will damage the CAMA-protected historic resources at Orton.

The Corps proposes dredging within the Orton Property NRHP Boundary. The NRHP Boundary for the Orton Property extends 500 feet into the Cape Fear River to protect historically significant underwater archaeological resources. 2013 NRHP Designation at 3, 16, 115. The Cape Fear River Shipping Channel sits less than 500 feet from Orton Point. *Id.* at 12. The dredging footprint for the Project overlays and includes the Orton Property NRHP Boundary and the listed underwater archaeological resources protected by that boundary. *See* Pages 3-4 (Figures showing shipping channel and 200-foot lateral dredging boundary overlaying NRHP Boundary). Project dredging will cause irreversible damage to the documented underwater archaeological resources and within the AEC at Orton in violation of the CAMA. *See* 15A N.C.A.C. §§ 7H.0209(d)(7), 7H.0208(a)(2)(C).

The coastal engineers that restored the 250-year old earthen dike believe the Project will cause the dike to fail. Foth Report at 2-3, 14. The soils in the vicinity of Orton's historic dike system do not support the construction of the proposed 3H:1V slope. Foth Report at 2, 14. The Project proposed dredging activity carries "a high risk of destabilizing the slope" supporting the historic dike system, and creates the potential for a "deep-seated, global failure" of the slope currently supporting the dike. Foth Report at 14. The Project threatens irreversible damage to and the failure of the historic earthen dike, flooding the 350 acres of listed, historic freshwater rice fields, all of which are protected under the CAMA. 15A N.C.A.C. §§ 7H.0209(d)(7), 7H.0208(a)(2)(C).

Indirect effects include both cumulative and secondary effects "resulting from the incremental impact of the federal action when added to other past, present, and reasonably foreseeable actions, regardless of what person(s) undertake(s) such actions." 15 C.F.R. § 930.11(g). The Project will cause multiple obvious adverse indirect effects to the documented historic and cultural resources at the Orton Property. These include impacts from (i) increased wake activity and (ii) increased salinity in the freshwater rice fields, and (iii) channel deepening on the stability of the Orton Property shoreline and the historic earthen dike and water control system it supports. All of these effects are sufficiently likely to occur, have a close causal relationship to the Project, and will result in obvious irreversible damage to historic resources at Orton in violation of the CAMA.

ii. The Project will damage protected freshwater wetlands at Orton.

The Project will undoubtedly cause "foreseeable direct and indirect effects" on the hundreds of acres of freshwater wetlands at Orton classified as "Exceptional" under

the North Carolina Coastal Region Evaluation of Wetland Significance. 15 C.F.R. § 930.33(a)(1) ("Effects are determined by looking at reasonably foreseeable direct and indirect effects on any coastal use or resource."). These impacts are obvious and foreseeable.

The channel deepening will accelerate saltwater intrusion into the coastal shoreline, including the historic rice fields and ecologically significant wetlands at the Orton Property. Lynker Report, Appendix III-IV. Peer-reviewed scientific studies confirm that the historical channel deepening of the Cape Fear River "has led to widespread intrusion of saltwater, loss of forested wetlands, and the rapid expansion of 'ghost forests' of dying bald cypress." Lynker Report at 4. The increased wave and wake energy from the Project will also increase the frequency of the overtopping events that already occur at the Orton Property. Lynker Report at 2, 5, Appendix IV at 2. This increased saltwater intrusion threatens the ecologically significant wetlands and historic freshwater rice fields at Orton. Lynker Report, Appendix III at 9-10. The Project threatens near- and long-term risk of catastrophic failure of the dike, flooding the Orton wetlands with saltwater. Foth Report at 2-3, 14. The CAMA protects the freshwater wetlands at Orton from these detrimental and adverse impacts. 15A N.C.A.C. § 7H.0209(d).

The Division should object to the Corps' consistency determination because the Corps has not satisfied its substantive obligation to ensure that the Project is carried out in a manner consistent with the CAMA "to the maximum extent possible." 16 U.S.C. § 1456(c)(1)(A), 15 C.F.R. § 930.43(a) (state agency objection grounds). The Project will undoubtedly cause irreversible damage to the listed historic rice fields, earthen dike, and underwater archaeological resources at the Orton Property, and adverse impacts to the Property's exceptional wetland ecosystem at Orton, all of which are protected under the CAMA. 15A N.C.A.C. §§ 7H.208(a)(2)(C), 7H.209(d)(7), 7H.208(a)(2)(A), 7H.209(d)(4).

Summary of the Corps' Failure to Satisfy the Coastal Zone Management Act

- The CZMA requires the Corps to carry out the Project in a manner which is consistent to the "maximum extent practicable" with the North Carolina CAMA.
- The Corps cannot state that the Project is consistent with the CZMA when it admits it has not analyzed the obvious direct and indirect impacts to the protected natural and historic resources at the Orton Property.
- The CAMA prohibits development within AECs that will cause irreversible damage to historic resources.
- The earthen dike, revetment, rice fields, and water control systems at the Orton Property are within an AEC and are protected by the CAMA.
- The Project is not consistent with the CAMA because it will cause irreversible damage to the earthen dike, revetment, rice fields, and water control structures.
- The CAMA also prohibits development that will damage the exceptional wetland ecosystem at the Orton Property.
- The Project is not consistent with the CAMA because it will damage the protected exceptional freshwater wetlands at Orton.

4. North Carolina should object to the federal consistency determination and protect Orton's important historic, cultural, and ecological resources.

The CZMA imposes a mandatory, non-discretionary obligation on the Corps to ensure that the Project is "consistent to the maximum extent practicable" with the North Carolina CAMA. 16 U.S.C. § 1456(c)(1)(A). The Corps must carry out the project in a manner that is "fully consistent" with the CAMA. 15 C.F.R. § 930.32(a)(1). The Corps has not fulfilled this obligation.

The North Carolina CAMA prohibits development within coastal shoreline and estuarine water AECs that will cause irreversible damage to documented archaeological or historic resources within the AEC or adverse impact to protected ecological resources within the AEC. 15A N.C.A.C. §§ 7H.208(a)(2)(C), 7H.209(d)(7), 7H.208(a)(2)(A), 7H.209(d)(4).

The Project poses obvious risks to the Orton Property that will cause irreversible damage to the historic resources at Orton. The structural integrity of the dike is Orton's number one concern. The Project poses a real and unacceptable risk of catastrophic failure of the dike system. Failure of the dike will result in a cascading series of events including saltwater intrusion into the historic rice fields, rendering them incapable of growing rice and destroying the freshwater ecological water system at the Orton Property. Failure of the dike would flood the rice fields and freshwater ponds with saltwater, erasing what stands today as a preserved monument to enslaved African Americans dating back centuries. The Corps cannot demonstrate that the Project is fully consistent with the CAMA when it will obviously violate the CAMA's explicit prohibition on development in AECs that will cause irreversible damage to documented archaeological and historic resources.

The Project will also adversely impact the freshwater wetlands at Orton. Failure of the dike will destroy the wetlands. The channel deepening will increase saltwater intrusion that will ultimately destroy the wetlands. A diverse list of aquatic birdlife relies on this ecosystem for habitat. Any saltwater intrusion into the wetlands threatens this important habitat. The CAMA protects Orton's exceptional freshwater wetlands. The Corps cannot demonstrate full consistency with the CAMA without analyzing and preventing these adverse impacts.

It is imperative that the Division protect the significant historic, cultural, and ecological resources at the Orton Property. The Division, the State Historic Preservation Office, and North Carolina Department of Cultural Resources have recognized the importance of these resources and partnered with Orton to protect and preserve them. The CAMA protects these resources.

This is a public project that will use nearly $900 million in public funds for public benefit. The adverse impacts of the Project should not be borne by Orton, a private property owner that is preserving the legacy of our past and protecting a site nationally

recognized as an historic place worthy of preservation listed in the National Register of Historic Places.

Please object to the Corps' consistency determination. We look forward to coordinating with the Division to prevent the obvious adverse effects of the Project to the Orton Property.

Sincerely,



Louis Moore Bacon
Chairman
Orton Plantation Holdings, LLC

cc: Dillon Epp, Orton Property Manager
Henry L. Kitchin Jr, Esq., McGuireWoods LLP
Ezekiel J. Williams, Esq., Williams Weese Pepple & Ferguson

Exhibits:

Exhibit 1:	Foth Technical Report
Exhibit 2:	Lynker Technical Report
Exhibit 3:	2013 National Park Service National Register of Historic Places Designation at Orton
Exhibit 4:	2012 Corps Permit & 2012 Division Permit
Exhibit 5	Orton Bird List
Exhibit 6	Orton Comments on Corps Draft EIS (Oct. 31, 2025) (w/o Exhibits)

Exhibit 1
Foth Technical Report

MEMORANDUM

Foth Infrastructure & Environment, LLC
2618 Herschel Street
Jacksonville, FL 32204
(904) 387-6114

October 30, 2025

TO: Orton Plantation Holdings, LLC

FROM: Chris Creed, P.E.
Bill Hobensack, P.E.
Steve Rushfeldt, P.E.
Mike Campagnone, P.E.

RE: Review of Wilmington Harbor 403 Letter Report and Draft Environmental Impact Statement for Orton Property – Shoreline, Geotechnical and Construction Conditions

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Foth Infrastructure & Environment, LLC has reviewed the Wilmington Harbor 403 Letter Report and Draft Environmental Impact Statement (DEIS) and identified deficiencies in engineering analyses and conclusions therein. Our review focused on potential effects from channel deepening and subsequent channel use by commercial ship traffic to areas of the Orton Property, including the riverfront shoreline, dike, rip-rap revetment, fronting river bed slope, and nearby foundations. Our specific concerns are related to an underestimation of the proposed project's contributions to shoreline erosion and impacts to the riverfront marsh and earthen dike on the Orton Property. In summary, several important points discussed in detail in this report are noted below,

1) The Orton riverfront has been under threat due to erosion caused by the presence and use of the federal navigation channel for decades. Project related ship generated wave energy and associated shoreline erosional stress is underestimated in the DEIS, thus the impacts to the Orton shorefront are not correctly quantified and considered in the project formulation and evaluation. Increased ship generated wave energy and frequency in the Lower Cape Fear River will exacerbate the impact of the federal project to the Orton shorefront and property, accelerating marsh loss and increasing impacts to the shoreline and protective dike.

2) The DEIS does not consider appropriate mechanisms that contribute to marsh shoreline erosion and loss. Changes to bed shear stress seaward of a marsh shoreline alone, cannot be used as the sole proxy to determine if the proposed project will exacerbate shoreline erosional stress, marsh loss, and shoreline impacts caused by channel

deepening and subsequent channel use by larger and more frequent ships. The finding that the proposed project and subsequent vessel traffic use will not adversely impact the Orton shoreline is misleading and incorrect. The modeling results presented in the DEIS predict an increase in wave heights, a known contributor to marsh shoreline instabilities and erosion, along the Orton shoreline.

3) The analyses included in the DEIS do not appropriately capture the actual impact that will occur to the Orton Property shoreline due to the additional channel deepening and a long-term increase in the size and number of ships that will transit past Orton Property to and from the Port of Wilmington.

4) The DEIS does not attempt to investigate scope and scale of additional marsh loss and shoreline retreat that will occur because of project construction and channel use.

5) The predicted wave heights for the design vessel for existing and future channel conditions are significantly larger than wave heights that have been found to contribute to marsh shoreline instabilities and erosion. This suggests that past vessel traffic through the Wilmington Harbor federal navigation channel has contributed significantly to the Orton shoreline marsh loss and dike impacts. Observations from the Orton shoreline at the time of vessel passage are consistent with these findings and conclusions.

6) Vessel wave modeling results predict a consistent trend of maximum wave high increase, up to 13%, for the with-project conditions at Orton Point.

7) The assumed design vessel used for wave modeling does not represent the largest vessel that currently calls on the Port of Wilmington or the largest vessel that will be expected to call on the port in the future. As such, the actual future wave impacts that will occur along the Orton shoreline are underestimated.

8) The USACE DEIS suggests that vessel traffic will decrease because larger ships and less frequent transit will be required to move the desired amount of cargo. While overall vessel traffic is argued to decrease, the use of larger vessels that produce larger waves will exacerbate the already existing shoreline erosion that occurs along the Orton Property dike. Further, the assumption that ship traffic will decrease is not consistent with the economic goal of growth upon which the project is justified.

9) The proposed dredge prism incorporates 3H:1V side slopes; however, geotechnical data indicate that the soils near the dike are unlikely to support such slopes, even under non-submerged static conditions.

10) Evaluation of channel geometry and the forces acting on the low-strength soils near the Orton Property dike indicates that any dredging encroaching on the toe of the existing

river channel slope poses a high risk of destabilizing the slope., At a minimum, this destabilization is expected to result in long-term consistent shoaling of the proposed deepened channel, accelerating further existing coastal erosion, and creating an unacceptable risk of failure of the Orton Property dike.

11) The available geotechnical data indicate saturated, low strength, cohesionless soils predominate beneath the Orton Property dike. These soils are susceptible to liquefaction and sensitive to construction vibration. Liquefaction could produce unacceptable settlement, lateral spread of foundation slope soils, or a global failure of the supporting river channel slope.

12) The Blasting Mitigation Plan in the DEIS does not appear to address the structural effect of vibrations on coastal and upland structures.

13) The Orton Property riverfront shoreline and dike are less than 450 feet away from the western edge of the federal channel and soil conditions along the river bottom at the Orton dike are highly unstable. Accordingly, we believe that the stability of the riverbed slope between the federal channel and the Orton Property riverfront shoreline and dike is at risk from the proposed project.

14) The identified risks to the Orton Property's dike resulting from dredging project are not discussed in the DEIS.

15) Included in this report is a list of USACE Engineering Manuals (EMs) that have guidance related to dredging and protection of adjacent infrastructure and resources. There is no evidence in the DEIS that any of these USACE guidelines and analyses were considered in the evaluation of the proposed project.

Shoreline Location and Configuration (relative to the Federal channel)

The Orton Property is located on the western side of the Lower Cape Fear River in the vicinity of Orton Point. The property occupies about 6,800 feet (~1.3 miles) of river shoreline (**Figure 1**). Historically, the Orton Cape Fear River shorefront was characterized by a continuous marsh grass area fronting an earthen dike. The dike protects an interior freshwater rice field and other freshwater areas on the property from the Cape Fear River estuary. This coastal marsh is critical to the protection and integrity of the shorefront and dike and helps mitigate the effects of water level fluctuations and the erosive effects of wave energy.

The Orton Property shoreline is located immediately adjacent to the Wilmington Harbor federal navigation channel. This channel supports commercial ship traffic between the Atlantic Ocean and the Port of Wilmington. The western edge of the channel is located between 460 and 1400 feet from the current position of the Orton shoreline (**Figure 1**).

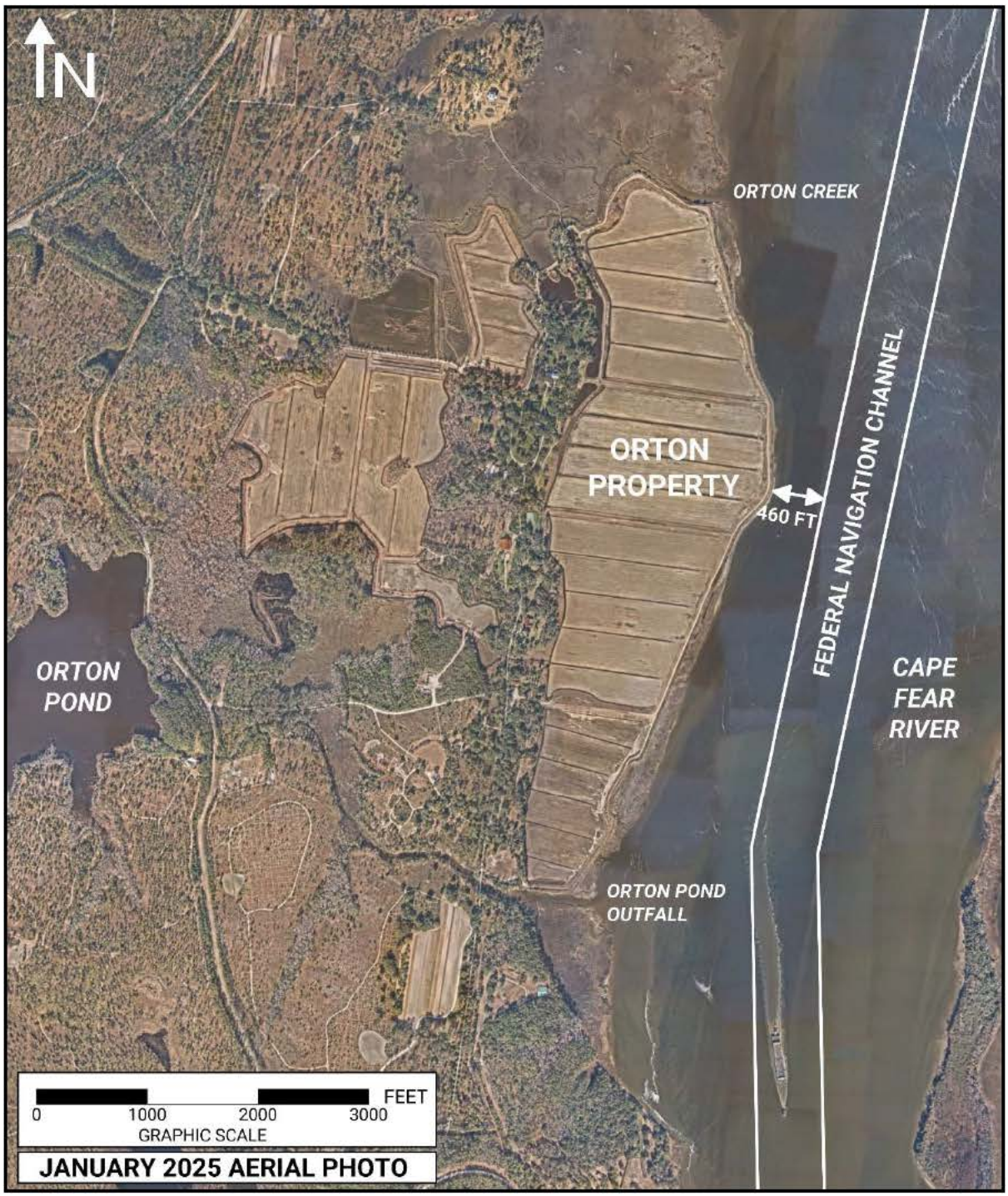


Figure 1: Location of the Orton Property and the Federal Navigation Channel.

Large areas of the fronting marsh have been lost to erosion. Because of the marsh loss, efforts to restore and stabilize the residual shoreline and to protect the earthen dike and interior freshwater rice field have been necessary. The entire 6,800 ft long earthen dike has been repaired and restored. Also, about 2,000 feet of the Orton shorefront is stabilized and protected with a rip-rap revetment. The revetment was required where the grass marsh was eroded away completely, leaving the dike exposed to the waves and water current of the Cape Fear River. Along the other areas of the Orton shorefront, some marsh areas remain, but they continue to be under constant erosional stress from ship waves generated in the adjacent Cape Fear River.

Historical Shoreline and Marsh Change

Reviews of historical aerial photographs suggest that the Orton marsh shoreline was relatively stable in the mid- to latter half of the 1900's (**Figure 2, 3 aerials 1958, 1993, and 2025**). Specifically, between about 1958 and 1993, minimal change to the marsh edge location is observed. At some point in the latter period of the 1900's, the shoreline and marsh area began to recede. This change occurred around the time of significant expansion of the Wilmington Harbor federal navigation channel and the associated commercial ship use. Below is a timeline of major changes to the Wilmington Harbor port and channel.

1930: Initial federal authorization for a 30-foot-deep channel under the Rivers and Harbors Act.

1952: Terminals capable of handling oceangoing vessels were completed at Wilmington.

1962: Channel deepened to 38 feet under the River and Harbor Act of 1962.

2002: Channel deepened to 42 feet. Last major deepening completed by the USACE.

2020: WRDA 2020 conditionally authorized a new deepening project to 47 feet.

2025: Draft EIS released; public comment period underway for deepening the 26-mile channel from 42 to 47 feet to accommodate larger vessels.

Since about 1958, more than 17.2 acres of the 28.2 acres of marsh area available in 1958 have been lost from along the Orton shorefront. An analysis performed using historical aerial photography suggests that between 1958 and 1993 (35 years), the shorefront lost about 4.0 acres of marsh. This is an equivalent loss rate of about 0.11 acres per year. Between 1993 and 2025 (32 years), 13.2 acres were lost, equivalent to about 0.41 acres per year[1]. The marsh loss between 1993 and 2025 is equivalent to about 77 percent of the total loss that occurred over the 67-year period between 1958 and 1993.

[1] The precise rate of marsh loss between 1993 and 2025 is difficult to determine due to the complete loss of marsh in some areas and subsequent shoreline armoring. It is likely that the actual loss rate during this period is significantly higher than that computed through simple comparison of shoreline positions.

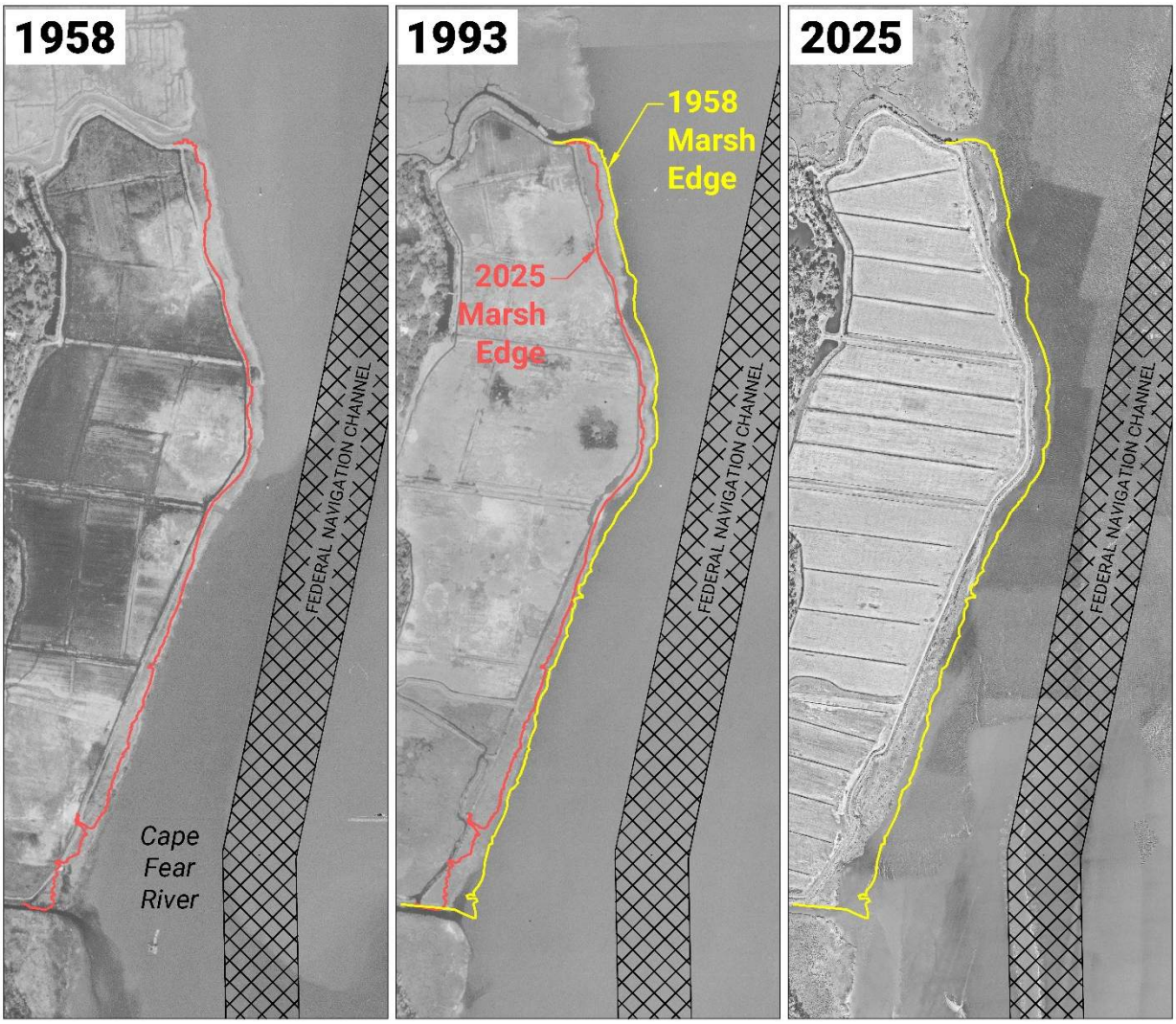


Figure 2: Historical aerial photography and marsh edge location at the Orton Property.

Figure 3 depicts the location of eight transects analyzed along the Orton shorefront. At each of these transects, the approximate location of the seaward edge of marsh was digitized from twenty historical aerial photographs taken between 1958 and 2025. **Figure 4** presents a timeline of the location of the seaward edge of marsh relative to the 1993 location at Transects 2 and 4. As of 2025, at all eight transects the marsh is located landward of both the 1958 and 1993 locations. Between 1958 and 1993, at three of the eight transects the marsh was stable with little net change (Transects 1, 2, and 6). At the remaining five transects, the marsh retreated between -0.2 and -2.7 ft per year. Between 1993 and 2025 all eight transects retreated, ranging between -2.1 and -6.9 ft per year (Transects 5 and Transect 2, respectively). As of 2025, there is no fronting marsh at Transects 3 and 4.

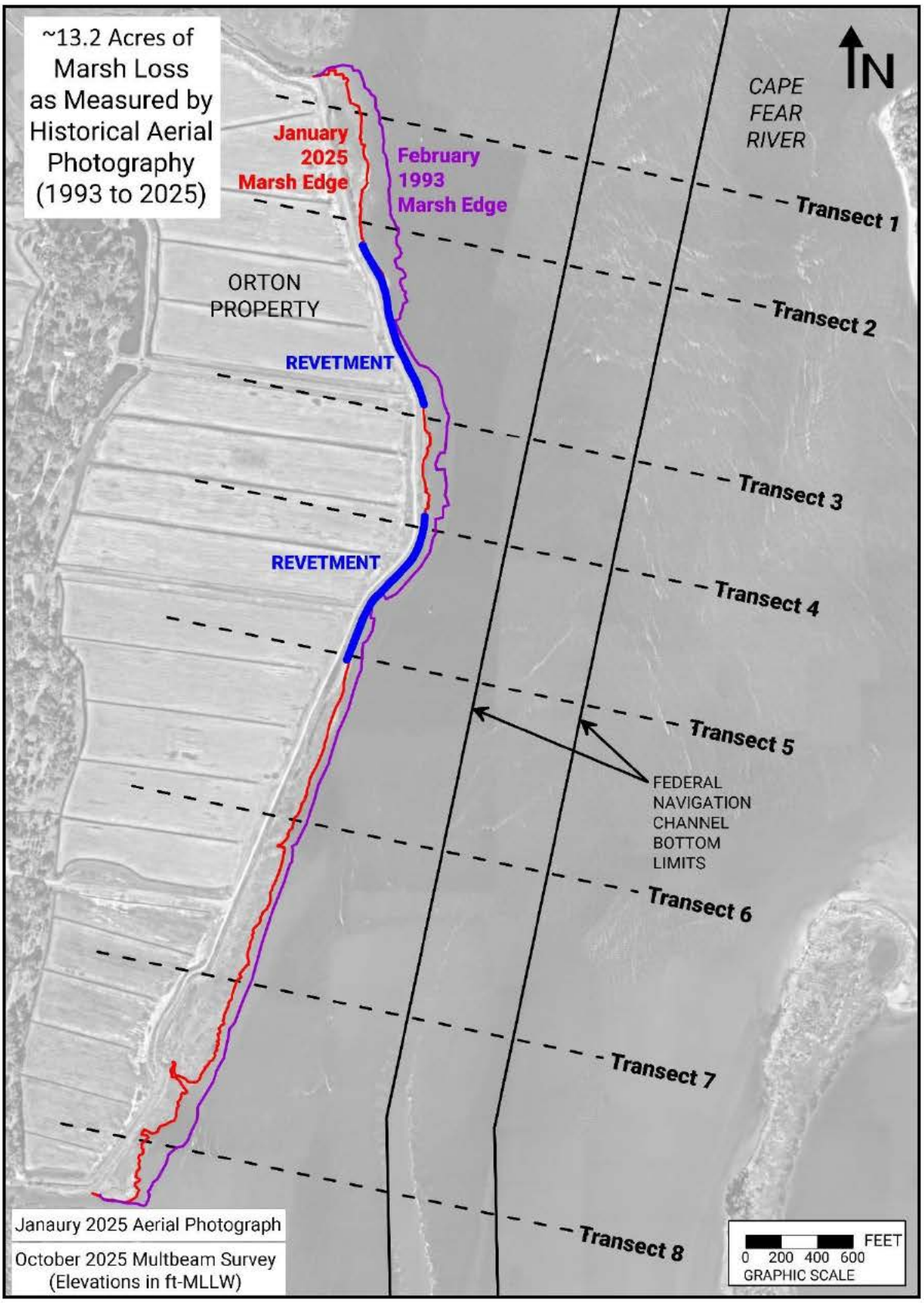


Figure 3: Transect locations along the Orton Property.

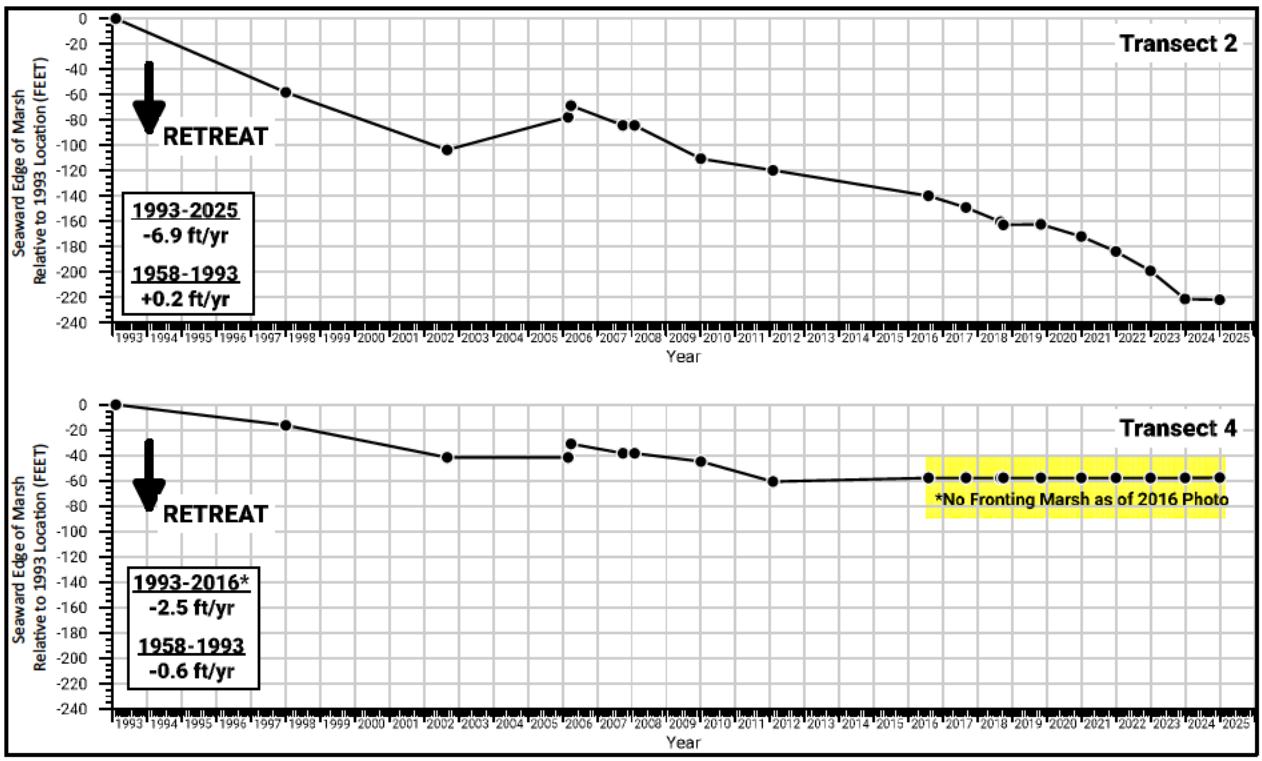


Figure 4: Location of the seaward extent of marsh along Transects 2 & 4 relative to 1993 location based upon aerial photography (1993 - 2025). (see **Figure 3** for transect locations).

The most significant change, natural or anthropogenic, to the lower Cape Fear River estuary during the above noted period has been the expansion of the Port of Wilmington and Federal navigation channel. As such, it is reasonable to conclude that the observed onset and acceleration of marsh loss along the Orton shoreline is related directly to channel deepening and ship use of the Wilmington Harbor federal navigation channel.

The introduction of ship traffic to the estuary introduced much larger wave conditions within the estuary. This is particularly significant along the Orton shoreline where fetch distances are small and wind wave growth is limited. Introduction of ship waves to this portion of the estuary significantly increased the size of the waves and the associated erosion forces to which the marsh shorelines and marsh foundations were exposed.

Shafer, D. J., et al. (2003), studied the relationship between marsh shoreline conditions and wave conditions within estuaries, understanding that marsh grass shorelines are highly susceptible to the wave energy to which they are exposed. They found that elevated wave conditions are contributing erosional stressors to marsh loss. A more specific investigation into the relationship between wave heights and marsh stability was later conducted by Roland and Douglass (2005). They found that non-eroding salt marshes with *Spartina alterniflora* exist at sites where (1) median significant wave height was approximately 0.1 meters (0.3 feet) and (2)

the 80th percentile significant wave height was approximately 0.2 meters (0.7 feet). Based upon these investigations, the thresholds represent the upper limits of wave energy that marsh vegetation can tolerate without experiencing erosion. These results show that marsh shorelines are highly susceptible to very small changes in waves heights.

Vessel wake analyses included in the DEIS predict increases in “maximum primary wave height” generated waves heights for both inbound and outbound vessels at Orton Point. We focused on the predicted maximum wave height from vessel passage at Orton Point because episodic high-energy events drive wave impacts and erosion, not the averaged effects of a series of wave events that may include smaller less impactive waves. Tables 3, 5, 7, 9, 11, and 13 of Appendix B-VII present results for the predicted maximum primary wave conditions for inbound and outbound vessel passages for various locations along the Lower Cape Fear River.

Orton Point is one of many model locations used to observe wave model output. The model was run for both Alternative 1 and Alternative 2 project conditions. The same vessel dimensions and speed were used for existing and project conditions. The model also was run for a range of water level conditions from MLLW to +7.77 feet above MLLW. The latter being a future water level conditions associated with sea level rise. For this assessment, we focus our interest on the lower water level since it is intended to represent existing conditions.

Results for the MLLW case presented for Alternative 1 (Table 3) indicate an increase in maximum wave height from 4.09 to 4.17 feet (1% increase) for the inbound assumed design vessel and 2.78 to 2.96 feet (6% increase) for the outbound assumed design vessel. A similar trend is identified for Alternative 2 (Table 5) where the results suggest an increase in maximum wave height from 4.09 to 4.12 feet (2% increase) for the inbound assumed design vessel and 2.78 to 3.06 feet (10% increase) for the outbound assumed design vessel.

Results for the MLLW +7.77 case presented for Alternative 1 (Table 11) indicate an increase in maximum wave height from 5.63 to 5.77 feet (3% increase) for the inbound assumed design vessel and 5.43 to 5.95 (10% increase) for the outbound assumed design vessel. A similar trend is identified for Alternative 2 (Table 13) where the results suggest an increase in maximum wave height from 5.53 to 6.34 feet (13% increase) for the inbound assumed design vessel and 5.42 to 5.67 feet (5% increase) for the outbound assumed design vessel. It is noted that the DEIS does not indicate where the wave heights were sampled relative to the vessel or the shoreline. Vessel generated wave heights can be higher at the shoreline than in deeper water near the point of generation.

The trend of a predicted increase in the maximum primary wave is consistent for all water levels considered in the analysis.

It is important to note that findings from a comprehensive review of the DEIS by Lynker (2025) have revealed numerous shortcomings of the hydraulic and hydrodynamic analyses intended to

evaluate potential project related impacts to the coastal system. Most importantly to potential estuarine shoreline impacts were deficiencies in the setup, use, presentation, and interpretation of findings from the numerical models used to evaluate ship generated waves and ship induced impacts on adjacent shorelines. Lynker finds that the approach presented in the DEIS grossly misrepresents and underestimates that actual impacts that will occur to adjacent shorelines from a deeper channel and planned future vessel traffic. For this reason, the impact on the Orton shoreline due to the project and project use by commercial vessel traffic is significantly underestimated.

Orton Shorefront Dike

The earthen dike along the Orton Property shorefront protects the interior property infrastructure from the Cape Fear River. The dike has experienced significant impacts due to the loss of the protective fronting marsh and ever-increasing erosional stress due to waves within the adjacent Cape Fear River. There is evidence of complete marsh loss and numerous dike breaches as early as 1993. The breaches were significant and required immediate intervention to restore the dike and protect the interior freshwater areas and infrastructure from saltwater intrusion and flooding from the Cape Fear River. Repeated repairs and additional stabilization were implemented between at least 1993 and 2014 to “hold the line” against continued marsh loss and dike erosion.

In 2014, Orton Plantation Holdings, LLC completed a comprehensive restoration and stabilization project along the riverfront dike. This work was necessary due to the continued degradation of the Orton shorefront and threat to the river front dike due to impacts associated with commercial ship traffic and vessel generated waves. The project restored and expanded the dike cross-section, raised the dike crest elevation to +8 feet, NAVD88 and added a rip-rap revetment along 2,000 feet of shoreline. The rip-rap placement occurred in those areas where the fronting marsh was lost completely and where the highest erosion stress was most apparent. Since the original dike restoration, marsh loss continued along the adjacent area.

Increases in the size and frequency of ship generated waves will expose the shoreline improvements to erosional stress that is beyond design conditions. The extent of the exceedance is not known since the actual intended vessel size and use for the proposed project has not been investigated in the DEIS. It is well understood, however, that the waves and associated impacts to the Orton shoreline are currently underestimated.

Geotechnical Concerns

Foth reviewed available geotechnical information relevant to the Orton Property riverfront dike and fronting river bottom. This information was provided by Orton Plantation Holdings, LLC and the USACE (Appendix G). The geotechnical data was reviewed to evaluate soil characteristics and identify conditions that could accelerate the loss of protective marsh and foundation soils supporting the river front dike along with degrading the structural integrity of the dike. The effect of erosion on a slope such as the Orton Property dike tends to create a non-linear cumulative response on the stability of an earthen structure. As foundation and dike soils are eroded, the effects of water intrusion, surface sluffing, and flow forces become cumulatively more detrimental and accelerate the rate of structural destabilization. Channel deepening, channel slope instabilities and the destabilizing effect of increased wave energy along the Orton shoreline to the shorefront soil and subsurface geotechnical conditions were not evaluated in the DEIS.

Information provided by Orton Plantation Holdings, LLC included geotechnical test borings and cone penetrometer tests (CPTs) that were completed by ECS in June and August 2010, along with geotechnical test borings that were completed in January 2014 by ECS within the limits of the Orton Property dike. Logs of the test borings, classification test results, and various supplemental figures were reviewed. This review found very loose, very soft, and organic soils extend to depths of between about 40 ft and 57 ft below the existing ground surface at the test boring locations. Laboratory test data indicates that elastic organic silt is present in varying layers throughout the zone of looser/softer soils. The standard penetration test (SPT) samples in this material were frequently reported to be obtained by “weight of hammer” (i.e., an effective SPT N-value of 0). Below the looser/softer soil layers, medium dense to dense sand was encountered above apparent weathered limestone. These reported subsurface conditions are consistent with the regional geology of the Outer Coastal Plain Physiographic Province of North Carolina. According to the North Carolina geological survey, this geographic unit is characterized by sedimentary materials deposited during periods of widely varying ocean levels and varying river flows. Underlying consolidated rock is typically of the Piedmont and Mountain Physiographic Provinces. Based on the test borings and corresponding CPT data, it is apparent that the foundation soils below and adjacent to the influence zone of the existing Orton Property dike consist of very loose sands and very soft to soft cohesive soils with varying amounts of organic material consistent with this tidal marine environment.

Along with a review of the 2010 and 2014 geotechnical data, Foth reviewed the test borings performed on behalf of USACE in 2023 as reported in the DEIS, Appendix C, Attachment 3, Profile N-N’ on the west side of the Lower Lilliput portion of the navigation channel. The subsurface conditions encountered in borings WH94-13, WH98-94, WH98-91, WH94-11, WH94-12 and WH93-68 completed in 2023 for USACE in the vicinity of the Orton Point river channel slope is like those encountered by ECS in 2010 and 2014. Low strength, low cohesion to

cohesionless soil was encountered throughout the channel profile to depths below the proposed -47 ft dredge elevation. Limestone was encountered at approximately -47.5 ft in boring WH93-68.

A review of the SPT N-values, laboratory testing, and CPT data from the 2010 and 2014 geotechnical investigations and SPT N-values from the 2023 USACE investigation indicates that the naturally deposited sediments that comprise the subsurface below and adjacent to the Orton Property dike are unconsolidated and have very low strength parameters (i.e., internal friction angle and shear strength). Based on empirical guidance and accounting for the presence of organic materials, the available subsurface data indicates that the effective friction angle of the unconsolidated layers below and adjacent to the dike are likely in the range of about 15 to 25 degrees. Based on the demonstrated loss of coastal marsh, it is possible that previous movement of the river channel slope could necessitate the consideration of residual or otherwise modified strength parameters, which could be significantly lower than the peak parameters referenced above. Soil layers with some clay fraction likewise may have contributary cohesion but based on information provided by ECS the effective cohesion of these layers may be 200 lbs./sq.ft., or less. Laboratory testing would be required to determine actual strength parameters. Such testing was not performed as part of the scope of the referenced geotechnical investigations, including the USACE investigation.

After reviewing the DEIS and relevant Appendices, it appears that no slope stability models were created or analyzed within the Lower Lilliput reach of the existing or proposed navigation channels. The current channel slope adjacent to the Orton Property dike is estimated to be about 12.5H:1V at Transect 04 (**Figures 5 & 6**) based on available bathymetric data. This slope is understood to be the result of naturally occurring hydraulic forces, the effect of previous channel dredging projects, ship wake forces, etc. Our understanding is that the existing river channel slope along the Orton Property dike was not designed or engineered and is in a relative state of equilibrium based on soil properties and hydraulic forces. While the width of the existing navigation channel is not proposed to change in the vicinity of the Orton Property, the deepening of the channel will result in removal of existing riverbank slope toe material. The proposed 3:1 side slope for the navigation channel dredging project would therefore cut into the toe of the existing slope at least 100 ft laterally and about 8 ft to 12 ft vertically in the vicinity of the referenced Transect 4 based on the USACE DEIS, accounting for potential over dredge. The current over dredge allowance is expected to extend to -49 ft but could extend deeper if limestone is encountered such as in boring WH93-68. Every foot of vertical dredging has a multiplicative effect on the amount of toe removal and therefore impact on the overall riverbank slope. The removal of toe material from the existing slope carries significant risk.

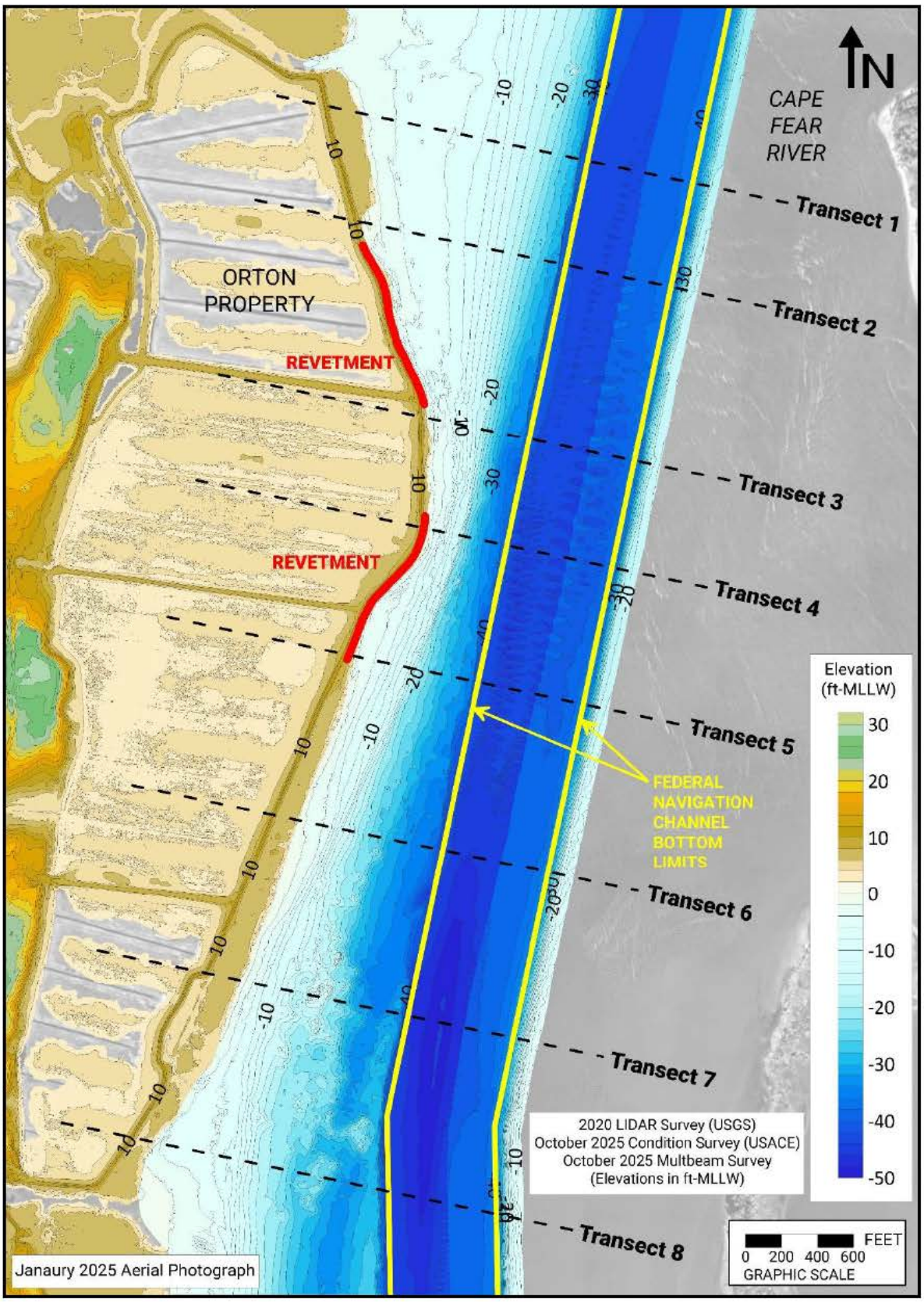


Figure 5: LIDAR and bathymetric survey contours at the Orton Property.

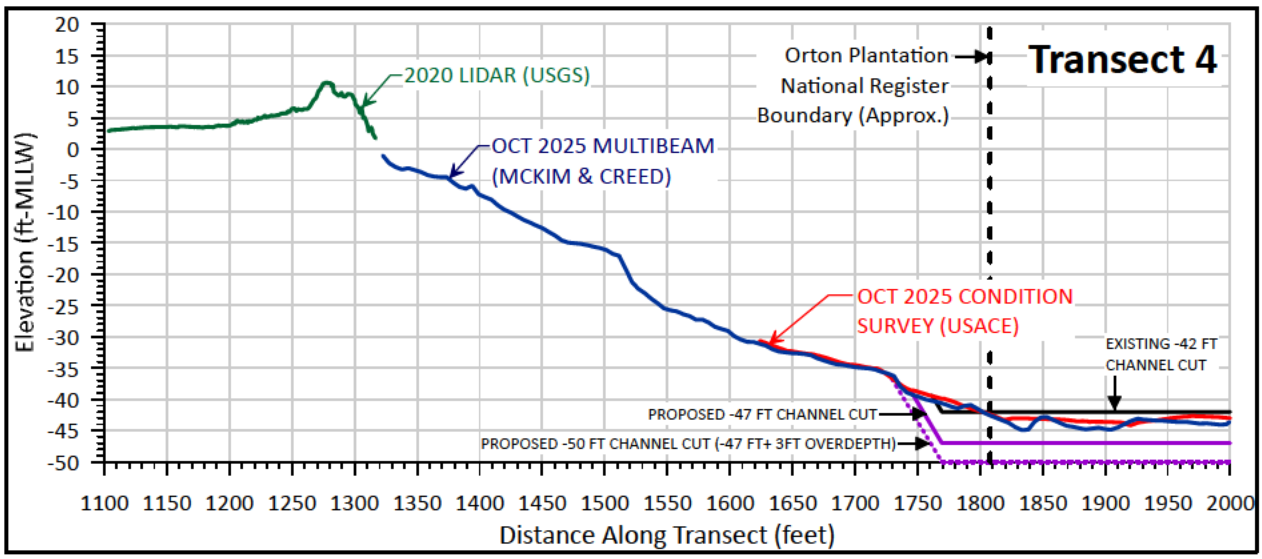


Figure 6: Cross-section at Transect 4 at the Orton Property (see **Figure 3** for transect location.)

The proposed dredge prism consists of 3H:1V side slopes. Based on available geotechnical data, the soils in the vicinity of the dike do not appear to support the construction of a 3H:1V slope under even non-submerged static conditions. The actual river channel conditions are fully submerged and subjected to numerous natural dynamic hydraulic forces including flooding and subsequent drawdown, seismic activity, scour/erosion, etc. in addition to shipping-related forces. Furthermore, approximately 45 ft to 50 ft of slope elevation above the proposed toe cut, will result in significant driving forces acting on the dredge prism side slope. Consideration of geometric conditions and known forces acting on the low strength soils that comprise the river channel in the vicinity of the Orton Property dike suggest that encroachment upon the toe of the existing river channel slope by means of any dredging activity will carry a high risk of destabilizing the slope. At a minimum, this destabilization is expected to result in long-term consistent shoaling of the proposed deepened channel, accelerating further existing coastal erosion, and creating an unacceptable risk of failure of the Orton Property dike. The potential for a deep-seated, global failure of the slope extending beyond the dike, resulting from changes in toe geometry, cannot be dismissed.

In addition to the risks posed by geometric reconfiguration of the river channel slope adjacent to the Orton Property dike, the dredging operation could also induce construction vibrations through either conventional mechanical equipment or blasting operations, if hard rock is encountered. The available geotechnical data indicates that saturated, low strength, cohesionless soil is predominant throughout the subsurface profile in the vicinity of the Orton Property dike. These soils may present a risk of liquefaction and are expected to be sensitive to construction vibration. Liquefaction of the soils supporting the Orton Property dike could cause issues ranging from unacceptable settlement, lateral spread of the foundation slope soils, to

global failure of the supporting river channel slope. Any construction operations within the vicinity of Orton dike must account for the risk of vibration-induced loss of soil strength. While a review of the DEIS indicates that the Lower Lilliput reach is not expected to include blasting, the presence of limestone in some of the available geotechnical test borings in this area and the accounting for soft rock removal in the DEIS removal estimates in the Lower Lilliput reach suggest that either blasting or high-energy mechanical removal has not been ruled out depending on contractor means and methods. Furthermore, the Blasting Mitigation Plan does not appear to address the structural effect of vibrations on coastal and upland structures.

The Orton Property riverfront shoreline and dike are less than 450 feet away from the western edge of the federal channel. The soil conditions along the river bottom at the Orton dike are highly unstable. Accordingly, we believe that the stability of the riverbed slope between the federal channel and the Orton Property riverfront shoreline and dike is at risk from the proposed project. It is important to understand how the channel configuration (existing and future) impacts the adjacent river bottom as well as the Orton Property riverfront and dike. There are existing concerns about the impact of past dredging to the stability of the Orton Property riverfront shoreline. Future channel deepening as well as potential widening would be expected to exacerbate the effects of the federal channel to the Orton Property riverfront and dike.

Construction Concerns

The proposed dredging project has the potential to impact the Orton site in several ways related to equipment selection and utilization. These potential dredging impacts are not fully and clearly disclosed in the DEIS. Based on previous projects performed by the USACE in this vicinity the expectation is that world class large dredging equipment will be employed to complete any dredging project within the vicinity of the subject site. Equipment proposed for the site could include clamshell dredges, excavators, or hydraulic dredges. With this large equipment comes large attendant plant, and recent improvement work included the need for marine blasting for pre-treatment prior to excavation.

Large dredging equipment operating at maximum capacity adjacent to the slope and dike may produce detrimental impacts to the dike in several ways. The primary concern being the impact of vibrations created during the dredging process. During excavation it is likely that the site will experience vibrations that are a direct result of vessel activities such as spud deployment, tug and barge movements, and direct impacts from dredge contact with bottom materials. This would be exacerbated should firm materials or rock be encountered within the dredging template. These concerns apply to any type of equipment selected. Vibration from dredging equipment may result in increased pore water pressure which can reduce the shear strength of the material and induce cracking or slumping of the dike materials. This can create cyclic softening, or even liquefaction depending on material type.

Operational impacts may be experienced due to tug and vessel propwash created during barge and scow maneuvering. Dredging operations within 450 feet of the dike may damage lateral support, increasing the risk of slope instability or localized failure, especially in zones with high silt and organic content. When dredging occurs directly adjacent to the Orton site, the tug propwash may be aligned directly at the dike creating scour of the soft sediments supporting the dike or directly to the dike itself. This may occur because of scow movement and placement and/or from dredge movements. If instead of spuds a dredge is selected that is working on anchors, anchor placement by tugs could be required very close to the dike to ensure proper dredge function. This type of operational concern would also apply to any dredge pipeline that may be installed should a hydraulic dredge be utilized. Submerged line laid adjacent to the slope may have leaks that generate scour or deposit material as a surcharge adjacent to the dike incurring direct impacts. This also applies to floating lines which may leak or break loose from the dredge plant and strike the dike.

Over-dredging and dredging outside of the channel can exacerbate potential issues that may occur from a channel deepening project that is beyond those which are anticipated. Excessive dredging of the channel or the side slope has the potential to develop impacts well beyond the channel limits. The typical design slope for USACE work in this area is shown as 3H:1V on recent survey plans provided by the USACE (**Figure 7**). Given known material descriptions this slope is potentially too steep to hold. A dredging contractor chasing a slope would be required to excessively dredge material to ensure that side slopes hold long enough for acceptance. This coupled with positioning uncertainties associated with machine control equipment represents a real risk to slope stability. Excessive dredging within the channel may also have impact on the dike if material beyond the over depth allowance is removed beyond the depth of slope stability analysis.

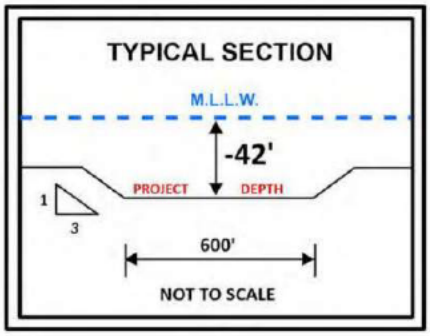


Figure 7: Typical channel section (existing).

Typically, there are no vibration and slope monitoring requirements on the contractor for dredging of this nature. The opportunity for impacts to the dike are evident in the proximity of the dredging channel to the site. Prior to any construction it is recommended that a full multibeam and LiDAR survey be done in the area between the channel and the dike. This baseline data could then be used to compare surveys done during and after construction to ensure that any impacts that are the result of the dredging activities can be accurately assessed. This in conjunction with vibration monitoring with exceedance criteria is the type of monitoring data that should be required but is not acknowledged in the DEIS.

The USACE Engineering Manual (EM) 1110-2-1913 “Design and Construction of Levees” provides valuable insight into concerns at the Orton Site. The dike is an agricultural dike that

prevents salt laden sea water from entering the site which is actively used for growing rice. The guidance expresses concern about excavation too close to the levee and recommends that any setbacks be developed from site specific geotechnical analysis. While USACE EM 1110-2-1913 does not prescribe a universal minimum setback, it requires that setback distances for dredging near dikes be determined by site-specific stability analysis. Regional USACE guidance (e.g., New England District) recommends a typical setback of three times the project depth, reflecting standard side slope requirements (3H:1V) for dredging operations. For future dredge depths of about fifty feet, the 3H:1V side slope would extend at least 150 feet from the channel edge. Given the documented soil conditions, however, it is likely that the side slopes will be much more relaxed, maybe as much as 12.5H:1V, causing the side slope to project much farther from the channel. If the current 12.5H:1V side slope is to be maintained for stability of the riverbank and supported dike, the required lateral extent of riverbank material removal could extend up to 625 feet from the channel edge. This geometry would project beyond the backslope of the existing dike. A scenario where the existing riverbank slope is maintained but soils within the zone of influence of the dike foundation are disturbed would present an imminent threat to the stability of the dike and the property that it protects. The geometry of the proposed navigation channel dredge depth and integrity of the dike are therefore in potential conflict

The EM also expresses concerns about changing groundwater flow paths caused by excavation. Bathymetric changes can cause a change in flow that increases seepage through or under the levee, this can lead to piping which is a common cause of levee failure. A full hydraulic analysis may recommend the installation of filters of cutoff walls to prevent this type of failure.

Below is a list of USACE EMs that have guidance related to dredging and protection of adjacent infrastructure and resources. Guidance listed throughout these manuals should have been considered in the development and evaluation of the project plans, especially along the Orton shoreline where the proposed activity is close to the shoreline and where soil conditions are known to be unstable. There is no evidence in the DEIS that any of these USACE guidelines and analyses were considered in the evaluation of the proposed project.

From USACE EM Guidance:

1. EM 1110-2-5025: Dredging and Dredged Material Management
    a. Slope Stability & Setbacks: Requires evaluation of slope stability and setbacks when dredging near levees or embankments. Site-specific geotechnical analysis is mandatory to prevent instability or failure.
    b. Sediment Management: Guidance on managing dredged material to avoid adverse impacts on adjacent structures, including levees.
    c. Monitoring: Recommends monitoring for settlement, erosion, and water quality impacts during and after dredging.

d. Environmental Protection: Stresses the need for environmental controls (e.g., silt curtains, turbidity monitoring) to protect levees and adjacent sensitive areas.

2. EM 1110-2-5027: Confined Disposal of Dredged Material
    a. Containment: Guidance on containment of dredged material to prevent migration toward levees.
    b. Hydraulic Effects: Addresses hydraulic effects of dredging and disposal on levee integrity.

Mitigation and Monitoring

The DEIS does not identify the need for mitigation along the Orton Property shorefront even though analyses included in the report suggest that there will be increases in impacts to the shoreline. The proposed project will cause impacts the Orton shoreline causing additional marsh loss and eventually increasing wave energy impact and erosional stress to the earthen dike. Mitigation to protect remaining marsh areas and the earthen dike should be added to the project plan. The most obvious mitigation approach will consist of marsh, shoreline and dike restoration and stabilization. Protection of existing marsh and reestablishment of lost marsh areas will protect adjacent interior infrastructure from the impacts expected from the deepening project.

In addition to physical mitigation to protect natural habitat and infrastructure, a comprehensive river bottom and shoreline monitoring program for the Orton shoreline and adjacent areas should be added to the project plan. Monitoring should include regular surveys and periodic engineering analyses. The data collected and analyses will document existing conditions and with continuation of the surveys following the deepening project, potential changes related to the deepening project can be documented and quantified. The information can be used to scope additional mitigation in the future should unanticipated project impacts be identified.

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CHRISTOPHER CREED, PE, BCCE

Senior Coastal Engineer & Client Manager

Education
MCE – Civil, Coastal & Oceanographic Engineering, University of Delaware
BSCE – Civil Engineering, North Carolina State University

Professional Registrations/ Certifications
- Professional Engineer – FL #49445; SC #23064; NC #037119; GA #044304

Memberships
- American Society of Civil Engineers; Association of Coastal Engineers (Board Member 2009-2011);
- Florida Shore and Beach Preservation Association (FSBPA);
- Executive Planning Committee for FSBPA National Conference on Beach Preservation Technology (2015-present)

Mr. Creed has 33 years of experience with planning, engineering studies, design analyses, permitting, cost analyses and scheduling, plans, specifications, and contract documents used from solicitation of competitive bids, and construction administration for large-scale Federal and non-federal civil works projects in the coastal, marine, and insular environments.

Relevant Experience

Flagler County Dune/Beach Restoration, Flagler County, FL. PM/Coastal Engineer responsible for comprehensive coastal management planning; engineering studies; permitting and coordination with regulatory agencies; shoreline protection design analyses; identification of beach sediment sources in Federal waters and BOEM lease agreement; cost estimates and schedule; economic analysis; liaison with staff, citizens, board members, and government agencies for 1.8 Mcy post- Hurricanes Matthew, Irma, Nicole, and Ian dune/beach reparation project. Construction Cost: $35.0M(est.). Project is planned for construction in 2025.

Broward County Federal Shore Protection Project: Segment II (Beach Restoration and Hardbottom Mitigation). PM/Coastal Engineer for Broward County, Florida (local sponsor). Responsible for engineering feasibility study; upland sand source development; community outreach; permitting; design; cost analysis and schedule; preparation of plans and specifications for competitive bidding; bidding; construction review/ administration for 0.69 Mcy beach upland truck-haul beach fill project and 6.8 acres reef habitation mitigation (separate contracts). The Segment II project was constructed under a Congressional authorization based upon a 2015 USACE Limited Re-evaluation Report (LRR). The Segment II project included the placement of approximately 690,000 cubic yards of sand along 6.5 miles of Atlantic Ocean shoreline. Work was completed in 6 months and required more than 42,000 truckloads of sand from the upland mine. An upland sand source was used for this project due to limited available sand sources offshore of Broward County and concerns regarding potential impacts of sand to hardbottom (reef) resources. Hardbottom mitigation project required placement of fabricated concrete units and limerock boulders to established replacement habitat for beach fill impacts. Construction Cost for Beach Fill: $49.0M; Construction Cost for Mitigation: $18M (est.).

Town of Hilton Head Island, SC, Beach Renourishment Projects (1997, 1999, 2026-07, 2011, 2016, 2017, 2025), SC. PM/Engineer-of-Record/Coastal Engineer for client since 1995. Responsible for engineering study; permitting; design analyses; cost-analysis and schedule; preparation of plans and specifications for competitive bidding; bidding assistance; identification of project beach sediment sources; storm damage assessments; and construction review/administration. Projects have included the 8.5 Mcy of sand along approximately 16.0 miles of Atlantic Ocean and Port Royal shoreline. Assisted with post-storm damage assessment and repairs after Hurricanes Matthew (2016), Irma (2017), Dorian (2019), and Nicole (2022). Worked with Town staff for post-storm damage assessment, coordinated with regulatory agencies to make rapid permit modifications to repair portions of the beach damage, negotiated with dredge contractor to incorporate immediate post-Matthew repairs into the active dredging contract, and assisted the Town staff with FEMA Cat B and Cat G reparation funding requests. Currently, assisting town with next scheduled renourishment in 2025. Construction Cost: $17.0M (2016) and $7.9M (2017). In 2017, designed, permitted, and assisted the Town with a follow-up post-Matthew beach repair for areas that could not be addressed immediately. Currently, assisting town with next scheduled renourishment in 2025. This project will replace more than 2Mcy of sand along 14 miles of shoreline. The project will include FEMA G funding from Matthew, Dorian, and Nicole. Work continues to assist the Town with beach management annual monitoring. All hurricane damage repairs were complete by December 2017. Construction Cost: $17.0M (2016) and $7.9M (2017).

Segment III Beach Management Plan, Broward County, FL. PM/Principal Investigator responsible for conducting a comprehensive beach management and resiliency investigation for 8.5 miles of Atlantic Ocean shoreline in Broward County, FL. Responsible for evaluation of beach and dune conditions and vulnerability of shorefront infrastructure to coastal erosion, storm impacts, and flooding. Developed the sediment budget, project need assessment, beach management goals, project plans and estimated costs for long-range shorefront resiliency and beach management. Identified funding needs and opportunities to implement plan recommendations.

Port Everglades Entrance Sand Bypass Project, Broward County, FL. PM/Principal Engineer for Broward County, Florida. Responsible for engineering feasibility study; design analyses for project scoping and plan selection; geotechnical investigation (unconsolidated sediments and subsurface rock); rock excavation feasibility study; permitting; USACE Section 408 analysis; design; cost analysis and schedule; preparation of plans and specifications for competitive bidding of dredging, jetty modifications, and reef habitat mitigation. The project will reduce the impact of the inlet on adjacent shorelines; provide a reliable, cost-effective and sustainable sand source for the Broward County Federal Shore Protection Project – Segment III; reduce maintenance requirements and dredging costs for the Federal navigation project; and re-expose and restore more than 10 acres of hardbottom habitat immediately north inlet impacted previously by historical channel expansion and dredging project. The planned project includes construction of a storage-type sand trap on the north side of the inlet channel, significant modifications and expansion of the inlet's north jetty (a feature of the Federal navigation project), removal of a large submerged rubble spoil shoal immediately north of the sand trap to facilitate sand transport into the sand trap, and construction of hardbottom mitigation to compensate for impacts associated with project construction. The feasibility study concluded that the initial capital cost of sand bypass project construction will be offset by a long-term reduction in the cost to maintain protective beaches south of the inlet, as compared to the long-term cost of alternative sand source options. Foth conducted calculations and analyses to design the sand trap dimensions, jetty improvements, dredging and material disposal requirements, sand placement templates along the downdrift shoreline, and mitigation structures sufficient to apply for regulatory permits. Total Construction Cost: $100M (est.)



WILLIAM HOBENSACK, PE

Lead Coastal Engineer

Education
MS, Civil Engineering, Ocean Engineering, Texas A&M University
BS, Civil Engineering, Environmental & Hydraulics Engineering, Purdue University

Professional Registrations/ Certifications

- Professional Engineer - FL #60112

Memberships

- American Society of Coastal Engineers
- Florida Shore and Preservation Association
- American Shore and Beach Preservation Association

Mr. Hobensack brings 25 years of experience in field data collection, engineering analyses, numerical modeling, design studies, permitting and research for a variety of civil works projects in the coastal and estuarine environments.

Relevant Experience

Duval County Federal Shore Protection Project, Duval County, FL. Coastal Engineer for permitting and physical monitoring of the Federally-constructed shore protection project and locally constructed FEMA dune projects (Hurricanes Matthew & Irma). Project elements include cyclical placement of up to about 900,000 cy of beach fill and construction of a non-Federal dune project along the Federal project reach. Services the general coastal engineering needs of the City including development of state grant requests and direct coordination with the USACE on behalf of the City.

South Amelia Island, Shoreline Stabilization Project, Nassau County, FL. Coastal Engineer for engineering study; design analyses for project scoping and plan selection; preparation of engineering reports (computations/analysis) geotechnical investigation; permitting; design analyses and cost analysis; preparation of plans and specifications for competitive bidding of beach nourishment projects, construction review and administration, 2002, 2011 and 2021/22. Also, Coastal Engineer for design, permitting, and implementation of a 1,600-ft permeable rock terminal groin, a 300-ft long detached rock breakwater, and an additional 170-ft stabilizing rock groin protect the southern terminus of the island at Amelia Island State Park, where the Florida Park Service is an active project partner. Construction Cost: $15.0M (2021/22); $9.8M (2011) $8.0M (2002), $5.0 M (2005-Structures).

Brevard County Shore Protection Project, Brevard County, FL. Coastal Engineer for Brevard County, FL (Local Sponsor) for the South Beaches Dune Maintenance Project and for Brevard County Federal Shore Protection Project. The former includes post-storm repair & annual maintenance of dunes along 12+ miles of coastline, since 2005, both with and without FEMA eligibility and cost-share. The most recent construction includes three separate truck-haul renourishment projects conducted to repair erosion damage after Hurricanes Matthew, Irma, Dorian. The latter federal project includes development of designs, acquisition of all State permits, Federal leases, participation in construction review, development of two offshore sand sources, seabed- and beach-stockpile areas for rehandling dredged sand, and other cost-savings features on 20+ mile long project, since 2000. Construction Cost: $150M+.

2020-2021 Ponte Vedra Beach, FL, Beach Management Project, St. Johns County, FL. Coastal Engineer for St. Johns County, FL. for upcoming beach nourishment project along (north) Ponte Vedra Beach. Tasks include engineering study; design analyses for project scoping and plan selection; preparation of engineering reports (computations/analysis), permitting; design analyses and cost analysis. Future tasks to include plans/specifications for competitive bidding; construction review/administration and post-construction monitoring. Construction Cost: ~$30.0 to 35.0M.

Bald Head Island Shoreline Stabilization Project, Village of Bald Head Island, NC. Coastal Engineer for design, permitting and construction management of beach restoration projects constructed in 2009/10 and 2019. Tasks including management of construction and post-construction monitoring data and preparation of engineering reports (calculations/analysis) relevant to post-construction physical monitoring. Project Cost: $10.6.

Broward County, Florida Federal Shore Protection Project-Segment II. Investigator for development and preparation of Federal LRR, permitting, storm economic impact to infrastructure analysis and management of easement acquisition, development of design plans, and analysis of impacts to hardbottom resources. Project Cost: $35.0M



MICHAEL CAMPAGNONE, PE

Lead Civil Engineer/Senior Geophysical Survey Leader

Education
B.S., Civil Engineering, University of Rhode Island, Kingston, RI

Professional Registrations/Certifications
- Professional Engineer - MA
- OSHA 40 hour HAZWOPER
- OSHA 30 hour Supervisor
- Transportation Worker Identification Credential (TWIC)

Key Expertise
- Hydrographic Surveying Dredge Engineering
- Site Surveys
- Marine Construction
- Site Inspections
- Stormwater and Drainage
- Construction Support Services

Mr. Campagnone has more than 20 years of experience in hydrographic surveying, marine construction, dredging, civil engineering and environmental permitting. Early in his career he worked for one of the largest dredging contractors in the world, gaining exposure to all types of hydrographic survey techniques. Data scrutiny was of utmost importance, particularly for projects such as the Øresund Fixed Link in Copenhagen, Denmark, giving him an understanding of the value and importance of quality data. Mr. Campagnone worked on innovative projects such as the Boston Harbor Federal Navigation Improvement project where contaminated materials were disposed in confined aqueous disposal (CAD) cells. His extensive field experience and strong commitment to deliver accurate data is valuable for each project in which he is engaged.

Relevant Experience

Quonset Development Corporation, North Kingstown, RI. Serves as hydrographer and engineer of record for the dredging work associated with the ongoing efforts to develop improve and maintain the waterways and berths integral to the activities at the QDC facility. In this capacity he has both performed bathymetric surveys and been responsible for QAQC of date created from these efforts. In addition to his role regarding bathymetric work he has responsible charge of bid development, dredge design, and project procurement.

ExxonMobil, East Providence RI. Pivotal in the development of a berth monitoring program that includes annual bathymetric surveys that confirm berth clearance depths and estimates of sediment accretion that have been used in the long-term planning of dredging activities. The data that has been collected and analyzed, along with the team's expertise in permitting and procurement, has allowed the client to maintain maximum utilization of the facility.

Holcim, Providence, RI. Applies extensive experience assisting Holcim with their long-term engineering needs, including bathymetric surveys, dredge planning and design, sediment investigations, structural inspections, drone surveys, and regulatory permitting.

Rock Harbor, Town of Orleans, MA. Serves as a designer, hydrographer and engineer of record for the dredging work associated with the maintenance dredging for the Rock Harbor on Cape Cod. This small harbor has several challenges due to its shallow water and rapid sediment deposition. In this capacity he has performed bathymetric surveys and been responsible for QAQC of data created from these efforts.

Shell – Annual Hydrographic Surveys/Inspections New Haven, CT and Providence, RI. Serves as the chief hydrographer, responsible for annual berth clearance surveys and pre-and post-dredge hydrographic surveys at multiple facilities. Compiled data and submitted a report for the underwater structural inspection of a pile-supported pier at Shell's Providence, RI facility following completion of its reconstruction. Responsible for compiling all data for the Level 1 and Level 2 inspections for incorporation into a final report describing the structural conditions and describing repairs to be made based on loading conditions.

Harbor Bay Ferry Terminal, City of Alameda/WETA, Alameda, CA. Project engineer responsible for Class 1 single and multi-beam hydrographic surveys for the Alameda Harbor Bay Ferry Terminal Channel Condition Assessment Project. Deployed methods and accuracies outlined in the U. S. Army Corps of Engineers' Hydrographic Surveying Manual (EM 1110-2-1003). Using multi-beam, single-beam, and manual sounding techniques, performed a conditional hydrographic survey of the area from the beginning of the 10' contour approximately ½ mile from the entrance of the channel outward (N/W) until 10' was again reached and along the area from the Harbor Bay Isle ferry landing float to the number 1 & 2 markers of the channel.



STEPHEN RUSHFELDT, PE

Lead Geotechnical Engineer

Education

MS, Civil Engineering, Purdue University
BS, Civil Engineering, Trine University (formerly Tri-State University)

Professional Registrations/ Certifications

- Professional Engineer - IN #PE11300273, MI #3201061937

Key Expertise

- Dredge Engineering
- Site Surveys & Inspections
- Marine Construction

Mr. Rushfeldt is a lead civil engineer with a specialty in geotechnical engineering. He has over 15 years of experience in analyzing, interpreting, and solving complex geotechnical solutions across a variety of industries and has consulted on projects for numerous federal and state agencies. His technical experience includes deep foundations, slope stability, retaining walls, utility and transportation structures. Mr. Rushfeldt has managed hundreds of geotechnical investigations in a variety of environmental and geological conditions. He has also provided construction engineering services and managed quality control testing for large private developments and new highway construction projects.

Relevant Experience

Perch Point Bulkhead Evaluation, Milwaukee, WI. Evaluated existing geotechnical data to determine whether an existing bulkhead was capable of new landside loading associated with a proposed redevelopment project.

Lower Harbor CAD Cell Repairs, New Bedford, MA. Evaluated existing geotechnical data as it pertains to repairs of an existing containment and disposal cell within the Acushnet River. Also evaluated the suitability of the existing berm design for extension around an additional cell.

GLC Facility Additions, Green Bay, WI. Evaluated conceptual site plans with regard to available geotechnical data and identified risks for design. Scoped future investigation phases based on proposed project elements and proximity to existing and proposed bulkheads along the Fox River.

Duke Energy Coal Ash Pond Stability and Closure along Wabash River, IN. Led a geotechnical investigation and evaluated the stability of existing ash pond embankments immediately adjacent to the Wabash River. Analyzed impacts of removing the existing ash, including within the embankments, and collaborated on the design of a new closure cap and modifications to the embankments to support facility water management objectives.

State Road 156 Landslide along Ohio River, IN. Led a geotechnical investigation of the slide area and evaluated the existing slope conditions. Analyzed proposed repairs and assisted in the design of embankment stabilization structures and new pavement section.

Trail of Tears Substation along Mississippi River, AR. Led a geotechnical and geophysical investigation and designed deep foundation elements for electrical equipment and transmission towers compatible with loose soil deposits and proximity to a bluff along the river.

Exhibit 2
Lynker Technical Report

TECHNICAL MEMORANDUM

To:	Orton Plantation Holdings, LLC
From:	Lynker Corporation (Lynker)
Subject:	Technical Assessment of Wilmington Harbor Navigation Improvement Project Draft Environmental Impact Statement
Date:	October 24, 2025

Overview

The U.S. Army Corps of Engineers (USACE) Draft Environmental Impact Statement (DEIS) for the Wilmington Harbor Navigation Improvement Project, released in September 2025, presents numerous significant technical deficiencies in its analysis of coastal processes, including vessel wave energy dynamics and saltwater intrusion risks. The historic Orton Plantation ("Orton"), listed on the U.S. National Register of Historic Places and acknowledged in the DEIS as a historic site located within the project area, is poised to be directly and disproportionately impacted by these deficiencies and oversights. While the DEIS notes that there may be *"adverse effects"* to the property (DEIS Appendix E, page E-37), the proposed mitigation measures only focus on broad, regional compensatory measures rather than local protective actions (DEIS Appendix M). It does not address site-specific strategies to reduce shoreline erosion, hydrodynamic stress, or saltwater intrusion at Orton.

This technical memorandum summarizes an independent scientific assessment conducted by Lynker and focused on two central issues in the DEIS and how these issues are likely to impact Orton: (1) the misapplication and limitations of the coastal hydrodynamic models in the DEIS, and (2) the worsening threat of saltwater intrusion, including the inadequacy of the groundwater modeling analysis, underestimation of sea-level rise and coastal storm risk, and the compounding impacts of channel deepening, on the last remaining example of historic rice cultivation along the lower Cape Fear River.

1. Misapplication of Coastal Hydrodynamic Models

Our comprehensive technical review of the coastal hydrodynamic (Appendix I) finds that the DEIS fundamentally misapplies its coastal hydrodynamic models – most notably, the XBeach vessel wake and erosion models. This has significant implications for Orton Plantation and its extensive natural, historical, and cultural assets as recognized by the U.S. National Register of Historic Places. The geotechnical implications of these modeling deficiencies are independently assessed by an accompanying report from Foth Engineers and are thus not explicitly discussed below. In summary, our assessment identified the following critical shortcomings of the hydrodynamical models:

1. Reliance on Uncalibrated Hydrodynamic Models
The DEIS applies an uncalibrated XBeach model (e.g., Roelvink et al., 2009; Quataert et al., 2022) to assess relative changes in vessel wake propagation and bed shear stress between "with-project" and "without-project" conditions (DEIS, Section 3.3.3, p. 3-20). While the XBeach model was not used to predict absolute magnitudes of shear stress or erosion, its results still depend on nonlinear hydrodynamic interactions that are sensitive to depth and draft variations. The DEIS's reliance on simple differencing assumes a linear response that may not hold in shallow estuarine environments where wake dynamics can amplify or damp nonlinearly (Ertekin et al., 1986; Forlini et al., 2021). Although absolute calibration may not be required for relative comparisons, the absence of a sensitivity analysis leaves the uncertainty in these relative differences unquantified and potentially dominated by numerical noise rather than physical signal.

2. Undersized Design Vessel
The DEIS's advanced wake modeling relies on a 12,400 TEU (twenty-foot container equivalent units; DEIS, Table 3-2) "design vessel," yet ships as large as the 14,220 TEU *Yang Ming Warranty* are already calling at the port (WECT, 2020), as acknowledged in the DEIS (Section 2.2, p. 2-6; Attachment 5, Table 5.11, p. 26). This is also in direct contradiction to the economic modeling, which assumes a forecasted fleet of larger vessels to estimate economic benefits (DEIS, Attachment 5, Section 5.3.1.2.1.3, p. 43). Furthermore, the project's stated goal is to enable larger vessels to carry even more cargo, presumably operating at a deeper draft. Empirical relationships (e.g., Kriebel & Seelig, 2005) show that both ship wake height and wake energy increase rapidly with vessel size, especially draft. The wake energy at the shoreline scales with the square of the wave height. If the design vessel used in the XBeach models is undersized relative to the actual maximum-draft or high-displacement vessels anticipated in the future fleet, the model will systematically underestimate wake energy and therefore erosion potential. By not modeling the largest vessels (14,220 TEU rather than 12,400 TEU), the DEIS significantly understates potential erosion impacts to the Orton Point shoreline.

3. Mischaracterization of Model Results in Summary Through Averaging
The DEIS includes both maximum and average bed shear stress outputs from XBeach simulations, which capture the effects of individual, high-energy vessel wakes. However, in summarizing project impacts and mitigation needs, the DEIS narrative often emphasizes average values (such as annual or project alternative means) rather than the episodic, short-duration peak stresses that drive real-world erosion and dike overtopping risks at sites like Orton. This emphasis on long-term averages (e.g., Table 11-15, Appendix B, p. B-268) very likely understates the severity and frequency of maintenance needs, bank stabilization costs, and habitat loss over the project's 50-year planning horizon. For highly vulnerable sites like Orton, shoreline erosion impacts are more likely to be accurately characterized by maximum shear stress, e.g., Table 11-10 in Appendix B (p. B-261), which shows a 21% increase in maximum bed shear stress at Orton Point under certain project alternatives.

4. Failure to Address Wind-Wave and Other Nearshore Processes
While the DEIS evaluates multiple static water level scenarios (e.g., present-day conditions, high tide, and projected sea level rise) it does not model wind-driven waves, nearshore wave

transformation, or the combined and compounding effects of wind waves and vessel wakes. The hydrodynamic simulations are conducted under "flat water" conditions for each scenario, meaning that vessel wakes are evaluated in the absence of ambient waves, dynamic tides, or storm surges. This approach fails to capture the energetic, real-world interactions that can produce rapid water level surges and drive overtopping at the Orton Plantation dike. Wind-wave and tidal nearshore processes are known to intensify erosive forces and increase shoreline water levels, particularly under rising sea levels and storm conditions. By not simulating these dynamic and compounding processes, the DEIS likely underestimates the risk of shoreline erosion and frequency of dike overtopping at Orton, which already experiences overtopping during storm events.

5. Absence of Local Mitigation or Protective Actions at Orton Plantation
Despite identifying Orton Plantation as a listed property on the U.S. National Register of Historic Places and acknowledging an increase in both modeled bed shear stress and water elevation levels *("… increased water surface elevations were observed on the western shoreline near Orton Creek, attributed to both inbound and outbound vessel wakes"*, Appendix B, p. B-267), the Mitigation Plan (DEIS Appendix M) fails to propose any site-specific mitigation or protective measures for Orton. Instead, the plan focuses exclusively on regional, compensatory actions such as wetland restoration at Eagle Island and the Black River Corridor. These mitigation measures do not address the direct physical or ecological stressors facing Orton's shoreline, dike, or groundwater systems. No measures are proposed to reduce hydrodynamic stress, stabilize eroding banks, or prevent saltwater intrusion into the rice fields and adjacent marshlands. This omission leaves the only remaining example of historic rice cultivation on the lower Cape Fear River unprotected against the very impacts the DEIS's models underestimate, including accelerated shoreline erosion, dike overtopping, and salinization of freshwater resources.

2. Risk of Saltwater Intrusion to Orton Plantation's Rice Fields

The DEIS broadly dismisses the risks of channel dredging and deepening to saltwater intrusion into local aquifers and sensitive freshwater wetlands throughout the lower Cape Fear River system, claiming that deepening will only *"subtly"* impact existing saltwater intrusion in the region (DEIS Appendix C, Attachment 6, page II). This is despite historical examples providing strong evidence to the contrary (Appendix III). At Orton Plantation, these saltwater intrusion risks are especially acute, as demonstrated by recent observed changes in salinity levels from soil samples (Appendix IV). For Orton's historic rice fields, which depend on fresh surface water and shallow groundwater for cultivation, even minor increases in salinity can make the soils unsuitable for rice production, as has occurred elsewhere in the Cape Fear River Estuary (Hackney & Yelverton, 1990; Sherman, 2014). Further degradation to the water quality at Orton Plantation threatens the agricultural viability of the remaining rice crop (Appendix IV), and the types of oversimplified regional groundwater models applied in the DEIS are insufficient for assessing such localized risks (Appendix II).

Regionally, recently published and peer-reviewed scientific studies show that repeated channel deepening along the Cape Fear River, including the most recent 2000-2002 USACE project, has already led to widespread intrusion of saltwater, loss of forested wetlands, and the rapid expansion of "ghost forests" of dying bald cypress (Devereux et al., 2025; Magolan & Halls, 2020; Appendix III). These impacts, which were not accurately assessed in previous USACE NEPA processes (USACE, 1996), highlight how channel deepening exacerbates rising sea levels and fundamentally alters the region's hydrology. Our review of the DEIS identified the following significant flaws and/or issues as it relates to saltwater intrusion risk to the region broadly and Orton's rice fields, specifically:

1. Missing Groundwater Model Figures in Appendix C, Attachment 6
   None of the figures from the groundwater modeling (MODFLOW) analysis, which are referenced in Appendix C Attachment 6, are included in the DEIS. This oversight makes it impossible for DEIS reviewers or the concerned general public to independently assess the groundwater modeling results or evaluate the overly broad conclusions regarding the risk of channel deepening to regional aquifers, wetlands, and other habitat. Without access to these figures, any assessment of the simulations of the MODFLOW modeling lacks the transparency required from the NEPA process. This is a significant procedural fault that renders the conclusions about the potential saltwater intrusion impacts incomplete and unsupported.

2. Oversimplification of Groundwater Model Boundary Conditions
   The MODFLOW model in the DEIS is grossly oversimplified, relying on static model states and regionally averaged conditions that ignore the complex hydrogeology of the project area and the Cape Fear River system more broadly: *"All stresses and boundary conditions are considered to be constant during the 50-year simulations."* (DEIS Appendix C, Attachment 6, p. 34; further discussed in Appendix II). As Becker et al. (2010) discuss, the extent and variability of saltwater intrusion in the Cape Fear estuary are governed by complex, nonlinear interactions among river discharge, tidal cycles, and channel morphology, which the groundwater model fails to fully represent. By using a static model boundary that simplify these dynamics, the model can only characterize 'average' hydrogeologic conditions, excluding known high impact events such as King Tides that would be exacerbated by project impacts. As a result, the DEIS likely substantially underestimates both the frequency and magnitude of salinity intrusion events, leaving impacts to highly vulnerable sites like Orton Plantation's rice fields inadequately assessed.

3. Insufficient Groundwater Model Calibration
   The DEIS regional groundwater MODFLOW model lacks calibration to observed salinity, meaning that, *"Salinity results are uncertain*" (DEIS Appendix C, Attachment 6, p. IV). There is no evaluation of how key factors like channel depth, sea-level rise, or storm surge might affect saltwater intrusion risk to regional shallow and surficial aquifers, including Orton's rice fields (Appendix II). Uncalibrated or oversimplified MODFLOW models can yield highly biased predictions (Brunner et al., 2010). Without proper parameter optimization, the DEIS cannot faithfully account for the full range of potential impacts to regional or local saltwater intrusion issue, including worst-case scenarios such as groundwater gradient reversal or confining unit failure during dredging. In low-gradient

coastal groundwater systems, dredging or storm surge can flatten groundwater gradients, induce saline upconing, or even reverse flow toward the land (Saad & Habib, 2021), posing a direct risk of salinization to Orton's historic rice fields.

4. Sea Level Rise (SLR) and Coastal Storm Risk
The Orton Plantation dike is already overtopped during large coastal storms, and saltwater intrusion into the southernmost rice field is a well-documented and worsening threat exacerbated by past public works, including the 2000-2002 channel deepening (Appendix IV). The DEIS's limited SLR scenarios fail to account for the compounding impacts of ongoing sea-level rise and continued channel deepening, which elevate baseline water levels and amplify tides and storm surge. An analysis from Familkhalili and Talke (2016) showed that channel deepening has already doubled the tidal range in Wilmington and increased modeled storm surge heights by 40-60% since the late nineteenth century. Further channel deepening will increase flood hazards even more. Even modest increases in river depth can cause significant changes in frequency and magnitude of flooding, overtopping, and saline intrusion, particularly when a system is already at or beyond a critical threshold, as is the case with Orton's rice fields.

5. Impacts of Channel Deepening on Saltwater Intrusion and Wetland Loss
Past channel deepening projects have already transformed the Cape Fear from a freshwater system to one with average salinity of ~16%, making it unusable for rice irrigation and driving wetland loss and "ghost forest" formation both at Orton and in nearby coastal watersheds/wetlands. The USACE EIS for the 2000-2002 dredging project predicted minimal wetland loss (USACE, 1996; Appendix III), but subsequent remote sensing and dendrochronological studies have shown widespread conversion of forested wetlands to emergent marsh and open water (Williams et al., 2019; Magolan & Halls, 2020; Devereux et al., 2025). Importantly, the wetlands at Orton are rated "Exceptional" by the NC Coastal Region Evaluation of Wetland Significance (NC-CREWS), underscoring their critical ecological value. Given the observed changes, and the historical underestimation of dredging impacts on the Cape Fear estuary, it is highly likely that these dynamics are not well understood and that additional channel deepening would exacerbate these trends.

6. Evidence of Increasing Saltwater Intrusion at Orton (Field Data, 2020–2024)
While the DEIS downplays the risk of saltwater intrusion from the project deepening, five years of soil sample data collected from Orton Plantation's rice fields (Appendix IV) show a concerning trend of increasing sodium content and exchangeable sodium percentage. These soil samples demonstrate that Orton's agricultural soils are already under measurable salinity stress. This is consistent with both recent maintenance dredging in the Cape Fear system and with broader, peer-reviewed findings of saltwater intrusion and ecosystem change throughout the region. The fact that this historic rice field is already exhibiting early signs of saltwater stress suggests heightened vulnerability: additional channel deepening or continued saltwater intrusion could push the system beyond a critical threshold, resulting in irreversible loss of agricultural viability and historic character. None of the mitigation measures currently proposed in the DEIS directly address this risk.

Project Team

Lynker was contracted by Orton Plantation Holdings, LLC to provide an independent scientific assessment of the DEIS with a specific focus on the potential implications for Orton. Orton separately contracted with Foth Engineering to provide coastal engineering and geotechnical consulting services to assess localized impacts of the project alternatives on the Orton shoreline, including stability of the Orton revetment and dike. During our review, Lynker met with Foth Engineering to exchange scientific and engineering understanding of the DEIS, particularly as it related to the coastal hydrodynamic modeling.

The Lynker team supporting this project are listed below.

Name	Title, Role
Bill Szafranksi, MS, PH	Senior Water Resources Scientist
Soroush Sorourian, PhD, PE	Senior Coastal Scientist/Modeler
Becky Bolinger, PhD	Senior Climate Scientist
Marinus Boon, MS	Senior Environmental Scientist/Ecologist
Justin Clark, MS	Senior Hydrogeologist
Josh Sturtevant, MS	Project Water Resources Scientist
Nayoung Hur, MS	Staff Water Resources Engineer
Emma Golub, MS	Staff Water Resources Engineer

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Appendices

I. Coastal Hydrodynamic Model (XBeach) Assessment
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Appendix I: Coastal Hydrodynamic Modeling Assessment

1 Key Findings

This technical memorandum presents a review of the U.S. Army Corps of Engineers (USACE) Draft Environmental Impact Statement (DEIS) for the proposed Wilmington Harbor Navigation Project. The review focuses on the adequacy of the hydrodynamic, sediment transport, and vessel wake analyses presented in the DEIS and its supporting appendices.

While the DEIS presents a substantial modeling effort, this review identifies methodological deficiencies, questionable assumptions, and internal inconsistencies that undermine the DEIS's conclusions regarding impacts to coastal processes, bank stability, and estuarine habitats.

The DEIS primary wake analysis is fundamentally flawed, presenting contradictory conclusions from two different modeling approaches. One analysis suggests a net beneficial effect from reduced vessel traffic, while another shows increased erosive forces from larger vessels. The DEIS fails to reconcile these divergent outcomes. Furthermore, its overarching conclusion of a net beneficial impact on shoreline erosion is based on a misleading annualized metric of cumulative bed shear stress. This approach is incorrect, as erosion is a threshold-dependent process driven by peak forces from individual vessel transits, not annual averages (Main DEIS, p. 3-7, Table 3-2).

Most critically, the DEIS fails to integrate and report specific adverse findings for the historically significant Orton Point property. Despite the execution of a dedicated, high-resolution "Orton Point Model" as part of the technical studies, the results—which indicate increased bed shear stress on the property's shoreline—are summarized in a technical appendix but are entirely omitted from the main impact assessment in the DEIS. This constitutes a critical failure in the NEPA process to fully disclose reasonably foreseeable adverse impacts to a known sensitive cultural and environmental resource.

These deficiencies should be addressed to ensure the Final Environmental Impact Statement (FEIS) satisfies the rigorous, objective analysis required under the National Environmental Policy Act (NEPA).

1.1 Summary of Key Methodological Deficiencies

- **Underestimation of Vessel-Induced Erosion:** The DEIS likely underestimates the erosional energy of future vessel traffic by employing a single, non-conservative "design vessel" for its primary wake and bank stability analyses (Main DEIS, p. 3-7, Table 3-2; Appendix B, p. B-239). Environmental modeling relies on a 12,400 TEU container vessel, which does not represent the largest class of vessels whose transit provides the primary economic justification for the project (14,220 TEU per Main DEIS, p. 2-6). This discrepancy leads to a systemic underestimation of future bank erosion, habitat loss, and required mitigation.
- **Inadequate Consideration of Future Conditions:** The hydrodynamic modeling framework appears to insufficiently account for the compounding effects of future sea-level rise (SLR) and potential increases in storminess over the project's 50-year design life (Main DEIS, p. 3-3). While multiple SLR scenarios including a "high" case were considered (Main DEIS, p. 3-78; Appendix B, p. B-184), the analysis concludes that the resulting vertical change in high tides is on the order of only 1-2 inches (Appendix B, p. B-234), potentially understating the cumulative impacts on baseline water levels and the vertical extent of vessel wake impacts on riverbanks. This could lead to a flawed assessment of long-term habitat conversion and shoreline stability.
- **Reliance on Oversimplified Wake Modeling:** The vessel wake analysis for the entire fleet relies on the Vessel Wake Prediction Tool (VWPT) (Main DEIS, p. 3-7, Table 3-2;

Appendix B, Sub-Appendix B-II, p. BII-61). Such tools are known to be inadequate for capturing critical hydrodynamic processes in confined, bathymetrically complex estuaries like the Cape Fear River (Sorensen, 1997). Specifically, they fail to accurately model the primary drawdown event, the highly energetic transverse stern wave system, and non-linear wave transformations, all of which are dominant drivers of erosion (Macfarlane et al., 2012).

- **Advanced Hydrodynamic and Wake Modeling:** The USACE would replace or supplement its simplified wake prediction tools (VWPT, as cited in Main DEIS, p. 3-7) with a more sophisticated, phase-resolving wave model (e.g., a Boussinesq-type model like FUNWAVE or a fully non-hydrostatic model) for all wake analyses. This is necessary to accurately simulate the generation, propagation, and transformation of vessel wakes, including the critical effects of drawdown, stern wave energy, and non-linear shoaling in the constrained Cape Fear River (de Jong et al., 2013). The limitations of any simplified models used must be explicitly acknowledged and their influence on the final conclusions quantified. EIS should quantify the uncertainty and sensitivity of sediment transport and erosion forecasts, with explicit analysis of how results change with vessel size and peak-force events, not just annual averages.
- **Revise Impact Assessment Metric:** The DEIS must explicitly address and reconcile the contradictory conclusions of the XBeach (single-vessel, event-based) and Vessel Wake Prediction Tool (VWPT) (fleet-based, annualized) wake models. The reliance on a net decrease in annual vessel calls as the primary justification for concluding reduced erosion risk should be re-evaluated. The DEIS should focus its impact assessment on the change in the magnitude and frequency of peak erosive forces (i.e., bed shear stress and primary wave drawdown) generated by the larger design vessels that will use the deepened channel.
- **Fundamental Contradiction Between Economic and Environmental Analyses:** A significant contradiction exists between the project's economic justification and its environmental impact assessment. The National Economic Development (NED) benefits are predicated on accommodating a "forecasted vessel fleet" of larger, more efficient vessels (Main DEIS, p. ES-2, 1-8). However, the primary environmental analysis is structured around a single 12,400 TEU vessel (Main DEIS, p. 3-7, Table 3-2; Appendix B, p. B-239), which may not represent the full range or upper limit of the fleet used to calculate economic benefits. This disconnect could invalidate the DEIS's cost-benefit analysis, as the full environmental costs of the activity justifying the project are not being assessed.
- **Disconnected Sediment Transport Modeling:** The sediment transport analysis uses a split-modeling approach for cohesive (mud) and non-cohesive (sand) sediments. However, the methodology described does not appear to account for the transport of suspended cohesive sediment from the upper estuary model into the nested sand transport model for the inlet, creating a disconnect that could lead to an incomplete analysis of total shoaling (Appendix B, p. B-185).
- **Omission of Estuarine Wave Propagation Analysis:** The DEIS's wave transformation modeling, conducted using the Delft3D-WAVE spectral model, focuses almost exclusively on the impacts to oceanfront shorelines at Oak Island and Bald Head Island (Main DEIS, p. 3-14; Appendix B, Section B-7). While the model can simulate key processes like refraction, shoaling, and diffraction, its application in the DEIS is improperly constrained. The analysis does not extend into the Cape Fear River Estuary to quantify how the modified channel will change wave characteristics (height, period, direction) at critical internal locations, such as port wharves, turning basins, and ecologically sensitive riverine shorelines. This omission prevents a full assessment of

potential impacts on shoreline stability within the river and operational conditions at the port.

- **Integrated Analysis of Cumulative Impacts:** The DEIS must include a robust analysis of the cumulative erosion impacts over the 50-year project life. This analysis must numerically integrate the effects of increased vessel wake energy (from the revised design vessel fleet) with all projected sea-level rise scenarios (as outlined in Appendix B, p. B-184), including the USACE High curve (Main DEIS, p. 3-78), various tidal regimes, ambient waves in the estuarine system, and potential changes in riverine flood events. The analysis must quantify the expected long-term shoreline retreat rates and associated habitat loss.
- **Inconsistent Reporting and Dismissal of Adverse Impacts:** The DEIS consistently downplays adverse findings through selective and inconsistent reporting of its own modeling results. For the sensitive Orton Point area, the summary text highlights only the least impactful scenario. Appendix B states, "The maximum increase in bed shear stress at MLLW occurred at Brunswick under the Alternative 2 design channel where the bed shear stress and water surface elevation changed by 0.16 lbf/ft² (3% increase)" (Appendix B, p. B-295). This statement is highly misleading as it ignores more severe impacts predicted under other conditions within the same appendix. For instance, Table 11-9 shows that for the same area (Brunswick), the bed shear stress under Action Alternative 1 (AA1) is projected to increase by 11% at a higher water level (+7.77 ft MLLW) (Appendix B, p. B-260). Similarly, Table 11-11 shows that under Action Alternative 2 (AA2), the bed shear stress increases by 21% at the same higher water level (Appendix B, p. B-262). By selectively reporting only the lowest percentage increase, the DEIS obscures the full range of potential impacts and presents an unjustifiably benign assessment of risk to a critical historic resource.

1.2 Table of Key Methodological Deficiencies

The following table summarizes the most critical methodological flaws identified in this review, linking them to their potential consequences. This provides a clear framework for challenging the scientific adequacy of the DEIS.

Table 1: Summary of Key Methodological Deficiencies

Identified Deficiency	Flawed DEIS Assumption or Method	DEIS/Appendix Location	Potential Consequence of Flaw
Underestimation of Vessel Wake Energy	Environmental modeling relies on a 12,400 TEU container vessel, not the larger 14,220 TEU class that provides the primary economic justification for the project.	Main DEIS, p. 3-7, Table 3-2; Appendix B, p. B-239	Systemic underestimation of future bank erosion, habitat loss, and required mitigation.
Inadequate Consideration of Future Conditions	Insufficiently accounts for compounding effects of SLR and storminess	Main DEIS, p. 3-3; Main DEIS, p. 3-78; Appendix B, p. B-184, p. B-234	Flawed assessment of long-term habitat conversion and shoreline stability due to understated impacts on water levels and wake effects

Reliance on Oversimplified Wake Modeling	The entire fleet analysis relies on the Vessel Wake Prediction Tool (VWPT), which is inadequate for complex estuaries and fails to model key erosional processes like drawdown and stern waves.	Main DEIS, p. 3-7, Table 3-2; Appendix B, Sub-Appendix B-II, p. BII-61	Inaccurate modeling of the dominant drivers of shoreline erosion.
Lack of Advanced Hydrodynamic and Wake Modeling	Uses simplified tools (VWPT) instead of phase-resolving models (e.g., Boussinesq, non-hydrostatic) and focuses on annual averages, not peak-force events.	Main DEIS, p. 3-7; Appendix B-II	Failure to accurately simulate critical wake effects (drawdown, stern waves, shoaling); unquantified uncertainty in conclusions.
Contradictory Models and Flawed Impact Metric	Fails to reconcile contradictory conclusions from XBeach and VWPT models; relies on reduced vessel calls instead of peak erosive forces as the primary impact metric.	Appendix B-11, B-II	The conclusion of reduced erosion risk is not scientifically supported and ignores the impact of peak events under larger, more erosive vessels.
Disconnect Between Economic and Environmental Scenarios	Economic benefits are calculated based on a "forecasted vessel fleet," while primary environmental wake impacts are modeled using a single, potentially non-conservative, vessel size.	Main DEIS, pp. ES-2, 1-8, 3-7; Appendix B, p. B-239	The DEIS presents a skewed cost-benefit analysis where the full environmental costs of the justifying economic activity are not assessed.
Omission of Estuarine Wave Propagation Analysis	Wave transformation modeling focuses exclusively on oceanfront shorelines and does not extend into the Cape Fear River Estuary.	Main DEIS, p. 3-14; Appendix B, Section B-7	Incomplete assessment of impacts on shoreline stability and operational conditions within the river and at the port.
Insufficient Analysis of Cumulative Impacts	Assessment focuses on single-vessel pass events rather than the cumulative, long-term (50-year) erosional effect of multiple vessel passages compounded by all projected SLR scenarios, tidal regimes, ambient waves, and flood events.	Main DEIS, p. 3-3, 3-87; Appendix B, p. B-184, B-234.	Failure to quantify expected long-term shoreline retreat rates and associated habitat loss.
Inconsistent Reporting and Dismissal of Adverse Impacts	Selectively reports the least impactful scenario while omitting more severe predictions found elsewhere in the appendices.	Appendix B, p. B-295; Appendix B, p. B-260; Appendix B, p. B-262	Obscures the full range of potential impacts and presents an unjustifiably benign assessment of risk to a critical historic resource.

Disconnected Sediment Transport Regimes	Use of a one-way nested model that passes hydrodynamic data but not suspended cohesive sediment concentrations to the sand transport model.	Appendix B, p. B-185	Inaccurate prediction of total shoaling rates and sediment composition in the lower estuary and inlet by omitting the contribution of fine sediments from upstream.

2 Supporting Analysis

This section provides the detailed technical basis for the key findings and recommendations presented above. It deconstructs the methodological approaches within the DEIS and highlights specific areas of scientific concern by referencing the provided documentation.

2.1 Assessment of Hydrodynamic, Wave and Sediment Transport Modeling

The proposed project involves significant modifications to the channel geometry—deepening from 42 feet to 47 feet and associated widening (Main DEIS, p. ES-2; Appendix A, p. A-2). These changes will fundamentally alter the hydrodynamics and salinity regime of the Cape Fear River estuary. The DEIS acknowledges that the project will allow "more ocean water to mix with the freshwater in the river," causing "increased salinity concentrations" and a resulting shift in wetland vegetation (Main DEIS, p. ES-3). The accuracy of these predictions depends entirely on the quality of the underlying numerical models.

2.1.1 Disconnected Sediment Transport Regimes

The Channel Morphology Study (Appendix B, Section B-9) employs a split-modeling approach to simulate sediment transport, dividing the estuary into two distinct regimes: a "Large domain FLOW/MOR model" for cohesive sediment (mud) in the upper estuary and a "Nested domain coupled FLOW/WAVE/MOR" for non-cohesive sediment (sand) near the inlet (Appendix B, p. B-185). The upstream boundary condition for the large domain is defined by a Total Suspended Solids (TSS) concentration, implicitly assuming all riverine suspended sediment is cohesive (Appendix B, p. B-186).

The two models are linked via a "one-way 'offline' nested approach," where the large domain model provides hydrodynamic boundary conditions (water levels and currents) to the nested model (Appendix B, p. B-185). However, the documentation fails to describe any mechanism for transferring the suspended cohesive sediment concentrations from the large domain into the nested domain. The models appear to be initialized with different sediment types in isolation—cohesive sediment upstream of Reeves Point in the large model and non-cohesive sand in the nested model (Appendix B, pp. B-193, B-194).

This methodological disconnect is a significant concern. While fine sediment from the upstream rivers is simulated spreading throughout the large model domain, it appears this sediment flux is not passed to the nested model. Consequently, the simulation of sand transport at the inlet occurs without accounting for the presence, transport, deposition, or potential cohesive influence of the mud being transported from upstream. This omission could lead to an inaccurate representation of the total shoaling budget, sediment composition, and bed dynamics in the lower estuary. The DEIS must clarify whether and how the flux of cohesive sediment from

the upper estuary was accounted for within the non-cohesive transport model for the inlet reaches.

2.1.2 Model Parameterization: Bed Roughness

A critical parameter for the calibration and accuracy of any hydrodynamic model is the specification of bed roughness, or friction. The documentation for the Delft3D modeling is deficient in its description of this parameter. The primary hydrodynamic model analysis (Appendix B, Section B-6) lacks a clear description of the bed roughness formulation (e.g., Manning's n, Chezy coefficient) or the values used.

Notably, for the simplified 2D tidal analysis, the report states that "Bottom friction and eddy viscosity are uniform throughout the domain" (Appendix B, p. B-219). Similarly, the non-cohesive sediment transport model used uniform values for current and wave-related roughness heights (Appendix B, p. B-194). Using a single, uniform roughness value across the entire model domain is an oversimplification that fails to represent the known geologic diversity of the Cape Fear River system, which includes areas of sand, silt, clay, and rock (Main DEIS, p. 3-66). This can lead to significant errors in modeled current velocities, water levels, and sediment transport pathways.

2.1.3 Model Parameterization: Wave Boundary Conditions

The Wave Transformation Model (Appendix B, Section B-7) relies on an overly simplified method for its offshore boundary conditions. The model applies directional wave spectra from a single offshore buoy, NDBC 41013, "uniformly along the offshore boundaries of the offshore grid" (Appendix B, p. B-111). This approach assumes that the wave field is homogenous across the entire offshore boundary, which is not physically realistic.

The DEIS itself acknowledges the significant errors this method introduces, particularly for wave direction, where Mean Absolute Errors (MAEs) were as high as 46 degrees. The report attributes this poor performance to "the necessity of specifying spatially uniform boundary conditions over a relatively large area" (Appendix B, p. B-114).

2.1.4 A more accurate and standard approach is to use dynamic downscaling, where boundary conditions for a local, high-resolution model are derived from a larger regional or global wave model such as NOAA’s WAVEWATCH III, etc.Failure to Use a Coupled Wave-Circulation Model for Storm Surge

Based on my review of Appendix B of the DEIS, the wave model (Delft3D-WAVE) and the hydrodynamic model (Delft3D-FLOW) are not fully coupled for the storm surge analysis. This represents a significant methodological flaw. During storm events, the total water level is a combination of astronomical tide, barometric setup, wind-driven surge, and wave-induced setup. By omitting the wave model from the storm surge simulations, the analysis fails to account for wave setup, which can be a substantial component of total storm-induced water levels. Best practices for storm surge modeling involve the use of tightly coupled circulation and spectral wave models to capture these critical wave-current interactions. The DEIS's uncoupled approach is likely to result in an underestimation of the project's potential to exacerbate storm surge and flooding within the estuary.

While the Channel Morphology Study (Appendix B, Section B-9) does use a "nested domain coupled flow-wave-morphology model," it is described as a "one-way 'offline' nested approach". This means the large-domain flow model provides boundary conditions for the smaller wave model, but there is no feedback from the wave model back to the circulation model. This is not

the "tight" or "integral" coupling necessary to accurately simulate the combined effects of waves and surge.

2.1.5 Omission of Harbor Resonance (Seiching) Analysis

The DEIS contains no analysis of the project's potential to alter the resonant characteristics of the harbor. Modifying the geometry and depth of a semi-enclosed basin like Wilmington Harbor can change its natural oscillation periods. If these new resonant periods align with the periods of incoming long-period waves (infragravity waves), it can lead to significant amplification of wave energy within the harbor, a phenomenon known as harbor resonance or seiching. This can create hazardous conditions for moored vessels and port infrastructure. A comprehensive impact analysis should include a study to identify the harbor's resonant modes and assess whether the proposed modifications will increase the risk of dangerous oscillations.

2.1.6 Model Parameterization: Wind Forcing

The accuracy of a nearshore wave model is highly dependent on the quality of the wind fields used to drive it. The DEIS states that the wind forcing for the wave model was derived from the NCEP Climate Forecast System Reanalysis (CFSR) dataset, which has a coarse spatial resolution of ~38 km and a temporal resolution of 3 hours (Appendix B, p. B-113). This resolution is inadequate for resolving critical, high-frequency coastal meteorological phenomena, most notably the land-sea breeze cycle (Drobinski et al., 2018; Fonseca-Hernández et al., 2021).

The sea breeze is a dominant driver of local wave generation and nearshore processes in many coastal systems, creating strong diurnal patterns in wave energy, currents, and sediment transport (Pattiaratchi et al., 1997; Pattiaratchi and Masselink, 1997). The model's own output appears to show a diurnal signature in the wave record (Appendix B, Figure 7-4, p. B-115), but the coarse, 3-hourly wind input cannot accurately resolve the physical drivers of this signal. This suggests that the model may be poorly calibrated or producing physically unrealistic results.

A more appropriate and accurate approach would be to use a high-resolution atmospheric model product, such as the High-Resolution Rapid Refresh (HRRR) model, which provides wind data at 3-km spatial resolution and hourly temporal resolution. Additionally, a more recent validation period should be selected for which both high-resolution wind data and wave observations from NDBC 41013 are available. This would allow for a more scientifically defensible validation of the model's ability to reproduce locally-driven wave dynamics.

2.2 Assessment of Vessel Wake and Bank Erosion Analysis

The primary driver of increased physical stress on the Cape Fear River system will be the wakes generated by larger vessels. The DEIS's assessment of these impacts is therefore a cornerstone of its environmental analysis.

2.2.1 The Criticality of the Design Vessel Selection

The advanced hydrodynamic modeling of vessel wakes (using XBeach) was performed for a single design vessel: a 12,400 TEU container ship (Appendix B, p. B-237). This choice of a single, non-conservative design vessel is a critical deficiency. The entire economic justification for the project is predicated on accommodating a "forecasted vessel fleet" of larger, more efficient Neo-Panamax vessels to achieve transportation cost savings. This creates a fundamental disconnect: the project's economic benefits are calculated based on large ships, while the environmental impacts are modeled using a significantly smaller vessel.

This discrepancy is not theoretical. The Port of Wilmington has already serviced vessels that are substantially larger than the 12,400 TEU vessel used in the DEIS modeling. In October 2020, the port welcomed the 14,220 TEU Yang Ming Warranty. More recently, the 15,500 TEU ZIM Mount Rainier became the largest ship to ever call the port. These vessels, along with others like the 15,072 TEU CMA CGM Brazil that are active on the U.S. East Coast, are representative of the modern fleet the project is intended to attract. By selecting a design vessel that is smaller than ships already calling the port, the DEIS fails to assess the impacts of the very fleet it purports to serve.

The technical consequences of this omission are significant. Wake energy, particularly the drawdown component, which is often critical for bank slumping, is highly sensitive to the vessel's size, hull form, speed, and blockage factor (the ratio of the vessel's cross-section to the channel's cross-section). By failing to model the largest class of vessels that are central to the project's justification, the DEIS likely underestimates the maximum wake forces and resulting shear stress that will be exerted on the riverbanks, leading to an unreliable forecast of future erosion. The DEIS must provide a complete and transparent description of the design vessel(s) used and demonstrate that their characteristics are consistent with the fleet forecast in the economic analysis.

2.2.2 Quantitative Underestimation from Design Vessel Selection

To quantify the potential underestimation of wake impacts, a back-of-the-envelope calculation was performed comparing the DEIS's 12,400 TEU design vessel (MSC Lauren) against the larger 14,220 TEU vessel (YM Warranty) already calling at the port. Using the Kriebel & Seelig (2005) empirical formulation cited in the DEIS appendices, peak secondary wave heights were estimated for both vessels at common transit speeds. The results show that at a speed of 12 knots, the larger YM Warranty generates a peak wave height approximately 11.4% greater than the vessel used in the DEIS analysis. At a higher speed of 16 knots, the wave height is 9.6% greater. This increase in wave height is significant because erosive forces, such as bed shear stress, are typically proportional to the square of the wave height. A ~10-11% increase in wave height can therefore translate to a 20-24% increase in erosive force. This simple comparison demonstrates that by excluding the largest vessels currently in service from the primary analysis, the DEIS has materially underestimated the potential for increased shoreline erosion.

2.2.3 Vessel Wake Modeling Methodology and its Limitations

The DEIS uses two primary tools for wake analysis: the advanced XBeach model for primary waves from a single design vessel, and the simplified Vessel Wake Prediction Tool (VWPT) for a fleet analysis (Main DEIS, p. 3-7, Table 3-2). While XBeach is a capable model, the reliance on VWPT for the fleet analysis is a major concern. VWPT is based on empirical equations and has significant limitations (Sorensen, 1997) [1]:

- **Poor Prediction of Stern Waves:** VWPT and similar tools are notoriously poor at predicting the secondary wave system, particularly the transverse stern wave, which is often the most erosive component for full-form container ships (Macfarlane et al., 2012).[2]
- **Inability to Model Drawdown:** These tools typically fail to model the "drawdown" effect—the initial depression of the water surface as the vessel's hull displaces water. This is a critical erosion mechanism that is ignored by simplified models (de Jong et al., 2013).
- **Handling of Complex Bathymetry:** Empirical models cannot accurately simulate complex wave transformations like shoaling and refraction that occur in the irregular bathymetry of the Cape Fear River (Appendix B-VI).

A scientifically defensible analysis requires the use of more advanced, physics-based numerical models for the entire assessment, not just a portion of it.

The DEIS uses an uncalibrated model and misleading annualized metrics to conclude erosion will decrease, contradicting its own data showing that peak erosive forces (bed shear stress) from individual large vessels will significantly increase at some locations. Erosion is an event-driven process governed by maximum bed shear stress, not annual averages. At least one location was projected to experience a doubling of peak bed shear stress under scenario AA1 (Ft. Caswell , +102%; Appendix B, Table 11-7, p. B-258). By relying on annualized metrics (Appendix B-II, Figure 87, p. II-61), the DEIS obscures these increases in peak erosive risk that are most relevant to physical channel change. Bank erosion is a threshold-driven physical process. Sediment is mobilized and erosion is initiated only when the force exerted by an event (i.e., bed shear stress) exceeds a critical threshold for the bank materials (Herbert et al., 2018). An annual average or cumulative stress value is not a reliable indicator of erosion risk, as it averages out the high-impact events that are responsible for morphological change. The XBeach model, which analyzes the peak stress from a single design vessel event, is therefore the more relevant tool for assessing the risk of bank instability and erosion. By failing to reconcile the models and relying on a misleading metric, the DEIS mischaracterizes the nature of the erosion risk, substituting a discussion of reduced traffic frequency for a necessary analysis of increased impact magnitude.

2.2.4 Unaddressed Wave Breaking and Dissipation Parameterization in XBeach

The non-hydrostatic mode of the XBeach model has known shortcomings related to the simulation of wave breaking. Non-hydrostatic formulations can delay the onset of modeled wave breaking, which leads to inaccurate energy dissipation, unless the model's vertical resolution is sufficient or specific breaker parameterizations are carefully handled and tuned (Smit et al., 2010). The DEIS and its appendices provide no documentation that these specific model parameters were tuned, that multiple vertical layers were used, or that any specialized breaking criteria were implemented to ensure the accurate simulation of wave breaking and dissipation. This issue, compounded by the acknowledged lack of any model calibration, introduces another significant source of unquantified uncertainty and calls into question the accuracy of the model's energy dissipation calculations and resulting bed shear stress predictions.

2.2.5 Inadequate Analysis of Tidal Scenarios

The vessel wake analysis is further flawed by its failure to model the full range of tidal conditions. The XBeach Run Matrix (Table 11-4 in Appendix B) shows simulations were conducted at MLLW and MLLW-relative water levels, but conspicuously omits simulations at Mean Higher High Water (MHHW). This is a critical omission, as water level is a primary control on bank erosion, determining the elevation at which wave energy attacks the bank profile. At MHHW, vessel wakes impact the upper bank and marsh edge, which are often less consolidated and more vulnerable to scour than the lower bank toe. Standard coastal engineering practice requires analysis across a range of representative water levels, including MHHW, to capture the different erosion mechanisms and identify worst-case impacts. By failing to model this routine high-tide condition, the DEIS has ignored a key mechanism of shoreline degradation and provided an incomplete assessment of the project's risks.

2.2.6 Failure to Model Multi-Vessel Interactions

The DEIS's vessel wake analysis is limited to simulating the passage of a single vessel in isolation, which fails to represent the complex hydrodynamic environment of an active navigation channel where ships frequently pass or overtake one another. The interaction of wakes from two or more vessels is a critical, non-linear process. When the wave systems from multiple ships superimpose, constructive interference can occur, leading to wave heights and drawdown depths that are significantly larger than those produced by any single vessel acting alone. These amplified, intermittent events may represent the "worst-case" loading conditions for the riverbanks and could be the primary drivers of episodic, large-scale erosion. This is not a limitation of the modeling technology itself, as physics-based models like XBeach are capable of simulating multiple moving vessels. By omitting any analysis of multi-vessel scenarios, the DEIS has failed to assess a realistic and potentially dominant mechanism for shoreline impact.

2.2.7 Omission of Ambient Wave Conditions

The vessel wake analysis was conducted in the absence of ambient waves, representing an unrealistic "calm water" scenario. This omission is a significant deficiency because the interaction between vessel wakes and the existing sea state is a critical factor in determining the total wave energy that impacts the shoreline. Ambient waves, generated by wind, alter the local water depth, wave phase, and energy field. This creates the potential for constructive or destructive interference with the ship wake, which can significantly change the resulting wave crest and trough amplitudes. By failing to model these interactions, the DEIS does not account for the potential amplification of wave heights and associated erosive forces. Furthermore, the characteristics of wave breaking and runup on the riverbanks are materially affected by the presence of ambient waves. The background water level, currents, and spectral energy provided by the sea state are all crucial for non-linear interactions with the vessel wake. Consequently, any prediction of shoreline impact or morphological response is inherently dependent on the ambient sea state. By excluding this variable, the DEIS analysis fails to assess a full range of realistic conditions and likely underestimates the total hydrodynamic forces acting on the riverbanks.

2.2.8 Invalid Reliance on Simple Model Differencing

The DEIS's comparative analysis, which simply subtracts the "without project" results from the "with project" results to determine impacts, is methodologically flawed. This approach assumes a linear system where impacts can be superimposed. However, ship wake interactions with bathymetry and currents are highly nonlinear, particularly in shallow estuaries where small changes in depth or vessel draft can cause disproportionate, nonlinear amplification or damping of waves (Ertekin et al., 1986; Forlini et al., 2021). Therefore, simply differencing the outputs of two model runs does not represent the true physical change in erosive forces.

This flawed comparative approach is further compounded by the acknowledged lack of model calibration and the absence of any documented sensitivity analysis. Without calibration, the model's outputs have no verifiable accuracy. Without sensitivity tests, the uncertainty bounds on the calculated differences between scenarios are unknown. The reported changes could be within the model's margin of error or simply be numerical noise rather than a representation of a real physical change.

2.3 Failure to Adequately Assess Impacts on Bank Stability, with Specific Focus on Orton Point

The DEIS is critically deficient under NEPA by failing to analyze and disclose potentially significant adverse impacts to the Orton Point property, a known, highly sensitive historical and environmental resource located directly adjacent to the navigation channel.

2.3.1 Critical Omission of Orton Point in the DEIS Impact Assessment

The Orton Plantation property is listed on the National Register of Historic Places and includes a 1.62-mile-long historic earthen revetment, 320 acres of historic rice fields, and a designated 500-foot underwater archaeological zone extending into the Cape Fear River. It is a known sensitive receptor.

The USACE's own modeling efforts, detailed in Appendix B-VI, included a specific, high-resolution model grid named the "Orton Point Model" (Appendix B-VI, pp. 13, 26, 31, Figures 13, 26, 33). The creation of this dedicated model domain demonstrates that the USACE was aware of Orton Point as a specific area of concern requiring detailed analysis.

Despite this, the main body of the DEIS, particularly Section 3.3.3 "River Shorelines," which is the primary section for discussing vessel wake impacts, contains no mention of Orton Point or the results from this specific model domain. Appendix B of the DEIS succinctly summarizes the XBeach model results for this location (p. B-295).

This represents a procedural failure in the NEPA process. The purpose of an EIS is to present a comprehensive and transparent analysis of environmental consequences to inform decision-makers and the public. By performing a detailed analysis that indicates increased stress on a historic site and then omitting those findings from the primary impact statement, the USACE has failed to provide a full and transparent disclosure of the project's reasonably foreseeable adverse effects. This omission actively conceals a potentially significant adverse impact on a National Register-listed property, undermining the credibility of the entire cultural resources and coastal processes assessment within the DEIS.

2.3.2 Analysis of Increased Erosion Risk at Orton Point Based on Appendix Data

The results that were omitted from the main DEIS body but are present in Appendix B clearly indicate an increased risk to Orton Point.

- The summary in Appendix B, Section B-11.3.5 states: "Inbound and outbound transit of the alternative channel designs appears to increase bed shear stresses on both sides of the channel" at Orton Point (p. B-295).
- The summary quantifies this impact, noting that for the AA2 scenario at MLLW, "the maximum increase in bed shear stress at MLLW occurred at Brunswick under the Alternative 2 design channel where the bed shear stress and water surface elevation changed by 0.16 lbf/ft² (3% increase) and -0.1 ft (3% decrease)" (Appendix B, p. B-295). The raw data tables confirm this finding for an outbound transit (Appendix B, p. B-265, Table 11-14).
- The finding that bed shear stress can increase even while the corresponding water surface elevation decreases is a critical physical nuance that is completely absent from the main DEIS. It demonstrates that the primary wave drawdown can be a more significant driver of bed stress and bank instability than the secondary waves that follow. This hydrodynamic pressure drop can induce pore water pressure gradients within the bank material, reducing its stability and making it more susceptible to failure.

- Given the historic nature and earthen construction of the revetment at Orton Point, any increase in bed shear stress at the toe of the structure poses a direct threat to its stability. The DEIS provides no analysis of this risk of undermining and potential failure.

2.4 Identification of Inconsistencies and Contradictions

Beyond specific methodological flaws, the DEIS appears to suffer from an overarching contradiction between its economic rationale and its environmental conclusions.

2.4.1 The Core Contradiction: Economics vs. Environment

The entire purpose of the project is to generate National Economic Development (NED) benefits by accommodating larger and more numerous vessels (Main DEIS, p. ES-2, 1-8). This creates an incentive within the economic analysis to forecast a future with a robust fleet of large Neo-Panamax ships. However, in the environmental analysis, there is an opposing incentive to minimize predicted impacts. This can be achieved by using a less conservative design vessel, as was done in the primary wake analysis (Appendix B, p. B-239). A thorough review of the DEIS must compare the assumptions in the Economics Appendix with the inputs to the Appendix B Vessel Wake study. Any significant discrepancy is evidence of an analysis that is biased toward project approval, as it assesses the impacts of a different, less damaging project than the one being justified economically.

2.4.2 Contradictory Impact Assessments

An integrated EIS must ensure that the findings of one technical analysis are consistently carried through to all others. For instance, the hydrodynamic modeling predicts changes in tidal current velocities (Appendix B, Section B-6). These altered currents will contribute to the total shear stress on the riverbanks. The bank stability analysis must therefore consider the combined stress from both ambient currents and vessel wakes. The vessel wake analysis in Appendix B, Section B-11, appears to model wake effects in isolation, failing to assess the compounding impacts and underestimating the total erosional stress.

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Appendix II: Groundwater Modeling and Hydrogeologic Assessment

Orton Plantation, located along the west shore of the Cape Fear River, represents a particularly vulnerable area for saltwater intrusion. Saltwater intrusion into local aquifers is already a documented and ongoing concern in the Cape Fear River region. For example, U.S. Geological Survey studies have identified the progressive inland migration of the saltwater interface within the Castle Hayne and Peedee aquifers, driven by reduced freshwater pressure gradients (Harden et al., 2003; McSwain et al., 2014). These changes are attributed to a combination of groundwater withdrawals, sea-level rise, and the naturally thin and discontinuous confining units that allow saltwater to move inland through preferential pathways.

This appendix provides a technical review of the groundwater modeling report (Appendix C, Attachment 6, "*Port of Wilmington Groundwater Modeling Update"*) that supports the Draft Environmental Impact Statement (DEIS) for the Wilmington Harbor Navigation Project. This review focuses on identifying data gaps, modeling limitations, and potential underestimations of saltwater intrusion risk to Orton Plantation.

All references to the DEIS in this appendix specifically refer to DEIS Appendix C, Attachment 6 "*Port of Wilmington Groundwater Modeling Update*" (hereafter, referred to as the "*groundwater model report*" or "*report*").

Missing Figures in the DEIS

The DEIS Appendix C, Attachment 6 references hundreds of figures throughout the groundwater modeling report. These figures include cross-sections showing where dredging penetrates aquifers, calibration plots demonstrating model accuracy, predictive scenario results showing salinity impacts, and sensitivity analysis outputs. However, after reviewing these materials, it is apparent that none of these figures have been included anywhere in the DEIS or its appendices.

Without these modeling figures, independent verification of the modeling approach is very difficult, and at times, impossible. When the DEIS claims the deepening project will have "*minor*" impacts, reviewers cannot examine the spatial patterns in the missing figures to assess whether this conclusion is justified. When the report states the model "*was not calibrated to salinity changes*" and "*salinity results are uncertain*" (p. IV), reviewers cannot see the calibration plots to judge how much uncertainty exists. A groundwater analysis that references hundreds of figures which were not included prevents meaningful public participation.

Groundwater Model Review

Despite the absence of figures, Lynker conducted a review of the groundwater model to the fullest extent possible, relying on the written descriptions and tables of the model set up, calibration and scenarios to evaluate the DEIS' conclusions regarding saltwater intrusion are supported. The 2020 "*Wilmington Harbor, North Carolina Navigation Improvement Project - Integrated Section 203 Study & Environmental Report*" was also reviewed as the groundwater model discussed in that report was used as the basis for the model used in the DEIS, referred to as the 2019 Groundwater Management Associates (GMA) model.

It is important to note that the DEIS groundwater model is explicitly described as "*a regional model intended to simulate large-scale processes... it does not model local-scale processes*" (p. 84). As such, it cannot accurately resolve localized impacts in hydrologically sensitive areas such as Orton Plantation. The coarse regional approach, referred to as the "*yardstick approach*" (p. IV), still provides useful regional-scale insights from which preliminary conclusions can be drawn.

Within the modeling domain, Orton Plantation is located near the *MOTSU Area of Interest* where modeling shows the deepening will cause "*small increases in heads*" (p. 96). However, the DEIS acknowledges that in this area, "*with the deepening, the aquifer is thinned or removed beneath the channel and the water backs up, increasing the head*" (p. 97). This description indicates fundamental alterations to groundwater flow patterns. These flow regime changes, and the associated saltwater intrusion, could very likely alter the specific hydrologic conditions required for successful rice cultivation at Orton Plantation, among other impacts.

Model assumptions and calibration

The groundwater model is based on the 2019 GMA model which was calibrated as a 2017 steady state model, using a 2011-2018 calibration period. From our review, the model has not been updated with any post-2018 data. As a result, the model may not simulate more recent hydrologic changes, including population growth and the model's representation of variable pumping demands, and continued sea level rise. Our review of the model assumptions includes:

- The model relies on 2011-2018 average pumping rates, and the report notes *"[there is] likely significant errors in the pumping data… [which could include] missing wells, underestimated annual average pumping rates or placement of the wells in the wrong aquifer*" (p. 36). Data show that groundwater levels have declined and withdrawal stress has increased in coastal aquifers, indicating growing pressure on the system (McSwain et al., 2014; NCDWR-GWRB, 2024). Using these historical average values smooths out both growth trends and seasonal variations that directly influence hydraulic gradients and saltwater intrusion potential.
- Although the groundwater model is intended to offer an assessment of saltwater intrusion risks, the report states that "*this model was not calibrated to salinity changes due to the lack of data and the short time scale of the calibration period*" (p. IV). While heads were calibrated against observed groundwater levels with acceptable residuals, this does not ensure accurate simulation of salinity transport dynamics. The report itself cautions that "*salinity results are uncertain"* (p. IV), yet the DEIS concludes the model's salinity output as evidence of "*minor*" impact.
- For predictive scenarios, the model assumes a set of constant boundary conditions: "*All stresses and boundary conditions are considered to be constant during the 50-year simulations. This assumes that all changes (the deepening, pumping, sea level rise) occur instantaneously on the day the deepening is completed and remain constant for the 50-*

year life of the project" (p. 34). This assumption eliminates transient effects of tidal cycles, droughts, storm surges, and gradual sea-level rise, all of which are key drivers of short-term saltwater intrusion events in the region. In reality, saltwater intrusion occurs episodically and nonlinearly, often triggered by compounding events, which the current steady-state framework cannot replicate.

- The coarse spatial resolution of the model and homogenized aquifer properties cannot capture thin or discontinuous units that govern vertical groundwater leakage and local hydrologic gradients, like those near the Orton property. This is not necessarily a limitation to the model, as the model is intended to "*simulate large-scale processes*" (p. 84), but significant limitations exist of such regional models. For example, the model results cannot quantify localized or transient salinity changes. Therefore, the model cannot definitively conclude that deepening-related impacts will be minimal across the region.
- The groundwater model assumes that the Cape Fear River is a gaining reach throughout most of the model area: "*when computed for the whole model, flow entering the groundwater domain from the Cape Fear River is less than 0.02% of the recharge and less than 0.2% of the pumping across the whole domain*" (p. 103). However, low-gradient groundwater dynamics are known to vary seasonally, and under increased pumping pressure.

Collectively, these model assumptions simulated a static hydrologic system that fails to capture the evolving nature of salinity intrusion dynamics expected over the project's planning horizon. By averaging temporal and spatial variability, the model smooths out conditions such as tidal forcing, seasonal pumping, and storm events, which are most likely to drive future change in the lower Cape Fear River region, including Orton Point.

Focusing on Saltwater Intrusion near Orton

Regional data already confirm vulnerability to saltwater intrusion is real: chloride levels continue to increase throughout the Cape Fear area (Talton, 2014), and North Caroline Department of Water Resources (NCDWR) data shows elevated chloride in the Peedee, Black Creek, Upper and Lower Cape Fear aquifers. Even the monitoring data from the DEIS shows a maximum Peedee Aquifer salinity of 7.4 ppt (p. 5), which is 15 times higher than the EPA secondary drinking water standard of 0.5 ppt (p. I). Although salinity data are "*sparse both spatially and temporally*" (p. 5), this could mean that the actual intrusion is likely more extensive than documented.

Cross sections across the Orton Plantation area show that the Castle Hayne confining unit is discontinuous from north to south (Figures 1 and 2). In the northern portion of the property, the Castle Hayne confining unit is absent, leaving the Castle Hayne aquifer partially unconfined and more susceptible to rapid salinity changes from the Cape Fear River. The top of the Castle Hayne aquitard occurs at roughly 45-50 feet below land surface, while the Peedee aquitard lies much deeper, around 100 feet. Therefore, any deepening of the navigation channel that approaches this

upper 45-50 foot zone could increase hydraulic connectivity or breach the Castle Hayne aquifer (as illustrated in Scenarios 2 and 3, p. III-IV), resulting in significant localized pathways for saltwater intrusion that cannot be reversed.

Orton Pond

Due to the Orton Plantation's significance as a historical site, especially its history as a rice farm, there is reasonable concern that major changes to the river channel will result in an increased salinity level in the groundwater. Irrigation water for the rice fields is sourced from Orton Pond located approximately one mile West of the Orton rice fields. Orton Pond is a gaining pond, with an average depth of 12 feet. Based on geologic cross sections of the area (Figure 3), Orton Pond is too shallow to connect to deeper aquifer layers like the Caste Hayne. Our analysis of the local hydrogeology suggests it is fed by the surficial aquifer system and other surface water runoff.

Available groundwater data from wells within a 5-mile radius of Orton Pond (Figure 4; NWQMC) is limited. Despite data sparsity, calcium, sodium, and chloride concentrations from nearby wells show increasing trends over the past 50 years (Figure 5). Specific conductance — a direct indicator of salinity (USGS, 2019) — shows a similar increasing trend (Figure 6), suggesting progressive saltwater intrusion into the aquifer that feeds Orton Pond. Channel deepening would alter riverbed geometry and properties, changing the interaction between the Cape Fear River and the surficial aquifer. Given that salinity levels appear to be rising in the aquifer feeding Orton Pond, any project-induced changes to this hydrological relationship could accelerate saltwater intrusion to levels that render the pond unusable as an irrigation source for the historic rice fields.

Conclusion and Recommendations

Because the Orton Plantation area is already under stress from existing saltwater intrusion, any project impacts that alters river stage, hydraulic gradients, or salinity dynamics risks exacerbating ongoing saltwater intrusion. The DEIS acknowledges that deepening "*may subtly adjust the direction or velocity of existing saltwater intrusion*" (p. II), yet it concludes that these effects will be minor compared to larger regional trends. This conclusion overlooks the compounding potential of the project: while channel deepening may not create a new intrusion pathway, it could intensify current conditions in localized, vulnerable reaches like the Orton Plantation where thin confining units already permit vertical and lateral saline migration.

To address these limitations, we recommend that the groundwater model be updated with more recent and site-specific data. Although new data collection can be challenging, a project of this scale and potential impact warrants the installation of dedicated monitoring wells to record groundwater levels and chloride concentrations for model calibration. Updated calibration data should allow the model to better represent seasonal variability and tidal influences, current factors that are not captured in the current steady-state configuration.

The modeling framework itself could also benefit from refinement using modern computational resources. With improved numerical stability and expanded cloud-based processing capacity, MODFLOW models can now accommodate finer grid resolutions and broader sensitivity testing without frequent computational failure. Incorporating these advances would enable a more robust representation of transient processes and improve the model's ability to evaluate local responses to channel deepening, as is standard practice. Some of these methods are described in ASTM "*Standard Guide for Application of a Numerical Groundwater Flow Model to a Site-Specific Problem*".

Under its current configuration, the groundwater model can only support a regional-scale conclusion that deepening will have "minor" or "negligible" impacts. However, without higher-resolution data and transient calibration, the model cannot rule out meaningful local impacts, particularly in areas like Orton Plantation, where small shifts in hydraulic gradient could have disproportionate effects on salinity intrusion and long-term aquifer health. Protecting groundwater quality in the lower Cape Fear region requires a modeling approach that can meaningfully represent both regional processes and local vulnerabilities using the best available data and methods.

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Figures

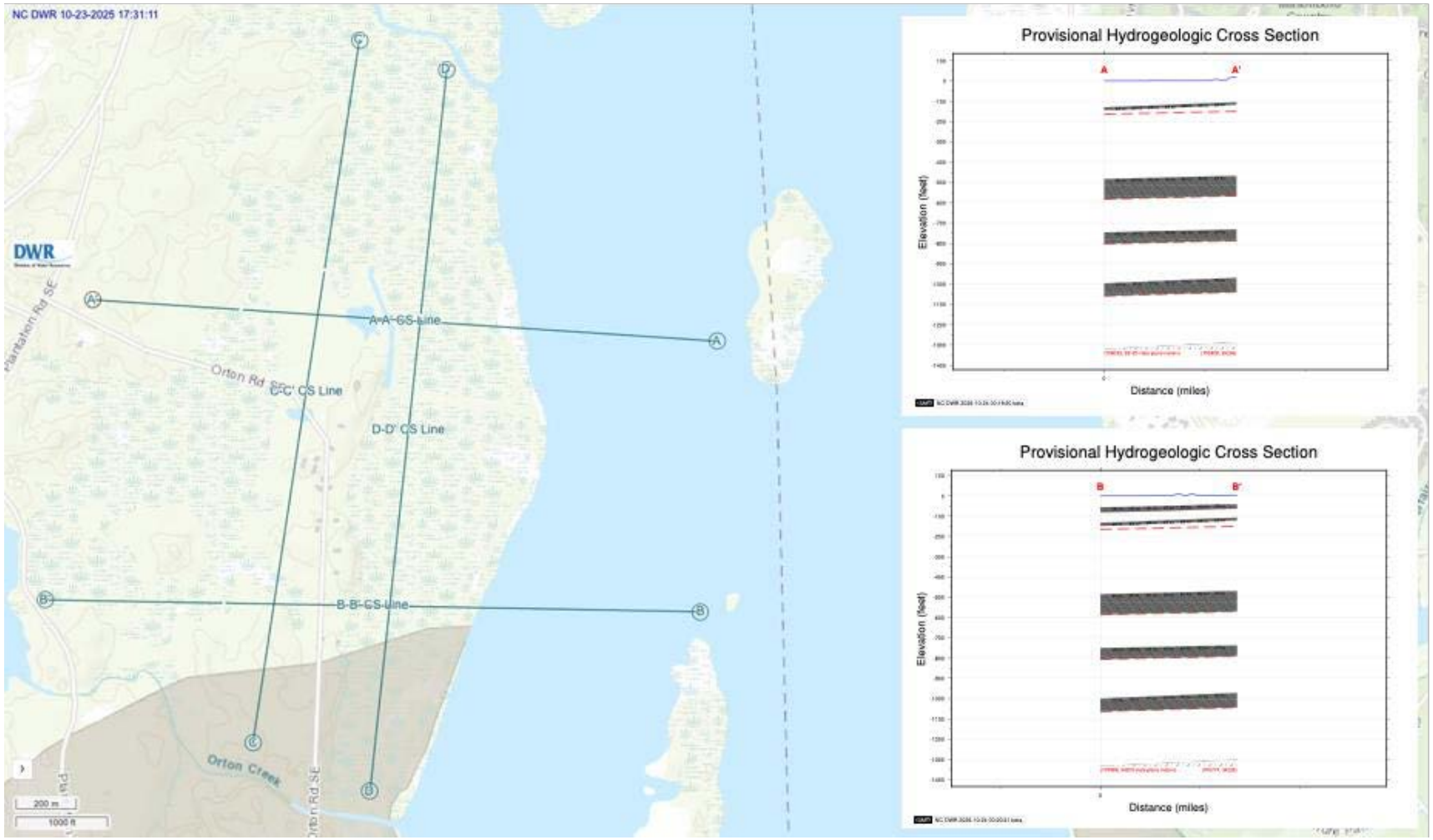


Figure 1. East-west cross sections: A-A' and B-B' (Source: North Carolina Department of Water Resources; NCDWR).

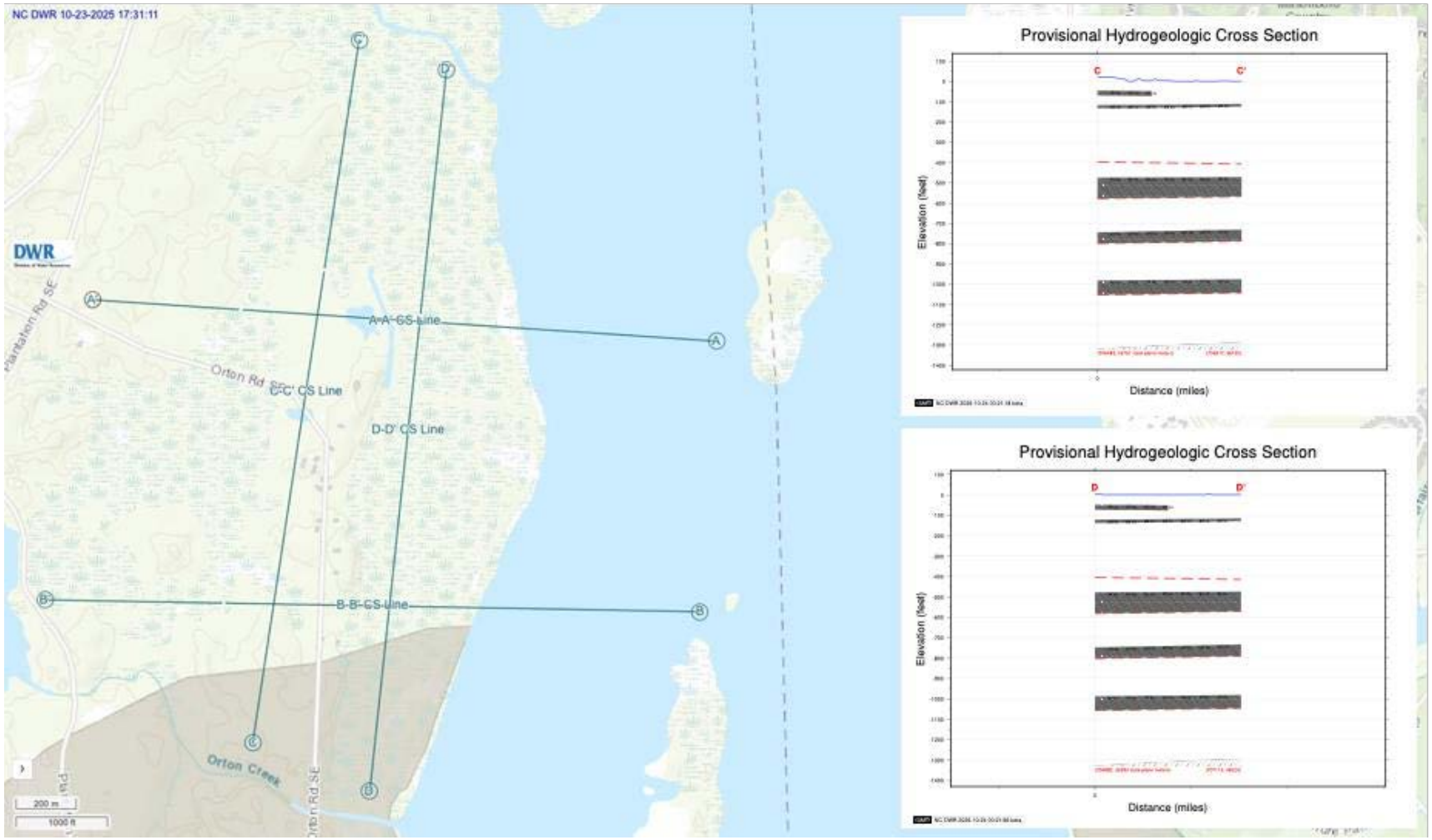


Figure 2. North-south cross sections: C-C' and D-D (Source: North Carolina Department of Water Resources; NCDWR).

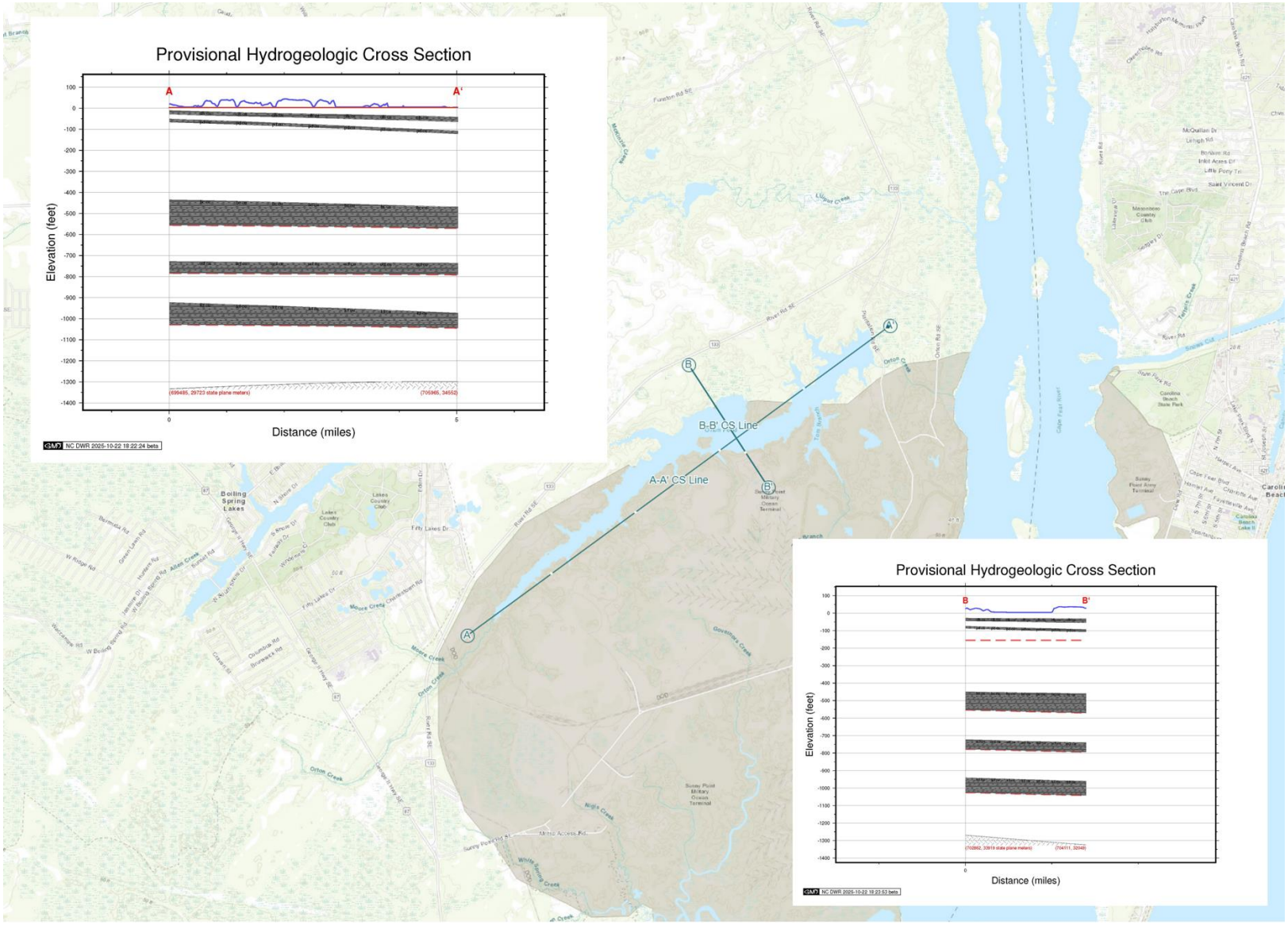


Figure 3. Cross sections across Orton Pond (Source: North Carolina Department of Water Resources; NCDWR).

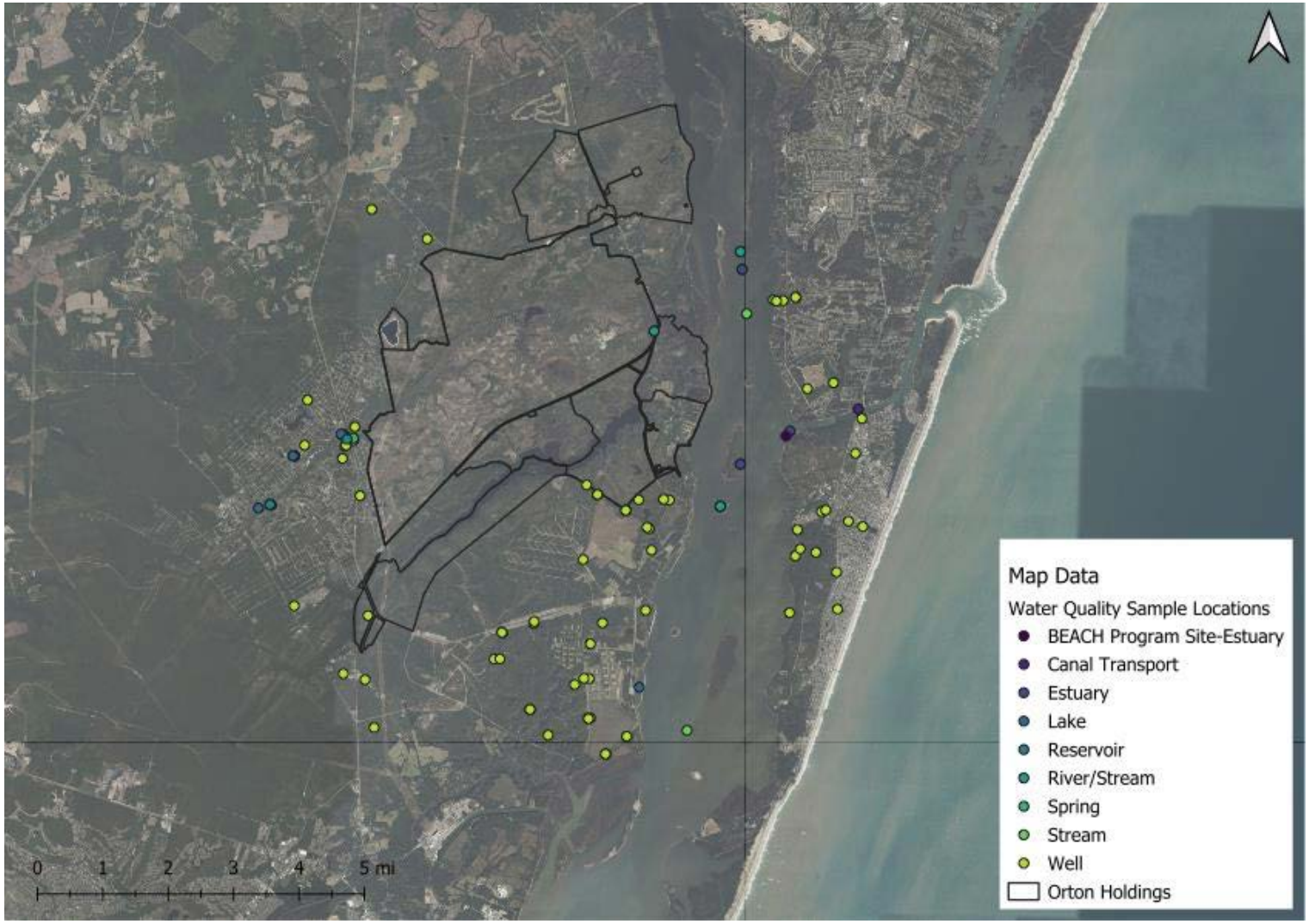


Figure 4. Water quality sample locations within 5 miles of the Orton property (Source: US EPA National Water Quality Monitoring Council; NWQMC).

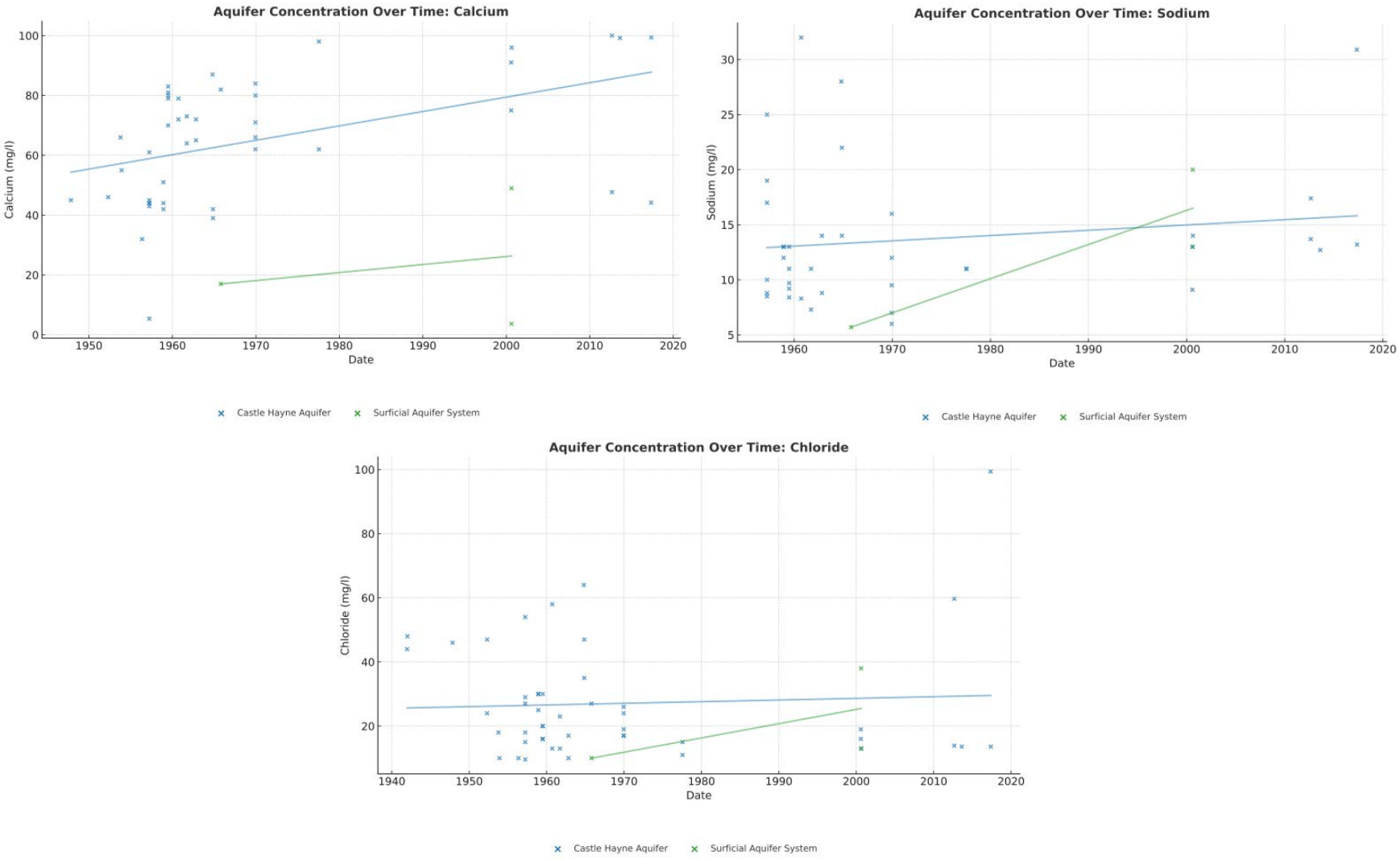


Figure 5. Calcium, sodium, and chloride data from sample points within 5 miles of the Orton property (Source: US EPA National Water Quality Monitoring Council; NWQMC).

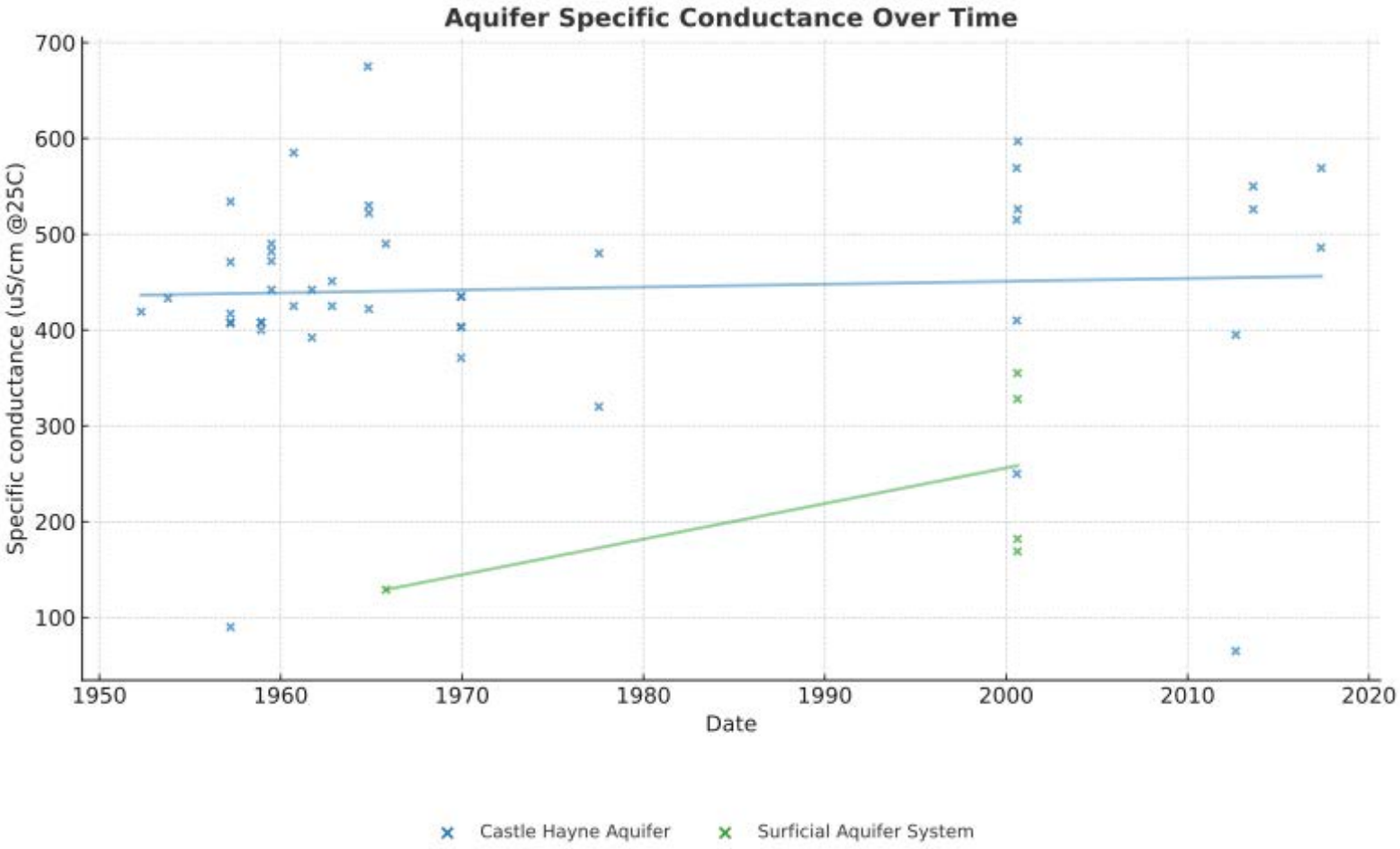


Figure 6. Specific conductance data from sample points within 5 miles of the Orton property (Source: US EPA National Water Quality Monitoring Council; NWQMC).

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Appendix III: Historical Wetlands Impacts Analysis

1. Overview

Recent peer-reviewed research (e.g., Magolan & Halls, 2020; Devereux et al., 2025) directly quantifies wetland losses in the Cape Fear River estuary due to recent dredging, showing that projections in the 1996 U.S. Army Corps of Engineers (USACE) EIS for the 2000–2002 Cape Fear River dredging project were substantially underestimated (USACE, 1996). Instead, these studies show how the region has experienced widespread conversion of forested wetlands to emergent marsh and open water, including the formation of "ghost forests" of dying bald cypress, driven by saltwater intrusion from channel deepening. Although these studies do not focus on Orton Plantation specifically, their findings are relevant given Orton's similar hydrogeomorphic setting along a tidal reach of the Cape Fear River. The key processes identified, including upriver saltwater penetration and tidal amplification linked to channel deepening, pose comparable risks to Orton's low-lying engineered rice-field wetlands and adjacent freshwater swamps.

In this appendix, we analyze how historic wetland conversion and salt-water intrusion processes that have been documented elsewhere along the lower Cape Fear River estuary can inform our understanding of the wetland dynamics around Orton Point. Through an additional review of literature and available historic wetland datasets, we highlight the vulnerability of freshwater wetlands around Orton Point to the proposed Port of Wilmington project alternatives.

2. Key Findings from Scientific Literature

Recent analyses of the lower Cape Fear River show a pattern of wetland transition linked to saltwater intrusion and channel modification. Magolan and Halls (2020) found that 14-18% of tidal-forest wetlands along Smith and Town Creeks (tributaries within the same tidal reach as Orton Point) converted to emergent marsh or open water between the 1980s and 2010s. Time-series mapping and hydrologic data analysis indicates that this transition accelerated following the 2000-2002 Cape Fear River deepening project, coinciding with widening creek channels, higher mean water levels, and greater tidal amplitude. These results demonstrate how dredging and sea-level rise together amplify tidal exchange and salinity intrusion.

Devereux et al. (2025) provide direct evidence of the mechanisms driving this conversion. Through tree-ring and sediment analyses of bald cypress (*Taxodium distichum*) stands along Smith Creek, they documented five major growth-suppression events since 1900, three of which align with known dredging periods (~1946, ~1970, and 2000). Salinity proxies in sediment cores showed a persistent mid-century increase in salinity at high-salinity sites (8–12 ppt), absent from lower-salinity controls (<5 ppt), confirming progressive upstream saltwater intrusion tied to channel deepening. These studies collectively attribute forest dieback and "ghost forest" formation to the dual stressors of dredging and sea-level rise, which elevate salinity and reduce freshwater flushing in tidal swamps.

From these findings at nearby Cape Fear River reaches, we can infer that such impacts to wetland migration and salinity intrusion have translated similarly to Orton Plantation. The site's low-lying rice-field wetlands and adjacent tidal forests share similar geomorphic setting and tidal dynamics as Smith and Town Creeks, making them equally vulnerable to salt encroachment and vegetation collapse. The influence of dredging on tidal amplification and saline penetration is a risk to Orton's wetlands, including the engineered rice fields.

Supporting regional studies (e.g., Becker et al. 2010; Hackney and Avery, 2015; Familkhalili and Talke, 2016) reinforce that ongoing channel deepening and sea-level rise are reshaping hydrodynamics along the Cape Fear River, pushing the freshwater-saltwater boundary further upstream and accelerating the type of wetland transformation already observed near Orton (i.e., Appendix IV).

3. Importance of Wetland Ecosystem Services

The *Freshwater Emergent, Seasonally Flooded-Tidal* wetlands adjacent to Orton Point play a quiet but critical role in supporting the historic rice-field landscape. Among many important ecosystem services (Table 1), these wetlands regulate temperature, moderate flooding, and trap sediments that protect the paddies' engineered water systems. As saltwater advances up the Cape Fear River with deeper channel dredging, the loss or conversion of these freshwater wetlands would erode many of these stabilizing functions. Understanding these linkages is essential to assessing how continued wetland transition may affect both ecological resilience and agricultural management at Orton.

Table 1: *Ecosystem services of wetlands and the benefit to rice farming*

Ecosystem Service	Benefit to Rice Paddies	How it Works (Without Direct Flow)
Microclimate Moderation	Stabilizes air temperature and humidity, reducing heat stress and water loss from the rice crop.	The large, wet mass of the wetland acts as a massive thermal buffer. Water's high specific heat means it warms and cools slower than the surrounding land, stabilizing the air temperature in the immediate vicinity of the paddy, especially during hot periods.
Regional Flood Control	Reduces the chance of catastrophic flooding that could breach the paddy's ditches or flood the crop.	As a Seasonally Flooded wetland, it acts as a massive sponge or detention basin for regional floodwaters, storm surge, and heavy precipitation. It slows the water's momentum and holds it temporarily, reducing the volume of water moving through the ditch network and the risk of ditch bank erosion or failure.
Sediment Trapping	Traps and settles wind-blown or overland-flow sediments before they reach the paddy ditches.	Even without a direct connection, overland sheet flow or wind will carry eroded soil. The dense, emergent vegetation of the wetland creates a vegetative buffer that slows water (or wind) movement, causing fine sediments to drop out and remain in the wetland, keeping the rice paddy's ditches and intake structures cleaner.

4. Further Analysis: A Review of Historic Wetland Datasets and the DEIS

To establish context for observed changes at Orton Plantation, we reviewed a range of existing wetland datasets and assessments, including the 2020 Wilmington Harbor Section 203 Feasibility Report, the recent Draft Environmental Impact Statement (DEIS) for the Wilmington Navigation Improvement Project, the National Wetlands Inventory (NWI), the

NOAA Sea Level Rise Viewer Marsh Migration window, and the North Carolina Coastal Region Evaluation of Wetland Significance (NC-CREWS) tool. These sources corroborate the presence of similar tidal and freshwater wetland types near Orton Point.

It is important to note that the migration and fine-scale transformation of wetlands at Orton occur at spatial and temporal resolutions too fine to be captured by the datasets reviewed as part of the DEIS. For example, while the *Section 203* study classified tidal wetlands across the Cape Fear system using Landsat imagery and ENVI 5.4 analysis validated by field surveys, the data (collected in 2016–2017) are now outdated and too coarse to reflect recent shifts. Updated wetland classification and field verification, which use higher-resolution NAIP imagery and site-specific mapping, would be needed to detect the next phase of change at Orton and to evaluate how future dredging or sea-level-related salinity intrusion might alter its freshwater wetland extent. Understanding how past events such as channel dredging in 2000-2002 and Hurricane Florence in 2018 influenced wetland distribution would provide additional resources with which to infer and model future transitions.

4.1 Wilmington Harbor Navigation Improvement Project USACE Reports

Both the Wilmington Harbor Navigation Improvement Project Section 203 Feasibility Study (2020; referred to as the *WHNIP 203 report*) and the more recent DEIS (2025) model future salinity and wetland response to channel deepening but characterize resulting effects as minimal. These reports form the technical foundation for understanding dredging-related impacts in the lower Cape Fear, yet their modeling approach and assumptions warrant closer examination in the context of site-specific vulnerability at Orton.

Section 203 Feasibility Study and Environmental Report

The WHNIP 203 report used Delft3D hydrodynamic modeling coupled with a 2016–2017 Landsat-based wetland classification developed through ENVI 5.4 image analysis software to assess salinity-driven transitions across the Cape Fear estuary. Figure 1 illustrates the study's wetland delineation in a region that captures Orton Point, located via the black 'x', and shows the presence of common reed (yellow), smooth cordgrass (pink), and brackish mix (light orange).

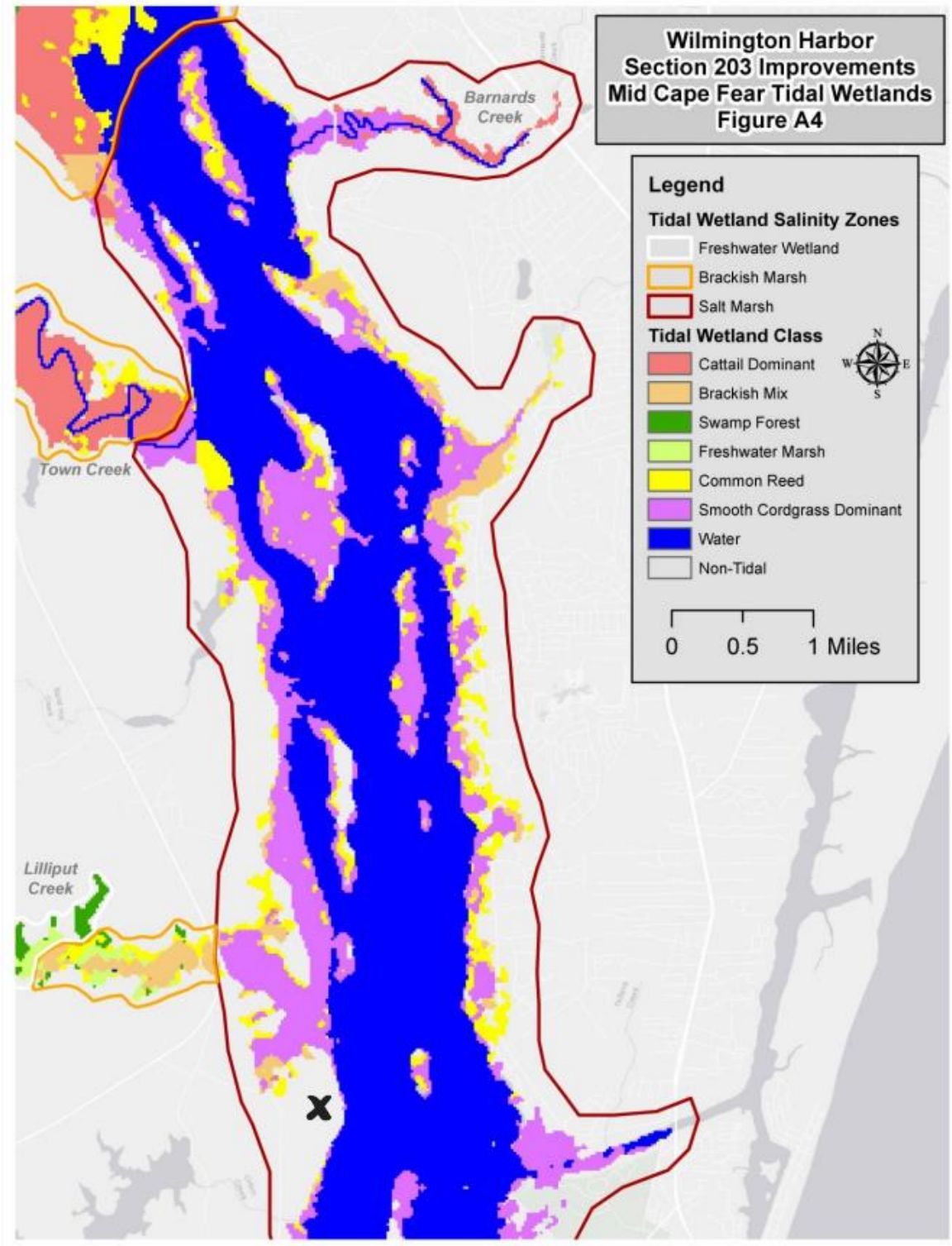


Figure 1: *Wetland map of the Orton Point area, from the Wilmington Harbor Section 203 report (Orton Plantation is marked by the black 'x', bottom left).*

The impacts on wetlands due to project dredging activities as characterized in the WHNIP Section 203 report is summarized as:

- Past Impact (Last 20 Years)
  - Tidal wetlands have not been affected, either directly or indirectly, by any dredging actions over the past 20 years.
- Near-Future Impact (Next Few Years)
  - The project is likely to directly affect about 1.07 acres of tidal wetlands and 9.03 acres of freshwater wetlands (specifically, those protected under Section 404 of the Clean Water Act).
  - Predictions include minor upstream salinity increases—typically ≤ 1.5 ppt and isopleth shifts of less than a mile—under the proposed –47 ft channel depth, with Orton Point remaining within mesohaline conditions during typical flow years and polyhaline under dry-year scenarios (see Figures 6-7 in the WHNIP 203 report, Appendix F).
- Long-Term/Modeled Impact (Projected Shift)
  - The project's modeled effects analysis for the Tentatively Selected Plan (TSP) suggests a significant ecological shift due to small, predicted increases in salinity.
  - This rise in salinity is expected to cause a fundamental change in the ecosystem, leading to some loss of freshwater tidal marsh and swamp forest acreage as these areas are converted to brackish marsh.
  - The report ultimately concludes that large-scale conversion of tidal freshwater swamp to brackish marsh is unlikely, citing vegetation tolerance ranges and the stability of the brackish wetland zone.

While the WHNIP 203 report characterizes both past and near-future impacts as *minimal* at the estuary scale, its conclusions are based on coarse regional modeling that cannot resolve the smaller, site-specific responses likely occurring at Orton Plantation. The wetland classification underpinning the model, which is derived from 2016–2017 Landsat imagery, also predates a decade of documented shoreline retreat, cypress mortality, and salinity amplification observed in more recent studies. As a result, the report's projections likely underestimate the degree and pace of ongoing wetland transition in the lower Cape Fear, particularly within low-lying areas like Orton where subtle shifts in salinity can trigger more severe changes.

The Draft Environmental Impact Statement

The subsequent DEIS builds on the WHNIP 203 modeling framework, extending its projections through additional sea-level-rise (SLR) scenarios but retaining old wetland baselines. Scenario comparisons across SLR conditions show tidal-fresh wetland losses of 2–3 % attributable to the deepening project and up to 29 % under high-SLR alone, reductions the DEIS frames as "*minor*" despite their compounding ecological significance. The DEIS further acknowledges uncertainties in model resolution and the inability to simulate high-frequency salinity spikes that drive forested wetland mortality.

For Orton Point, located within the mesohaline-polyhaline transition reach of the Cape Fear River, these assumptions likely underestimate sensitivity to subtle salinity increases that can precipitate vegetation shifts and soil changes. The 203 feasibility study and DEIS provide useful regional context but underplay localized vulnerability, highlighting the need for finer-

scale monitoring and classification to evaluate how continued dredging and sea-level rise may accelerate salt-driven wetland transition at Orton.

4.2 National Wetland Inventory

Based on the National Wetland Inventory (NWI), the 2010 assessment identified six wetlands immediately surrounding the main rice fields at Orton Plantation (Figure 2).

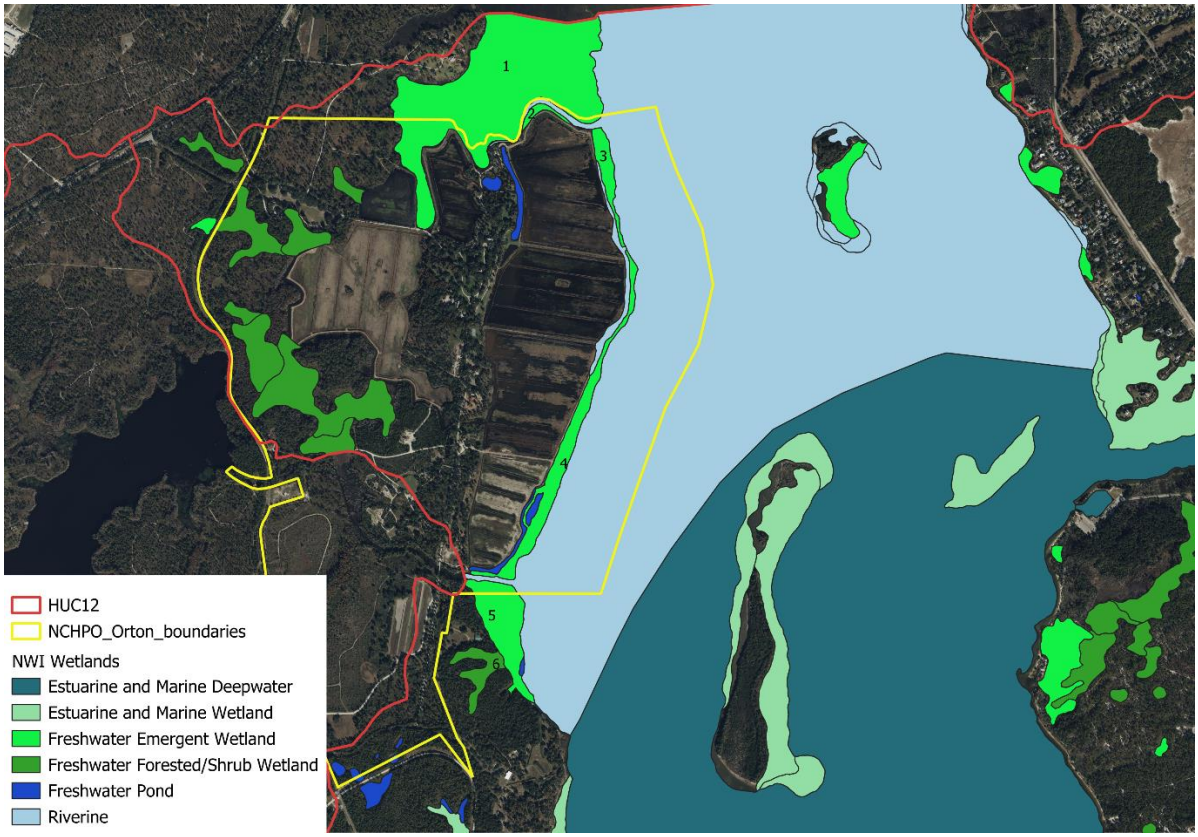


Figure 2: *National Wetland Inventory (NWI) wetlands map near Orton Plantation (within yellow polygon).*

Wetlands 1-5 are classified as *Palustrine (inland) Freshwater Emergent Wetlands* while Wetland 6 near Orton Creek is classified as a *Palustrine Freshwater Forested/Shrub Wetland*. The freshwater emergent wetlands vegetation consists of persistent vegetation dominated by erect, rooted, herbaceous hydrophytes (wetland plants). Wetlands 4 and 5 are dominated by *Phragmites australis,* a large perennial grass. The vegetation of Wetland 6 is forested (woody vegetation with a height of 6+ meters) with a composition of both broadleaved and needle-leaved deciduous trees. The *Freshwater Emergent Wetlands* (Wetlands 1-5) are partially drained/ditched. A partly drained wetland has been altered hydrologically, but soil moisture is still sufficient to support hydrophytes. A few palustrine freshwater ponds are located at the northwest corner of the main rice paddies and at the southeast corner (dark blue regions) (North Carolina Natural Heritage Program and USFWS 2024).

The parts of the Cape Fear River just to the east of the Orton rice fields are classified by the NWI as *Tidal Riverine* (light blue) and *Estuarine/Marine Deepwater* (blue green). This *Tidal Riverine* zone extends from the upstream limit of tidal fluctuations down to the upper boundary of the *Estuarine System* (North Carolina Natural Heritage Program and USFWS 2024).

The NWI classifies Orton's main rice fields as a *Palustrine Freshwater Emergent* wetland (we have excluded it from the map in Figure 2, since it is an human-made engineered wetland). In accordance with the NWI, these wetlands have been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water (North Carolina Natural Heritage Program and USFWS 2024).

4.4 Wetland extent comparison

In addition to wetland classification datasets such as NWI, wetland extent and condition can also be qualitatively assessed through the review of historical satellite and aerial imagery (Figure 3; USGS and Airbus imagery accessed through Google Earth). Over a 30-year period, these images suggest an appearance of wetland stability at Orton, but on closer inspection reveal signs of gradual change, including channel widening in the streams north and south of the rice fields. Field and drone surveys make clear that these remotely sensed indicators are part of an accelerating process of shoreline retreat and wetland loss at Orton Point.

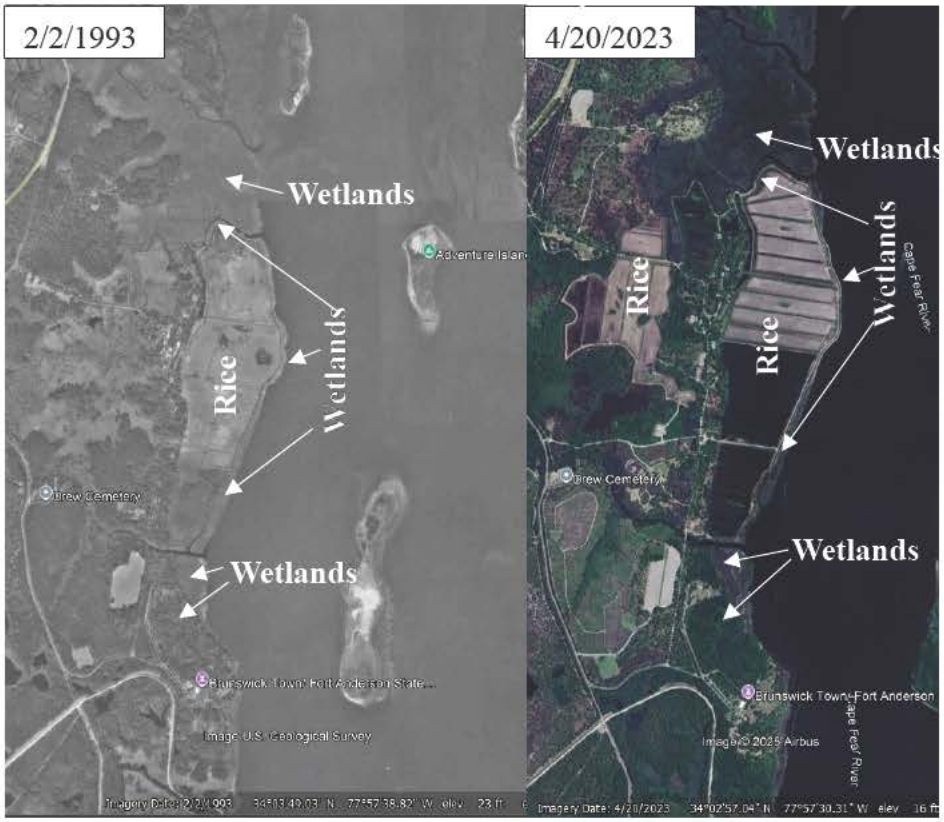


***Figure 3**: Aerial images of the Orton Plantation. The left image is from USGS 1993, and the right image is from Airbus 2023. For context compare with Figure 2 and 4.*

The October 2025 low-tide drone images in Figure 4 captures clear visual evidence of shoreline retreat, saltwater marsh expansion, and the ongoing erosion processes that threaten the Orton dike and the historic rice fields protected by it. What appears as a relatively stable and static boundary in low-resolution historical maps is a dynamic, retreating wetland accelerated by rising water levels and wave action. This "on-the-ground" perspective shows the contrast between a broad regional review of wetland extent and health can be in comparison to ground-truthed observations.



Figure 4: *Low tide drone images of the Orton Point shoreline, October 16, 2025.*

4.5 North Carolina Coastal Region Evaluation of Wetland Significance

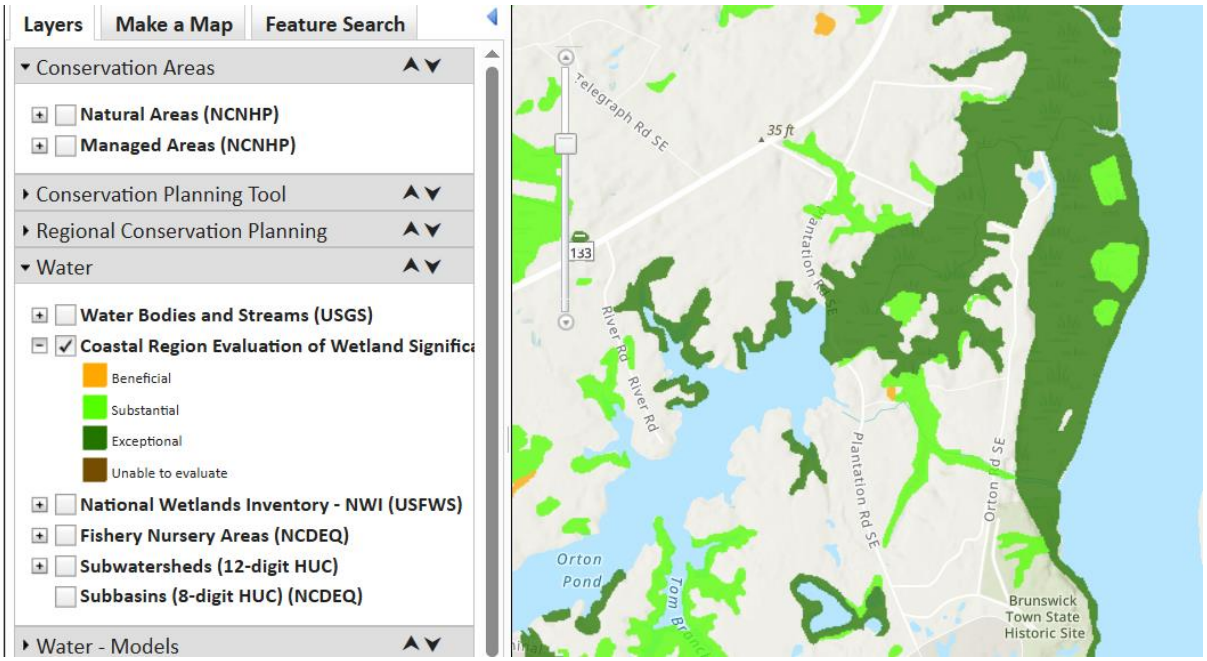


Figure 5: *4NC-CREWS Dashboard Tool*

In terms of The North Carolina Coastal Region Evaluation of Wetland Significance (NC-CREWS) Wetland 1 to 5 are regarded as exceptional freshwater marsh wetlands. Wetland 6 as substantial Depressional Swamp Forest (North Carolina Natural Heritage Program, n.d.)

For a wetland to achieve an Exceptional rating, it typically means it is performing at the highest level for multiple functions, often by meeting criteria such as:

- Water Quality Function (NPS Function): High ratings for parameters like proximity to pollution sources (e.g., being located next to agriculture/developed land) and proximity to a water body (e.g., within 300 ft of permanent surface water). This combination means the wetland is positioned perfectly to intercept and filter runoff before it hits an adjacent river or estuary.
- Wildlife Habitat Function: High ratings for factors like size, shape, connectivity to other natural areas, or proximity to listed species habitats.
- Hydrologic Function: High ability to store floodwater or maintain base flow.

The Substantial rating means that while the Depressional Swamp Forest is an intrinsically high-value habitat type, it did not meet the most stringent criteria to be classified as "Exceptional." This could be due to:

- Landscape Position: It might be located further away from a critical downstream water body, reducing its score for water quality and hydrologic functions compared to the marshes.
- Disturbance: The area might show indicators of partial drainage, cutting, or other human impacts ("Altered Sites"), which can lower its functional score, pulling it down from "Exceptional" to "Substantial".

The NC-CREWS ratings confirm that the wetlands adjacent to Orton's rice fields are not just typical tidal marshes, but that they are among the most highly valued and functionally important freshwater wetlands in coastal North Carolina. Their "Exceptional" status reflects

the highest capacity for water quality improvement, flood attenuation, and wildlife support. This underscores the significance of any potential impact or conversion. Loss or degradation of these wetlands would be a disproportionate harm to regional ecological health and the resilience of Orton's historic rice-field landscape. Regulatory guidance emphasizes protection of such "*Exceptional*" wetlands, further emphasizing the need for site-specific monitoring and mitigation from any possible project imp[acts.

5 Conclusion

Recent scientific studies, various wetland datasets, and new field observations show that the freshwater wetlands of the lower Cape Fear River estuary, such as those the natural wetlands and rice fields at Orton Plantation, remain highly vulnerable to ongoing and future impacts, particularly as it relates to channel deepening and saltwater propagation upriver. The Port of Wilmington DEIS does not sufficiently address these risks. Instead, it relies on outdated datasets and coarse-scale regional modeling that does not reflect the current state of the system. This approach underestimates the exposure and sensitivity of Orton's "Exceptional"-rated wetlands and the rice fields designated as historic under the U.S. National Registry of Historic Places.

The DEIS assessment should go beyond its coarse modeling and compensatory regional mitigation measures and instead incorporate up-to-date, site-specific wetland delineation and assessment. Where appropriate, it also needs to propose localized and site-specific mitigation measures, including for anticipated worsening of shoreline erosion and saltwater intrusion at Orton Plantation. This should be supported by monitoring campaigns. Without these improvements, the DEIS does not provide an adequate technical foundation for evaluating or mitigating the risks to Orton's wetlands and historic rice field landscape.

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Appendix IV: Orton Plantation Soil Samples and Assessed Impacts of Channel Deepening on Salinity Changes

Saltwater Intrusion in Orton Rice Fields

The proposed channel deepening, which measurably increases tidal range and facilitates storm surge penetration (Familkhalili et al., 2020; Mansur et al., 2023), poses a significant and unmitigated risk to the historical rice field soils near Orton Point. Soil sampling data, when interpreted against established state standards, indicates that these fields are already vulnerable to saltwater intrusion (Figure 1), a condition that is likely to be compounded by the project's effects and rising sea levels.

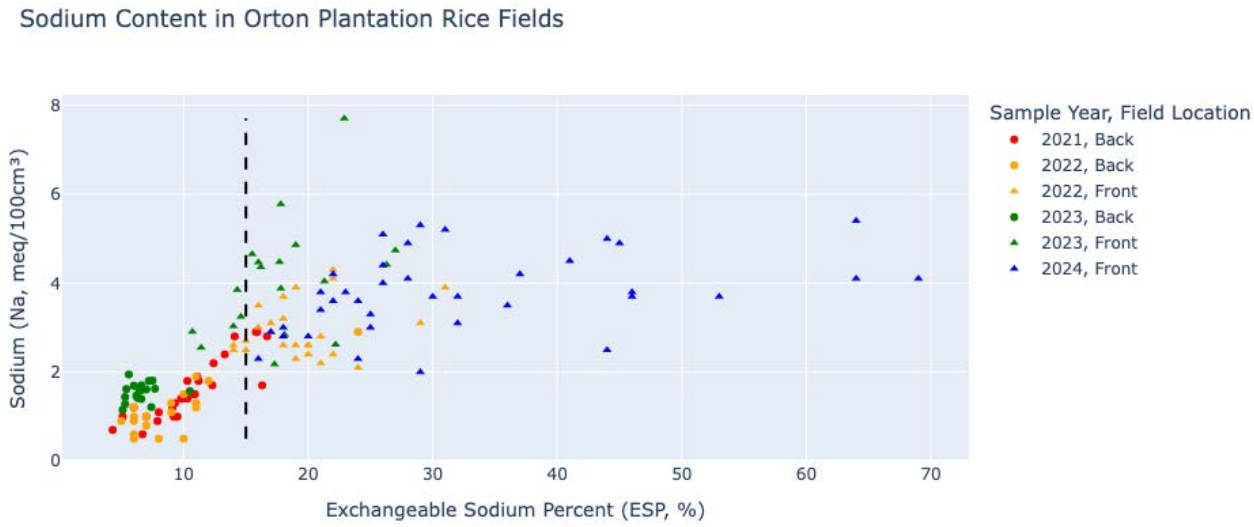


Figure 1: *Soil samples from Orton Plantation rice fields, comparing exchangeable sodium percent (ESP) with sodium (Na). Markers are colored by year and are denoted with a circle for the back rice fields and triangle for the front rice fields. 15% ESP is marked with a vertical dashed line.*

The North Carolina Department of Agriculture (NCDA) describes typical sodium content in the state's soils as being less than 0.4 meq/100cm^3, with higher values potentially indicating plant stress (NCDA 2013). Elevated sodium values can be typical in coastal areas and not necessarily result in plant damage (Ozlu et al. 2024), however anecdotal reports from Orton Plantation indicate that in the most heavily impacted fields, crops are already routinely stressed, suggesting high sensitivity to additional sodium inputs.

Figure 1 shows that sodium content throughout the rice fields is elevated and worsening, likely due to their proximity to the coast of Cape Fear River and exposure to brackish water. More than 50% of all the soil samples exceed 15% exchangeable sodium percent (ESP). According to NCDA, ESP values above 15% can cause soil dispersion, poor water infiltration, and potential toxicity to plants (NCDA 2013). The evidence of this for the majority of the soil samples indicates saltwater is already reaching the root zone and impacting the rice fields.

In Figure 1, we also see that sodium levels are significantly higher (orange/red colors) for the front rice fields compared to the back rice fields. The front rice fields, located along the coast of

the Cape Fear River have a mean ESP of 25%, with 89% of the soil samples measuring an ESP greater than 15%. The back rice fields, which are further inland, have a mean ESP of 9%, with 8% of the samples measuring greater than 15%.

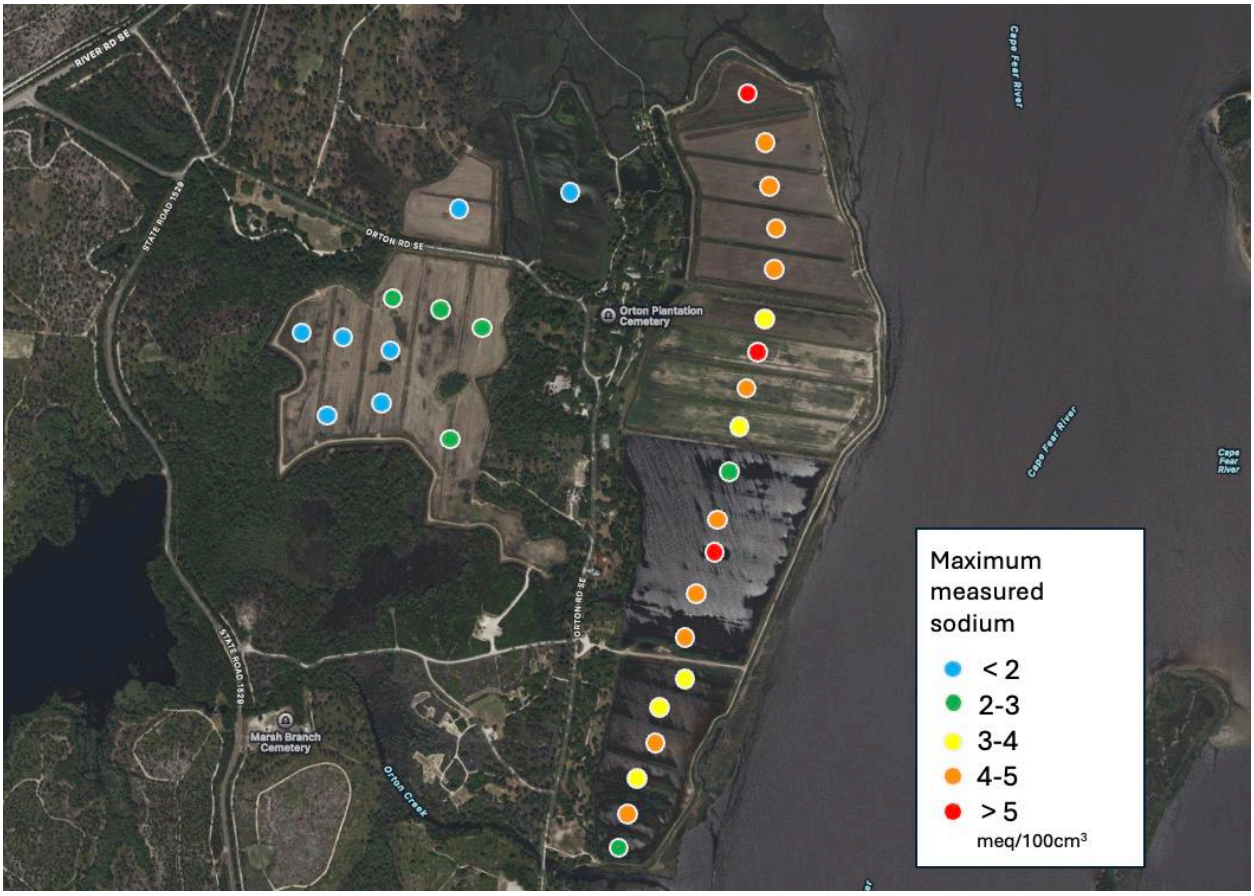


Figure 2: *Map of the rice fields on the Orton Plantation. Colored dots represent the maximum measured sodium from the soil samples on each field, for the period 2021-2024.*

The higher sodium content in the front rice fields is also evident in the map shown in Figure 2. The back rice fields, which are located to the west of the front fields, show maximum sodium levels less than 3 meq/100cm^3. Only two of the front fields have similarly low values. The remaining front rice fields have all exceeded 3 meq/100cm^3, and three of the fields have exceeded 5 meq/100cm^3. This highlights the front fields' existing vulnerability to increased saltwater intrusion from the Cape Fear River.

While the back rice fields are further inland, some of their samples are already indicating vulnerability to saltwater intrusion. Three of the back fields have soil samples that measured above 15% ESP.

Compounding Effects of SLR and Channel Deepening

The sodium levels currently observed in the rice fields indicate a pre-existing vulnerability to saltwater intrusion. The effects of the project proposed in the DEIS would directly intensify the

mechanisms that cause this vulnerability. The NC State Extension identifies tidal surges, high tides, and hurricanes as the primary drivers of saltwater intrusion and salt accumulation in coastal soils (Ozlu et al. 2024). Deepening the channel is highly likely to magnify all three of these mechanisms, as summarized in Table 1.

Table 1:*Description of the different mechanisms that result in saltwater intrusion, how the proposed project would modify these mechanisms, and the resulting impacts on the soils.*

Intrusion Mechanism	DEIS Project Effect	Consequence on Soil
High Tides, Tidal Surges	Action Alternative 1 projects increase in Mean High Water (MHW) of 5.3% and increase in Mean Range of 5.9%.	Accelerates chronic salinization. Higher daily tides sustain the saltwater wedge at a higher elevation for longer, increasing sodium accumulation in the root zone. This can lead to nutritional stress and reduced yields.
Hurricane, Storm Surge	Deeper channel amplifies surge and allows penetration further upstream (Familkhalili et al. 2020).	Accelerates acute sodicity. Increases the frequency and severity of "overspray of coastal waters", introducing larger salt loads that push the ESP near or above the 15% threshold.

Using the NOAA Sea Level Rise viewer (NOAA Office for Coastal Management 2022), we can see that current mean higher high water levels (MHHW) significantly impact the front rice fields and portions of the back rice fields, with all the back rice fields located in low-lying areas (Figure 3). A slight increase in sea level of 0.5 feet results in all the rice fields being inundated with ocean water during MHHW.

It is expected that channel deepening will induce tidal amplification. As stated in the DEIS, Action Alternative 1 would increase MHW by 0.11 feet (5.3%). While it may seem like an inconsequential rise compared to sea level rise, this human-induced increase accelerates the timeline for emergence of chronic inundation and flooding. This would result in detrimental impacts to the rice fields several years sooner than they would under the No Action Alternative, thus reducing the time to effectively implement any mitigation strategies.

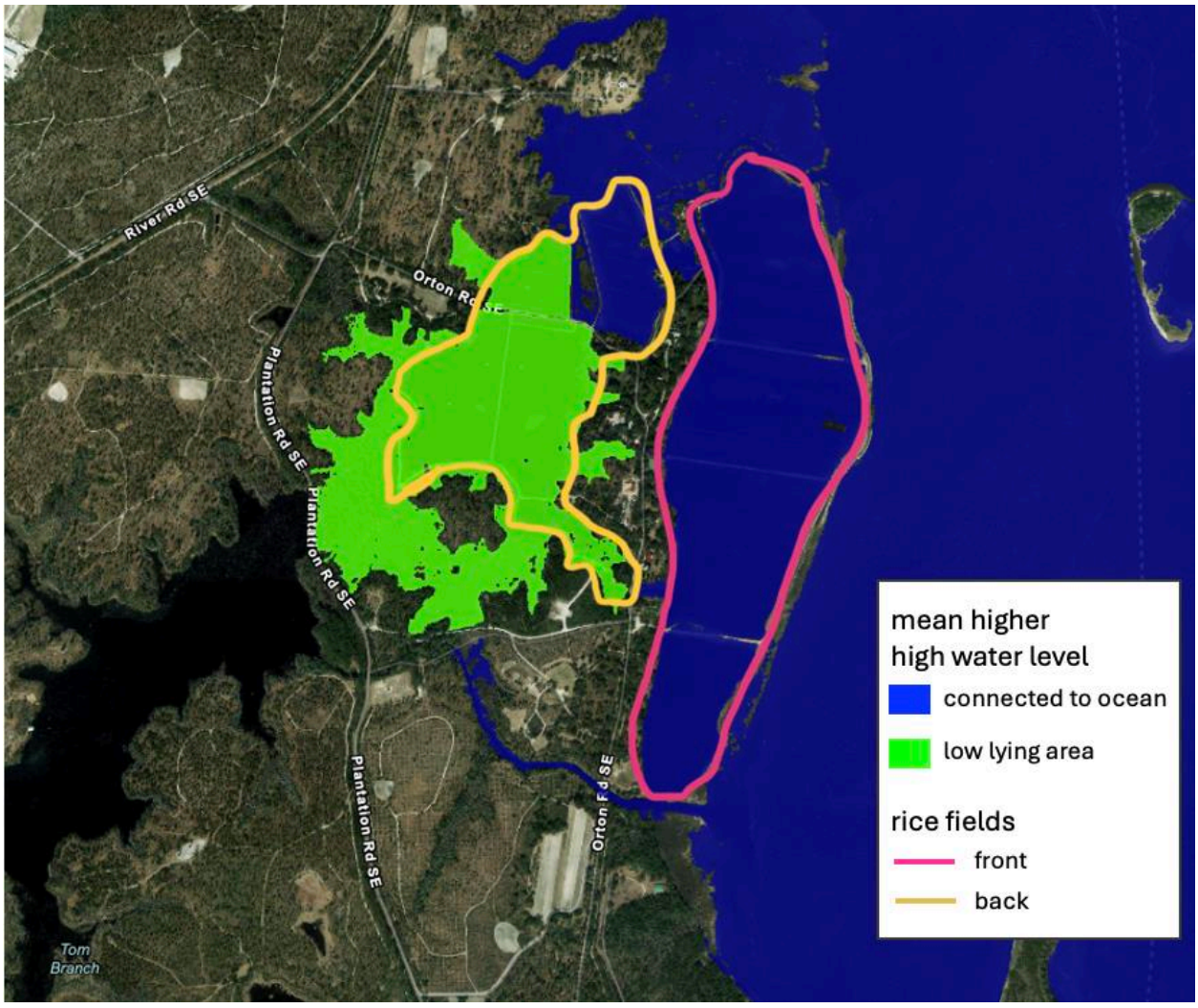


Figure 3: *Map of current Mean Higher High-Water levels (MHHW) over the Orton Plantation via the NOAA Sea Level Rise Viewer. Front and back rice fields are outlined in salmon and orange, respectively.*

Not only will the project accelerate the timeline, it will also reduce the rice fields' resilience. These fields rely on times of lower salinity and increased freshwater to flush out accumulating salts. Increasing the MHW resulting from project dredging will decrease the windows of opportunity for natural or artificial (i.e., irrigation-driven) flushing. This may push the fields into irreversible land degradation long before it would have based on SLR trends alone.

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Rebecca A. Bolinger, PhD

Climate & Water Resources Scientist

Lynker



Education

Ph.D. Atmospheric Science, Colorado State University, 2014

M.S. Meteorology, Florida State University, 2007

B.S. Meteorology, Metropolitan State University of Denver, 2002

Memberships/Affiliations

American Meteorological Society

American Association of State Climatologists

Employment History

Lynker Corporation, Senior Climate & Water Resources Scientist, 2024-Present

Colorado State University, Assistant State Climatologist , 2016-2024

NOAA Great Lakes Environmental Research Laboratory, Postdoctoral Fellow, 2014-2016

Illinois State Water Survey, Research Climatologist, 2007-2009

Summary

Becky Bolinger is a Senior Scientist at Lynker Corporation with a focus in climate services. Prior to joining Lynker, she was the Assistant State Climatologist with the Colorado Climate Center at Colorado State University. Within that role, she communicated relevant climate information across the state and region through webinars, presentations, media interviews, and monthly climate summaries. She has coordinated across agencies to integrate climate information into planning. She has led several projects, including the update to the Climate Change in Colorado Report (2024), and the forthcoming Colorado Climate Impacts and Vulnerability Study.

Core Skills

- 15 years of experience in drought monitoring and developing drought and climate tools and products.
- 19 years of experience researching climate variability and extremes.
- 15 years of experience in stakeholder engagement, including the agriculture and water sectors, state and local agencies, teachers and students, and public outreach.

Selected Project Experience

Project: Colorado Climate Impacts and Vulnerability Study

Colorado Water Conservation Board, Denver CO, 2024 – current

Becky is leading the development and publication of the updated Colorado Climate Change Vulnerability Study. The study focuses on impacts from Colorado's four key hazards – drought, wildfire, flooding, and extreme heat. It also summarizes vulnerabilities for sectors and provides examples and guidance of adaptation and response measures.

Project: Santa Barbara County Drought Resilience Plan

Santa Barbara County, California, 2024 – 2025

Becky has contributed to a Lynker team project to write a drought resilience plan for the County of Santa Barbara. This plan focuses on water shortage risks, primarily from drought, and includes guidance on short-term emergency response and long-term mitigation plans.

Project: Climate Change in Colorado

Colorado Water Conservation Board, Denver CO, 2021 – 2023

Becky led the development and publication of the report, located at climatechange.colostate.edu

Project: Enhancing NIDIS Drought Monitoring and Early Warning in the Intermountain West

NOAA NIDIS, Boulder CO, 2018 – 2021

Becky worked regularly with the team at the Colorado Climate Center on drought monitoring efforts across the Intermountain West, including the production of a Colorado Drought Update Dashboard.

Project: Identifying Drought-related Triggers and Impacts on Decision Calendars for the Ski Industry

NOAA Climate Program Office, 2019 – 2020

Becky led a team at CSU on this NOAA funded grant to investigate how and when the ski industry makes decisions based on climate and drought information. Read the Final Report.

Bill Szafranski, MS, PH

Senior Water Resources Scientist



Education

2015, M.S., Civil Engineering – Hydrology and Water Resources, University of Colorado, Boulder, CO

2006, B.S., Hydrologic Sciences, University of California, Santa Barbara, CA

Memberships/Affiliations

Professional Hydrologist (PH) – Surface Water, 2020

American Water Resources Association Professional Member

Employment History

Lynker Corporation, Water Resources Scientist, 2015-Present

AMEC Foster Wheeler, Water Resources Scientist, 2012-2015

AMEC Environment & Infrastructure, Water Resources Scientist, 2008-2012

Kinnetic Laboratories, Inc., Environmental Scientist, 2007-2008

Summary

Mr. Szafranski is a water resources scientist with 15 years of experience in surface water hydrology, risk assessment, watershed modeling, climate change analysis, watershed planning, statistical hydrology, and project management.

Mr. Szafranski led the wildfire risk analysis for the FACE:Hazards project where he worked with a diverse team of modelers, adaptation specialists, and economists to quantify current and future projected building damages from wildfire across Colorado. He has presented on the project methods and findings for the Colorado Wildland Fire Conference, FEMA Hazus quarterly webinar, and at the American Geophysical Union (AGU) Fall Meeting 2020. He has led many climate, hazard, and vulnerability studies for governmental agencies in Colorado, Oregon, and California.

He has experience using Esri GIS products including ArcMap and ArcPro and he is experienced with statistical analysis using the software and programming language R. Mr. Szafranski has managed many water resources planning projects including his work with the Chatfield Watershed Authority and Left Hand Watershed Center. He uses Lynker's quality management indicators to keep projects on time and on budget, carefully tracking project completion with project budget.

Core Skills

- Climate change impact analysis
- Vulnerability assessments
- Watershed planning
- Hydrologic modeling (HSPF, VIC)
- Spatial analysis (ArcMap, ArcPro, ESRI story maps)
- Data analysis, statistical analysis & stochastic simulation (R)

Emma Golub, MS, EIT

Water Resources Engineer



Education

2024, M.S., Civil and Environmental Engineering – Water Resources, University of Illinois, Urbana Champaign, IL

2022, B.S., Civil and Environmental Engineering,

University of California, Los Angeles, CA]

Memberships/Affiliations

American Society of Civil Engineers

Engineers Without Borders

Employment History

Lynker Corporation
Water Resources Engineer,
2024-Present

Lynker Corporation,
Water Resources Engineer Intern, Summer 2023

Center for Advanced Biofuel & Bioproducts Innovation at University of Illinois, Urbana Champaign,
Research Assistant, 2022-2024

CDM Smith, Water Resources Engineering & Transportation Planning Intern, 2020-2022

Summary

Emma Golub is a water resources scientist focused on the interactions among hydrology, human systems, and climate. Her work spans hydrologic modeling, climate risk assessment, and hydraulic design. At Lynker, she applies statistical and spatial data science to evaluate water management impacts, improve precipitation phase forecasting, and analyze hydrologic and climate datasets. Her graduate research explored socio-hydrology, biofuel policy impacts, and sustainable stormwater design. She aims to advance modeling and risk analysis to support balanced, integrated water management.

Core Skills

- Data analysis, statistical analysis (R, Python)
- Spatial analysis (ArcPro, QGIS, Python)
- Physics-based hydrologic modeling

Selected Project Experience

City of Boulder Desertification

City of Boulder, Desertification Risk Assessment Tool, 2024-Present

Desertification, driven by climate and human pressures, threatens rangeland resilience. To aid local response, Lynker and Boulder County created an open-source, remote-sensing framework assessing desertification risk using land productivity, cover, soils, and water data. Applied from 2000–2023 and refined with manager input, the dashboard guides restoration efforts. Emma developed a soil health indicator and analyzed NDVI data to enhance detection of degradation trends.

Colorado River Basin Wetland and Beaver Pond Mapping, Colorado state Wetland Mapping

Colorado Water Conservation Board (CWCB), Walton Family Foundation (WFF), March 2025-Present

Lynker and the Colorado Natural Heritage Program developed remote sensing–based wetland mapping for Colorado and the Colorado River Basin to fill gaps in statewide wetland data. Focusing on dynamic systems like beaver complexes, the team used machine learning and expert input to map ponds, wetlands, and surface water, supporting drought resilience and restoration planning. Emma contributed GIS analysis, post-processing, and pond counting to refine datasets and track beaver-driven landscape change.

Mountain Rain or Snow

NASA, Mountain Rain or Snow Citizen Science Project, 2023-Present

Lynker, in partnership with the Desert Research Institute and NASA, supports a citizen science project that enhances precipitation phase data with human observations. Emma manages data processing and storage pipelines and is developing a product that integrates citizen observations with meteorological data to improve precipitation phase predictions in mountain regions.

Coping with Drought Initiative and Grant Competition Phase 2

NOAA National Integrated Drought Information System (NIDIS), 2023

Lynker analyzed drought impacts across water, forest, recreation, and public health sectors in the intermountain west, developing a framework linking drought indicators to observed effects. Emma assessed secondary drought impacts on water utilities and rights, building regression models using SWE, EDDI, and streamflow forecasts to predict water rights call dates.

Justin Clark, MS
Senior Hydrogeologist

Lynker



Education

M.S., Earth Sciences, Hydrogeology Focus, University of Waterloo, 2011

B.A.S., Hydrology and Water Resources, University of Arizona, 2008

Memberships/Affiliations

Officer, Arizona Hydrological Society

Member, National Groundwater Association

Member, International Association of Hydrogeologists

Employment History

Lynker Corporation
Senior Hydrogeologist, June 2022 – Present

Arizona Department of Water Resources
Associate Hydrologist, 2021 – 2022
Groundwater Modeler, 2017 – 2021

Matrix New World (Southwest Groundwater)
Groundwater Modeler, 2013 – 2017

HydroGeoPhysics, inc
Geochemist, 2013

Programming Languages

Python, expert level

c (basic), intermediate level

Fortran, beginner level

Summary

Mr. Clark has 10 years of experience as groundwater modeler and geochemist, primarily working on regional groundwater modeling and geochemical site investigations, including leading the calibration and application of 3 regional scale groundwater models within Arizona. As a digital data analysis expert, he uses computer-based tools to process large quantities of observational data alongside model input and output data to evaluate models using statistical methods. Mr. Clark has developed a robust toolset to efficiently analyze the numerical model's ability to replicate field data and conceptual models that form the basis of model structure and inputs.

Mr. Clark worked on funded research in geochemistry and hydrogeology during his undergraduate degree at the University of Arizona, launching him into active involvement in research. As a graduate student at the University of Waterloo, he applied complex geochemical methods including isotopes to analyze the attenuation and biodegradation of TCE in a fractured rock aquifer. Knowledge of geochemistry was applied to his work in consulting to better characterize contaminated sites in Arizona and New Jersey and many other projects to help understand the movement of water through its life cycle.

Before joining Lynker, Mr. Clark worked for Arizona Department of Water Resources most recently, and groundwater consulting groups on many projects with large teams and various stakeholders. Having contributed to many projects with important resource management implications, Mr. Clark has the knowledge and experience to guide and contribute to projects. His hands-on experience in automated model calibration using the PEST code combined with his large-scale digital data analysis expertise drives a desire to explore and apply methods and models using industry standards and cutting-edge but accessible tools.

Core Skills

- Groundwater flow model calibration, local and regional scale
- Python scripting for automated pre and post processing
- Model sensitivity and uncertainty using parameter estimation (PEST)
- Aquifer pumping test analyses
- Data analysis and visualization with GIS linkage
- Structural geology and well log interpretation
- Applied geochemical characterization
- Isotopic analyses / isotope hydrogeology
- DNAPL release conceptual and numerical models
- Contaminant transport modeling

Marinus Boon, MSc

Senior Environmental Scientist



Education

2016, MSc., Aquatic Health - Rivers and Wetlands, UAV Remote Sensing, University of Johannesburg, South Africa

2012, Hons BSc., Environmental Management, University of South Africa, South Africa

2008, National Diploma in Nature Conservation, University of South Africa

2022, Certificate of Proficiency, Environmental Remote Sensing, Massey University, NZ

Memberships/Affiliations

Professional Natural Scientist (Pr.Sci.Nat) - Environmental Science, South African Council for Natural Scientific Professions (SACNASP), 2017

New Zealand Wetland Trust

Employment History

Lynker Corporation, Ecological Remote Sensing Lead, 2023-Present

Pattle Delamore Partners, Service Leader - Environmental Remote Sensing, 2021-2023

Pattle Delamore Partners, Senior Scientist - Remote Sensing & Ecology, 2019-2021

Limosella Consulting, Wetland Specialist, 2016-2018

Kite Aerial Imagery, Founder and Principal Scientist, 2016-2018

Lidwala Consulting Engineers, Environmental Professional & Wetland Ecologist, 2012-2016

Savannah Environmental, Environmental Scientist, 2012-2012

NCC Environmental Services, Environmental Control Officer, 2008-2012

Department of Environmental Affairs South Africa, Senior Marine Conservation Officer, 2004-2008

Summary

Marinus is a remote sensing scientist and ecologist with 16 years' technical experience in environmental consulting. Marinus uses remote sensing, computer vision and machine learning technologies to inform and enhance decision making. Marinus specializes in ecosystem mapping and monitoring, land use/cover changes, wetland detection, identification and classification and biodiversity mapping. He is a leader in combining ecological knowledge with GeoAI technology. His combined involvement in the environmental planning, ecological consulting and remote sensing industry equipped him to service the environmental, engineering and agricultural sectors. Marinus is actively developing landscape-scale wetland detection technologies, vegetation mapping and ecological GEOAI solutions. Marinus has leaded various large scale ecosystem mapping projects in New Zealand including US based mapping projects. Notable projects include inventory of wetlands and beaver ponds in the Colorado River Basin, regional wetland mapping and riparian planting survival analysis in New Zealand. He is an experienced project manager with strong business development and collaboration skills.

Marinus has experience with satellite, aerial imagery, UAV, LiDAR and machine learning (ML) solutions. Practical application includes using cloud computing such as Google Earth engine for processing imagery and mapping ecosystems. He has experience in various remote sensing and geospatial software applications. Marinus consulting experience in wetlands includes field-based delineation, classification, the use of rapid tools to assess wetland condition (health), values (ecosystem services), risk assessment, scientific buffer calculation, impact assessment and rehabilitation/restoration.

Core Skills

- Remote Sensing
- Riverine and wetland ecology
- Development and collaboration on new mapping approaches
- Machine learning and GEOAI
- Ecosystem Services
- UAV mapping technology

Nayoung Hur, MS
Water Resources Engineer



Education

2022, M.S., Environmental Engineering + Hydrologic Sciences Certificate, University of Colorado, Boulder, CO

2019, B.S., Environmental Science/Geology + Corporate Communications, University of Texas, Austin, TX

Memberships/Affiliations

American Water Resources Association

Colorado Lake and Reservoir Management Association

Employment History

Lynker Corporation, Water Resources Engineer, 2022 -Present

University of Texas at Austin – Isotope Geochemistry and Hydrogeology Lab, Research Assistant, 2017-2020

CAS Consulting and Services Inc., Civil Engineer and Marketing Intern, 2016-2017

Summary

Nayoung is a Water Resources Engineer focused on the intersection of water systems and a changing environment, aiming to support informed and data-driven decision making. With an interdisciplinary background in engineering, hydrology, water quality, ecology, meteorology, and geography, her work includes planning and data analysis related to water availability, drought, and climate variability. She is skilled in interpreting diverse environmental data—from geochemical to meteorological—and is particularly interested in how small-scale processes interact with broader watershed and climate dynamics. She is committed to translating what is learned for impactful science communication and public engagement.

Nayoung has contributed to a diverse portfolio of projects spanning climate resilience, hydrogeology, and environmental monitoring across the United States. Her work with Lynker collaborates with partners ranging from local counties to national agencies such as NASA, developing geospatial and analytical tools to improve environmental assessment and resource management. Her efforts include advancing remote sensing methodologies, automating data processing, and designing stakeholder-informed frameworks to better understand land degradation, precipitation patterns, and hydrologic dynamics.

In addition, Nayoung has applied her expertise in hydrogeology and geochemistry to groundwater and mining projects. She has interpreted water quality and geochemical datasets to support groundwater modeling, integrated field and remote sensing data to monitor harmful algal blooms and water quality trends, and led drought vulnerability and wildfire risk assessments. She has also developed reproducible workflows for drought impact modeling and environmental monitoring, translating complex data into actionable insights. By combining hydrologic science, geochemical analysis, and spatial modeling, Nayoung helps inform adaptive water management strategies and advance long-term ecosystem resilience.

Core Skills

- Data and statistical analysis (R)
- Spatial analysis (QGIS, Google Earth Engine)
- Environmental risk and vulnerability mapping
- Hydrogeologic data analysis and groundwater system evaluation
- Community engagement and science communication

Soroush Sorourian, PhD, PE

Coastal Scientist/Modeler



Education

PhD, Physical Oceanography Louisiana State University Baton Rouge, LA 2019

M.A.Sc., Civil Engineering University of Ottawa Ottawa, ON, Canada 2007

B.Sc., Civil Engineering Baha'i Institute for Higher Education Tehran, Iran 2002

Employment History

Lynker Corporation, Coastal Scientist/Modeler and Data Scientist, June, 2024 - Present

FTN Associates Coastal Engineer III, August, 2019 - May, 2024

Louisiana State University Graduate Research Assistant, June, 2013 - August, 2019

Daryabandar Consulting Engineers Coastal Engineer and Modeler, October, 2007 - May, 2013

Summary

Soroush Sorourian is a coastal scientist and modeler based in Raleigh, NC, with a PhD in Physical Oceanography from Louisiana State University and professional experience spanning academic, private, and consulting sectors. As a Coastal Scientist/Modeler and Data Scientist at Lynker since June 2024, Sorourian develops and advances hydrodynamic models for NOAA's Office of Water Prediction, and specializes in coastal resilience initiatives, climate studies, and machine learning applications for model uncertainty quantification. His expertise includes a wide range of technical skills, such as FORTRAN, MATLAB, Python, high-performance computing, various coastal and hydrologic modeling platforms, and professional engineering licensure in Louisiana.

Previously, Sorourian held key roles with FTN Associates and Daryabandar Consulting Engineers, contributing to major sediment transport, flood modeling, and coastal infrastructure projects, and conducting storm surge studies for events like Hurricanes Isaac and Ida. He is recognized for leading multidisciplinary teams in coastal modeling, presenting research at AGU and AMS conferences, and developing novel modeling tools for academic and practical applications.

Core Skills

- **Programming Languages:** FORTRAN, MATLAB, Python
- **Coastal Models**: Delft3D, Delft3D FM, FVCOM, MIKE 21, ROMS, COWAST, ADCIRC
- **H&H Models**: HEC-RAS, HEC-HMS, AdH
- **Other Skills**: Linux, Git, Bash scrip0ng, HPC, ArcGIS, Microsoft Office applications, Grapher. GRI, SMS Professional Engineer (PE) State of Louisiana Selected Project Experience

NOAA, Office of Water Prediction, National Water Modelv4 Implementation

NOAA, Office of Water Prediction, 2024 - Present

Soroush Sorourian developed, enhanced, and implemented hydrodynamic models as part of NOAA's NextGen framework, providing advanced water prediction capabilities for ten regions across the continental U.S. and beyond. He worked extensively with high-performance computing systems and significantly improved Python-based workflows for model analysis. Through ongoing engagement with coastal modeling, he deepened his expertise in platforms such as D-Flow FM and SCHISM, strengthening his analytical skills in both hydrodynamic modeling and post-processing.

Additionally, Soroush integrated confidence and prediction interval techniques into machine learning algorithms—including random forest and multi-layer perceptron—using tools such as ForectCI, Bagging Aggregation, and MAPIE to improve the quantification of model uncertainty. His leadership and research accomplishments have been highlighted through presentations at major conferences, including AGU2024 and AMS2025, where he represented the Coastal Hydraulics group.

Joshua Sturtevant, MS

Project Water Resources Scientist



Education

2020, MS, University of Nevada, Reno, Hydrology

2014, BS, Bates College, Geology (Honors)

Employment History

Lynker Corporation, Water Resources Scientist, 2021-Present

National Center for Atmospheric Research, Research Applications Lab, Associate Scientist, 2020-2021

University of Nevada, Reno, Research Assistant, 2018-2020

Acadia Harvest Inc., Project Manager, 2016-2018

Summary

Josh Sturtevant is a Project Water Resources Scientist at Lynker with expertise in hydrologic modeling, streamflow forecasting, and climate change impact analysis for federal agencies and municipal water systems. He has supported water providers across Colorado and the western US, leading technical studies on reservoir operations and drought planning in basins such as the Upper Rio Grande and Colorado's Front Range. He also has project management experience, helping clients translate complex modeling results into practical, local solutions.

Josh's technical background includes advanced programming for big data analysis and visualization, as well as extensive experience with conceptual and physics-based hydrology models for seasonal water supply forecasting. Recently, he has incorporated machine learning to improve time series predictions of streamflow and water temperature. He works closely with utilities to evaluate supply portfolios, conservation, and drought strategies, collaborating with multidisciplinary teams to deliver robust, tailored plans.

Core Skills

- Hydrologic modeling and water supply planning
  - Streamflow forecasting using statistical (e.g., regression-based), physics-based, and machine learning techniques
  - Surficial hydrology, reservoir operations, and drought impact analysis
  - Climate change scenario modeling for municipal and regional systems
- Computer programming and data science
  - Advanced Python and Bash programming on UNIX systems for hydrologic modeling and big data analysis
  - High-performance and cloud computing for large-scale model simulation, calibration, and visualization
  - Application of machine learning for streamflow and stream water temperature prediction
- Geospatial data analysis
  - GIS and remote sensing for water management applications
  - Proficient in ArcGIS, QGIS, and Google Earth Engine
- Project management and client engagement
  - Project management of numerous Colorado water resources consulting projects
  - Experience managing federal research grants (NSF, NASA)
  - Skilled in translating technical findings for city utilities, stakeholders, and public outreach

Exhibit 3

2013 National Park Service National Register of Historic Places Designation at Orton

NPS Form 10-900 OMB No. 1024-0018 (Expires 5/31/2012)

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

RECEIVED 2280
JUL 26 2013
NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

698

1. Name of Property

historic name Orton Plantation Boundary Increase and Additional Documentation

other names/site number

2. Location

street & number 9149 Orton Road Southeast [n/a] not for publication

city or town Winnabow [X] vicinity

state North Carolina code NC county Brunswick code 019 zip code 28479

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this _X_ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _X_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance: _ national _X_ statewide _local.

Kevin Cherry 7/12/2013
Signature of certifying official/Title Date

North Carolina Department of Cultural Resources
State or Federal agency/bureau or Tribal Government

In my opinion, the property ____ meets ____ does not meet the National Register criteria.

Signature of commenting official Date

Title State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

✓ entered in the National Register _ determined eligible for the National Register

_ determined not eligible for the National Register _ removed from the National Register

_ other (explain:)

Signature of the Keeper Edson H. Beall Date of Action 9.9.13

5. Classification

Ownership of Property
(Check as many boxes as apply.)

- [X] private
- [ ] public - Local
- [ ] public - State
- [ ] public - Federal

Category of Property
(Check only **one** box.)

- [ ] building(s)
- [X] district
- [ ] site
- [ ] structure
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
8	6	buildings
14	4	sites
2	2	structures
31	116	objects
55	128	**Total**

Name of related multiple property listing:
N/A

Number of contributing resources previously listed in the National Register:
2

6. Function or Use

Historic Functions

DOMESTIC/single dwelling
DOMESTIC/secondary structure
COMMERCE/TRADE/specialty store
RELIGION/religious facility
FUNERARY/cemetery
AGRICULTURE/SUBSISTENCE/processing
AGRICULTURE/SUBSISTENCE/agricultural field
AGRICULTURE/SUBSISTENCE/agricultural outbuilding
AGRICULTURE/SUBSISTENCE/irrigation facility
LANDSCAPE/garden
LANDSCAPE/forest
LANDSCAPE/natural feature

Current Functions

DOMESTIC/single dwelling
DOMESTIC/secondary structure
RELIGION/religious facility
FUNERARY/cemetery
AGRICULTURE/SUBSISTENCE/agricultural field
AGRICULTURE/SUBSISTENCE/agricultural outbuilding
AGRICULTURE/SUBSISTENCE/irrigation facility
LANDSCAPE/garden
LANDSCAPE/forest
LANDSCAPE/natural feature
LANDSCAPE/unoccupied land
Vacant/not in use

7. Description

Architectural Classification
(Enter categories from instructions.)

Greek Revival
Colonial Revival
Classical Revival
Other: Minimal Traditional

Materials
(Enter categories from instructions.)

foundation: Brick, wood, concrete, stone
walls: Wood, stucco, metal, synthetic siding
roof: Slate, asphalt, metal
other: Copper, marble, stone, metal, brick

Narrative Description

Summary Paragraph

Orton Plantation Boundary Increase and Additional Documentation is an expansion of Orton Plantation (NR 1973), which encompassed twelve acres of Orton Plantation, including the Orton mansion and its ornamental gardens. Since Orton Plantation's listing, important historic resources have been identified in the surrounding landscape that have inspired the owner to apply to the National Register in order to broaden the boundaries of the district to 953.8 acres and to expand the period and areas of significance. Orton Plantation Boundary Increase and Additional Documentation describes the historic core of the larger Orton property, which historically comprised almost 10,000 acres. For the purposes of this nomination, the property included within the boundary discussed here will be called Orton Plantation, and the larger, surrounding property, the Orton property. When referred to historically, it will be called, simply, Orton.

Orton Plantation is located in Brunswick County, North Carolina, and situated almost equidistant between the cities of Wilmington and Southport, with the Cape Fear River forming its eastern boundary. To the east of Orton and the Cape Fear River lie the coastal beaches of New Hanover County and the Atlantic Ocean, and to the west lie vast acreages of pine forests. The Sunny Point Military Ocean Terminal borders Orton Plantation to the south.

Today, the Orton property comprises about 14,000 acres held in four ownerships. The largest of these, some 8,400 acres owned (since 2010) by Louis Moore Bacon, a sixth great-grandson of Roger Moore, encompasses the most historically significant features of the Orton property. The centerpiece of the property is the main owner's residence, the Orton mansion (ca. 1729-1732). Also located within the property is the family chapel, known as "Luola's Chapel" (1915); historic roadways (1800s,1910); one late nineteenth-century worker's dwelling (1880s); historic rice fields (1820s); two cemeteries dating to the eighteenth and nineteenth centuries; historic ornamental garden features (1910s, 1935-1940, and 1960s); historic features related to the Orton Nursery (1935-1940); and several archaeological sites, including the possible site of the plantation's slave settlement, for a total of fifty-five contributing and one hundred twenty-eight noncontributing resources.[1]

The boundary runs from the confluence of Orton Creek and the Cape Fear River, heading westward along Orton Creek. As the creek reaches the plantation's north entrance drive, the boundary turns to parallel the drive until it reaches Plantation Road, which was the primary route to Wilmington until the construction of State Road 133 in the 1950s. There, the boundary turns south and follows the route of Plantation Road, jogging westward across the road to encompass the Orton Pond dam and water release structure, then returning to follow the road, only to jog west again to encompass the Orton Pond outfall. From there the boundary returns to the road to head further south, then jogs eastward around an outlot containing the Drew Cemetery, until it meets the boundaries of the Sunny Point Military Ocean Terminal. At that point, the boundary turns to the northeast towards the Brunswick Town/Fort Anderson State Historic Site. After a short jog to the south, the boundary turns northward along the western edge of the state historic site to its northern extent where the boundary turns to head eastward to meet the Cape Fear River, extending out into the water 500 feet to encompass underwater archaeological resources, then runs north before turning back to meet the river's edge at its starting point.

Orton Plantation also includes portions of the property around Orton Pond, owned by the Sprunt family, including the Orton Pond dam, the Orton Pond outfall, and a water release structure that controls water flow to the rice fields. Orton Pond is the historic impoundment first created by Roger Moore to power his sawmills and also provided water power for Orton's successive saw, grist, and rice mills; fresh water for cultivating the plantation's rice fields; and, for most of the twentieth century, a splendid recreational and ornamental water feature for the Sprunt family, their friends, and guests. Members of the Sprunt family in three entities hold the 5,600 acres comprising most of Orton Pond, woodlands, marshes, fields; a hunting camp; most of the colonial Lilliput plantation of Eleazar Allen (d. 1749), including the site of his long-lost brick house and the Allen burial ground. While these features are also integral to the setting of the historic district, they are not included in this documentation, nor is the Brunswick Town/Fort Anderson State Historic Site, which commemorates the town founded by Roger Moore and his family and is now owned by the State of North Carolina. However, the histories of all of these sites are inextricably intermingled.

Narrative Description

Setting and Overview Property Description

With the exception of the small community of Boiling Springs Lakes to the southwest, the landscape surrounding Orton Plantation is rural in character. North Carolina State Road 1529 (Plantation Road) runs through the Orton property, forming the western edge of the nominated property. Originally the primary north-to-south highway connecting Wilmington to Southport, this highway was re-routed around Orton Pond when the Sunny Point Military Ocean Terminal was created in the 1950s. Plantation Road now serves as access to the Brunswick Town/Fort Anderson State Historic Site, to the north gate of Sunny Point, and to various gates into Orton. The eastern border of the property is formed by the Cape Fear River, on which the operations of Orton depended throughout most of its history. Orton Creek forms a portion of the northern boundary and flows through the back rice fields, then eastward around Orton Ridge and into the tidal flats, eventually converging with the river. It is this waterway that was dammed to form Orton Pond, providing a controlled source of fresh water for the rice fields and a source of power for milling operations.

Orton Plantation occupies the eastern edge of the ecologically-rich Coastal Plain physiographic province. The potential of this province for supporting forest-related industry and the availability of fresh water for rice cultivation prompted the development of Orton and nearby plantations along the Cape Fear River in the eighteenth and early nineteenth centuries. Orton exhibits the gently rolling topography of the ancient sand beach ridges typical of the Cape Fear Arch, a geological feature typical of the Coastal Plain province that runs through the southern mainland of Brunswick County. The historic core of Orton is organized along the Orton Ridge, which runs north-to-south parallel to the river. Rice was grown on both sides of this sandy ridge in the surrounding tidal flats related to the Cape Fear River, Orton Creek, and its tributaries. The earliest road in the district, Old Brunswick Town Road, runs the length of the Orton Ridge between the historic town site and the Orton mansion at the high point of the ridge. Past the tidal flats, the upland ridges and terraces of Orton host recently-regenerated longleaf pine forests, a resource on which the economy of the plantation historically depended.

The topography of Orton Plantation has been manipulated over centuries to accommodate cultural uses. Within the property, numerous interventions have been made since the time of Roger Moore and the siting of the original house on Orton Ridge overlooking the Cape Fear River. Since then, the topography has changed with each ensuing owner and the needs of the plantation to accommodate lifestyles and economic activities. These modifications include the creation of the rice fields using earthen dikes; construction of the entrance causeway; farm field preparation; and grading for buildings and structures, access roads and parking, recreational features, and garden paths. A borrow pit is also located within the property and was used to mine materials for dike and revetment repair.

Most of the property is wooded, including native hardwood communities associated with stream corridors and longleaf pine-covered uplands. Most of the woodlands have arisen through secondary succession after the abandonment of agricultural activities, timbering, or through intentional planting, as with the recently re-established longleaf pine *(Pinus palustris)* communities. The species list also includes live oak (*Quercus virginiana*), swamp tupelo *(Nyssa biflora),* red maple (*Acer rubrum)*, sweet gum *(Liquidambar styraciflua),* bald cypress *(Taxodium distichum)*, Carolina ash *(Fraxinus caroliniana),* laurel oak *(Q. laurifolia),* water oak *(Q.nigra),* willow oak *(Q. phellos),* loblolly pine *(P. taeda),* swamp magnolia *(Magnolia virginiana)*, and Eastern red cedar *(Juniperus virginiana).* Understory species include American holly *(Ilex opaca),* swamp dogwood *(Cornus obliqua),* ironwood *(Carpinus caroliniana),* wax myrtle *(Myrica cerifera)*, huckleberry *(Gaylussacia frondosa),* inkberry *(Ilex glabra),* and common wiregrass *(Aristida stricta).*

Ornamental plantings of woody vegetation include allées of live oaks and bald cypress that line the primary roadways through the property, and camellias *(Camellia japonica)*, azaleas *(Rhododendron sp.),* and other shrubs and groundcovers that survive from the period of significance and are related to horticultural use of the property. However, most ornamental plants found immediately around the Orton mansion were installed in 2012.

The property is visually dominated by its historic rice fields, which exhibit the forms and patterns extant during the period of significance. Elsewhere on the property, other agricultural fields survive from the period of significance, including seven and one-half acres to the east of the Gatehouse, now maintained in turf grass; twenty-one acres along Old Brunswick Town Road, currently kept in corn; and another five acres west of that field, also kept in corn. Open areas in the vicinity of the site of the African American worker's settlement have been recently cleared of secondary growth, but were historically kept in household gardens and probably livestock, hog, or chicken yards. In addition to the agricultural fields, several acres were also used to raise ornamental plants for the Orton Nursery, but these plots have since revegetated in secondary tree growth.

The open fields along Old Brunswick Town Road allow for a sequence of views from the road to the rice fields and the Cape Fear River beyond. A similarly powerful sequence of views can be experienced along the north entrance road through its allée of live oaks, over the causeway, which provides views into the back rice fields, and to its intersection with Old Brunswick Town Road where it rises up the ridge to reveal expansive views of the river. It is this sequence of views, culminating in the magnificent view of the river from the front yard of the Orton mansion, which gives the property its strong visual character.

Orton Plantation is bounded on the east by the Cape Fear River, which historically provided the transportation necessary for the economic viability of Orton and other plantations in the larger region surrounding it and reaching northward. The river's tidal marshes provided the environment for the cultivation of rice that proved an economic boom for the plantation in the nineteenth and early twentieth centuries. Throughout its history, Orton's various owners have worked to maintain the earthen dike structure that separates the rice fields from the Cape Fear River, despite damage from storm events and wave action.

Old Brunswick Town Road and the north entrance road are the oldest circulation features on the property. Old Brunswick Town Road, which runs from the state historic site to the Orton mansion, dates from at least as early as the Civil War era, as it is first recorded on the 1864 Gilmer map. However, it is likely that the road existed in some form at least 100 years prior to 1864 to provide direct access to Brunswick Town. The southern end of the road had been realigned to meet Plantation Road around 1910-1916, when the south entrance gate was constructed. The north entrance road was established at the same time. It is also likely that it was at the same time that the causeway and the first gatehouse were constructed. The north entrance road intersects with Old Brunswick Town Road at the crest of Orton Ridge. From each extend other roads that link other parts of the plantation to these major routes.

Sites

Orton Plantation contains thirteen contributing sites, including the overall landscape, which comprises one site, and twelve archaeological sites, each described separately.

Orton Plantation

The landscape features that comprise Orton Plantation collectively constitute **ONE CONTRIBUTING SITE**. The site can be understood best as three distinct areas: the north entrance corridor, the Orton mansion and grounds, and the working plantation, which includes the rice field complex. The resource description that follows is arranged to take the reader through the property from the north entrance gate to the south entrance gate, as it has been traditionally experienced by most visitors to the plantation through the past century. As each area is described, historic associated features of the site will appear in bold print at their first significant mention. These are also listed in the tables of contributing and noncontributing features at the end of this section. Buildings and structures found within this site are briefly described with a reference to the Buildings and Structures sections for full descriptions. Archaeological sites and objects will be listed with their numbers, but full descriptions will be provided in the Archaeological Resources and Objects sections.

North Entrance Corridor Landscape

For the past one hundred years, the main entrance into Orton Plantation has been through the north entrance gate, down the avenue of trees, over the causeway, and up onto Orton Ridge from where the visitor first sees the front rice fields and the Cape Fear River, beyond. At this point, the Orton mansion stands to the north and Old Brunswick Town Road lies southward. The north entrance corridor landscape comprises the open and lightly wooded landscape from the north gates to Old Brunswick Town Road, and includes the north entrance gate; the asphalt- and sand-paved road and its live oak allée; the Gatehouse, its outbuildings, and garden; a large field; a portion of the original boundary ditch between Kendal and Orton; a trace of the old road that preceded Plantation Road (now used as an internal access road to Kendal), the causeway and bald cypress allée; broad views to the back rice fields; and glimpses of the Orton mansion.

The **north entrance gate** is composed of a double metal gate supported on brick piers attached to curved walls that terminate in another set of piers (see Structures for full description). This gate, along with the matching south entrance gate, was constructed by James Sprunt, sometime between 1910 and 1916 based on a design attributed to Kenneth McKenzie Murchison Jr. A dial pad and speaker have been installed on a concrete footing in front of the gate for security call-in and planting beds prepared in front of the walls. A black, vinyl-coated chain link fence extends from the curved walls in both directions for approximately 40 feet, where they meet the standard site post and wire perimeter fencing.

The **north entrance road** is asphalt-paved to the gates and then in compacted sand, a treatment that continues throughout the property. To the south of the road rises a small hill on which stands the Gatehouse, built ca.1910-1915 by the Sprunt family, and two associated outbuildings (see Buildings for descriptions). The Gatehouse is set in a small **ornamental garden** bounded by a ligustrum hedge, shaded with young live oaks, and planted with azaleas, camellias, and other shrubs and groundcovers. The establishment date of this garden is not known, but the camellia and azalea specimens likely date to around 1935-1940 and are likely related to the development of the Orton Nursery. Aerial photographs from 1938 and 1949 indicate that a walkway or driveway approached the house on axis with the front door, but this feature is not discernible in the landscape today. The broad open field to the east of the house was once an agricultural field, as depicted in historic aerials. This area is currently kept in mown turf.

The most outstanding landscape features associated with the area around the Gatehouse are the three large-caliper **specimen live oaks**, each at least three feet in diameter, two of which flank the view of the house from the entrance road, with the third located further east. These trees appear in the 1938 aerial as already quite large and mature trees and may date from the eighteenth century. A **live oak allée** formed of various sized trees creates a leafy tunnel that leads ot to the edge of the back rice fields. Most of these trees appear at a mature size in the 1938 photograph and likely date from the early twentieth century, while smaller specimens may have been planted during the garden renovations in around 1935-1940

The site of another building, called the Bonnie House Site (**31BW787**9**, see Archaeological Resources for full description), has been discovered between the two specimen live oaks that flank the Gatehouse front yard.[2] The functional relationship between this building and the Gatehouse is presently not known.

Directly across from the Bonnie House Site is the south end of the visible portion of the **trace of the old highway** that preceded Plantation Road in the nineteenth century. The trace is discernible in the landscape as a dirt track, which runs northward through Kendal to where it meets Plantation Road close to Lilliput Creek. It is not known exactly when Plantation Road was originally constructed, but it was prior to the installation of the north entrance gate, ca. 1910-1916.

The old highway trace crosses the remains of the antebellum boundary ditch that marked the property line between Orton and Kendal (**31BW787**16**, see Archaeological Resources for full description), The ditch once ran almost due east to Orton Creek, but today there are gaps where portions have been filled in for road crossings. Most of the ditch, however, remains distinct in the landscape.

From the end of the live oak allée, the north entrance road angles slightly to the northwest to continue onto the **north entrance causeway** that leads through the back rice fields. The causeway is lined with a **bald cypress allée**; the trunks of the trees frame intermittent views to the Orton mansion, beyond.

Orton Mansion and Grounds Landscape

The **Orton mansion** stands within its ornamental grounds at the crest of the northern end of Orton Ridge (see Buildings for full description). The mansion and grounds landscape begins at the eastern end of the causeway and comprises all of the uplands reaching from the Roger Moore Cemetery to Canal #1, including the gardens and manicured lawns associated with the mansion and the service area complex of greenhouses, sheds, barn, office, and parking areas.

From the end of the causeway, the road curves about forty-five degrees to the southeast then curves back again to due east. At the western base of the Orton Ridge, the entrance road passes a picturesque **bald cypress pond**. From this point, the road historically continued straight up the ridge slope to meet **Old Brunswick Town Road**, on axis with the Sundial Garden, which was designed by Robert Swann Sturtevant. This portion of the road and the Sundial Garden were removed in 2012. Another road, designed by Sturtevant in the 1930s to provide access to the nursery operation, is now also used to access the heart of the plantation. It will be referred to as the **nursery road**. At the point where the nursery road diverges from the north entrance road, another sand track, called the **service road**, extends around the western side of the mansion and its gardens, then passes the Roger Moore Cemetery, to end at Orton Creek.

Just before it reaches the Roger Moore Cemetery, the service road crosses over a canal that links a large, irregularly-shaped, **ornamental pond** to the west with a second ornamental pond, known today as "the **lagoon**." The lagoon appears as a canal in the survey of the Orton and Kendal plantations dated 1921, but is believed by some to survive possibly from the eighteenth century and once provided boat access through the marsh to the west end of the causeway. A few wood pilings that survive around the southern end of the lagoon were part of a bulkhead that existed as late as the 1960s and enclosed that end of the lagoon, if not its entire edge.

To the north of the intersection of the nursery road with Old Brunswick Town Road stands the Orton mansion and its surrounding gardens. The original access from the north entrance road to the parking area for the mansion occurred via a diagonal driveway that led to the southwest corner of the building, where the drive turned east to meet Old Brunswick Town Road. This drive and the parking area were removed in 2012 and the area reconfigured as the Camellia Court, a formal four-car parking court shaded with standard crape myrtles and surrounded by dwarf white camellias. From the point where the original entrance road met Old Brunswick Town Road, the old road, which was originally aligned with the south end of the mansion, was realigned slightly to meet the parking court. A ten-foot-by-ten-foot concrete pavilion was constructed in 2012 on the east side of the Camellia Court as an entrance feature leading to the front of the mansion. The white-painted pavilion has an arched doorway opening on both its east and west sides and an arched window opening on both its north and south sides. Italianate dentils ornament its eaves and its slate-clad hipped roof is capped with a ball finial. Entrance to the rear of the mansion is through a metal gate mounted on two large white-painted columns, installed in 2012 on the north end of Camellia Court.

Five new garden areas were established around the Orton mansion in 2012, including the back entrance garden that extends from the 2012 gate to the west portico of the 2012 addition; another garden featuring a small oval fountain fed by a hand pump and set in paving, located at the southwest corner of the mansion; the Breakfast Terrace, with its false perspective to a spray fountain, located off of the dining room at the south end of the building; the Sunset Terrace, with its boxwood hedges and decorative concrete well head, located at the northwest corner of the mansion; and the parterre gardens that flank its east portico. Nearby, small walkways connect these gardens to the larger landscape.

A brick well head is located at the northeast corner of the Orton mansion along the brick sidewalk leading to the Hydrangea Walk into the gardens. The well head was constructed in 2012 atop an old well that had been discovered when a camellia was transplanted from the area. The well is part of an eighteenth-through-nineteenth-century domestic archaeological site related to two structures that were located there as early as 1878 (**31BW787**1,** see Archaeological Resources for full description). The new well head was constructed out of brick taken from the Kendal Plantation house site.

While the area immediately around the Orton mansion was redeveloped in 2012, many of the original garden features from the period of significance still survive in the landscape, including the original **garden terraces**. The Orton mansion was built at the highest point along Orton Ridge, atop a terrace that was likely graded flat to accommodate the building and front yard. Cascading to the east from the house level are two more earthen terraces, which were constructed around 1916, during the Sprunt era, possibly from earth removed from the intersection of the nursery road with Old Brunswick Town Road. These terraces extend from the area of the lagoon bridge to just south of the chapel. While slightly weather-worn, the terraces are distinguishable in the landscape.

The landscape on the east side of the Orton mansion comprises the long, broad, open lawn that extends from a point just south of Luola's Chapel, to the bottom of the garden, around one thousand feet to the north. The lawn is lined on both sides with live oaks and ornamental shrubs. To the south of the mansion, in an area Sturtevant called the **Long Green**, the remaining ornamental display gardens of the Orton Nursery were removed in 2012 and replaced by lawn. The removed displays included the Sundial Garden, which was located on axis with the section of the old entrance road that ended at Old Brunswick Town Road. The Sundial Garden, while consistently in the same location since it was created, had been variously paved in sand, concrete, and brick throughout its tenure at Orton. It appears that the sundial that formed the centerpiece of the garden was relocated to the Scroll Garden in the mid-twentieth century, where it remains today.

Another feature found within the display gardens was a mounded garden bed that had its beginnings in the 1910s as a three-tiered, stone-edged, garden bed and display feature that was topped with an ornamental cast iron planter. Later in the history of the garden, the planter was removed and the featured remodeled as a mound on which azaleas were displayed. This feature was removed in 2012.

Numerous paths and walkways cross through the Orton mansion gardens and grounds. These include the **long walkway**, that extends from the south end of the Long Green, where it functions as the edge of the lawn, past the mansion's east portico, and through the gardens, becoming the **Hydrangea Walk** as it extends to the north.. Perpendicular to this path is the **axial walkway** that leads from the east portico to the garden terrace stairway. Although the paving materials have been replaced over time, these two walkways survive in their alignment from around 1910, when they were laid out as features of Luola Sprunt's formal garden. A symmetrical semi-circular brick path was added in 2012 to define the east lawn. Circular limestone pads mark the nodes where the semi-circular path meets the long walkway and a square limestone pad where it meets the axial walkway.

The axial walkway leads to the head of a three-tiered concrete **terrace stairway** that provides access from the house terrace to the causeway. This stairway is located on the central axis of the mansion grounds, which runs from the front door of the Orton mansion, down the stairs, and along the front causeway to the Cape Fear River. It is composed of three flights of stairs, the first leading from the house terrace to the middle terrace. A second flight leads from this level to a lower earthen terrace that is now difficult to distinguish in the landscape. From here, the third flight leads down to the level of the Scroll Garden site. At the top of this flight of steps are **concrete planter bases** with rebar protruding through the center and out of the top of the base. Historically, there were decorative urns attached to the bases and planted with ornamental shrubs and a concrete platform at the second terrace on which the family arranged wood garden benches. A walkway led from the concrete platform to an overlook to the north, which later became the north belvedere. The concrete was removed from the platform in 2012 and it is now paved in sand and gravel.

The **site of the Scroll Garden** is at the bottom of the concrete stairway on the causeway level. The Scroll Garden was a parterre of evergreen and flowering shrubs meant to be viewed primarily from the second terrace level. While the plant material did not survive a recent hurricane and subsequent inundation of salt water, the scroll pattern of the planting beds is still discernible in the landscape. Various planting schemes in that area included a ca.1910 formal linear planting of ornamental trees and hedges that appears to have extended from the Orton wharf and along the causeway to the terrace stairway. A second scheme, likely dating from around 1935-1940, extended out along the front causeway to just past the lagoon. The end of this garden was formed with a semicircle of shrubs around a sundial at its center, forming the focal point of the garden. It is possible that the pedestal and sundial were relocated at that time from the Sundial Garden to this level. The concrete or cast stone base of the sundial is extant. Other structures were associated with the Scroll Garden, including a white-painted wood fence that was installed at the south end of the lagoon around 1960. The fence, in Colonial Revival style, sported panels of Chinese Chippendale patterns and had a gate at the center. In addition, this end of the lagoon is lined with posts that appear to have been a part of a wood bulkhead and the fence may have been mounted on or close to the bulkhead structure. The current owner plans to remodel the Scroll Garden.

Extending at a northwest diagonal to the long walkway in front of the Orton mansion is the **path to the White Garden**, which survives from the Sturtevant plan and was constructed around 1935-1940. The **White Garden**, at around fifty feet in diameter, is comprised of an enclosure of azaleas with entrance and exit openings. Inside this enclosure is a circular brick walk around three feet wide that bounds a planting bed. At the center stands an ornamental fountain, around sixteen feet wide, comprised of an approximately eighteen-inch-deep concrete bowl, painted pool-blue. At the center of the fountain, set on a concrete base, is a marble sculpture created by nineteenth-century Italian artist, Fernando Andreini, entitled "Spring Star." Andreini was born in Florence and established himself as a sculptor after studying with Ulysse Cambo. The sculpture belongs to a series Andreini executed during the last quarter of the nineteenth century focusing on nudes or partially clothed female figures. He died in 1922 but his sculptures continue to appear in the catalogs of major auction houses. The sculpture appears to be in good condition. The White Garden was indicated conceptually on Sturtevant's plan simply as a circular space, so it may have been designed by the Sprunts. The statue was installed in 1953 but it is not known if it replaced another fountain feature or if the fountain was constructed at that time to accommodate the statue. The fountain is not in operation.

A short sand path leads northwest from the White Garden to the Sun Garden. The Sun Garden, at around fifty feet in diameter, comprises a circle of pink and white crape myrtles enclosing a second circle of boxwood. A sand pathway encircles the central feature, which is a brick-edged mound that may have been used to display flowering plants. The Sun Garden was not indicated on the Sturtevant plan and appears to have been installed after the period of significance because of the age of the plant material.

Other garden paths meet the Sun Garden and White Garden paths, as well as the Hydrangea Walk, and lead around and through the plantings that encompass these garden features. A **perimeter path**, paved in sand, defines the edge of the gardens, leading from the semi-circular path in the front lawn, around the eastern edge, curving around the north end of the front lawn, and returning to meet the Hydrangea Walk. This feature survives from the Sturtevant plan and has been recently restored with steel edging and new sand.

A **secondary path**, also surviving from the period of significance, leads from the middle garden terrace to the north belvedere, then onward to meet up again with the perimeter path. The aerial photograph from 1949 shows this path ending at what may have been a constructed overlook, the function of which appears to have been later replaced with the belvedere. It is also possible that a rustic wood overlook built around a tree, which is depicted in photographs from the mid-twentieth century, may have been in this location.

From the Sun Garden, one has a view across the #1 Rice Field. A path that extends from the path that runs between the White Garden and the Sun Garden leads to the **Chinese Bridge**, a wood decking arranged in a zig-zag pattern, which crosses the large ornamental pond that lies to the east of the #1 Rice Field. The bridge was indicated in a similar configuration in the unimplemented Gillette garden plan from 1955, so it is possible that it was constructed around that time. It is in poor condition and the owner intends to replace it. The bridge connects to the service road as it leads to the north, passing a **wood gazebo**. Historic photographs indicate that the gazebo survives from the period of significance.

The Roger Moore Cemetery (**32BW787**2**, see Archaeological Resources for full description), contains the graves of Roger Moore, his wives, and other members of the family. The cemetery is shaded by several **specimen live oaks** that frame **sweeping views of the rice fields** to the east from the cemetery. Just south of the cemetery is another archaeological site (**31BW787**3,** see Archaeological Resources for full description), but the remains are not conclusive enough to merit further investigation.

The service road loops back around from the cemetery to meet itself north of the culvert. A dirt track extends from the loop to provide access to the perimeter of the #1 Rice Field, returning eventually to meet the entrance road causeway. A second dirt track extends from the area of the cemetery, around the end of the lagoon to return south to meet the central plantation causeway at the Scroll Garden site. This dirt track once served as a path through a heavily planted garden along the eastern edge of the lagoon.

The sweeping **views of the tidal flats** landscape from the Roger Moore Cemetery is only one of many dramatic views available within the property. The focus of most of these views is on the expansive rice fields as they extend beyond the entrance causeway, to the west, and stretch toward the Cape Fear River, to the east. The **iconic view to the rice fields and the Cape Fear River** beyond from the east elevation of the house has been a constant feature of the plantation over the centuries, as has the view of the house from the river. There are visual connections to both the front and back rice fields from various areas around the house and gardens that have existed since at least the 1820s when the rice fields were established. Some areas around the Orton mansion are maintained in mown grass, which opens up views to both natural and ornamental features. Roadways lined with trees and garden pathways lined with ornamental shrubs provide focused, axial views of central features of the landscape.

Two wood-frame belvederes extend the advantage of the house terrace level into the landscape for spectacular views of the rice fields and the river. The two structures are located to the north and south of the main axis of the Orton mansion front garden. The **north belvedere** is located where an overlook had been established, around 1910, within the formal garden. It is angled to the southeast. The **south belvedere** is located off of the second level of the garden terrace, in line with the south end of the Orton mansion, and is also angled to the southeast. A short concrete stairway provides direct access from the house terrace to the south belvedere. Constructed on wood columns with cross braces, similar to ocean piers, the belvederes form elevated walkways that afford magnificent views into the surrounding landscape extending to the Cape Fear River. The decking and Chinese Chippendale railings are of wood, and the railings are painted white. These structures were designed in 1958 by Nathalia Williams, an architect, and Morley Jeffers Williams, a landscape architect, both from New Bern, North Carolina, and best known for their work at Tyron Palace and Colonial Williamsburg. It appears that they were constructed shortly thereafter, as they begin to appear in photographs dating to the 1960s. They are currently in fair to poor condition and the owner plans to reconstruct them both.

The path to the north belvedere curves around to meet the perimeter path, which follows along the edge of the upper terrace, northward. From this path, a shorter path exits to the east to provide access to a stairway that leads to the lagoon bridge. The **brick stairway**, which is constructed of mortared units, is parallel to the main terrace stairway and located near the north belvedere. The stairway ends at a landing from which the **lagoon bridge** extends. This arching wood bridge provides a pedestrian crossing over the lagoon at around its midpoint. Its decking and Chinese Chippendale railings are wood and the railings are painted white. It was designed in 1959, also by Nathalia and Morley J. Williams, and appears in several mid-twentieth-century postcards with the belvederes, so it is likely they were built at the same time. It appears to have replaced an older wood bridge that is shown in historic photographs in the same location.

Most of the cultural vegetation in this area is associated with the aesthetic pursuits of plantation owners through the centuries. Trees include live oaks arranged in allées and as specimens, some of which may be over one hundred years old to three hundred years old, as well as other oak species. A **remnant row of Eastern red cedar** that once edged the eastern end of the entrance drive remains intact, as do the live oaks that line Old Brunswick Town Road. Ornamental shrubs, such as **camellias and azaleas,** survive from the nursery's demonstration gardens within the area of the Orton mansion and gardens. Garden plants grown for aesthetic purposes are found in and around the Hydrangea Walk, the

White Garden, and the Sun Garden, including gardenia, camellia, azalea, ligustrum, liriope, cast iron plant, boxwood, crape myrtle, and French hydrangea, some of which were planted during the period of significance.

Utility components have been worked into the ornamental landscape around the house, including a septic field that is laid out under the lawn terrace to the west of the Sunset Terrace, and above-ground HVAC units located downhill from Camellia Court.

Moving south from the house along Old Brunswick Town Road is **Luola's Chapel,** which was built in 1915 to honor Luola Sprunt (see Buildings for full description). Prior to the removal of the driveway to the house and the extension of the entrance road to Old Brunswick Town Road, the area around the chapel and south to the nursery road comprised a landscape all on its own, known by one source as "Luola's Arboretum."[3] To the east of the chapel, a formal, symmetrical entrance garden was laid out in 1916, with clipped hedges bounding a mix of evergreen shrubs, such as camellia and cedar. These beds mirrored each other on each side of the concrete center walk that led from the door of the chapel to Old Brunswick Town Road. The walkway and garden were remodeled in 2012 based on a design that echoes the original somewhat in that it is symmetrical and the gardens are bounded in evergreen shrubs, but the center is of a new design implemented in boxwood and gravel. The concrete of the center walkway was replaced with brick in a herringbone pattern and the landing at the base of the chapel porch is a new design made from orchard stone.

To the south of the chapel are the **remnants of the camphor grove** that was part of the garden plan proposed by Sturtevant in 1935. Stumps of old camphor trees that were lost to weather are beginning to re-sprout and the area is being partially cleared as the owner contemplates a new design. Until it was removed in early 2013, set within this grove was the Dinky House, a worker's cottage that was erected ca.1945-1948. Near the Dinky House were two lavatories that were constructed, likely around 1935-1940, for use by the public visiting the Orton Nursery and touring the grounds. These were also removed in early 2013.

Within the same area and just south of the Dinky House site once stood the Caretaker's House and its garage. These structures were built in 2004 to replace an older dwelling and outbuildings on that site. The Caretaker's House (see Buildings for full description) was moved in 2013 to a location across the nursery road, closer to the greenhouses, and the garage was demolished. The older dwelling that the Caretaker's House replaced would have likely functioned as the nursery manager's house. A historic aerial photograph from around 1930 depicts the house with a formal garden to its south side, bounded by an evergreen hedge and featuring a central walk flanked by five pairs of evergreen shrubs, and which may have functioned as a nursery display garden. A variety of evergreens formed a foundation planting around the house. A driveway led to its rear and to two outbuildings behind it. A crop field lay to the west beyond the house and behind Luola's Chapel, and may have been used to grow nursery plants. The camphor grove is visible in the photograph between the manager's house and the chapel.

The nursery road curves between this landscape area and the service area to the south, forming a Y intersection at Old Brunswick Town Road. Flanking the Y are two large **live oaks growing on earthen mounds**. It is thought that the mounds were created when the surrounding area was excavated for fill to form the garden terraces in the 1910s, so it is likely that the live oaks survive from before that period.

To the south of this intersection is the service area, containing the Caretaker's House, plantation office, two greenhouses, one attached to a head-house. the Power House/Barn, and a maintenance shed (see Buildings for full descriptions). Within the service area is the concrete block **greenhouse foundation** related to the Orton Nursery. It was later filled with soil to create a planter and currently holds several large camellias, probably survivors of the commercial nursery operation once located on this site.

A dirt track, called the **Low Road** by Sturtevant, descends from Old Brunswick Town Road close to the Y intersection down the east slope of the house terrace to the rice field level. This area was used for parking during Orton's high visitation periods in the twentieth century. This area has grown over in turf, but the flat area used for parking is still discernible in the landscape.

To the west of the cluster of buildings of the service area, situated on a small hill overlooking the Back Rice Fields, is the Orton Graveyard (**31BW548****, see Archaeological Resources for full description), the traditional burial ground for Orton's African American servants in the nineteenth and twentieth centuries. Forty marked graves have been identified with the earliest occurring in 1876 and the most recent in 1977; there are seven unmarked graves. Most of the graves are found in four rows oriented north-northeast to south-southwest. At least twelve of the individuals buried there were born as slaves.

The site is wooded with secondary growth and some evergreen shrubs, such as American holly and Easter red cedar, which may have been planted as memorials.

Working Plantation Landscape

From the service area, Old Brunswick Town Road extends southward along its historic alignment atop Orton Ridge and through the working plantation landscape. The working plantation landscape is characterized by a variety of open, wooded, or agricultural spaces bisected by historic roads lined with live oaks. It contains the historic rice fields, as well as residential and industrial structures and sites related to the historic active operation of the agricultural and industrial uses of the plantation. It is organized along Old Brunswick Town Road, which ends at the south entrance gate on State Road 1533, or **Phillips Road**. Old Brunswick Town Road once turned to the southeast at this point, towards the old town, but upon establishment of the Brunswick Town/Fort Anderson State Historic Site, the connection was realigned. Phillips Road follows the southern perimeter of the property to the state historic site to the east and westward where it intersects with the end of Plantation Road at the north gate of Sunny Point. Located along Old Brunswick Town Road, historically, have been dwellings for slaves and other workers, farm structures, agricultural fields, rice mills, sawmills--all the necessary features for the profitable production of a thriving plantation economy.

The other historic road in this area was historically called the **Sand Dam Pond Road**. This dirt track runs west from Old Brunswick Town Road to Plantation Road. It intersects Old Brunswick Town Road in the area of the African American settlement sites (**31BW787**4, 31BW787**5, 31BW787**6, 31BW787**7, 31BW787**12,** and **31BW787**13,** see Archaeological Resources for full description), identified in the archaeological survey of Orton. The **Sand Dam Pond** was last depicted in the 1939 survey of Orton and Kendal and exists today as a bald cypress wetland. The 1939 survey shows a pipeline extending between the pond and the service area, so the Sand Dam Pond may have been a water source for the plantation, or possible the nursery operation.

The low, flat expanse of the 320 acres of rice fields extends to the east and west of Orton Ridge and includes the **complex of rice fields, canals, dikes, roads, dams, ditches, and control structures**. The layout survives from the period of significance and includes five named fields: Front North Rice Field, which lies to the east of the Orton mansion and north of the east causeway; Front South Rice Field, which lies south of the east causeway; #1 Field, which lies just to the west of the Orton mansion and gardens; #9 Field, which lies west of the #1 Field and north of the entrance causeway; and Back Rice Field, which lies to the west of the mansion and south of the entrance causeway. The fields are irrigated by a complex of ditches comprising larger rim, or "feeder" or "facing," ditches that supply most of the fresh water to the smaller "quarter" ditches. The quarter ditches are fifty-five feet apart and distribute the water in a uniform, non-erosive, pattern through the interiors of the fields.[4]

The fresh water that feeds the rice fields is supplied from Orton Pond, which is situated on the west side of Plantation Road on land still held by the Sprunt family. Through a reciprocal easement agreement, the owner of Orton Plantation has the right to draw water from Orton Pond for the cultivation of crops in the rice fields, and in return, has agreed to maintain the structural integrity and good condition of the Orton Pond dam and its outfall. As a result of this agreement, the owner has been able to install a water release structure on the eastern edge of the pond, a mechanical device that controls the amount of water leaving the pond to feed the rice fields. The boundary of the nominated property jogs to the west in the vicinity of Orton Pond to include the dam, the water release structure, and the pond outfall.

The water management system for the rice fields fed by this water supply survives from the period of significance, having been continuously maintained by a succession of owners, although individual components of the system have been repaired and replaced over the years with more modern materials. The original design, including the pattern of dikes, rice trunks, irrigation canals, and interior irrigation ditches remains essentially intact. The existing water control system from Orton Pond to the outlying rice fields features numerous water control structures in the form of managed spillways gates, gate valves, culvert pipes with and without flap gates, and wooden rice trunks.

Along their eastern edge, the front rice fields are separated from the Cape Fear River by a 1.62-mile-long narrow earthen dike, or revetment. Initially constructed over 250 years ago, the revetment originally stood well inland of the Cape Fear River shoreline. An expansive and stable *Spartina alterniflora* marsh grass flat lay between the dike and the open water of the river, protecting the structure from wave action. This marsh fringe has been identified in aerial photography as recently as 1956, when it measured from 100 to 200 feet wide. Since that time, due to increased wave action from larger ships, this protective marsh border has become unstable, with large sections of the vegetation and its root mat substrate being detached. The affected lengths of the revetment are now directly exposed to the river's natural hydraulic forces and

increased wave action coming from ships in the shipping channel that lies 450 feet away. Efforts to protect and repair the revetment over the past thirty years include the placement of concrete debris rip-rap as armor, and the construction of lengths of retaining walls made variously of wood, steel, and concrete. These structures have since proved to be inadequate to meet the challenge of increasing erosion along the river front.

Repair and replacement of thirteen of the water control structures was requested in a 2012 application to U.S. Army Corps of Engineers.[5] The permitted work includes repairs to eroded portions of the Front Rice Field revetment; an increase in its overall elevation; enhancement and re-vegetation, with grass, of its interior slope; and reconstruction and stabilization of its seaward face. Improvements also include the installation of metal sheet pile panels within the core of the revetment to give it greater strength and stabilization of the seaward face with rip-rap or gabion matting. Additional work includes repair and reinforcement of rice field dikes beyond the revetment throughout the rest of the front rice fields, and the #1 and #9 Fields, including erosion repair, contouring of dike crests, and installation of sheet pile with backfill as necessary. Throughout the system, water control structures will be either repaired or replaced *in situ* in thirteen locations. Most of the water control structures are bounded by wooden bulkheads and their repair or replacement will require partial or complete dismantling and reconstruction. Canal and quarter ditch systems will be maintained and re-established through excavation of material from existing canals and ditches. Some existing ditches may be filled and some new ditches constructed, depending on the requirements for water distribution. Through an agreement with the U.S. Army Corps of Engineers as part of permit mitigation conditions and requirements, sections of the Back Rice Field and #9 Field will be retained as undisturbed wetland.

Three sloughs, or canals, connect the Back Rice Field with the front fields, named in this report as **Canal #1**, **Canal #2**, and the **Orton Pond Outfall**. Canal #1 and Canal #2, which was historically known as the Cow Bridge Branch, pass under Old Brunswick Town Road through culverts. The Orton Pond Outfall is crossed via a concrete bridge that replaced an older concrete bridge around 2011. Canal #1 divides the Orton mansion landscape from the working plantation landscape.

Just south of Canal #1 is a cluster of features, including a tennis court constructed in 2012 (see Structures for full description). Next to it, a building constructed between 1990 and 1994 as a stable (see Buildings for full description), is currently being used to house landscape equipment. The owner plans to keep this building and use it as a tennis cabana. Across the road stands a large metal shed being used to shelter large equipment. The owner plans to relocate the shed to an area across State Road 133 from the property.

On the hilltop above the tennis court and stable is **Elijah's House**, a late nineteenth-century wood-frame dwelling in only fair, but stabilized, condition (see Buildings for full description). Elijah's House is the only remaining of two dwellings that stood on the hilltop prior to 2012. That year, the second was lost to fire. Two buildings appear in these locations on coastal surveys from 1878 and 1888, but a survey plat created in 1939 shows only Elijah's House. Because of their locations on the hilltop, their placement halfway between the Orton mansion and the worker's settlement to the south, and their relative isolation, Elijah's House and the other dwelling shown in 1888 were likely managers or overseer's residences. The area around Elijah's house is identified as archaeological site **31BW787**7** (see Archaeological Resources for full description).

Further to the south, the road crosses over Canal #2 and enters the traditional working heart of the plantation. It was in this area that most of the worker's dwellings were located, as well as the mills, storage buildings, and docks for product and supply loading and unloading. Just south of the canal, Sand Dam Pond Road extends from Old Brunswick Town Road to the west to meet Plantation Road.

Today, little above-ground evidence remains of the once-lively complex of dwellings and work places, but several archaeological sites have been identified in this area and are evidence of nineteenth- and twentieth-century domestic dwellings. There is also evidence that points to possible extension of the period of significance into the late antebellum period. The coastal maps from the 1870s and 1880s are detailed enough that one can see fence lines enclosing yards around these houses, as well as patterns and textures that indicate vegetable gardens and agricultural fields. It has been recommended that this area be protected for its ability to provide more information about the lifeways of African Americans living on the plantation. Additional investigation is recommended due to the potential for recovery of data associated with the African American church, as well as slave dwellings.

On the northeastern corner of 31BW787**12 lies site **31BW787**8**, which contains the remains of a twentieth-century structure identified as having been built by the North Carolina Wildlife Department for the storage of grain and equipment

when they were managing the rice impoundments for wildlife in the 1950s (see Archaeological Resources for full description).

To the south of these sites, Old Brunswick Town Road crosses over the Orton Pond Outfall on a one-lane bridge. The bridge is constructed of poured concrete and has a low curb but no safety rails. It was constructed around 2011-2012 to accommodate heavy equipment and replaced an older concrete bridge.

There are two archaeological sites in this area, one on each side of the Orton Pond Outfall. The first, **31BW787**14** (see Archaeological Resources for full description), contains the remains of an antebellum mill and possibly a residence associated with the mill. The second site, **31BW787**15** (see Archaeological Resources for full description), contains the remains of what is likely an antebellum structure, possibly used for threshing or other agricultural activity.

South of the Orton Pond Outfall, the road extends past the Brunswick Town/Fort Anderson State Historic Site, which is enclosed by a security fence. Although the state historic site was once part of Orton Plantation, views into the site from Old Brunswick Town Road are now obscured by secondary growth vegetation along the property boundary. The boundary was established in 1952, when James Lawrence Sprunt and his sons donated the 114.5 acres of Orton Plantation that contained the site of historic Brunswick Town to the State of North Carolina.

To the west of the road is the **South Field**, a large agricultural field currently planted in corn. This cleared area is first documented in the 1864 Gilmer Civil War map and continues to appear as an open landscape free of trees in late nineteenth-century coastal charts. It is shown in Sturtevant's 1937 master plan for Orton and labeled South Field therein. An annotated aerial photograph taken in 1949 indicates the field as twenty-one acres in size. In the photo, two ovoid patterns within the field appear to represent a perimeter road or possibly another use, such as a training track. In the same photograph, another cleared area is visible across the road, identified today as the site of historic Russellborough, part of the Brunswick Town/Fort Anderson State Historic Site. Since 1949, the South Field has been enlarged, extending further to the south. Today, in addition to the corn crop, it contains tall poles with connecting lines that have been erected to provide roosting spots for birds.

A dirt track runs around the field and then extends to the west to meet Plantation Road close to its intersection with Phillips Road. Before this point, the dirt track passes another, smaller agricultural field, called the **West Field**, also planted in corn. This field is not indicated in Sturtevant's 1937 master plan, but does appear in the 1949 aerial as five acres in size.

Old Brunswick Town Road ends at its intersection with Phillips Road at the **south entrance gate**, which matches the north entrance gate (see Structures for full description). The property extends past Phillips Road, incorporating a portion of Liberty Pond, which is named in the 1921 survey of Orton. It is possible that some remains of Civil War breastworks identified in that survey between Liberty Pond and Sampson Pond, to the west, are extant in the landscape. Phillips Road extends from Plantation Road to provide access to the state historic site. It appears as early as the late nineteenth century in coastal surveys.

The property boundary is defined by a post and wire fence, set with a handful of black-painted metal gates with two arms mounted on metal posts. The gates are secured with a chain and padlock system and small regulatory signs are posted on the fence posts indicating private property.

Excluded from the boundary is Drew Cemetery, which was established in the 1950s to accommodate the remains of persons buried in an older cemetery that was relocated when Sunny Point was established. Adjacent to the cemetery, but within the boundary, are two communications towers established within an easement. These towers are slated for removal in 2013 and the easement for release.

Archaeological Resources

Two archaeological investigations have taken place within the boundaries of the Orton Plantation Boundary Increase and Additional Documentation, one landside and the other along the edge and within the waters of the Cape Fear River.[6,7] During each investigation, resources were found that support the eligibility of the property for National Register listing under Criterion D, that is, likely able to provide information supporting the significance of the story of Orton and thus, worthy of protection.

From 2011 to 2012, the Chicora Foundation undertook reconnaissance-level archaeological investigations within the historic core of Orton.[8] Most of the sites located during these surveys represent nineteenth-century settlements that are documented on historic maps and charts showing Orton. Many are post-bellum settlements of African Americans and two contain antebellum artifacts. A few artifacts also pointed to Native American occupation. The contributing resources are identified in the discussion below.

Landside Archaeological Resources

Contributing Resources

31BW548 (Orton Graveyard)**. The Orton Graveyard, an African American burial ground, was identified as a tenant burial ground in 1980 during a survey of disused cemeteries in Brunswick County.[9] The cemetery is located on the western edge of a ridge above the back rice field. The topography of the cemetery is undulating and slopes towards the rice field. It is vegetated in secondary growth hardwood saplings underlain by dense scrub vegetation.

A second survey, undertaken in 2012 by Dr. Michael Trinkley of the Chicora Foundation, located four rows of burials oriented north-northeast to south-southwest, following the edge of the rice field.[10] Many graves were also oriented west-northwest by east-southeast. Some were defined by sunken depressions and others were flush with the surrounding grade. Thirty-seven graves were marked, although only thirty-two of these were legible. Trinkley posited that thirty-seven graves was a small number for an operation as large as Orton's and suggests that there are likely many other graves that the ground-penetrating radar did not identify in the cemetery, or that there is another cemetery associated with the plantation.

The earliest documented grave at the Orton Graveyard is that of Schuyler Hooper, who died in 1876. The most recent marked grave is that of Maggie Delts Moore, who was buried in 1977. At least twelve of the individuals in marked graves were born as slaves, including Mary Ann Brown (b. 1818), Amy Davis (b. 1842), and Eli Davis (b. 1852). Nineteen surnames are present, although eleven of these occur only once. The most common surnames are McClammy (seven occurrences) and Delt or Delts (five occurrences). An unusual quality of the cemetery is the abundance of markers – many of them commercial marble. Six stones were re-set in the field so that inscriptions could be read.

31BW7871 (eighteenth- and nineteenth-century domestic site).** This site, measuring 200 by 150 feet, is located immediately north of the Orton mansion and on the edge of the terrace that overlooks the rice fields to the east. It comprises a scatter of historic artifacts that have been disturbed by garden creation in the early to mid-twentieth century and additional landscape work in 2011–2012. The artifacts may represent a kitchen, servant's quarters, or an overseer's house. The site also features a brick well, which is located in the east yard of the main house.

31BW7872 (Roger Moore Cemetery).** The Roger Moore Cemetery is located on the high ground overlooking Orton Creek to the north and rice fields to the east. This small site, at only fifty feet by fifty feet, rests at the northern edge of the designed landscape of Orton and is shaded by a cluster of live oak.

Contained within the cemetery are one gabled brick vault and three domed vaults with end pediments, as well as three brick box tombs with marble ledgers, one marble box with a marble ledger, and one head and footstone. These features, surveyed in 2012 by Michael Trinkley of the Chicora Foundation, form three lines oriented north-northwest by south-southeast, with each individual tomb or grave oriented west-northwest by east-northeast.[11] As Trinkley describes it,

> [t]he largest, gabled vault by tradition is ascribed to Roger Moore, with the smaller surrounding vaults assigned to wives and other family members. If the gable vault is that of Roger Moore there would have been ample room in it for his wives. It is more likely that the surrounding tombs are other family members, although since [*sic*] none have any sort of marble plaque (except for a very late addition to the one thought to be Roger Moore). The three smaller brick tombs have entrance areas where often a marble ledger is attached, but none are present here.[12]

Trinkley reported that most of the brickwork in the cemetery exhibits multiple repair episodes using hard Portland cement mortar. Much of the original stucco, originally present on all of the vaults, is missing, although bits of the underlying scratch coat are still present. The repairs appear to have been made in the 1940s. Despite the negative effects of these repairs, the condition of the cemetery has greatly improved since reports from 1917 described the collapsed roof of the tomb.[13]

31BW7874, 31BW787**5, 31BW787**6, 31BW787**7, 31BW787**12, and 31BW787**13 (nineteenth- and twentieth-century domestic sites).** These six sites contain resources identified by the Chicora Foundation in 2012.[14] They are likely associated with a small African American settlement that was located south of the Orton mansion along Old Brunswick Town Road and just north of the Orton Pond outfall. Historic maps and other documents reveal the presence of multiple small dwellings, many of which appear to have had small gardens or livestock yards.

Site 31BW787**4 consists of a brick mound measuring about ten feet in diameter and two feet in height that is likely the remains of a chimney. Found artifacts include ceramics, a porcelain button, and window glass, all suggesting a nineteenth-century dwelling. Site 31BW787**5 is similar, consisting of the remains of a fireplace and other rubble, as well as ceramics that suggest another nineteenth-century dwelling. Site 31BW787**6 is similar, but contains artifacts that may date it to before the Civil War. Site 31BW787**7, another domestic site, still contains a wood frame structure dating to the late nineteenth or early twentieth century. Shovel testing around the building site uncovered artifacts that may date to before the Civil War. Sites 31BW787**12 and Site 31BW787**13 are also late nineteenth- and early twentieth-century domestic sites. Until an accidental fire in 2011, Site 31BW787**12 contained a wood frame house. Shovel testing close by revealed artifacts that may date to before the Civil War. Site 31BW787**13 also contains the remains of domestic materials and may be related to use of Sites 31BW787**5 and 31BW787**6.

These sites are important for their potential to yield information about the lives of colonial or antebellum slaves at Orton and on the coast of North Carolina, as well as the tenant farmers who succeeded them.

31BW7879 (Bonnie House site).** This is the site of a building called the "Bonnie House," which was located between the two specimen live oaks that flank the Gatehouse front yard.[15] The Bonnie House is thought to have been constructed in the late nineteenth or early twentieth century and likely burned down or was removed prior to 1938, as it does not appear in the aerial photograph from that year. It appears that another house was constructed at that site after 1949, but this house burned down in 2007. The functional relationship between the Bonnie House and the Gatehouse is presently not known.

31BW78714 (eighteenth- to nineteenth-century domestic or industrial site).** This site, at 100 by 100 feet, comprises the remains of a structure located within and along the bank of the Orton Pond Outfall. The remains, consisting of wood planking used to shore up the banks of the canal, support timbers, metal pipes, and a stock of brick, may represent a structure related to the mill that was once on the site.

31BW78715 (nineteenth-century domestic or industrial site).** This site consists of a brick column that may have been either a corner or a pier that supported a structure related to Orton's antebellum rice mill. Its close proximity to the canal suggests that it may have been a threshing barn.

31BW78716 (Antebellum drainage ditch and property boundary).** This site consists of a drainage ditch that also marked the property boundary between Kendal to the north and Orton. The ditch once ran almost due east to Orton Creek, but today there are gaps where portions have been filled in for road crossings. Most of the ditch, however, remains distinct in the landscape.

Noncontributing Resources

31BW7873 (Prehistoric and historic remains).** This site was surveyed by the Chicora Foundation in 2012. It consists of a scatter of prehistoric and historic remains in an area measuring 50 x 75 feet on a terrace edge south of the Roger Moore Cemetery. The prehistoric remains are lightly scattered and confined to an area around 30 x 70 feet. They represent a limited activated site that has been impacted by road construction and gardening activities. Historic remains comprise a scattering of ceramics and glass dating to around 1853 and a pile of coal slag. None of these remains exhibit good integrity, nor are they likely to address significant research questions. No addition investigation is recommended.

31BW7878 (Twentieth-century structural remains).** This site was surveyed by the Chicora Foundation in 2012. It consists of a concrete pad measuring 18 x 39 feet and oriented parallel with the rice fields, about 100 feet to the west. A small structure located on the north end of the pad burned around 2012 when a nearby controlled burn got out of control. Oral history identifies the structure as having been built by the North Carolina Wildlife Department for the storage of grain and equipment when they were managing the rice impoundments for wildlife in the 1950s. The only artifacts found around the pad likely related to the 1950s building. It is not considered a contributing site and no further archaeological investigations are recommended.

31BW78710 (Low incidence of prehistoric and historic remains).** This site was surveyed by the Chicora Foundation in 2012. It is located on an upland flat overlooking rice fields to the east and is bisected by a recently-created logging road. Only two artifacts were discovered at this site. It appears unlikely that this site can make significant contributions to the research.

31BW78711 (Low incidence of prehistoric remains).** This site was surveyed by the Chicora Foundation in 2012. This 50 x 50 foot site is located on a ridge overlooking rice fields to the east. A pedestrian survey was conducted and encountered two prehistoric stone flakes. Researchers concluded that the site appears to be of limited or specialized use and is unlikely to make significant research contributions.

Underwater and Shoreline Archeological Resources

In 2012, Tidewater Atlantic Research, Inc. (TAR) conducted a magnetometer and sidescan sonar survey of the Orton waterfront from the mouth of Orton Creek to the mouth of the Orton Pond Outfall.[16] It was followed by an on-ground shoreline survey to further investigate the waterfront. The goal of the survey was to identify potentially significant cultural resources that should be avoided during dike restoration activities. These surveys resulted in the identification of 150 objects; 32 contributing and 118 noncontributing (refer Appendix A). The magnetometer and sidescan sonar surveys resulted in the identification of 112 magnetic anomalies and 27 sonar objects. Twenty-two of the magnetic anomalies are contributing resources and 90 are noncontributing. Eight of the sonar objects are contributing resources and 19 are noncontributing. The contributing magnetic anomalies and sonar objects were identified within 10 cultural resource buffer zones which should be avoided during any dike restoration activity. The shoreline survey identified 11 objects. Two of these are contributing resources and nine are noncontributing.

Contributing Resources
Underwater and shoreline investigations identified 32 contributing objects. Twenty-two potentially significant objects are magnetic anomalies, eight are sonar targets, and two are objects located along the shoreline. These objects include: breakwater pilings, dock pilings, ballast piles, and features associated with Orton Point Light.

Twenty-two magnetic anomalies were individually or in clusters were determined to have signature characteristics suggestive of potentially significant submerged cultural resources. The potentially significant submerged cultural resources are clearly different than the 22 anomalies that represent modern debris associated with pipes, riprap, bulkheads, and crab traps.

The sonar survey identified remains of the Orton Point Light. Features include an L-shaped feature and associated structures that could represent the remains of a dock or bulkhead designed to serve or protect the light itself. Distinctive crescent, rectangular, and square structures could represent elements of the lighthouse base.

A line of pilings that could be associated with the lighthouse likely identify the remains on one of several waterfront bulkheads or breakwaters constructed to protect the Orton Plantation shoreline from erosion.

At the site of the Orton Plantation vessel dock site illustrated in the 1913 Coast Survey Chart sonar revealed the remains of the dock pilings and piling breakwaters built to protect the Orton Plantation waterfront and the dock structure. Sonar images also identify bottom surface material that could be associated with the remains of vessels and navigation lights.

The shoreline survey identified two areas containing potentially significant features. One included the structural remains of a trunk in the Orton Plantation dike, a structure used to regulate water in the rice fields. The second feature identified was a 24-inch diameter, 8-foot-long section of a riveted iron cylinder that may be associated with a late nineteenth-century navigation light. It is known that at least one Funck tubular navigation light was erected at Orton Point in 1895.

Noncontributing Resources
Underwater and Shoreline Investigations identified 118 noncontributing objects. These include 90 magnetic anomalies, 19 sonar objects, and nine objects identified during the shoreline survey. These noncontributing objects include pipes, riprap, bulkheads, crab traps, pieces of degraded cable, possibly associated with the steamer dock, range lights, and associated debris near the mouth of Orton Creek and off Orton Point, and numerous small single objects.

Buildings

Orton Mansion

ca.1729-1732, ca. 1810s-1820s, ca.1840, 1909-1910, 2011-2012

Contributing building

Introduction

Orton, the mansion and the seat of the legendary plantation of the same name, is an imposing Classical Revival-style temple-form residence whose fabric includes an overbuilt ca.1729-1732 one-and-a-half-story brick house and whose appearance reflects three major building programs of the mid-nineteenth, early twentieth, and early twenty-first centuries. When nominated to the National Register in 1972 and cited for its significance in the area of architecture, Orton enjoyed an iconic status as a landmark of antebellum Greek Revival-style domestic architecture in North Carolina and one of the state's most distinguished examples of the American Country House Movement. The early colonial brick house of one-and-a-half stories erected for Roger Moore in about 1729-1732 was then, as now, concealed within the stucco-clad walls of the dramatic temple-form two-story house built ca.1840 for Dr. Frederick Jones Hill (1792-1861). The architect for that work is not known. As noted in the 1972 nomination, evidence in the attic, visible until being sheathed over in 2012, indicates an "intermediate stage of development" whereby the Moore house had been raised to a two-story-with-attic dwelling, in about the 1810s or 1820s.

Orton stood essentially as completed until 1909 when the plantation passed into the ownership of Luola Murchison Sprunt (1858-1916). Determined to renew and adapt Orton as a country house and winter retreat, Mrs. Sprunt engaged her brother, Kenneth McKenzie Murchison Jr. (1872-1938), a New York-based architect, for her proposed improvements. Deferring to Dr. Hill's achievement and Orton's grandeur, Mr. Murchison added one-story balustraded wings on the north and south sides of the house, whose classical finish complemented the earlier antebellum house, and a substantial one-story gable-end service wing on the rear, west elevation. He embellished Orton's already handsome two-story Doric portico with a black-and-white marble paved floor, enrichments of the existing second-story balcony and the louvered lunette in its pediment, and replaced the rectangular panes and sash treatment in the existing three-part, first-story windows with multi-pane upper sash and single-pane lower sash. These upper sashes held diamond-shaped lattice-like tracery that complemented similar diamond-shaped panes in the entrance sidelights. (Documentary photographs prove that this treatment was short-lived, and the openings were almost immediately refitted with nine-over-nine and three-over-three sash that appear in the earliest, ca.1885-1890 photographs of the house.) The lunette, which originally vented the attic, was replaced by an elegant glazed fanlight that could also be opened for ventilation.

These new tracery windows were coincident with Mr. Murchison's one known major change to the interior of Dr. Hill's Orton. The rectangular form of Roger Moore's house had been preserved through Dr. Hill's enlargement and comprised the first-story east front and easternmost parts of the north and south side walls of the antebellum dwelling. The Moore house's west wall had also survived and become an interior wall. Kenneth Murchison removed the interior partitions of the rectangular Moore block, believed to have then had a center-hall plan, and created a large living room within its embrace, with pendant fireplaces centered in its north and south walls. He also added paired, adjoining bathrooms on the second story to serve its four bedrooms.

The American Architect published a first-story floor plan of the completed house, three exterior views of Orton, and a photograph of the well-furnished living room in its 24 May 1911 issue. Orton, as expanded and refitted by Kenneth M. Murchison, survived for a century with little visible change except for the replacement of his 1910 service wing in the early 1960s by a new gable-roof ell of a less appealing, utilitarian design and appearance.

In 2010 Louis Moore Bacon, a lineal descendant of Roger Moore, acquired the principal part of Orton Plantation's 14,000-plus acres, including the mansion, the plantation outbuildings and cemeteries, and its gardens. He simultaneously engaged Richard Sammons of Fairfax & Sammons, an architectural firm with principal offices in New York, to design an architectural program for the plantation seat that included certain restorations to the existing house as well as significant alterations and a major addition. The two-story-with-attic addition, in a post-Modern Colonial Revival style, was inset just inside the rear southwest and northwest corners of Dr. Hill's temple-form house, replicated its stucco-clad elevations, and reproduced the classical woodwork and finish as had Mr. Murchison a century earlier. The addition increased the footprint of Orton by about one-third and its total square footage by a like measure. The addition also accomplished another feat. Its elegant, richly finished, double-tier porch effectively created a new entrance front for Orton, easily accessible from the

newly-devised motor court. Its implied role is confirmed by paired classical piers, inscribed with Orton and the year 1725 in Roman numerals, positioned on a true north-south axis with the entrance to the motor court and the hanging lamps on the first-story porch.

The addition contains an entrance hall, vestibule, boot room, lavatory, kitchen, and pantries on the first story, and new private bathrooms for the bedrooms in the southwest and northwest corners of Dr. Hill's house and a new pair of guest rooms *en suite* with closets and bathrooms on the second floor, all aligned on a center hall with doors opening onto the second-story porch.

Inside Orton, alterations were made to rooms in both the antebellum and early twentieth-century blocks. In the dining room, contained in Mr. Murchison's south wing, the raised floor level of the tea room/solarium at its south end was eliminated, the shallow centered dome was deepened, and a new wall in the northwest corner rendered the main space a true octagon. In the adjoining butler's pantry, now redesigned as a breakfast room, the existing three-part south window was refitted as a projecting bay window and a service counter was installed in the east end of the pantry. In the north, bedroom wing, the Sprunts' east-facing bedroom, opening off the north end of the living room, was redressed as a heavily-paneled office and fitted with a coffered, domed ceiling that rises to a lantern. Other repartitioning and the opening and closing of doorways recast the formerly communicating pair of smaller bedrooms as private chambers. On the second story, the paired, adjoining bathrooms positioned slightly off-center on the south side of the house were combined and refitted as a private marble-detailed bathroom for the master suite.

This introduction provides a brief, necessary chronology of the architectural evolution of Orton and the sequential changes made at three important points in its history to accommodate the needs and lifeways of its wealthy owners. Considered together they have resulted in a house whose fabric and appearance is effectively one-third antebellum, one-third early twentieth-century, and one-third early twenty-first-century. The following description reflects this chronological development and incorporates portions of the description written in 1972 for the initial listing of Orton Plantation in the National Register of Historic Places.

Description of Orton

As described in 1972, the two-story stuccoed brick temple-form "main block of Orton retains much of its original character." This is particularly evident on the east façade, which is dominated by a bold tetrastyle portico of fluted Doric columns and a rich Doric entablature incorporating modillions in the cornice and corresponding triglyphs in the frieze. This entablature, which carries down the side elevations of the house, is a defining feature of Orton and one adopted by its later architects for their additions in 1909-1910 and 2011-2012, respectively. The present fanlight occupies a lunette originally fitted with louvers to ventilate the attic. The date of the slate roof remains to be confirmed, but probably dates to the 1909-1910 enlargement. The 1972 National Register nomination describes the appearance of the mansion:

> The façade has at both levels a central doorway, which is flanked at the first level by single wide three-part windows and at the second by pairs of normal size windows; this arrangement existed at least as early as 1890. The first-level entrance consists of a single door flanked by fluted Ionic columns and sidelights. An entablature with pulvinated frieze breaks out over the columns; above it is a wide transom with tracery. These elements, within paneled soffit and reveals, are framed by a symmetrically molded architrave with roundel corner blocks and base blocks featuring a Greek fret. The first-floor façade windows have nine-over-nine sash in the center section . . . and three-over-three in the sidelights. They are framed and divided by symmetrically molded architraves with roundel corner blocks. At the second level, the doorway, of twentieth century design, consists of a double door beneath a transom; the upper part of each leaf is glazed. The symmetrically molded architrave has corner blocks and base blocks featuring a Greek fret. This doorway serves a balcony which, though it had an earlier precedent, was elaborated in 1910. It is supported by large, carved scroll brackets and enclosed by turned balusters and paneled pedestals that carry a molded rail. The four windows at this level contain six-over-six sash and are framed by symmetrically molded architraves with roundel corner blocks like those below. Louvered shutters appear on all windows of the main block and wings, except at the rear.
>
> The addition of the wings about 1910 altered the side elevations. As seen in a circa 1890 photograph, the widely spaced two front bays of the south side of the main block were identical at both levels, with windows containing six-over-six sash flanking an interior end chimney. Behind these (but within the block of the house) was a porch with a two-bay elliptical-arched open arcade; four closely placed windows appeared above. Today the wing covers the second bay and the rear porch is enclosed; the second-floor

> fenestration is undisturbed. No early picture of the north elevation has been found; the present scheme with six bays and two interior end chimneys may be the original one.
>
> The one-story side wings echo many of the features of the Greek Revival main block; the wall, cornice, and window treatments are identical. The south wing is a single room. Three arched openings occur in the south wall, that in the center containing a French door. The northern wing is much larger and contains three bedrooms and several baths. The flat roofs of the wings are enclosed with balustrades identical to that of the gallery on the temple form section.[17]

The main block of Orton remains essentially as described in 1972 except that the fenestration in the enclosed westernmost bay of the south elevation's first story, which then illuminated the butler's pantry, has been refitted by Mr. Sammons with a three-sided bay window surmounted by a fanlight. This change reflects the present, dual role of the interior space as both a breakfast room and a butler's pantry.

The north and south side elevations of the 2011-2012 two-story rear wing have an asymmetrical symmetry on the first story reflecting the differing functions and uses of the interior spaces, including a three-part window on the south side illuminating the kitchen and a door on the north elevation that provides access to a newly-devised stone-paved terrace. Elegant variety appears, as well, on the second story, which has a four-bay arrangement on the south elevation and three windows on the north side. Following the pattern seen earlier, the first-story openings hold mostly nine-over-nine sash while the second-story openings contain six-over-six sash windows. Most are fitted with louvered blinds. The new wing is dominated by its two-tier west porch whose principal fabric repeats the finish of the east portico. The signal difference is the provision of porches for the two principal levels of the house. The finish of the centered doorways on both levels echoes that of the east façade. Both porches are supported by plain Tuscan columns. The first-story porch, with its appealing paneled ceiling, is open and accessed by an almost full-width wood stair. On the second story the columns are linked by a fretwork railing, and the porch is fitted with copper screening on paneled mounts that recalls sleeping porches of an earlier day.

The interior of Orton reflects the same three principal periods of development seen on the exterior. While scholars can reasonably debate the floor plan of Roger Moore's elegant brick house, there is every likelihood that a center-hall plan came into existence on the first story coincident with Dr. Hill's ca.1840 remodeling and that the three-part first-story windows on the façade are also original to his rebuilding of Orton. The configuration of the present stair hall and billiard room probably also date to his era, however, the existing stair, with its boldly wrought newel and railing may represent an improvement dating to the later nineteenth century. The billiard room was probably first used as a dining room.

The 1972 National Register nomination acknowledged the changes made to the antebellum plan and finishes of Orton by Kenneth M. Murchison for the Sprunts in 1909-1910. Principal among these was his removal of partition walls to create a large living room with fireplaces centered in its north and south ends. The window openings on the west side of both fireplaces were enlarged as doorways to provide access to the new dining room and bedroom wings.

The description of the first story crafted in 1972 remains accurate today, with the modifications noted in the introduction:

> The two stylistic eras (1840s Greek Revival and 1910 Neoclassical Revival) present in the interior features are so compatible that identifying all of them is impossible. In addition, it appears that some of the Greek Revival molding was either reused or reproduced. In the parlor, all the windows are framed with symmetrically molded architraves with roundel corner blocks. The reveals are flat-paneled with alternating square and vertical panels. A panel also occurs beneath each window. The doors are framed with a modified version of the front entrance, each employing a pair of Ionic columns and an entablature with a pulvinated frieze. The fireplace at each end of the room features a gray-black marble mantel with engaged Ionic columns which support a frieze of serpentine with faceted panels in the center tablet and end blocks. Elaborate plaster work of classical motifs dating from 1910 forms the cornice and adorns the ceiling. The stair located in a transverse hall behind the parlor rises in two flights with a landing in between. The newel is turned and covered with acanthus leaves. Turned balusters carry a handrail oval in section. Behind the stair hall is the billiard room which has a tall neo-Federal style mantel, a molded chair rail, and a deeply molded baseboard. In the dining room, a shallow dome forms the central portion of the ceiling. The woodwork consists of a high flat-paneled wainscot, symmetrically molded architraves with paneled corner blocks, and a neo-Federal style mantel. The south end of the dining room is treated as a solarium. Its terrazzo floor is raised one step, and the room is visually divided by a pair of Tuscan columns which occur at each end of the step.[18]

As noted earlier, the Murchison-designed, Sprunt-era butler's pantry, which encompassed the recessed, arcaded porch of Dr. Hill's house, was refashioned in 2011-2012 as a breakfast room with a service counter on its east end, beside the door leading to the dining room. Here a section of the handsome English-bond brickwork of the west wall of Roger Moore's legendary colonial house has been exposed and enframed above the counter. The finishes in the kitchen, pantries, the hall, the vestibule, and the boot room in the new wing are of high quality and expected character. The hall, the vestibule, and the boot room are wood paneled.

The 1972 nomination, as typical of its period, gave little notice to the finish of the bathrooms at Orton. The two bathrooms in the first-story bedroom wing retain their hexagonal tile floor and wainscot of glazed square creamy white tiles and some fittings that date to 1909-1910. In these rooms and on the second story, the new bathroom fittings are mostly modern reproductions or adaptations of early twentieth-century fixtures. Some reconditioned enamel-on-cast-iron claw-foot bath tubs are also used.

The basement level of Orton, accessible both from an interior stair positioned under the staircase rising to the second story and an exterior hatch door on the north side, contains two chambers. The original basement dating to Dr. Hill's era, with mixed brickwork walls and ballast-stone masonry, and a later poured concrete floor, is located under the stair hall and billiard room. Sections of eighteenth- and nineteenth-century brickwork are visible here, including parts of the west foundation wall of Roger Moore's house. A new door in the old basement's west wall opens into the full basement under the new wing, also concrete floored, that houses mechanical, electrical, and utility equipment.

A comparison of the second-story plan recording existing conditions at Orton, dated 13 June 2011, with one dated 12 January 2012, showing the work as proposed (and essentially built) confirms the survival of the interior arrangement at the time of the nomination and the retention of its significant features during the 2011-2012 work. The stair rises to a landing at the near center of the house, which opens on its east and west sides into the respective sections of the center hall, which is remarkably narrow for a house of Orton's commanding presence. The entry into the east hall is marked by a well-executed transverse elliptical arch supported on paneled pilasters. While much of the Sprunt-period flooring on the first story has been replaced, most of the original pine flooring on the second story remains in place.

The architectural finish in the four bedrooms aligned along the center hall and positioned in the northeast, southeast, southwest, and northwest corners of the main block, the closets, and dressing rooms comprises molded baseboards, chair rails, architraves framing the doors and windows, and plaster or wood cornices executed in late Federal, transitional Federal-Greek Revival, Greek Revival, and early twentieth-century classical designs, together with some woodwork introduced in refitted areas in 2011-2012. Their use varies room to room.

The architraves in the hall and the southeast bedroom, likely the one used by Dr. and Mrs. Hill, are symmetrically molded and have faceted corner blocks. The southeast bedroom is *en suite* with a dressing room and the earlier mentioned marble-detailed bathroom on the south side of the hall. The architraves in the front, northeast bedroom have a three-part transitional Federal/Greek Revival design. Both rooms feature classically-detailed mantels that appear to be original. The northwest bedroom has molded three-part transitional Federal/Greek Revival-style architraves and a simple Federal-period mantel that was added in 2011-2012.The southwest bedroom is fitted with both early/original and modern three-part architraves; it has no fireplace.

In the 2011-2012 building program, the bathroom that had been enclosed in the west end of the center hall was removed and the hall was continued through the addition to paired doors that open onto the second-story porch. Its narrow path is interrupted about midway by recesses. Three rooms are aligned along each side and comprise new *en suite* bathrooms for the respective northwest and southwest corner bedrooms of the main block, and a second, pendant pair of bathrooms that are *en suite* with the two new bedrooms in the northwest and southwest corners of the new wing. The molded woodwork and three-part architraves are traditional in character and of a high quality. The bathrooms have tile floors and period revival fixtures.

The attic level of Orton is simply finished. The stair rises to a shallow landing with doorways in its east and west elevations. The doorway on the east opens into the front, east attic, which has new wood flooring and wallboard on the walls and ceiling. The doorway in the west side of the landing opens into an ante-hall, in the main block of the house that is flanked by a simply-finished bathroom on the north and paired cedar-lined closets on the south side. The west attic is simply finished and fitted with a window seat under the fanlight in the pediment of the two-tier porch.

Luola's Chapel

1915

Contributing building

Luola's Chapel is one of two entirely original buildings at Orton designed by Kenneth McKenzie Murchison Jr. that, together with his work at the mansion and the north and south entrance gates, constitutes an important part of Orton's early twentieth-century renaissance. Designed as a private family chapel for Luola Murchison Sprunt and completed in 1915, it became a memorial upon her death on 17 February 1916. Soon thereafter her husband, James Sprunt, commissioned the stained glass tribute for the Venetian window centered in the chapel's west elevation. While the three-part Venetian window has a certain precedent in similar windows on Orton's façade and architectural practice in the period, its use here likely recalls the chancel window in St. Philip's Church, Brunswick Town, whose ruined walls stand a few hundred feet south of Orton's south entrance gate. Luola's Chapel was briefly acknowledged in the 1972 National Register nomination as "A 1915 Memorial Chapel."

Luola's Chapel is a rectangular, one-story Classical Revival-style temple-form building of stuccoed frame construction. It stands on a low brick foundation, signified by a visible ground-level water table of soldier-course brick, that incorporates a small basement under the chapel's northwest corner. The gable-front roof is covered with slate. An interior brick flue in the chapel's northwest corner rises above the roof at the rear. An octagonal belfry, positioned astride the ridge line, near the front (east) of the roof, features tall arched openings on its eight faces and a conical roof with a ball-shaped finial.

The classical design of the chapel and its architectural refinements are characterized by an insistent symmetry, the repetitive, unifying use of arches, and a certain lightness that contrasts with the heavier/more robust classicism of the Doric order seen at the mansion. The chapel's east-facing tetrastyle portico, which also overlooks the historic road linking the mansion with Brunswick Town, is supported by fluted Corinthian columns that rise from its herringbone-pattern brick floor to an entablature that fully encircles the building. The columns have complementing pilasters with molded bases and egg-and-dart caps that define three bays on the façade wall. Pilasters of the same design appear on the chapel's side and rear elevations, where they serve the same architectural function. A typical, molded architrave is the base for an inventive frieze featuring alternating rectangular sections of parallel, vertical incisions, which have the appearance of fluting, and circular, molded disks with pulvinated faces centered by a bull's eye. The cornice includes a dentil course and modillion blocks. This treatment is repeated in the raking cornice framing the tympanum that, in turn, is centered by a molded, louvered lunette. The center-bay entrance is framed by a free classical surround featuring Tuscan columns rising from a marble threshold to molded impost blocks that support a segmental arch. The double-leaf, four-panel doors are surmounted by a glazed fanlight. A handsomely-framed circular window is set in the wall above the entrance.

The north and south elevations of Luola's Chapel have a five-bay arrangement defined by shallow pilasters. The three center bays have tall, large arch-headed openings that hold paired nine-over-twelve sash windows below fanlights with complementing muntins. Blind, recessed arch-headed panels of the same dimension as the window openings are centered in the respective end bays. The chapel's rear, west elevation is as well-finished as its other elevations with three bays defined by pilasters. Occupying the center bay, the Venetian window is fitted twelve-over-sixteen sashes flanked by three-over-three sidelights and surmounted by a fanlight in a molded classical surround featuring Tuscan pilasters. A single-leaf three-panel door is positioned in the south bay and framed by a traditional three-part recessed surround. For symmetry's sake a small window fitted with four-over-four sash occupies a corresponding position in the west elevation's north bay. A brick stairwell, with concrete steps, is positioned parallel with the elevation and provides access to the small basement with a poured concrete floor and exposed brick walls that houses a furnace.

The interior has a center-aisle plan and is finished with pine flooring, plaster walls, a segmental-arch ceiling, and classical woodwork. Boxed pews with paneled ends and complementing doors are raised on low platforms and carry west from the back of the chapel for about three-fourths of its depth. A taller raised platform in front of the Venetian window is the setting for the expected trio of chairs for clergy and a communion table. The elevated, paneled pulpit and its corresponding sounding board are fitted against the north wall in the chapel's northwest corner and accessed by a simple quarter-turn stair. The lectern of like design is freestanding and portable. A trio of six-light brass chandeliers of colonial design is suspended on chains in an alignment above the center aisle. Double-light sconces of the same design are mounted on the side walls in pendant positions near the back of the chapel. The stained glass memorial in the Venetian window is executed in grisaille with yellow accents on a frost ground and features geometric strapwork-like designs. A shield in the center of the composition bears the following inscription:

Luola's Chapel
Erected to the
Glory and Worship
Of
God
By Luola
Beloved Wife
Of
James Sprunt
1915

Caretaker's House

2004, 2013

Noncontributing building

Together with the nearby plantation office, this one-story frame residence is one of two management-related buildings recently erected by the Sprunt family. Both were designed by Ian Johnson, a Wilmington architect, built by Rick Register of Southport, and have a conventional, minimally traditional character. Both buildings were moved from their original sites to new locations in the redesigned service area in spring 2013. The rectangular house is elevated above ground on a partial basement/concrete-block foundation, sheathed with manufactured siding that resembles weatherboards, and covered by a hip roof with wide eaves of asphalt shingles. The footprint of the house is enlarged by a hip-roof porch on the north-facing three-bay front elevation. It and the rear service porch have simple supports and railings, and wood steps to ground level. While the north front of the house has a symmetrical arrangement, with a double-door entrance flanked by three-part windows, the east and west sides have an asymmetrical appearance with single, paired, and three-part windows. A flue, which vents a gas-fired heating element in the living room, is positioned at the north end of the west side and has a sheathed, chimney-like form. A service porch is inset in the rear southeast corner of the house. The interior has an informal plan with a living and dining area in the north front and a kitchen, three bedrooms, two bathrooms, and a utility room flanking a part-length center hall that opens onto the rear porch. This house was originally built on the site of an earlier ca.1930 house known as the "Green Cottage" that was home to at least two resident plantation managers prior to the arrival of Churchill Bragaw in 1937.

Plantation Office

2006-2007, 2013

Noncontributing building

Similar in character, materials, and finish to the caretaker's house, this is a one-story frame building sheathed with manufactured siding, and covered by a hip roof with wide eaves and asphalt shingles. Designed by Ian Johnson and built by Rick Register along the nursery road across from the caretaker's house, the office was placed in use in February 2007. The office building was moved from its original location to the present site in spring 2013 during the redesign of the service area. The office stands on wood piers with woven wire and wood lattice screening. The rectangular core block, containing offices and related spaces, is enhanced with a hip-roof entrance bay porch on its three-bay south front, whose wood floor continues to the east as a handicap ramp, wraps the building's southeast corner, and reaches ground level about mid-way of the three-bay east elevation. The west elevation, also three bays in width, has a center staff entrance protected by a small hip-roof porch. All three elevations are symmetrically treated and feature pairs and trios of single-pane windows. The interior is arranged around a central reception area and is finished in a simple manner with conventional, mostly manufactured materials. This office building originally occupied the site of the plantation's first modern office that was placed in service ca.1940 and was demolished in 2006. That Colonial Revival-style frame building, erected near the mansion as a playhouse and known as the "Doll House," was moved to the nursery/service area ca.1940.

Greenhouse #1 and Head-house

ca.1937-1940

Contributing building

Believed to be the first permanent greenhouse erected for the Orton Plantation Nursery, this building comprises two principal blocks; a large gable-front glasshouse, and a frame side-gable roof head-house. Whether the two blocks were built at the same time is uncertain but likely: both stand on poured-in-form concrete foundations. However, neither block appears on Sturtevant's January 1937 plan of Orton Plantation or his separate undated plan of the plantation gardens.

As noted, the glasshouse stands on a poured concrete foundation that is partially inset into grade and appears as an apron on its four elevations. The sawn timber framing of the short upper elevations and the roof structure is in place, somewhat deteriorated, but with all of the glazing removed. On the north front elevation, where the grade is higher and the top of the apron is close to ground level, the framing is sheathed with fiberglass panels. The center entrance is protected by a simple gable-front board-and-batten sheathed porch. It is flanked, in turn, by horizontal openings fitted with top-hinged window frames that each holds most of its six large glass panes. These panes comprise the only glass that remains *in situ*. The interior of the glasshouse has a perimeter table for plants and three inner rows of plant stands aligned on a north/south axis and elevated on round metal supports. The glasshouse has an earthen floor. The mechanical works for opening and closing the glazed wall and roof panels remain largely in place.

A door in the south end of the glasshouse opens into the one-story frame head-house, which is rectangular and perpendicular in plan and positioned slightly off center, with a longer length of its north wall visible on the west than on the east. The head-house is sheathed with German siding and covered with a gable-end roof of 5-V sheet metal. The east and west gable ends are both fitted with a board-and-rail door and a window: a modification has been made to the doorway on the east end. These have plain-board frames with a drip cap, and the windows are fitted with six-over-six sash. Openings, which have later infill, also occur in the upper gable ends. The south elevation has a symmetrical arrangement of four six-over-six sash windows and an exterior brick flue stack near its east end. The interior of the head-house is simply finished and appears to have had slight modifications through time to accommodate various nursery-related operations and storage requirements. It was long used for packaging nursery-grown plants for shipment or sizable orders bought on site.

Greenhouse #2

2005-2006

Noncontributing building

Built in the closing years of the Sprunts' ownership of Orton, this large rectangular building has a concrete-block perimeter wall, with five courses of block visible above ground, and a metal gable-front superstructure on which fiberglass panels are mounted on the elevations and roof. A label affixed to the building identifies its maker as "Jaderloon, The Greenhouse Engineers, Irmo, S. C. 29063." A simple, fiberglass-clad door is centered on the north gable front and flanked by large wall-mounted metal fans. The side walls have no openings. A second simple fiberglass-clad door is set at the east end of the greenhouse's south, rear wall. Inside, the ground has a gravel cover and the building's mechanical systems are visible. Now used for storage, the building is scheduled to be demolished in 2013-2014.

Power House/Barn

ca.1890-1910,1950s,1990s

Contributing building

According to Sprunt family tradition, this building was erected to house the generator that provided electrical power to the mansion and plantation buildings before rural electrification. It appears on Sturtevant's January 1937 plan of Orton Plantation. The generator was also used to power a small mill that cut fire wood for the mansion fireplaces and stoves. For the last half-century or more it has been used principally for storage and garaging of small equipment.

The one-story-with-loft building stands on a low concrete block foundation and is sheathed with board-and-batten. Its gable-front roof is covered with sheet metal. In about the 1950s a three-stall concrete-block shed-roof equipment shed was built on its west side and ill-fitted with the frame block by a shed that covers the west side of the barn's north gable

front. In about the 1990s the fronts of both blocks were fitted with faux brick and other materials as part of a set for a movie filmed at Orton. The building's large ground-level opening on the north front is set in the east half of the wall and fitted with double-leaf board-and-rail doors. Most of the remaining first-story wall is covered by the shed addition and its faux-brick veneer. The upper part of the gable front is centered with a four-panel, turn-of-the-century door and small, flanking window openings that appear to be early, if not original features. Four window openings of different sizes, including one six-over-six sash window, occupy the building's east side: three have infill.

The ground level interior is one principal space with a work bench on the east wall and simply enclosed storage areas. A wood stair in the near center of the barn rises to the north to the loft area, which is mostly sheathed with tongue-and-groove ceiling and partitioned into two room-like spaces. Whether these "rooms" might have served as living or sleeping quarters at one time is unclear. The troughs for sliding sash in the small façade windows are visible here.

The three-bay equipment shed has faux brick on the stall partition fronts and a board-and-batten false-front across the top of the three openings. The center opening is fitted with double-leaf doors sheathed with sheet metal. The west shed end is blind. A small shed-roof frame addition for oil storage is built against the concrete block wall near its center.

Equipment Shed #1

ca.1950-1955

Contributing building

The simply-built shed, of utilitarian character and no refinement, was built to provide storage for large equipment and related needs. Rectangular in plan, it has creosote pole supports and sawn framing, sheet metal applied to its north, east, and south sides, and a side gable roof of sheet metal. The west front is entirely open, and the presence of two creosote poles effectively divides the interior into three storage bays. The floor is compact earth. Six vertical fiberglass panels are fitted into the metal sheathing on the east wall to provide light. The building stands slightly north of the site of the plantation's main barn, which appears on the Sturtevant plan, but which was struck by lightning in 1950 and lost to fire.

Stable

ca.1990-1994

Noncontributing building

Rectangular in plan, this small one-story frame building was erected as a four-stall stable for pleasure horses. Its exterior elevations, doors, and blinds are sheathed with manufactured exterior sheet siding. The side-gable roof is covered with sheet metal. The stable's center passage plan is indicated by centered openings with paired doors on the stable's three-bay north, front and south elevations. The opening on the front elevation is protected by a simple gable-front porch. The bays flanking both openings were originally fitted with rectangular openings protected by side-hinged blinds that provided light and ventilation to the stalls. All remain in place except on the front where the west section of the wall has been removed, as has the interior stall partition, to allow for drive-in garaging/storage. Openings on the two-bay east and west gable ends also provided light and cross ventilation for the penned animals. The interior finish of the barn is conventional with horizontal sheathing in the stalls and the expected fittings for feeding.

Elijah's House

ca.1885-1905

Contributing building

While the history of this building remains to be confirmed, it and the recently-burned house of like design that stood to the south in the same relationship to Old Brunswick Town Road are probably part of the improvements effected to the estate by Kenneth McKenzie Murchison (1831-1904) (*Note: No archaeological survey was completed at the site of the burned building but this action is recommended for the future*). These investments were noted in a general appreciation by James Sprunt in his *Chronicles of the Cape Fear River* (1914). Elijah's House has a significance and meaning in the history of Orton belied by its simple appearance. It is one of only three surviving historic dwellings on the home grounds of the estate that served as housing for the many, many workers who once resided here as slaves, freedmen, or paid employees over the course of nearly three centuries. The house carries the name of Elijah Robbins, a white estate carpenter, who was its last occupant.

The L-shaped plan, finish, and appearance of the one-story west-facing house is that of many that once stood on important plantations and farms in eastern North Carolina. Most have been lost, abandoned, or stand vacant and deteriorating like Elijah's House. The house comprises a two-room main block served by a center brick chimney, a two-room rear ell expanded by a two-stage shed-roof addition on its east end, a shed-roof front porch with simple posts and wood steps on its west elevation, and an expanded, screened service porch on the south side of the ell. The house is sheathed with board-and-batten with two exceptions. The main block has wood shingles in the upper gable end of its north elevation and weatherboards in the pendant south gable end. Elijah's House stands on low brick piers, with no underpinning, and is covered by gable-end roofs of sheet metal. The window openings hold six-over-six sash and have plain-board surrounds.

The elevations have a general symmetry. The four-bay west front has four-panel, turn-of-the-century doors in the outer bays and windows between them. Ghost marks of its original hip-roof porch appear on the upper wall. Single and paired windows appear in the long four-bay north elevation. The south side has a single window in the main block's gable end; a screened porch with simple uprights and a wood railing, grating, and lattice foundation screening; and a small window in the shed end of the east addition. The east end of the ell has a covered stoop flanked by windows.

The interior is mostly sheathed in tongue-and-groove ceiling, applied vertically on the walls. The finish includes pine flooring, four- and five-panel doors, and mantels in the two front rooms.

Equipment Shed #2

ca.2011

Noncontributing building

Erected for the storage of larger farm equipment, tractors, and trucks, this shed is a large rectangular metal structure with six uprights along its east and west sides and a shallow gable-end metal roof. The four sides of the shed are entirely open. The ground under the shed is covered with gravel. Located here on a temporary basis, the shed is destined to be dismantled and relocated to an agricultural and forestry service complex to be developed in the near future on the estate on the west side of NC 133 outside the boundaries of the Orton Plantation Boundary Increase and Additional Documentation.

Gatehouse

ca.1910-1915, moved in 1930s

Contributing building

The Gatehouse was built coincident with the creation of the north entrance to Orton and the erection of the north and south entrance gates. The design of the house and the gates, as well as Luola's Chapel, are attributed to Kenneth McKenzie Murchison Jr., who designed the expansion and refitting of the mansion for his sister and her husband. The Gatehouse originally stood nearer the north gate, where brick piers remain and mark the site, and was moved to the present location in the 1930s.

The small, one-story, hip-roof weatherboarded frame house is representative of the modest hybrid Queen Anne/Colonial Revival-style cottages that were popular at the turn of the century. The simple, almost-square plan of the three-bay-by-four-bay house, is enhanced by a shallow projecting gable-front bay on its north front elevation and a like projection on the rear elevation that provide a pleasing irregularity. The house stands on brick piers with decorative wood-lattice infill. Its elevations are finished with tall, flat sill boards with molded drip caps, corner boards, and flat frieze boards under the boxed eaves. The window openings have plain-board surrounds with molded drip caps and hold six-over-six sash. The roof is covered with asphalt shingles and has a decorative metal crest at its apex. A brick chimney rises through its east plane.

The three-bay front elevation, with a center entrance, is protected by a near-full façade hip-roofed porch supported by Tuscan columns that are paired to support the shallow gable-front projection centered on the front door. The columns are linked by railings. The porch has a wood floor and steps to ground level. The gable end of the projecting bay is fitted with a peaked louvered vent. The façade is further enhanced by the windows flanking the front door that feature large fixed panes of glass surmounted by transoms with muntins of lancet-arch-and-diamond tracery. The house's east elevation has an asymmetrical four-bay arrangement. The west elevation was probably identical originally, but it now has a fifth window

in its center, which holds two-over-six sash. The rear, south elevation is mostly occupied by a shed-roof porch, also on brick piers, built in 1998 as a replacement and possibly an enlargement of the original porch. It has been partially enclosed with a weatherboarded apron below fixed sections of screened wire. Wood steps with a railing descend on its east side to ground level.

The interior of the house has a center-hall plan that originally extended the full depth of the house. However, the south end was enclosed as a bathroom in about the mid-twentieth century. The living room and an eat-in kitchen are located on the east side of the hall while three bedrooms are aligned on its west side. The use of wallboard for the inner partition walls between the bedrooms (and the fifth window) indicates a re-partitioning of the original arrangement. Otherwise, the house retains its original character and finish including pine flooring, sheathed walls of beaded tongue-and-groove ceiling, plain-board surrounds, and five-panel turn-of-the-century doors with porcelain knobs. The house's brick chimney was rebuilt in 1998 and the fireplace in the living room has a brick face and hearth and a molded wood shelf.

Garage/Workshop

ca.1915-1925

Contributing building

Almost square in plan, this one-story frame outbuilding is sheathed with board-and-batten and covered by a shed roof of sheet metal. A large opening on the north front, positioned off-center to the west, is fitted with simple double-leaf doors with sheet metal faces. Small openings with six-pane sash are asymmetrically positioned on the east and south elevations. The building's west wall is blind. The interior has a simple work bench built along most of the east wall and a dirt floor.

Barbecue Pavilion

ca.1960; shed rebuilt in the later twentieth century

Noncontributing building

This building consists of a low brick pit and chimney, which is large enough to barbecue a whole pig/hog, and an open frame shelter supported by four-by-four posts with Y-shaped braces that, in turn, support the roof structure and the pavilion's east and west weatherboarded ends. The gable roof is covered with sheet metal. The pavilion has a poured concrete floor.

Structures

North Entrance Gate

ca.1910-1916

Contributing structure

The creation of a new entrance to the estate, to supplement the traditional access by way of the plantation's Old Brunswick Town Road and convenient to the increasing travel by automobile from Wilmington, was a part of Orton's early twentieth-century renewal. The design of the gate to mark the new, principal entrance is attributed to Kenneth McKenzie Murchison Jr. His solution is at once both simple and imposing. The roadway is flanked by tall square-in-plan brick piers, which rise from the ground to molded classical stone/cast-stone caps surmounted by majestic stone/cast-stone eagles with their sculpted, feathered wings raised as if at the point of flight and their heads turned to the left (south). These eagles are "warring eagles" and hold a clutch of arrows in their left talons. This pose dates the eagles to the opening years of World War I (1914-1918). "ORTON" and "1725" are inscribed on the faces of the molded caps. The tall piers are linked to shorter piers of the same design, minus the eagles, by curved segmental brick walls, which are also capped and ramp as they meet the tall piers. The roadway is protected by paired ornamental iron gates that are side-hinged on the inside faces of the tall piers.

The earliest known photograph of the north entrance gate is one taken with James Sprunt, his first-born grandson, James Laurence Sprunt Jr. (1915-2003), and the young boy's nurse standing at the gate. The brick were then unpainted. The whitewash probably dates to the mid-twentieth century.

South Entrance Gate

ca.1910-1916

Contributing structure

The south entrance gate is of the same design, materials, and appearance as the north entrance gate except that the two-leaf iron gate protecting Old Brunswick Town Road is of a simpler ornamental design.

Tennis Court

2012

Noncontributing structure

The tennis court is a simply-graded rectangular area, covered with asphalt that is marked with lines as a single tennis court. It has simple metal uprights at its corners on which synthetic netting is affixed to capture loose balls.

Integrity Assessment

Throughout its known history the character of Orton Plantation has been defined by its two chief features: its landscape, and the plantation seat. Since ca. 1730-1732 both have evolved in their appearance, reflecting Orton's place in the sequential epochs of local, state, and southern history. These stages of development, occurring in the long, continuous period of significance, are represented today by the qualities of location, design, setting, materials, workmanship, feeling, and association that exist in the Orton Plantation Boundary Increase and Additional Documentation.

The landscape and man's shaping of it for agricultural purposes, livelihood, and pleasure over the space of nearly 300 years is represented in the place seen today. The woodlands and marsh have held their primacy through time. In the nineteenth century they were the two prominent physical assets of the plantation described in newspaper advertisements, when the plantation was offered for sale at public auction in 1824, 1872, and 1873. Beginning in Roger Moore's day, the woodlands, then harvested for naval stores and lumber, have been the wealth of Orton Plantation, and they continue in that financial respect to the present. The marshes, with their potential for the lucrative cultivation of rice, have been an equal or greater asset of the plantation during periods in its history, particularly in the antebellum years. Their value and increasing use for the profitable cultivation of the "golden grain" are likewise defined in the auction broadsides, published notices, and the documents of Orton's history. The plantation woodlands and its former rice fields today bear the evidence of their place in the history of this storied acreage.

In 1909-1910 ornamental gardens became a third defining feature of Orton Plantation's landscape, when Luola Murchison Sprunt and her husband, James Sprunt, went about creating the terraces across the river (east) front of the mansion. These terraces and the adjacent gardens were planted, replanted, and nurtured over the course of a century by their son, James Laurence Sprunt, and his wife, Annie Gray Nash Ruffin Sprunt, and their grandson, Kenneth Murchison Sprunt, with the aid of well-known landscape architects, paid gardeners and plantation managers, and the labor of uncounted and largely anonymous laborers who brought the gardens and their plantings into bloom season after season. The gardens evolved in their extent and character through time, again reflecting the horticultural fashions of their period.

In 2011 a major redesign and remodeling program was initiated at Orton Plantation, focused on the mansion gardens, grounds, and service area, which has produced dramatic changes that, in turn, have diminished the character, integrity, and significance of the historic plantation landscape. These changes comprise two principal distinct initiatives: alterations to the approach to the mansion, chapel and gardens and a reconfiguration of the service area; and a remodeling of the historic gardens concurrent with the introduction of new gardens on three sides of the mansion and the addition of a motor court. Both initiatives have involved discernible changes to historic spatial arrangements, the loss of historic plant materials, the introduction of new plants, including recent cultivars, and plantings, and either the loss of historic buildings, the relocation of buildings, and/or the introduction of new architectural features and materials, including an extensive use of "Crab Orchard" stone.

During the late decades of the period of significance and until 2011, the approach to the mansion, chapel, and gardens arced through the service area between the plantation office, greenhouses, and nursery facilities on the south and the caretaker's house, the Dinky house used by garden staff, and separate frame lavatories for male and female visitors to the garden on the north, in and on the edge of a sizable grove immediately south of Luola's Chapel. The resdesign of this

part of the estate grounds has relocated the service area to the acreage between Greenhouse #1 and the Powerhouse/Barn, to be concealed by large new planting beds of trees and shrubs that flank the north end of the greenhouse. The plantation office and caretaker's house have been moved to this area. The Dinky house, the visitors' lavatories, and all the historic nursery facilities, except Greenhouse #1, have been demolished and the chapel-side grove, which functioned as a southern pendant to the grove protecting the Moore family burying ground at the north end of the peninsula, has been greatly thinned. This part of the estate now has an open, modern character.

The entrance drive, which now circles to the north, past Luola's Chapel on the left (west), to the house, ends in a motor court, the largest and most conspicuous of the designed additions to the grounds immediately around the mansion. New gardens incorporating fountains, stone-paved terraces and walks, and dense plantings surround the mansion on all sides, except on the west front of the new service wing, and are merged with Orton's spacious historic lawns and gardens. The recent loss of the scroll garden was followed in the new and ongoing work by the removal of historic plantings, particularly on the south lawn, where they incorporated impressive displays of the camellias and azaleas grown at Orton. Some of these mature camellias were relocated to the new motor court, where they are used as screening rather than as specimen shrubs. The remodeling of the north walk and adjoining areas has included both the removal and relocation of historic plant materials and the introduction of new species and cultivars.

Notwithstanding these changes and losses, the Orton gardens even in their diminished state continue to recall the historic pleasances and plantings, which attracted the attention of visitors from North Carolina, the region, and from a larger audience to "A Garden From a Rice Plantation," as described by A. G. L. Hellyer in the pages of Country Life in 1973.

But in 1734, when an English gentleman visited the Lower Cape Fear, it was the plantation seat, Roger Moore's brick house, the first built of the plantation's known surviving architectural resources, that garnered his notice and note in 1735 in the publication of A New Voyage to Georgia . . ., and Part of North Carolina. Thereafter in successive guises, superbly sited on a peninsula projecting into the marshes, it has drawn and held attention and admiration. The Orton house and the now-lost Allen seat at Lilliput to the northeast were the earliest known brick houses erected as plantation seats in the Lower Cape Fear. Roger Moore's colonial mansion was overbuilt ca. 1840 as one of the earliest, fully-realized temple-form residences in North Carolina. In 1872, when Orton Plantation was advertised for auction sale, the plantation seat was described as "the late Palatial residence of Dr. F. J. Hill, deceased."

Its iconic status as a reflection of antebellum North Carolina was enhanced in the early twentieth century when architect Kenneth M. Murchison Jr. sympathetically enlarged the house during the American Country Place Era. The Classical Revival-style mansion thus gained the mantle of a second important period in North Carolina, southern, and American architectural history. Today Orton retains and evidences its status as an architectural landmark built by Dr. Hill and enlarged for the Sprunts, even with the latest and largest of three successive service wings on its rear (west) elevation.

The plantation seat embodies the architectural history of Orton alone for over half of the plantation's existence and most of its period of significance. There are no other standing buildings or structures on the plantation for the entirety of the eighteenth and nineteenth centuries except for the colonial-era brick grave vaults in the Moore Family Cemetery and Elijah's House and the Powerhouse/Barn that date to Kenneth McKenzie Murchison's late nineteenth-century renewal of the plantation. The forty houses that sheltered William C. Miller's 144 slaves at Orton in 1860 had apparently vanished by the turn of the twentieth century, and so, too, had the plantation's agricultural outbuildings. Slight traces on the land mark their locations as archaeological sites. Within time, and well before the end of the period of significance and the original listing of Orton Plantation in the National Register of Historical Places in 1973, most of Kenneth M. Murchison's improvements had likewise been lost.

The survival of Orton's twentieth-century architectural legacy and its integrity represent a very distinct, positive contrast. The refitting of Dr. Hill's mansion for the Sprunt family was one part of a renaissance at Orton that included the North and South Gates, the Gatehouse, and Luola's Chapel, all of which are known, or believed, to have been designed by Kenneth M. Murchison Jr. between ca. 1909 and ca. 1916. As a group, even with the major addition in 2011-2012 to the mansion, they are important, well-maintained, and well-preserved buildings that reflect the essential qualities of location, design, setting, materials, workmanship, feeling, and association that are critical to Orton's status as an exemplar of the American Country House Movement in North Carolina. Their place in Orton's history is complemented by a second, smaller group of surviving architectural resources dating from the mid-twentieth century. While deteriorated as a result of dis-use, Greenhouse #1 is nevertheless a significant reminder of the role and presence of Orton Plantation Nursery, which specialized in the propagation and sale of camellias and azaleas to gardeners throughout the South and for plantings in

its own gardens and grounds. The overlooks and lagoon bridge designed for the gardens by Morley Jeffers Williams and his wife, Nathalia, in 1958-1959 represent the final enhancements to place during the period of significance.

While buildings have been lost through the centuries to disuse and decay, fire, and storms and other remaining secondary structures reflect degrees of deterioration, the buildings and structures that survive, beginning with the colonial-era brick vaults in the Moore Family Cemetery, retain their integrity and reflect and represent important chapters in the history of the plantation. They, the gardens and grounds, and the woodlands and rice fields, whose historic contours and character are re-emerging during the present, consciously-executed stewardship of the plantation, in their separate parts and as a whole possess the essential qualities of location, design, setting, materials, workmanship, feeling and association that define Orton Plantation Boundary Increase and Additional Documentation. The incorporation of the agricultural landscape, significant woodland acreage, and archaeological resources in this expansion provide a greater understanding of the history of Orton and its significance and they mitigate the effect of losses in the designed landscape. Altogether, the resources in the original nomination and those in this addition comprise a place of extraordinary significance with no peer in North Carolina.

Table 1. Contributing Resources

Resource Name	*Date of Origin*	*Modification Date(s)*	*Condition 2012*	*Notes*
Sites - 13				Criterion A, Social History, Agriculture, Politics/ government; Criterion B, various, Criterion C, Landscape Architecture; Criterion D, Archaeology
Orton Plantation Landscape				
Roads				
North entrance road	1910-1916		good	
Old highway trace	c.19th c.		fair	
North entrance causeway	1910-1916		good	
Old Brunswick Town Road	Late 18th c. to 1916	2012	good	
Nursery road	1935-1940		good	
Service road	1935-1940	2012	fair	
Phillips Road	18th or 19th c.	20th c.	good	
Sand Dam Pond Road	1908-1921		fair	
Low Road	1935-1940		fair	Grading discernible, paving material now turf

Resource Name	Date of Origin	Modification Date(s)	Condition 2012	Notes
Phillips Road	19th c.	Paving, widening	good	
Ornamental garden features				
Gatehouse ornamental garden	1935-1940		fair	
Ornamental pond	Before 1921	Chinese bridge	good	
Lagoon	Before 1921	20th century, bulkhead	fair	Some erosion, bulkheads rotted
Garden terraces	ca.1916	2012 re-graded	fair	Erosion
Long Green	1935-1940	remodeled 2012	fair	changes in border configuration and interior features
Long walkway	1910	2012 repaved	good	
Hydrangea Walk	1910	2012 remodeled	fair	Shrub removal/replacement
Axial walkway	1910	2012 repaved	good	
Terrace stairway	1910		fair to good	Some cracking, displacement
Concrete planter bases	1910		fair to good	Some displacement
Site of Scroll Garden	1935-1940	Loss to inundation	poor	Plant materials have died but beds discernible
Path to the White Garden	1935-1940		poor	Overgrown, eroded, uneven
White Garden, including fountain and "Spring Star"	1935-1940	Sculpture installed 1953	fair to good	Overgrown, biological growth, non-functioning
Perimeter path	1935-1940	2012, upgraded with gravel and steel edging	good	
Secondary path	1935-1940		good	
Chinese bridge	ca.1955		poor	Wood members deteriorated
Wood gazebo	1935-1940		good	
Sweeping views of the rice fields and tidal flats from locations within the property	ca.1820s		good	
Iconic view from mansion to Cape Fear River	1729-1732	1910	good	

Resource Name	Date of Origin	Modification Date(s)	Condition 2012	Notes
North belvedere	ca.1960		poor	Wood members deteriorated
South belvedere	ca.1960		poor	Wood members deteriorated
Brick stairway	ca.1960		poor	Masonry unstable
Lagoon bridge	ca.1960		poor	Wood members deteriorated
Greenhouse foundation	1935-1940		poor	
Cultural vegetation				
Live oak allées: north entrance road, Old Brunswick Town Road	18th – 19th c.		good	
Specimen live oaks: Gatehouse, Orton mansion, Roger Moore Cemetery	18th – 19th c.		good	
Bald cypress allée	1908-1916		good	
Bald cypress pond	ca. 19th c.		good	
Remnants of camphor grove	1935-1940	2013, tree clearing	poor	
Remnant row of eastern red cedars	1908	2012, road removed	good	
Live oaks on earthen mounds	1910s	1935	good	
Camellias and azaleas	1935-1940	2012, thinning and transplanting	fair to good	
Sand Dam Pond			fair	Once a possible water reservoir, the pond now supports bald cypress and other vegetation.
Agricultural features				
Rice field complex, including Front North, Front South, #1, #9, and Back Rice Fields; dikes, access roads, and ditches; water control structures; Orton Pond dam; Canal #1; Canal #2; and Orton Pond Outfall	1820s to 1930s	Repaired over time, 2012 permit (ACOE) to restore	fair to good	
South Field	by 1864	Rotation of crop plantings	good	
West Field	1935-1940	Rotation of crop plantings	good	
Archaeological sites				
31BW548**, Orton Graveyard	19th c.			

Resource Name	Date of Origin	Modification Date(s)	Condition 2012	Notes
31BW787**1,18th- and 19th-century domestic site	18th c., 19th c.			
31BW787**2, Roger Moore Cemetery, including brick vaults and tombs, grave markers, large live oak cluster, and views to rice fields	1750s	1910s, repairs to tombs		
31BW787**4, late 19th- through mid-twentieth-century settlement	19th c.			
31BW787**5, late 19th-century domestic site	19th c.			
31BW787**6, late 19th-century domestic site	19th c.			
31BW787**7, 19th- and 20th-century domestic sites	19th c., 20th c.			
31BW787**9, Bonnie House site	Late 19th or early 20th c.			
31BW787**12, 19th-century domestic site	19th c.			
31BW787**13, 19th-century domestic site	19th c.			
31BW787**14, eighteenth- to nineteenth-century domestic or industrial site	18th c., 19th c.			
31BW787**15, 18th- to 19th-century domestic or industrial site	18th c.-19th c.			
31BW787**16, 18th- to 19th-century domestic or industrial site	18th c.-19th c.			
Buildings - 8				Criterion C, Architecture
Orton mansion	1729-1732	ca.1840; 1909-1910; 2011-2012	good	
Luola's Chapel	1915		good	
Greenhouse #1and Head-house	1935-1940		fair	
Power House/Barn	ca.1890-1910	relocated [date]	fair	
Elijah's House	ca.1885-1905		fair	
Gatehouse	1910-1915		good	

Resource Name	Date of Origin	Modification Date(s)	Condition 2012	Notes
Garage/workshop	1915-1925		fair	
Equipment shed #1	ca.1950-1955		Fair	
Structures - 2				Criterion C, Architecture
North entrance gate	ca.1910-1916			
South entrance gate	ca.1910-1916			
Objects - 31				Criterion D, Archaeology
22 potentially significant magnetic anomalies				
7 significant objects, sonar target				
2 objects, marsh and low tide survey				

Table 2. Noncontributing Resources

Resource Name	Date of Origin	Modification Date(s)	Condition 2012	Notes
Sites - 4				
31BW787**3, prehistoric and historic remains	Prehist.-19th c.			
31BW787**8, 20th-century structural remains	20th c.			
Low incidence of prehistoric and historic remains (31BW787**10)	Prehist.-19th c.			
Low incidence of prehistoric remains (31BW787**11)	Prehist.			
Buildings - 6				
Caretaker's House	2004	2013	Good	
Plantation Office	2006-2007	2013	Good	
Greenhouse #2	2005-2006		Fair	
Stable	ca.1990-		Good	

Resource Name	Date of Origin	Modification Date(s)	Condition 2012	Notes
	1994			
Equipment shed #2	2011		Good	
Barbeque pavilion	ca.1960		Good	
Structures - 2				
Tennis courts	2012		Good	
Concrete pavilion	2012		Good	
Objects - 116				Criterion D, Archaeology
88 magnetic anomalies, including small single objects, modern objects, degraded cable, and slightly larger objects				
19 non-significant objects, sonar target				
9 objects, marsh and low tide survey				

[1] Brunswick County Deed Book 3104, Page 0552.

[2] Michael Trinkley, Ph.D. and Debi Hacker, *Historical Synopsis and Archaeological Reconnaissance of Orton and Kendal Plantations, Brunswick County, North Carolina.* Chicora Research Contribution 546, August 2012, 188-189.

[3] Orton guestbooks, 1910-1960; first Sprunt book, 1910-1922; February 17, 1918. Orton Collection.

[4] U.S. Army Corps of Engineers, Wilmington District, Public Notice, Corps Action ID # SAW-2011-00624, issued October 5, 2011.

[5] U.S. Army Corps of Engineers, Wilmington District, Public Notice, Corps Action ID # SAW-2011-00624, issued October 5, 2011.

[6] Trinkley et al.

[7] Gordon P. Watts Jr., Ph.D, *A Remote-Sensing Archaeological Survey of the Cape Fear River, Intertidal Zone and Marsh Reconnaissance Along the Orton Plantation Waterfront, Brunswick County, North Carolina* (Washington, North Carolina: Tidewater Atlantic Research, Inc., 2012.

[8] Trinkley et al.

[9] Trinkley et al., 163, referencing survey conducted by North Carolina's Office of State Archaeology, OSA site form for 31BW548**, coding date of 4/24/96.

[10] Trinkley et al., 163-170.

[11] Trinkley et al., 172-177.

[12] Trinkley et al., 172-173

[13] Trinkley et al., 174, citing "Pilgrimage to Old Brunswick," *The Orphans' Friend and Masonic Journal*, Oxford, NC, April 20, 1917.

[14] Trinkley et al., 178-198.

[15] Michael Trinkley, Ph.D. and Debi Hacker, *Historical Synopsis and Archaeological Reconnaissance of Orton and Kendal Plantations, Brunswick County, North Carolina*. Chicora Research Contribution 546, August 2012, 188-189.

[16] Gordon P. Watts Jr., Ph.D, *A Remote-Sensing Archaeological Survey of the Cape Fear River, Intertidal Zone and Marsh Reconnaissance Along the Orton Plantation Waterfront, Brunswick County, North Carolina* (Washington, North Carolina: Tidewater Atlantic Research, Inc., 2012.

[17] National Register of Historic Places, Orton Plantation Historic District, Brunswick County, North Carolina, 1972.

[18] Ibid.

8. Statement of Significance

Applicable National Register Criteria

[X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.

[X] B Property is associated with the lives of persons significant in our past.

[X] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

[X] D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

Property is:

[ ] A Owned by a religious institution or used for religious purposes.

[ ] B removed from its original location.

[ ] C a birthplace or grave.

[ ] D a cemetery.

[ ] E a reconstructed building, object, or structure.

[ ] F a commemorative property.

[ ] G less than 50 years old or achieving significance within the past 50 years.

Areas of Significance
(Enter categories from instructions.)

Agriculture
Architecture
Landscape architecture
Politics/government
Social history
Archaeology

Period of Significance

1751 – ca.1960

Significant Dates

n/a

Significant Person

Hill, Dr. Frederick Jones

Moore, Roger

Cultural Affiliation

African American

Architect/Builder/Artist

Murchison Jr., Kenneth McKenzie – architect

Sturtevant, Robert Swan – landscape architect

Williams, Morley Jeffers and Nathalia – landscape architect/architect

Period of Significance Justification

See statement of significance paragraph.

Criteria Considerations (explanation, if necessary)

n/a

Statement of Significance Summary Paragraph

Orton Plantation occupies a storied place in the history of the Lower Cape Fear region and the state of North Carolina. Over the course of nearly three centuries, since its core lands were acquired by Roger Moore in the 1720s, Orton achieved a legendary status and gained recognition locally, regionally, and across the state. The Orton Plantation Boundary Increase and Additional Documentation comprises some 826 acres of woodlands, former rice fields, roads, water courses, two cemeteries, and gardens, together with the mansion house of the same name that has served as the plantation seat in successive guises since ca. 1730-1732, a private family chapel, and associated outbuildings. Orton Plantation Boundary Increase and Additional Documentation meets National Register Criteria A, B, C, and D, and holds local significance in the areas of landscape architecture, social history, and archaeology, and statewide significance in the areas of agriculture, architecture, and politics/government. The period of significance begins in 1751 with Roger Moore's death and interment in the cemetery where his imposing brick vault and those of other members of his family stand. Shaded by live oaks, this family cemetery is located at the north end of the promontory on which Orton, the mansion, holds the place of honor. The period of significance ends in ca. 1960 by which time repairs to its fabric, the landscape, and plantings in its gardens, following on the destruction of Hurricane Hazel on 15-16 October 1954, and the plans for the scroll garden, overlooks, and lagoon bridge designed in 1958-1959 by Morley Jeffers Williams and his wife, Nathalia, were effected. Over this period the property has held associations with a series of people important in its life and on a larger civic stage, most notably Roger Moore (1694-1751), its founder, and Dr. Frederick Jones Hill (1792-1861), who oversaw its antebellum prosperity as a rice plantation and introduced the bill in the House of Commons in 1839 that was reconciled with a senate bill and produced the legislation creating a public school system in North Carolina. Roger Moore is associated with the property's significance in the areas of social history and agriculture. Frederick Jones Hill is associated with its significance in the areas of social history, agriculture, architecture, and politics/government.

Orton's significance in the areas of agriculture and social history begin with the establishment of the plantation here in the later 1720s on a small portion of the many thousands of acres Roger Moore acquired through land grants. Exactly when Roger Moore first called this place Orton is unclear, although it is first identified by that name in his will in 1748. However, he created and gave name to a plantation that among so very few others of its date in North Carolina has survived and maintained its storied identify to the present. And it was Roger Moore, a founder of Brunswick Town, a seat of colonial government and the residence of royal governors, who exercised an early, critical leadership role in the settlement of the Lower Cape Fear region that evolved into one of the wealthiest plantation communities in coastal North Carolina and encouraged the development of Wilmington. He initiated naval stores and timbering operations at Orton Plantation by the 1730s, which became a principal, sustained agricultural operation with timbering continuing as an important enterprise to the present.

Roger Moore's dynastic intentions for Orton and Kendal, his adjoining plantation, were short lived and both had passed from his family before the Revolution. William Dry (1720-1781) and Richard Quince (1717-1778), both important figures in the Lower Cape Fear, came into possession of Orton in the 1760s and held it during the first of two periods in its history about which operations on its lands are little known. In 1796, Richard Quince's grandson, also of the same name, sold Orton and its 4,000 acres to General Benjamin Smith (1756-1826), a grandson of Roger Moore. General Benjamin Smith, who served as governor of North Carolina from 1810 to 1811, is the first of Orton's owners who is known to have successfully cultivated rice in its fields and to have had a rice mill on the plantation. Rice cultivation, centered in North Carolina in Brunswick County, brought wealth to a host of planters on the Cape Fear River up to 1865. General Smith and his wife Sarah, the daughter of William Dry, lived lavishly, incurred large debts, lost virtually all of their property, and died impoverished. Orton was repossessed by General Smith's creditor, the Bank of Cape Fear, advertised for sale at public auction in 1824, and held for a year by Joseph Alston Hill (1800-1835), who in May 1826 sold Orton and its then-4,975 acres, to his cousin, Dr. Frederick Jones Hill.

Dr. Hill had a distinguished career as a physician, legislator, Episcopal layman, and civic leader in Wilmington and the state. His years at Orton, from 1826 to 1854, are among its most celebrated. He brought the plantation to an unprecedented prosperity as a rice plantation and ca. 1840, he rebuilt Roger Moore's house as one of the first temple-form private residences in North Carolina. He is better known, however, as an advocate for education and his introduction of "A Bill for the establishment of Common Schools" in the legislative session of 1838-1839, which was combined with a Senate Bill, amended, and passed by the General Assembly on 7 January 1839. In 1854 Dr. Hill sold Orton, its 4,975 acres plus acquired lands, and some 61 slaves for $100,000 to Thomas Calizance Miller (1814-1865), the husband of his niece. Mr. Miller increased the productivity and profitably of rice culture at Orton, prospered as its owner through the Civil War, but died in June 1865, leaving an insolvent estate.

Orton Plantation was again advertised for public auction in 1872 and 1873, but it was not until 1874 that the plantation was sold to Isaac Bates Grainger for $6,500. Mr. Grainger's ownership of Orton was short-lived as was that of its next owner, Currer Richardson Roundell (18__-1876). In 1877 a group of four investors, including Mr. Grainger and Kenneth McKenzie Murchison purchased Orton largely, it appears, for the value of its timber. In 1884 Mr. Murchison (1831-1904), a wealthy North Carolina-born businessman then residing in Brooklyn, New York, became the sole owner of Orton.

Orton's renewal in the closing decades of the nineteenth century and its existence to the present owe almost entirely to the foresight, enterprise, and stewardship of Kenneth McKenzie Murchison--and his heirs. Alfred Moore Waddell, one of the earliest historians of the Lower Cape Fear, appreciated Mr. Murchison's achievement in an account published in 1905 in the first volume of the *Biographical History of North Carolina From Colonial Times to the Present*, writing that "he expended a large amount of money in restoring it to its former condition and improving it in various ways to satisfy his taste." Luola Murchison Sprunt (1858-1916), Mr. Murchison's daughter, acquired Orton in 1909 and with her husband, James Sprunt, launched a series of improvements, including the addition of wings to Dr. Hill's antebellum house, new entrance gates, a gatehouse, and a private chapel that, with Mrs. Sprunt's death in 1916, became her memorial. The architect for this work was Mrs. Sprunt's brother, Kenneth McKenzie Murchison Jr., a New York-based architect. These improvements were a part of a larger renaissance at Orton Plantation that included extensive landscape improvements to the property and coincided with a renewed interest in the long-abandoned colonial town of Brunswick. The Sprunts' historical interests culminated in 1914 with the publication of James Sprunt's *Chronicles of the Cape Fear River*, a history of Wilmington and the Cape Fear region that has yet to be bettered.

The early twentieth-century gardening efforts were but the prelude to those of the Sprunts' only son, James Laurence Sprunt (1886-1973) and his (second) wife Annie Gray Nash (Ruffin) Sprunt (1886-1978). They engaged Robert Swan Sturtevant (1889-1955) for the first known professional plan for the Orton gardens coincident with their establishment of the Orton Plantation Nursery that specialized in camellias and azaleas. That plan and its planting out as both pleasure and display gardens produced the expansive estate gardens, managed by their son, Kenneth Murchison Sprunt (1920-2011), from ca. 1946-1947 into the 1990s, that were widely photographed and published in the mid-twentieth century. The gardens drew thousands of visitors to the plantation, which had become an icon of antebellum history and "Old South" imagery and the subject of a color film produced by Tom Draper in ca. 1948-1949. However, in truth, the scene at Orton was largely a product of the early twentieth-century American Country House Movement and the commitment to Orton exercised by the Sprunt family and James Laurence Sprunt, whose gravestone in Oakdale Cemetery bears "Envisioned and established the Gardens at Orton Plantation" as his epitaph. Today, portions of Mr. Sturtevant's plan and some plantings, later features designed by Morley Jeffers Williams in 1958-1959, as well as relocated plant material and the greenhouse, are what remain of this important chapter of Orton's history and the landscape history of the Lower Cape Fear region, the state, and the South. Orton Plantation remained in the ownership of members of the Sprunt family until 2010, when Louis Moore Bacon, a lineal descendant of Roger Moore, acquired some 8,400 of its 14,000-plus acres.

Narrative Statement of Significance

Historical Background and Social History Context

Introduction

Orton is situated about twelve miles due south of Wilmington, North Carolina, and adjoins the ruins of Brunswick, the colonial town founded by Maurice (and Roger) Moore in 1726 that is now a North Carolina State Historic Site. First a part of Bath County, then in Archdale precinct, and next in Craven County, Orton and its lands became a part of New Hanover Precinct/County in 1729, when the southern part of Craven was set apart as a new political jurisdiction and named in honor of the House of Hanover. Next, in 1764, Orton became a part of Brunswick County when parts of New Hanover and Bladen counties were combined to form a new county. It, too, was named Brunswick in honor of the earlier, eponymous

town and the royal house whose son succeeded his grandfather on the English throne in 1760 as George III (1738-1820). Orton remains in Brunswick County, its chief landmark to the present.

Orton, which gained its identity as a place in colonial North Carolina in about the late 1720s as the home plantation of Roger Moore (1694-1751), has enjoyed a legendary status in succeeding generations as it became an icon of North Carolina history and a celebrated landscape of the American South. It originally comprised a plantation of "about 2500 Acres" that Roger Moore bequeathed to his second son, William Moore. In 1796 when Benjamin Smith (1756-1826), Roger Moore's grandson, acquired Orton from Richard Quince (III) it was simply described in the deed as "all that plantation parcel or tract of land well known by the name of Orton situated lying and being on the west side of the Cape Fear River and bounded thereby. . ." which, together with 1,280 acres acquired as grants by Richard Quince (I), comprised 4,000 acres.[1] In 1824 when Orton was offered up for sale at auction by Benjamin Smith's creditor, the Bank of Cape Fear, the plantation was described as comprising 4,975 acres.

In 1872, following further enlargements by subsequent owner-proprietors, Dr. Frederick Jones Hill in 1842 and Thomas Calizance Miller in 1855-1857, Orton's extent was redefined as 9,026 acres by its first known professional survey. That was the property acquired by Kenneth McKenzie Murchison, in part in 1877 and in full in 1884, and conveyed by his children in 1909 to their sister, Luola Murchison Sprunt, the wife of James Sprunt. Orton was enlarged again by purchases in the 1910s to encompass acreages on its north side. In 1912 Mrs. Sprunt purchased a tract of 394 acres, which was a part of Roger Moore's Kendal plantation that adjoined the original Orton lands on the north side of Orton Creek. Next, in 1918, James Sprunt purchased the remaining part of Kendal plantation and the residual part of the Lilliput plantation that lay on the north side of Kendal. Doing so he added about 4,000 acres to Orton which remained in the ownership of his descendants until 2010.[2] In January 1921 Eric Norden (1869-1946), the Swedish-born Wilmington civil engineer, produced the first modern professional survey and plat of Orton, titled "Orton & Kendall Plantations," which was based on the earlier surveys of J. N. Bennett in 1872, C. R. Humphreys in 1908, that of Mintz & Taylor (undated), and his own field work at Kendal.

Today, after some additional small increases and further professional surveys over time, Orton is known to comprise about 14,000 acres held in four ownerships. The largest of these, some 8,400 acres owned since 2010 by Louis Moore Bacon in Orton Plantation Holdings, LLC, encompasses the historic core of the plantation, the plantation seat, other buildings and outbuildings, white and black cemeteries, gardens and grounds, woodlands, marshes, former rice fields, the upper (north) and lower (south) gated entrances, roadways, ponds, fields, and sites of numerous long-lost buildings and facilities that are historically known as Orton, together with a significant part of the Kendal plantation, including the site of its weatherboarded frame seat that burned in 1919. Mr. Bacon's holding also includes a portion of Orton Pond, the historic impoundment first created by Roger Moore to power his sawmills, which provided water power for Orton's successive saw, grist, and rice mills, fresh water for cultivating the plantation's rice fields, and, for most of the twentieth century, a splendid recreational and ornamental water feature for the Sprunt family, their friends, and guests. Members of the Sprunt family in three entities hold the remaining 5,600 acres, comprising most of Orton Pond, woodlands, marshes, fields, a hunting camp, and most of the colonial Lilliput plantation of Eleazar Allen (d. 1749), including the site of his long-lost brick house and the Allen burial ground.

Roger Moore, the Moore family, and Orton

Throughout its existence Orton has been owned by remarkable figures who left indelible imprints on its life, its history, and its landscape. Other owners have been stewards in their time, leaving little evidence of their tenure except for their names in the ownership records. When Roger Moore left his native South Carolina for the Lower Cape Fear, he came as a scion of privilege, with established social, political, and financial status. His father, James Moore (ca. 1650-1706), emigrated from Barbados to South Carolina by about 1674, became a successful planter in the Goose Creek community, and held a number of political offices that culminated with his service as governor of South Carolina from 1700 to 1703. Roger Moore was also a child of privilege on his maternal side. His mother, Margaret Barringer (ca. 1660-1720), was the daughter of Benjamin Berringer, a wealthy planter in Barbados, and his wife, Margaret Foster, who, as Mr. Berringer's widow, married John Yeamans. John Yeamans (ca. 1604-1674) was a leading figure in the attempt to settle a colony from Barbados at Charles Town in today's Brunswick County, North Carolina, in 1665, which failed in 1667, and as Sir John Yeamans served as governor of South Carolina from 1672 until his death in 1674.[3] In addition to being the step-grandson and son of governors of South Carolina, Roger Moore also enjoyed the privilege of being the brother of a governor of the colony. James Moore Jr. (ca. 1682-1724) was governor of South Carolina from 1719 into 1721 when he was succeeded by Francis Nicholson, the colony's first royal governor.[4] Roger Moore's leave-taking of South Carolina was calculated. He, his

brothers Maurice and Nathaniel, and others from South Carolina with close family and social ties came to the Cape Fear region and formed a wealthy close-knit plantation society that over time came to be described as "The Family."

Permanent settlement in the Lower Cape Fear region of North Carolina occurred a near half century after that in the Albemarle region and had its enabler in the person of George Burrington (ca. 1682-1759) who came to North Carolina and took the oath of office as governor of the colony on 15 January 1724.[5] As Lawrence Lee relates in *The Lower Cape Fear in Colonial Days*, "Recognizing land as the principal attraction to new settlers, Burrington made the land available to them. He did this by the simple expedient of defying the will of the Proprietors and ignoring South Carolina's claim to the west bank of the Cape Fear River."[6] The first of Burrington's grants as governor and head of the Council, of which Maurice Moore was a member, were dated 2 June 1725. Two of these, for 640 and 1,500 acres, were to Maurice Moore. The third was awarded to Eleazar Allen and (probably) forms the original tract of Lilliput. On 25 March 1726 Maurice Moore conveyed the lands of the 640-acre grant to Roger Moore.[7] Lawrence Lee identified this acreage as the original tract of Roger Moore's plantation that he called Kendal.[8] According to tradition Roger Moore and his family occupied a house built at Kendal prior to building at Orton. If this tradition is accurate, Roger Moore's residency at Kendal was brief.

Coming to the Lower Cape Fear from the prosperous, cosmopolitan Goose Creek community, Maurice and Roger Moore well understood that the success of their proposed plantation settlement required a port town through which goods could be received and shipped and where other colonists, practicing the trades and professions necessary for the development of an agreeable community, could establish homes and places of business. The creation of such a town was the first order of business. Maurice Moore set apart 320 acres of his 1,500- acre grant for a town to be called Brunswick and went about laying out a series of 336 half-acre lots aligned on a grid with its long streets, parallel with the Cape Fear River, linked by short streets on an east/west axis. On 30 June 1726 the first sale of lots (#s 22 and 23) was made to Cornelius Harnett senior (d. 1742), identified as a "victualer" who soon built a lodging.[9] Others arrived, bought lots and built, and Brunswick developed into a sizable town and important colonial port, if not the larger place the Moores envisioned. Its status would be circumscribed by the development of a rival port called New Town/Newton (and other names), higher on the waters of the Cape Fear, that soon surpassed Brunswick and gained the name Wilmington in honor of Spencer Compton, Earl of Wilmington, who died in 1743. Nevertheless Brunswick enjoyed prestige in the later colonial period as the residence of royal governors Arthur Dobbs (1689-1765) and his successor William Tryon (1729-1788) until Governor Tryon decamped Brunswick for his new "palace" at New Bern. They resided on a small estate on the north edge of Brunswick known as Russellborough.

The lands making up the plantation Roger Moore named Orton, where he lived from ca. 1730-1732 to his death in 1751, comprise three known tracts assembled in 1728-29. (Two of these are delineated and labeled on the 1921 plat of "Orton & Kendall Plantations" by Eric Norden. On 30 March 1728 Roger Moore received a patent of 500 acres described as 500 acres "on the S. side of town creek issuing out of the W. side of Capefear River joining John Porter and the sd. creek."[10] On 11 December 1728 Maurice Moore conveyed 500 acres of his 1,500-acre 1725 grant to Roger Moore.[11] Five months later, on 2 May 1729, Roger Moore added to Orton with the receipt of a patent for 2,000 acres "on the W. side of Cape fear (river), joining Allens creek, Roger Moore, and Town Creek which Land was Taken up before the Arrival of the Lords Proprietors orders forbidding the Sale of Lands."[12] Thus, as of Spring 1729 Roger Moore's Orton and Kendal plantations comprised about 3,640 acres centered on the waterway flowing east into the Cape Fear that came to be known as Orton Creek and whose impoundment provided the critical water power to operate Roger Moore's mills. Roger Moore is believed to have then built the brick house at Orton, which was probably completed in about 1730-1732.

When built and occupied by Roger Moore, his (second) wife Katherine Rhett Moore, the couple's four known children, William, Sarah, Mary, and Ann, and George Moore, the son of Roger Moore's first marriage, the plantation seat at Orton became one of the few known brick houses of its date in colonial North Carolina. At present no known image of Roger Moore's house, prior to its ca. 1840 overbuilding, exists. The long-lost brick plantation seat of Eleazar Allen at Lilliput, adjoining Kendal on the north, is believed to be its close contemporary: its design, finish, and appearance are also unknown. The closest known surviving contemporary house in North Carolina, the Newbold-White House in Perquimans County, has been dated by dendrochronology to ca. 1730. Both Roger Moore and Eleazar Allen are noted as landowners, on their respective plantations, on Moseley's map of 1733, which is the first of a series of eighteenth-century maps whose notations reflect the increasing settlement on the waters of the Cape Fear River.

Roger Moore and his family were comfortably ensconced at Orton in June 1734 when an English traveler came to the Lower Cape Fear. His account of extended travels in the American South was published in London in 1735 as *A New Voyage to Georgia. By a Young Gentleman. Giving an Account of His Travels to South Carolina, and Part of North*

Carolina. He and his traveling part set out from Charleston, South Carolina, for the Lower Cape Fear on 10 June 1734 and they crossed the ferry at Lockwood's Folly in the evening of 15 June.

> We left Lockwood's Folly about eight the next morning, and by two reached the town of Brunswick, which is the chief town in Cape Fear; . . . . We dined there that afternoon. Mr. Roger More hearing we were come, was so kind as to send fresh horses for us to come up to his house, which we did, and were kindly received by him; he being the chief gentleman in all Cape Fear. His house is built of brick, and exceeding pleasantly situated about two miles from the town, and about half a mile from the river; though there is a creek comes close up to the door, between two beautiful meadows about three miles length. He has a prospect of the town of Brunswick, and of another beautiful brick house, a building about half a mile from him, belonging to Eleazer Allen, Esq., late speaker to the Commons House of Assembly, in the province of South Carolina . . . . The river is wonderfully pleasant, being, next to Savannah, the finest on all the continent.[13]

After exploring the upper reaches of the Cape Fear and its branches, including an excursion to Lake Waccamaw, and stays at several plantations, the English traveler stopped at Orton on his return on 10 August 1734 and spent the night with the Moore family. The English traveler's description of Roger Moore as "being the chief gentleman in all Cape Fear" reflected the circumstances of his life and the status he would enjoy until his death in 1751.[14] Roger Moore's Orton plantation was his residence, however, its acreage was but a fractional part of his vast real estate holdings. Between 1725 and 1730 he obtained 23,095 acres on the Northeast and Northwest Branches of the Cape Fear River through land grants. Slightly more than one-half of the total, 12,740 acres, lay along the Northeast Branch, and of this amount 3,720 acres were located at or near Rocky Point, north of Wilmington, which the English traveler described as "the finest place in all Cape Fear."[15] Roger Moore's brother, Maurice Moore, lived at Rocky Point. In 1735 Roger Moore was awarded another series of grants totaling 5,032 acres of which 802 acres readily appear to be associated with his expansion of Orton and 600 acres were at Blue Banks.[16] His last significant grants came in 1736 to 1738 when he acquired another 1,965 acres including a 1,000-acre tract at Blue Banks.[17] Between 1725 and 1738 Roger Moore received 30,092 acres through grants, nearly all, if not all, of it in today's New Hanover, Brunswick, and Pender counties. Beginning in 1732 Roger Moore held certain local and political offices, including those of justice of the peace in New Hanover County and assistant justice of the General Court, of which his service on the royal Council, from 1734 until his death, was the most important.

On about 4 January 1747 Roger Moore married Mrs. Mary Vail (Jones) Wilson as his third wife. Mary Vail (ca. 1706-ca. 1792), a daughter of Jeremiah Vail, was first married to Frederick Jones II by whom she had two known sons, Harding Jones (b. 1736) and Frederick Jones III. Her second husband was William Wilson. Mary Vail Wilson brought her own wealth to her marriage with Roger Moore. To protect her assets and his own, destined principally for his five surviving children, he prepared his will within months of their nuptials.

Roger Moore signed his will on 7 March 1747/8, making bequests to each of his children and his wife. Roger Moore died between 30 June 1750, when he added a codicil to his will, and May 1751, when it was entered for probate. He was buried in a brick vault at Orton, probably beside one containing the remains of his second wife. The principal bequests were to his two sons, George and William. To George he bequeathed "all that part of my Plantation Called by the name of Kendal "Bounding to the Southward by the Creek that runs up to my Mill . . . and bounded to the Northward by Mr. Allens Creek with the Little Island of Marsh fronting the said Plantation in the River and all other my Lands bounding on the said Creek . . . " and other property. Roger Moore bequeathed to William Moore "all that (part of) my Plantation called Orton where I now Dwell Joining on Kendall as is before bounded by this my Will with all my Land bounded to the Southward on the Creek where my Mill now is being in all about 2500 Acres," and other named tracts. William was also bequeathed "all the stock of Horses and Cattle and Sheep that shall properly belong to and be on my Plantation Orton at my Decease with all my Plate and Household furniture" with the consideration that William Moore pay his older brother one hundred pounds "two years after my Decease." The slaves were to be divided into one-fifth parts for the five siblings.[18]

At the signing of his will, only one of Roger Moore's three daughters was married, and he made cautious provisions for bequests to them in regard to their likely marriages. The circumstances of the legacy payments by his sons and executors out of his residual estate were described and defined. The wording in this provision, apparently describing the residual estate, "there being Twenty odd Thousand Acres of Land and Near Two Hundred and fifty Slaves with the Stock of Horses Cattle &c besides the Debts due to me not before bequeathed," gives rise to different interpretations of the total lands and slaves held by Mr. Moore that are not easily resolved. Neither is it clear how many of the slaves were at Orton, what number lived at Kendal, or whether others lived and worked on Roger Moore's other holdings.[19]

Roger Moore's dynastic plans to settle his two sons, George and William, at Kendal and Orton, respectively, proved short-lived. Fate did not favor William Moore who signed a very simple will on 18 November 1754 and died young, probably in the middle to later 1750s, leaving his widow, Mary Paris Davis Moore, and a young, underage son named Roger Moore.[20] In 1764 William Moore's executors assigned the heavily encumbered essay to William Dry, a first-cousin of William Moore, and Richard Quince.[21] William Dry (1720-1781) was a wealthy planter and the owner of Belvedere Plantation near Wilmington.[22] Richard Quince (1717-1778) was a successful merchant at Brunswick and a planter who became the sole owner of Orton by, and probably well before, 31 March 1775, when he received two land grants totaling 1,280 acres at the west end of Orton Pond.[23] This was the first of a series of known additions to Orton that continued into the twentieth century.

The following year Orton was the scene of a Revolutionary War encounter involving Lieutenant General Charles Cornwallis (1738-1805). In his *A History of New Hanover County* Alfred Moore Waddell describes the event.

> This was the first appearance of Cornwallis in the South, . . . on Sunday May 12th, he began his career by landing nine hundred men at Orton with the intention of capturing an outpost of one hundred and fifty men under Maj. Wm. Davis of the first Regiment, Continental Line, who were stationed at the mill on that plantation; but Davis's pickets gave the alarm in time, and he retired, taking his supplies with him, after killing one, wounding several, and capturing a sergeant of Cornwallis's celebrated 33rd Regiment. After burning the mill, Cornwallis went two or three miles down to General Howe's plantation at Howe's Point, which he plundered, carrying away as the spoils of his warfare about twenty steers for his beef-eaters.[24]

The mill destroyed at Orton was surely the sawmill noted on both the Collet and Munson maps, which was rented by Captain Robert Ellis and referenced in the 1764 William Moore estate assignment.[25]

Fate, in its time, also thwarted Roger and Maurice Moore's plans for Brunswick Town but not until after it had prospered in the colonial period, served as the home for successive royal governors, and become the site of the most sophisticated church building known to have been built in colonial North Carolina. The ruins of St. Philip's Episcopal Church remain impressive to the present and serve as the anchor of the North Carolina State Historic Site at Brunswick Town. But Brunswick Town and Roger Moore's important role in its creation was of greater significance. For a short, critical period Brunswick Town was the center of a community of pioneering planters that evolved into one of the wealthiest plantation societies in eastern North Carolina. Brunswick Town was the nursery for this settlement and the stepping stone for the place that became Wilmington. Described in 1735 as "the chief gentleman in all Cape Fear," Roger Moore was a patriarch whose legacy transcended family and gave rise to the development of place in the Lower Cape Fear.

Benjamin Smith and Orton

On 23 January 1796 Richard Quince III (1769-1809) sold Orton to Benjamin Smith, who was identified in the deed as "Brigadier General of the District of Wilmington and Speaker of the Senate of the State of North Carolina," for the sum of $5,200. The deed described Orton as

> ...all that plantation parcel or tract of land well known by the name of Orton situated lying and being on the west side of the Cape Fear River and bounded thereby and all the land thereunto belonging or ever appertaining on each side of Orton Creek & which was divided of by the late Roger Moore Esquire to his son William Moore by him devised unto his son Roger Moore and by him sold unto Richard Quince (,) grandfather of Richd. Quince aforesaid party hereunto and also two other tracts of or parcels of land adjoining the said Orton land containing six hundred and forty acres each which were patented to the said Richard Quince the elder (,) the whole of the above tracts & parcels containing four thousand acres.[26]

Benjamin Smith is the lone owner of Orton whose life has been the subject of a full length biography. *General Benjamin Smith: A Biography of the North Carolina Governor*, written by Alan D. Watson (b.1942), a modern-day historian of the Lower Cape Fear, was published in 2011. In its pages Mr. Watson traces the remarkable trajectory of Benjamin Smith's life as a lawyer, planter, county official, state legislator, and benefactor of the University of North Carolina, that culminated in his election and service as governor from 1810 to 1811. Benjamin Smith married Sarah Dry (17__-1821), one of two daughters of William Dry and Mary Jane Rhett, and also a kinswoman in the extended Moore family. The biographer also documents a parallel arc in Benjamin Smith's private life of lavish hospitality, overspending, self-aggrandizement, poor judgment in adopting the role of providing surety for the obligations of others, and obvious mismanagement that led to a

series of retrenchments in the 1810s and finally, in the last years of his life, to abject poverty and utter dependence on a few friends who had remained loyal to him and his wife. He lost Orton, the last of his prized properties, to the Bank of Cape Fear, his long-time creditor, in 1824. He died in distressed circumstances in Smithville (Southport) on 26 January 1826.

At this distance Benjamin Smith's intentions for Orton in 1796 are unclear. Belvedere Plantation and his town house in Wilmington, together with a house in Smithville and the summer refuge on Bald Head Island, appear to have remained his principal residences until circumstances forced him to give them up, one by one, or they were claimed by his creditors. Nevertheless he soon launched certain initiatives at Orton. By 1797 he had placed a trusted slave, named Bob, at Orton and secured for him the right to keep a gun "to preserve stock and kill game for the family."[27] That same year he gained permission to repair a grist mill at Orton powered by a "never failing mill stream."[28] In 1800 Benjamin Smith listed 199 slaves who toiled at his properties in Brunswick County.[29] He was then the largest slaveholder in Brunswick County.

On 23 March 1812 Benjamin Smith executed a deed of trust with William Belvidere Meares (1787-1841) and John Rutherford London (1786-1832), the son of the president of the Bank of Cape Fear, and the president, directors, and company of the Bank of Cape Fear to secure an indebtedness to the bank of $26,214.27. Belvedere Plantation and its 1,010 acres, Orton and its 4,000 acres, and seven additional tracts comprising 5,226 acres, altogether totaling 10,236 acres, were included in the deed. Benjamin Smith was to "remain in possession of the aforesaid property & have and enjoy all the rents and profits of the same until a sale shall be made in pursuance of and by virtue of these presents . . ."[30] This action bought little time: his descent continued. In 1815 the Bank of Cape Fear offered Governor Smith's mortgaged properties up at auction. The Smiths lost Belvedere and their Wilmington town house, but retained Orton, which then became their primary residence, through the generosity of friends.[31]

This extraordinary chapter of Lower Cape Fear history came to an end with events in the 1820s. Sarah Dry Smith's health failed in autumn 1821, and she died in the evening of 21 November 1821 in the couple's ill-kept house in Smithville. She was buried near the graves of her parents in the old churchyard at St. Philip's in Brunswick. By 1824 Orton was again in the possession of the Bank of Cape Fear, which advertised its auction at the New Hanover County Courthouse in Wilmington on 1 December 1824 in an advertisement published in Charleston's *City Gazette and Commercial Daily Advertiser.*[32]

On 27 January 1825 a deed of trust between Joseph Alston Hill (1800-1835) and the Bank of Cape Fear was executed for the sale of Orton, its 4,975 acres, the house and surviving improvements, and eleven slaves for $6,392.66.[33] Joseph Alston Hill was descended from both Maurice and Nathaniel Moore who, with Roger Moore, formed the family triumvirate that settled in the Lower Cape Fear.[34] Joseph Alston Hill's tenure as owner of Orton was among the shortest in its history. On 24 May 1826 he sold Orton, its acreage, and its improvements, for $8,000 to his cousin, Dr. Frederick Jones Hill.[35] Four months earlier, on 27 January 1826, Governor Benjamin Smith suffered an ignominious death in Smithville (Southport). His body was buried in Smithville and the remains later interred in St. Philip's churchyard at Brunswick.

Architectural evidence visible until 2012 on the attic level of Orton indicates that Roger Moore's brick house was raised to a full two stories with a gable front attic, with windows in its east and west gable ends, prior to Dr. Hill's dramatic ca. 1840 Greek Revival-style overbuilding. Given Benjamin Smith's proclivities, that work might have been executed by him. However, the substantial difference in the price Joseph Alston Hill paid for Orton and eleven slaves in 1825, $6,392.66, and the price of $8,000 which Dr. Frederick Jones Hill paid for Orton, less the slaves, sixteen months later, suggests that the enlargement of the house was effected ca. 1825 for Joseph Alston Hill. The late Federal-style finish of the molded window surrounds in the west gable end, visible in the attic of Orton until being covered over in 2012, supports that date. For reasons now unknown Joseph Alston Hill decided against becoming a planter and continued to practice law.

Orton's Antebellum Ascendancy

Dr. Frederick Jones Hill's purchase of Orton marked the beginning of a brilliant era in its history.

On 24 May 1826 when Frederick Jones Hill (1792-1861) acquired Orton Plantation he was thirty-four years of age, married, a successful medical doctor, and a prominent member of Wilmington society. The son of John Hill (1761-1832) and Elizabeth Jones Hill, he was a grandson of William Hill (1737-1783) and Margaret Moore Hill, and a great-grandson of Nathaniel Moore--Roger Moore's brother. He was born on the family's plantation, Farifields, on the Northeast Branch of the Cape Fear River, and educated at the University of North Carolina and the College of Physicians and Surgeons in New York City. In 1812 he married Ann Ivy Watters of Chatham County, North Carolina, and in 1825 he acquired Watters

family lands near Pittsboro, the county seat, which became the couple's summer residence and was given the name "Kentucky."[36]

While the proprietor of Orton, Dr. Hill also played an important political role as Brunswick County's representative in the State Senate in 1835 and its representative in the North Carolina House of Commons in 1836, 1838, and 1840. In 1835 he was also elected a trustee of the University of North Carolina and held that position until 1860. His earliest service on the board may well have informed his most important and lasting legislative achievement. On 10 December 1838 Dr. Hill delivered a speech advocating state support for public education and ended his oration stating "In a government founded upon the popular will, Education is necessary for all classes, and for each individual in the community--and it is the duty of such Government to take care that this great end is secured." Dr. Hill subsequently introduced "A Bill for the establishment of Common Schools" in the House of Commons. The language in his bill and another introduced in the State Senate was reconciled and on 7 January 1839 the two chambers of the state legislature approved the act creating a common school system for North Carolina.[37]

While his brief, highly important political career came to an end, his role as an Episcopal layman continued to the end of his life. In late December 1832 The Right Reverend Levi Silliman Ives, Bishop of the Episcopal Diocese of North Carolina, arrived in Wilmington on his annual visitation. At the 1833 annual convention the bishop gave an account of his visit to the Lower Cape Fear region that had extended to 10 January 1833.

> During my visitation here, I spent a day or two at Orton, the seat of Dr. Frederick Hill, and visited the walls of an ante-revolutionary Church, situated about two miles distant, amid the ruins of the old town of Brunswick. These walls, 85 by 62 feet, are in a state of almost entire preservation, and by being newly roofed and repaired, would still furnish a commodious place of public worship to the inhabitants of a neighboring settlement.[38]

On 27 April 1842 Dr. Hill made an entry for an eighty-five acre tract adjoining Orton on its south side that included the ruins of St. Philip's Church and its adjoining burying grounds. The tract was awarded in a grant dated 28 April 1845.[39]

Dr. Hill's management of Orton appears to have been successful from the outset, with prosperity evident at every turn. His ownership of slaves increased notably from the 1830 federal census, the first in which he is listed as a resident of Brunswick County, through 1840, to the census of 1850 in which schedules document his slave ownership, his agricultural operations at Orton, and the industrial enterprises on the plantation. In 1830 the free white Hill household at Orton comprised Dr. and Mrs. Hill and three others whose identity is now unknown, including one male and one female under the age of fifteen, and a male in his 50s, all likely kin of the couple. Fifty-five slaves comprised the domestic and agricultural workforce at Orton.[40] Ten years later, in 1840, Dr. Hill owned seventy-six slaves, an increase of twenty-one, of which fifteen were under the age of ten and probably due to births in the Orton slave community. The free white household again constituted Dr. and Mrs. Hill, two females between the ages of fifteen and twenty and a male between the ages of ten and fifteen.[41] While their identities remain unknown at present one of the young females might have been Mrs. Hill's favored niece, Annie Davis, who would marry Thomas Miller in 1840.

The 1850 federal census of Brunswick County provides a wider range of information than was previously recorded in the decennial censuses. In Schedule 1, Free Inhabitants, the Orton household included Dr. Hill, identified as a "Planter" with real estate valued at $30,000, Mrs. Ann Hill, and William McKeithan, the forty-nine year old overseer who resided in the plantation seat with its owners. This household, listed as the thirty-eighth in the Town Creek District, was followed by that of Frederick Jones Lord, Dr. Hill's kinsman and agent, his wife, Columbia, and their three children in household #39, who (probably) occupied a now-lost house on the plantation. Dr. Hill was listed as the owner of seventy-seven slaves.[42]

The record of a sustained increase in agricultural and lumbering operations at Orton during Dr. Hill's tenure as a resident-owner exists in historic statistics and facts: the wealth generated in the rice fields, the upland fields, where corn, peas, and sweet potatoes were cultivated, and woodlands of Orton found its most visible expression in his ca. 1840 rebuilding of the plantation seat. The temple-form Greek Revival-style building immediately became one of the most stylish such plantation seats erected in antebellum North Carolina. Designed and detailed in the classical style favored by builders in town and country alike, Orton was one of a very few houses with full-scale, two-story classical porticos.

Given the expenditure on the rebuilding of Orton, described in an 1872 auction notice as "the late Palatial Residence of Dr. F. J. Hill," the likelihood exists that Dr. and Mrs. Hill would have undertaken improvements to the grounds of their splendid new mansion. However, at present, no contemporary improvements are known except, possibly, for the axial

causeway in the front rice fields leading to the Cape Fear River and the aged live oaks, aligned in two parallel, broken rows south of the house and flanking the old, established road to Brunswick Town, that was the principal land approach and access to Orton. The Hills were the last owners of Orton who are known to have used the house as a permanent, year-round residence. That fact and the maintenance of the property after the Civil War into the 1880s, which varied from minimal to neglect by a series of short term and multiple-investor ownerships, both contributed to the loss of any other antebellum garden features.

The documentation of antebellum outbuildings on the property is slim, appearing later in 1872, in an auction handbill and described simply as "all necessary Out-Houses, extensive Barns, Stables, &c., with Houses detached for 200 Hands." These could have been built by Dr. Hill or Orton's next owner, Thomas C. Miller. As far as can now be determined all those buildings are lost, including two that appear in one of the earliest known photographs of the mansion. Also lost is the Orton Point Light that was funded by Congress in 1848, constructed, and placed in service in 1850.[43]

In 1853 Dr. Hill, then sixty-one years of age, determined to end his career as a planter and to reestablish his and Mrs. Hill's residence in Wilmington. His sale of Orton to Thomas Calizance Miller was in the form of a self-financed mortgage arrangement in the amount of $100,000.00. The articles of agreement and the accompanying deed are dated 7 January 1854.[44] The sale comprised the 4,975-acre plantation tract he purchased of his cousin in 1826 and two fifty-acre tracts he had acquired in 1851. The conveyance also included some sixty-two slaves at Orton who were named in the deed. A second deed of 7 January 1854 conveyed for $100 the property on which the ruins of St. Philip's Church stood and rights to timber on a 300-acre tract on the south side of Orton that Dr. Hill had conveyed earlier to William McKeithan, his overseer.[45] Thomas Calizance Miller (1814-1865) was one of two sons of Alexander Calizance Miller (17__-1831), a European emigree who arrived in the United States in about 1797, and Mary Brown (1781-1836), a daughter of General Thomas Brown of Oakland Plantation in Bladen County.[46] On 14 July 1840 in Pittsboro, North Carolina, he married Anne W. Davis, a favored kinswoman of the Hills.

In 1854 when Thomas Miller acquired Orton he was an experienced planter. In 1847 he acquired Belleville (also known as Belville), one of the Waddell family plantations on the Cape Fear, that was located south of Governor Benjamin Smith's Belvedere on the west side of the Northwest Branch of the Cape Fear River. With his purchase of Orton in January 1854 Thomas C. Miller simultaneously, on 1 January 1854, sold the Belleville plantation to his younger brother Joseph Swift Miller (1816-1854), together with the lands of the adjoining Ashley plantation.[47]

As the owner of Belleville and Ashley plantations in 1850 and as the owner of Orton from 1854 to his death in 1865, Thomas C. Miller maintained a residence in Wilmington where he practiced law. He is believed to have occupied a house in the northwest corner of North Front and Chestnut streets on the site occupied since 1913 by the Murchison Building.[48] In the 1850 census his real estate was valued at $23,200. A decade later, in 1860, its valuation had increased to $85,000 and his personal property was valued at $150,000. These valuations included Orton and his slaves in Brunswick County. His household included his wife and six children; a seventh child had died in the 1850s and was buried in the family plot at Oakdale Cemetery.[49]

The 1860 federal census for Brunswick County yields important information on Orton and its agricultural operations. In a variation from the 1850 Census, when Orton was listed in the Town Creek District, Orton is listed in the county's Smithville District. In Schedule 2. - Slave Inhabitants, Thomas C. Miller is listed as the owner of 144 slaves who are housed in forty "Slave houses." (The location of these houses remains to be confirmed.) The figures reported in Schedule 4 – Productions of Agriculture provide valuable insight into the expansive operations at Orton for the year ending 1 June 1860, on the eve of the Civil War.[50]

With no indications to the contrary, the rice-dominated agricultural operations at Orton are believed to have continued in like scale, or with possible increases, during the Civil War. Surviving Confederate government vouchers for the period from April 1862 to March 1864 indicate quantities of rice straw/hay, merchantable lumber, refuse (rough/slab) lumber, cord wood, and shingles, acquired from Orton as well as the services of its blacksmiths, and the use of Mr. Miller's schooner, the "Blue Perch," for use by the officers and troops stationed at Fort Anderson and Fort Fisher and nearby.[51] With these forts being near to Orton and Wilmington's importance to both North Carolina and the Confederate cause, there was certain military activity along the course of the Cape Fear River in Brunswick County and near Orton. For periods the Orton Plantation seat was utilized by Confederate officials. However, it survived the war virtually unscathed, and not without irony, as Orton's architectural grandeur was such a prominent, visible symbol of Southern antebellum society and its slave-labor foundation.

Following the abandonment of Wilmington by Confederate forces in February 1865 and with North Carolina coming under Federal Control in April 1865, the denouement was quick. In Wilmington, Thomas C. Miller experienced the loss of the slaves who formed his work force at Orton and served as domestic servants in Wilmington, people who in turn, had comprised the majority, if not the near-entirety, of his personal property that was reported as $150,000 in the 1860 federal census. He was also responsible for the unpaid balance of $40,000 due Dr. Hill's estate for the purchase of Orton. Like so many other Southerners who had a significant indebtedness at the end of the Civil War, he was ruined. Thomas Calizance Miller died on 9 June 1865 in Wilmington and was buried beside his son in the family plot at Oakdale Cemetery. His grave remains unmarked to the present.[52]

Orton in a Period of Uncertainty, 1865-1884

The emancipation of slaves, proclaimed in 1863 by President Abraham Lincoln and put into effect in spring 1865 with the Federal occupation of North Carolina, Thomas C. Miller's death in June 1865, the indebtedness of his estate, and the many-fold results of the Civil War produced an uncertainty at Orton that was not resolved until 1884 when Kenneth McKenzie Murchison became its sole owner. The insolvency of Thomas Miller's estate and the tremendous loss represented by the emancipation of his slaves, who represented his principal personal property, left his wife and the couple's six children in dire circumstances. Her situation was further complicated by the fact that Dr. Hill's estate had not been settled. Desperate, she attempted measures to protect her interest and those of her children, but she ultimately failed in a situation made even more complex by complicated, conflicting loyalties and responsibilities. The fact that there are no stones in Oakdale Cemetery marking the graves of Dr. Hill and Mrs. Hill, her uncle and aunt, or her husband, is one indication of the unsettled character of the times and her own particular place in them. Both Orton and the extensive lands Thomas C. Miller had purchased of Enoch Robbins and added to the plantation became a part of the estate of Dr. Frederick Hill.[53]

A degree of resolution was reached in 1872 when DuBrutz Cutlar and Charles Manly Stedman, commissioners, advertised the sale of "ORTON PLANTATION, Lands Adjacent Thereto, 9,026 Acres by Actual survey" at public auction by the firm of Cronly & Morris on 22 August 1872 at the Brunswick County Courthouse at Smithville. The auction handbill lists the valuable assets of the property, including "300 Acres of Superior Rice Land . . . 8,000 acres of Pine, and a large assortment of Live Oak Timber . . . An immense Water Power" and improvements consisting of "a Two Story Dwelling House, containing 10 Rooms, Brick Basement, with all necessary Out-Houses, extensive Barns, Stables, &c., with Houses detached for 200 hands" cited as "the late Palatial Residence of Dr. F. J. Hill, deceased."[54] Either the auction did not attract bidders or any bids received were simply too low to be accepted. A second auction was scheduled and advertised for 26 February 1873 that included Dr. Hill's Wilmington residence (at today's 314 Grace Street), the couple's summer residence in Chatham County and other properties. This second auction also failed to attract a new owner for Orton.[55]

On 2 March 1874 DuBrutz Cutlar and Charles M. Stedman, commissioners, and William E. Boudinot, the surviving executor of Dr. Hill's estate, completed a court-approved private sale to Isaac Bates Grainger of two tracts comprising 7,918 acres and 1,108 acres, respectively, for $6,500.[56] Mr. Grainger was the owner of Orton Plantation for just under two years and the details of his stewardship of the property are now unknown. So, too, are the reasons that influenced his decision to sell Orton in 1876. On 11 February 1876 he and Mrs. Grainger sold Orton Plantation, less the 180-acre "Durant tract" contracted to be sold "to a certain _____ Hooper (colored)," to Currer Richardson Roundell, an Englishman, for $8,000.[57] Mr. Roundell's tenure as owner of Orton is the shortest in history. On Wednesday morning 26 July 1876, he was found dead in his room in the Manning House, a lodging in Wilmington, of a gunshot in his forehead. The account of the event(s) published on the front page of *The Morning Star* on 27 July 1876 noted his purchase of Orton "upon which he had intimated his purpose to reside and cultivate the land, having had several conversations with different gentlemen within a day or two of his death in regard to the best mode of culture, the question of procuring laborers, &c." In the afternoon of the 27th of July his body was buried from St. James Church in Oakdale Cemetery. Whether the wound was self-inflicted or accidental was never established.

The future of Orton was again in question. As his only heirs, Laura Eleanor Roundell and Mary Dorothea Lucy Roundell of Middlesex County, England, Mr. Roundell's spinster sisters, became the owners of Orton Plantation. They executed a power of attorney to William Lord DeRossett, an attorney in Wilmington, on 10 March 1877, giving him the charge to sell Orton on their behalf.[58] Meanwhile, on 18 February 1877, Mr. DeRosset published an advertisement in *The Morning Star* under the caption "ORTON Plantation For Sale!" The advertisement repeated the language of the 1872 public notice, noted Mr. Roundell's purchase of Orton, and that the plantation would be sold "FOR CASH ONLY, at a great sacrifice." In the event he did so, at the sisters' disadvantage. On 7 April 1877 he conveyed Orton and its vast acreage for $4,000 to an

ad hoc quartet of investors; David Reid Murchison, Isaac Bates Grainger, and Charles M. Stedman of Wilmington, and Kenneth McKenzie Murchison of New York City.[59]

Each of these men well understood the value of Orton. Whether they planned a joint enterprise or simply purchased a one-fourth interest in the plantation as a sure investment is unconfirmed, but within the space of three years the ownership of Orton passed to the Murchison brothers. On 21 November 1879 Charles M. Stedman and his wife, Katherine DeRosset Wright Stedman, sold their one-fourth interest in Orton to David R. Murchison for $1,500. Three months later, on 18 February 1880, John W. Atkinson, commissioner and guardian of the three minor heirs of the late Isaac B. Grainger, conveyed the Grainger estate's one-fourth interest in Orton to Kenneth M. Murchison for $1,500.[60] Meanwhile, the brothers were making plans for improvements at Orton. On 3 December 1879 an advertisement appeared in *The Morning Star* for "50 Men to Work at Orton" under the caption "Laborers Wanted." On 4 March 1880 the advertisement was published again with a call "For experienced ditchers" who would be paid "75 cents per day." On 5 February 1881, readers of *The Morning Star* learned "The rice fields at Orton were being burned off yesterday." The cultivation of rice was about to be renewed.[61]

In addition to being brothers, the sons of Duncan and Fannie Reid Murchison and natives of Manchester, Cumberland County, North Carolina, David Reid Murchison (1837-1882) and Kenneth McKenzie Murchison (1831-1904) both had significant careers as officers during the Civil War and acquired larger fortunes through investments in a wide range of businesses. They also prospered through the ownership of a group of family-held businesses that operated as Williams and Murchison in Wilmington, J. D. Williams and Company in Fayetteville, and Murchison and Company in New York City. Both were also investors in financial institutions with Kenneth Murchison later being the founder of the Murchison National Bank in Wilmington in 1899.[62] The plans they had as partners at Orton Plantation ended with David R. Murchison's death at the age of forty-four on 22 February 1882 leaving his widow and a young daughter. One of their few known acts as co-owners of Orton occurred on 25 May 1880 when they conveyed a four-acre tract that contained the ruins of St. Philip's Church and the surrounding churchyard to the trustees of the Diocese of North Carolina.[63] In order to effect a division of Orton between the heirs of David R. Murchison and Kenneth M. Murchison, Orton was put up at public auction at the Brunswick County Courthouse on 4 March 1884. Kenneth M. Murchison's bid of $24,000 secured the property and Orton Plantation was conveyed to him as sole owner on 18 April 1884.[64]

Kenneth McKenzie Murchison and Orton

Kenneth McKenzie Murchison was owner and master of Orton Plantation for a full score of years during which time he was both a good steward of the plantation and instilled a high regard for Orton and its history in his children, which would come to fruition after his death. His legacy to Orton would long outlast his memory in Wilmington where he was the principal figure in two of its major concerns. In 1886 he built the Orton Hotel on Princess Street that functioned as the city's leading hostelry through the early twentieth century and stood until being destroyed by fire in 1949. In 1899 he founded the Murchison National Bank and oversaw the design and construction of its new premises at 200 North Front Street in 1902. He was also an investor in other Wilmington concerns.

Kenneth Murchison's commitment to Orton, which effectively secured the plantation's future, was widely recognized and appreciated. Alfred Moore Waddell (1834-1912), the author of *A History of New Hanover County and the Lower Cape Fear Region, 1723-1800* (1909), gave voice to his admiration in a sketch of Mr. Murchison that was published in 1905 in volume one of *Biographical History of North Carolina, From Colonial Time to the Present.*

> Colonel Murchison lived in New York after the war, but generally spent the winter in North Carolina. . . . he bought the old historic plantation called "Orton," the family seat of "King" Roger Moore, situated about sixteen miles below Wilmington, on the west side of the Cape Fear, and the southernmost of all the old rice plantations on that river, and he expended a large amount of money in restoring it to its former condition and improving it in various ways to satisfy his taste. . . . Orton has always been a paradise of sportsmen, and the colonel was very fond of hunting. It was his custom to bring some of his friends down from the North every winter, and give them the opportunity to enjoy the old-time hospitality, which he dispensed with a lavish hand. It was here that those who loved him best and who were loved by him spent their happiest days. The restful seclusion of this grandest of all colonial homes, with its broad acres and primeval forests, was most grateful to him and to his intimate associates after the storm and stress of war and the subsequent struggles of business life. It was here that the austerity of worldly contact was relaxed and the manifold humanities of a gentle, kindly life unfolded. He never spoke of his own exploits, nor did he willingly recall the horrors of the four years' war. He loved to roam the woods with his faithful

> dogs, to linger for hours in the secluded sanctuary of the game he sought so eagerly, and the sight of his triumphant return from an exciting chase, with Reynard at the saddlebow, surrounded by his yelping pack of English hounds, would rouse the dullest of his guests to exclamations of delight.
>
> Colonel Murchison's striking personality was likened by those who knew him to that of the great German chancellor, Prince Bismarck, in is younger years. The commanding figure and uncompromising expression, which characterized his outward life, suggested a military training beyond that of his war experience, and this was in strange contrast to his inner life, a knowledge of which disclosed a sympathetic tenderness for all suffering or afflicted humanity. He preferred and practiced the simple life; his wants were few and easily supplied. A notable characteristic was his exceeding devotion to his five surviving children; he was proud of them and of their loyal love to him, and he made them his constant companions. He gave to worthy charities with a liberal and unostentatious hand. His patriotic spirit responded quickly to every public emergency, and his local pride was manifested in the building and equipment, at a great expense, of "The Orton," when a good hotel was needed in Wilmington, and when no one else would venture the investment.
>
> During the last fifteen years of his honored life, Colonel Murchison gradually withdrew from the activities of strenuous business cares, and with the first frosts of autumn resumed control at Orton Plantation. He left it in June of 1904 in the vigor and spirits of abounding health, to meet, a few days later, the sudden call of the Messenger of Death, whom he had never feared. . . . He was an example of splendid physical manhood, of broad experience, of unyielding integrity, pure in heart and in speech, with the native modesty of a woman and the courage of a lion. He was especially sympathetic and generous to his negro servitors, who regarded him with loving veneration.[65]

Kenneth Murchison's ownership of Orton coincided with important developments in photography and its increasing use in many areas. The earliest known photographs of Orton, believed to be ca. 1890, date to Mr. Murchison's ownership with a number including him, his beloved hounds, and members of the family and friends in the views. The dating of some of these images remains a matter of educated estimation. However, the appearance of the mansion, ranging from an unkept appearance to visibly increasing degrees of maintenance, encourage an emerging chronology in their arrangement. In this regard the fact that a number of the images were recorded as part of the work to prepare the North Carolina exhibits for the World's Columbian Exposition in Chicago in 1893 has been confirmed.[66] This group includes views of the house and several views of the rice fields on the east side of the mansion between it and the Cape Fear River. The representation of rice in the agricultural exhibit is surely that of the Orton rice fields. The state executive committee charged with overseeing the preparation of the exhibits held the view that the expense involved would be more than rewarded by their display in Raleigh in the State Museum at the close of the Chicago fair. This conviction is noted in the committee's official report printed in the *Report of the Board of Agriculture for 1893-94*.[67]

In a separate article on the exposition it was reported that the North Carolina exhibits won 157 medals and awards and that "The Board particularly invites attention to the State Museum, which is now filled with such of the State's exhibit at Chicago as was not perishable and which could be placed to advantage in the cramped apartments now used as a Museum in the Agricultural Building.[68] The *Hand Book of the North Carolina State Museum* . . . published in 1897 lists the photographs on display by their caption, and a comparison of those captions with both the handwritten and typed captions on several of the images confirms the origins of a number of views and the use of Orton to represent North Carolina history in these important venues.[69]

These photographs and others also reflect certain improvements that Mr. Murchison made at Orton and the many types of fencing of the period. Two-story white-painted weatherboarded frame buildings standing to both the north and south of the mansion appear in separate views and probably contained kitchen facilities as well as staff and guest accommodations. Those buildings appear to have been short-lived and came down with the 1909-10 work at Orton. Over time the "Houses detached for 200 Hands" standing on Orton Plantation and noted in the 1872 auction handbill were lost. Other housing was erected for workers and employees who continued to live on the plantation. One constant in the lives of its black community was the cemetery, occupying elevated ground southwest of the mansion, where slaves had been buried and where their descendants and other black plantation staff were interred into the mid-twentieth century. The board-and-batten-clad powerhouse/barn and Elijah's house are possibly--and probably--the surviving part of Mr. Murchison's renewal at Orton on the home grounds noted by Alfred Moore Waddell.

Kenneth M. Murchison died in Baltimore on 3 June 1904. His body was brought back to Wilmington and placed in the Murchison Mausoleum at Oakdale Cemetery. For a man of his extraordinary wealth and business holdings, Kenneth M. Murchison left a remarkably simple will and placed a high degree of responsibility in the judgment of his named executors, Kenneth M. Murchison Jr., James Sprunt, and Shirley Carter (1871-1940), also a son-in-law and an attorney of high standing in Baltimore. They were to make every provision for his widow, Katherine Elliott Williams Murchison (1836-1912). Mr. Murchison then directed "that my property of every description be equally divided between my five children - - Luola M. Sprunt, Jane M. Ellis, Jesse (sic) M. Carter, Kenneth M. Murchison Jr., and Marion Hurkamp."[70] Aside from placing Mrs. Hurkamp's inheritance in trust, the principal caveat given to the executors concerned Orton and his vast Yancey County hunting lands. "Believing that Orton Plantation and my property in Yancy (sic) County known as Caney River will be enhanced in value on account of the growing timber, I direct that these properties not be sold until such time as seems best." The will was signed on 10 November 1903. Orton Plantation would remain in Mr. Murchison's estate, enjoyed by his heirs, into 1909.

The Sprunt Family at Orton

Orton entered a golden age, marked by a high degree of stewardship, in 1909 when Luola Murchison Sprunt purchased the plantation from her siblings. Mrs. Sprunt and her husband had decided on this seemingly destined course earlier, and by the fall of 1908, when they launched a series of improvements to Orton's pillared antebellum house and its grounds. Their efforts, motivated in part by famial affection, also reflected those of their class, across the South, who reclaimed historic, sometimes ancestral properties and remade them as country houses, hunting lodges, or seasonal residences. Orton Plantation served all three functions for the Sprunts, their son James Laurence Sprunt (1886-1973), and the families of his four sons.

The marriage of Luola Murchison and James Sprunt on 27 November 1883 represented the union of two families, which had prospered and grown wealthy through initiative, enterprise, good fortune, and investment in businesses that met a series of regional, national, and international needs for goods and services in the second half of the nineteenth century. While the history of the Murchison concerns and that of Alexander Sprunt & Son, Incorporated, and the Sprunt family-owned Champion Compress and Warehouse Company, which had branch offices in several European cities, remain to be addressed, there is no question of their important impacts, of varying degrees, on local, regional, national, and international commerce. Nor is there question of the manner of living afforded the Murchison and Sprunt families from their investments and business operations.

In 1909 when Luola Sprunt became the owner of Orton Plantation, the Sprunt family was living in the Governor Dudley Mansion at 400 South Front Street in Wilmington. James Sprunt had purchased the house in February 1895 from Pembroke and Sarah W. Jones and soon raised the flanking wings of the house to two stories and added a monumental, frankly overscaled two-story Corinthian portico on the façade.[71] The designer of these additions remains to be confirmed. However, the involvement of Mrs. Sprunt's brother, Kenneth M. Murchison Jr. is likely as he also exercised a hand in the design of the Murchison Mausoleum that was completed in Oakdale Cemetery in 1898.[72] In March 1896, when a principal part of the work is believed to have been completed, Mr. Sprunt conveyed the property to his wife.[73] Among people of their class and station, vesting the ownership of residences in the name of the wife was an honored convention and that practice was repeated at Orton. While Mrs. Sprunt could well have purchased Orton of her siblings, the family tradition that Mr. Sprunt made a gift of Orton Plantation to her likely reflects both fact and convention. The Sprunts also had a summer residence at Narragansett, Rhode Island, which they acquired in the summer of 1905 and renamed Orton Lodge.[74] Kenneth Murchison Jr. oversaw certain architectural improvements and furnishing requirements for the summer place, largely in 1906, for the Sprunts.

On 18 September 1909 the deed conveying Orton Plantation to Luola Sprunt was executed by her siblings, their spouses, and the executors of Mr. Murchison's will. The consideration was the payment of $5,000 to each of the four.[75] Her purchase of the property had been understood for some time, and at least a year or more, as certain landscaping efforts on the river front of Orton had begun in 1908. When Kenneth Murchison Jr. began designing the improvements to Orton has not been established. However, it appears likely that the architectural construction on the mansion had commenced well before the execution of the deed. In a letter of 22 March 1909 to Theophilus Parsons of Boston, James Sprunt wrote "We are making great improvements at Orton so that you would hardly recognize the old plantation, and we would be very pleased if you would come again to Wilmington and give us the opportunity of entertaining you there."[76] The addition of the wings on the north and south sides of the house, the enhancements to the existing portico, the new one-story service wing on the west rear of the house, and the interior improvements were completed in 1910.

At present the designer of the extensive gardens, terraced, laid out, and planted to complement the house and its axial approach along the causeway from a dock on the west side of the Cape Fear River is not known. Mr. Murchison likely had a voice in the work, and he might well have called on the services of a colleague in landscape architecture in New York. Documentary photographs of the house and gardens in the 1910s (and 1920s) show varying plantings in the evolving beds and borders immediately in front of the house and lining the front walk.

The Sprunts' architectural program at Orton Plantation included new entrance gates at the north and south entrances to the property, a gatehouse inside the north gate, and the construction of a private chapel that was essentially completed in 1915. The date of the gates and the gate house have not been established. However, the stance of the "warring eagles" atop the piers places them in the period of World War I. During this time, in December 1912, Mrs. Sprunt purchased a 394-acre tract of the Kendal plantation from the heirs of Frederic Kidder.[77] It was also during this period, in 1914, that James Sprunt's decades-long research into the history of Wilmington and the Lower Cape Fear came to fruition in the publication of *Chronicles of the Cape Fear River.*

During the years James and Luola Sprunt lived on Front Street, wintered at Orton, and summered in Narragansett or in a cottage at Wrightsville Beach, their family circle was small and included their one surviving child, James Laurence Sprunt (1886-1973). The couple's two daughters, Kate (1884-1887) and Marion (1889-1901), had died early. In 191_ James Laurence Sprunt married Amoret Cameron Price (1891-1915), and on 5 January 1915 she gave birth to James Laurence Sprunt Jr. Amoret Sprunt died within hours of giving birth, and the care of the infant devolved to Mrs. Sprunt and her cousin, Miss Kate Fairley, who had joined the household as her companion.

Luola Murchison Sprunt died on 17 February 1916 at the age of fifty-seven and was buried in the Sprunt family plot in Oakdale Cemetery. The provisions in her will reflect a certain equanimity and concern for the offspring of her siblings who were less-secure financially. Her husband was given a life estate in the Wilmington and Wrightsville Beach residences and in Orton Plantation. At his death James Laurence Sprunt would come into full possession of the two first-named properties. Orton was held in a different, higher regard, treated as a legacy, and with the intention it remain in the family. James Laurence Sprunt was to receive a life estate in Orton Plantation with full ownership of it being vested in a child or children of his parenting. In the event there were no natural grandchildren, Orton Plantation was to be placed in trust for the benefit of her Murchison nieces and nephews and her sister Jessie M. Carter who was apparently childless.[78] As events prove she guaranteed the ownership of Orton Plantation in the Sprunt family to her son's death in 1973. Like her father, she sought to instill a commitment to Orton's stewardship and, to protect it as a hereditary patrimony. In this she was fully successful until 2010 and partially determining to the present.

James Sprunt would survive his wife by eight years during which time he would continue his commitment to history, philanthropy, and family. He maintained a close friendship with the leading historians in North Carolina, saw to publication a revised edition of *Chronicles of the Cape Fear River* in 1916, and served as president of the North Carolina Literary and Historical Society. He also provided assistance and Orton's hospitality to Evangeline Walker Andrews who edited Janet Schaw's travel diary and saw to its publication as the *Journal of a Lady of Quality; Being the Narrative of a Journey from Scotland to the West Indies, North Carolina, and Portugal, in the years 1774 to 1776* by Yale University Press. This valuable first-person account of colonial-era Cape Fear plantation society was dedicated to Mr. Sprunt and its introduction written at Orton by Mrs. Andrews in March 1920.[79]

James Sprunt's philanthropic gifts were numerous, some noted in their time and others remaining anonymous to the present, and they often reflected the close relationship of church (Presbyterian) and family. The chapel at Orton became a memorial to Luola Sprunt in 1916, and the Marion Sprunt Hospital for Women and Children, also designed by Kenneth Murchison Jr., was a memorial to his daughter and a remembrance of the circumstances attending the birth of his first and as yet only grandson. History and family were both well served in May 1918 when James Sprunt purchased the residual parts of Kendal and Lilliput plantations, comprising some 4,000 acres, and added them to the family's Orton holding, thereby preserving the adjoining lands of three colonial-period Cape Fear River plantations, the resources standing thereon, and those reclaimed by soil, water, and forest.[80] James Sprunt died on 9 July 1924 and his body was buried beside that of his wife at Oakdale Cemetery.

James Laurence Sprunt's tenure at Orton as the holder of a life estate in the plantation spanned a near half-century from Mr. Sprunt's death until his own on 18 June 1973. He married his second wife, Annie Gray Nash (Ruffin) Sprunt (1886-1978) in 1919. She was a fully-engaged partner in his efforts and the mother of three sons born between 1920 and 1927: Kenneth Murchison Sprunt (1920-2011), Samuel Nash Sprunt (192_-200_), and Laurence Gray Sprunt (b. 1927). The cultivation of rice, practiced on a limited, increasingly non-remunerative basis ended in about 1931 while timbering

continued. Beginning in 1934-35 they launched the second major landscape gardening initiative at Orton that included the development of extensive new gardens intended both as pleasure grounds for the family and guests at Orton and as display gardens for the stock of a commercial nursery specializing in camellias and azaleas they were about to undertake. In this work they had a third, critical helpmate in the person of Clarence Jones (1908-2008), a gardener and factotum at Orton for over seventy years. In about 1936 the Sprunts engaged Robert Swan Sturtevant (1889-1955), a Massachusetts-born and Harvard-educated landscape architect, who had also served as director of the Lowthorpe School of Landscape Architecture in Groton, Massachusetts, as consulting landscape architect for proposed improvements at Orton. The first of his two surviving plans for the work, a general plan of the property entitled "Orton Plantation on the West Bank of the Cape Fear River about 15 miles below Wilmington, North Carolina," is dated January 1937. On it he identified existing garden areas and plantings, buildings, roadways, fields, and woodlands. Mr. Sturtevant then designed an ambitious series of gardens, aligned on both axial and curvilinear walks that incorporated significant existing features, and linked the nascent nursery operations and sales area on the south, southwest of the chapel, with the mansion, and the Moore family cemetery on the north. The east axial approach from the Cape Fear River along the causeway was enhanced, spacious green lawns were identified, and new garden features proposed.[81] This second plan, titled "The Gardens at Orton (,) Wilmington (,) North Carolina," bears his name but no date.

The Sprunts' decision to engage Robert Swan Sturtevant as the landscape architect for Orton coincided with a series of decisions they were making in regard to the gardens and grounds of Orton in the 1930s. Beginning in the early 1930s, they had opened the gardens to the public one day each spring, when the bloom was at its height, to benefit local charities and particularly the Brunswick County Hospital Auxiliary. This was the case on the Saturday afternoons of 11 April 1936 and 27 February 1937. In January 1939 the gardens were opened for the entire Spring season and a small fee was charged for admission. This initiative was promoted by a lengthy illustrated article, "Historic Orton Gardens Nearing Azalea Season," published in *The News and Observer* in Raleigh on 5 March 1939. The response gave rise to the full-scale opening of the gardens to visitors, the development of facilities for their comfort, and the creation of promotional brochures. During this period nursery operations, probably first developed to provide plants for Orton's gardens and grounds, began their evolution into a full-scale nursery operation specializing in camellias and azaleas. A parallel effort to grow cut flowers, principally daffodils, for the florist trade proved to be short-lived. Additional staff was required for these initiatives and in late 1937 or early 1938 Henry Churchill Bragaw (1914-1944), a graduate of North Carolina State College, was hired to supervise the garden operations at Orton. His stay at Orton, which embraced management of the plantation, was storied.

Most of Mr. Sturtevant's plan was implemented and planted as he proposed by the Sprunts, Clarence Jones, and Henry Churchill Bragaw. The older of the two surviving greenhouses at Orton is believed to have been built during Mr. Burgaw's stay as manager, which ended in February 1942 when he left for service in World War II, or by young Kenneth Sprunt soon after the end of the war. Mr. Bragaw was succeeded at Orton by James Ferger (1912-1993), a graduate of the University of North Carolina. In 1945 when the American Camellia Society was organized, Mr. Ferger, Robert Kenneth Godfrey (1911-2000), another employee in horticultural operations at Orton, and Kenneth Murchison Sprunt all became life members. Mr. Ferger, who was also one of the society's first twelve state directors, contributed an essay, "Camellias in the Landscape Scheme," to the society's first yearbook that was published in 1946. The Orton Nursery was one of five nurseries specializing in camellias that had full-page advertisements in the inaugural yearbook.[82]

About this time, 1946-1947, Mr. Ferger left Orton (to work as a landscape architect in Wilmington) and Kenneth Sprunt began his long tenure as manager of the plantation's nursery operations and its gardens and grounds. The gardens at Orton, which were already open to the public, were often photographed in the middle decades of the twentieth century, by John Hemmer and others, and figured prominently in the efforts of the North Carolina Department of Conservation and Development to promote tourism in the State. The gardens at Orton Plantation were also handsomely promoted in another medium. In about 1948-1949 the Sprunts engaged Tom Draper, a New York-based cinematographer, to produce a 16-mm color film of the gardens to promote both visitation and sales from the Orton Plantation Nursery. Notice of the film, "Orton Plantation under Spring Skies," appears in the Orton Plantation Nursery Catalogue for Fall 1951-Spring 1952.

> GARDENS AND CIVIC CLUBS are invited to avail themselves without charge of a beautiful 16mm sound and color film of Orton Plantation by the well known professional photographer, Mr. Tom Draper who spent a week at Orton on this undertaking. The gardens are shown in full bloom and additional interest is afforded by views of the ruins of St. Philip's Church and other outstanding spots on the historic Plantation. Harmonious music and voice commentary add their attraction to the brilliance of the color effects and provide eighteen minutes of unusual entertainment. We will be pleased to send this film direct from Orton Plantation if so requested.

Most of the initial planting out of the gardens to Mr. Sturtevant's plan at Orton was completed by about 1950 and they were flourishing in 1954 when Hurricane Hazel struck coastal North Carolina. At the time James Laurence Sprunt was building a new house at 1820 Live Oak Parkway in suburban Wilmington and had called on Charles Freeman Gillette (1886-1969), a landscape architect practicing in Richmond, Virginia, for a grounds plan for his new house. Mr. Gillette was also asked to consult on the gardens at Orton that year. On 19 October 1954, a few days after Hurricane Hazel passed through the Lower Cape Fear, Mr. Sprunt wrote to Mr. Gillette concerning the grounds plan for the Wilmington house and a possible visit to Orton. "On account of a lot of debris at Orton, it is just as well that you have to defer your Wilmington trip to November, as this delay will enable us to clean up etc and maybe have some of the Winter grass up. I would hate to have you see Orton in such a mess-- nothing serious. Except the loss of ½ of a double trunked tree and possibly that might not be as bad for my son Ken has wanted a 'look out' in a tree for some time, and this is an ideal spot."[83] Mr. Gillette did prepare a plan for revising the Orton gardens and nursery facilities but nothing came of any of his proposals. However, repairs and new plantings were made to ameliorate the effects of the hurricane in the immediate years.

The gardens and grounds of Orton were to benefit from the talents of yet another well-known landscape architect at the end of the 1950s. In 1945, as plans for the reconstruction of Governor Tryon's Palace in New Bern, North Carolina, were advancing, a group of distinguished North Carolinians was appointed to the twenty-five member Tryon Palace Commission. The commission was charged with overseeing and advising on the costly, historic enterprise. Mrs. James Laurence (Annie Gray) Sprunt was one of the charter members of the Tryon Palace Commission and served on it until 1974. During those years she witnessed the development of plans for the reconstruction, the rebuilding of the palace, the acquisition of furnishings, and the development of its gardens and grounds. The reconstructed, newly-furnished palace was opened with ceremonies in April 1959. Morley Jeffers Williams (1886-1977), who had been engaged in garden archaeology and restoration projects at Stratford Hall and Mount Vernon, both in Virginia, and served on the faculty of design schools at both Harvard and North Carolina State College, was hired for the Tryon Palace project in 1952. Over the course of a decade he conducted archaeological research on the palace site, developed plans for the gardens and grounds, and oversaw their implementation and planting. His role in the project ended in 1962.

Mrs. Sprunt's experience prompted her and her husband to undertake three important, related projects in the 1950s. These followed on the issuance of the first two of three known surviving catalogues for the Orton Plantation Nursery prepared by Kenneth Sprunt. The first catalogue is undated. The second is for the Fall 1951-Spring 1952 planting season. A third, last known catalogue was issued for the Fall 1953-Spring 1954 season. In 1952, the site of Brunswick Town, which embraced the ruins of St. Philip's Church and cemetery and the site of Governor Tryon's earlier residence, Russellborough, were conveyed to the State of North Carolina and subsequently developed as a State Historic Site. Then, following on the example of his father, James Laurence Sprunt turned to history, and more particularly to the history of Orton, and wrote a guidebook, *The Story of Orton Plantation*, that was published in 1958. That same year (or possibly in late 1957) Mr. and Mrs. Sprunt hired Morley Jeffers Williams to undertake work at Orton, which also engaged the talents of his wife, Nathalia Williams, an architect with whom he had practiced in the past. Four known surviving drawings bearing both their names were produced for the Sprunts between 2 October 1958 and 6 February 1959. These include a sheet of details for the railings of the paired overlooks, which provide vantages from which to enjoy views over the scroll gardens and rice fields, and a sheet with two designs for a new bridge crossing the lagoon. The drawing for the "Scroll Garden" is dated 18 October 1958. The plan labeled "Path to North Overlook" is dated 6 February 1959.

It was these renewed and enhanced gardens that were photographed in 1972 as part of the field recording process for the original nomination of Orton to the National Register and for an article on Orton, "A Garden From a Rice Plantation," that was published in *Country Life*, the British weekly, on 4 January 1973.[84] Meanwhile, in the early 1960s, in an initiative unrelated to storm damage, Mr. Sprunt pulled down the 1910 service wing at Orton and replaced it with another one-story block of similar dimensions but lesser character.

James Laurence Sprunt died on 18 June 1973 and he, too, was buried at Oakdale Cemetery. Despite the provisions of Luola Sprunt's will no real change in the operation and management of Orton Plantation occurred until after the death of his widow, the matriarchal Annie Gray Nash (Ruffin) Sprunt on 12 January 1978. Family discussions reflecting different perspectives on the future of Orton led James Laurence Sprunt Jr. (1915-2003), the privileged first-born grandson indulged by his grandfather, to press a suit in 1982 for the division of Orton Plantation among the four heirs. Instead of a forced division, the matter was resolved by the sale of his undivided one-fourth interest in Orton Plantation to his three half-brothers, Kenneth Murchison Sprunt, Samuel Nash Sprunt, and Laurence Gray Sprunt, on 2 April 1984.[85] They continued in their established patterns of care with Kenneth Sprunt attending to the gardens and grounds and nursery operations while Laurence Gray Sprunt supervised the agricultural, woodland, and timbering side of operations. Samuel Nash Sprunt, who long resided in Houston, Texas, was an absentee owner.

The three brothers held Orton Plantation in a joint undivided ownership, with one-third interests each, until 1989 when a division was effected. The core of the plantation, including the mansion, the outbuildings, gardens, grounds, and rice fields, was set apart as a separate tract and continued in the joint, undivided interest of the three as Orton Plantation, a general partnership. The plantation woodlands were divided among the three men; Kenneth Sprunt received the Orton woodlands, Laurence Gray Sprunt was deeded title to those associated with Kendal, and Samuel Nash Sprunt gained ownership of the Lilliput woods on the north edge of the overall holding.[86] This arrangement remained in effect until 3 July 1996 when Laurence Gray Sprunt bought out the interests of his two brothers in the historic core tract.[87] He continued to manage the agricultural and timber operations on the plantation acreages held by his brothers, Kenneth M. and Samuel N. Sprunt, as well as those on his own holding. In three conveyances in 2000, 2001, and 2002, Kenneth M. Sprunt sold the Orton woodlands to Laurence Gray Sprunt, whose son, David H. Sprunt (b. 1967), joined the staff of Orton in October 2001 as the manager of the gardens.[88] He oversaw the replacement of the caretaker's house and plantation office and the erection of the pavilion and greenhouse #2.[89]

Louis Moore Bacon's long-held interest in Orton Plantation became the subject of discussions with Laurence Gray and David Sprunt in about 2009. His desire to establish a quail hunting operation on the plantation was also a principal consideration. After a professional study by a game consultant, Mr. Bacon and the Sprunts reached an agreement on the acreage and the sale was placed under contract in May 2010. The 8,388 acres comprised the core tract and a large portion of the Orton and Kendal woodlands, totaling 5,167 acres and 3,221 acres of Samuel Sprunt's Lilliput woodlands. The sales by Orton Plantation, LLC, Orton Longleaf, LLC, and Lilliput Interests, LLC, to Orton Plantation Holdings, LLC, were executed on 10 November 2010.[90] Subsequently, Richard Sammons of Fairfax & Sammons, a New York-based architectural office, and Ben Page of Page|Duke Landscape Architects, in Nashville, Tennessee, were engaged for proposed work on the Orton mansion and its gardens. Mr. Sammons designed a new Post-modern Colonial Revival-style two-story service wing and alterations to portions of the existing mansion. Construction was begun in 2011 and completed in 2012. Alterations to the gardens and grounds, including the addition of a motor court and new gardens on the south side of the mansion, a stone-paved terrace on the north, new plantings in front of Luola's Chapel, and new walks of stone, brick, or gravel laid in the immediate house grounds were undertaken and completed in 2011-2012. Landscape work and new plantings are ongoing in the gardens north of the mansion and the grounds south of the chapel and at other points in the vicinity of the mansion. Important forestry management practices were also initiated in 2011 and they continue with visible success under the direction of a trained estate forester.

Social History

Orton Plantation has held an exceptional importance in the social history of Brunswick County and the Lower Cape Fear region throughout its existence, and most particularly during the period of significance, when Orton embodied and reflected on a local level the evolving character and status of the plantation as a cultural, agricultural, and social institution in the American South. In this regard its significance in the area of social history is strongly interwoven with other areas of significance, namely agriculture, architecture, landscape architecture, and archaeology. It also embraces the critical role of African Americans as both slaves and free men, who worked at Orton throughout the period of significance. Today the chief reminder of their presence is the black cemetery where they lie in marked and unmarked graves. None of the forty houses reported in the 1860 federal census as housing Thomas C. Miller's 144 slaves survive on Orton Plantation, nor does any of the housing occupied by free black employees in the later nineteenth and twentieth centuries. Neither the church built for the black workers through the generosity of the Murchisons and Sprunts in 1893, to replace the earlier building lost to fire in November 1892, nor the church Luola M. Sprunt built in the last year of her life to replace the 1893 building survive. Orton and its founder, Roger Moore, are associated with the development of the plantation as a model of settlement in this part of coastal, colonial North Carolina. The plantation and the man occupy a critical role in the creation of community that historian Bradford J. Wood presents in *This Remote Part of the World: Regional Formation in Lower Cape Fear, North Carolina 1725-1775* (2004).

In the antebellum period Orton Plantation was owned from 1826 to 1854 by Dr. Frederick Jones Hill who greatly expanded its timbering operations and rice cultivation. Dr. Hill brought the plantation to a remarkable degree of prosperity, which was reflected then, and still yet, in his dramatic expansion of Roger Moore's brick house as a handsome Greek Revival-style temple form residence. In the eighteenth century and the years of the nineteenth century, when Orton Plantation was owned by Dr. Hill and his successor, William Calizance Miller, to the end of the Civil War and Mr. Miller's death in 1865, Orton was one of the most celebrated of many plantations that lined the Northeast and Northwest branches of the Cape Fear River. The end of slavery and the financial disruptions of the war effectively spelled their doom. In the later decades of the nineteenth century one after another of these important plantations fell with the declining fortunes of their owners, changing agricultural practices, and larger societal transformations, including a steady movement from countryside to

town. Wilmington was a powerful draw for those with enterprise and initiative. But Orton survived, increasingly alone as its contemporaries in successive stages of its existence disappeared.

In the years around the turn of the twentieth century Orton figured in another distinct phase of American social history as did some few other important Southern plantations. This occurred when the captains of finance, industry, and commerce brought wealth earned at a distance from agriculture back to the country. Their revival and renewal of Southern plantations as hunting lodges, winter estates, and country houses constituted an important part of the American Country House Movement. Over the course of four decades, from 1884 to 1924, the commitment of Kenneth McKenzie Murchison, his daughter, Luola, and her husband, James Sprunt, preserved Orton, enhanced the house, its gardens, and its vast lands, and created a place for sport, refuge, and winter leisure on a working farm that remained in their family until 2010.

Agricultural Significance

The significance of Orton Plantation Boundary Increase and Additional Documentation in the area of agriculture is two-part, both in the levels of significance and in the specific areas of agricultural production in which its owners excelled, namely naval stores and the timbering of its extensive woodland resources and rice cultivation. Vast forests of longleaf pines that covered so much of the North Carolina Coastal Plain were immediately available to the pioneering settlers of the Lower Cape Fear region. The virgin woodlands of Orton Plantation, naval stores production, and the sawmills Roger Moore built to produce lumber and shingles were the principal agricultural source of his wealth. The earliest surviving document associated with Orton, records these processes occurring at Orton in 1732-1733. Regenerated year after year, generation after generation, the Orton woodlands have remained an important part of the agricultural operations at the plantation and a valuable part of its financial health to the present. While the harvesting of Orton's abundant woodland resources can be traced from 1732-1733 to the present, the context of this longevity in the Coastal Plain and the state and its representative significance is difficult to assess. Thus, the level of significance for this area of agricultural production is local.

The sandy upland soils on which Orton's vast woodlands thrived were flanked by marshlands lining Orton Creek and the Cape Fear River that, when cleared, proved to be highly valuable for rice production. Precisely when rice was first successfully cultivated at Orton remains to be confirmed through further research. Hugh Meredith described the appearance of "Rice Swamps" in his *An Account of the Cape Fear Country 1731*.[91] At present rice cultivation is first documented during the plantation's ownership by General Benjamin Smith, Roger Moore's grandson, during the period from 1796 to 1824. Rice production at Orton and in Brunswick County, where cultivation was centered in North Carolina, appears to have been the most successful and financially remunerative in the antebellum period when Dr. Frederick Jones Hill and William Calizance Miller, respectively, planted its fields from 1826 until Mr. Miller's death in 1865. The emancipation of slaves, coupled with the intensive labor necessary for its cultivation, effectively ended large-scale production at Orton as it did elsewhere in Brunswick County. Cultivation was revived after the Civil War on a reduced scale at Kendal, immediately north of Orton, and continued there during its ownership by Frederic Kidder until the last known crop was harvested in 1908, shortly before his death.[92] Orton is believed to be one of the last places in North Carolina where rice was cultivated historically. Kenneth McKenzie Murchison revived its cultivation at Orton in the 1880s, and photographs of its rice fields were part of the North Carolina exhibits at the World's Columbian Exposition in Chicago in 1893 that were reinstalled in the State Museum in Raleigh in 1894. Rice cultivation diminished and effectively ceased in North Carolina altogether in the early twentieth century. It ended at Orton in about 1931. Although its rice fields have grown up, their form and presence in the Orton landscape are still remarkably visible, and now, in the process of repair, they are evocative reminders of Orton's statewide significance in the history of rice production in North Carolina.

Given the abundant riches of Orton's colonial-era woodlands, there is no coincidence in the fact that the earliest known surviving document in the history of the plantation records evidence of their harvest. This singular document in the Secretary of State's Records, dated 20 February 1735, is an account statement between Roger Moore and Captain Jonathan Skrine covering transactions in 1732 and 1733. It records a range of goods, services, shipping expenses, and financial dealings that were representative of the roles of ship captain, factor, and planter in the period. More importantly, however, are the entries for goods produced at Orton that Captain Skrine hauled away to market. The balance sheet lists 700 feet of boards at six pounds per hundred feet, 33 barrels of turpentine valued at 82 pounds 10 shillings, 19,000 shingles at 3 pounds per thousand, a quantity of cedar timber valued at 150 pounds, and 28 bushels of peas.[93] This is important early evidence of the profitable naval stores and timbering operations at Orton that produced essential income and continued through Mr. Moore's life.

Roger Moore signed his will on 7 March 1747/8, making bequests to each of his children and his wife Mary. Mary Moore was to receive the estate she held at the time of their marriage and "the Saw Mills I intend to Build on Briars Creek with the Slaves and all utensils that shall properly belong to them(,) and if it shall so happen that I shall die before the said Mill shall be Completely Finished that she my said Wife is to have the work of my four Carpenters now at (unreadable) until they be completely finished . . ." in lieu of her dower claim.[94]

On 30 June 1750 Roger Moore added a codicil to his will in regard to the bequest to his wife. "Whereas it is apparent from the late Storm that the Legacy I have Bequeathed unto my Loving Wife Mary (,) the giving my Saw Mills and the Appurtenances thereunto belonging May instead of being a Yearly Profit to her prove rather an Expense, therefore I do Absolutely Declare that part my Will so much as Relates to the saw Mills and appurtenances thereunto belonging to be void . . . ." In lieu thereof she was to receive 100 pounds sterling each year so long as she remained his widow. Roger Moore died within months of adding this codicil, probably early in 1751, as his will was entered for probate in May 1751. The circumstances of his widow, Mary Moore's, last years and death remain to be confirmed.

William Moore inherited Orton; however, circumstances did not favor his days there and he died at a young age. In 1764 his heavily indebted estate was consigned by his executors to the management of William Dry and Richard Quince. The inventory of the estate listed sixty-five slaves and "the yearly rent from Capt. Robert Ellis for the Mill which he has hired from 11 Oct. 1761 for seven years."[95]

During the period Messrs. Dry and Quince had charge of Orton, cartographers came to the area and noted landmarks of the growing settlement that they, in turn, identified on their maps. Claude Joseph Sauthier (1736-1802), a French-born landscape gardener, was probably the first and produced plans of both Brunswick and Wilmington in 1769. John Abraham Collet was in the Lower Cape Fear about the same time. On his 1770 map of North Carolina, Orton is not noted as such; however, "Saw M." and "Cap. Ellis" appear as landmarks in its place. A similar identification was made by Henry Mouzon on his 1775 map of North and South Carolina, reflecting Captain Robert Ellis's long-term lease of the sawmill at Orton. In the event this degree of notice contributed to the mill's end. It was surely the mill destroyed by Lord Cornwallis and troops under his command on (or about) 12 May 1776 early in the Revolutionary War.[96]

There is little notice of agricultural operations at Orton until the end of the eighteenth century. On 23 January 1796 Richard Quince (III), whose grandfather of the same name had come into ownership of Orton, sold the plantation to General Benjamin Smith, a wealthy if also overextended Wilmington-area planter.[97] Soon thereafter he petitioned the Brunswick County Court to repair a mill on the plantation that was powered by a "never failing mill stream," a somewhat oblique reference to the Orton pond.[98]

The matter of when rice was first, successfully cultivated at Orton remains to be confirmed. However, Benjamin Smith grew both rice and cotton in its fields while timbering was surely also practiced. Alan D. Watson addresses the cultivation of both rice and cotton in *General Benjamin Smith*.

> Smith planted rice on both sides of the Northwest Cape Fear River at Belvedere Plantation and later cultivated the seed at Orton, which contained a rice machine and threshing mill. He marketed his crop in New York and Philadelphia.
>
> Cotton, a potentially appealing crop, was early grown in the Lower Cape Fear, but in limited quantity meant mostly for home use. According to an observer on the eve of the Revolution, "under proper management" cotton "would be an Article of great consequence." A quarter century later, though dubious, Smith was "very much inclined to try Cotton," no doubt impressed by the vigor and profit with which South Carolinians pursued the crop. In fact, those neighbors to the south may have contributed to the "rage" to grow cotton in the Lower Cape Fear at the turn of the nineteenth century. Tidal swamp was unsuitable for the crop, but the General owned "a great deal of cleared high River Swamp" that offered possibilities. Indicative of Smith's interest and perhaps cultivation of cotton was his advertisement in 1801 of a "cotton mill" of the saw-tooth variety at Orton, where cotton could be separated from the fiber "for the customary Toll," an indication that at least some fiber was grown on an ongoing basis in the region.[99]

By 1824 Orton was in the possession of General Smith's principal creditor, the Bank of Cape Fear, which advertised its sale at auction on 1 December 1824. The published advertisement noted its acreage, 4,975 acres, of which "between 400 and 500 acres is swamp land, of a strong and fertile soil" ideal for rice and cotton cultivation. "Included in the premises is a

very superior and never failing Mill stream, with an excellent dam, wanting only flood gates – the Rice Machine, Mill and Gin having been recently destroyed by fire. The pond may be used at all times as a reservoir of water to flow the low lands, thus rendering Orton one of the most valuable Rice Plantations in the country."[100]

Orton Plantation enjoyed its greatest prosperity and achieved its acme of agricultural significance during the antebellum period when it was owned by Dr. Frederick Jones Hill and Thomas Calizance Miller, from 1826 into 1865. During these years its rice fields produced increasingly large crops, and became among the most productive in Brunswick County and in North Carolina. At the same time, its vast upland pine woodlands were lumbered and tapped for naval stores. The principal evidence appears in the decennial censuses of 1850 and 1860 and the slave, agricultural, and industrial schedules compiled in those years. In 1830, the first census year he was resident at Orton, Dr. Hill is listed as the owner of fifty-five slaves. The number of slaves at Orton in 1840 was seventy-six, and the number in servitude on the plantation increased by one to seventy-seven in 1850. In 1860 Thomas C. Miller owned 144 slaves who occupied forty slave houses at Orton and on the lands Mr. Miller added to the plantation.

The 1850 federal census of Brunswick County provides an important, wider range of information than was previously recorded in the decennial censuses. The listings of "Productions of Agriculture" in Schedule 4. provides extraordinary detail of operations on the plantations and farms of Brunswick County. The entries under Dr. Hill's name confirm his status among the most productive planters in the county. Dr. Hill reported 500 improved acres (under cultivation) and 1,500 unimproved acres with Orton's cash value being $30,000, a figure matched by the Thomas L. Cowan's plantation, with the two being among the best known and the most valuable in the county. Dr. Hill reported farm implements and machinery valued at $2,000. His livestock, comprising 8 horses, 3 mules, 12 milk cows, 12 working oxen, 20 other (probably beef) cattle, 58 sheep, and 20 swine, was valued at $1,197.00 and again represented his status of one of the leading planters in Brunswick County, of which the numbers of his horses and sheep were among the highest. The crops grown at Orton, including 400 bushels of Indian corn and 30 bushes of peas and beans, were conventional except for the 3,000 bushels of sweet potatoes, the largest crop of 1850 in the county, and 325,000 pounds of rice, which was also the largest reported crop of rice in 1850 in Brunswick County. The next highest producers of rice were William B. Meares and Henry H. Watters who produced 308,000 pounds and 275,000 pounds of rice, respectively, in Brunswick's North West District. Orton also produced 100 pounds of wool and 75 pounds of butter.[101]

Dr. Hill's extremely valuable rice crop at Orton was one source of his wealth and high status as a planter. Another was his water-powered industrial operations, which were reported on Schedule 5., "Products of Industry," in the 1850 census. The figures he reported were for the year ending on 1 June 1850. His sawmills, representing an investment of $10,000 were the most valuable and productive in the county, producing 2,160,000 board feet of good lumber valued at $21,600. Orton's rice threshing machine, valued at $400, processed 15,000 bushels of "rough rice" with a value of $12,400.00 and rice straw with a value of $80.00. Dr. Hill's corn grinding mills, reflecting an investment of $500, produced 18,720 bushels of corn meal valued at $10,948.00. The question in regard to each of these productions is what proportion of the goods produced came from crops raised at Orton and its woodlands and represented direct profits and what part was produced on a toll basis for neighboring planters and farmers. Given the size of Orton and the difficulty of moving large logs long distances to a mill to be sawn into lumber, nearly all, if not all, of the lumber produced at Orton and reported in the 1850 census was surely from trees cut at Orton. However, corn, which can be easily transported in wagons in large or small quantities, might well have been brought to Orton's grist mill by Dr. Hill's neighbors for grinding into meal. While both Henry H. Watters and William B. Meares each matched Dr. Hill's production of rough rice, 15,000 bushels valued at $12,400, no other sawmill in Brunswick County had any significant production to rival the sawmills of Orton. Lumbering and the operation of sawmills at Orton had been a mainstay of Dr. Hill's agricultural and industrial works almost from the beginning of his ownership. In February 1830 Dr. Hill placed an advertisement in the *Cape-Fear Recorder* under the heading "Lumber below the Flats." "Lumber, in all respects equal to the best sawed at the Steam Mills, can be obtained at the Mill at Orton, 4 miles below the lower flats . . . . A good wharf has been constructed, where Vessels can lay securely, free of expence: and supplies of wood and water be procured with facility."[102] This mention of the wharf is an early reference to the industrial complex Dr. Hill constructed and operated to the south of the plantation seat on the east, river side of the historic road to Brunswick Town, where certain archaeological remains survive.

In 1854 when Thomas C. Miller acquired Orton Plantation he was a man of about forty years of age and an experienced planter having owned and operated Belleville and Ashley plantations for some years. By 1860 he, his overseer, and his slaves had raised six annual crops at Orton and raised its level of productivity. The 1860 federal census for Brunswick County yields important information on Orton and its agricultural operations. In a variation from the 1850 census, when Orton was listed in the Town Creek District, Orton is listed in the county's Smithville District. In Schedule 2. – "Slave Inhabitants," Thomas C. Miller is listed as the owner of 144 slaves who are housed in forty "Slave houses." (The location

of these houses remains to be confirmed.) The figures reported in Schedule 4. – "Productions of Agriculture" provide valuable insight into the expansive operations at Orton for the year ending 1 June 1860, on the eve of the Civil War. Orton then comprised 417 improved acres (under cultivation) and 8,276 unimproved acres, being its woodlands and abandoned fallow tracts, with a valuation of $42,500. The increases in acreage and valuation reflect in part the purchase of tracts adjoining Orton on the south that Mr. Miller bought of Enoch Robbins.[103] The plantation's farm implements and machinery were valued at $700. Orton's livestock numbers, including 90 swine, were well within convention except for 78 sheep that produced 100 pounds of wool. The crops at Orton comprised 1,200 bushels of Indian corn, 300 bushels of oats, 561,600 pounds of rice, 100 bushels of peas and beans, 4,000 bushels of sweet potatoes, 100 pounds of butter, and 6 tons of hay. The corn, ground into meal, and the sweet potatoes were principal foodstuffs for the slaves at Orton. The rice crop, while a substantial increase above that reported in 1850, was not the largest in Brunswick County, being exceeded in 1860 by the production of 864,000 pounds by T. D. Meares, Smithville District, 864,000 pounds by Thomas C. McIlhenny in the Town Creek District, and 624,960 pounds produced by Lenora Watters in Brunswick County's North West District. The "Value of Animals slaughtered" for the year was $730.

The entries in Schedule 5. – "Products of Industry" in the 1860 census show the productions of the rice threshing machines at Orton being in proportion to those on the plantations of Mr. McIlhenny and Mr. Meares. Orton's two water-powered rice mills produced 561,600 pounds of rough rice with a value of $10,400.00 and 505,440 pounds of rice straw valued at $1,008.00. Mr. Meares's steam-powered mill valued at $4,000.00, produced 884,000 pounds of rough rice valued at $16,370.00 while Mr. McIlhenny's water-powered mill produced 864,000 pounds of rough rice valued at $16,000: their productions of rice straw were proportional. The water-powered grist mill at Orton produced 2,250 bushels of corn meal with a value of $2,350.00. Mr. Miller reported no saw-milling operations at Orton in 1860.[104]

With no indications to the contrary, operations at Orton are believed to have continued in like scale, or with possible increases, during the Civil War. Surviving Confederate government vouchers for the period from April 1862 to March 1864 indicate quantities of rice straw/hay, merchantable lumber, refuse (rough/slab) lumber, cord wood, and shingles acquired from Orton as well as the services of its blacksmiths, and the use of Mr. Miller's schooner, the "Blue Perch," for use by the officers and troops stationed at Fort Anderson and Fort Fisher and nearby.[105]

At present relatively little is known of agricultural operations at Orton in the years following Mr. Miller's death in June 1865 until the 1880s when, in 1884, Kenneth M. Murchison became the sole owner of the plantation. A knowledge of his business activities and those of members of his family in Fayetteville and Cumberland County, where they were involved in trade, shipping, lumbering, and naval stores, leads to the conclusion that his initial interest in Orton owed to the value of its vast woodlands. However, he soon came to a remarkable appreciation of all its potential. In the pages of *Chronicles of the Cape Fear River* James Sprunt reprinted Alfred Moore Waddell's earlier-published statement that Mr. Murchison "expended a large amount of money restoring it to its former condition and improving it in various ways to satisfy his taste."[106] When the fact that the rice fields had apparently lain largely fallow from the mid-1860s into the early1880s is considered in the context of the earliest known photographs of the mansion and its rice fields, it appears likely that much of his expenditure of money and energy went into the repair and re-ditching of the rice fields and the renewed cultivation of rice by black hands who were paid, not enslaved. While the agricultural productions of his enterprise remains to be confirmed, photographs of Orton's rice fields, renewed and once-again productive, are virtually certain to have been displayed in the North Carolina exhibits at the World's Columbian Exposition in Chicago in 1893, brought back to Raleigh in 1894, and put on view in the State Museum on Capitol Square. The *Hand Book of the North Carolina State Museum, Giving the Names and Localities of All Specimans*, published in 1897, includes the following named photographs; "Orton's Rice Farm, Brunswick County", "Orton Rice Farm on Cape Fear River", "Orton Rice Farm", and "Orton Rice Plantation," as well as "Planting Rice", "Reservoir Lake, Orton Plantation", "Rice Fields Flooded," and "Planting Rice," and several images of "Orton Mansion."[107]

Little specific information on rice production at Orton in the twentieth century is known; however, it was cultivated in varying acreages for periods up to about 1931 when it is believed to have been ended.[108] Given the fact that rice cultivation declined to increasingly smaller plantings in the years after the Civil War in North Carolina and effectively ended in the early twentieth century, when one of the last important crops in Brunswick County was harvested at Kendal in 1908, it is possible that the last grains grown and harvested in North Carolina were in a final crop of ca. 1931 at Orton.[109]

In *Looking for Longleaf: The Fall and Rise of An American Forest*, Lawrence S. Earley describes the Cape Fear River as "in 1860 the greatest artery of the worldwide naval stores trade."[110] With Wilmington as the principal port city on the Cape Fear River, the greatest quantity was shipped from or through Wilmington, and virtually all of it passed in front of the

mansion on its way to every point in the United States and abroad. In time production in North Carolina waned and the industry moved to the woodlands of the deeper South. When naval stores production ended at Orton is unconfirmed; however, it likely occurred in the closing decades of the nineteenth century coincident with Kenneth M. Murchison becoming its owner. While he and his family had a long experience in the regional naval stores industry, he saw the wiser less-destructive use of woodlands for timber production. His view in that regard was specific. In his will he cautioned his executors on the point. "Believing that Orton Plantation and my property in Yancy (sic) County known as Caney River will be enhanced in value on account of the growing timber, I direct that these properties not be sold until such time as seems best."[111] His admonition held, and it has been honored through four generations of his descendants in the Sprunt family who have harvested the Orton timberlands over the course of a century. During this period they have engaged expert services, including a study in 1972 conducted by the International Paper Company and executed restrictive timber deeds.[112] Today, with the core portion of Orton in the ownership of a descendant of Roger Moore, a professional forester is on staff and in charge of the plantation woodlands. There can be few other places in North Carolina where the history of forest resources can be documented, generally continuously, from 1732-1733 to the present.

In that the practices and mechanics of rice cultivation changed little at Orton and in Brunswick County through the course of the nineteenth and early twentieth centuries, except for the dramatic change from enslaved labor to paid laborers after the Civil War, the field arrangement and patterns have retained a surprising degree of integrity since rice was last cultivated to any extent in about 1931. The principal impact on them has been the effects of nature, storms, and the rampant growth that occurs in such marsh-like areas over time. During the years since ca. 1931, the grid-like pattern of parallel ditches in the fields, seen in documentary photographs and on maps, has weakened; however, significant parts of the principal drainage system remain intact, having been repaired and rebuilt through time. The rice fields on the east side of the mansion, between it and its grounds on the peninsula and the west bank of the Cape Fear River, form a patchwork of generally quadrangular shapes. The back fields, on the west side of the peninsula and along Orton Creek have an irregular shape. All of these fields are now in the process of reclamation. Virtually all other historic rice fields in Brunswick County have been reclaimed by nature and returned to marsh status since rice had ceased to be cultivated elsewhere in the county prior to its demise at Orton. These include the former fields at Kendal, which adjoin those of Orton on the north side of Orton Creek, and those of Clarendon Plantation, which is also located on the west side of the Cape Fear River, about midway between Orton and Wilmington. Frederic Kidder (1847-1908) cultivated rice at Kendal, his favored home plantation, up to his death and at Clarendon, which he owned in partnership, through the turn of the twentieth century. The fields at Clarendon Plantation, like those of Orton were noted for their fertility through the nineteenth century, and today they form an expansive, watery greensward on the west bank of the Cape Fear River.

Through time the upland woodlands of Orton, which cover most of the remainder of its acreage on the ridges above the lower, marshy acres of the property, have been set apart into areas or zones that are defined mostly by water courses, historic roadways, or paths and lumber roads likewise laid upon the surface of the woodland floor to facilitate dragging or hauling cut logs out of the forest to either onsite, temporary sawmills or log trucks for hauling away from the plantation. While the rice fields have a grid-like appearance, the divisions in the woodlands have a seemingly natural, less mechanical appearance except for their definition along the path of the asphalt-paved, state-maintained public road that carries through the larger acreage of the estate to Brunswick Town/Fort Anderson State Historic Site. The woodlands themselves, historically and now, reflect the systematic patterns of forest management that were practiced by the Sprunt family and, since 2010, the present owner, including the periodic harvesting of timber in certain designated areas or zones when it has reached maturity. While there is variation in the age of standing trees, area to area, the appearance of the woodlands is one of a large essentially pine-covered acreage. What sets the woodlands in the Orton Plantation apart from other privately-held managed forests and woodlands in Brunswick County is the appearance of obvious care and post-lumbering cleanup that reflects the high professional standards of the forest management practices effected by the estate's full-time professional forester.

Architectural Significance

The statewide significance of Orton Plantation Boundary Increase and Additional Documentation in the area of architecture is associated with two major historic building programs implemented, respectively, in the antebellum period and the early twentieth century. The first of these, the overbuilding of Roger Moore's English-bond brick house by Dr. Frederick Jones Hill in about 1840, produced a handsome Greek Revival-style plantation seat with a tetrastyle Doric portico. Described in an 1872 auction handbill as "the late Palatial residence of Dr. F. J. Hill," it is one of the earliest temple-form domestic buildings in North Carolina and, thus, one of a significant group of like domestic and institutional buildings that ornamented the plantation landscape of the antebellum South. Dr. Hill's house, while enlarged by additions

in 1909-1910 and 2011-2012, remains visible today as a highly important example of Greek Revival architecture in North Carolina.

James and Luola Murchison Sprunt's building program of 1909-ca. 1916, that included an expansion of the antebellum house, entrance gates, a gatehouse, and a private chapel, together with newly-terraced and planted gardens, produced an early and important example of the American Country House Movement in North Carolina. The enlargement of the house in 1909-1910 and (surely) the other new architectural features were designed by Kenneth McKenzie Murchison Jr., a New York-based architect whose father had owned Orton and whose sister was his client. Long familiar with the plantation seat, he designed one-story wings, enhancements to the portico, and a service wing that respected the materials and styling of the antebellum house and repeated its impressive Doric entablature. Doing so he produced a mansion that is at once both Classical Revival and Colonial Revival in character, embodies the appearance of houses of its era that were described as "Southern Colonial," and has a truly colonial building as its core. *The American Architect* published a first-story floor plan, exterior photographs, and a photograph of the living room in its 24 May 1911 issue. Luola's Chapel, an elegant Classical Revival-style building that became her memorial in 1916, is one of two known surviving private plantation chapels in North Carolina

If, as is believed, the oft-cited traditional date of ca. 1840 is correct, Dr. Hill's imposing Greek Revival-style house at Orton is both one of a very small number of such temple-form domestic buildings in North Carolina and the most architecturally accomplished of the group. Its contemporaries in the 1840s, Wills Forest in Raleigh of 1840-1842 and Stockton in Hertford County of the late 1840s, both have two-story pedimented porticos that run with the roof of the house, but both porticos have the appearance of a certain separateness.[113] At Orton, the east-facing Doric portico and the two-story house block are fully integrated by the seamless continuation of the bold Doric entablature on its long north and south elevations. The temple form and the architectural finish are fully unified at Orton just as they are at the Orange County Courthouse (NR, 1971) in Hillsborough of 1844-1845 and the Rowan County Courthouse (NR, 1970) of a decade later in Salisbury. And at Orton there was the further matter of the elegant porch recessed in the rear southwest corner of the first story that is fronted by arched openings carried on a center column. Combined with the pattern book moldings enframing doors and windows, inside and out, Orton was a fully realized Greek Revival temple. A building that begs the identity of its designer.

How Dr. and Mrs. Hill came to build such a fashionable house in rural Brunswick County, on a rise overlooking the Cape Fear River, is easier to establish. Dr. Hill was born to privilege, into an elite tier of society in Wilmington and the Lower Cape Fear region. The buildings he saw at Chapel Hill, while a student in 1805-1806, were relatively rudimentary. However, those he would have seen in New York City, while an ambitious, highly-intelligent student at the College of Physicians and Surgeons in 1811-1812, would have been among the most up-to-date in the country. Dr. Hill's experience of architecture in the period from 1812 to ca. 1835 and his travels during those years remain unknown at present. However, in the short period from 1835 to 1840, he came into personal contact with the construction of the most important building of the time in North Carolina, the State Capitol (NR, 1970; NHL, 1973) in Raleigh, and, in Wilmington, the construction of St. James Church (Wilmington HD, NR, 1974), the first built of a series of handsome, costly antebellum public and institutional buildings in the cosmopolitan port city.

In Raleigh, while serving Brunswick County as a senator in 1835 and as its representative for the sessions of 1836, 1838, and 1840, Dr. Hill saw the State Capitol through all but its first years of construction. Doing so he witnessed the granite masonry building emerge and evolve from the plan initially produced by William Nichols, to one greatly refined by Ithiel Town and Alexander Jackson Davis, and erected under the supervision of Scottish-born architect David Paton, who overlaid the building with his own knowledge of British neoclassicism. As the State Capitol neared completion William Strickland, the talented Philadelphia architect, was called upon for advice.[114] This collaboration was extraordinary and produced a building that grew in sophistication, elegance, and significance with the addition of each voice. Catherine Bishir, the author of several important works on North Carolina architecture, put the case simply and succinctly. "Seen at the time as a nationally important building symbolizing new hope for an economically depressed state, the Capitol has consistently held foremost place among the state's architecture."[115]

In 1838-1840, Dr. Hill had a second, more intimate opportunity for association with a major building. In 1837 Thomas U. Walter, then engaged on the design of Girard College in Philadelphia, visited Wilmington and consulted with leaders of St. James Parish regarding a new church for the Episcopal congregation. The Philadelphia architect completed his Gothic Revival-style design for the new church in January 1838. The old church was taken down at the end of March 1839 and the cornerstone was laid for the new building on an expanded, improved site on 3 April 1839. Architect John S. Norris superintended construction of the brick masonry church, which was essentially completed in 1840 when it was consecrated on 29 March by Bishop Levi Silliman Ives. Stucco, intended to cover the elevations, and other refinements for

the church, particularly its interior, were added in the 1840s.[116] Dr. Hill and his wife were long-time communicants of St. James Church, he many times represented the parish at diocesan conventions, and they had been host to Bishop Ives at Orton in the winter of 1832-1833.

In retrospect at least four of the men involved in the two building projects could have provided the design for Dr. Hill's Orton; David Paton, William Strickland, Thomas U. Walter, or John S. Norris. Circumstances favor either Thomas U. Walter, who would later achieve lasting fame for his work on the United States Capitol in the 1850s, or John S. Norris, who designed Italianate improvements for the Bank of Cape Fear, the United States Custom House in Wilmington in 1843, and is known to have undertaken private commissions simultaneously before relocating to Savannah.[117] It is also possible that an architect other than these four was Orton's designer. Whatever the case, the expert Greek Revival-style design of Orton, with its accomplished temple form, handsome entablature, and elegant, recessed side porch, was the work of a master and retained its intact, iconic status through the sympathetic additions of 1909-1910.

In about 1909 when Kenneth McKenzie Murchison Jr. began to design the additions to the antebellum house at Orton, he had two distinct advantages. He had come to know the house and its setting, the grounds, fields, and woodlands, over the course of a quarter-century. Kenneth Murchison fully appreciated its siting and the splendid prospect the mansion commanded. He also enjoyed the benefit of his sister and her husband as clients for the work, kinsmen whose lives and manner of living he knew intimately, and clients with whom he had worked in the past and would again in the future. The result was an ideal solution, a house that deferred to precedent and provided the new spaces and facilities, including ground-level bedrooms, sought by the Sprunts. Mr. Murchison's pride in his work was rewarded almost immediately with Orton's publication in *The American Architect* in May 1911.

Kenneth Murchison's work at Orton for the Sprunts continued with the design for gates that were erected at the north and south entrances to the estate, a one-story weatherboarded frame gatehouse for the north entrance, and most spectacularly in the design of a private chapel that became a memorial to his sister on her death in February 1916. Presbyterian by birth, Luola Sprunt had been profoundly affected by the deaths of her two daughters, and she saw Christian worship as a valuable and necessary part of everyday life. In this regard she had seen earlier to the erection of a church for black residents and workers on the plantation. In the design of the chapel Mr. Murchison exercised a lighter classical hand and adopted the Corinthian order for a building that became and remains an important part of the manorial building-up of Orton. Today, with Salem Chapel, built for Duncan Cameron in the 1820s on his Fairntosh Plantation (NR, 1973), Luola's Chapel is one of two known private chapels standing on historic plantations in North Carolina.[118]

The skilled enhancement of the mansion at Orton and the additional work designed there by Kenneth M. Murchison Jr. immediately became an important, early example of the American Country House Movement in North Carolina and, arguably, one of the first in a series of distinguished houses and estates that followed on George W. Vanderbilt's Biltmore Estate (NHL, 1963; NR, 1966). The movement was not one of a particular style but with the intent and purpose of emulating English or Continental estates, setting apart a country house, outbuildings, entrance gates, gardens and associated domestic and agricultural features as a distinct entity in a rural or open suburban landscape. The style adopted for the country house could be Tudor, Manorial, Jacobethan, or Elizabethan revival as well as Georgian Revival reflecting the principally English antecedents of the movement, or Classical Revival. These estates featured gardens and landscaped grounds and reflected an important new professional collaboration between architects and landscape architects, whose professional identity was gaining recognition at the turn of the twentieth century. Expressions and examples of the movement could be single houses of particular grandeur or, as at Orton, a large imposing house, joined by entrance gates and a gatehouse, approaches through the fields and grounds of the estate, and other buildings. The fullest expression of the style could include model farms, residential villages for workers on the estate, decorative or working water-powered mills, churches or chapels, as at Orton, and a host of related buildings and facilities that took on the appearance of generous self-sufficiency. At Orton there is a likelihood that further upbuilding would have occurred, but such work was forestalled by declining health in Mrs. Sprunt's last years and her death in February 1916.

The movement had an appealing, influential advocate and promoter in *Country Life in America*, a monthly magazine launched in November 1901 and modeled on the English magazine, *Country Life*. Its scholars have included James T. Maher, the author of *The Twilight of Splendour: Chronicles of the Age of American Palaces* (1975), a book that launched serious academic interest in the field, Mark Alan Hewitt and Clive Aslet whose respective books, *The Architect and the American Country House* and *The American Country House*, were both published in 1990 by Yale University Press. Other scholars have written and published monographs on the principal architects and landscape architects of the early twentieth century. As at Orton, in the best of circumstances, country houses and estates often descended within a family and were nearly always dependent on substantial inherited wealth. Orton was held by the Murchison-Sprunt family for

some 126 years from 1884 to 2010, an association of people with an important place matched by the Vanderbilts at Biltmore Estate among few others in North Carolina.

In the event Orton was not the first of the important Southern Colonial or Colonial Revival-style country houses built in North Carolina. Following by a decade on the construction of Flat Top Manor in Blowing Rock in 1899-1900, as a summer residence for Moses H. Cone (1857-1908), Orton was the second landmark house built in this mode in the opening years of the American Country House Movement. Designed by Orlo Epps (1864-1926), a now little-known Cornell-educated architect then based in Greensboro, Flat Top Manor is a large, two-and-a-half-story weatherboarded frame house of twenty-three rooms, symmetrical in design, enriched with a lavish combination of Colonial, Federal, and Classical detailing, and crowned with a balustraded roofline that imparts a certain New England feeling. As the seat of a summer estate, Flat Top Manor stood on landscaped grounds of some 3,000 acres that included agricultural operations, ponds, orchards, gardens, and bridle paths. It remained a summer house of the Cone family until the death of the textile magnate's wife, Bertha Lindau Cone (1858-1947), in 1947, and is now the property of the National Park Service.

Orton was soon joined, ca. 1912, by another member of the movement, Belmont (Richardson Houses HD, NR, 1986), the imposing Classical Revival-style house built by Robert Paine Richardson II near Reidsville, in Rockingham County. Within a few years Charles Barton Keen was about the design of Reynolda (Reynolds HD, NR, 1980) in Winston-Salem for Richard Joshua and Katharine Reynolds. Other important examples followed in the 1920s and early 1930s including Chinqua-Penn Plantation (NR, 1993) in Rockingham County, whose eclectic development continued through the decade, Morrocroft (NR, 1983) in Mecklenburg County, the manor house designed by Harrie P. Lindeberg for Cameron and Sara Watts Morrison as the seat of a gentleman's farm, and the Georgian Revival-style Meadowmont (NR, 1985) near Chapel Hill, built for David St. Pierre and Valinda Hill DuBose. The partial subdivision of the Reynolda Estate, following Katharine Reynolds Johnston's death in 1924, provided grounds for Bowman Gray's Norman Revival-style Graylyn that was completed in 1932. The American Country House Movement effectively ended in the mid-1930s with a final group of sometimes smaller houses such as Eastover (NR, 2011) in Rowan County that was designed by Louis H. Asbury for Hearne Swink in 1934 and completed in 1935.[119] In Brunswick County Orton was joined in the mid-1920s by the construction of a new seat at Clarendon Plantation, a handsome two-and-a-half brick Georgian Revival-style house, erected for D. H. Lippit. Mr. Lippit, a resident of Wilmington, used his new country house at Clarendon in much the same fashion as the Sprunts enjoyed Orton, for hunting parties, as a retreat, and as a winter residence. Clarendon, long abandoned as a residence, and its Colonial Revival-style parterre gardens are now untended and deteriorating.

Within this group of houses and estates erected in North Carolina in the era of the American Country House Movement, Biltmore Estate is exceptional both in the state and the nation. The mansion, most of its many outbuildings, and the designed gardens and grounds retain a high degree of integrity; however, some significant parts of its plantings, including the original tulip poplars in the forecourt, have been replaced or replanted over time, and the vast acreage of the estate has been reduced to just under 7,000 acres. The Reynolda Estate has also been greatly diminished in its size, the house compromised by a major remodeling for the Reynolds's daughter and the addition of a large museum wing, and the farm and village outbuildings altered and adapted for commercial use. While both Morrocroft and Meadowmont retain their architectural integrity as houses, their expansive acreages have been greatly diminished to the immediate house grounds by commercial/residential and institutional development, respectively. Within this group of important estates erected during the American Country House Movement, Orton along has retained the principal part of its historic acreage even while the mansion has been expanded and the gardens and immediate grounds remodeled in 2011-2013. While both Belmont and Chinqua-Penn have experienced varying, slight degrees of change--the entire original furnishings of Chinqua-Penn having been sold at auction recently--the house, gardens, and grounds of Eastover have remained intact.

Within this chronology Orton is also an important North Carolina example of a parallel effort in the South, namely the acquisition and refitting of eighteenth- and nineteenth-century plantations as winter residences or hunting preserves. This was Orton's history during Mr. Murchison's ownership, 1884 to 1904, and it continued in the Sprunt era. While not an outdoorsman like his father-in-law, James Sprunt allowed close friends and colleagues hunting and fishing rights on the plantation. This practice was seen to an altogether greater extent in South Carolina where former rice plantations and other worked-out lands were remade, often by those of recent, great fortune, including Archer Milton and Anna Hyatt Huntington at Brookgreen Gardens, Georgetown County, and John King Garnett and his friends at the Okeetee Club in Jasper County, among others.[120]

Landscape Architectural Significance

The gardens at Orton hold local significance in the area of landscape architecture. Together with those at Biltmore Estate, the early twentieth-century Airlie Gardens at Wilmington, and the Elizabethan Garden at the Fort Raleigh National Historic Site in Dare County, established in 1951 by the Garden Club of North Carolina, they are among the best known and most often photographed gardens in North Carolina. Within this group, the Orton, Biltmore, and Airlie gardens are also documented by valuable photographs that reflect their evolution from the decades around the turn of the twentieth century into the mid-twentieth century. Their scholarly address as historic landscapes varies one to the other and complicates the matter of comparative evaluation.[121] Each is a significant reflection of its time and place in North Carolina, its owners, its designers, and its gardeners, and each has a unique history. Location, climate, and plant materials knit a special relationship between the gardens at Airlie and Orton, but they, too, have the facts of history and circumstance that set them apart.

While the Orton gardens are beautifully recorded in photographs, their history is altogether less well documented. They first appear on a plan of the plantation, titled "Orton Plantation on the West Bank of the Cape Fear River about 15 miles below Wilmington, North Carolina," drawn by Robert Swan Sturtevant (1889-1955), a Harvard-educated landscape architect then based in Groton, Massachusetts, and dated January 1937. They are shown in greater detail in a second, undated plan titled "The Gardens at Orton (,) Wilmington (,) North Carolina." It also bears Mr. Sturtevant's name but no date; however, it probably dates to ca. 1937. Both were prepared after Mr. Sturtevant was engaged as the consulting landscape architect for the extensive improvements and enlargements anticipated by James Laurence and Annie Gray Sprunt.[122] In his research for *Carolina Gardens*, published in 1937 and the first such survey covering North and (principally) South Carolina, Edward Terry Hendrie Shaffer (1880-1945) visited Orton, probably in about 1935-36. Reflecting, it appears, his acknowledged friendship with Louis Toomer Moore, the published account of the plantation focuses more heavily on the history of Orton than its gardens.

However, the gardens were the reason for his visit and he gave them his attention:

> Under the dark live oaks that surround the white structure thousands of azalea indica and camellias now grow illuminating the scene with color. The garden at Orton has made use of the dwarf or Japanese azalea perhaps to greater extent than has any other garden in the Carolinas. The collection of camellia plants, from four to ten feet in height, contains many of the most beautiful of the important newer varieties. From the central steps of the portico a camellia bordered path leads to steps that descend through flower filled terraces to the level of the old river fields. At the head of these steps, crowning the bluff, two banana shrubs, *michelia fuscata*, stand like perfumed guards on either hand. Between them one looks out over a far prospect, a stage upon which much history has been acted through many years – the wide marshes that were once rice fields, the broad river, . . . and on the horizon a radiance that marks the open sea. . . .
>
> Passing through the wonders of the garden to the left of the dwelling, another camellia walk curves down to a group of live oaks that crown a point jutting out in the marsh. Here is the peaceful cemetery of the estate, old marbles with moss encrusted inscriptions. . . .
>
> One must come here in spring to catch the utter loveliness, the strange wistful spell of this garden in an antique setting on its high commanding site, a ridge between the river fields and the low fresh marsh at the rear. An emerald lawn set with jeweled beds of pale pink, magenta, reds and pearl white in the noonday twilight of moss strewn live oaks, the marsh and the river and the sea beyond! Deep in the heart of the garden is a pool of dark water ringed with color and framed in oaks and moss, and in the midst of so many colors, such wealth of green, so many shadows, the white walls and columns of the great house.
>
> Across the distant waters one glimpses Smith Island, . . . and here in the garden is an amazing grove of pale green camphor trees, *cinnamomum camphora*, native of China and Japan, and unusual in such luxuriance in this latitude. . . .
>
> A spirit of hospitality seems to cling here, . . . While the mansion itself is now the private home of the owners, the park and garden, so beautiful, so rich in historical associations, are open to the public at all times. An admission fee is charged to defray the cost of guides and to provide the necessary protection to the flowers and rare shrubs. . . .[123]

At the time of Mr. Shaffer's visit to Orton, James and Annie Gray Sprunt had had charge of the gardens for about ten years. In the late1930s and 1940s the Sprunts, with the assistance of their son Kenneth, continued planting out the gardens and implemented the Sturtevant plan. Their work is seen at its acme in the color film, "Orton Plantation under Spring Skies," photographed and produced by Tom Draper in about 1948-1949.

The gardens at Orton flourished under the Sprunts' attention in the early 1950s as did the Orton Plantation Nursery, a commercial horticultural operation that specialized in camellias and azaleas, the two principal ornamental shrubs in the Orton gardens. The nursery issued a printed catalogue for the Fall 1951-Spring 1952 planting season and another for the Fall 1953-Spring 1954 season. In 1954 the Sprunts consulted with Charles Freeman Gillette (1886-1969), a landscape architect in Richmond, Virginia, but his suggestions were not adopted. Near the end of the 1950s the Sprunts turned to Morley Jeffers Williams (1886-1977), a landscape architect then in charge of the garden restoration program at the Tryon Palace reconstruction in New Bern, North Carolina, where Mrs. Sprunt was a charter member of the Tryon Palace Commission. His work at Orton coincided with the publication in 1958 of the first guidebook, *The Story of Orton Plantation*, by James Laurence Sprunt. Mr. Williams, in collaboration with his wife Nathalia Williams, produced designs for the overlooks, the lagoon bridge, and the scroll gardens between 2 October 1958 and 6 February 1959. The implementation of these plans was effected in 1959-1960 and effectively completed the historic expansion and development of the gardens. The high degree of stewardship and maintenance practiced by the Sprunt family continued.

In spring 1972 Arthur George Lee Hellyer (1902-1993), the eminent, prolific English garden writer, visited Orton while *en route* to Cypress, Magnolia, and Middleton Place gardens in South Carolina. Months passed before he wrote an account of his visit in "A Garden From a Rice Plantation," an article published in *Country Life* on 4 January 1973. On short notice Mr. Hellyer secured an interview with James L. Sprunt (and probably Mrs. Sprunt), gained an overview of the history of Orton from his host, and incorporated both fact and his impressions in the article.

> Because of its situation near the Atlantic, Orton is dominated by the great trees native to this area, mainly live oaks and swamp cypresses, all of which are heavily draped in grey Spanish moss hanging like widow's weeds. Trees and moss immediately set the scene and establish the air of mystery that is characteristic of many Carolina gardens. But at Orton mystery is brilliantly contrasted with lucidity.
>
> The juxtaposition of opposed styles is most strikingly exemplified in the Scroll Garden made in a natural amphitheatre beside one of the lagoons. This is a parterre in the French manner, moderately elaborate in design, with numerous geometric flower beds and larger, more flowing shapes formed in clipped evergreens of various kinds and sizes. Occasionally a single bush has been allowed to sprout upwards more or less untrimmed to make a striking vertical accent in what would otherwise be an almost wholly two-dimensional pattern.
>
> But what gives the parterre at Orton its special quality are the two wooden structures that jut out into it at opposite ends. They stand on tall columns, have lattice-like sides and are painted white, and look like two little seaside piers – an impression enhanced by the large sheets of water that they overlook. They are amusing and decorative and are obviously meant to be looked at and admired. They also serve the utilitarian purpose of providing platforms from which the Scroll Garden and its surroundings can be viewed.
>
> It should be an axiom of all garden making that parterres must be capable of being seen from above. Usually a terrace of some kind encircles or borders them, but too often in modern gardens the necessity is overlooked. No such error has been made at Orton, for not only has its charming little Scroll Garden been placed in a naturally sunken site with an excellent viewing path on the high ground above it, but the two little piers allow one to walk out over it and so enjoy its patterns to the full.
>
> There are other equally ingenious but smaller features at Orton, for example, a quaint snail-like bed rising in a shallow spiral beside the largest lake, and charmingly planted, when I saw it in spring, with white, yellow and lavender pansies and a miniature pink azalea. Elsewhere there is what might be described as an inversion of the same idea: a more or less circular bed of purple and yellow violas sunk a foot or more below ground level and surrounded by white, pink and rose azaleas. These are the kind of features that Gertrude Jeckyll (*sic*) often uses effectively, and she would, I feel sure, have enjoyed the little rustic arbour or look-out perched in a tree and bowered in double yellow Banksia roses.

> She might also have liked the rustic bridge that crosses the neck of the largest lake in a series of zig-zags according to the Chinese recipe for defeating pursuing evil spirits, for this is generally festooned with climbers that blend it with the landscape.
>
> Possibly she would have considered the Japanese bridge that spans the lagoon a trifle too stark despite the fine wisterias that are trained over one end, but it does echo the clear-cut woodwork features of the Scroll Garden, from which it can be seen.
>
> Wistarias grow magnificently throughout the south-eastern states, and the native wisteria can climb 40 ft. into the trees, smothering them in April with pale violet bloom. But it is the Chinese wisteria, even more vigorous and much more variable, that provides one of the major glories of the Carolina gardens, and at Orton there is a particularly beautiful variety with large, double, deep purple, extra-sweetly-scented flowers.
>
> Azaleas are another feature of all these sea-board gardens, and at Orton they are planted in great drifts of pink, rose, crimson and white. Because they are nearly all evergreen and derived from the Indian azalea, they are completely devoid of the harsher shades of yellow, orange and flame that make some deciduous azaleas difficult to place. At Orton they harmonise admirably with camellias.
>
> No account of this enchanting garden would be complete without some mention of the perfumes that pervade it. Dominant at the time of my visit was a baffling blend of pear drops and bananas that eluded me completely until my attention was drawn to the rather dull ochre-coloured flowers of *Michelia fuscata*, which in America is often known as the banana tree because of its distinctive scent. D*aphne odora* was also contributing its heady sweetness, and there was a pleasantly aromatic background that I was unable to fix precisely, though it probably came from some of the numerous species of pine in the garden. . . .
>
> Dr. Sprunt died eight years after his wife and was succeeded at Orton by his son James Laurence Sprunt, who continued to expand and improve the garden that his mother had begun. He engaged as landscape architect Mr. Robert Swann (*sic*) Sturtevant, and was also greatly assisted by Mr. Churchill Bragaw, who managed the estate for some years in the 1930s and, after the war, by his son Kenneth M. Sprunt.[124]

Luola Murchison Sprunt's place in the genesis of the gardens at Orton is critical. While the many variations of the plantings lining the walk immediately in front (east) of the house have come and gone, yet survive as a record of her continued efforts in numerous period photographs, the terraces on the east front of the lawn, descending to the lagoon level, remain a signal feature of the Orton landscape to the present. James Sprunt noted their immediate success in a letter of 5 January 1909 to Herman C. Schumm of Fort Hamilton, New York. "You would hardly know the place at Orton since we have improved the appearance of it, having graded the front and terraced it, and put in three flights of stone steps, which greatly adds to its attractiveness."[125] In 1952 in "Camellias at Orton," Kenneth M. Sprunt elaborated on his grandmother's role.

> In the early 1900's, Mrs. James Sprunt laid the foundation for the present gardens. Under her direction were constructed extensive terraces overlooking the rice fields, and many specimens and other ornamental plant materials popular at the time were set out. It was during this period that the first camellias were brought to Orton. It is thought that they were purchased from Berckmans' Nursery – now Fruitland Nurseries – at Augusta, Georgia. Among them were Anna Zucchini (Lilyi), Bella Romana, Orton Pink (Dixie), Henri Favre, and a variety afterwards named Annie Gray. The largest of these original plants is the Anna Zucchini, which is at present twenty-four feet in height and eighteen feet through; the trunk at the ground is forty-six inches in circumference.[126]

The foregoing quotes from the writings of Mr. Shaffer, Mr. Hellyer, and Kenneth Murchison Sprunt describe the extraordinary gardens that flourished at Orton for most of the twentieth century and drew thousands of visitors to the plantation. Kenneth Murchison Sprunt well understood the nature of their appeal, and in 1952 he had voiced the precept that guided his hand in the gardens from 1947 into the 1990s. "These gardens are designed to approach what is sought by the traveler and garden lover alike when they are looking for the South's bygone grandeur as exemplified by a plantation."[127] Now, they, their mystery, and the sense of a lush, rich oasis are largely a part of Orton's past. The gardens at Orton were arguably at their peak in 1972 when both Mr. Hellyer and the North Carolina State Historic Preservation

Office staff visited Orton and photographed the mansion and pleasure grounds. Time and inattention gradually took a certain toll. The scroll garden disappeared and many of the camellias, azaleas, and other plantings became overgrown.

With the introduction in 2011 and 2012 of a series of new gardens and landscape features, modern cultivars, the removal of some older plantings and the relocation of others, and the use of new materials for the walks, paths, and terraces the grounds of Orton reflect a changed course. Nevertheless, the early twentieth-century terraces crafted by James and Luola Sprunt, much of Mr. Sturtevant's plan developed for their son, James Laurence Sprunt, including the circle garden with its Italian, carved marble figure of "Spring," as well as the overlooks and the lagoon bridge added to the garden on the advice of Morley Jeffers Williams, and many of the plantings added in their time and during the long stewardship of Kenneth Murchison Sprunt remain, recall, and represent the pleasure grounds described by A. G. L. Hellyer as "one of the loveliest and most original gardens I have visited." It was, as he concluded "the creation of three generations of one family all like-minded in their dedication to the task and all seeing it with very similar eyes and ideals. It would be difficult to think of a better recipe for the creation of an outstanding garden." Today Orton Plantation holds local significance in the area of landscape architecture. In Brunswick County the only other known twentieth-century large-scale residential garden is the once-appealing, while modest, garden planted at Clarendon coincident with the interwar-period building of a new Georgian Revival-style house as its seat. Abandoned in the late twentieth-century as a residence, the house and the garden are both compromised by neglect and in ruin.

Politics/Government Significance

The statewide significance of Orton Plantation in the area of politics/government is associated with the political career of Dr. Frederick Jones Hill (1792-1861), the resident owner/proprietor of the plantation from 1826 to 1854. His signature legislative achievement was the introduction of "A Bill for the establishment of Common Schools" in the House of Commons on 1 January 1839 that was effectively reconciled with a very similar bill introduced in the State Senate by William W. Cherry, amended, passed on 7 January 1839, and thereby produced the law creating a public school system in North Carolina. In the original nomination the subject was addressed in a single sentence.

Dr. and Mrs. Hill had been living at Orton for some dozen years when the bill was introduced. While Dr. Hill owned Orton, from 1826 to 1854, the plantation seat was their primary residence: they also spent the season at their summer residence in Chatham County, North Carolina. With the sale of Orton in 1954 Dr. Hill bought the imposing Lazarus family house in Wilmington, remodeled it in the Italianate style, and resided there until his death in 1861. In 1835 he represented Brunswick County in the State Senate. His known commitment to education earned his election to the board of trustees of the University of North Carolina in 1835 and he served continuously as a trustee until 1860, the year before his death. In 1836 Dr. Hill was elected to the first of three terms as Brunswick County's representative in the North Carolina House of Commons. In each of those sessions, in 1836, 1838, and 1840, Dr. Hill served on the Committee on Internal Improvements and was a strong advocate for progressive initiatives throughout the state.

In the biography of Dr. Hill published in the *Dictionary of North Carolina Biography*, the late Lawrence F. London notes his support for "roads, canals, and railroads," but "His most valuable contribution, however, was in the field of education." He then quotes from a speech Dr. Hill delivered in the House of Commons in which he "advocated using a part of the funds derived from the sale of state land to support public schools."[128] The speech was immediately printed in Raleigh and issued as *Remarks of Mr. F. J. Hill, Of Brunswick, Delivered in the House of Commons of North-Carolina, December 10, 1838, on Certain Resolutions Submitted by Him on the Subject of the Public Lands.*[129] The fourteen-page pamphlet was critical in garnering public and legislative support for public schools. Mr. London's analysis of the speech reflects Dr. Hill's learned passion on the subject.

> He said that it had always been one of his most cherished desires "to furnish the means of a plain education to every citizen within our limits." Moreover, he continued, the word "education" meant "something more than the mere imparting of instruction; it is the engrafting of knowledge upon a good stock, the application of all those means calculated to develop the physical, moral, and intellectual faculties of man." In conclusion, Hill declared that "In a government founded upon the popular will, Education is necessary for all classes, and for each individual in the community – and it is the duty of such Government to take care that this great end be secured."[130]

In his final term as a representative in the General Assembly, Dr. Hill introduced a motion for the better regulation of public schools that was likewise amended and passed on 9 January 1841. But by then his goals had been achieved. "On January 20, 1840, the first public school in the state was opened in Rockingham County; other counties soon followed

suit, and by 1846 every county had one or more public schools, and the state education fund exceeded $2,000,000."[131] The value of North Carolina's public school system, its influence on every citizen of the state and every sphere of public life is beyond estimation.

Archaeological Significance

Orton Plantation Boundary Increase and Additional Documentation meets National Register Criterion D because it has yielded and is likely to yield information regarding the lifeways of the enslaved African American workers and the postbellum-period African American tenants that lived on Orton. The plantation contains a burial ground and settlement made up of multiple domestic archaeological sites dating from the nineteenth through twentieth centuries associated with this population. It is also significant because it has the potential to provide information about the owners and overseers at Orton. The property contains the Moore family's colonial and antebellum period cemetery, as well as the possible remains of an overseers' house. Orton also is significant in the area of agriculture for its ability to provide information regarding the farming of rice, as well as cotton. It also contains the remains of a mill, which has the potential to provide information concerning an industrial operation associated with the agriculture of the plantation. The remains of lighthouses, vessel docks and early bulkheads at the site also preserve important information about the maritime heritage of the Lower Cape Fear River and Orton Plantation.

Two archaeological investigations have been conducted within the boundary of the property. From 2011 to 2012, the Chicora Foundation undertook reconnaissance-level archaeological investigations within the historic core of Orton.[132] Most of the archaeological sites located during these surveys represent nineteenth-century settlements that are documented on historic maps and charts showing Orton. Many are postbellum settlements of African Americans and two contain antebellum artifacts.

31BW548 (Orton Graveyard).** Site 31BW548, the Orton Graveyard, an African American burial ground is located on the western edge of a ridge above the back rice field.

The Orton Graveyard, is significant because it has many of the features and characteristics that are typical of African American burial places and it is an excellent representation of the stylistic type. The site retains excellent integrity, easily conveying the qualities that make the site significant. The isolated, rural site easily conveys the feelings of the overall setting consistent with its use during the nineteenth and early twentieth century. This feeling is assisted by the presence of the adjacent swamp and forest setting, and shielding from modern structures. The proximity of the swamp provides a clear reminder of the economic origins of the plantation and the areas to which African American cemeteries were relegated by white landowners.

There is virtually no visible damage or modification to the cemetery nor is there evidence that any significant features have been lost. Grave goods, while present, are not abundant. Gravestones are intact and exhibit remarkably little damage. There are also numerous depressions, clearly marking the location of burials. These characteristics are consistent with the cemetery's period of historic use and help convey a feeling that is consistent with African American burial locations.

It is significant because it has been investigated archaeologically and has the very strong potential for the recovery of bioanthropological data (e.g., skeletal remains) that would address a broad range of questions concerning the health, diet, and disease of rural low country African Americans during the nineteenth and early twentieth centuries. Assisting such studies, many of the graves are marked and the identification of others may be determinable. The cemetery reflects a transitional period between plantation and modern medicine. However, there are suggestions that African American health may actually have declined during the postbellum period. Studies at sites such as 31BW548, the Orton Graveyard, would begin to allow these significant questions to be more fully examined.

In addition, the site would provide the opportunity to examine African American mortuary patterns typical of a rural, low income population along the southern North Carolina coast. Research questions might involve the exploration of traditions documented through oral history, such as the use of coins on eyes or the inclusion of salt in the coffin. Other research questions might involve the examination of soil samples to determine the frequency of embalming, which would be expected to leave tell-tale traces of heavy metals, such as arsenic. There would also be the opportunity to explore the use of coffins and coffin hardware and the differences in mortuary behavior between individuals buried by friends and family and those whose burials were handled by commercial undertakers and funeral homes. Therefore, Site 31BW548, the Orton Graveyard, meets National Register Criterion D.

31BW7871 (eighteenth- and nineteenth-century domestic site).** Site 31BW787**1 is located immediately north of the Orton mansion and on the edge of the terrace that overlooks the rice fields to the east. It is significant because it has the potential to contain structural remains and artifact assemblages associated with eighteenth- and nineteenth-century domestic occupation. These features and artifacts would begin to better tell the story of Orton Plantation by providing data on the ancillary support structures, such as the kitchen and possibly overseer's structure. It is important to realize that while the white owners of Orton may be researched using available historical and legal documents, white overseers left little imprint in historical records. Their lives can be studied by examining the archaeological sites they left behind. The site may contain data that would address research questions concerning the consumer behavior of the eighteenth- and nineteenth-century overseers at the site and how it compares to that of the owners and other overseers on Orton Plantation, as well as other plantations in the low country and in other regions. Therefore, Site 31BW787**1 meets National Register Criterion D.

31BW7872 (Roger Moore Cemetery).** Site 31BW787**2, the Roger Moore Cemetery is located on the high ground overlooking Orton Creek to the north and rice fields to the east. It is significant because it includes many features and characteristics that are typical of colonial and antebellum family burial grounds and is an excellent representation of this stylistic type. The site retains excellent integrity, easily conveying the qualities that make the site significant. The isolated, rural site conveys the feeling of the overall setting consistent with its use during the eighteenth and early nineteenth centuries. This feeling is assisted by the presence of the adjacent rice fields and spreading live oaks.

The brick vaults are similar to those found at other coastal plain graveyards extending southward through South Carolina and throughout Georgia and is an example of this architectural form. The 1843 ledger on the vault of Marie Ivie Winslow is interesting as an example of extralocal stone carving. Additional historical research may be able to determine why a New York carver was used, rather than local resources, perhaps from either Wilmington or Charleston. Although the old repairs are of low quality, they are typical of the mid-twentieth century. Work is underway to remove the worst of the offending repairs and this will dramatically improve the visual appearance of the cemetery.

The site is significant because it would provide the opportunity to explore colonial and early antebellum mortuary patterns. This could be done by examining the use of coffins and coffin hardware. The human remains thought to be present may offer an opportunity to explore several successive generations and would allow mitochondrial DNA studies. The remains, if well preserved, would also offer an exceptional opportunity to examine high status individuals of the colonial period, exploring issues such as diet and disease. This information would take on special importance when compared and contrasted to studies of African American populations. Therefore, Site 31BW787**2 meets National Register Criterion D.

31BW7874, 31BW787**5, 31BW787**6, 31BW787**7, 31BW787**12, and 31BW787**13 (nineteenth- and twentieth-century domestic sites).** These six sites are likely associated with a small African American settlement that was located south of the Orton mansion along the plantation road and just north of the Orton Pond outfall. These nineteenth- and twentieth-century domestic sites are significant because they are associated with the enslaved African American workers and the postbellum period African American tenants that lived on Orton. Four of the sites contain structural remains (31BW787**4-brick mound, 31BW787**5-fireplace and brick rubble, 31BW787**6-brick rubble, 31BW787**12-nineteenth-century structure burned in 2011 and brick pile) and one contains a standing structure and the chimney ruins of at least two more structures. No structural remains were identified at Site 31BW787**13, although historic maps depict four or five structures at this location. These sites have the potential for the recovery of additional structural remains, including slave dwellings, as well as the potential to produce abundant artifacts. These features and artifacts would begin to better tell the story of Orton Plantation by providing data on an African American community during not only the antebellum and postbellum periods, but potentially during the colonial period as well. This research is of special importance since North Carolina has few documented slave dwellings on colonial and antebellum period plantations, and none associated with rice cultivation. The archaeological data these sites contain can assist in defining the lifeways of the African Americans living on Orton. Research questions these sites can address include determining the location of former slave quarters/dwellings and identifying construction techniques and how they may have changed over space and time; determining the location of enslaved peoples food storage and preparation areas and how these may have changed over space and time; determining the location of cisterns, wells, and/or refuse pits associated with African Americans and how these may have changed over space and time. African Americans were the most undocumented persons on Orton Plantation. During the plantation history, it was the enslaved blacks that planted rice and cotton, processed the crops, and even constructed the houses and mansion. The African American population continued to be the backbone of the plantation during the postbellum period and into the twentieth century, whether it continued to involve planting, tending, and harvesting rice or incorporated truck crops and later garden plants. Therefore, Sites 31BW787**4, 31BW787**5, 31BW787**6, 31BW787**7, 31BW787**12, and 31BW787**13 meet National Register Criterion D.

31BW78714 (eighteenth- to nineteenth-century domestic or industrial site).** Site 31BW787**14 comprises the remains of a structure located within and along the bank of the Orton Pond Outfall. This site has the potential to address questions concerning how a particular industrial occupation associated with agriculture was treated on the plantation. Therefore, Site 31BW787**14 meets National Register Criterion D.

31BW78715 (nineteenth-century domestic or industrial site).** This site consists of a brick column that may have been either a corner or a pier that supported a structure related to Orton's antebellum rice mill. Its close proximity to the Orton Pond Outfall suggests that it may have been a threshing barn. Like Site 31BW787**14, this site has the potential to address questions concerning how a particular industrial occupation associated with agriculture was treated on the plantation. Therefore, Site 31BW787**15 meets National Register Criterion D.

31BW78716 (Antebellum drainage ditch and property boundary).** This site consists of a drainage ditch that also marked the property boundary between Kendal to the north and Orton. This is an important antebellum landscape feature of the plantation and meets National Register Criterion D.

Underwater and Shoreline Archaeological Resources. In 2012, Tidewater Atlantic Research, Inc. (TAR) conducted a magnetometer and sidescan sonar survey of the Orton waterfront from the mouth of Orton Creek to the mouth of the Orton Pond Outfall.[133] It was followed by an on-ground shoreline survey to further investigate the data. TAR discovered the remains of one of the early Cape Fear River lighthouses, steamer docks dating from the late nineteenth century, and early twentieth-century bulkheading installed to protect the rice dike from erosion, which appears to be associated with several of the magnetic anomalies and sonar images generated by the remote sensing survey.

Because of their association with historical figures and the broad patterns of North Carolina history, the remains of lighthouses, vessel docks and early bulkheads preserve important information about the maritime heritage of the Lower Cape Fear River and Orton Plantation. The canals of Orton should also be considered important archaeological resources. Maps and charts reveal that the Orton rice fields were flooded using five access points. Each of these may exhibit a variety of water control devices, which were part of the extraordinary system that was in operation at the plantation by the first quarter of the nineteenth century. Site 31BW787**14 located along the Orton Pond Outfall and possibly associated with a mill is another important resource associated with this water control system. These resources, if investigated using a combination of terrestrial and underwater methods can provide important information about nineteenth-century rice farming practices.

In summary, Orton Plantation Boundary Increase and Additional Documentation contains an archaeological landscape consisting of a wide range of significant archaeological sites that contain features, artifacts, and strata that reflect the prehistoric through twentieth-century occupations and activities taking place on the plantation. These sites can potentially address a range of research questions concerning the operation of a plantation, lifeways of the occupants, material culture, enslaved African American culture, waterfront technology, consumer behavior, status, and market availability. Archaeological sites contain domestic evidence of the owners, white overseers, and enslaved African Americans. Sites along the waterfront provide evidence for how the plantation was part of the larger regional and possibly global economy. Finally, the cemeteries provide a tangible link between the past occupants and the present.

Endnotes

1. New Hanover County Deeds, C/288-90, Brunswick County Deeds, F/149-51, respectively.

2. Brunswick County Deeds, X/189-93, BB/527-32, 12/383-94, 21/229-30, and 29/388-90, respectively.

3. While the general facts of the Moore family genealogy and Roger Moore's place in it are known, many questions persist regarding dates of marriage, birth, and death for individuals. Various people, some known and others whose names are not affixed to accounts now in general circulation, have compiled family records wherein dates are in conflict and sources sometimes are not given. The matter is vexing and beyond the parameters of a National Register nomination. Arguably the most reliable account is that of Mabel Louise Webber. Mabel Louise Webber, compiler, "The First Governor Moore and His Children," *The South Carolina Historical and Genealogical Magazine* XXXVII (January 1936): 1-23. See also Mabel Louise Webber, compiler, "Berringer Notes," *The South Carolina Historical and Genealogical Magazine* XXV (October 1924): 173-78. *The South Carolina Encyclopedia*, s.v. "James Moore Sr."

Gregg E. Stuart Jr., compiler, *A Crane's Foot (or Pedigree) of Branches of the Gregg, Stuart, Robertson, Dobbs and Allied Families* (Columbia, SC: Robert L. Bryan Company, 1975), 175-216. *Dictionary of North Carolina Biography*, s.v. "George Moore", "James Moore", "Louis Toomer Moore", "Maurice Moore", "Maurice Moore Jr.", "Roger Moore (1694-1751)", and "Roger Moore (1839-1900)."

4. *The South Carolina Encyclopedia*, s.v. "James Moore Jr."

5. *Dictionary of North Carolina Biography*, s.v. "George Burrington."

6. Lawrence Lee, *The Lower Cape Fear in Colonial Days* (Chapel Hill: The University of North Carolina Press, 1965), 93. Hereafter cited as *The Lower Cape Fear*.

7. *The Lower Cape Fear*, 94.

8. The name of his plantation has been spelled "Kendal" and "Kendall" through history. "Kendal" appears to be the earliest used and that is the spelling used in this nomination.

9. The best, scholarly account of the history of Brunswick is that of Stanley South, a pioneer of historical archaeology, who began his career at the North Carolina Department of Archives and History in 1956. Stanley South, *Archaeology at Colonial Brunswick* (Raleigh, NC: North Carolina Office of Archives and History, 2010).

10. This author's research regarding land patents is based on the excellent abstracts compiled and published by Margaret M. Hofmann who is known to him. Margaret M. Hofmann, *Province of North Carolina 1663-1729, Abstracts of Land Patents* (Weldon, NC: Roanoke News Company, 1979), 103. The patent (#1127) was recorded in Patent Book Two, 261. Hereafter cited as *1663-1729 Land Patents*.

11. *The Lower Cape Fear*, 94.

12. *1663-1729 Land Patents*, 106. The patent (#1155) was recorded in Patent Book Two, 268.

13. A reprint of this pamphlet printed in 1842 was consulted. *Collections of the Georgia Historical Society, Vol. II* (Boston: Freeman and Bolles, 1842), 54-55. Hereafter cited as *A New Voyage*.

14. *Dictionary of North Carolina Biography*, s.v. "Roger Moore."

15. *A New Voyage*, 58. In the preparation of this nomination the writer reviewed all of the abstracts of land patents awarded to Roger Moore (and other members of the Moore family) compiled by Margaret M. Hofmann for the period of his life in North Carolina. The patents issued during the Proprietory period began in 1663 and officially ended in 1729, however, some few date into 1730.

16. Between 19 February and 25 February 1735 Roger Moore received a total of thirteen patents for this acreage. See Margaret M. Hofmann, *Colony of North Carolina 1735-1764 Abstracts of Land Patents Volume One* (Weldon, NC: Roanoke News Company, 1982), 99. Hereafter cited as *1735-1764 Land Patents*. These patents, bearing numbers 1386 through 1398, were recorded in Patent Book 3, 293-95.

17. *1735-1764 Land Patents*, 107, 112, 288.

18. New Hanover County Deeds, C/288-90.

19. The matter of Roger Moore's land holdings and the portion of them that comprise Orton has been clouded through time by exaggeration and overstatement. However, the tracts and acreages cited in his will are not greatly different from the total represented in deeds and land patents. The larger question concerns the matter of his stated 250 slaves, their activities, and how Roger Moore provided sustenance and housing to such a large number of people.

20. Will of William Moore, 18 November 1754, New Hanover County Original Wills, State Archives, Division of Archives and History, Raleigh, NC. William Moore's bequest to his wife ended with the statement of his "Will that she has the Use of my Plantation at Orton."

21. Brunswick County Deeds, A/1-5.

22. *Dictionary of North Carolina Biography*, s.v. "William Dry III."

23. *Dictionary of North Carolina biography*, s.v. "Richard Quince." The two state grants are located on Eric Norden's plat, "Orton & Kendall Plantations," of January 1921.

24. Alfred Moore Waddell, *A History of New Hanover County and the Lower Cape Fear Region, 1723-1800, Volume I* (n.p., 1909), 179. [place and publisher missing]

25. At present the location of this mill is not known; however, given Orton's history it is possibly a mill erected for Roger Moore.

26. Brunswick County Deeds, F/149-51.

27. Alan D. Watson, *General Benjamin Smith: A Biography of the North Carolina Governor* (Jefferson, NC: McFarland & Company, 2011), 102. Hereafter cited as *General Benjamin Smith*.

28. *General Benjamin Smith*, 123.

29. Cited in *General Benjamin Smith*, 115. This author did not examine the 1800 North Carolina Census, Brunswick County.

30. Brunswick County Deeds, F/139-41.

31. *General Benjamin Smith*, 186. See *Wilmington Gazette*, 27 April 1815. See also Robert S. Neale, *The Bank of Cape Fear of Wilmington, North Carolina: A History of North Carolina's First Antebellum Bank and its Paper Money, Branches, Key Personnel, and Local Impact* (Wilmington, NC: Lower Cape Fear Historical Society, 1999), 27.

32. The Charleston advertisement is cited in James Laurence Sprunt, *The Story of Orton Plantation* (n.p., 2002), 14. [place and publisher missing] Hereafter cited as *The Story of Orton Plantation*. The auction sale of Orton was also advertised in Wilmington's *The Cape Fear Recorder* on 16 October 1824 in the center of its front page under the heading "Valuable Rice & Cotton Lands For Sale."

33. Brunswick County Deeds, J/73-74.

34. *Dictionary of North Carolina Biography*, s.v. "Joseph Alston Hill."

35. Brunswick County Deeds, J/264.

36. *Dictionary of North Carolina Biography*, s.v. "Frederick Jones Hill."

37. *Dictionary of North Carolina Biography*, s.v. "Frederick Jones Hill."

38. *Journal of the Proceedings of the Seventeenth Annual Convention of the Protestant Episcopal Church in the State of North Carolina Holden in Immanuel Church, Warrenton, on Wednesday May 29, Thursday May 30, Friday, May 31, Saturday June 1, and Monday June 3, 1833* (Fayetteville, NC: Edward J. Hale, 1833), 11.

39. The record of this entry (#2743), being grant #1249 and file #1566, is located in the Secretary of State Land Records, recorded in Book 150, page 303, in the State Archives, Division of Archives and History, Raleigh, NC.

40. Fifth Census of the United States, 1830: Brunswick County, NC, Population Schedule, Slave Schedule.

41. Sixth Census of the United States, 1840: Brunswick County, NC, Population Schedule, Slave Schedule.

42. Seventh Census of the United States, 1850: Brunswick County, NC, Population Schedule, Slave Schedule.

43. The 1872 auction handbill is reproduced and published in *The Story of Orton Plantation*, 16. Dr. Hill conveyed a small tract on Orton Point to the United States of America for the payment of $100 on 10 February 1849 that became the site of the Orton Point Light. Brunswick County Deeds O/486-87. For Orton Point Light see Claude V. Jackson III, Jack E. Fryar, editor, *The Big Book of the Cape Fear River* (Wilmington, NC: Dram Tree Books, 2008), 170.

44. Brunswick County Deeds, Q/581-85. Flush with the profits of his enterprise, Dr. Hill purchased a handsome residence in Wilmington in 1854, the imposing brick house built ca. 1816-1818 by Aaron Lazarus (1777-1841). Dr. Hill remodeled the house in the Italianate style and resided there until his death. The Lazarus-Hill-Devine House stands today at 314 Grace Street.

45. Brunswick County Deeds, Q/586-87.

46. See William E. Craig, "The Mysterious Frenchman: Alexander Calizance Miller in America, 1797-1831," *Lower Cape Fear Historical Society, Inc. Bulletin* XXIX (October 1985), 1, 3-6.

47. Joseph Swift Miller died before the deed was recorded. On 1 January 1856 Thomas C. Miller, as executor of his brother's estate, sold Bellville plantation and the adjoining Ashley plantation, together with a group of slaves, personal and household property, and agricultural property including "the rice straw threshing machine" and "straw press" for $29,200 to Salter Lloyd. Brunswick County Deeds, Q/588-95.

48. Beverly Tetterton, letter to author, 10 July 2012. The house was known for a time as the James Dawson House and was later owned by the Cape Fear Club. It was torn down and the site prepared for the Murchison Building.

49. Seventh Census of the United States, 1850: New Hanover County, Population Schedule. Eighth Census of the United States, 1860: New Hanover County, Population Schedule. The grave of Joseph Swift Miller (1856-1858) is marked by a white marble monument in the family plot.

50. Eighth Census of the United States, 1860: Brunswick County, Slave Schedule, Agriculture Schedule.

51. Photocopies of these receipts were made available to this author by Jim McKee, Brunswick Town-Fort Anderson State Historic Site, Winnabow, NC.

52. Thomas Calizance Miller's death and interment in Oakdale Cemetery are recorded in the "St. James Church, Wilmington, North Carolina, Historical Records, Volume II, 1852-1872," compiled by Lula Walton Mathews, Leora Hiatt McEachern, and Curry Kirk Walker. Copy held by the New Hanover County Public Library.

53. On 2 October 1865 Annie W. Miller rented the family's Front Street house in Wilmington for a year, beginning on 13 October, for $1,000 to P_____ Murphy and John Dawson. The receipt for this transaction with payments noted on the reverse is one of two significant surviving documents in her husband's estate record. See Estate of Thomas C. Miller, 1865 (1866), New Hanover County Estates Records, State Archives, Division of Archives and History, Raleigh, NC. Mrs. Miller qualified as executrix of her husband's estate in 1866. The outstanding debt of $40,000 owed by the Miller estate to the estate of Dr. Hill crippled any prospect of solvency, and coupled with the fact that the unsettled nature of the time made it virtually impossible to sell Orton, the estate's principal asset, left her situation nothing short of dire. In 1867 William E. Boudinot, the executor of Dr. Hill's estate, filed suit in Superior Court for the recovery of the unpaid balance. The court ruled in favor of the plaintiff and ordered payment of $40,957.33 to the plaintiff. In April 1869, as the settlement, Annie W. Miller, as executor of her husband's estate, conveyed to Mr. Boudinot, executor of Dr. Hill's estate, the lands of Orton received from Dr. Hill "and all the other Tracts adjoining or adjacent to 'Orton' which were subsequently purchased by said Thos. C. Miller from different persons. . ." (Brunswick County Deeds, T/777-78). See also Estate of Frederick J. Hill, 1861, New Hanover County Estates Records, State Archives, Division of Archives and History, Raleigh, NC.

54. The auction handbill is reproduced and published in *The Story of Orton Plantation*, 16.

55. An advertisement for the Commissioner's Sale of Orton Plantation, a brick house, outhouses, and lot in Wilmington, Kentucky--the Hill's summer house in Chatham County, the Reddeck lot in Pittsboro, three tracts of land in Moore County, a lot in Haywood, Chatham County, and Dr. Hill's interest in the "McIver Copper Mine Tract" on 26 February 1873 in Wilmington was published on the front page of the Wilmington's *The Morning Star* on 15 January 1873.

56. Brunswick County Deeds, W/336-43.

57. Brunswick County Deeds, W/343-47. The circumstances of Mr. Roundell's decision to purchase Orton remain obscure.

58. Brunswick County Deeds, X/193-96. William Lord DeRosset was a son of Dr. Armand DeRosset III (1807-1897), the builder of the DeRosset House at 23 South Second Street. Mr. DeRosset was a classmate of both DeBrutz Cutlar and Kenneth M. Murchison at the University of North Carolina.

59. Brunswick County Deeds, X/189-93.

60. Brunswick County Deeds, X/474-78 and X/582-86, respectively.

61. Clippings of these items and numerous others regarding Orton Plantation, dating principally from 1873 into the early 1910s, are mounted on sheets in the Orton file in the Bill Reaves Collection, New Hanover County Public Library, Wilmington, NC. Nearly all are dated, however the respective newspapers are noted in a code by the compiler. The record of a rice crop at Orton appears in 1887. Accounts of hunting parties, country house parties, and family gatherings predominate in the 1890s.

62. *Dictionary of North Carolina Biography*, s. v. "David Reid Murchison" and "Kenneth McKenzie Murchison."

63. Brunswick County Deeds, Z/179-82.

64. Brunswick County Deeds, BB/527-32.

65. Samuel A. Ashe, Stephen B. Weeks, and Charles L. Van Noppen, *Biographical History of North Carolina, From Colonial Times to the Present, Volume* I (Greensboro, NC: Charles L. Van Noppen, Publisher, 1905), 399-402. A biographical sketch of David Reid Murchison written by Charles Manly Stedman appears in the same volume. James Sprunt reprinted lengthy parts of both accounts verbatim in his *Chronicles of the Cape Fear River 1660-1916* in 1916. James Sprunt, *Chronicles of the Cape Fear River 1660-1916* (1916; reprint, Spartanburg, SC: The Reprint Company, 1974), 348-49. Hereafter cited as *Chronicles.*

66. This author gratefully acknowledges the assistance and counsel of Margaret Cotrufo, assistant librarian, North Carolina Museum of Natural Sciences, Raleigh, NC, with this research.

67. *Report of the Board of Agriculture to the General Assembly of North Carolina, For the Years 1893-'94.* (Raleigh: State Board of Agriculture, 1895), 37-48. Hereafter cited as *Report.*

68. *Report*, 8.

69. *Hand Book of the North Carolina State Museum, Giving the Names and Localities of All Specimens* (Winston: M. I. & J. C. Stewart, Public Printers and Binders, 1897), 262, 265, 269, 272-73. Hereafter cited as *Hand Book.*

70. Brunswick County Wills, A/185-87.

71. New Hanover County Deeds, 15/86-87. For the Dudley-Sprunt House see "Governor Dudley's Mansion" in Tony P. Wrenn, *Wilmington, North Carolina: An Architectural and Historical Portrait* (Charlottesville, VA: The University Press of Virginia, 1984), 53-55. Hereafter cited as *Wilmington*. Mr. Sprunt also had the impressive brownstone retaining wall at the back of the Dudley house lot built in 1895.

72. *Wilmington*, 303-04.

73. New Hanover County Deeds, 17/256-66.

74. James Sprunt to Mrs. Joseph A. Holmes, 9 June 1906, James Sprunt to the Railroad Agent, Narragansett Pier, Rhode Island, 30 May 1906, and Kenneth M. Murchison Jr. to Luola Sprunt, 23 May 1906, Alexander Sprunt Papers,

Rare Book, Manuscript, and Special Collections Library, Perkins Library, Duke University, Durham, NC. This collection and the repository is hereafter cited as Alexander Sprunt Papers, Duke University.

75. Brunswick County Deeds, 12/383-94.

76. James Sprunt to Theoph. Parsons, 22 March 1909, Alexander Sprunt Papers, Duke University. There are numerous references to the work at Orton in surviving copies of letters from 1909 and 1910 that gained this author's notice but are beyond the level of address required for this nomination.

77. Brunswick County Deeds, 21/229-230. Florence Hill Kidder (18__-1971), one of the heirs and signatories to the deed, is a maternal grandmother of Louis Moore Bacon. She married Louis Toomer Moore (1885-1961) in 1916.

78. Brunswick County Wills, B/366-88.

79. Janet Schaw came to the Lower Cape Fear region to visit her elder brother, Robert Schaw (17__-1786), who lived at Schawfield. She arrived at Brunswick on 14 February 1775 and departed on 10 November 1775 on her return to Edinburgh, Scotland. Mrs. Andrews was assisted in her work to publish Miss Schaw's diary by her husband, Charles McLean Andrews, Farnam Professor of History at Yale. In the introduction, written at Orton, she acknowledged "with peculiar gratitude" the "cooperation of Mr. James Sprunt of Wilmington, himself a Scot, under whose kindly guidance they were able to study Wilmington and the Cape Fear, and to whom most affectionately they dedicate this volume." In her closing sentence, written at Orton on 30 March 1920, she appreciated "the delicious warm sunshine of early spring, . . . the odours of sweet-scented flowers and shrubs drifting in from well-kept gardens. . . ."

80. Brunswick County Deeds, 29/388-90. Valuable insight into Mr. Sprunt's life and particularly his later years was gained from a typescript memoir, "Data About James Sprunt, LL.D.," written by Jane Dalziel Wood and held by the Lower Cape Fear Historical Society. Miss Wood was Mr. Sprunt's private secretary. A photocopy of the undated manuscript was made available to this author by Susan Taylor Block of Wilmington.

81. Robert Swan Sturtevant, the son of Edward Lewis Sturtevant (1842-1898) and his second wife Hattie Mann, is one among many early twentieth-century landscape architects and garden designers whose careers and significance are being increasingly addressed and appreciated. He and his elder sister Grace Sturtevant (1865-1947) were founders of the American Iris Society. Mr. Sturtevant served as secretary of the society and as editor of its bulletin. He relocated to Nashville, Tennessee, after he began his work at Orton. Mr. Sturtevant produced four essays on design, color, plantings plans, and iris under those titles for the *Woman's Home Companion Garden Book* edited by John C. Wister and published in 1947. He died in a house fire in Nashville on 22 February 1955. A memorial was published in the "Bulletin of the American Iris Society," No. 137 (April 1955), 5-6.

82. Henry Churchill Bragaw Jr. (1914-1944), a native of Washington, Beaufort County, North Carolina, one of four gifted young/teenage founders of the Bughouse Laboratory or Washington Field Museum, and a graduate in forestry from North Carolina State College, was destined for greatness, but he became a casualty of World War II in Italy on 22 January 1944. One of his last acts as manager of Orton was to lead Sunday services for an assembly of white and black employees in February 1942, days before he reported for duty in Alabama. A newspaper account reported "Luola's Chapel, the registration mecca for the thousands of tourists who visit Orton Plantation, was the scene of a most impressive service" that "turned into a farewell service for Lieutenant Churchill Bragaw." A memorial was published in "The Chat," the bulletin of the North Carolina Bird Club in March 1944. James Ferger (1912-1993) a native of Lawrenceburg, Indiana, received a bachelor's degree from the University of North Carolina in 1937. Robert Kennedy Godfrey (1911-2000) was a teaching fellow in the botany department at North Carolina State College, made important contributions to the herbariums there and at the University of North Carolina, and had a distinguished career as an educator and writer while at Florida State University (1954-1973). He continued writing and (last) co-authored *Trees of Northern Florida*, published in 1993.

83. James Laurence Sprunt to Charles Freeman Gillette, 19 October 1954, The Papers of Charles F. Gillette, Private and Business Collections, The Library of Virginia, Richmond, VA.

84. Both groups of photographs, while small in number, document the rich, lush, well-maintained densely-planted character of the garden in 1972. Both also show a lattice-work railing that protected the south end of the lagoon which has disappeared.

85. David Sprunt, telephone conversations with this author, 30 July 2012, 31 January 2013. Hereafter cited as David Sprunt interviews. Brunswick County Deeds, 526/181-86.

86. David Sprunt interviews. Brunswick County Deeds, 791/464-92.

87. Brunswick County Deeds, 1100/1186-1223.

88. David Sprunt interviews. Brunswick County Deeds, 1404/899-902, 1476/1142-46, and 1595/1343-47.

89. David Sprunt interviews. The new caretaker's house replaced an employee residence that was known as the "Green Cottage," occupied the same site, and appears on the Sturtevant garden plan. The new plantation office replaced the plantation's first known modern office at this location, which was a playhouse known as the "Doll House" that originally stood southwest of the mansion and was relocated here for office use.

90. David Sprunt interviews. Brunswick County Deeds, 3104/552-56, 559-73, 578-87, 590-608.

91. Hugh Meredith, *An Account of the Cape Fear Country, 1731*, ed. Earl Gregg Swem (Perth Amboy, New Jersey: Charles F. Heartman, 1922), 20-21. Mr. Meredith's account of rice swamps confirms the fact that some such swamps on the Cape Fear and its tributaries had been cleared and were being planted, however, he does not cite their location, ownership, prevalence, or extent. This is the first known mention of a crop whose cultivation was still in its infancy in the late colonial period and would reach its greatest measure in the antebellum period. It is possible that Roger Moore, his son, and other owners of Orton in the eighteenth century grew rice on the plantation. However, their rice cultivation at Orton has yet to be documented and proven. The principal scholarly study of rice cultivation on the Lower Cape Fear River and its tributaries is James M. Clifton, "Golden Grains of White: Rice Planting on the Lower Cape Fear," *The North Carolina Historical Review* 50 (October 1973), 365-93. Rice cultivation at Orton, Kendal, Clarendon, Belvidere, and the Bluffs, the plantation of Thomas D. Meares, is represented in the article. See also Bradford J. Wood, *This Remote Part of the World: Regional Formation in Lower Cape Fear, North Carolina (,) 1725-1775* (Columbia, SC: University of South Carolina Press, 2004), principally 179-187, and other pages noted in the index. Hereafter cited as *This Remote Part*.

92. Estate of Frederic Kidder, 1908, Brunswick County Estates Records, State Archives, Division of Archives and History, Raleigh, NC.

93. Colonial Court Records, Box 190, Personal Accounts, 1730-1739, State Archives, Division of Archives and History, Raleigh, NC. This document is cited by Bradford J. Wood in *This Remote Part*, 201.

94. Will of Roger Moore, New Hanover County Deeds, C/288-90.

95. Brunswick County Deeds, A/1-5

96. At present little is known of Captain Robert Ellis other than in this regard and the fact that he is surely the same Robert Ellis who acquired a tract of 640 acres on the east side of the Cape Fear River, opposite Brunswick Town, in 1764. See *The Big Book of the Cape Fear River*, 96.

97. Brunswick County Deeds, F/149-51.

98. The location of eighteenth-century mills known to have stood at Orton and the size/extent of Orton Pond at critical points in the plantation's history remain to be confirmed.

99. *General Benjamin Smith*, 122.

100. The advertisement published in *The Cape-Fear Recorder* on Saturday, 16 October 1824, also cited Orton as "late the residence of Governor Benjamin Smith."

101. Seventh Census of the United States, 1850: Brunswick County, North Carolina, Productions of Agriculture. An original contemporary copy of the census in the State Archives, Division of Archives and History, Raleigh, NC, was reviewed by this author.

102. Seventh Census of the United States, 1850: Brunswick County, North Carolina, Products of Industry. The advertisement was first published on 10 February 1830 and appeared in issues of 17 and 24 February and 3 March 1830, when this author ended his review.

103. Brunswick County Deeds, Q/438. For location of this property see plat of "Orton & Kendall Plantations," January 1921.

104. Eighth Census of the United States, 1860: Brunswick County, North Carolina, Productions of Agriculture, Products of Industry.

105. Photocopies of some of these vouchers were provided to this author.

106. *Chronicles*, 348. Earlier, in *Tales & Traditions of the Lower Cape Fear*, published in 1896, James Sprunt wrote "Colonel Murchison has brought the plantation up to its best production--about a hundred laborers are employed and many expensive permanent improvements have been adopted. He resides here with his family during the winter months. . ." (64-65).

107. Prints of photographs corresponding to these captions survive at the North Carolina Museum of Natural Sciences and the State Archives, Division of Archives and History, Raleigh, NC. Multiple later prints are also in circulation.

108. This approximate date for the end of rice cultivation at Orton is based on the remarks of Clarence Jones (1908-2008) in an interview with Susan Taylor Block which was recorded on videotape and is in the collection of the New Hanover County Museum, Wilmington, NC.

109. Ironically, one of the most important documents in the history of rice cultivation in the Lower Cape Fear dates to the post-war period. On 20 October 1866 *Frank Leslie's Illustrated Newspaper* published a full page of eight sketches entitled "Rice Culture on Cape Fear River, N.C." by James E. Taylor and an unsigned companion article, "Rice Culture in North Carolina." Although the name of the property illustrated in the sketches was not cited, its description as "the plantation leased by Major J. C. Mann, near Wilmington, North Carolina, which was owned by General Robert Howe, of Revolutionary fame" identifies it as Kendal. Exactly how Mr. Taylor came upon the scene at Kendal is not known. This author's review of issues of the publication preceding and following the 20 October issue indicates James E. Taylor was traveling through the defeated South and recording scenes of destruction and renewal and events of reconstruction. Mr. Taylor's sketches of work in "The Tobacco Manufactory of Geo. A. Burks, Lynchburg, VA." were published in the 7 July 1866 issue. "A Turpentine Distillery at Wilmington, N.C." was one of Mr. Taylor's illustrations for "Turpentine Manufacture in the Southern States" published in the newspaper on 29 September 1866. An unsigned sketch of "Ruins of St. Philip's Church at Brunswick, N.C." and a short account of the church in the issue of 13 October 1866 were probably also contributed by James E. Taylor, who continued on to Charleston, South Carolina.

110. Lawrence S. Earley, *Looking for Longleaf: The Fall and Rise of an American Forest* (Chapel Hill: University of North Carolina Press, 2008), 92.

111. Brunswick County Wills, A/185-87. The Caney River property in Yancey County included the mountain on which Elisha Mitchell fell to his death in 1857, which was named Mount Mitchell in his honor in 1882.

112. David Sprunt interviews. Examples of recent timber deeds include the Sprunts to Georgia Pacific Corporation in 1984 (Brunswick County Deeds, 570/141 and 581/779), to Georgia Pacific Corporation in 1987 (Brunswick County Deeds, 691/347), and to O. I. P. Timberlands Operating Company in 1987 (Brunswick County Deeds, 717/137).

113. Photographs of Orton, Wills Forest, and Stockton appear in Mills Lane, *Architect of the Old South: North Carolina* (Savannah: Beehive Press, 1985), 186-88.

114. For the North Carolina Capitol see Thomas Tileston Waterman, *The Early Architecture of North Carolina* (Chapel Hill: University of North Carolina Press, 1947), 252, 272-76, and Catherine W. Bishir, *North Carolina Architecture* (Chapel Hill: University of North Carolina Press, 1990), 163-172. *North Carolina Architecture* is hereafter cited as *North Carolina Architecture*.

115. Catherine W. Bishir and Michael T. Southern, *A Guide to the Historic Architecture of Piedmont North Carolina* (Chapel Hill: University of North Carolina Press, 2003), 108. Hereafter cited as *Guide to Piedmont North Carolina*.

116. For the construction of St. James Church see Susan Taylor Block, *Temple of Our Fathers: St. James Church (1729-2004)* (Wilmington, NC: ARTSPEAKS, 2004), 73-90.

117. *North Carolina Architecture*, 224-26, 478-79 (notes 94-95).

118. For Salem Chapel see Jean Bradley Anderson, *Piedmont Plantation: The Bennehan-Cameron Family and Lands in North Carolina* (Durham, NC: Historic Preservation Society of Durham, 1985), 31-32. Mrs. Anderson notes chapels built by H. K. Burgwyn and Josiah Collins Jr. on their plantations (194). Both buildings are believed to be lost.

119. Short accounts of the Richardson House and Chinqua-Penn Plantation appear in *Guide to Piedmont North Carolina*, 360. For Reynolda see Catherine Howett, *A World of Her Own Making: Katharine Smith Reynolds and the Landscape of Reynolda*. (Amherst, MA: University of Massachusetts Press in association with the Library of American Landscape Architecture, 2007). A short account of Morrocroft appears in *Guide to Piedmont North Carolina*, 520-21, as does one of Graylyn, 393. This author prepared the National Register nominations for Meadowmont (NR, 1985 and Eastover (NR, 2011).

120. For Brookgreen gardens see the short account in Mac Griswold and Eleanor Weller, *The Golden Age of American Gardens: Proud Owners, Private Estates*, 1890-1940 (New York: Harry N. Abrams, 1991), 169. Hereafter cited as *The Golden Age*. For the Okeetee Club (and other similar places in South Carolina) see Robert B. Cuthbert and Stephen G. Hoffius, eds. *Northern Money, Southern Land: The Lowcountry Plantation Sketches of Chlothilde R. Martin* (Columbia, SC: University of South Carolina Press, 2009), 151-56.

121. For Biltmore Estate see the National Historic Landmark nomination for Biltmore Estate (Additional Documentation and Boundary Reduction) prepared by this author in 2003. For Airlie see Susan Taylor Block, *Airlie: The Garden of Wilmington* (Wilmington, NC: The Airlie Foundation, 2001). Short paragraphs on Orton and Airlie appear in *The Golden Age* in a section titled "Great Southern Plantation Gardens," 167-68.

122. A photocopy of the undated, ca. 1937 Sturtevant garden plan is included in this nomination.

123. E. T. H. Shaffer, *Carolina Gardens* (Chapel Hill: The University of North Carolina Press, 1939), 150-52. The full account appears on pages 146 to 153. Photographs of the mansion and Luola's Chapel appear following pages 112 and 120, respectively.

124. A. G. L. Hellyer, "A Garden From a Rice Plantation," *Country Life*, (4 January 1973): 26-28.

125. James Sprunt to Herman C. Schumm, 5 January 1909, Alexander Sprunt Papers, Duke University.

126. Kenneth M. Sprunt, "Camellias at Orton Plantation," *American Camellia Yearbook, 1952* (Gainesville, FL: American Camellia Society, 1952), 75. The full article appears on pages 75 through 77. A photograph of the mansion and the front lawn, framed by lush borders of azaleas, appears as figure 4 in the yearbook. Hereafter cited as "Camellias at Orton."

127. "Camellias at Orton," 76.

128. *Dictionary of North Carolina Biography*, s. v. "Frederick Jones Hill."

129. *Remarks of Mr. F. J. Hill, of Brunswick, Delivered in the House of Commons of North-Carolina, December 10, 1838, on Certain Resolutions Submitted by Him on the Subject of the Public Lands*. (Raleigh, NC: J. Gales and Son, Office of the Raleigh Register, 1838).

130. *Dictionary of North Carolina Biography*, s. v. "Frederick Jones Hill."

131. Hugh Talmage Lefler and Albert Ray Newsome, *North Carolina: The History of a Southern State* (Chapel Hill: The University of North Carolina Press, 1954), 351.

132. Trinkley, et.al. 2012.

133. Gordon P. Watts Jr., Ph.D, *A Remote-Sensing Archaeological Survey of the Cape Fear River, Intertidal Zone and Marsh Reconnaissance Along the Orton Plantation Waterfront, Brunswick County, North Carolina* (Washington, North Carolina: Tidewater Atlantic Research, Inc., 2012.

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Previous documentation on file (NPS):

___preliminary determination of individual listing (36 CFR 67 has been requested)
_X_previously listed in the National Register
___previously determined eligible by the National Register
___designated a National Historic Landmark
___recorded by Historic American Buildings Survey #_____
___recorded by Historic American Engineering Record # _____
___recorded by Historic American Landscape Survey # _____

Primary location of additional data:

___State Historic Preservation Office
___Other State agency
___Federal agency
___Local government
___University
___Other
Name of repository: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property 826 acres
(Do not include previously listed resource acreage.)

UTM References
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing		Zone	Easting	Northing
A	18	226680	3773170	C	18	228740	3770210
B	18	228740	3773170	D	18	226680	3770210

Verbal Boundary Description

The boundary of the Orton Plantation Boundary Increase and Additional Documentation is shown by a heavy line on the accompanying tax parcel map at a scale of 1:200.

Boundary Justification

Orton Plantation Boundary Increase and Additional Documentation, which comprises 953.8 acres of the expansive holdings of its founder, Roger Moore (1694-1751), is Orton Plantation's historic core and contains its most significant features. Drew Cemetery, on the west edge of the boundary, is excluded as it is the site of the reburial of members of a family unrelated to the owners of Orton. To the north of the boundary, Kendal and its historically associated acres are excluded due to the loss of the main house and a loss of integrity in the rice field structure. To the south of the boundary, Sunny Point and Brunswick Town/Fort Anderson State Historic Site are excluded due to changes in land use and character.

11. Form Prepared By

name/title Laura L. Knott, Principal Landscape Architect; Jane Jacobs, Landscape Architect; Christina Osborn, Landscape Architecture Intern

organization John Milner Associates, Inc. date

street & number 300 West Main Street, Suite 201 telephone (434) 979-1617

city or town Charlottesville state VA zip code 22903

e-mail LKnott@johnmilnerassociates.com; JJacobs@johnmilnerassociates.com

name/title Davyd Foard Hood, Architectural and Landscape Historian

organization date

street & number 6907 Old Shelby Road telephone (704) 462-1847

city or town Vale state NC zip code 28168

Additional Documentation

Submit the following items with the completed form:

- **USGS map** indicating the property's location
- **Sketch maps** keyed to show locations of photographs

Photographs:

Schedule of Photographs

The following information applies to all of the photographs included in this nomination except where otherwise noted:

1. Name of Property: Orton Plantation Boundary Increase and Additional Documentation
2. Location: Winabow vicinity, Brunswick County, North Carolina
3. Name of Photographer: Davyd Foard Hood
4. Dates of photographs: 4-5 January 2013
5. Location of original negatives: NC SHPO
6. Photographs
    1. Mansion, overall view, looking northwest.
    2. Mansion, east façade, looking west, with walks and parterre gardens in front of north and south wings added in 2011-2012.
    3. Mansion, main block, and north wing, looking southwest, with reconstructed brick wellhead.
    4. Mansion, north elevation of 2011-2012 service wing, and terrace garden of same date, looking southwest.
    5. Mansion, west elevation of 2011-2012 service wing and 1909-1910 wings, looking east.
    6. Mansion, landscape view south elevation with 2011-2012 motor court, looking north/northeast.
    7. Mansion, south elevation of south wing, with 2011-2012 terrace and garden, looking north.
    8. Mansion, interior, living room, looking southeast (Claudia Brown, January 2012)
    9. Garden, 2011-2012 circle fountain on axis with south wing and Old Brunswick Town Road, looking south with Luola's Chapel in right background.
    10. Landscape view, south walk and lawn, looking north.
    11. Landscape view, north walk, with 2011-2012 brick walk, parterre garden, and reconstructed brick wellhead, looking north.
    12. Landscape view, north walk, looking south to mansion.
    13. White Garden, pool, and sculpture, "The Morning Star," by F. Andreini, looking east.
    14. Moore Family Cemetery, looking west/southwest.
    15. Landscape view, lagoon with 1958-1959 lagoon bridge and north belvedere, looking north.
    16. Landscape view, looking east from east edge of lawn across terrace steps, site of lost scroll garden, causeway, and former rice fields to Cape Fear River.
    17. Landscape view, looking west from west head of the causeway to the 1909-1910 terraces, 1958-1959 south belvedere, and east front of mansion.
    18. Luola's Chapel, looking west.
    19. Luola's Chapel, interior, looking west.

20. Greenhouse and Head-house, looking west.
21. Greenhouse, interior, looking south/southwest.
22. Powerhouse/Barn, looking south.
23. Landscape view with Old Brunswick Town Road and Elijah's House, looking south.
24. Elijah's House, looking northwest.
25. North Entrance Gate, looking east.
26. Gatehouse, looking south/southwest.
27. Gatehouse and Garage/Workshop, looking west/northwest.
28. North entrance road, looking east under live oaks.
29. North entrance, looking east on cypress-lined causeway with former rice fields on each side.
30. North entrance road, looking west on cypress-lined causeway with rice fields on each side and woodlands in the background.
31. South Entrance Gate, looking north with Old Brunswick Town Road carrying north into the estate.
32. South Entrance Gate, detail, looking northwest.

Property Owner:

name Orton Plantation Holdings, LLC

street & number 1251 Avenue of the Americas, 17th Floor telephone (631) 287-1081

city or town New York state NY zip code 10020

Appendix A: Tabulation of Archaeological Sites and Objects at Orton Plantation Based on Trinkely and Hacker (2012) and Watts (2012)

Terrestrial Archaeological Resources (Based on Trinkley and Hacker 2012)

Contributing Sites: 31BW548**
31BW787**1, 2, 4, 5, 6, 7, 9, 12, 13, 14, 15, 16

Total Contributing Sites = 13

Noncontributing Sites: 31BW787**3, 8, 10, 11

Total Noncontributing Sites = 4

Underwater Survey Resources (Based on Watts 2012:Appendix A)

Magnetic Anomalies

Potentially Significant	22 - Contributing
Small Single Objects	56 - Noncontributing
Modern Objects	21 - Noncontributing
Degraded Cable	6 - Noncontributing
Slightly Larger Objects	5 - Noncontributing
Range Lights	2 – Noncontributing

Contributing Anomalies = 22
Noncontributing Anomalies = 90
Total Magnetic Anomalies = 112

Sonar Targets

Significant Objects	7 – Contributing
Orton Point Lighthouse	1 – Contributing
Nonsignificant Objects	19 – Noncontributing

Contributing Sonar Objects= 8
Noncontributing Sonar Objects= 19
Total Sonar Objects = 27

Marsh and Low Tide Survey

Contributing	2
Noncontributing	9
Total Objects =	11

Total Contributing Objects 32
Total Noncontributing Objects 118
Total Objects 150



Figure 1. 1938 aerial depicting the upper half of the property, north to the left. Source: National Archives.



Figure 2. 1949 aerial depicting the upper half of the historic district, north to the left. Source: National Archives.

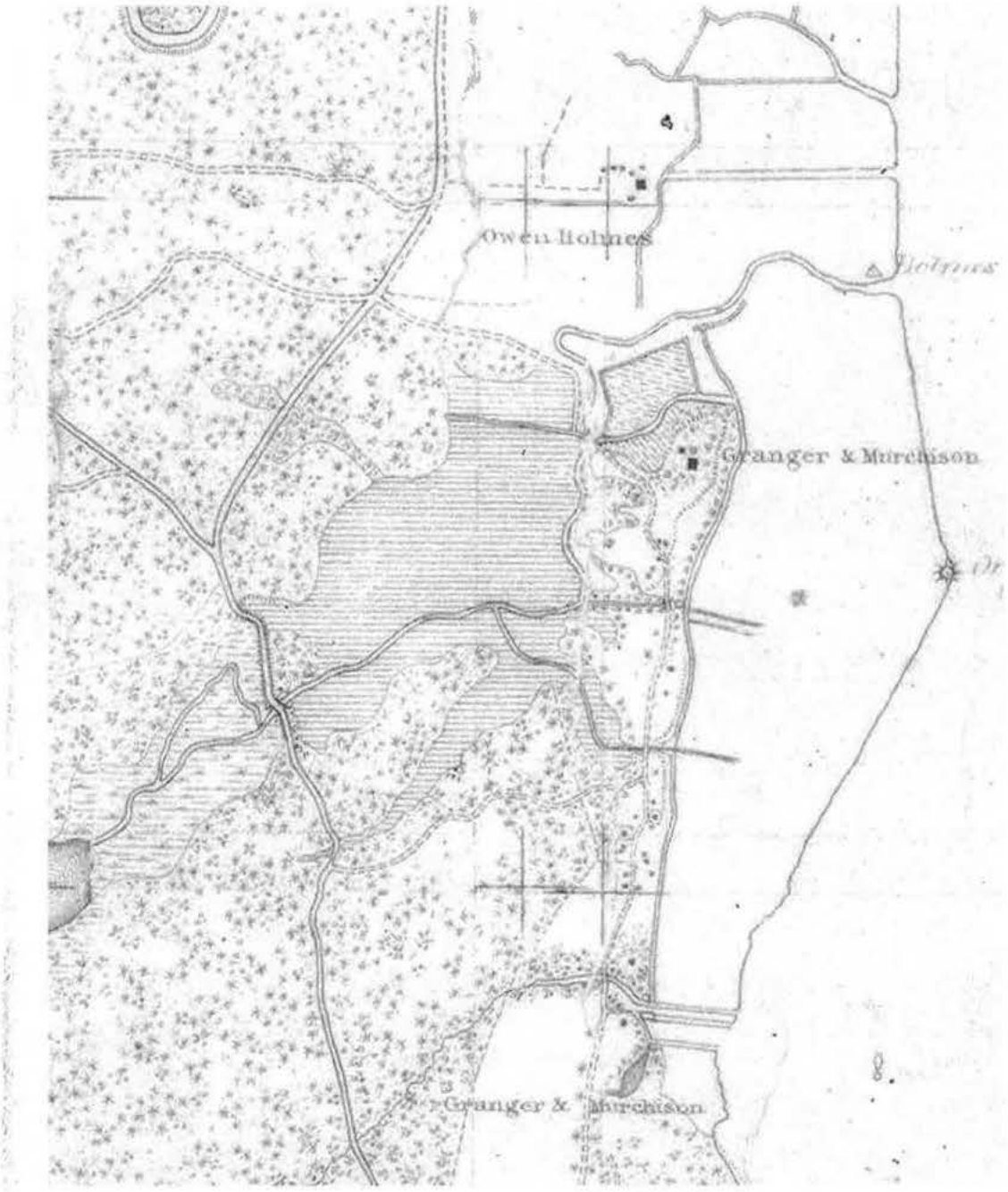


Figure 3. Coastal chart dated 1878, with north to the top. The Orton mansion is the large rectangle labeled "Granger & Murchison." The Old Brunswick Town Road runs parallel to the bluff above the rice fields. Towards the bottom of the image is an area that was likely used for loading and unloading rice and supplies. Just north of this area is the worker's settlement that is represented today by archaeological sites. Source: Orton Collection.



HOUSE BEFORE ALTERATIONS

"ORTON" PLANTATION HOUSE, NORTH CAROLINA
KENNETH M. MURCHISON, *Architect*

Figure 7. Orton, prior to renovation in 1911. Source: Princeton University via Hathi Trust.

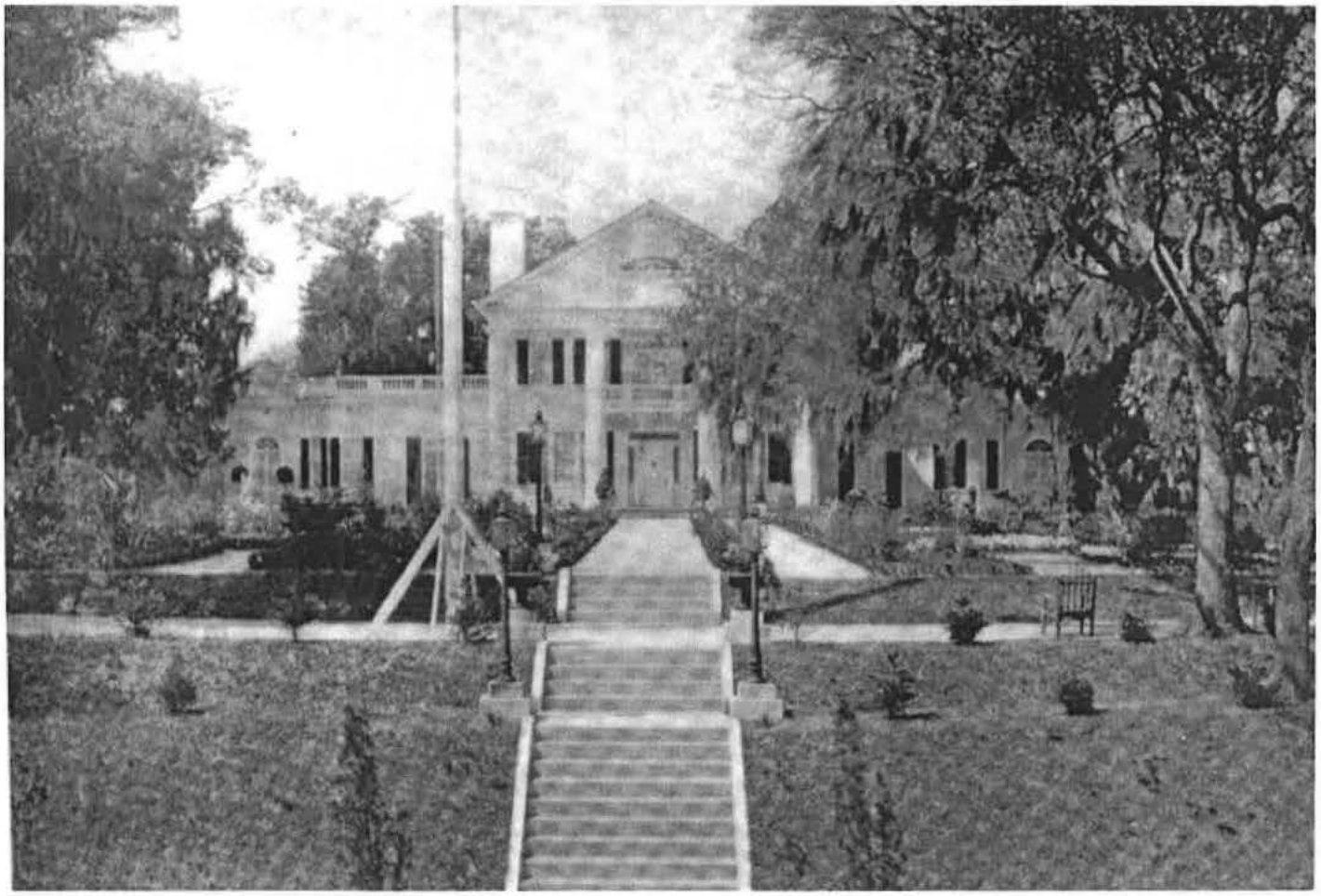


Figure 8. View of the newly remodeled Orton mansion and its formal gardens and terraces, ca. 1919, from the *American Architect*. Source: Hathi Trust Digital Archives.



"ORTON" PLANTATION HOUSE, NORTH CAROLINA
KENNETH M. MURCHISON, *Architect*

Figure 9. Front of Orton, after renovation in 1909-10. Source: Princeton University via Hathi Trust.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Orton Plantation Boundary Increase and Additional Documentation

Section number Additional Documentation Page 93

Brunswick County, North Carolina

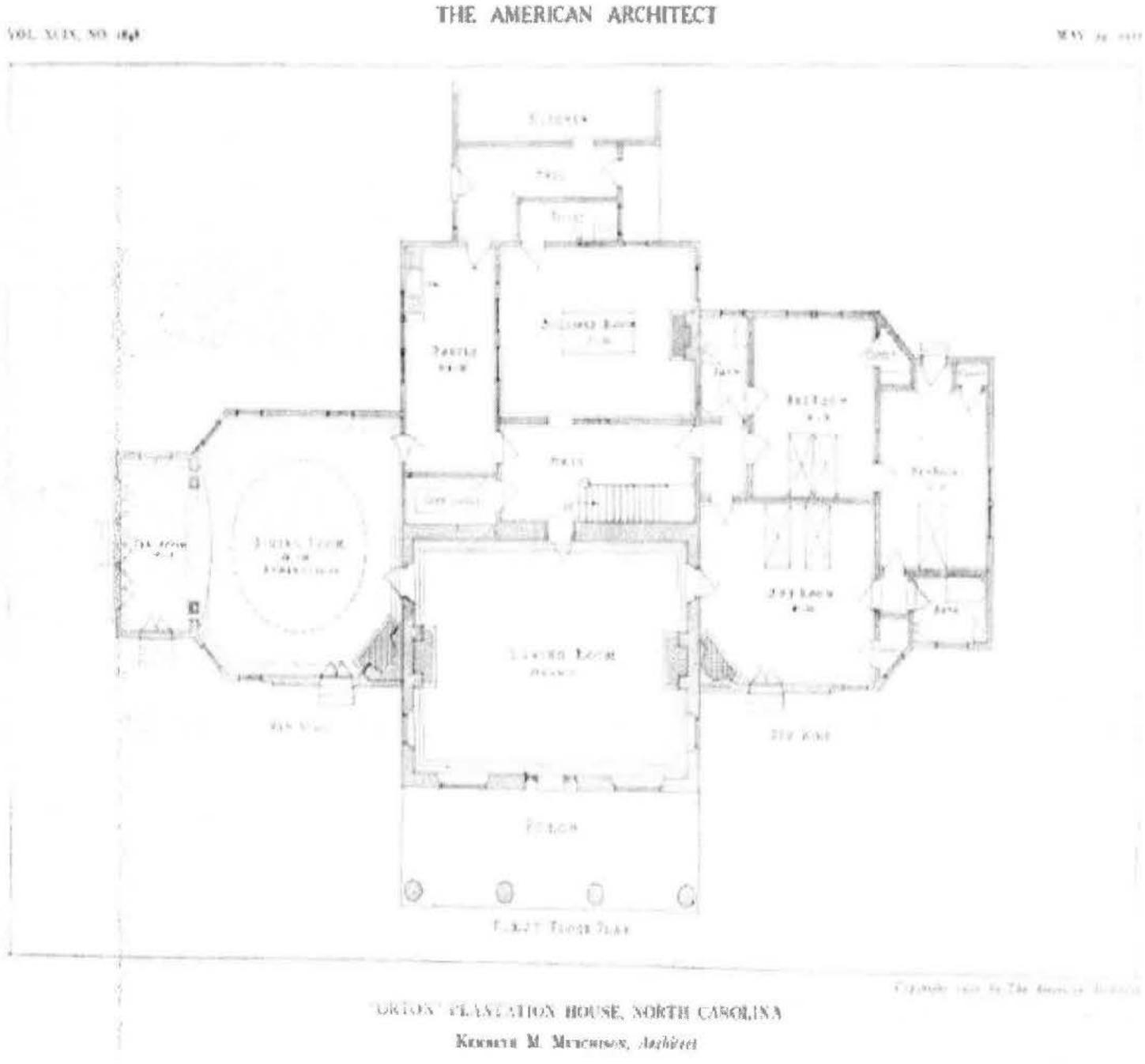


Figure 10. Floor plan for Orton, 1909, by Murchison. Source: American Architect via Hathi Trust.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Orton Plantation Boundary Increase and Additional Documentation

Section number Additional Documentation Page 94

Brunswick County, North Carolina



Figure 11. Orton front room, after renovation in 1909-1910. Source: Princeton University via Hathi Trust.



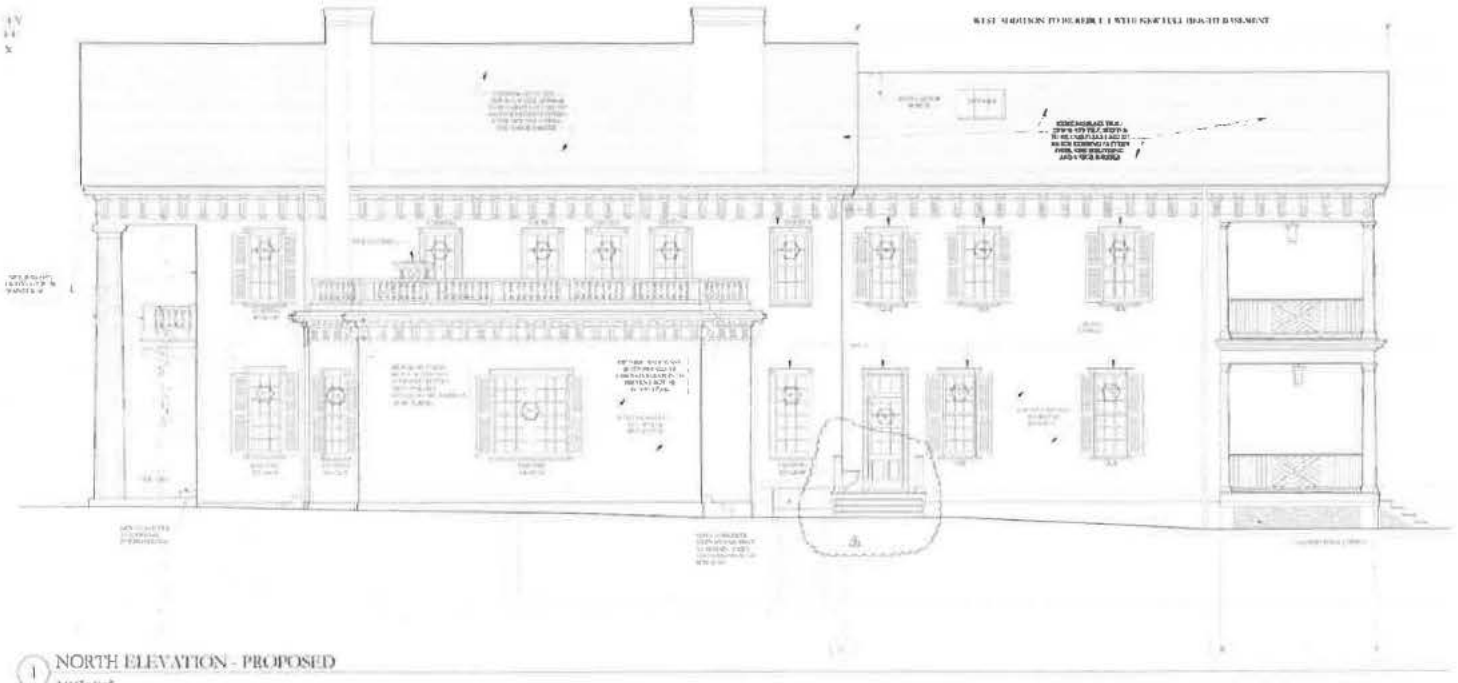
Figure 12. East and south elevations, 2011, prior to renovation. Source: Belvedere Property Management.



Figure 13. North and south elevations, 2011, prior to renovation. Source: Belvedere Property Management.



Figure 14. East and west elevations for renovation, 2012. Source: Belvedere Property Management.



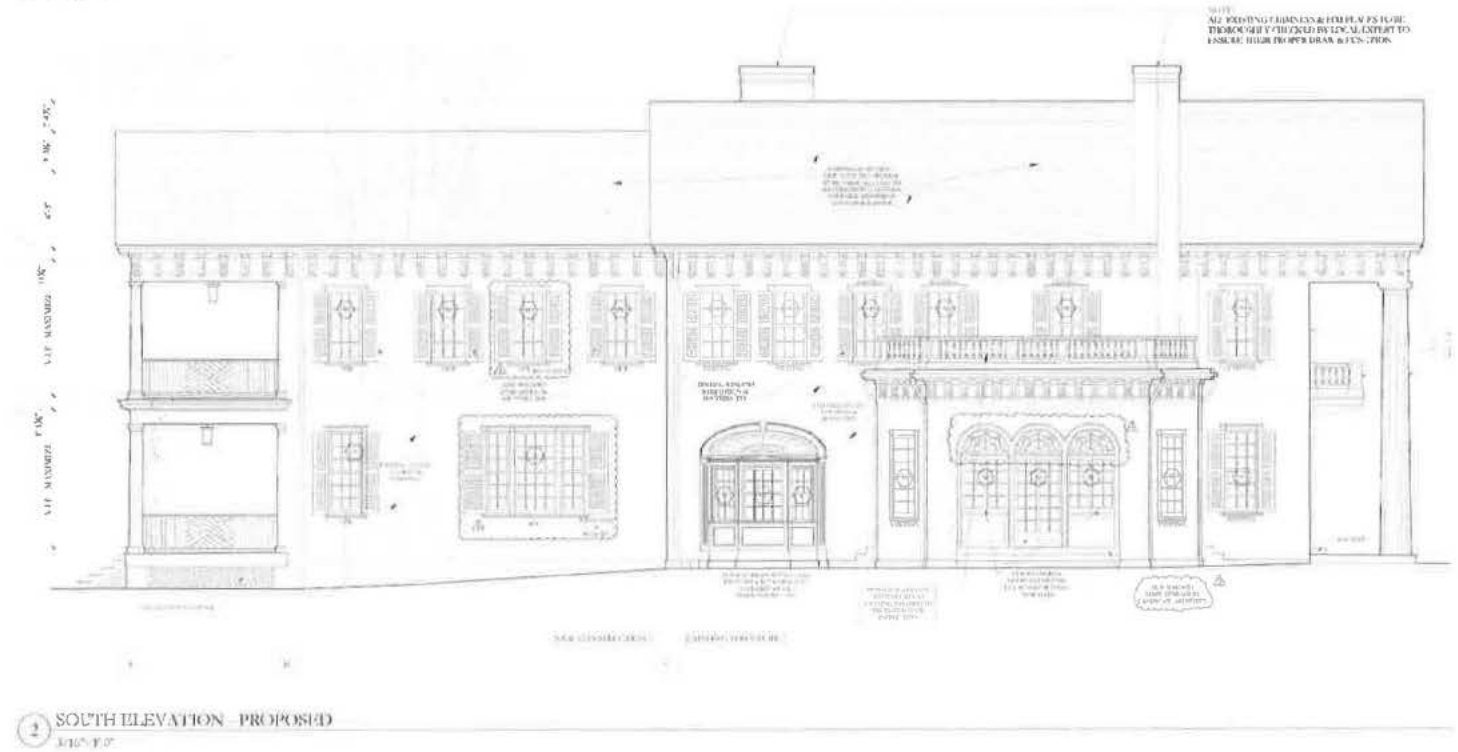


Figure 15. North and south elevations for renovation, 2012. Source: Belvedere Property Management.

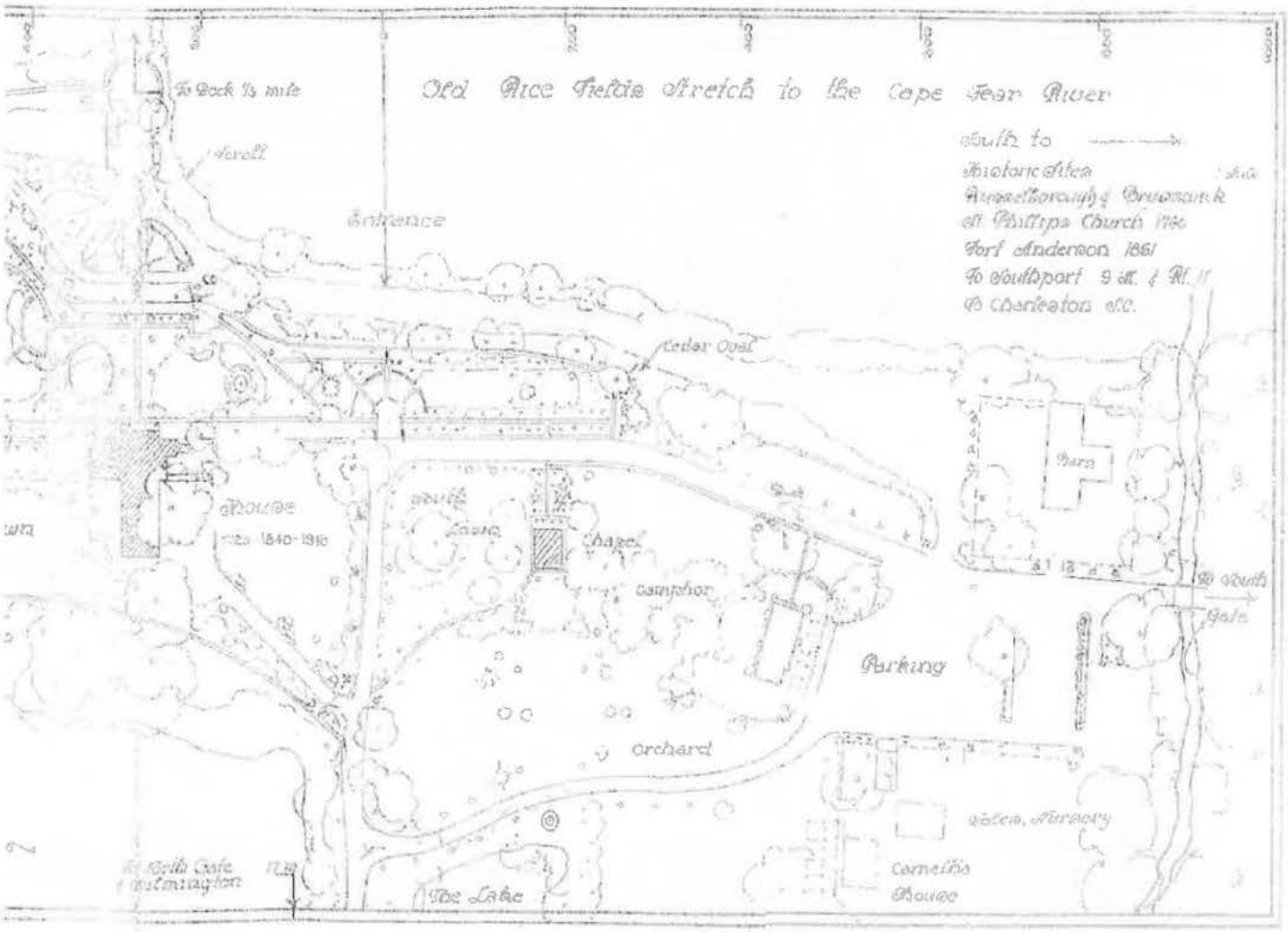


Figure 16. Robert Swann Sturtevant garden plan, 1935, southern half. Source: Orton Collection.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Orton Plantation Boundary Increase and Additional Documentation

Section number Additional Documentation Page 100

Brunswick County, North Carolina

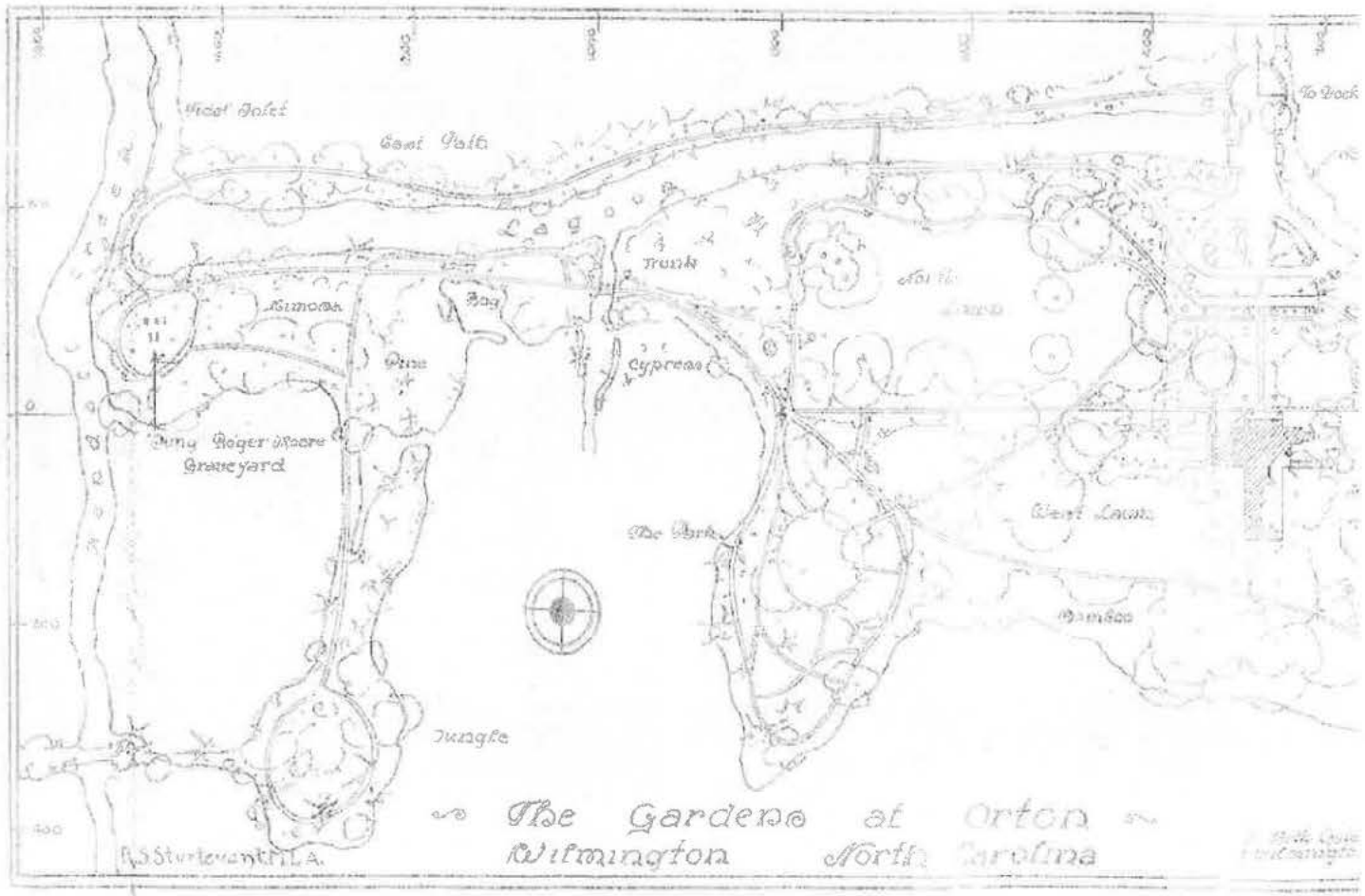


Figure 17. Robert Swann Sturtevant garden plan, 1935, northern half half. Source: Orton Collection.



Figure 18. Garden terraces between the Orton mansion and the Scroll Garden site, 2013. The north belvedere is center right. The concrete pedestals once supported cast iron planters. Source: JMA.



Figure 19. Same view, around 1937-1940. It is notable that while the concrete terrace surface has not survived, the live oak pictured is extant. Source: Orton Collection.



Figure 20. Front lawn at Orton in 2010, prior to renovation. The azaleas to the far left represent the edge of the Azalea Mound that was featured in postcards from the late twentieth century. Source: Belvedere Property Management.



Figure 21. Front lawn at Orton, 2013. The live oak closest to view was transplanted from an area south of the house in 2012. Source: JMA.



Figure 22. Sundial Garden, ca. 1937-40. Source: Orton Collection.



Figure 23. Similar view of Sundial Garden, 2010. The garden had undergone several iterations until it was removed in 2012. Source: Orton Collection.



Figure 24. Garden flanking the long walkway in 1927, looking north. The garden display structure to the right is topped with a cast iron planter. Source: Louis T. Moore Collection.



Figure 25. Same area, looking south in 2010, with azalea mound, right center. The azalea mound was likely an adaptation of the original tiered garden structure. Source: Belvedere Property Management.



Figure 26. Similar view, 2012. Source: JMA.

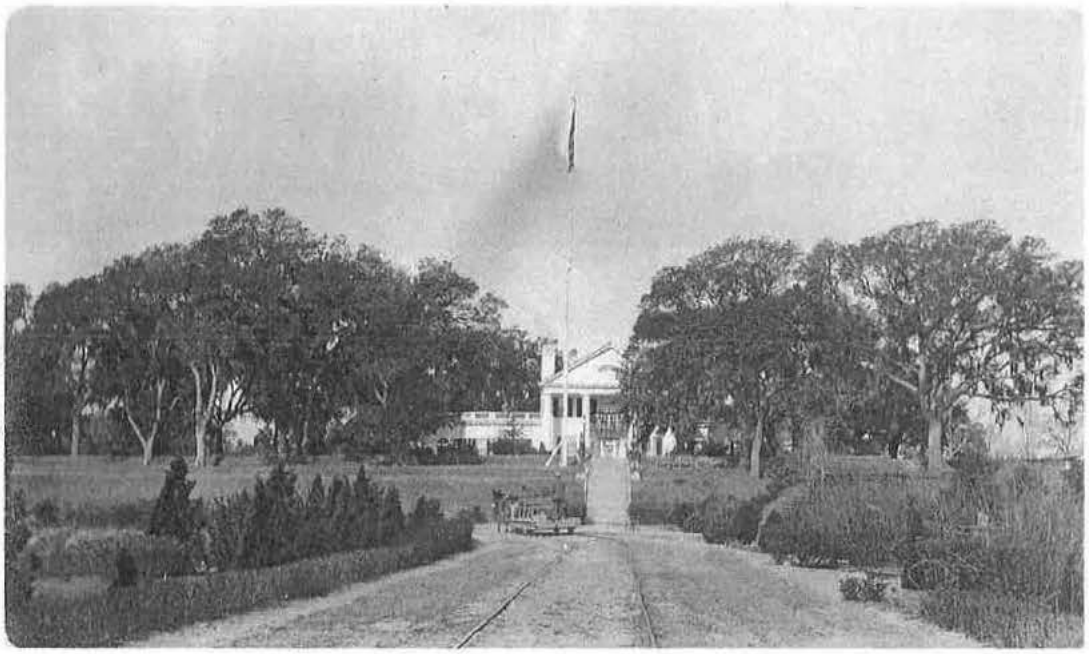


Figure 27. View westward along the front causeway, ca. 1916. Source: Orton Collection.



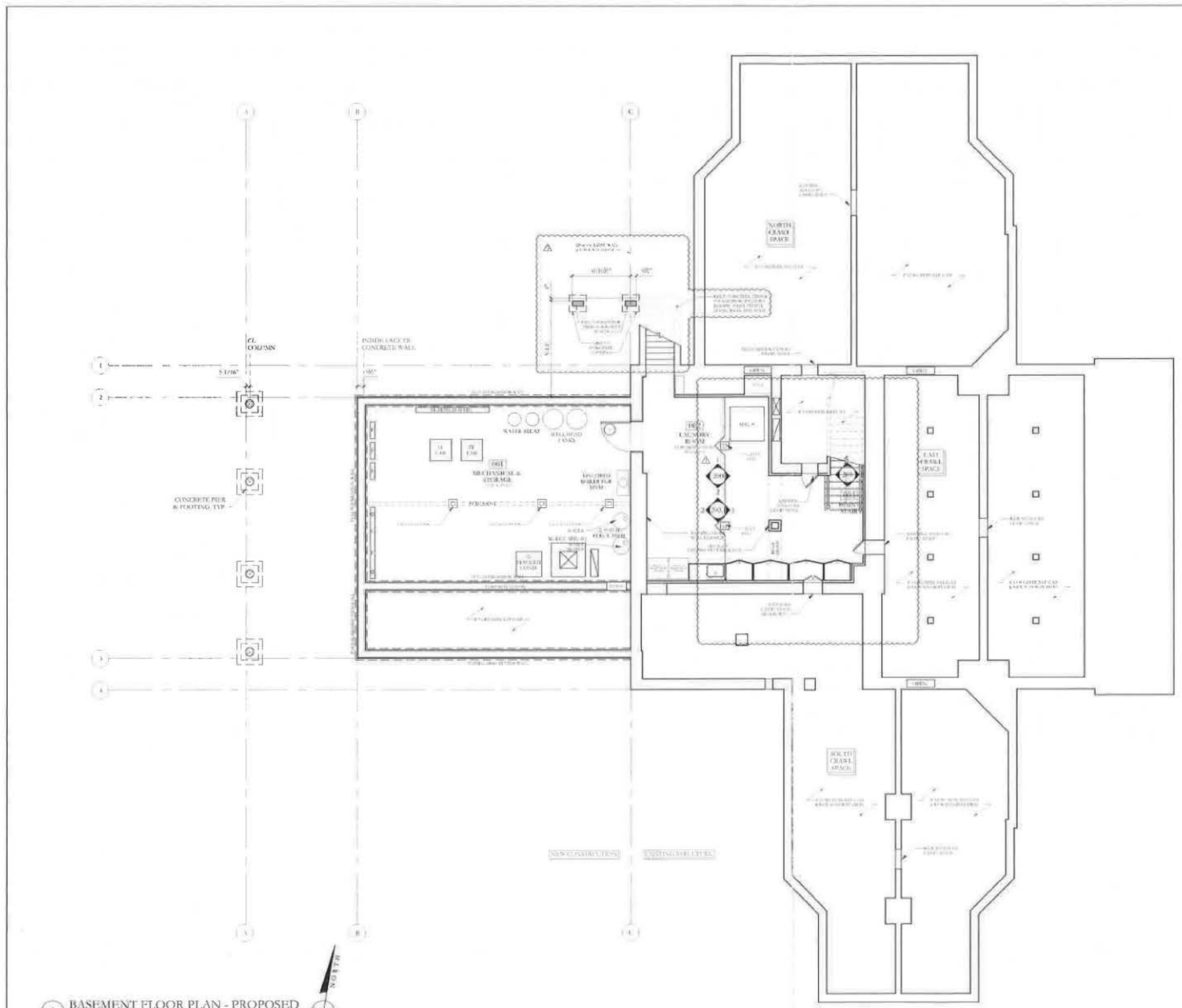
Figure 28. The Scroll Garden, ca 1950. Source: Orton Collection.



Figure 29. Wood fence and gate at south end of lagoon, with the north belvedere and lagoon bridge in the background, ca 1960. Source: Orton Collection.



Figure 30. Luola's Chapel, ca. 1919. Source: Orton Collection.



1 BASEMENT FLOOR PLAN - PROPOSED
3/16"=1'-0"

NOTE:
SEE DRAWING ST-100 FOR DIMENSIONAL SETTING OUT OF FRAMING PLANS.

NOTE:
SEE ANDREW CONSULTING ENGINEERS DRAWINGS FOR ALL STRUCTURAL INFORMATION.

NOTE:
RE-ACCESS TO ALL CRAWLSPACES.

⚠	REVISION 5 SET 01 / 12 / 2012
	CLIENT WALK THROUGH 11 / 23 / 2011
	ISSUED FOR DECORATOR REVIEW 11 / 09 / 2011
	RE - ISSUED FOR CONSTRUCTION 10 / 24 / 2011
	ISSUED FOR PLUMBING SUBCONTRACTOR 10 / 24 / 2011
	ISSUED FOR DECORATOR REVIEW 10 / 12 / 2011
	PRELIMINARY CONSTRUCTION SET 08 / 19 / 2011
	ISSUE FOR SURVEYOR 06 / 17 / 2011
	PRICING SET 06 / 16 / 2011
	ISSUE FOR STRUCTURAL REVIEW 05 / 09 / 2011
	ISSUE FOR MECHANICAL REVIEW 05 / 09 / 2011
	PRELIMINARY CONTRACTOR REVIEW SET 02 / 05 / 2011
	ISSUED TO PAGE DUKE LANDSCAPE ARCHITECTURE 10 / 05 / 2011

ORTON PLANTATION
BRUNSWICK COUNTY, NORTH CAROLINA

SHEET TITLE
ORTON PLANTATION
BASEMENT PLAN - PROPOSED

DATE	SHEET NO.
JANUARY 12 2012	A-100
SCALE: AS NOTED	
BY: KSH	

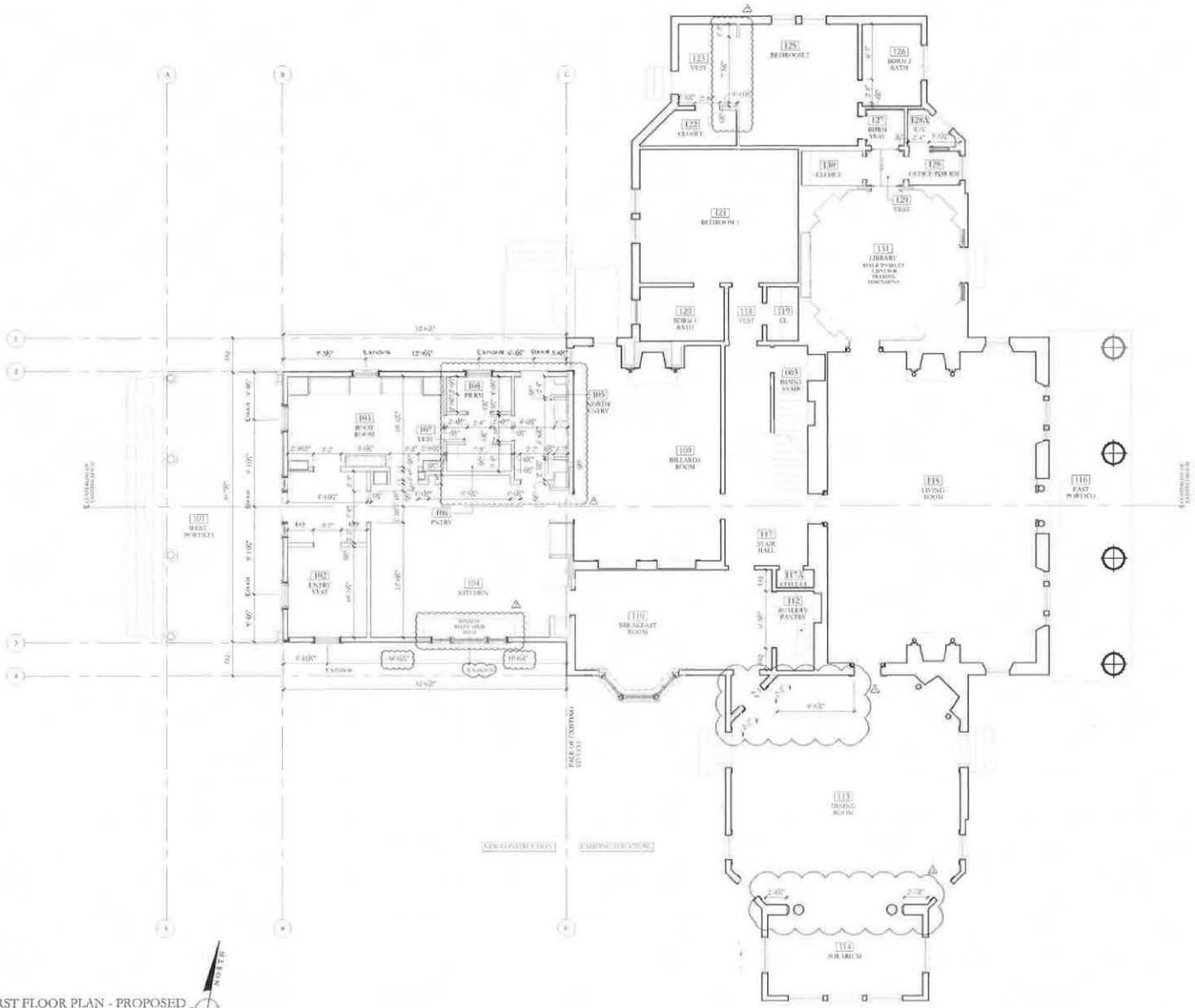
FAIRFAX & SAMMONS
NEW YORK - PALM BEACH

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Orton Plantation
Boundary Increase
and Additional
Documentation

Winnabow vic.
Brunswick County
North Carolina

DIMENSIONS ARE TO EDGE OF FRAMING UNLESS OTHERWISE NOTED



1 FIRST FLOOR PLAN - PROPOSED
3/16"=1'-0"

1	REVISION 3 SET 01 / 12 / 2012
1	ISSUED FOR CLIENT UPDATES 12 / 16 / 2011
1	ISSUED FOR CLIENT UPDATES 12 / 15 / 2011
	DRAFT FOR DECORATOR REVIEW 12 / 05 / 2011
	RE - ISSUED FOR CONSTRUCTION 09 / 28 / 2011
	ISSUED FOR DECORATOR REVIEW 09 / 12 / 2011
	PRELIMINARY CONSTRUCTION SET 08 / 08 / 2011
	PRICING SET 06 / 06 / 2011
	ISSUE FOR STRUCTURAL REVIEW 05 / 09 / 2011
	PRELIMINARY CONTRACT DOCUMENT SET 05 / 06 / 2011

ORTON PLANTATION
BRUNSWICK COUNTY, NORTH CAROLINA

SHEET TITLE
ORTON PLANTATION FIRST FRAMING PLAN

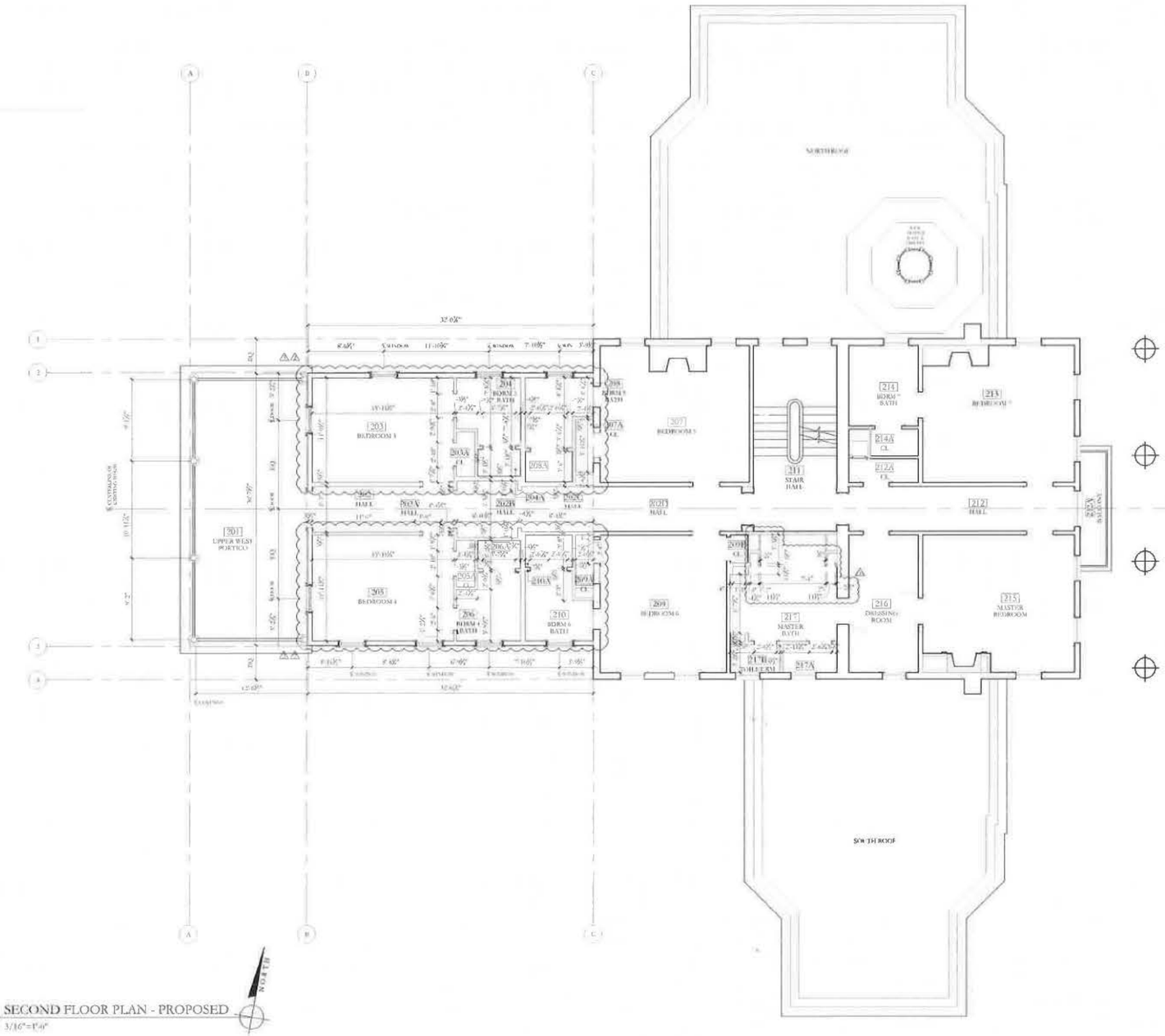
DATE: JANUARY 12, 2012
SCALE: AS NOTED
BY: MG
SHEET NO: ST-101

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NEW YORK • PALM BEACH

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Orton Plantation Boundary Increase and Additional Documentation

Winnabow Vic., Brunswick County, North Carolina



1 SECOND FLOOR PLAN - PROPOSED
3/16"=1'-0"

⚠	REVISED SET 01 / 12 / 2012
⚠	ISSUED FOR CLIENT UPDATES 11 / 15 / 2011
	ISSUED FOR DECORATOR REVIEW 11 / 09 / 2011
	RE - ISSUED FOR CONSTRUCTION 10 / 24 / 2011
	ISSUED FOR DECORATOR REVIEW 10 / 12 / 2011
	PRELIMINARY CONSTRUCTION SET 08 / 19 / 2011
	PRICING SET 06 / 03 / 2011
	ISSUE FOR STRUCTURAL REVIEW 05 / 09 / 2011
	PRELIMINARY CONTRACTOR REVIEW SET 03 FEB 2011

ORTON PLANTATION
BRUNSWICK COUNTY, NORTH CAROLINA

SHEET TITLE
ORTON PLANTATION
SECOND FLOOR FRAMING PLAN

DATE: JANUARY 12, 2012
SCALE: AS NOTED
BY: KVH
SHEET NO: ST-102

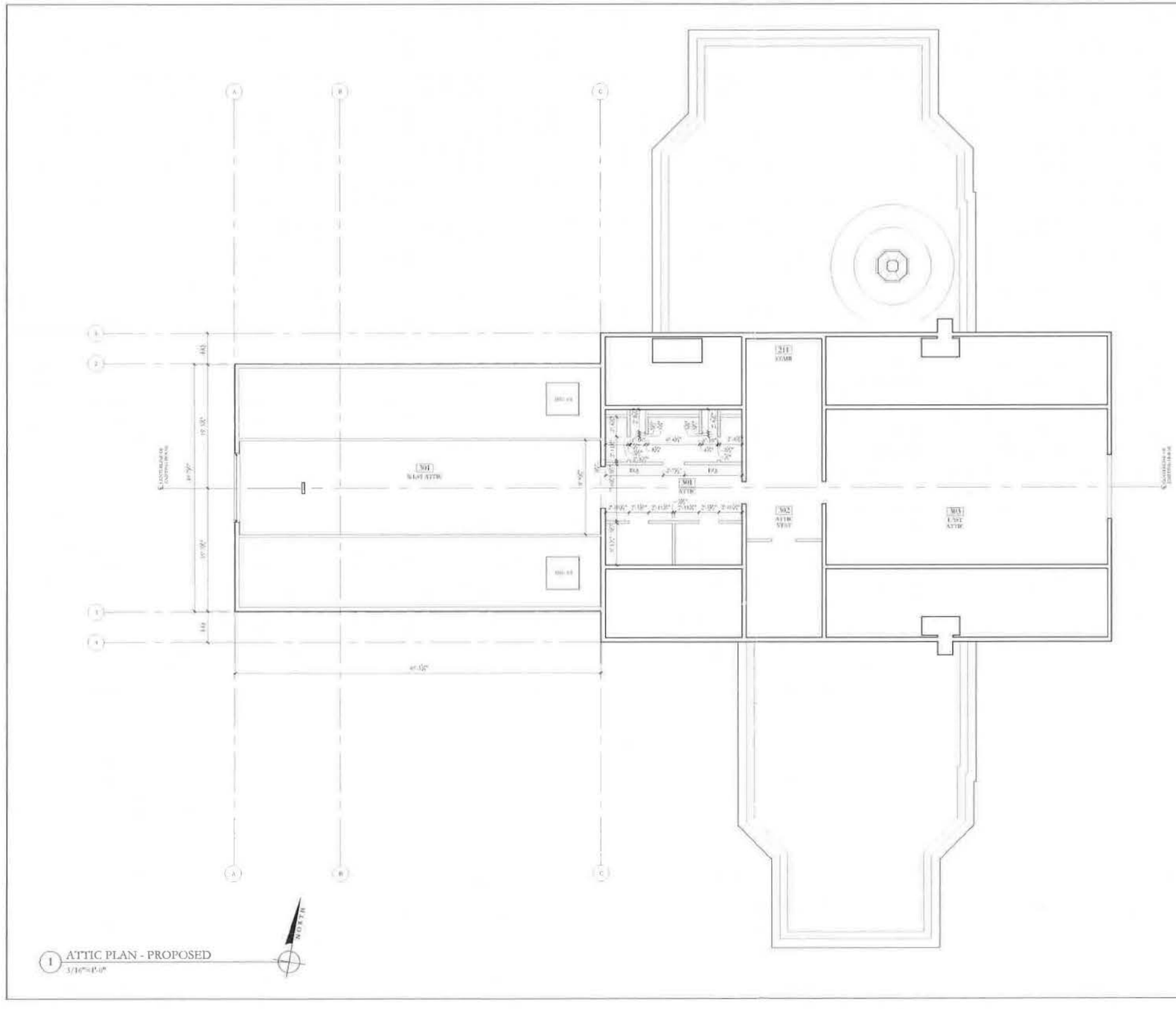
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NEW YORK - PALM BEACH

FAIRFAX & SAMMONS ARCHITECTS PC
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Orton Plantation Boundary Increase and Additional Documentation

Winnabow vic., Brunswick County, North Carolina

DIMENSIONS ARE TO EDGE OF FRAMING UNLESS OTHERWISE NOTED



1 ATTIC PLAN - PROPOSED
3/16"=1'-0"

NORTH

REVISION 3 SET
01 / 12 / 2012

ISSUED FOR DECORATOR REVIEW
11 / 05 / 2011

RE-ISSUED FOR CONSTRUCTION
10 / 24 / 2011

ISSUED FOR DECORATOR REVIEW
10 / 12 / 2011

PRELIMINARY CONSTRUCTION SET
08 / 19 / 2011

PRICING SET
06 / 10 / 2011

ISSUED FOR STRUCTURAL REVIEW
05 / 09 / 2011

PRELIMINARY CONTRACTOR REVIEW SET
03 / 18 / 2011

ORTON PLANTATION

BRUNSWICK COUNTY, NORTH CAROLINA

SHEET TITLE
ORTON PLANTATION
ATTIC FRAMING PLAN

DATE
JANUARY 12, 2012

SHEET NO.
ST-103

SCALE
AS NOTED

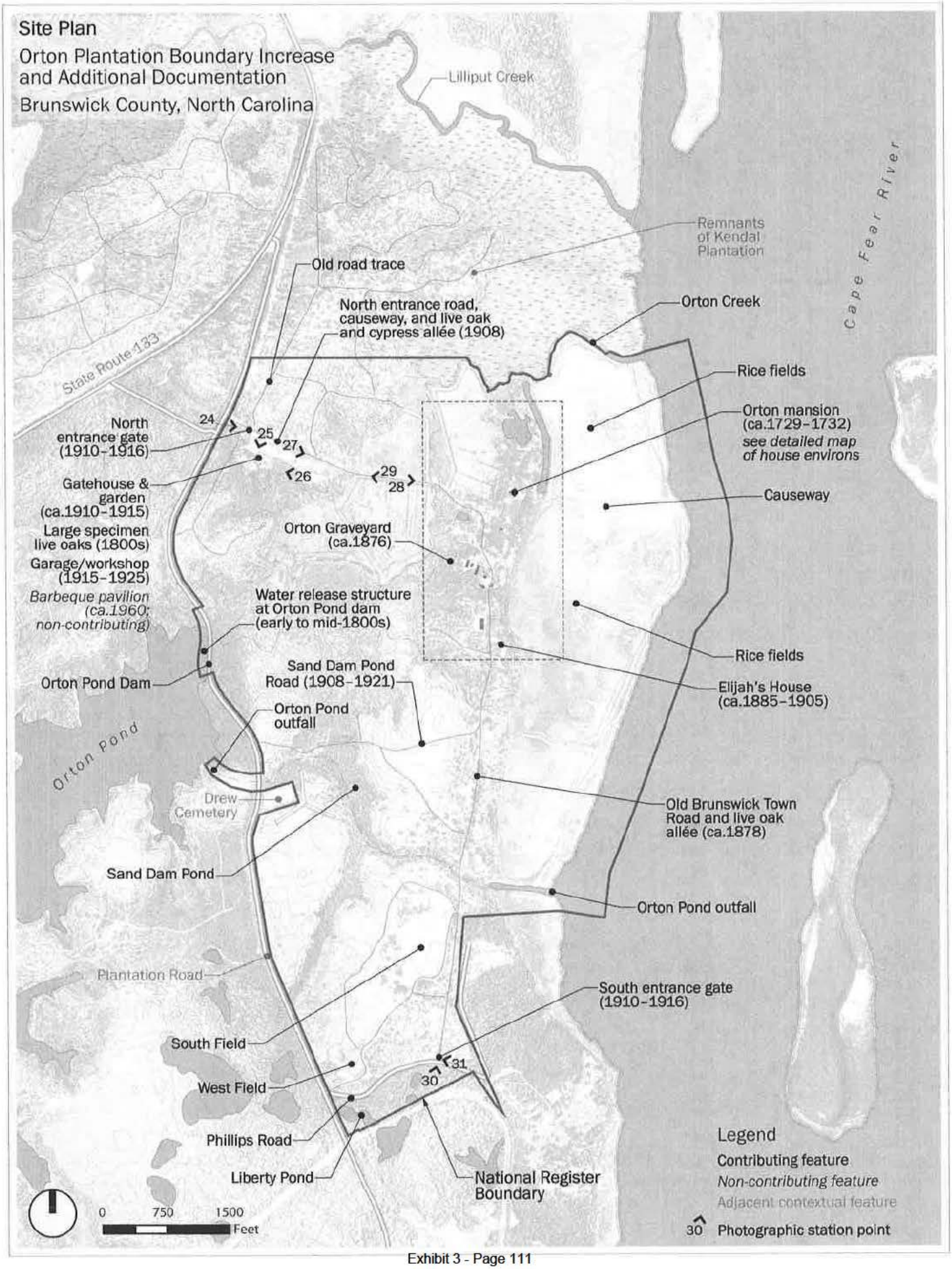
BY
AWH

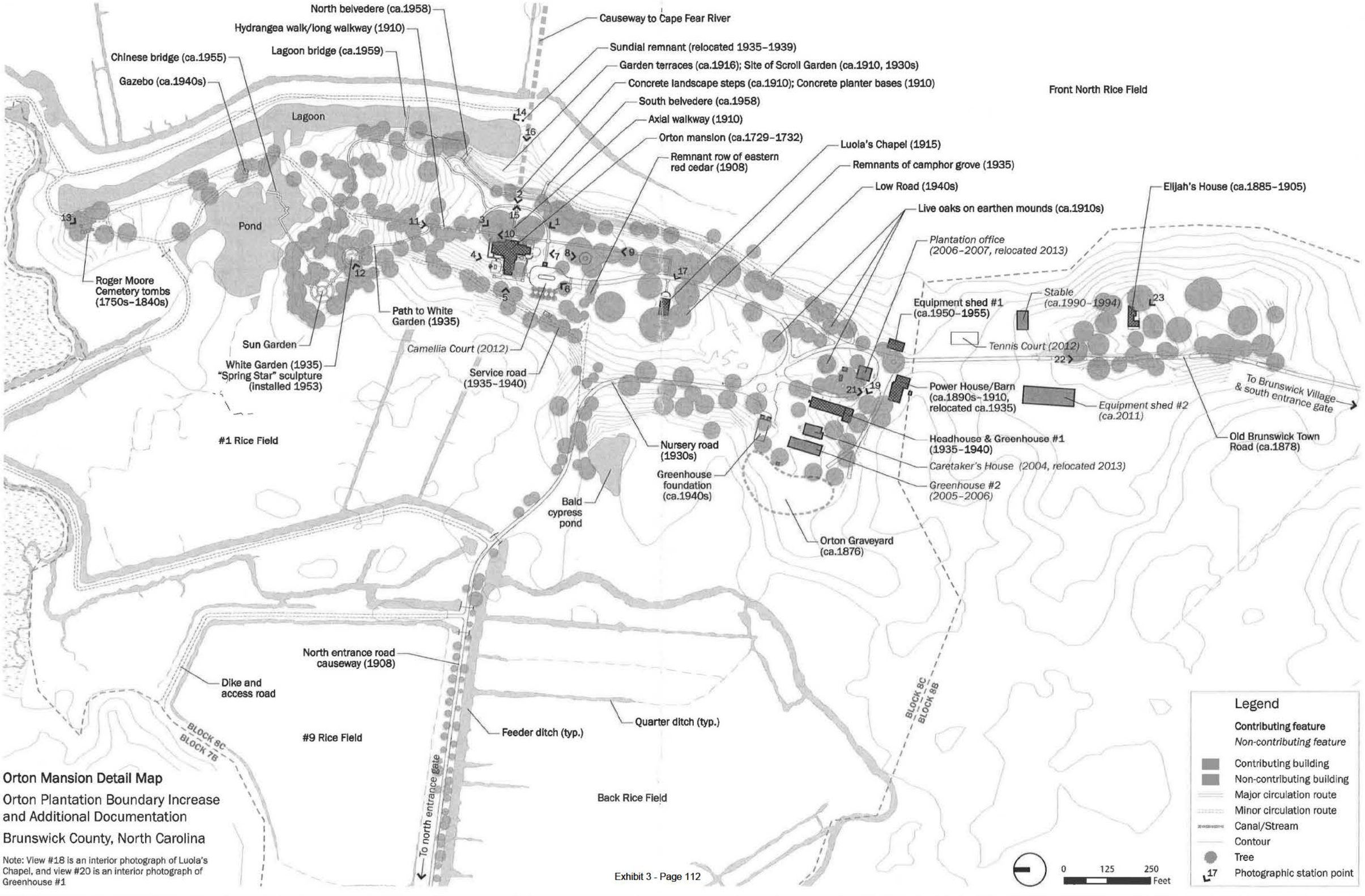
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Orton Plantation Boundary Increase and Additional Documentation

Winnabow vic., Brunswick County, North Carolina


Site Plan
Orton Plantation Boundary Increase and Additional Documentation
Brunswick County, North Carolina
Lilliput Creek
Cape Fear River
Remnants of Kendal Plantation
Old road trace
North entrance road, causeway, and live oak and cypress allée (1908)
Orton Creek
State Route 133
Rice fields
Orton mansion (ca.1729–1732)
see detailed map of house environs
North entrance gate (1910–1916)
24
25
27
26
29
28
Gatehouse & garden (ca.1910–1915)
Large specimen live oaks (1800s)
Garage/workshop (1915–1925)
Barbeque pavilion (ca.1960; non-contributing)
Causeway
Orton Graveyard (ca.1876)
Water release structure at Orton Pond dam (early to mid-1800s)
Rice fields
Orton Pond Dam
Sand Dam Pond Road (1908–1921)
Elijah's House (ca.1885–1905)
Orton Pond outfall
Orton Pond
Drew Cemetery
Old Brunswick Town Road and live oak allée (ca.1878)
Sand Dam Pond
Orton Pond outfall
Plantation Road
South entrance gate (1910–1916)
South Field
31
30
West Field
Phillips Road
Liberty Pond
National Register Boundary
0
750
1500
Feet
Legend
Contributing feature
Non-contributing feature
Adjacent contextual feature
30
Photographic station point

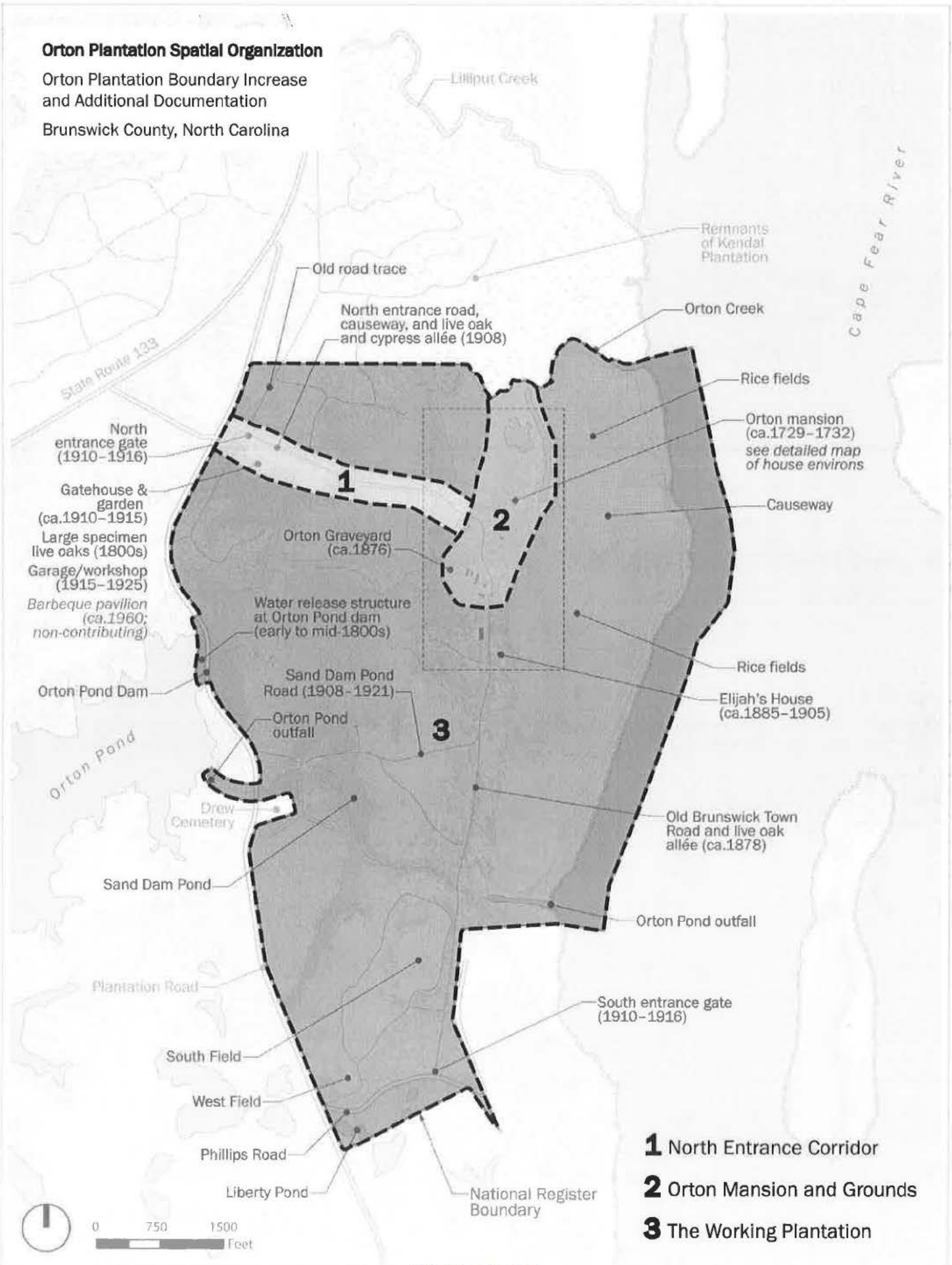


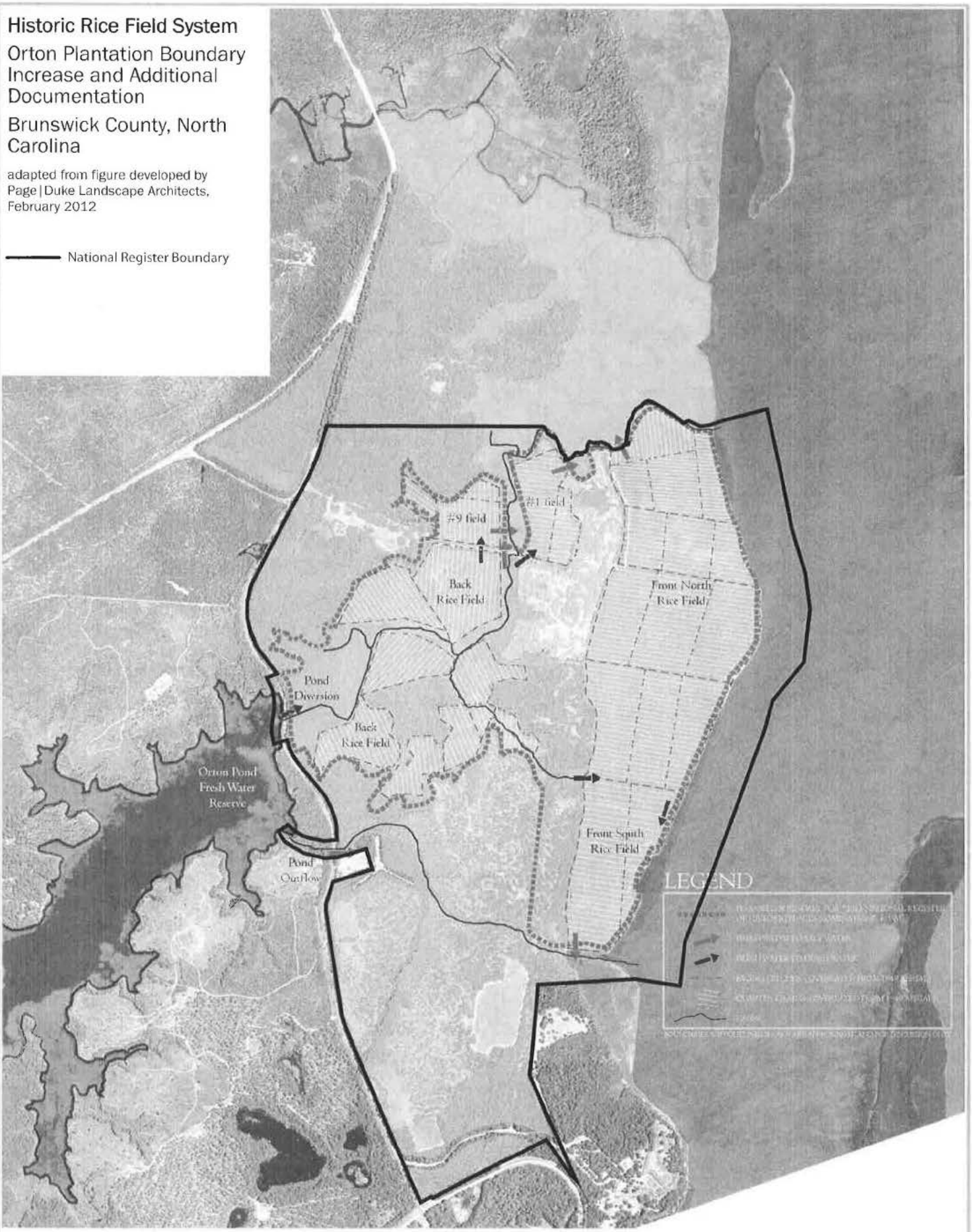
Orton Mansion Detail Map

Orton Plantation Boundary Increase and Additional Documentation

Brunswick County, North Carolina

Note: View #18 is an interior photograph of Luola's Chapel, and view #20 is an interior photograph of Greenhouse #1


Orton Plantation Spatial Organization
Orton Plantation Boundary Increase and Additional Documentation
Brunswick County, North Carolina
Lilliput Creek
Cape Fear River
Remnants of Kendal Plantation
Old road trace
North entrance road, causeway, and live oak and cypress allée (1908)
Orton Creek
State Route 133
Rice fields
Orton mansion (ca.1729–1732)
see detailed map of house environs
North entrance gate (1910–1916)
Gatehouse & garden (ca.1910–1915)
Large specimen live oaks (1800s)
Garage/workshop (1915–1925)
Barbeque pavilion (ca.1960; non-contributing)
1
2
Causeway
Orton Graveyard (ca.1876)
Water release structure at Orton Pond dam (early to mid-1800s)
Rice fields
Orton Pond Dam
Sand Dam Pond Road (1908–1921)
Elijah's House (ca.1885–1905)
Orton Pond outfall
3
Orton Pond
Drew Cemetery
Old Brunswick Town Road and live oak allée (ca.1878)
Sand Dam Pond
Orton Pond outfall
Plantation Road
South entrance gate (1910–1916)
South Field
West Field
Phillips Road
Liberty Pond
National Register Boundary
0
750
1500
Feet
1 North Entrance Corridor
2 Orton Mansion and Grounds
3 The Working Plantation

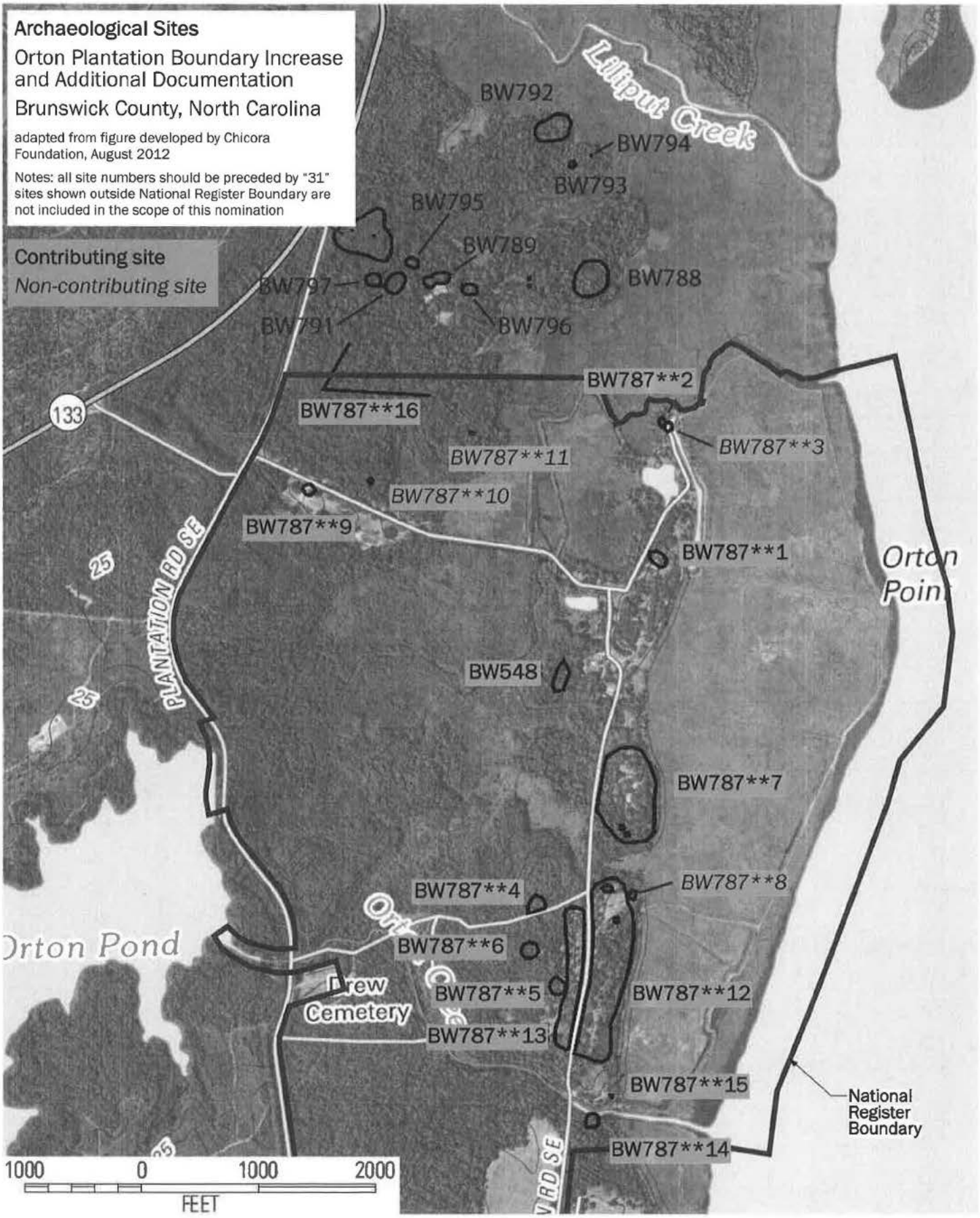


A PRELIMINARY PLANNING STUDY FOR

ORTON PLANTATION

NORTH CAROLINA

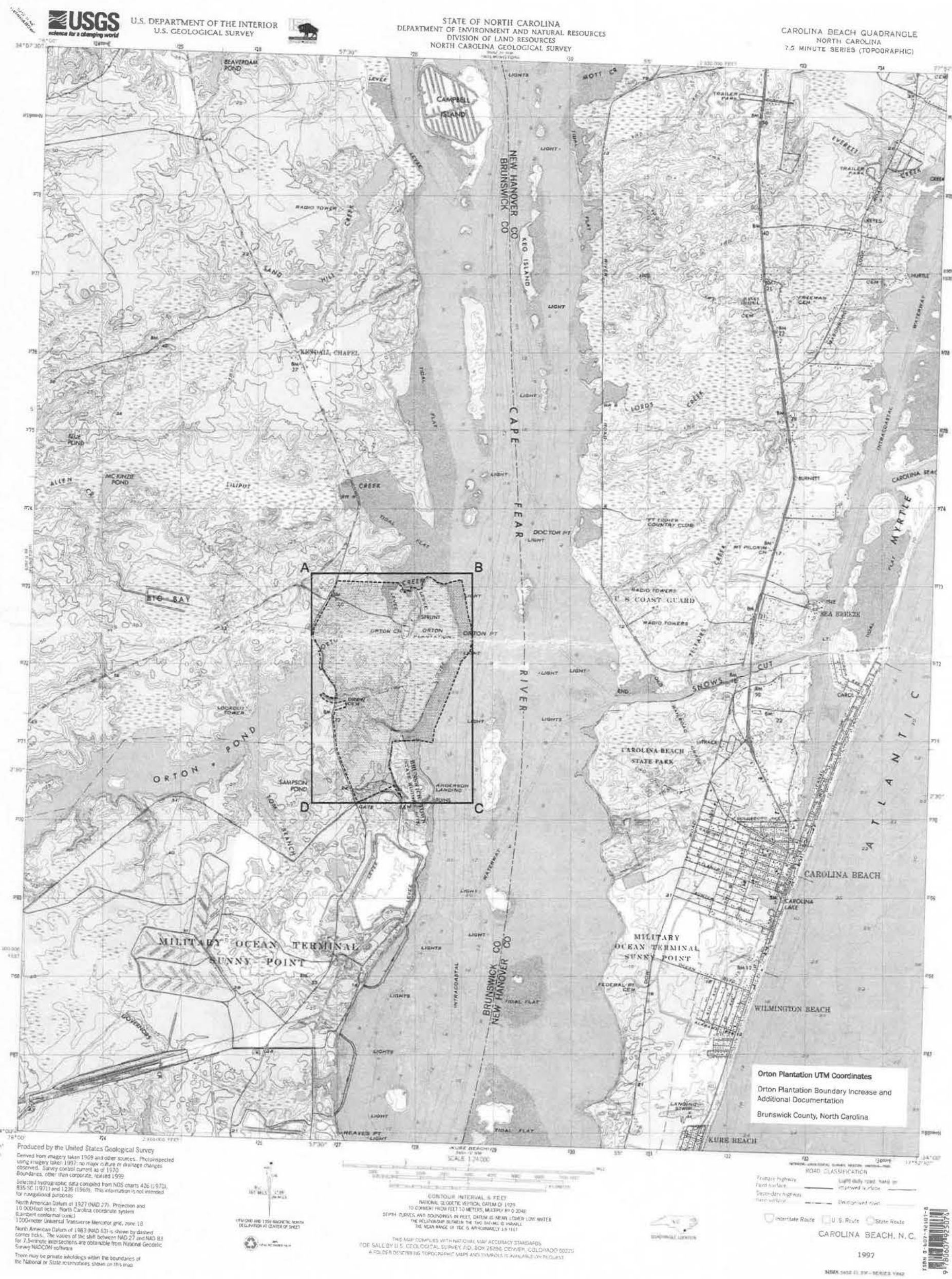
FEBRUARY 21, 2012


Archaeological Sites
Orton Plantation Boundary Increase and Additional Documentation
Brunswick County, North Carolina
adapted from figure developed by Chicora Foundation, August 2012
Notes: all site numbers should be preceded by "31" sites shown outside National Register Boundary are not included in the scope of this nomination
Contributing site
Non-contributing site
Lilliput Creek
BW792
BW794
BW793
BW795
BW789
BW788
BW797
BW791
BW796
BW787**2
BW787**16
133
BW787**3
BW787**11
BW787**10
BW787**9
PLANTATION RD SE
25
BW787**1
Orton Point
BW548
BW787**7
BW787**8
BW787**4
Orton Pond
BW787**6
Drew Cemetery
BW787**5
BW787**12
BW787**13
BW787**15
National Register Boundary
BW787**14
1000 0 1000 2000
FEET

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF LAND RESOURCES
NORTH CAROLINA GEOLOGICAL SURVEY

CAROLINA BEACH QUADRANGLE
NORTH CAROLINA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Produced by the United States Geological Survey

Derived from imagery taken 1969 and other sources. Photoinspected using imagery taken 1997; no major culture or drainage changes observed. Survey control current as of 1970
Boundaries, other than corporate, revised 1999

Selected hydrographic data compiled from NOS charts 426 (1970), 836-SC (1971) and 1235 (1969). This information is not intended for navigational purposes

North American Datum of 1927 (NAD 27). Projection and 10 000-foot ticks: North Carolina coordinate system (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid, zone 18

North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

There may be private inholdings within the boundaries of the National or State reservations shown on this map

SCALE 1:24 000

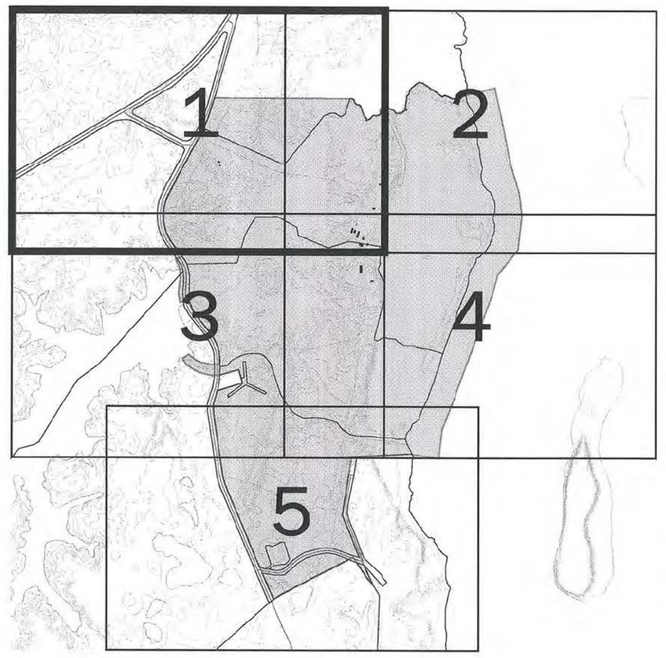
CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048
DEPTH CURVES AND SOUNDINGS IN FEET, DATUM IS MEAN LOWER LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
THE MEAN RANGE OF TIDE IS APPROXIMATELY 3.9 FEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25286, DENVER, COLORADO 80225
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION

CAROLINA BEACH, N.C.
1997

Zone 18
A E 226680
N 3773170
B E 228740
N 3773170
C E 228740
N 3770210
D E 226680
N 3770210



0 200 400 800

Parcel Map
Orton Plantation Boundary Increase
and Additional Documentation
Brunswick County, North Carolina
1 of 5

1440000105

1440000110

1440000120

1440000105

14400001

1440000111

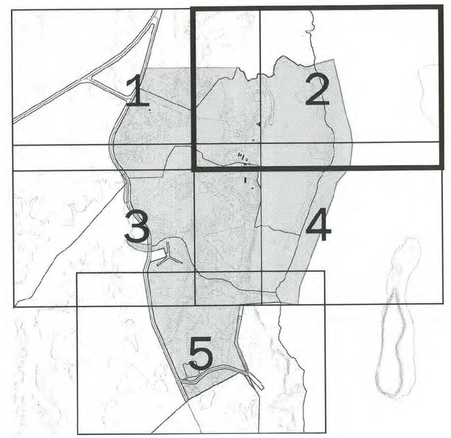
State Route 133

Orton Road

Plantation Road

0 200 400 800

Parcel Map
Orton Plantation Boundary Increase and Additional Documentation
Brunswick County, North Carolina
2 of 5



1440000105

14400001

1440000111

Cape Fear River

14400001

1440000120

1440000111

Orton Pond

Plantation Road

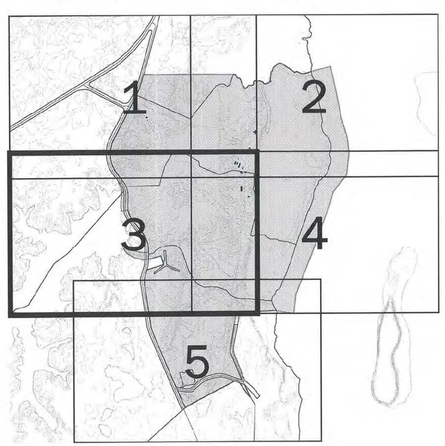
1440000119

1440000104

1440000103

1440000112

Plantation Road



Parcel Map

Orton Plantation Boundary Increase and Additional Documentation

Brunswick County, North Carolina

3 of 5

0 200 400 800

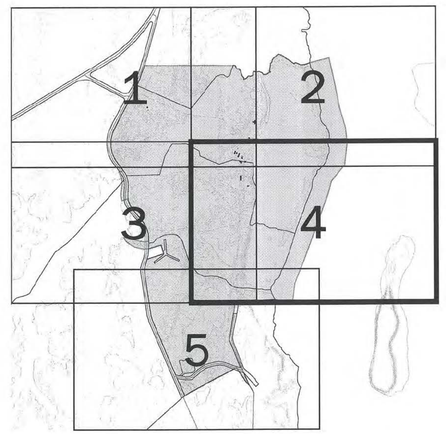
14400001

1440000111

1440000112

15900001

Cape Fear River



0 200 400 800

Parcel Map
Orton Plantation Boundary Increase and Additional Documentation
Brunswick County, North Carolina
4 of 5

1440000111

Plantation Road

1440000112

1440000119

Cape Fear River

15900002

St Phillips Road

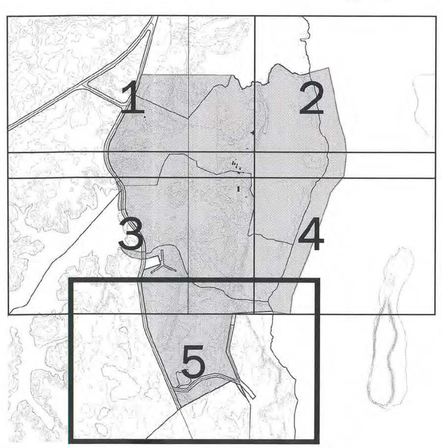
1440000112

1440000112

15900001

Plantation Road

17400001



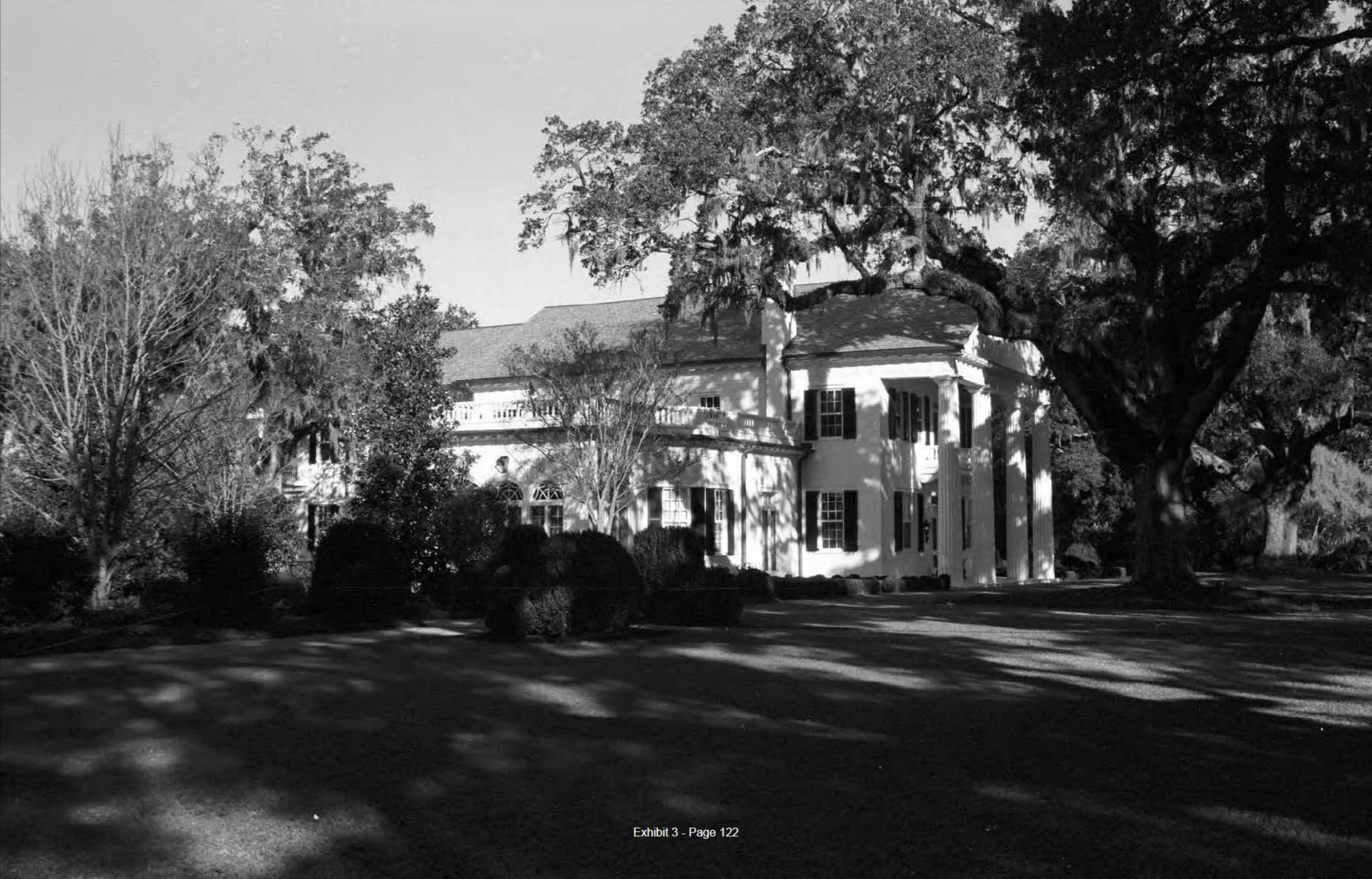
Parcel Map

Orton Plantation Boundary Increase and Additional Documentation

Brunswick County, North Carolina

5 of 5

0 200 400 800



































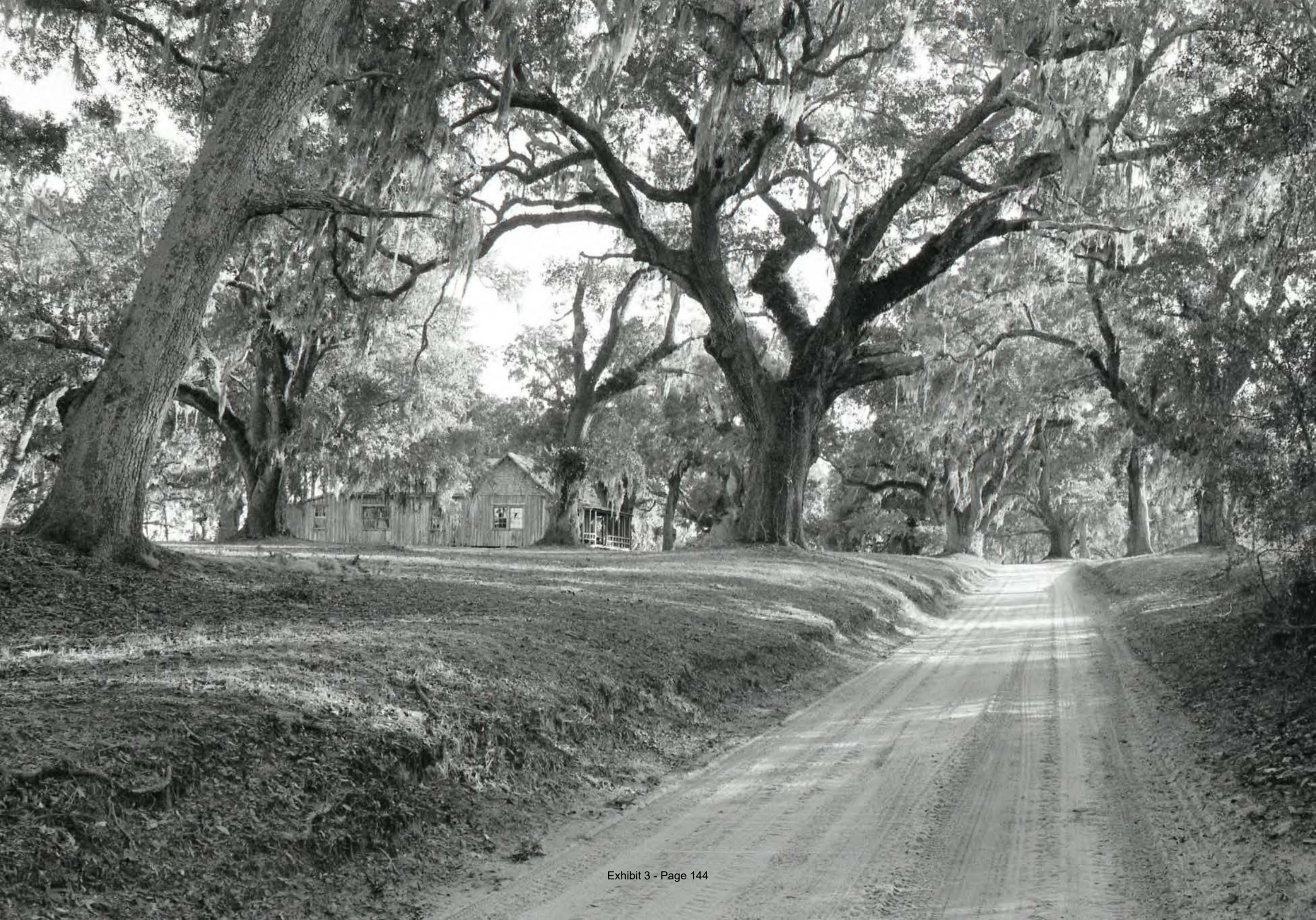









SLOW
SPEED
BUMPS




















1725

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Orton Plantation (Boundary Increase)

MULTIPLE NAME:

STATE & COUNTY: NORTH CAROLINA, Brunswick

DATE RECEIVED: 7/26/13 DATE OF PENDING LIST: 8/16/13
DATE OF 16TH DAY: 9/03/13 DATE OF 45TH DAY: 9/11/13
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 13000698

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	N
OTHER:	N	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	N	SAMPLE:	N	SLR DRAFT:	N	NATIONAL:	N

COMMENT WAIVER: N

✓ ACCEPT ___ RETURN ___ REJECT 9.9.13 DATE

ABSTRACT/SUMMARY COMMENTS:

Entered in
The National Register
of
Historic Places

RECOM./CRITERIA_____

REVIEWER_____ DISCIPLINE_____

TELEPHONE_____ DATE_____

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

RECEIVED 2280
JUL 26 2013
NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

July 15, 2013

Ms. Carol Shull, Keeper
National Register of Historic Places
National Park Service
U.S. Department of the Interior
1201 Eye Street NW (2208) Eighth Floor
Washington, D.C. 20005

Re: Star Historic District – Montgomery County
Orton Plantation, Boundary Increase and Additional Documentation – Brunswick County
Moore County Hunt Lands and Mile-Away Farms – Moore County

Dear Ms. Shull:

Enclosed are the above referenced nominations to be approved for the National Register of Historic Places.

We trust you will find the nominations to be in order. If you have any questions please call Ann Swallow, 919.807.6587.

Sincerely,

Kevin Cherry

Kevin Cherry, PhD.
State Historic Preservation Officer

KC/jct: enclosures

Exhibit 4

2012 Corps Permit & 2012 Division Permit

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

November 9, 2012

Regulatory Division

Action ID. 2011-00624

Mr. Peter Talty
Orton Plantation Holdings, LLC
17th Floor
1251 Avenue of the Americas
New York, NY 10020

Dear Mr. Talty:

In accordance with your written request of May 1, 2012, and the ensuing administrative record, enclosed are two copies of a permit to authorize the discharge of fill material into 0.16 acre of Section 10 coastal marsh and 2.41 acres of Section 404 riparian freshwater marsh/wetlands to construct/repair/replace 7,700 linear feet of revetment, 3,300 linear feet of dike, 13 water control structures, and 12 field access points. Authorization also includes temporary impacts to 358.9 acres (i.e., 283.9 acres not requiring mitigation, and 75.0 acres requiring mitigation) of freshwater marsh/riparian wetlands for the conversion to rice fields to include ditch construction and maintenance. The approximately 700-acre project area is located along the east side of Plantation Road SE, off NC Highway 133, northeast of the City of Southport, Brunswick County, North Carolina.

You should acknowledge that you accept the terms and conditions of the enclosed permit by signing and dating each copy in the spaces provided ("Permittee" on page 3). Your signature, as permittee, indicates that, as consideration for the issuance of this permit, you voluntarily accept and agree to comply with all of the terms and conditions of this permit. All pages of both copies of the signed permit with drawings should then be returned to this office for final authorization. A self-addressed envelope is enclosed for your convenience.

Title 33, Part 325.1(f), of the Code of Federal Regulations reads, in part, that, "A $10 fee will be charged for permit applications when the work is noncommercial in nature and provides personal benefits that have no connection with a commercial enterprise...", and "A fee of $100 will be charged for permit applications when the planned or ultimate purpose of the project is commercial or industrial in nature and is in support of operations that charge for the production, distribution, or sale of goods or services." As your application fits the latter category, you are requested to remit your check for $100.00, made payable to the Finance and Accounting Officer, USAED, Wilmington. The check should accompany the signed and dated copies of your permit.

This correspondence contains an initial proffered permit for the above described site. If you object to this decision, you may request an administrative appeal under Corps regulations at 33 CFR part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this decision you must submit a completed RFA form to the District Commander, Wilmington District Corps of Engineers at the following address:

Col. Steven A. Baker, District Commander
US Army Corps of Engineers, Wilmington District
69 Darlington Ave.
Wilmington, North Carolina 28403

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit a RFA form, it must be received at the above address by January 9, 2013.

It is not necessary to submit an RFA form to the Division Office if you do not object to the decision in contained in this correspondence.

After the permit is authorized in this office, the original copy will be returned to you; the duplicate copy will be permanently retained in this office. If you have questions, please contact Emily Hughes at the Wilmington Regulatory Field Office, telephone (910) 251-4635.

Sincerely,

Dale E. Beter
Chief, Wilmington Regulatory Field Office

Enclosures

DEPARTMENT OF THE ARMY PERMIT

Permittee: Orton Plantation Holdings, LLC (c/o: Peter Talty)

Permit No.: SAW-2011-00624

Issuing Office: CESAW-RG-L

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: to authorize the discharge of fill material into 0.16 acre of Section 10 coastal marsh and 2.41 acres of Section 404 riparian freshwater marsh/wetlands to construct/repair/replace 7,700 linear feet of revetment, 3,300 linear feet of dike, 13 water control structures, and 12 field access points. Authorization also includes temporary impacts to 358.9 acres (i.e., 283.9 acres not requiring mitigation, and 75.0 acres requiring mitigation) of freshwater marsh/riparian wetlands for the conversion to rice fields to include ditch construction and maintenance.

Project Location: along the east side of Plantation Road SE, off NC Highway 133, northeast of the City of Southport, Brunswick County, North Carolina

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2017 If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit,

Special Conditions:

SEE ATTACHED SPECIAL CONDITIONS

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit, Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Kelly J. Talley — 11/9/12

(PERMITTEE) *(DATE)*

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

for Scott McClendon — 9 Nov 2012

(DISTRICT ENGINEER) **STEVEN A. BAKER, COLONEL** *(DATE)*

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) *(DATE)*

Orton Plantation Holdings, LLC
Brunswick County
AID# SAW-2011-00624

SPECIAL CONDITIONS TO BE INCLUDED WITH THE STANDARD PERMIT

Work Limits

a) In accordance with 33 U.S.C. 1341(d), all conditions of the North Carolina Division of Water Quality 401 Water Quality Certification revised on August 21, 2012, are incorporated as part of the Department of the Army permit.

b) All work authorized by this permit must be performed in strict compliance with the attached plans, which are a part of this permit. Any modification to these plans must be approved by the US Army Corps of Engineers (USACE) prior to implementation.

c) Except as authorized by this permit or any USACE approved modification to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters or wetlands. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.

d) Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act.

e) Vegetative debris and excavated material from irrigation ditches will be disposed of in such a manner as to not impair lateral water flow. Disposal of vegetative debris and excavated material may include, but it not limited to, removal to high ground or spreading dredged material in situ.

f) Heavy equipment shall operate adjacent to the river or if to be operated from a barge, unavoidable propwash induced turbidity, i.e., such as being unintentionally caught or wedged on invisible shoals, shall not exceed state water quality standards. At no time will prop washing be permitted in order to access shallow areas.

g) No activity may cause a hazard to navigation. It is incumbent on the permittee to receive all prior authorizations, including any consent to easement required, for structures located in or over navigable waters where there is a dedicated right-of-way to a federally

maintained channel. Information on any consent to easement required may be obtained from contacting the U.S. Army Corps of Engineers, Navigation Section, c/o Mr. Justin Arnette, Land-use Coordinator, at 910-251-4196.

h) No work shall occur in, or adjacent to, areas containing concentrated shellfish populations, such as mussels or clams.

i) Wetland Avoidance/Minimization Areas: A total of 46.8 acres of jurisdictional wetlands within the historic rice field, referred to as "Exclusion Areas", were voluntarily removed from the project during the permit review process as avoidance and minimization (Attachment A referred to as "Exclusion Areas"). No regulated activity in the Exclusion Areas is authorized under this Permit.

j) Ditch work for the Facing ditches (a.k.a "feeder ditches" or "canals") and Quarter ditches shall not substantially deviate from the plans titled *Ditch Cross Section (Typical)* dated October 10, 2012 (Attachment B) nor be constructed beyond areas as shown in the map titled Composite Drawing dated October 10, 2012 (Attachment C).

k) The permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization (Attachment D as detailed on Sheets 1 – 15 and referred to as "Front Rice Fields/River Dike Rehabilitation" and as detailed on Drawings C-1 through C-14 and referred to as "Rice Field Drainage Structures 1 – 13 and Field Access Crossing Design"). No other maintenance activities shall be authorized which deviate from the attached permit drawings, or for other purposes than maintaining the following structures: spillway gates, gate valves, culvert pipes, and wooden rice trunks. Written verification shall be provided that the final construction drawings comply with the attached permit drawings prior to any active construction in waters of the United States, including wetlands. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers, Ms. Emily Hughes, Wilmington Regulatory Field Office prior to any active construction in waters or wetlands.

Related Laws

l) The Permittee shall fully abide by all conditions of the CAMA Major Development Permit No. #83-12, dated July 17, 2012, issued by the North Carolina Division of Coastal Management, which are incorporated herein by reference.

m) All mechanized equipment will be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the N.C. Division of Water Quality at

(919) 733-5083, Ext. 526 or (800) 662-7956 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

n) All necessary precautions and measures will be implemented so that any activity will not kill, injure, capture, harass, or otherwise harm any protected federally listed species. While accomplishing the authorized work, if the permittee discovers or observes a damaged or hurt listed endangered or threatened species the District Engineer will be immediately notified to initiate the required Federal coordination.

o) If the permittee discovers any previously unknown historic or archeological resources on site while accomplishing the authorized work, he shall immediately stop work and notify the Wilmington District Engineer who will initiate the required State/Federal, and/or Tribal coordination.

p) In order to protect the federally protected Short-nose and Atlantic sturgeon, a moratorium on in-water construction, located below the plane of mean high water for the Cape Fear River and its tributaries, will be in place from February 1-June 30 (*if applicable*).

q) In order to further protect the endangered West Indian Manatee, *Trichechus manatus,* the applicant must implement the U.S. Fish and Wildlife Service's Manatee Guidelines, and strictly adhere to all requirements therein. The guidelines can be found at http://www.fws.gov/nc-es/mammal/manatee_guidelines.pdf.

Project Maintenance

r) The permittee shall advise the Corps in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit, except for ongoing farming activities within the identified cultivation areas.

s) Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source and will be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used.

t) The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, shall be available at the project site during construction and maintenance of this project.

u) The permittee shall employ all sedimentation and erosion control measures necessary to prevent an increase in sedimentation or turbidity within waters and wetlands outside the permit area. This shall include, but is not limited to, the immediate installation of silt

fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4).

v) The permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

w) The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and shall restore natural grades in those areas, prior to project completion.

x) The permittee shall take measures to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with any water in or entering into waters of the United States. Water inside coffer dams or casings that has been in contact with concrete shall only be returned to waters of the United States when it no longer poses a threat to aquatic organisms.

Compensatory Mitigation

In-Lieu Fee

y) In order to compensate for impacts to 2.41 acres of freshwater wetlands and 0.16 acre of coastal wetlands associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form (Attachment E). The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.

Permittee-Based

z) To offset impacts to 75.0 acres of freshwater marsh and woody/shrub-scrub wetlands, the permittee has proposed to mitigate impacts by preserving approximately 187.5 acres of high quality riverine swamp forest wetlands to include a 100-foot surrounding buffer (approx. 68.5 acres) adjacent to Allen's Creek. The permittee shall execute and cause to be recorded in the Brunswick County Register of Deeds the *Permanent Conservation Easement* (Attachment F language and map as detailed on Sheets 1 – 7 and referred to as "Conservation Easement Plat"), as accepted by the Corps of Engineers for the purpose of maintaining approximately 256.0 acres of jurisdictional wetlands and buffer as conservation areas, within 60 days of permit issuance, in their natural state in perpetuity. The permittee shall enforce the terms of the easement and shall take no action on the property described in the easement inconsistent with the terms thereof. The permittee

shall not sell or convey the property to any third party prior to recordation of the easement.

Miscellaneous

aa) Upon completion of each construction phase, the permittee shall submit to the Corps as-built plans for exterior dikes and water control structures affecting wetlands and waters of the U.S. within six (6) months following the completion of construction.

Enforcement

bb) Violation of these conditions or violation of Section 404 of the Clean Water Act of Section 10 of the Rivers and Harbors Act must be reported in writing to the Wilmington District U.S. Army Corps of Engineers within 24 hours of the permittee's discovery of the violation.

cc) A representative of the Corps of Engineers will periodically and randomly inspect the work for compliance with these conditions. Deviations from these procedures may result in cessation of work until the problem is resolved to the satisfaction of the Corps.

Other

dd) This Department of the Army permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

ee) In issuing this permit, the Federal Government does not assume any liability for:

1. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

2. Damages to the permitted project or uses thereof as a result of current or future Federal activities initiated on behalf of the general public.

3. Damages to other permitted or un-permitted activities or structures caused by the authorized activity.

4. Design and construction deficiencies associated with the permitted work.

5. Damage claims associated with any future modification, suspension, or revocation of this permit.

ff) REPORTING ADDRESS: All reports, documentation and correspondence required by the conditions of this permit shall be submitted to the following address: U.S. Army Corps of Engineers, Regulatory Division, Wilmington Regulatory Field Office, c/o Mrs. Emily Hughes, 69 Darlington Avenue, Wilmington, North Carolina 28403, and by telephone at: 910-251-4635. The Permittee shall reference the following permit number, SAW-2011-00624, on all submittals.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Orton Plantation Holdings, LLC	File Number: 2011-00624	Date: 11/09/2012
Attached is:		See Section below
X	**INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)**	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Emily B. Hughes, Regulatory Specialist U.S. Army Corps of Engineers, Wilmington District 69 Darlington Avenue Wilmington, North Carolina 28403-1398 Phone: (910) 251-4635	Mr. Jason Steele, Administrative Appeal Review Officer CESAD-PDO U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 10M15 Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

DIVISION ENGINEER:
Commander
U.S. Army Engineer Division, South Atlantic
60 Forsyth Street, Room 9M15
Atlanta, Georgia 30303-3490

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Chuck Wakild, P.E.
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

North Carolina Division of Water Quality
401 Water Quality Certification
Summary of Permitted Impacts and Mitigation Requirements

In accordance with 15A NCAC 2H.0500, Mr. Peter Talty and Orton Plantation Holdings, LLC, have After-the-Fact permission to fill or otherwise impact 286.47 acres of 404/wetlands (2.41 acres of 404/wetland freshwater permanent impact and 0.16 acres 404/wetland coastal wetland permanent impact, and 283.9 acres of temporary remaining rice field impacts), to rehabilitate the historic extent of the Orton Plantation rice fields at the site, which is located along the east side of Plantation Road SE, off NC Highway 133, northeast of the City of Southport, Brunswick County, North Carolina. All activities associated with these authorized impacts must be conducted with the conditions listed in the attached Permit transmittal letter. THIS CERTIFICATION IS NOT VALID WITHOUT THE ATTACHMENTS.

COMPENSATORY MITIGATION REQUIREMENTS, ECOSYSTEM ENHANCEMENT PROGRAM

EEP Project Name:	Orton Plantation
DWQ PROJECT #:	20110896
LOCATION:	Near Southport
COUNTY	Brunswick
BASIN/ SUB BASIN	Cape Fear/03030005

As required by 15A NCAC 2H.0500, and the conditions of this Certification, you are required to compensate for the above mitigable impacts through the restoration, creation, enhancement or preservation of wetlands, surface waters and riparian buffers as outlined below prior to conducting any activities that impact or degrade the waters of the state.

Note: Acreage requirements proposed to be mitigated through the Ecosystem Enhancement Program must be rounded to one-quarter acre increments and linear foot requirements must be rounded up to the nearest foot according to 15 2R.0503(b).

Impacts	Mitigation
2.41 Acres Of Freshwater 404 Wetlands	2.41 Acres Of Freshwater 404 Wetlands
0.16 Acres Of Coastal 404 Wetlands	0.16 Acres Of Coastal 404 Wetlands

One of the options you have available to satisfy the compensatory mitigation requirement is through the payment of a fee to the Wetlands Restoration Fund per NCAC 2R.0503. If you choose this option, please sign this form and mail the form along with a copy of your 401 Certification or Buffer Approval to the Ecosystem Enhancement Program at the address below. An invoice for the appropriate amount of payment will be sent to you upon receipt of this form. PLEASE NOTE, THE ABOVE IMPACTS ARE NOT AUTHORIZED UNTIL YOU RECEIVE NOTIFICATION THAT YOUR PAYMENT HAS BEEN PROCESSED BY THE ECOSYTEM ENHANCMENT PROGRAM.

Signature _____ Date _____

ECOSYSTEM ENHANCEMENT PROGRAM
1652 Mail Service Center
RALEIGH, N.C. 27699-1652
(919) 716-1921

Filename: 110896OrtonPlantation(Brunswick)401_IC_EEP

Wetlands Buffers Stormwater Compliance and Permitting Unit 1WaBSCaPer
1650 Mail Service Center Raleigh North Carolina 27699-1650
Phone: 919-807-6300 FAX: 919-807-6494
Internet: http://portal.ncdenr.org/web/wq/ws
An Equal Opportunity Affirmative Action Employer

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Chuck Wakild, P.E.
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

August 21, 2012

Orton Plantation Holdings, LLC
17th Floor, 1251 Avenue of the Americas
NY, NY 10020

Re: **Orton Plantation**
Brunswick County
DWQ #20110896; USACE Action ID. No. SAW-2011-00624
Ut to Orton Creek [030617-18-86-C, SW]

APPROVAL of 401 Water Quality Certification with Additional Conditions
AFTER-THE-FACT - REVISED

Dear Sir or Madam:

Attached hereto is a copy of Certification No. 3933 issued to Orton Plantation Holdings, LLC, dated August 21, 2012. **This Certification replaces the Certification issued on July 13, 2012.** In addition, you should get any other federal, state or local permits before you go ahead with your project including (but not limited to) Solid Waste, Sediment and Erosion Control, Stormwater, Dam Safety, Non-discharge and Water Supply Watershed regulations.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,
Karen Higgins
for Charles Wakild, P.E.

CW/kah/*ijm*

Attachments: Certificate of Completion
NCDWQ 401 WQC Summary of Permanent Impacts and Mitigation Requirements

cc: Jeff Garnett, EPA, Sam Nunn Federal Center, 61 Forsyth Street SW, Atlanta, GA 30303
Emily Hughes, USACE Wilmington Regulatory Field Office
Chad Coburn, DWQ Wilmington Regional Office
DLR, Wilmington Regional Office
File Copy
Kim Williams, LMG, Inc., P.O. Box 2522, Wilmington, NC 28402

Filename: 110896OrtonPlantation(Brunswick)401_IC_Revised

Wetland & Stormwater Branch 401 & Buffer Permitting Unit (WeBS PeU)
Mail Service Center 1617 Mail Service Center Raleigh, North Carolina 27699-1617
Phone: 919 807 6300 FAX: 919 807 6494
Internet: http://portal.ncdenr.org/web/wq/ps
An Equal Opportunity \ Affirmative Action Employer

RECEIVED
AUG 27 2012
REG WILM. FLD. OFC

NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (the "Division") Regulations in 15 NCAC 2H, Section .0500, to Orton Plantation Holdings, LLC, who have After-the-Fact permission to fill or otherwise impact 286.47 acres of 404/wetlands (2.41 acres of 404/wetland freshwater permanent impact and 0.16 acres 404/wetland coastal wetland permanent impact, and 283.9 acres of temporary remaining rice field impacts), to rehabilitate the historic extent of the Orton Plantation rice fields at the site, which is located along the east side of Plantation Road SE, off NC Highway 133, northeast of the City of Southport, Brunswick County, North Carolina, pursuant to an application dated October 5, 2011, and received by the Division on May 16, 2012, with additional information received on November 23, 2011, May 14, 2012, June 29, 2012, July 12, 2012, and August 6, 2012, and by Public Notice issued by the USACE on October 5, 2011, and received by the DWQ on October 5, 2011.

The application and supporting documentation provides adequate assurance that the proposed work will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application, the supporting documentation, and conditions hereinafter set forth.

This approval is for the purpose and design submitted in the application materials and as described in the Public Notice. If the project is changed, prior to notification a new application for a new Certification is required. If the property is sold, the new owner must be given a copy of the Certification and approval letter and is thereby responsible for complying with all conditions of this Certification. Any new owner must notify the Division and request the Certification be issued in their name. Should wetland or stream fill be requested in the future, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). If any plan revisions from the approved site plan result in a change in stream or wetland impact or an increase in impervious surfaces, the DWQ shall be notified in writing and a new application for 401 Certification may be required. For this approval to be valid, compliance with the conditions listed below is required.

Conditions of Certification:

1. Impacts Approved

The following impacts are hereby approved as long as all of the other specific and general conditions of this Certification (or Isolated Wetland Permit) are met. No other impacts to wetlands, streams, and/or buffers, are approved including incidental impacts:

Type of Wetland	Amount Approved (Units)	Plan Location or Reference

404/Wetlands	286.47 [(acres) of 404/wetland (2.41 acres of 404/wetland freshwater permanent impact and 0.16 acres 404/wetland coastal wetland permanent impact, and 283.9 acres of temporary remaining rice field impacts)]	Application and Public Notice and email with maps C0-1, Rice Field Exclusion Area, and Figure 7 – Proposed Repair Areas and Field Access Points received 7/12/2012

Sediment and Erosion Control:

2. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:

   a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual.*
   b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual.* The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
   c. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

3. No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the footprint of the impacts depicted in the 404/401Permit Application. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control Best Management Practices, shall be performed so that no violations of state water quality standards, statutes, or rules occur;

4. Sediment and erosion control measures shall not be placed in wetlands or waters without prior approval from the Division. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and down stream of the above structures. All sediment and erosion control devices shall be removed and the natural grade restored within two (2) months of the date that the Division of Land Resources or locally delegated program has released the project;

5. Wetland Demarcation - As per the CAMA Permit, "The alignment of the permitted bulkhead shall be staked by the permittee and approved on site by a Division of Coastal Management representative prior to initiation of construction." DWQ will rely on this DCM inspection for the salt marsh/river impacts. With respect to the freshwater wetland

fill, DWQ will explicitly allow staking with flagging since there will be additional work in the wetlands to prepare them for rice planting.

Continuing Compliance:

6. Orton Plantation Holdings, LLC shall conduct construction activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with section 303(d) of the Clean Water Act) and any other appropriate requirements of State law and federal law. If the Division determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the Division may reevaluate and modify this Certification to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 2H.0507(d). Before modifying the Certification, the Division shall notify Orton Plantation Holdings, LLC, and the US Army Corps of Engineers, provide public notice in accordance with 15A NCAC 2H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 2H.0504. Any new or revised conditions shall be provided to Orton Plantation Holdings, LLC in writing, shall be provided to the United States Army Corps of Engineers for reference in any Permit issued pursuant to Section 404 of the Clean Water Act, and shall also become conditions of the 404 Permit for the project;

7. Construction Stormwater Permit NCG010000

   The proposed project has been determined by the Division of Land Resources (DLR) to be exempt from the provisions of the Sedimentation Pollution Control Act. If an Erosion and Sedimentation Control Plan (Plan) is required by Division of Land Resources (DLR) for this project, an NPDES General stormwater permit (NCG010000) administered by DWQ is also required. Upon the approval of a Plan, the NCG010000 is automatically issued. The General Permit allows stormwater to be discharged during land disturbing construction activities as stipulated by conditions in the permit. If your project is covered by this permit, full compliance with permit conditions including the sedimentation control plan, self-monitoring, record keeping and reporting requirements are required. A copy of this permit and monitoring report forms may be found at: http://portal.ncdenr.org/c/document_library/get_file?uuid=d15e7ee8-cb50-443f-9dcf-049b001337ac&groupId=38364 ;

8. Mitigation:

   Mitigation must be provided for the proposed impacts as specified in the table below. We understand that you wish to make a payment to the Stream Restoration Fund administered by the NC Ecosystem Enhancement Program (EEP) to meet this mitigation requirement. This has been determined by the DIVISION to be a suitable method to meet the mitigation requirement. **Until the EEP receives and clears your check (made payable to: DENR – Ecosystem Enhancement Program Office), no impacts specified in this**

Authorization Certificate shall occur. The EEP should be contacted at (919) 716-1921 if you have any questions concerning payment into a restoration fund. You have 60 days from the date of this approval to make this payment. **For accounting purposes, this Authorization Certificate authorizes payment into the Stream Restoration Fund to meet the following compensatory mitigation requirement:**

Type of Impact	Compensatory Mitigation Required	River and Sub-basin Number
404/Wetlands	2.41 (acres) – freshwater wetlands	Cape Fear03030005
404/Wetlands	0.16 (acres) – coastal wetlands	Cape Fear03030005

Re-opener Clause

9. Orton Plantation Holdings, LLC, and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with section 303(d) of the Clean Water Act) and any other appropriate requirements of State law and federal law. Orton Plantation Holdings, LLC, shall require its contractors (and/or agents) to comply with all of the terms of this Certification, and shall provide each of its contractors (and/or agents) a copy of this Certification. A copy of this Certification shall be included in the construction contract and available on the job site at all times. If DWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, DWQ may reevaluate and modify this certification to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 02H.0507(d). Before modifying the certification, DWQ shall notify Orton Plantation Holdings, LLC, and the US Army Corps of Engineers, provide public notice in accordance with 15A NCAC 02H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 02H.0504. Any new or revised conditions shall be provided to Orton Plantation Holdings, LLC, in writing, shall be provided to the United States Army Corps of Engineers for reference in any permit issued pursuant to Section 404 of the Clean Water Act, and shall also become conditions of the 404 Permit for the project.

10. Please be aware that by having impacted waters without first applying for and securing the issuance of a 401 Water Quality Certification, you have violated Title 15A of the North Carolina Administrative Code (NCAC) 2H .0500. Title 15A NCAC 2H .0500 requires certifications pursuant to Section 401 of the Clean Water Act whenever construction or operation of facilities will result in a discharge into navigable waters, including wetlands, as described in 33 Code of Federal Regulations (CFR) Part 323. It also states any person desiring issuance of the State certification or coverage under a general certification required by Section 401 of the Federal Water Pollution Control Act shall file with the Director of the North Carolina Division of Water Quality. **Pursuant to G.S. 143-215.6A, these violations and any future violations are subject to a civil penalty assessment of up to a maximum of $25,000.00 per day for each violation**.

11. Certificate of Completion

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return the attached certificate of completion to the Wetlands, Buffers, Stormwater, Compliance and Permitting Unit (WeBSCaPe), North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1650.

Also, this approval to proceed with your proposed impacts or to conduct impacts to waters as depicted in your application shall expire upon expiration of the 404 or CAMA Permit. If this Certification is unacceptable to you, you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This the 21st day of August 2012
DIVISION OF WATER QUALITY
Karen Higgins
for Charles Wakild, P.E.

3933
CW/kah/*ijm*

Permit Class
NEW

Permit Number
83-12

STATE OF NORTH CAROLINA
Department of Environment and Natural Resources
and
Coastal Resources Commission

RECEIVED
JUL 20 2012
REG. WILM. FLD. OFF.

Permit

for

X Major Development in an Area of Environmental Concern pursuant to NCGS 113A-118

X Excavation and/or filling pursuant to NCGS 113-229

Issued to **Orton Plantation Holdings, LLC, 17th Floor, 1251 Avenue of Americas, New York, NY 10020**

Authorizing development in Brunswick County at Orton Creek, 9149 Orton Road SE, Winnabow, as requested in the permittee's application dated 5/1/12, including the attached workplan drawings (30), Sheets 1-15 of 15 dated revised 4/10/12, C0-1 & C1-C5 dated 10/12/11 and C6-C14 dated 6/1/11

This permit, issued on **July 17, 2012**, is subject to compliance with the application (where consistent with the permit), all applicable regulations, special conditions and notes set forth below. Any violation of these terms may be subject to fines, imprisonment or civil action; or may cause the permit to be null and void.

Rice Field Restoration and Protection

1) Unless specifically altered herein, this permit authorizes the grading and other land disturbing activities associated with the repair and the replacement of the dike system, the repair or replacement of the water control structures, and the overall reversion to rice fields, all as expressly and specifically set forth in the attached permit application and workplan drawings. Any additional land disturbing activities and/or construction may require a modification of this permit. Contact a Division of Coastal Management representative at (910) 796-7215 for this determination.

(See attached sheets for Additional Conditions)

This permit action may be appealed by the permittee or other qualified persons within twenty (20) days of the issuing date. An appeal requires resolution prior to work initiation or continuance as the case may be.

This permit must be accessible on-site to Department personnel when the project is inspected for compliance.

Any maintenance work or project modification not covered hereunder requires further Division approval.

All work must cease when the permit expires on

December 31, 2015

In issuing this permit, the State of North Carolina agrees that your project is consistent with the North Carolina Coastal Management Program.

Signed by the authority of the Secretary of DENR and the Chairman of the Coastal Resources Commission.

David V Hugget

for Braxton C. Davis, Director
Division of Coastal Management

This permit and its conditions are hereby accepted.

Signature of Permittee

ADDITIONAL CONDITIONS

RipRap for Shoreline and Wetland Protection

2) Unless specifically altered herein, the alignment and design of the authorized riprap structures shall adhere to the alignments and designs depicted on the attached workplan drawings.

3) The alignment of the permitted bulkhead shall be staked by the permittee and approved on site by a Division of Coastal Management representative prior to initiation of construction.

4) The riprap material shall be free from loose dirt or any pollutant. It shall be of a size sufficient to prevent its movement from the approved alignment by wave or current action.

5) The riprap material shall consist of clean rock or masonry materials such as but not limited to granite, marl or broken concrete.

6) The riprap shall consist of clean rock or masonry materials such as but not limited to granite, marl, or broken concrete.

7) The riprap material shall be free from loose dirt or any pollutant. It shall be of a size sufficient to prevent its movement from the approved alignment by wave or current action.

8) If the crossing of wetlands with mechanized or non-mechanized equipment is necessary, temporary construction mats shall be utilized for the areas to be crossed. The temporary mats shall be removed immediately upon completion of the construction of the riprap structure.

Rice Trunk Replacement Bulkheads

9) The authorized Rice Trunk replacement bulkheads shall adhere to the alignment depicted on the attached workplan drawings.

10) The Rice Trunk replacement bulkheads shall be constructed prior to any backfilling activities.

11) The temporary placement or double handling of fill materials within waters or vegetated wetlands is not authorized.

12) The Rice Trunk replacement bulkheads shall be structurally tight so as to prevent seepage of backfill materials through the structure.

13) The Rice Trunk replacement bulkheads shall be solid and constructed of treated wood, concrete slabs, metal or vinyl sheet piles, or other suitable materials approved by Division personnel.

14) All backfill material shall be clean and free of any pollutants except in trace quantities.

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JUL 13 2012
DCM WILMINGTON, NC

RECEIVED
JUL 20 2012
REG WILM

ADDITIONAL CONDITIONS

Cultural Resource Protection

15) Proposed plans indicate that identified magnetic anomalies and acoustic targets #1 and #11 will be impacted by construction. It is unclear whether these anomalies and targets are, which appear to be sections of remnant wooden bulkheads, are potentially significant. Additional documentation for temporal association and construction details shall be undertaken by the Permitee and submitted the State Historic Preservation Office (HPO/OSA), prior to stabilization work commencing in these areas.

16) The near shore remote sensing survey performed by the permittee identified numerous magnetic anomalies and acoustic targets deemed to be potentially significant submerged cultural resources. These targets, grouped into eleven (11) cultural buffer zones, should be avoided during any construction activity. The shoreline stabilization plans indicate that the proposed work can avoid these buffer zones. Thus, additional documentation of the buffer areas is not required at this time. However, if construction plans change to make avoidance of the buffer areas impossible, additional archaeological investigations shall be carried out to determine the significance of the submerged resources. If the resources are determined to be eligible for listing in the National Register of Historic Places, a data recovery plan shall be developed in consultation with the HPO/OSA and undertaken by the Permitee.

17) With regard to the repair, rebuilding, and/or replacement of the associated water control structures and the reversion of the existing fields to rice production, care should be taken to repair, rebuild, and/or replace any such structures in-kind. If any archaeological remains are encountered during construction, all work should stop in the area of the remains and the HPO/OSA immediately contacted so that it may determine the significance of the remains and their appropriate treatment.

18) Prior to any work being carried out under this permit, views to and from the house and at various points along the dike system shall be photographically documented and submitted to the HPO/OSA so that there is a record of the current conditions. Guidelines for digital photographic recordation may be found at: http://www.hpo.ncdcr.gov/digital/NCHPO_Digital_Photo_Policy-11-08.html

NOTE: The introduction of any new water control structures such as new culverted-crossings or field access points will require a separate review by the HPO/OSA to ensure the integrity of the historic landscape.

Sedimentation and Erosion Control

19) In order to protect water quality, runoff from construction shall not visibly increase the amount of suspended sediments in adjacent waters.

20) A ground cover sufficient to restrain erosion shall be provided within 30 calendar days of completion of any phase of grading on cut or filled slopes. At a minimum, a silt fence shall be properly installed immediately landward of the top of the Rice Trunk replacement bulkheads immediately following completion of backfilling activities.

ADDITIONAL CONDITIONS

General

21) Prior to the initiation of any activities requiring a Water Quality Certification, the permittee must obtain the required Water Quality Certification, and a copy provided to DCM prior to construction.

NOTE: Should coordination with the Army Corps of Engineers and/or the Division of Water Quality result in alterations to the project design approved by this CAMA Permit, additional authorization from the Division may be required.

22) The permittee understands and agrees that, if future operations by the United States requires the removal, relocation, or other alteration of the structure or work authorized by this permit, or if in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate or alter the work or obstructions caused thereby, without expense to the United States or the state of North Carolina. No claim shall be made against the United States or the state of North Carolina on account of any such removal or alteration.

23) No wetlands shall be excavated or filled, even temporarily, outside of the areas indicated on the attached workplan drawings.

24) This permit shall not be assigned, transferred, sold, or otherwise disposed of to a third party without the written approval of the Division of Coastal Management.

25) The permittee and/or his or her contractor shall meet with a representative of the Division prior to project initiation.

NOTE: In an effort to further enhance long term management for game and wildlife species, the permitee is encourages to develop a wildlife management plan to help guide future management decisions at Orton Plantation. The N.C. Wildlife Resources Commission has offered to assist in the development of such a plan if the permittee wished to pursue this approach. The N.C. Wildlife Resources Commission may be contacted at (910) 645-4115.

NOTE: This permit does not eliminate the need to obtain any additional state, federal or local permits, approvals or authorizations that may be required, including but not limited to a 401 Water Quality Certification from the Division of Water Quality.

NOTE: Future development of the permittee's property may require a modification of this permit. Contact a representative of the Division at (910) 796-7215 prior to the commencement of any such activity for this determination.

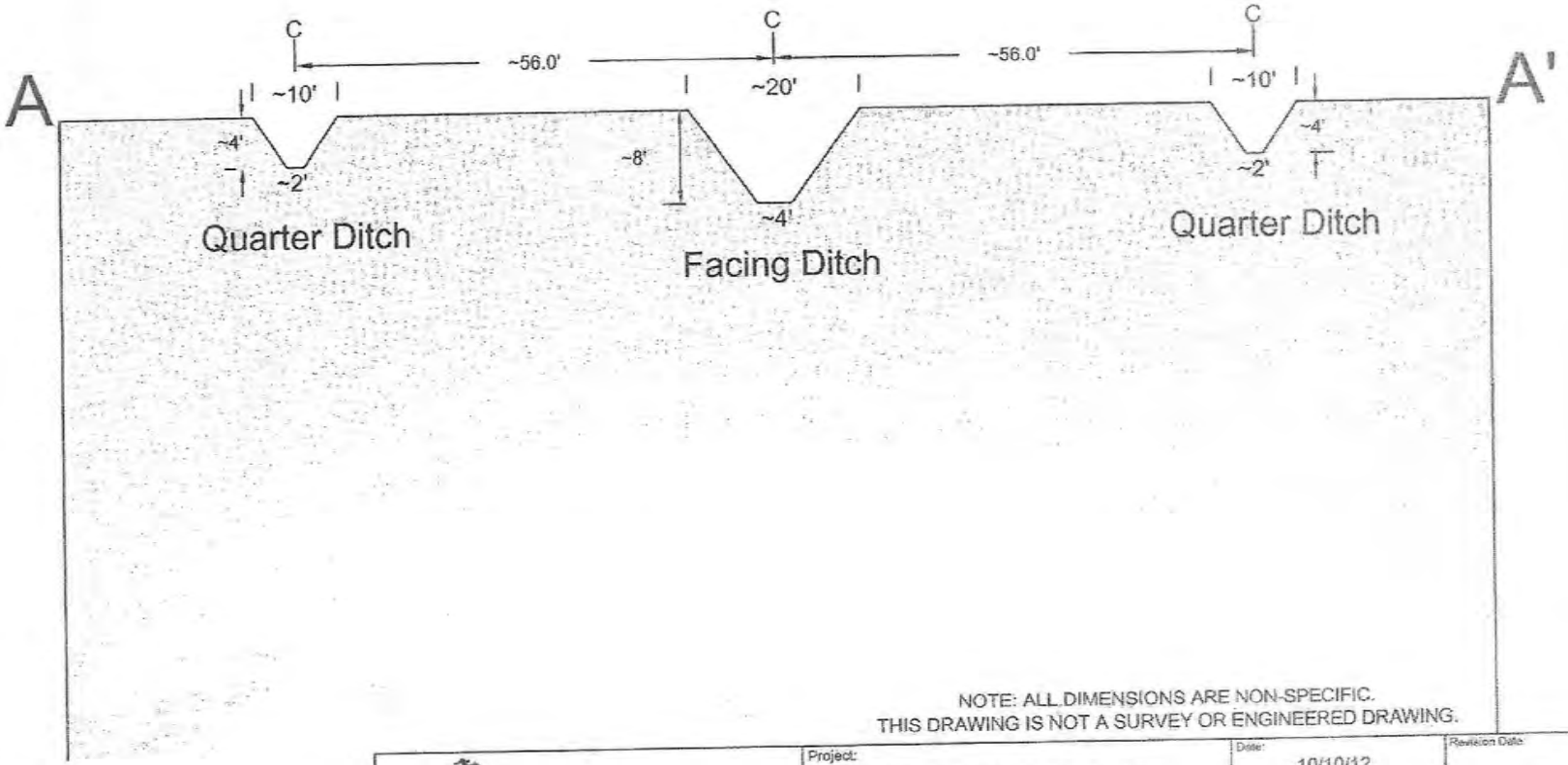
RECEIVED
DCM WILM

Attachment A


Orton Plantation
Rice Field Exclusion Areas (revised 5/31/12)
(A, B, C, D, E) = 46.8 acres
A
3.7 acres
B
1.1 acres
C
4.5 acres
E
4.1 acres
D
33.4 acres
LEGEND
Avoidance and Minimization
Upland
Rice Field Boundary
0 300 600 1200
Original Survey Information Provided By:
Survey One, PLLC.
109 Mishoe Rd.
Leland, NC 28429
NOTE: THIS DRAWING IS NOT A SURVEY OR ENGINEERED DRAWING.
FOR ENVIRONMENTAL PERMITTING ONLY.
LMG
LAND MANAGEMENT GROUP inc.
Post Office Box 2622
Wilmington, North Carolina 28402
Telephone: 910-452-0081
Project:
Orton Plantation Holdings, LLC
Title:
Rice Field Exclusion Areas
Date:
04/10/12
Revision Date:
05/31/12
Scale:
1"=600'
Job Number:
02-16-116C
Drawn By:
VLJ
Sheet Number:
1 of 2

Attachment B

Typical Ditch Cross Section



NOTE: ALL DIMENSIONS ARE NON-SPECIFIC.
THIS DRAWING IS NOT A SURVEY OR ENGINEERED DRAWING.

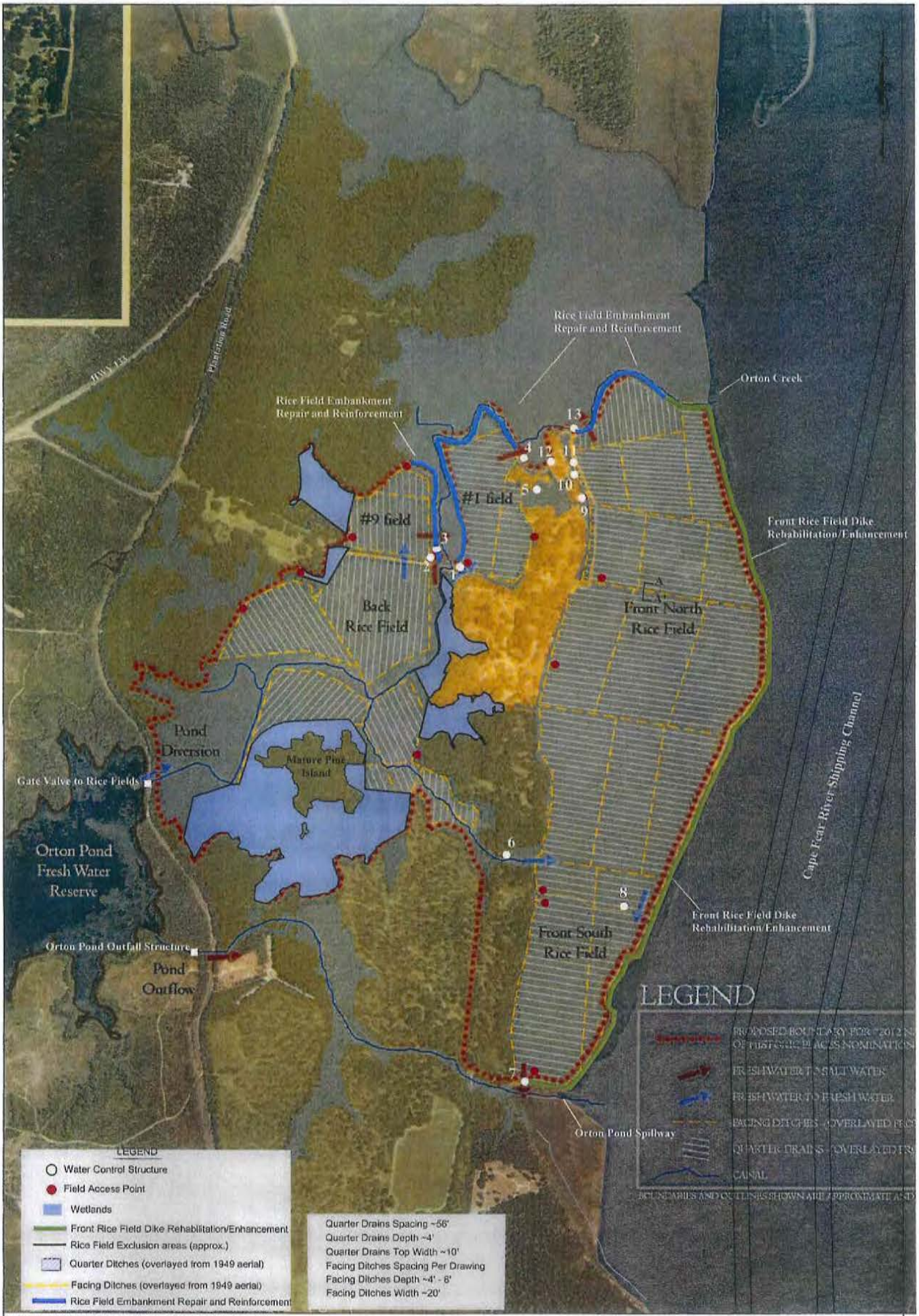
0 10 20 40

LMG
LAND MANAGEMENT GROUP inc.
Environmental Consultants
Post Office Box 2522
Wilmington, North Carolina 28402
Telephone: 910-452-0001

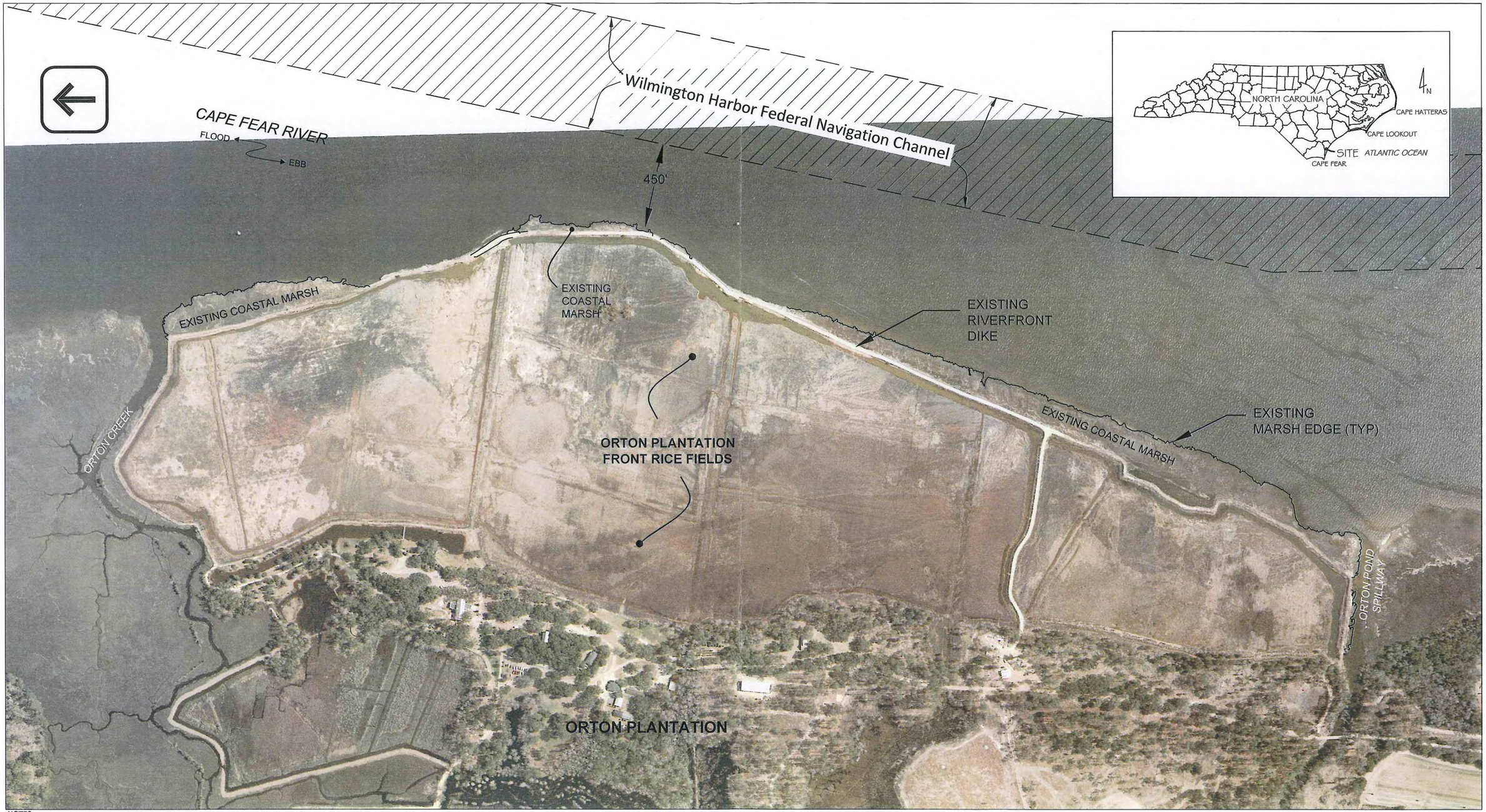
Project: Orton Plantation Holdings, LLC		Date: 10/10/12	Revision Date:
		Scale: 1"=20'	Job Number: 02-10-110C
Title: Ditch Cross Section (Typical)		Drawn By: VLJ	Sheet Number: NA

L:\CAMA\2010 CAMA FILES\02-10-110C --- Orton-Belvedere CAMA Peter Tally\ACAD\orton summary 9-25vlj.dwg

Attachment C


Rice Field Embankment Repair and Reinforcement
Orton Creek
Rice Field Embankment Repair and Reinforcement
#1 field
#9 field
Front Rice Field Dike Rehabilitation/Enhancement
Back Rice Field
Front North Rice Field
Pond Diversion
Mature Pine Island
Gate Valve to Rice Fields
Cape Fear River Shipping Channel
Orton Pond Fresh Water Reserve
Front Rice Field Dike Rehabilitation/Enhancement
Front South Rice Field
Orton Pond Outfall Structure
Pond Outflow
Orton Pond Spillway
LEGEND
Water Control Structure
Field Access Point
Wetlands
Front Rice Field Dike Rehabilitation/Enhancement
Rice Field Exclusion areas (approx.)
Quarter Ditches (overlayed from 1949 aerial)
Facing Ditches (overlayed from 1949 aerial)
Rice Field Embankment Repair and Reinforcement
Quarter Drains Spacing ~56'
Quarter Drains Depth ~4'
Quarter Drains Top Width ~10'
Facing Ditches Spacing Per Drawing
Facing Ditches Depth ~4' - 6'
Facing Ditches Width ~20'
LEGEND
FRESHWATER TO SALT WATER
FRESHWATER TO FRESH WATER
CANAL
THIS IS A COMPOSITE DRAWING AND SHOULD NOT BE USED FOR SPECIFIC LOCATIONAL INFORMATION. REFERENCE SHOULD BE MADE TO DRAWINGS SUBMITTED WITH THE APPLICATION.
EXISTING DITCHES WITHIN THE RICE FIELD EXCLUSION AREAS ARE NOT SHOWN.
0 400 800 1600
Original Survey Information Provided By: Survey One, PLLC. 109 Mishoe Rd. Leland, NC 28428
NOTE: THIS DRAWING IS NOT A SURVEY OR ENGINEERED DRAWING.
LMG LAND MANAGEMENT GROUP inc. Environmental Consultants Post Office Box 2522 Wilmington, North Carolina 28402 Telephone: 910-452-0001
Project: Orton Plantation Holdings, LLC
Title: Composite Drawing
Date: 9/10/12
Revision Date: 10/10/12
Scale: 1"=800'
Job Number: 02-10-110C
Drawn By: KCW/VLJ
Sheet Number: NA
L:\CAMA\2010 CAMA FILES\02-10-110C --- Orton-Belvedere CAMA Peter Tally\ACAD\orton summary 9-25v6.dwg

Attachment D



NOTES:

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5) Location of "Existing Marsh Edge" and vegetation edge in rice fields estimated from July 2011 aerial photography.

PRELIMINARY CONCEPT DESIGN
FOR PURPOSES OF PERMIT ONLY
NOT FOR CONSTRUCTION

GRAPHIC SCALE

0 250 500 FT

olsen associates, inc.
2618 Herschel St.
Jacksonville, FL 32204
(904) 387-6114
(FAX) 384-7368
COA No. 1468

ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION

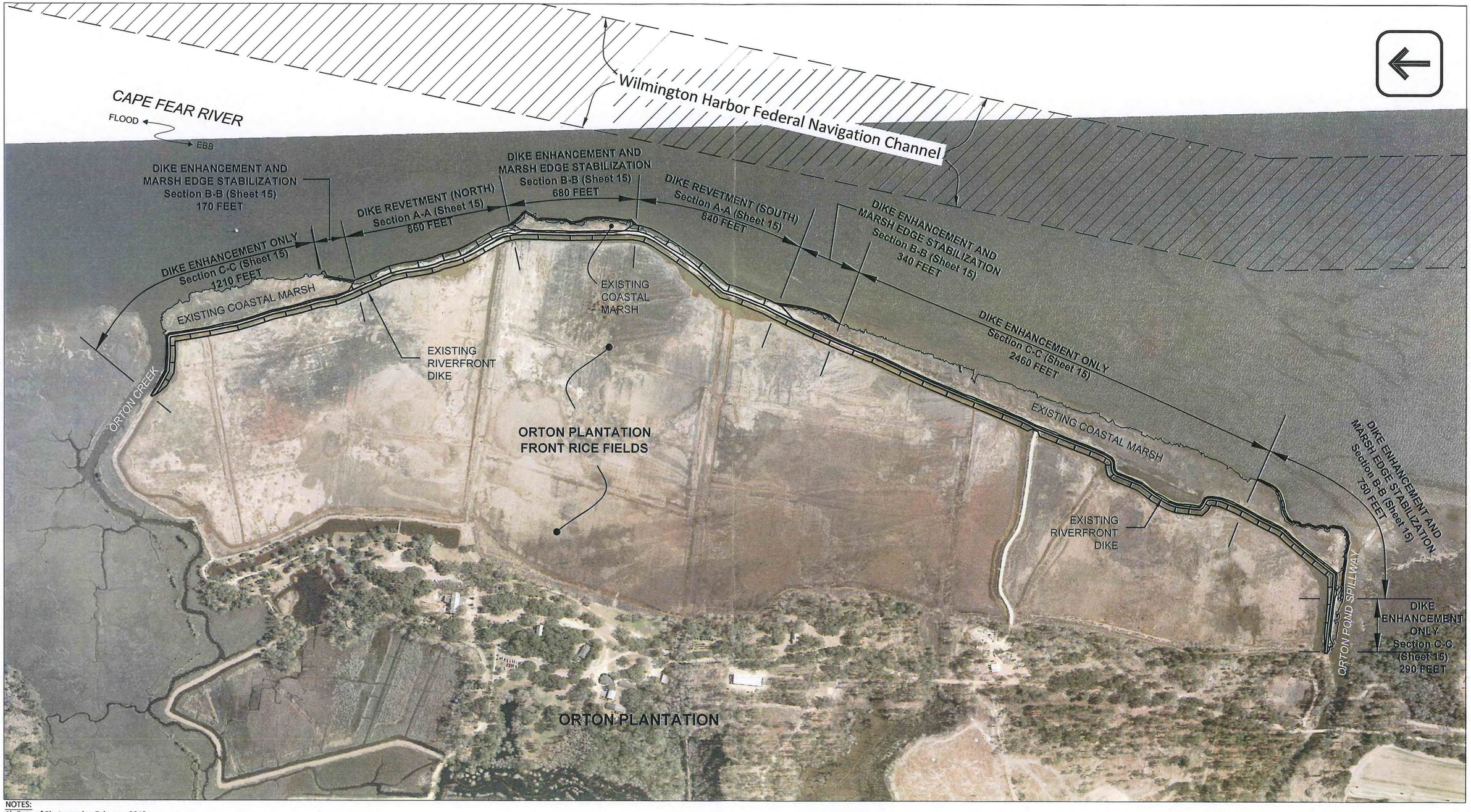
LOCATION MAP

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11

DRAWN BY: WAH

SHEET 1 OF 15



NOTES:

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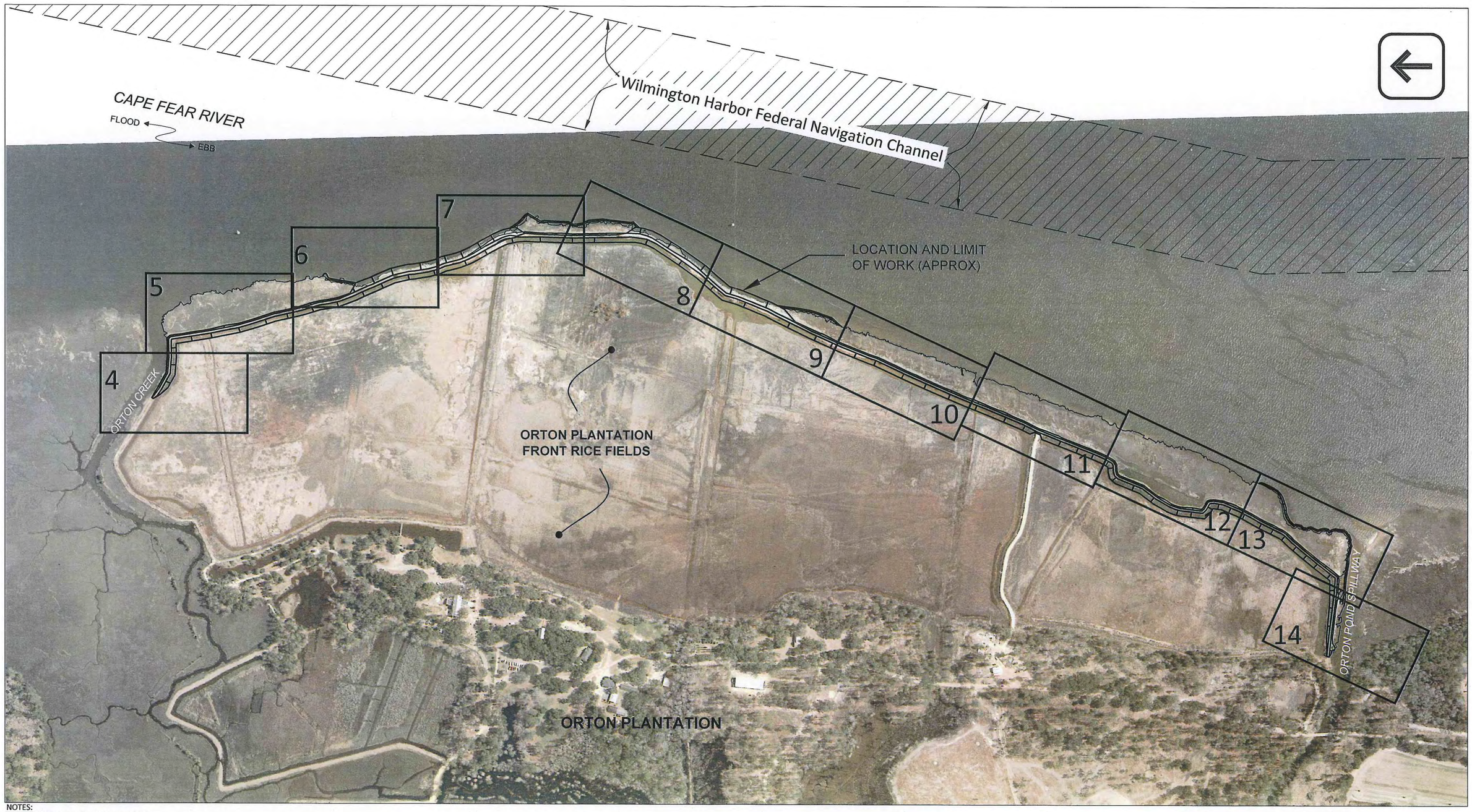
olsen associates, inc.
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Jacksonville, FL 32204
(904) 387-6114
(FAX) 384-7368
COA No. 1468

ORTON PLANTATION FRONT RICE FIELDS RIVER DIKE REHABILITATION

CONCEPT PLAN

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11
DRAWN BY: WAH
SHEET 2 OF 15



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ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION

DETAIL SHEET INDEX

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11
DRAWN BY: WAH
SHEET 3 OF 15

CONTINUES ON SHEET 5

DIKE ENHANCEMENT (TYP)

BERM SLOPE TOE (TYP)
(LOCATION MAY VARY)

APPROX. HIGH WATER LINE

APPROX. LOW WATERLINE

BERM CREST (TYP)

RAISE EXISTING
DIKE ELEVATION
(TYP)

BERM SLOPE TOE/404 &
COASTAL WETLAND BOUNDARY (TYP)
(LOCATION VARIES)

C 15

BERM CREST (TYP)

C 15

EXISTING MARSH EDGE (TYP)

ORTON CREEK

FLOOD

EBB

EXISTING RIVERFRONT DIKE

RICE FIELD CANAL (typ.)

ORTON PLANTATION
FRONT RICE FIELDS

Wetland Boundary Legend

404	
Coastal	
Approx. High Water Line	
Approx. Low Water Line	

Wetland Impact Legend

404 *(Interior)*		1.84 acres
(Riverside)		0.08 acres
404/Rice Field		0.37 acres
404/Coastal *(Revetment)*		0.15 acres
(Marsh Armor)		0.01 acres
Fresh Water		2.55 acres
Open Water *(Revetment)*		1.53 acres
(Marsh Armor)		0.47 acres

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GRAPHIC SCALE
0 25 50 FT

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COA No. 1468

ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION

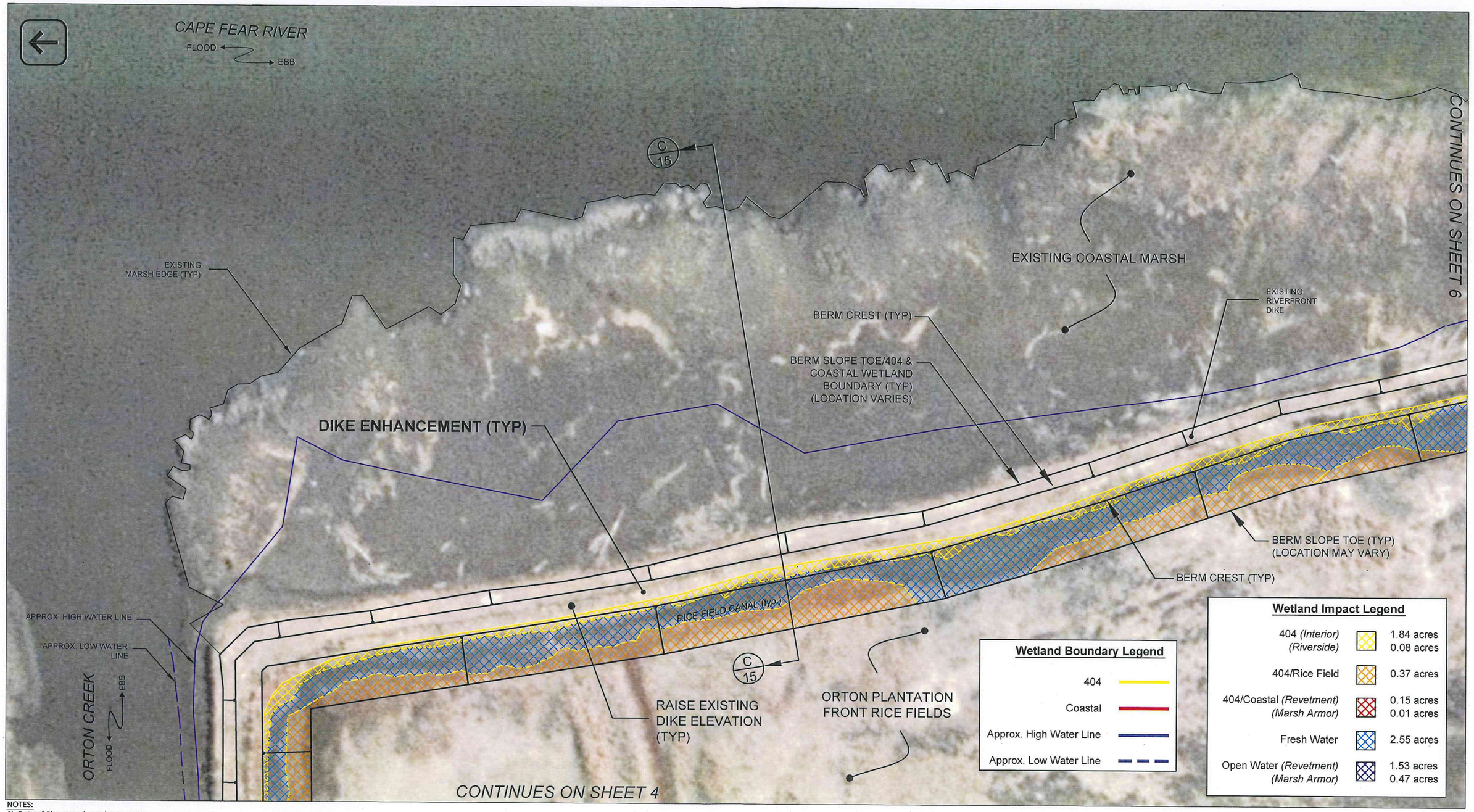
CONCEPT PLAN DETAILS

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04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11

DRAWN BY: WAH

SHEET 4 OF 15



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ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION

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03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11
DRAWN BY: WAH
SHEET 5 OF 15

CAPE FEAR RIVER

FLOOD

EBB

CONTINUES ON SHEET 5

DIKE REVETMENT TRANSITION

MARSH EDGE STABILIZATION (TYP)

EXISTING MARSH EDGE (TYP)

C/15

B/15

A/15

BERM CREST (TYP)

BERM SLOPE TOE/404 & COASTAL WETLAND BOUNDARY (TYP) (LOCATION VARIES)

EXISTING COASTAL MARSH

EXISTING BULKHEAD, TYP. (APPROX)

APPROX. HIGH WATER LINE

APPROX. LOW WATER LINE

EXISTING RIVERFRONT DIKE, TYP.

DIKE REVETMENT (NORTH)

RICE FIELD CANAL (typ.)

RAISE EXISTING DIKE ELEVATION (TYP)

ORTON PLANTATION FRONT RICE FIELDS

BERM SLOPE TOE (TYP)

BERM CREST (TYP)

DIKE ENHANCEMENT (TYP)

CONTINUES ON SHEET 7

Wetland Boundary Legend

404	
Coastal	
Approx. High Water Line	
Approx. Low Water Line	

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404 *(Interior)*		1.84 acres
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404/Rice Field		0.37 acres
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GRAPHIC SCALE

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ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION

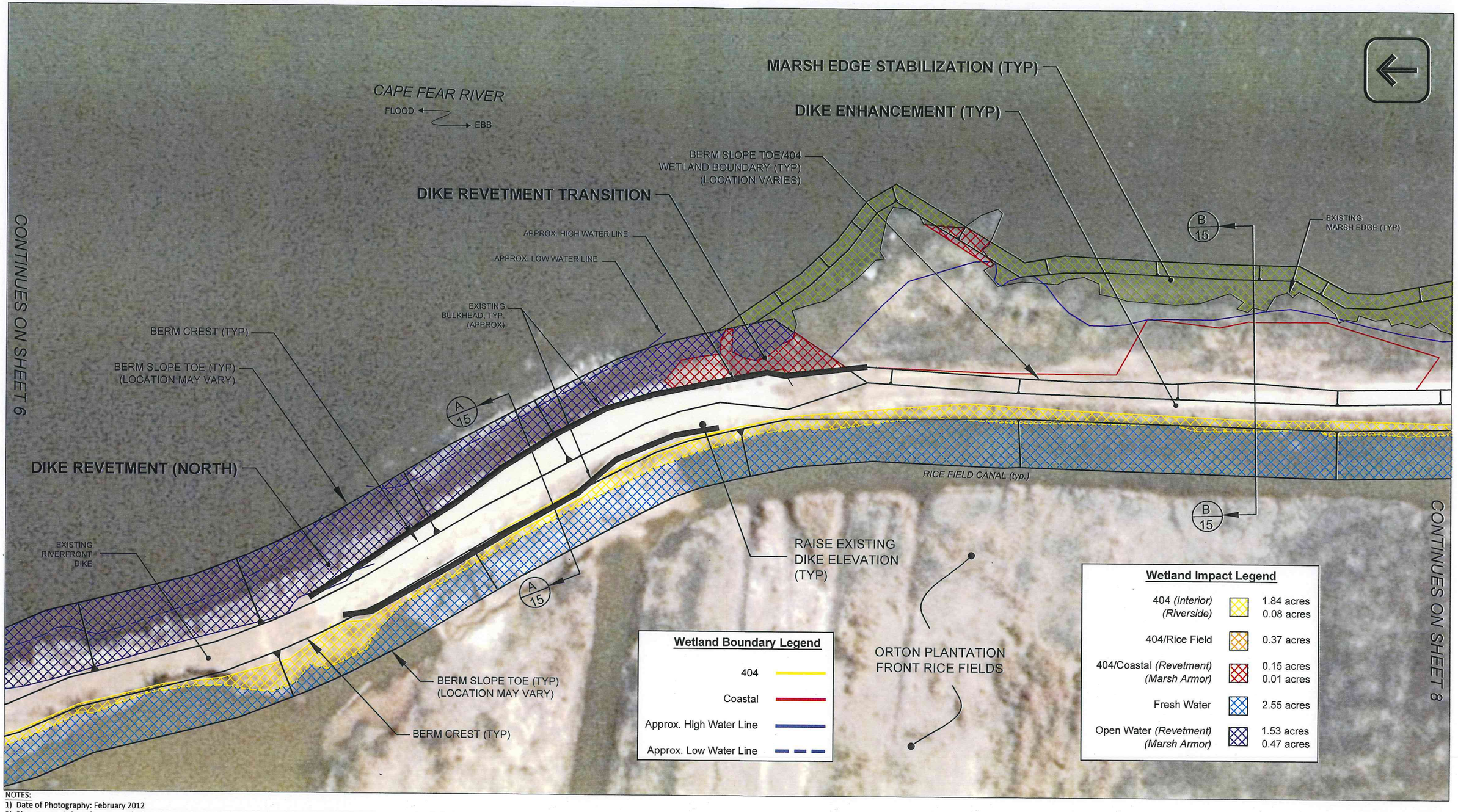
CONCEPT PLAN DETAILS

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03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11

DRAWN BY: WAH

SHEET 6 OF 15



CONTINUES ON SHEET 6

CONTINUES ON SHEET 8

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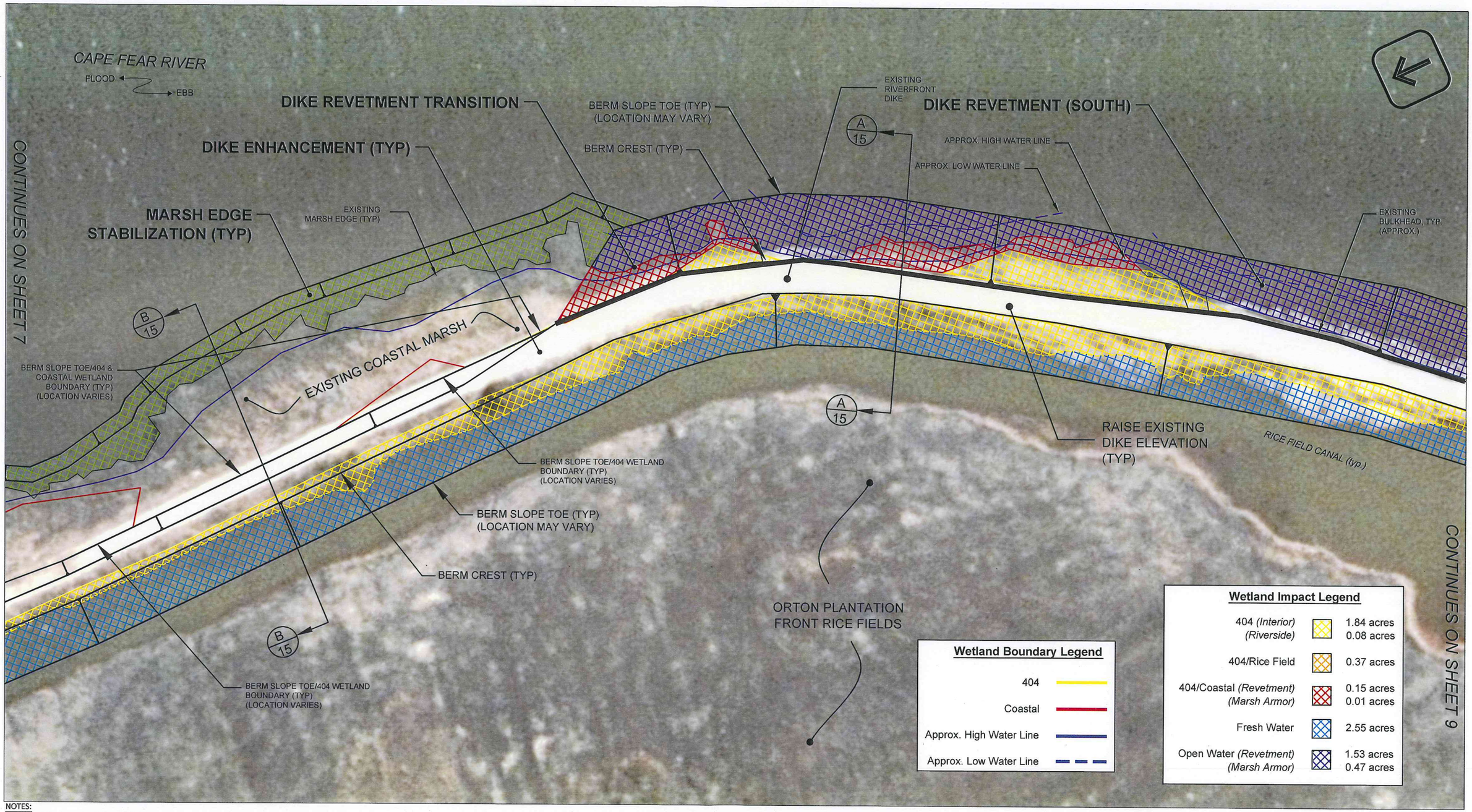
olsen associates, inc.
2618 Herschel St.
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ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION

CONCEPT PLAN DETAILS

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04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11
DRAWN BY: WAH
SHEET 7 OF 15



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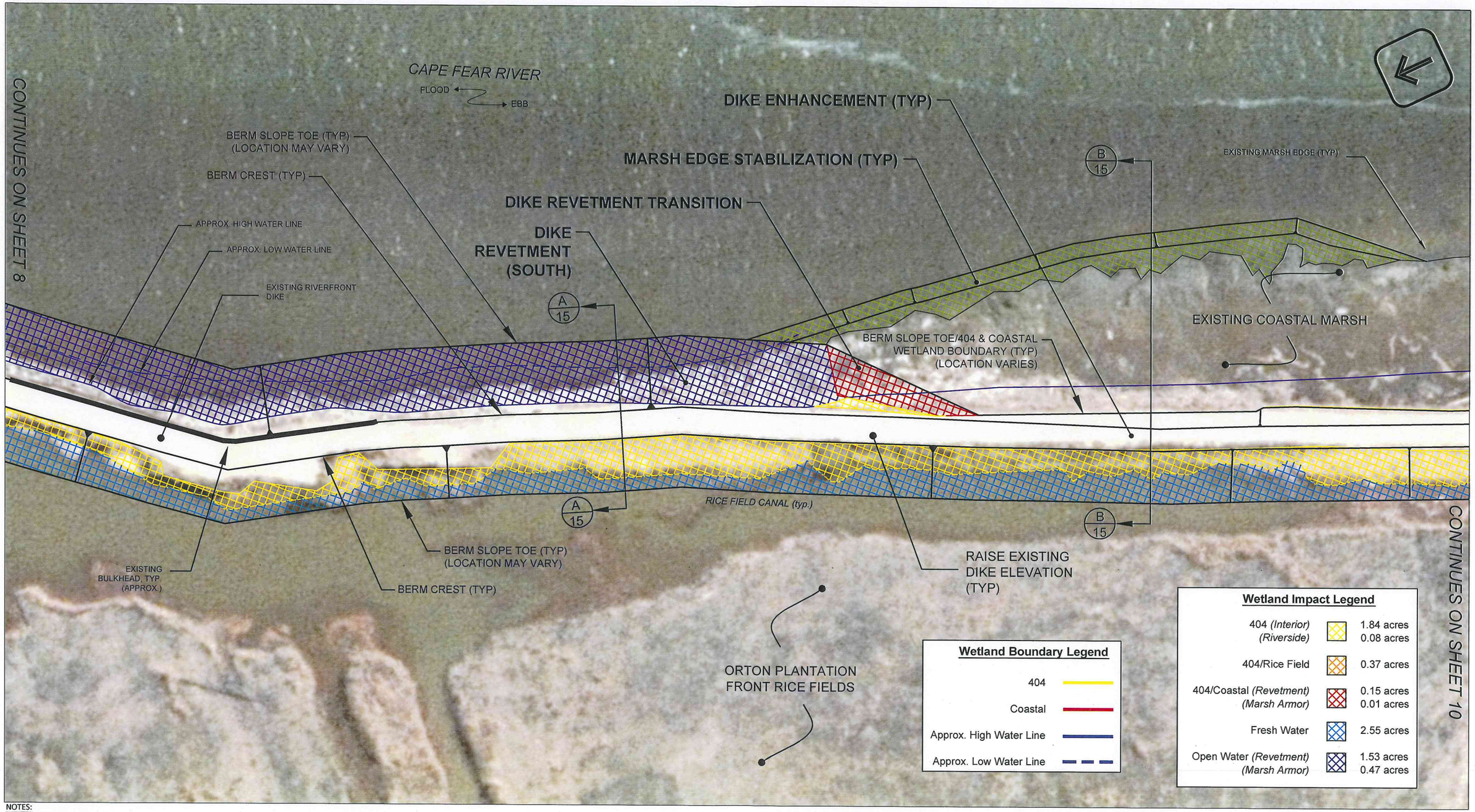
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ORTON PLANTATION FRONT RICE FIELDS RIVER DIKE REHABILITATION

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5) Location of "Existing Marsh Edge" and vegetation edge in rice fields estimated from July 2011 aerial photography.

PRELIMINARY CONCEPT DESIGN
FOR PURPOSES OF PERMIT ONLY
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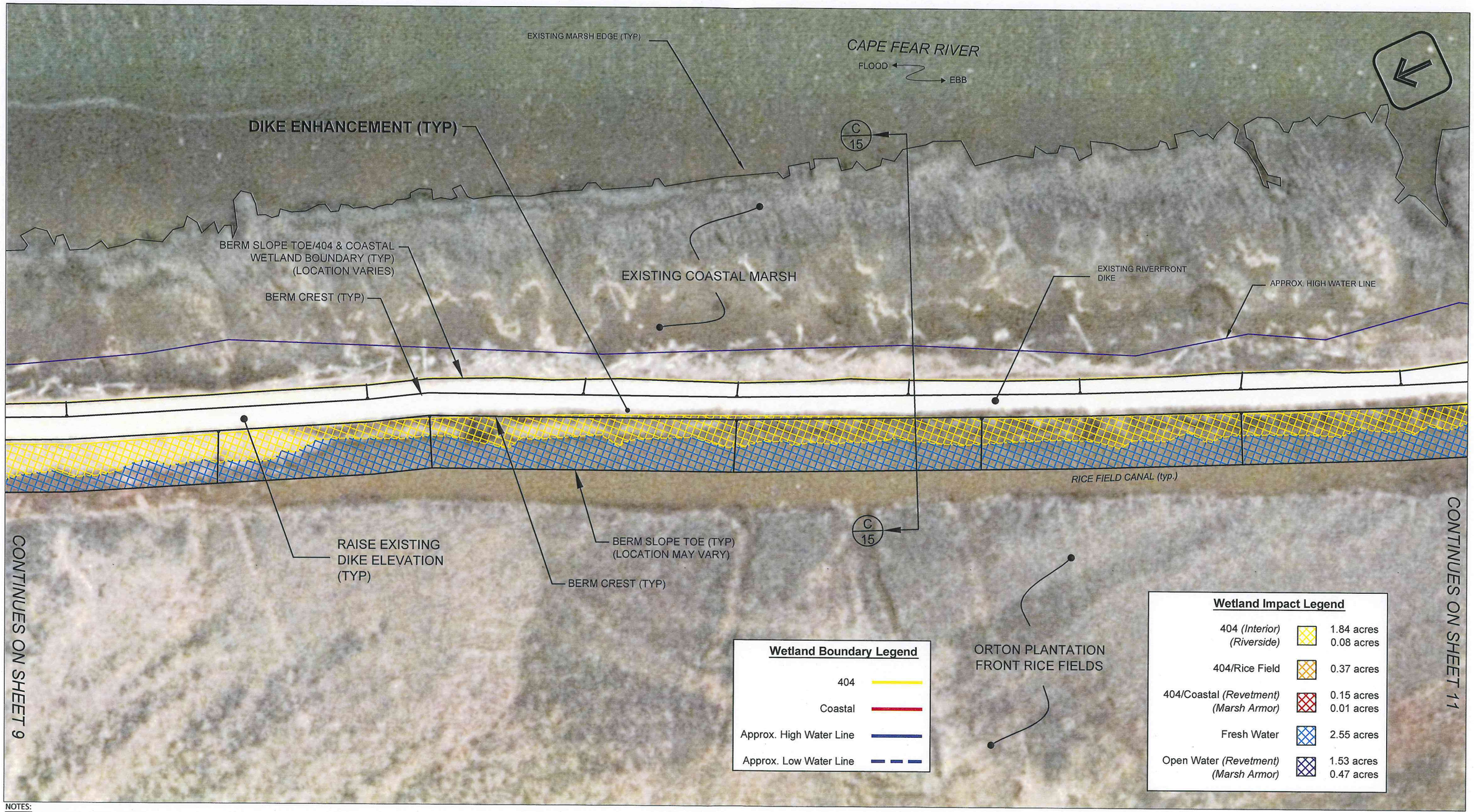
GRAPHIC SCALE
0 25 50 FT

olsen associates, inc.
2618 Herschel St.
Jacksonville, FL 32204
(904) 387-6114
(FAX) 384-7368
COA No. 1468

ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION
CONCEPT PLAN DETAILS

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11
DRAWN BY: WAH
SHEET 9 OF 15



NOTES:

1) Date of Photography: February 2012
2) Plan concept is based upon very limited topographic, hydrographic, and geotechnical survey information from a variety of sources. Additional surveys, analyses, and engineering will be required prior to final design.
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PRELIMINARY CONCEPT DESIGN
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GRAPHIC SCALE
0 25 50 FT

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(FAX) 384-7368
COA No. 1468

ORTON PLANTATION FRONT RICE FIELDS RIVER DIKE REHABILITATION

CONCEPT PLAN DETAILS

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11
DRAWN BY: WAH
SHEET 10 OF 15

CONTINUES ON SHEET 10

CAPE FEAR RIVER

FLOOD

EBB

DIKE ENHANCEMENT (TYP)

EXISTING MARSH EDGE (TYP)

C 15

Wetland Boundary Legend

- 404
- Coastal
- Approx. High Water Line
- Approx. Low Water Line

Wetland Impact Legend

404 *(Interior)*	1.84 acres
(Riverside)	0.08 acres
404/Rice Field	0.37 acres
404/Coastal *(Revetment)*	0.15 acres
(Marsh Armor)	0.01 acres
Fresh Water	2.55 acres
Open Water *(Revetment)*	1.53 acres
(Marsh Armor)	0.47 acres

EXISTING COASTAL MARSH

CONTINUES ON SHEET 12

BERM SLOPE TOE/404 & COASTAL WETLAND BOUNDARY (TYP) (LOCATION VARIES)

APPROX. HIGH WATER LINE

BERM CREST (TYP)

EXISTING RIVERFRONT DIKE

RICE FIELD CANAL (typ.)

C 15

ORTON PLANTATION FRONT RICE FIELDS

RAISE EXISTING DIKE ELEVATION (TYP)

BERM SLOPE TOE (TYP) (LOCATION MAY VARY)

BERM CREST (TYP)

NOTES:

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GRAPHIC SCALE

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ORTON PLANTATION FRONT RICE FIELDS RIVER DIKE REHABILITATION

CONCEPT PLAN DETAILS

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11

DRAWN BY: WAH

SHEET 11 OF 15

CAPE FEAR RIVER

FLOOD

EBB

C 15

EXISTING MARSH EDGE

EXISTING COASTAL MARSH

DIKE ENHANCEMENT (TYP)

APPROX. HIGH WATER LINE

APPROX. LOW WATER LINE

EXISTING RIVERFRONT DIKE

BERM SLOPE TOE/404 & COASTAL WETLAND BOUNDARY (TYP) (LOCATION VARIES)

BERM CREST (TYP)

BERM SLOPE TOE (TYP) (LOCATION MAY VARY)

BERM CREST (TYP)

RAISE EXISTING DIKE ELEVATION (TYP)

ORTON PLANTATION FRONT RICE FIELDS

C 15

RICE FIELD CANAL (typ.)

CONTINUES ON SHEET 11

CONTINUES ON SHEET 13

Wetland Boundary Legend

404	
Coastal	
Approx. High Water Line	
Approx. Low Water Line	

Wetland Impact Legend

404 *(Interior)*	1.84 acres
(Riverside)	0.08 acres
404/Rice Field	0.37 acres
404/Coastal *(Revetment)*	0.15 acres
(Marsh Armor)	0.01 acres
Fresh Water	2.55 acres
Open Water *(Revetment)*	1.53 acres
(Marsh Armor)	0.47 acres

NOTES:

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PRELIMINARY CONCEPT DESIGN
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GRAPHIC SCALE

0 25 50 FT

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COA No. 1468

ORTON PLANTATION FRONT RICE FIELDS RIVER DIKE REHABILITATION

CONCEPT PLAN DETAILS

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11

DRAWN BY: WAH

SHEET 12 OF 15

CAPE FEAR RIVER

FLOOD

EBB

EXISTING MARSH EDGE

MARSH EDGE STABILIZATION (TYP)

DIKE ENHANCEMENT (TYP)

CONTINUES ON SHEET 12

EXISTING COASTAL MARSH

B 15

RAISE EXISTING DIKE ELEVATION (TYP)

EXISTING COASTAL MARSH

ORTON POND SPILLWAY

BERM SLOPE TOE/404 & COASTAL WETLAND BOUNDARY (TYP) (LOCATION VARIES)

BERM CREST (TYP)

EXISTING RIVERFRONT DIKE

BERM SLOPE TOE (TYP) (LOCATION MAY VARY)

BERM CREST (TYP)

B 15

APPROX. LOW WATER LINE

APPROX. HIGH WATER LINE

RICE FIELD CANAL (typ.)

ORTON PLANTATION FRONT RICE FIELDS

CONTINUES ON SHEET 14

Wetland Boundary Legend

404	
Coastal	
Approx. High Water Line	
Approx. Low Water Line	

Wetland Impact Legend

404 *(Interior)*		1.84 acres
(Riverside)		0.08 acres
404/Rice Field		0.37 acres
404/Coastal *(Revetment)*		0.15 acres
(Marsh Armor)		0.01 acres
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GRAPHIC SCALE

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(FAX) 384-7368
COA No. 1468

ORTON PLANTATION FRONT RICE FIELDS RIVER DIKE REHABILITATION

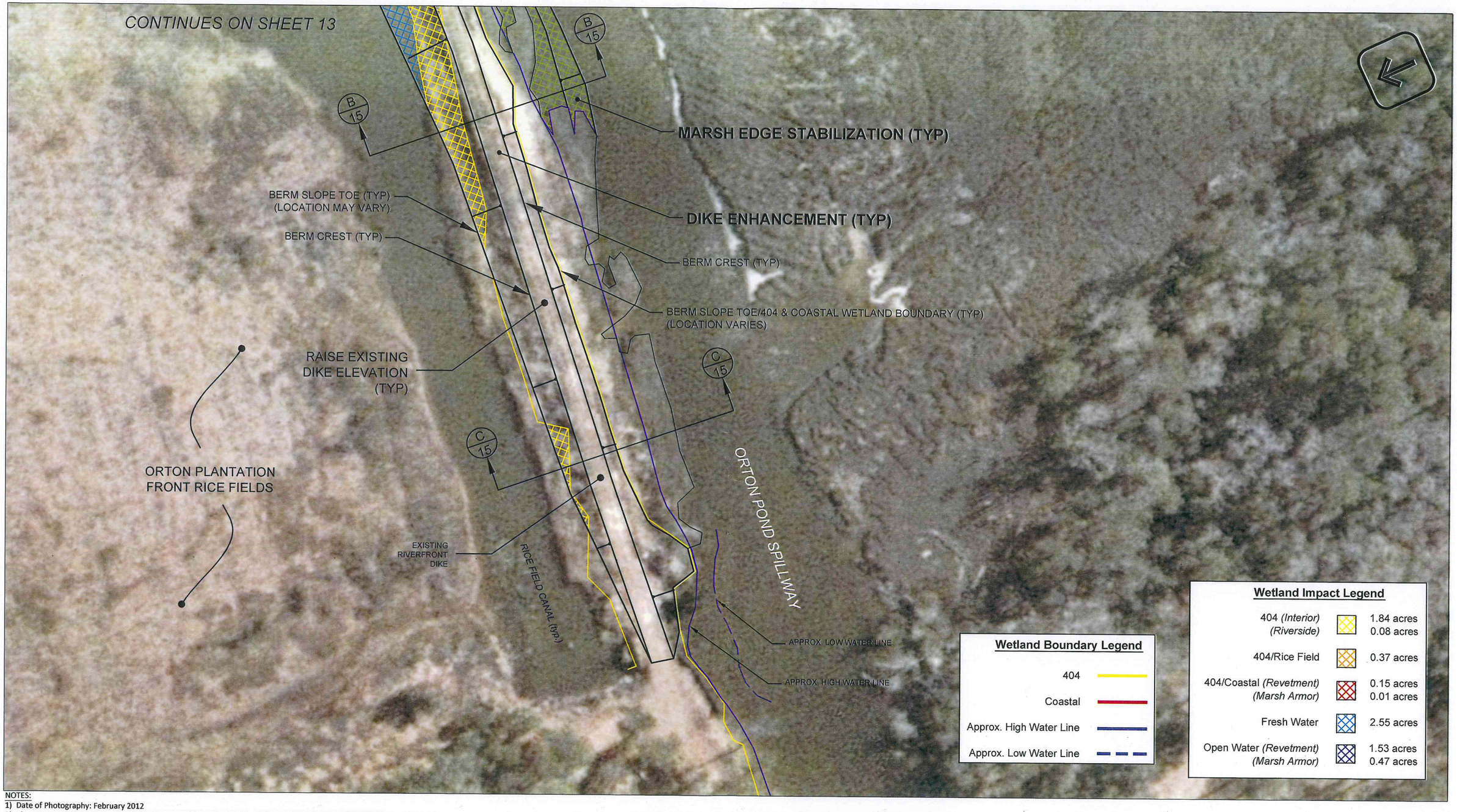
CONCEPT PLAN DETAILS

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11

DRAWN BY: WAH

SHEET 13 OF 15



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GRAPHIC SCALE
0 25 50 FT

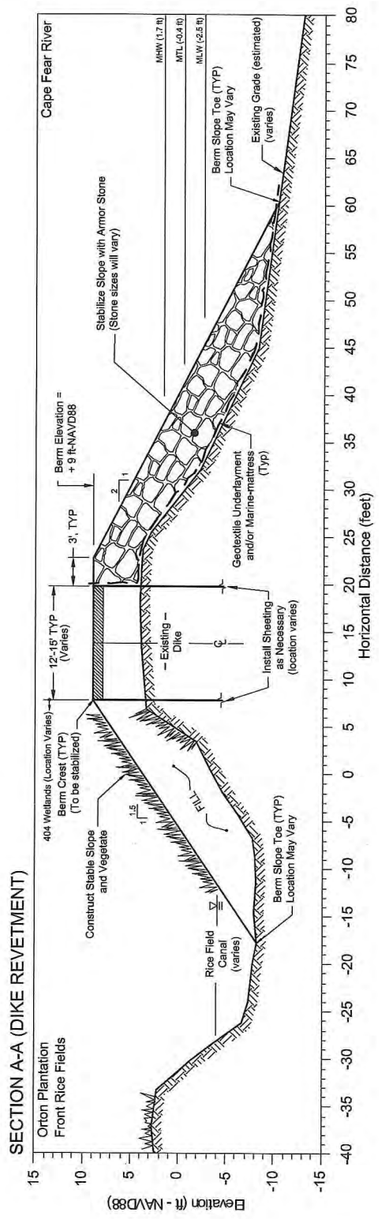
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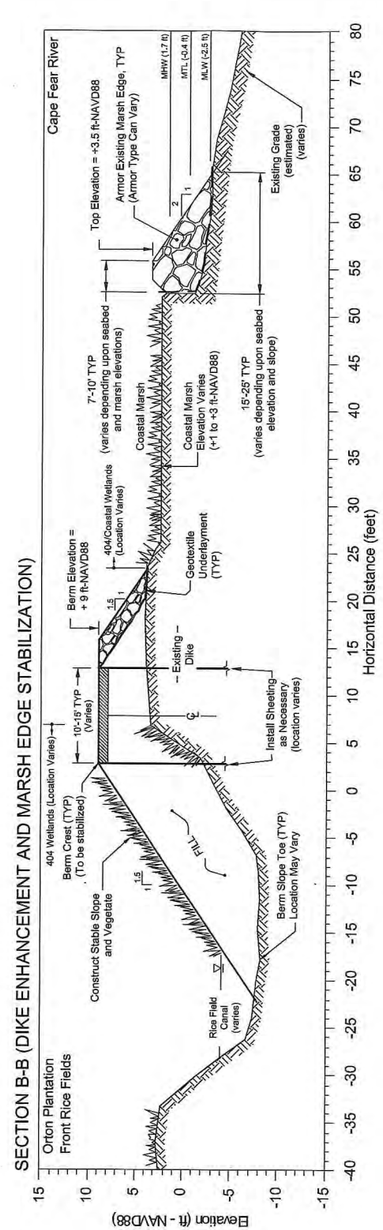
ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION

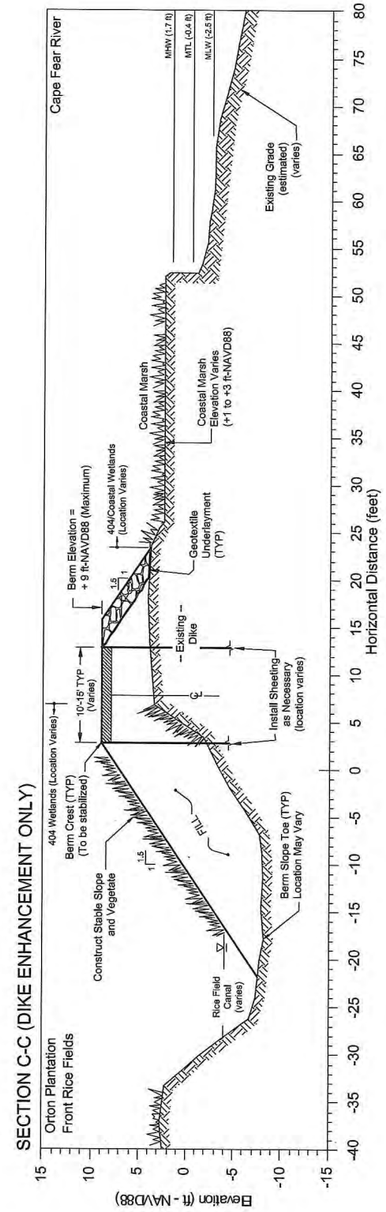
CONCEPT PLAN DETAILS

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

DATE: 09/08/11
DRAWN BY: WAH
SHEET 14 OF 15







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(904) 387-6114
(FAX) 384-7368
COA No. 1468

ORTON PLANTATION
FRONT RICE FIELDS
RIVER DIKE REHABILITATION

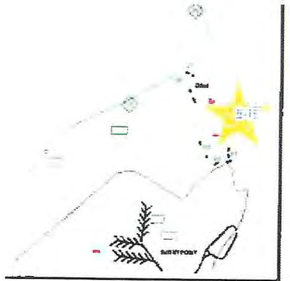
CONCEPT SECTIONS

DATE:	APPR	REVISION
02/20/12	CGC	REVISED PLAN VERSION 2
03/06/12	CGC	REVISED PLAN VERSION 3
04/10/12	CGC	REVISED PLAN VERSION 4

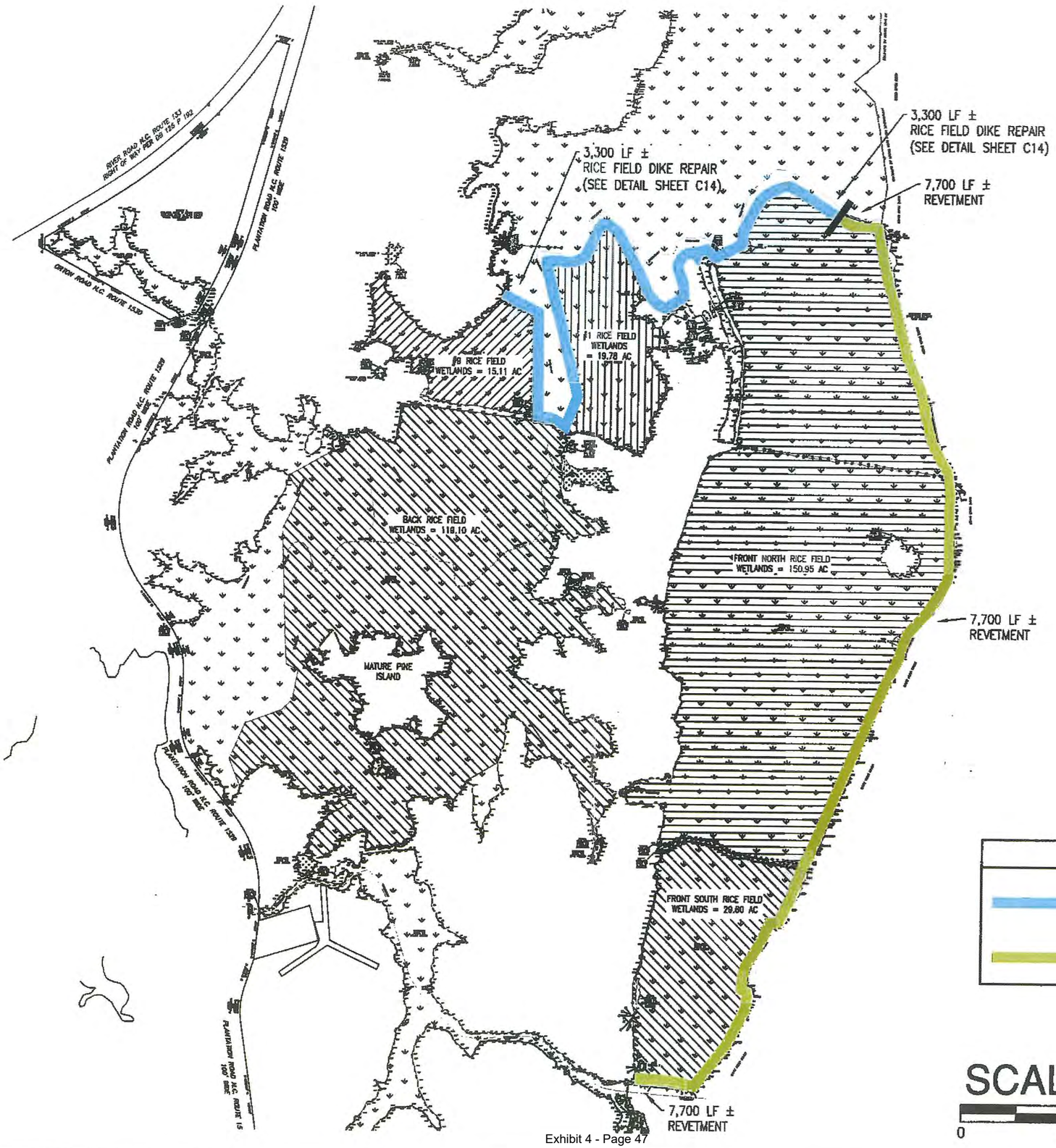
DATE: 09/08/11

DRAWN BY: WAH

SHEET 15 OF 15



VICINITY MAP
N.T.S.



LEGEND

- 3,300 LF ± RICE FIELD DIKE REPAIR (SEE DETAIL SHEET C14)
- 7,700 LF ± REVETMENT

SCALE: 1" = 800'

0 800 1600 2400

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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DIKE WORK VICINITY MAP

ORTON PLANTATION

BRUNSWICK COUNTY, NORTH CAROLINA

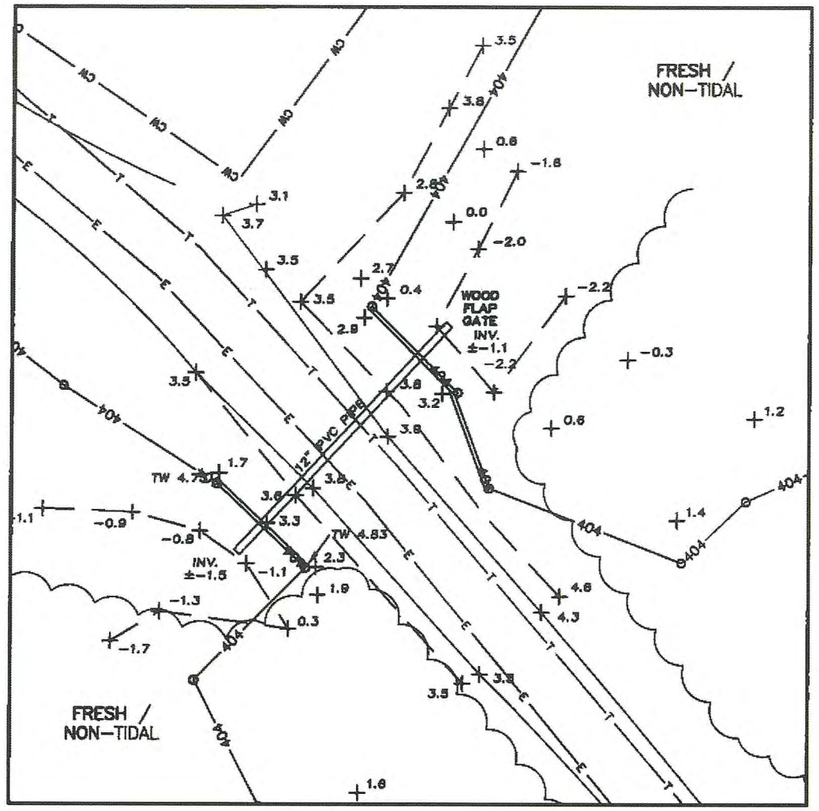
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9853
WILMINGTON, NC, 28403 FAX (910) 343-9804
N&T LICENSE NO. C-3841

10070

DES.	JPN
D.D.	JPN
CHK.	EDB
DATE	10/12/11

C0-1



EXCONDITIONS / DEMO PLAN

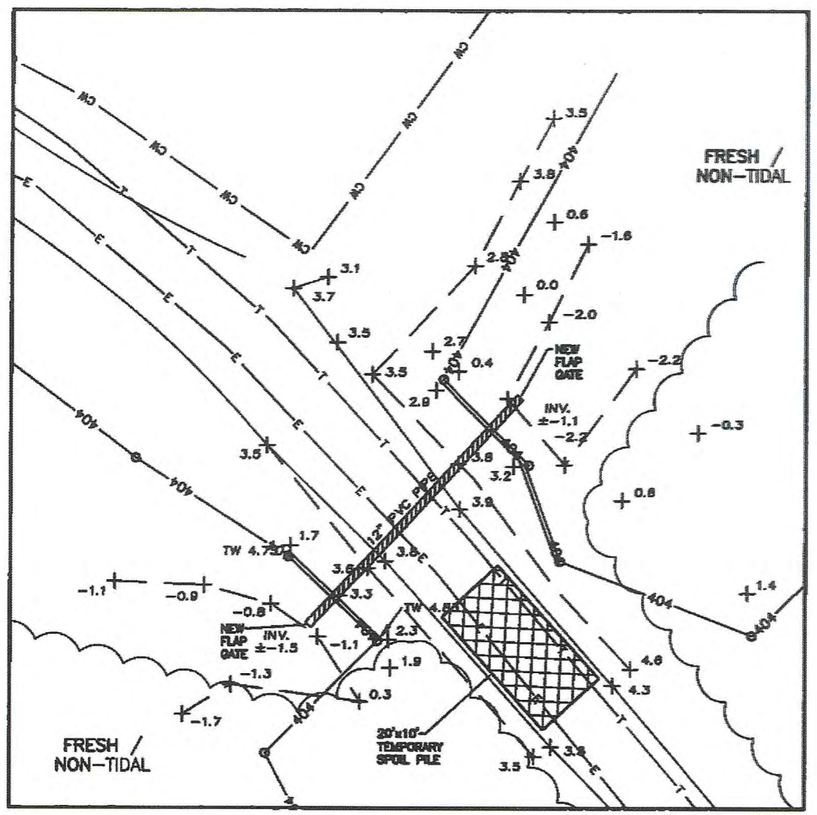
SCALE: 1" = 20'

STRUCTURE #1

REMOVE EXISTING 12" PVC PIPE & FLAP GATE.

EXISTING PIPE:
LENGTH: 41 LF ±
DIAMETER: 12"
INVERT IN: −1.1± INVERT OUT: −1.5±
TOP IN: −0.1± TOP OUT: −0.5±

PROPOSED PIPE:
LENGTH: 41 LF ±
DIAMETER: 12"
INVERT IN: −1.1± INVERT OUT: −1.5±
TOP IN: −0.1± TOP OUT: −0.5±



REPAIR PLAN

SCALE: 1"=20'

STRUCTURE #1

REPLACE WITH NEW 12" PVC PIPE AT SAME INVERTS AND LENGTH WITH NEW FLAP GATES. REPAIR EXISTING BULKHEAD AS NECESSARY.



OUTLET VIEW

LEGEND

404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY OUTSIDE ANY AEC ZONE.



INLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #1
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY, NORTH CAROLINA

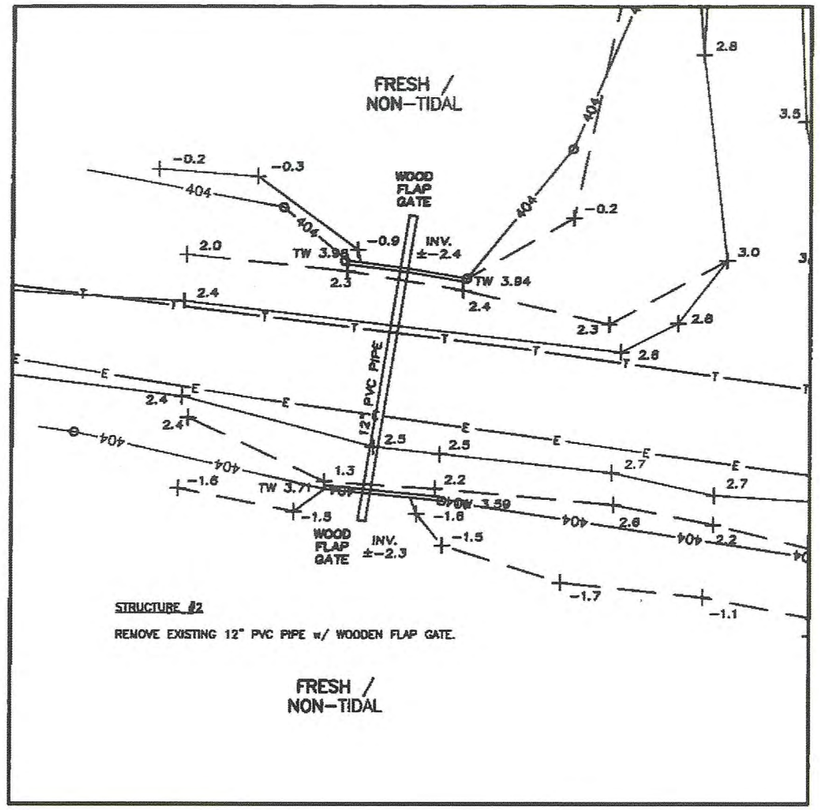
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9653
WILMINGTON, NC. 28403 FAX (910) 343-9604
P&T LICENSE NO. C-3641

10070

DES	JPN
DRN	JPN
CHK	EDB
DATE	10/12/11

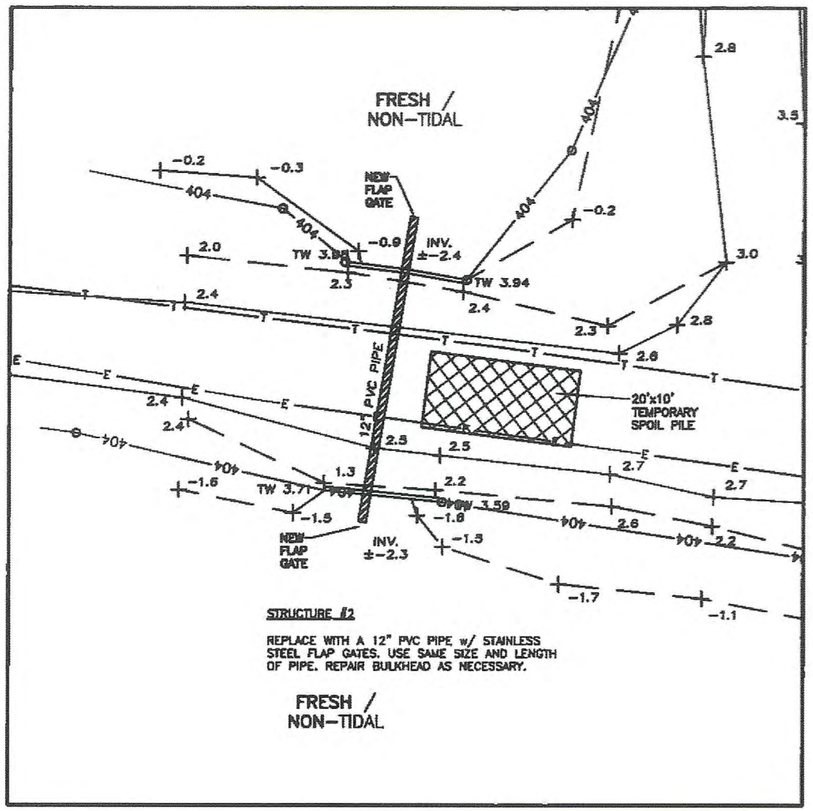
C1



EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

EXISTING PIPE:
LENGTH: 41 LF ±
DIAMETER: 12"
INVERT IN: -2.3± INVERT OUT: -2.4±
TOP IN: -1.3± TOP OUT: -1.4±

PROPOSED PIPE:
LENGTH: 41 LF ±
DIAMETER: 12"
INVERT IN: -2.3± INVERT OUT: -2.4±
TOP IN: -1.3± TOP OUT: -1.4±



REPAIR PLAN
SCALE: 1" =20'



OUTLET VIEW

LEGEND

404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY OUTSIDE ANY AEC ZONE.



INLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #2
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

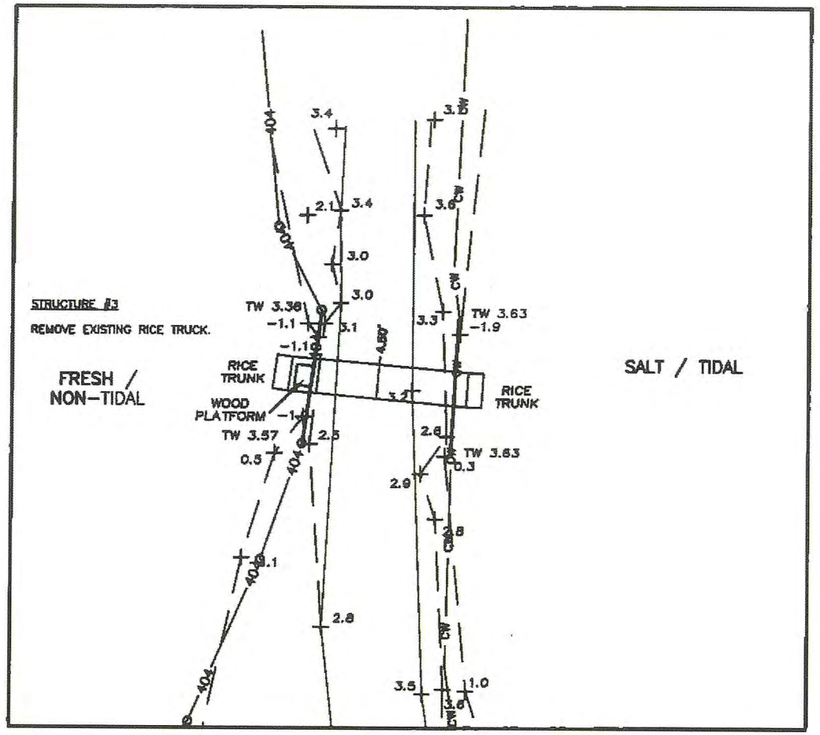
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400
WILMINGTON, NC. 28403
N&T LICENSE NO. C-3641
PHONE (910) 343-9853
FAX (910) 343-9804

10070

DES.	JPN
DRN.	JPN
CHK.	EDS
DATE	10/12/11

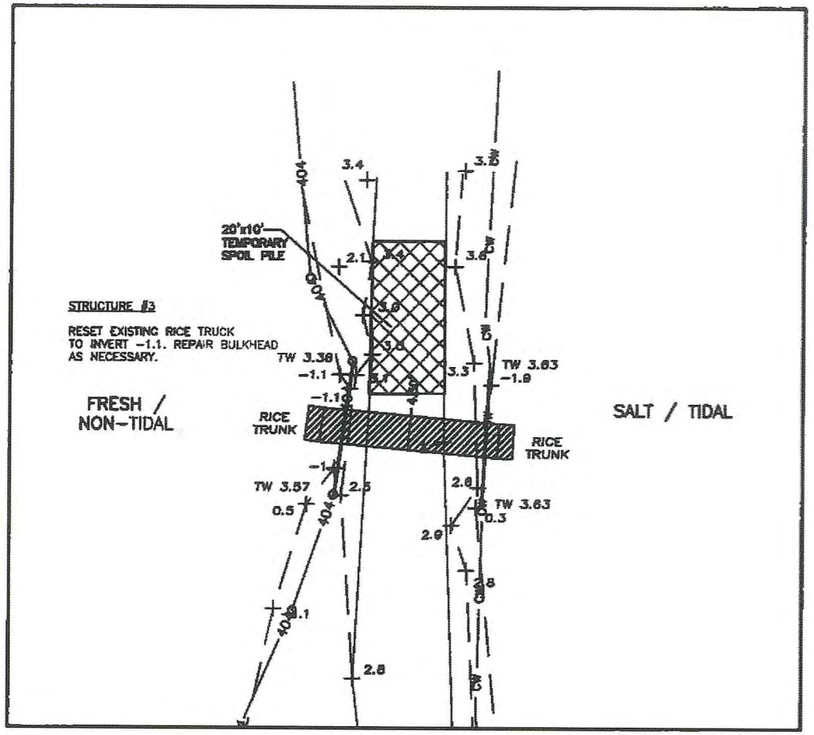
C2



EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

EXISTING RICE TRUNK:
LENGTH: 28 LF ±
WIDTH: 4.5'
INVERT IN: −0.6± INVERT OUT: −0.6±
TOP IN: 0.9± TOP OUT: 0.9±

PROPOSED RICE TRUNK:
LENGTH: 28 LF ±
WIDTH: 4.5'
INVERT IN: −1.1 INVERT OUT: −1.1
TOP IN: 0.4 TOP OUT: 0.4



REPAIR PLAN
SCALE: 1" =20'

DATUM NOTES:
1. MEAN HIGH WATER (MHW) IS 1.9 FEET ABOVE NAVD 88.
2. MEAN LOW WATER (MLW) IS −2.5 FEET BELOW NAVD 88.

NOTES:
1. MEAN LOW IS BELOW THE LOWEST ELEVATION AT THIS SITE.
2. MEAN HIGH FOLLOWS THE COASTAL WETLAND LINE AND THE FACE OF THE BULKHEAD.

LEGEND

CW	COASTAL & 404 WETLANDS
404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION



OVERALL VIEW (OUTLET ON RIGHT)

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.
2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.
3. THE PROJECT AREA IS COMPLETELY INSIDE ANY AEC ZONE.

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #3
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

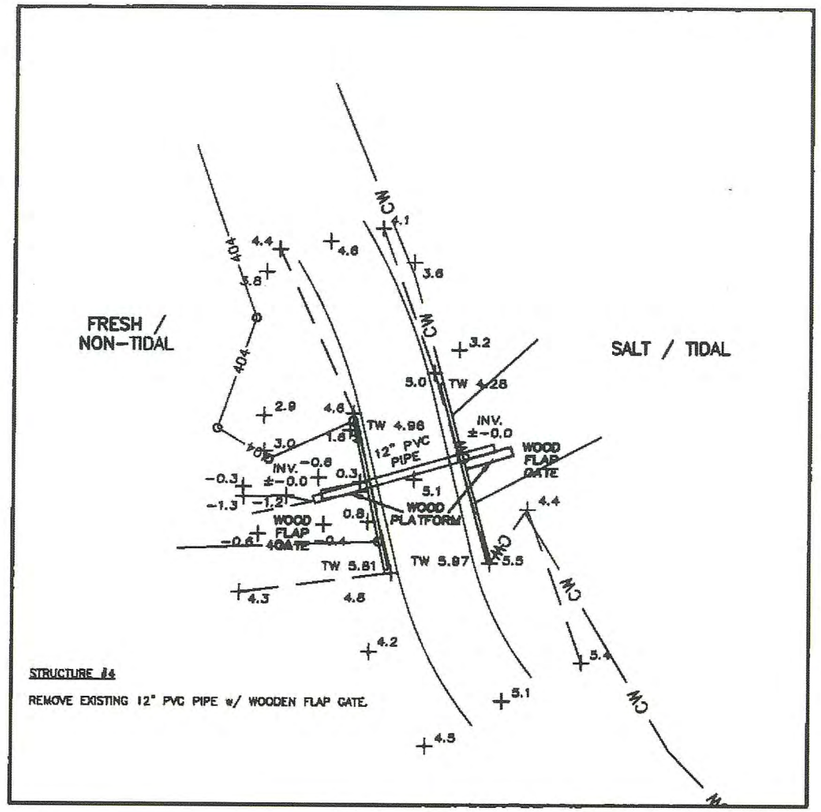
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-8853
WILMINGTON, NC 28403 FAX (910) 343-8804
NAT LICENSE NO. C-3841

10070

DES.	JPW
CAD.	JPW
DRWN.	EDB
DATE	10/12/11

C3



EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

DATUM NOTES:
1. MEAN HIGH WATER (MHW) IS 1.9 FEET ABOVE NAVD 88.

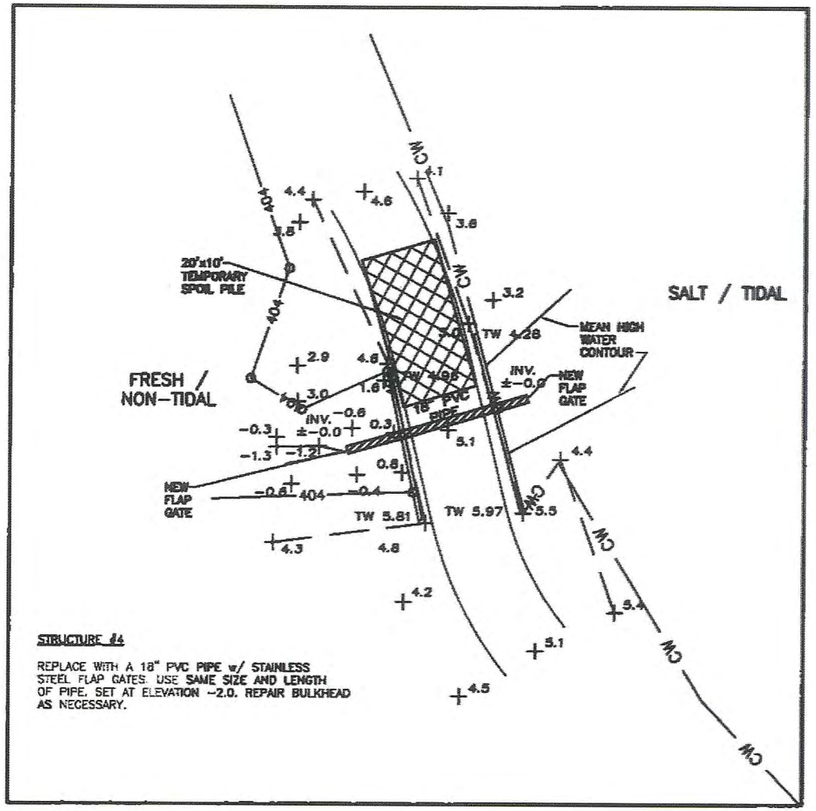
2. MEAN LOW WATER (MLW) IS -2.5 FEET BELOW NAVD 88.

NOTES:
1. MEAN LOW IS BELOW THE LOWEST ELEVATION AT THIS SITE.

2. MEAN HIGH FOLLOWS THE FACE OF THE BULKHEAD.

EXISTING PIPE:
- LENGTH: 25 LF ±
- DIAMETER: 12"
- INVERT IN: 0.0± INVERT OUT: 0.0±
- TOP IN: 1.0± TOP OUT: 1.0±

PROPOSED PIPE:
- LENGTH: 25 LF ±
- DIAMETER: 18"
- INVERT IN: -2.0± INVERT OUT: -2.0±
- TOP IN: -0.5± TOP OUT: -0.5±



REPAIR PLAN
SCALE: 1" =20'



INLET VIEW

LEGEND

CW	COASTAL & 404 WETLANDS
404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY INSIDE ANY AEC ZONE.

4. THE ADDED DIAMETER OF PIPE CREATES 2.75 SF OF PERMANENT WETLANDS IMPACT.



OUTLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #4
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

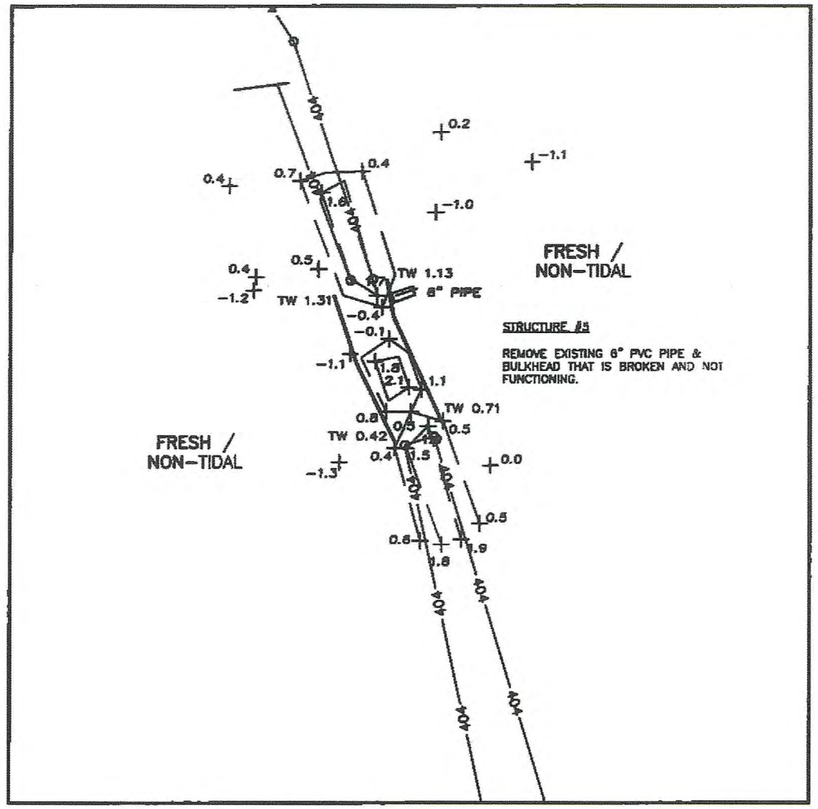
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9653
WILMINGTON, NC, 28403 FAX (910) 343-9604
NBT LICENSE NO. C-3841

10070

DES	JPN
DRN	JPN
CHK	EDB
DATE	10/12/11

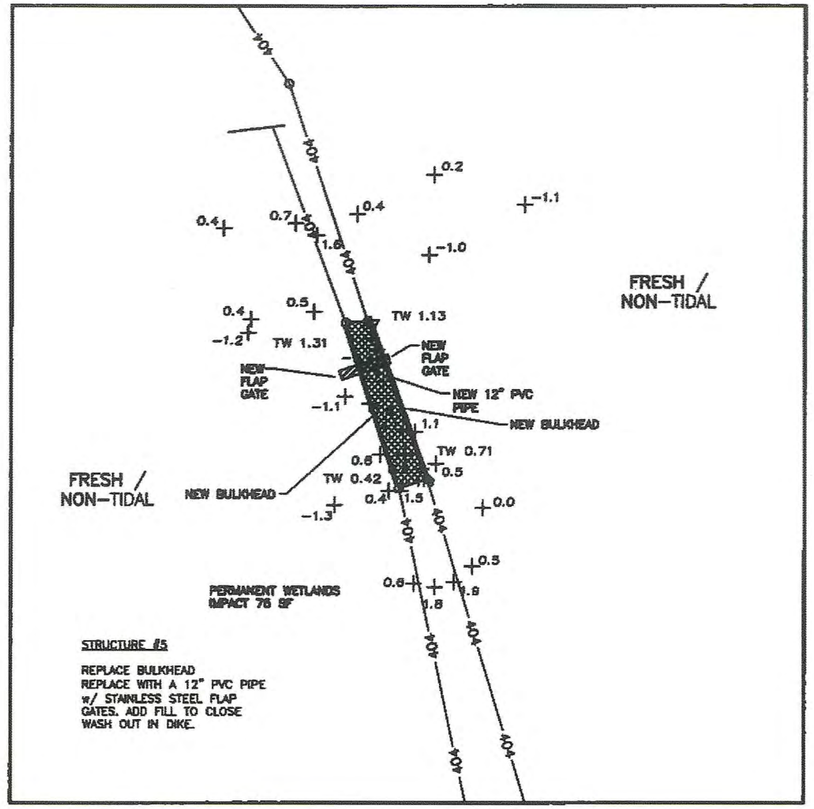
C4



EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

EXISTING PIPE:
LENGTH: 3 LF ±
DIAMETER: 6"
INVERT IN: N/A INVERT OUT: N/A
TOP IN: N/A TOP OUT: N/A

PROPOSED PIPE:
LENGTH: 7 LF ±
DIAMETER: 12"
INVERT IN: −1.0 INVERT OUT: −1.0
TOP IN: 0.0 TOP OUT: 0.0



REPAIR PLAN
SCALE: 1" =20'



OVERALL VIEW (OUTLET TO RIGHT)

LEGEND

404 — 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION
	WETLAND IMPACT AREA

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY OUTSIDE ANY AEC ZONE.

4. NO TEMPORARY SPOIL AREA IS NEEDED.



OVERALL VIEW (OUTLET TO RIGHT)

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #5
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY, NORTH CAROLINA

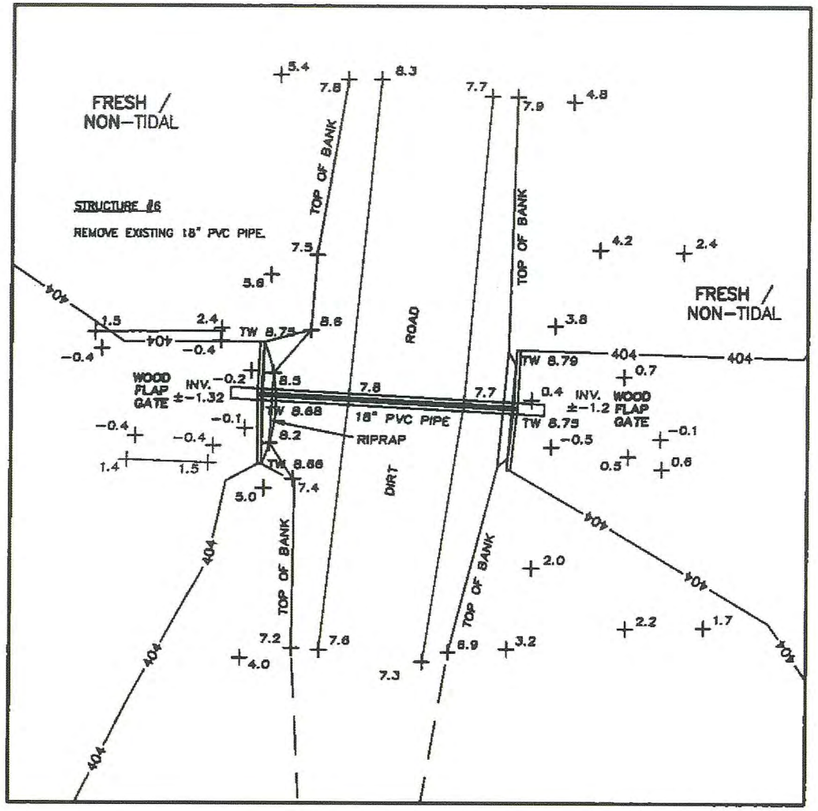
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9653
WILMINGTON, NC, 28403 FAX (910) 343-9604
NAT LICENSE NO. C-3641

10070

DES.	JPN
DRN.	JPN
CHK.	EDB
DATE	10/12/11

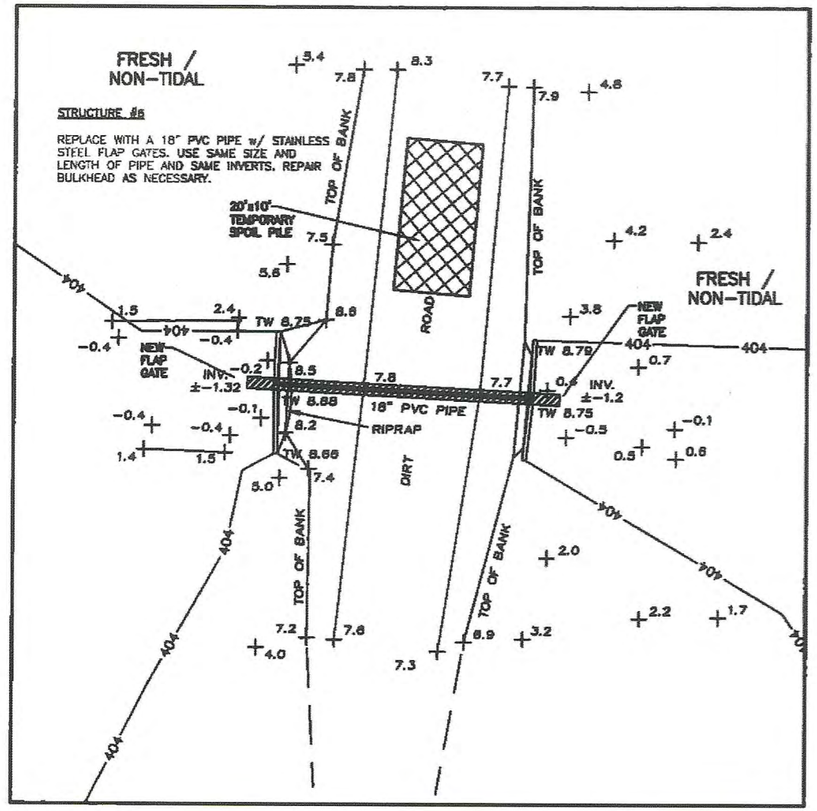
C5



EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

EXISTING PIPE:
LENGTH: 41 LF ±
DIAMETER: 18"
INVERT IN: -1.2± INVERT OUT: -1.32±
TOP IN: 0.3± TOP OUT: 0.18±

PROPOSED PIPE:
LENGTH: 41 LF ±
DIAMETER: 18"
INVERT IN: -1.2± INVERT OUT: -1.32±
TOP IN: 0.3± TOP OUT: 0.18±



REPAIR PLAN
SCALE: 1" =20'



OUTLET VIEW

LEGEND

404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY OUTSIDE ANY AEC ZONE.



INLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #6
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

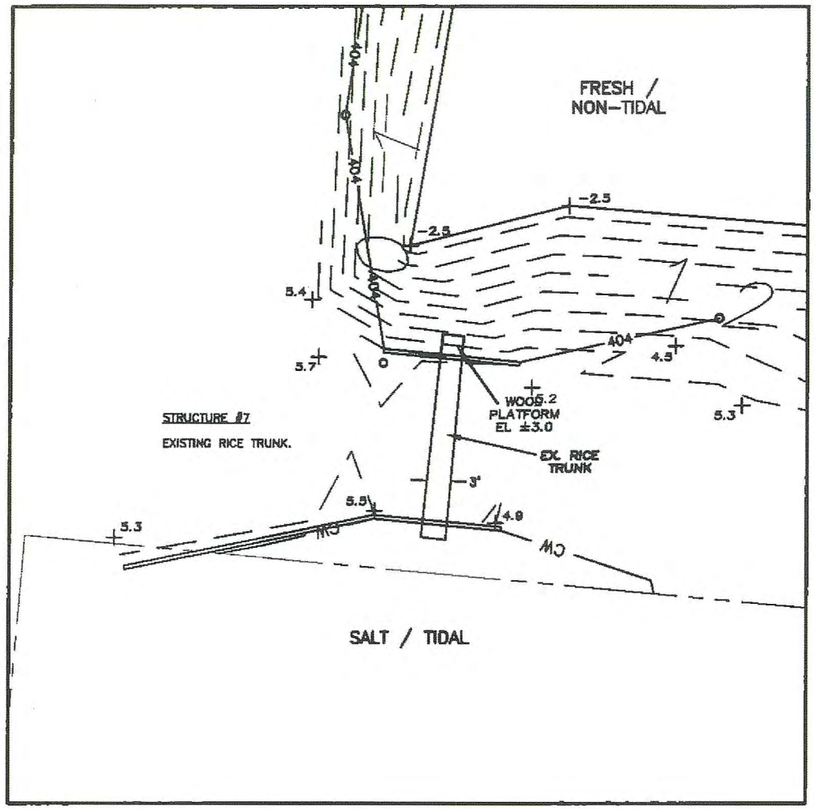
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9853
WILMINGTON, NC. 28403 FAX (910) 343-9604
N&T LICENSE NO. C-3641

10070

DES.	JPN
DR.	JPN
CHK.	EDB
DATE	08/01/11

C6

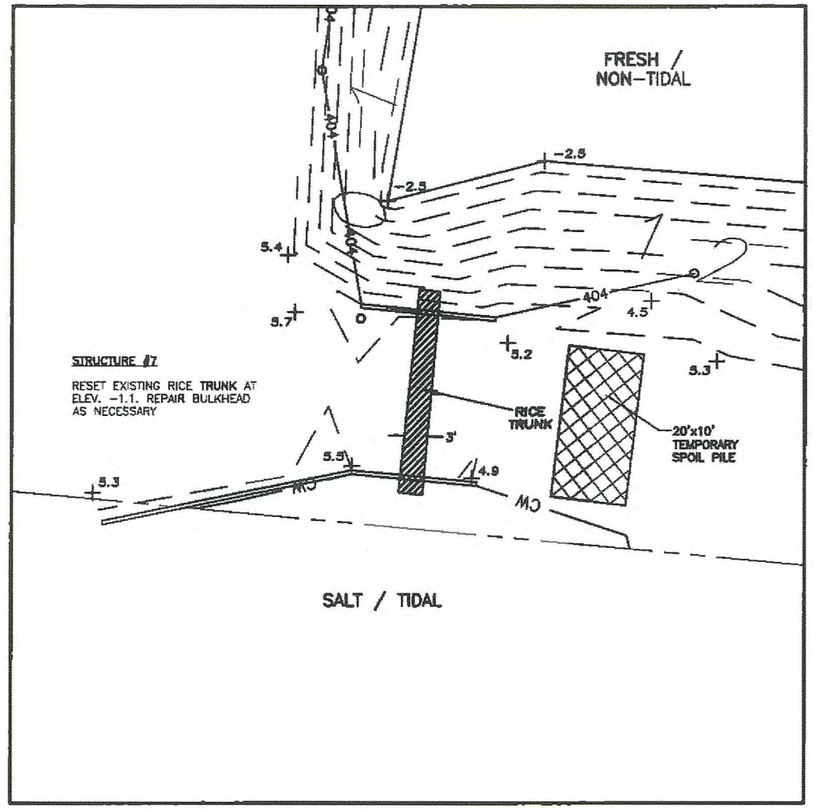


EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

DATUM NOTES:
1. MEAN HIGH WATER (MHW) IS 1.9 FEET ABOVE NAVD 88. AND FOLLOWS THE BULKHEAD.
2. MEAN LOW WATER (MLW) IS -2.5 FEET BELOW NAVD 88.

EXISTING RICE TRUNK:
LENGTH: 27 LF ±
WIDTH: 3.0'
INVERT IN: 0.0± INVERT OUT: 0.0±
TOP IN: 1.5± TOP OUT: 1.5±

PROPOSED RICE TRUNK:
LENGTH: 27 LF ±
WIDTH: 3.0'
INVERT IN: -1.1± INVERT OUT: -1.1±
TOP IN: 0.4± TOP OUT: 0.4±



REPAIR PLAN
SCALE: 1" =20'



OUTLET VIEW

LEGEND

CW	COASTAL & 404 WETLANDS
404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY INSIDE ANY AEC ZONE.



INLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #7
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

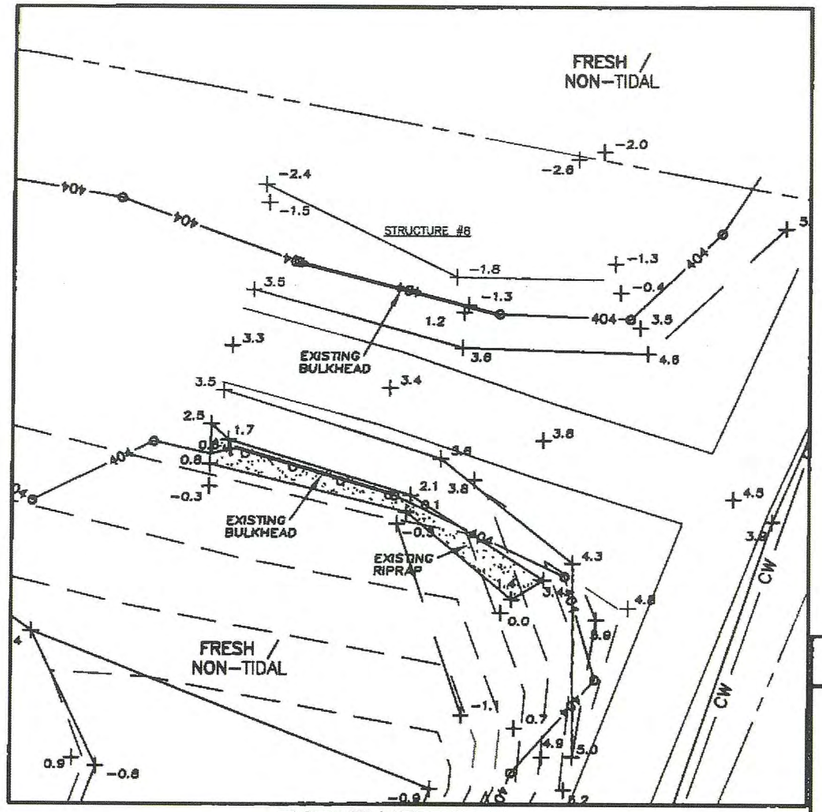
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-8853
WILMINGTON, NC, 28403 FAX (910) 343-8804
NET LICENSE NO. C-3641

10070

DES.	JPN
DWN.	JPN
CHKD.	EDB
DATE	08/01/11

C7



PRE-EXISTING PIPE / STRUCTURE NOT FOUND.

EXCONDITIONS / DEMO PLAN

SCALE: 1" = 20'

PROPOSED RICE TRUNK:

LENGTH: 32 LF ±

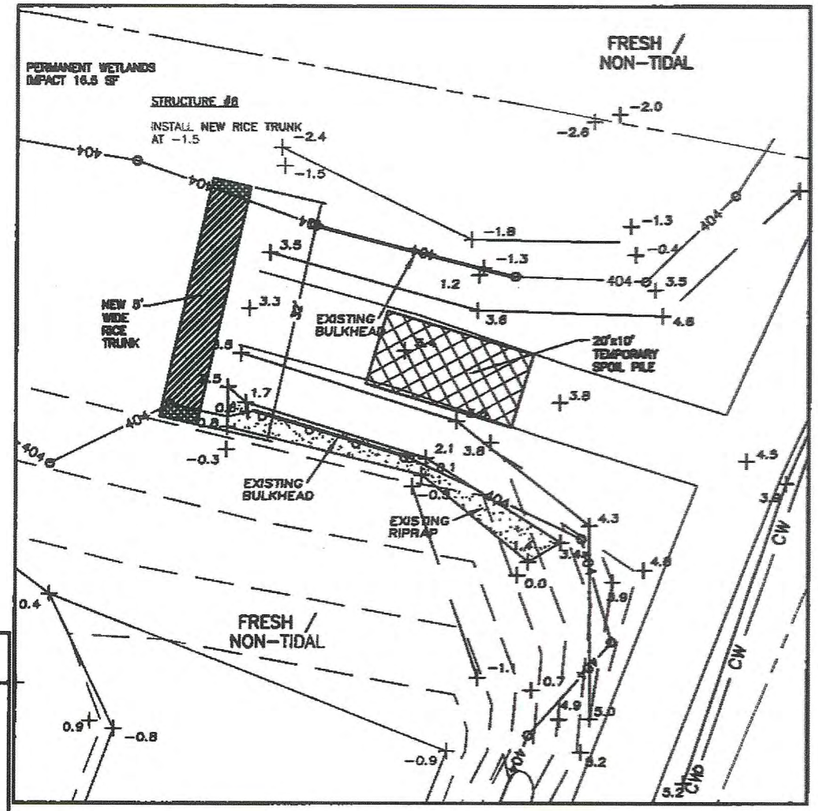
WIDTH: 5.0'

INVERT IN: −1.5± INVERT OUT: −1.5±

TOP IN: 0.0± TOP OUT: 0.0±

LEGEND

404 — 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION
	WETLAND IMPACT AREA



REPAIR PLAN

SCALE: 1" =20'

NOTES:

1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.
2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.
3. THE PROJECT AREA IS COMPLETELY OUTSIDE ANY AEC ZONE.



VIEW LOOKING LANDWARD



OUTLET VIEW LOOKING SOUTH



INLET VIEW LOOKING NORTH

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #8
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

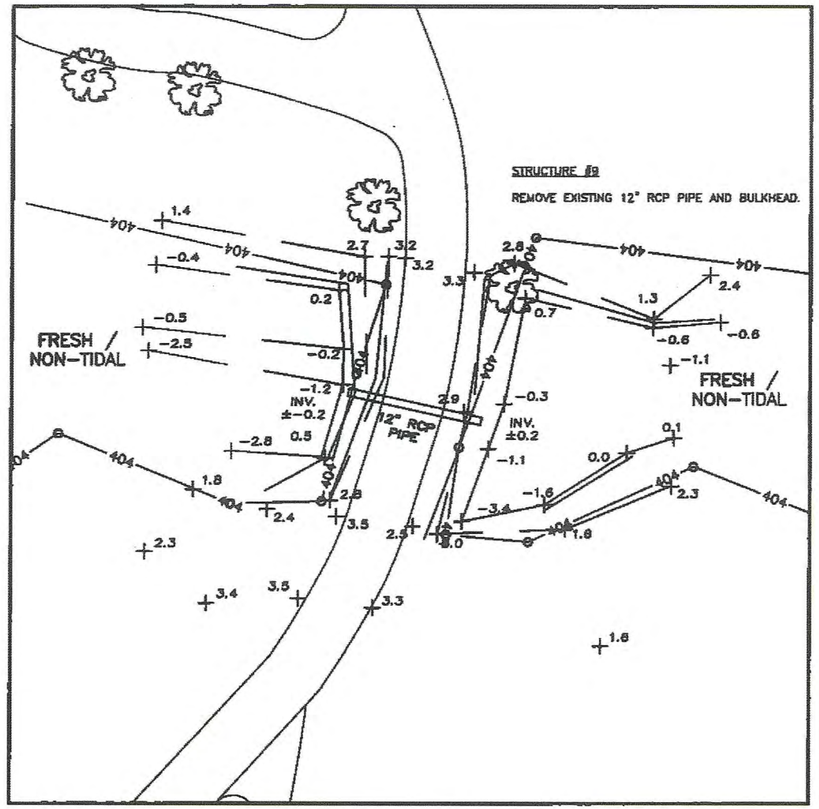
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-8653
WILMINGTON, NC, 28403 FAX (910) 343-9804
NET LICENSE NO. C-3641

10070

DES.	JJH
DRN.	JJH
CHK.	DB
DATE	08/01/11

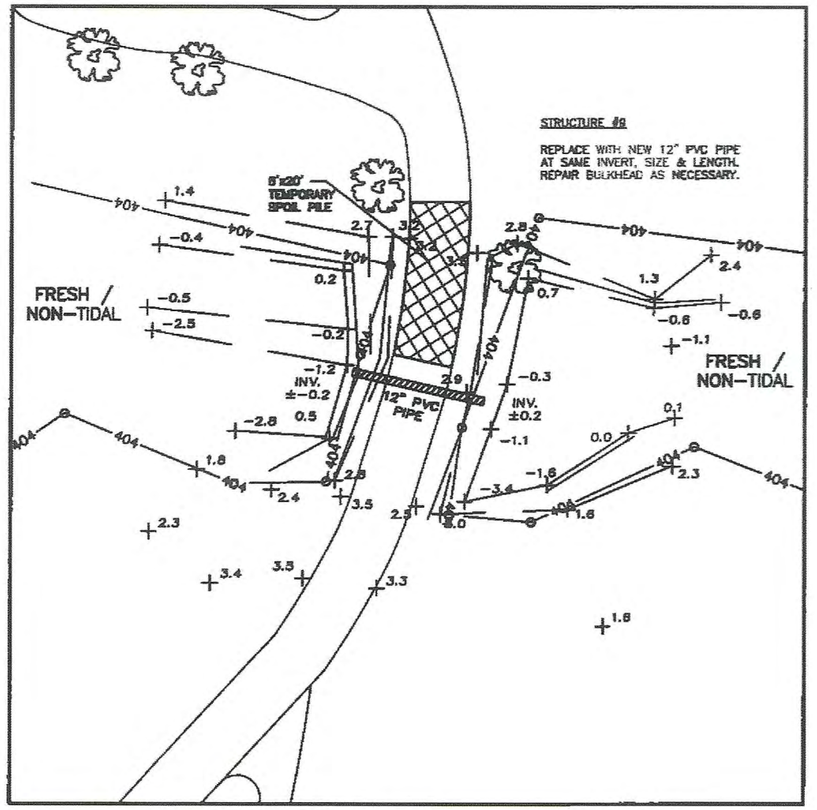
C8



EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

EXISTING PIPE:
LENGTH: 18 LF ±
DIAMETER: 12"
INVERT IN: 0.2± INVERT OUT: −0.2±
TOP IN: 1.2± TOP OUT: 0.8±

PROPOSED PIPE:
LENGTH: 18 LF ±
DIAMETER: 12"
INVERT IN: 0.2± INVERT OUT: −0.2±
TOP IN: 1.2± TOP OUT: 0.8±



REPAIR PLAN
SCALE: 1" =20'



INLET VIEW

LEGEND

404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY OUTSIDE ANY AEC ZONE.



OUTLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #9
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

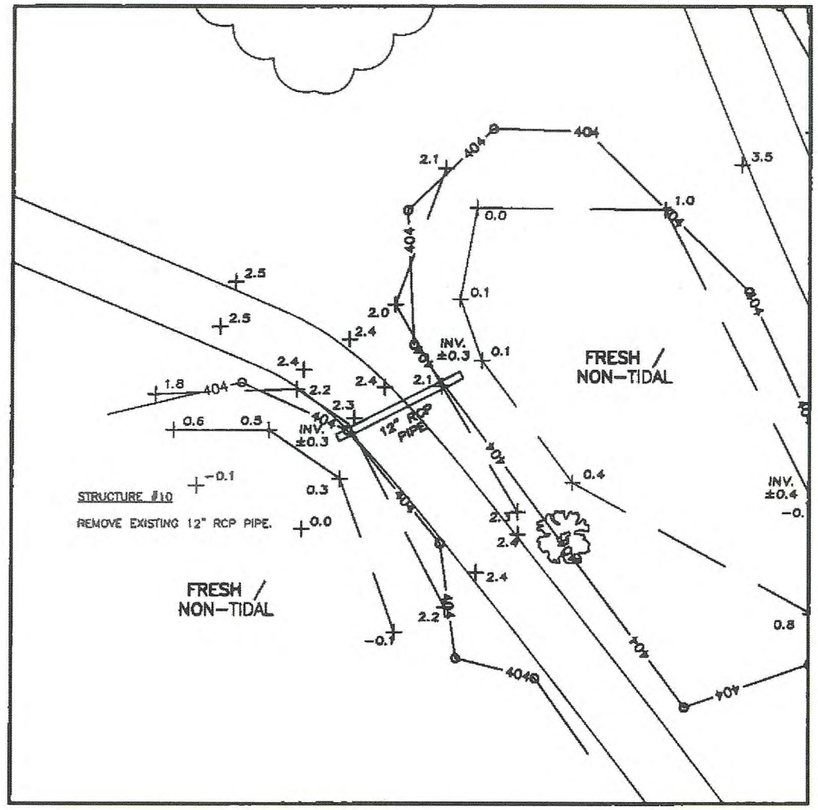
OWNER:
ORTON PLANTATION HOLDINGS, LLC
125TH AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

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CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9633
WILMINGTON, NC, 28403 FAX (910) 343-9604
N&T LICENSE NO. C-3641

10070

DES.	JPN
DWG.	JPN
CHKD.	EDB
DATE	06/01/11

C9



EXCONDITIONS / DEMO PLAN

SCALE: 1" = 20'

EXISTING PIPE:

LENGTH: 18 LF ±

DIAMETER: 12"

INVERT IN: 0.3± INVERT OUT: 0.3±

TOP IN: 1.3± TOP OUT: 1.3±

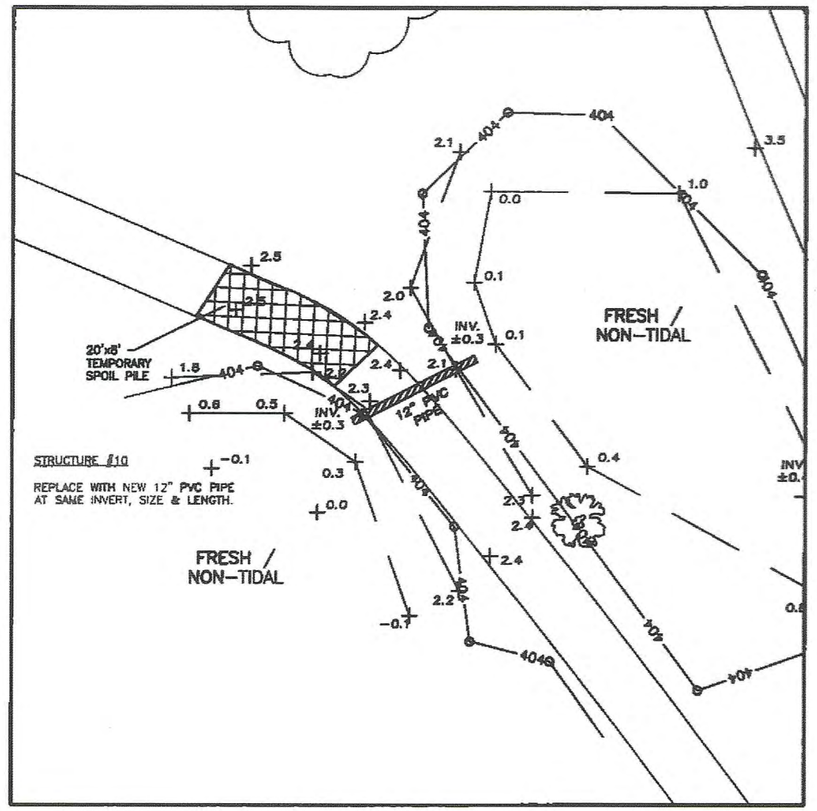
PROPOSED PIPE:

LENGTH: 18 LF ±

DIAMETER: 12"

INVERT IN: 0.3± INVERT OUT: 0.3±

TOP IN: 1.3± TOP OUT: 1.3±



REPAIR PLAN

SCALE: 1" =20'



INLET VIEW

LEGEND

404 — 404	404 WETLANDS
— — — 1 — — —	EXISTING CONTOUR
——— E ———	UNDERGROUND ELECTRIC
——— T ———	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:

1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY OUTSIDE ANY AEC ZONE.



OUTLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #10
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

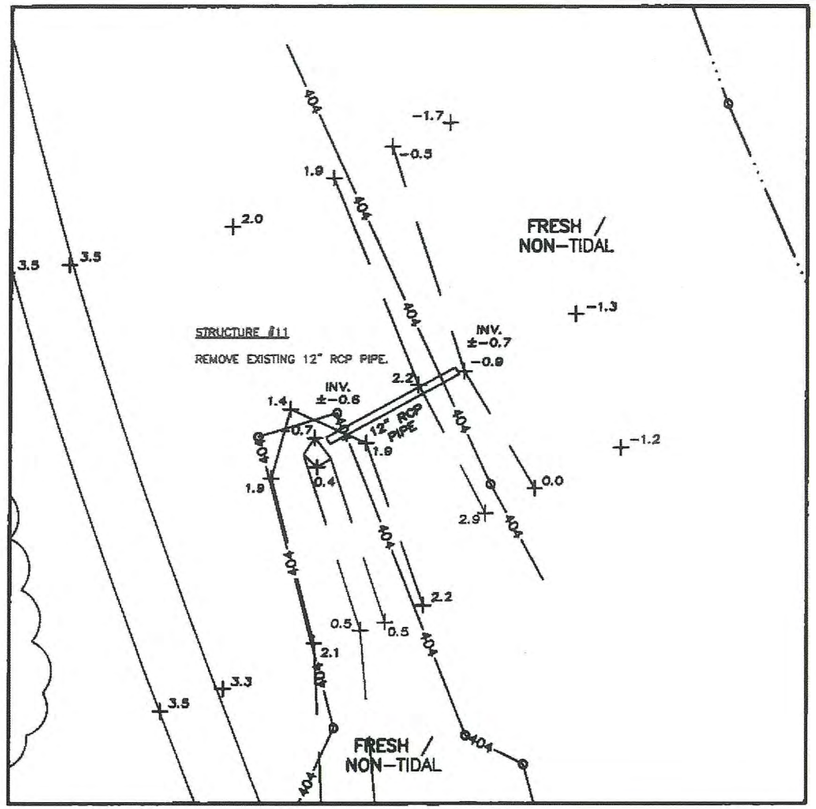
OWNER:
ORTON PLANTATION HOLDINGS, LLC
125T AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

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CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-0853
WILMINGTON, NC, 28403 FAX (910) 343-9804
NOT LICENSE NO. C-3641

10070

BY	JPN
CHK	JPN
DWN	DB
DATE	08/01/11

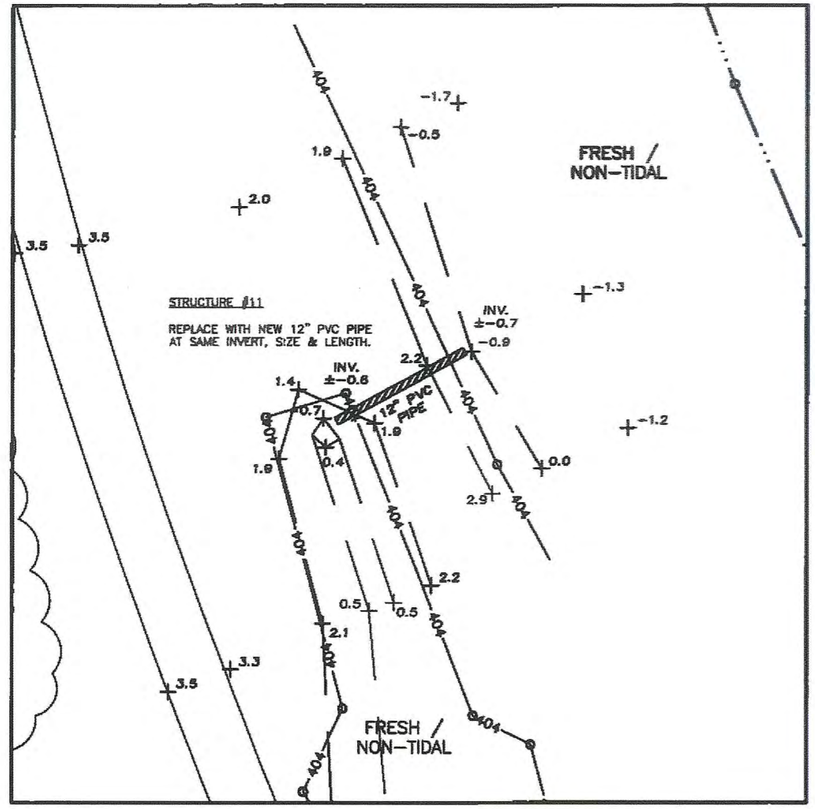
C10



EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

EXISTING PIPE:
LENGTH: 19 LF ±
DIAMETER: 12"
INVERT IN: -0.6± INVERT OUT: -0.7±
TOP IN: 0.4± TOP OUT: 0.3±

PROPOSED PIPE:
LENGTH: 19 LF ±
DIAMETER: 12"
INVERT IN: -0.6± INVERT OUT: -0.7±
TOP IN: 0.4± TOP OUT: 0.3±



REPAIR PLAN
SCALE: 1" =20'



INLET VIEW

LEGEND

404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY OUTSIDE ANY AEC ZONE.



OUTLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	
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RICE FIELD DRAINAGE STRUCTURE #11
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY, NORTH CAROLINA

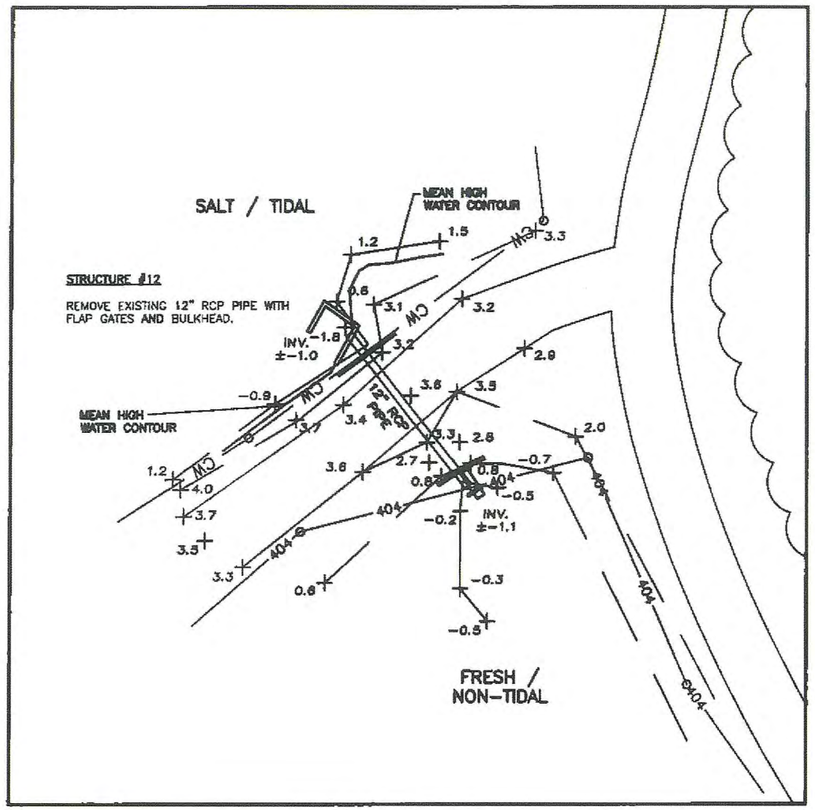
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
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NEW YORK, NEW YORK 10020

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CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9853
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NAVY LICENSE NO. C-3641

10070

	JPH
	JPH
	EHB
DATE	08/01/11

C11



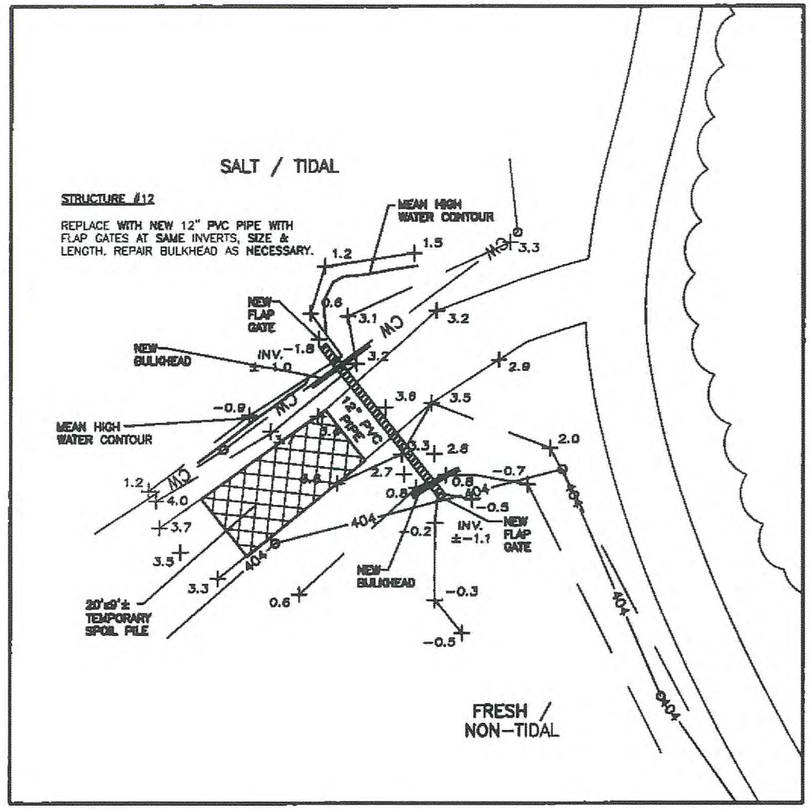
EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

DATUM NOTES:
1. MEAN HIGH WATER (MHW) IS 1.9 FEET ABOVE NAVD 88.
2. MEAN LOW WATER (MLW) IS -2.5 FEET BELOW NAVD 88.

NOTES:
1. MEAN LOW IS BELOW THE LOWEST ELEVATION AT THIS SITE.
2. MEAN HIGH IS ALONG THE BULKHEAD.

EXISTING PIPE:
LENGTH: 26 LF ±
DIAMETER: 12"
INVERT IN: -1.0± INVERT OUT: -1.1±
TOP IN: 0.0± TOP OUT: -0.1±

PROPOSED PIPE:
LENGTH: 26 LF ±
DIAMETER: 12"
INVERT IN: -1.0± INVERT OUT: -1.1±
TOP IN: 0.0± TOP OUT: -0.1±



REPAIR PLAN
SCALE: 1" =20'



INLET VIEW

LEGEND

CW	COASTAL & 404 WETLANDS
404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.
2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.
3. THE PROJECT AREA IS COMPLETELY INSIDE ANY AEC ZONE.



OUTLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

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RICE FIELD DRAINAGE STRUCTURE #12
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

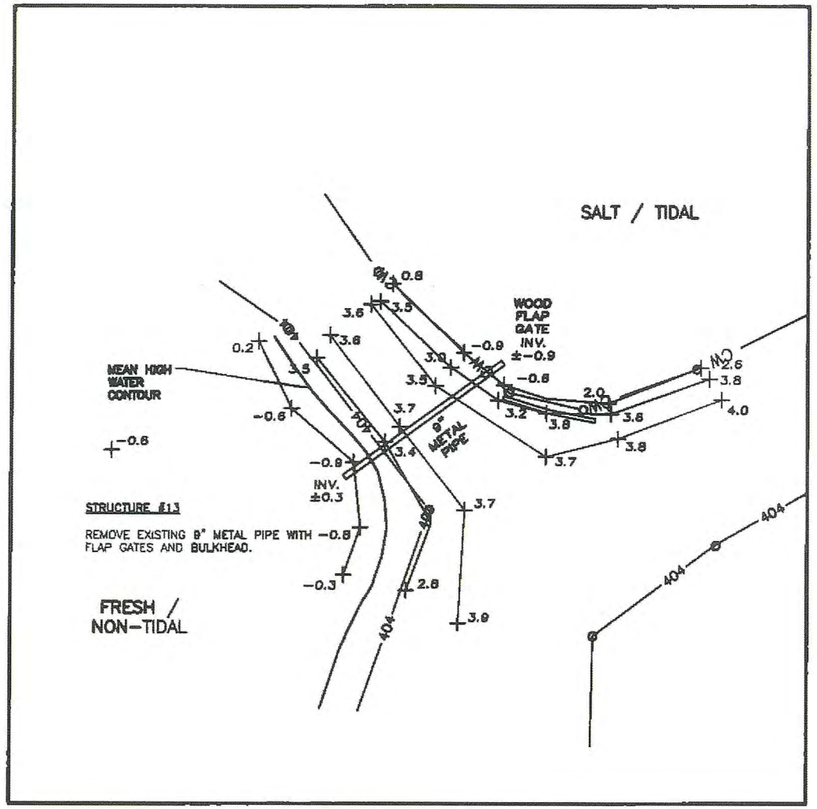
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9853
WILMINGTON, NC, 28403 FAX (910) 343-9804
NAET LICENSE NO. C-3641

10070

DES.	JPN
DRN.	JPN
CHK.	EDB
DATE	06/01/11

C12



EXCONDITIONS / DEMO PLAN
SCALE: 1" = 20'

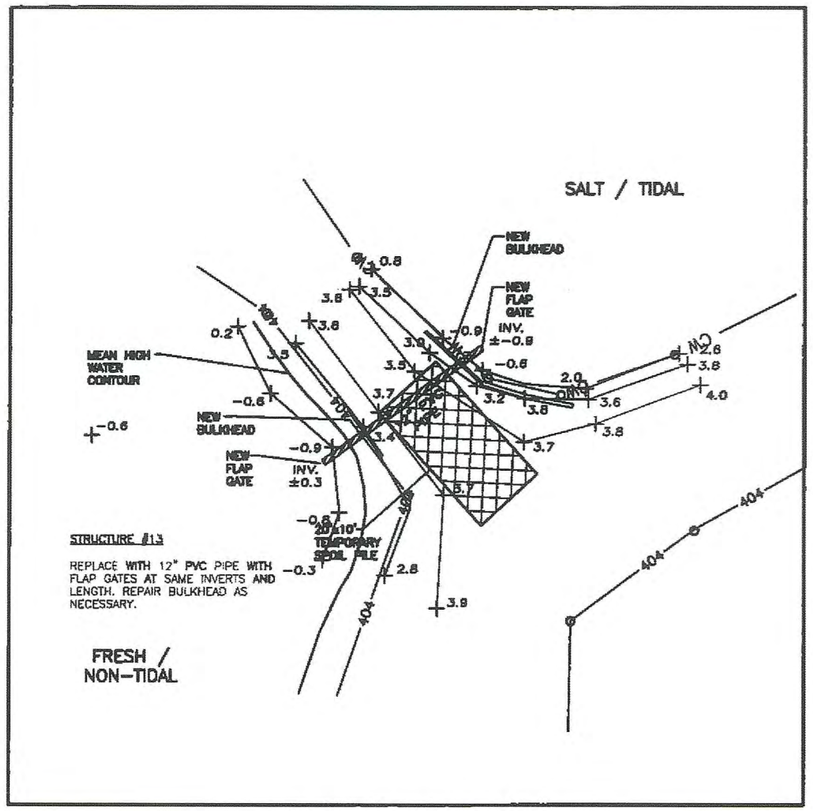
DATUM NOTES:
1. MEAN HIGH WATER (MHW) IS 1.9 FEET ABOVE NAVD 88.

2. MEAN LOW WATER (MLW) IS -2.5 FEET BELOW NAVD 88.

NOTES:
1. MEAN LOW IS BELOW THE LOWEST ELEVATION AT THIS SITE.

EXISTING PIPE:
LENGTH: 26 LF ±
DIAMETER: 9"
INVERT IN: 0.3± INVERT OUT: -0.9±
TOP IN: 1.05± TOP OUT: -0.15±

PROPOSED PIPE:
LENGTH: 26 LF ±
DIAMETER: 12"
INVERT IN: 0.3± INVERT OUT: -0.9±
TOP IN: 1.3± TOP OUT: 0.1±



REPAIR PLAN
SCALE: 1" =20'



INLET VIEW

LEGEND

CW	COASTAL & 404 WETLANDS
404 404	404 WETLANDS
1	EXISTING CONTOUR
E	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
+ 5.3	EXISTING SPOT ELEVATION

NOTES:
1. ALL DATUM IS NAVD 88 DETERMINED USING BENCHMARKS AT THE CORPS OF ENGINEERS BOAT YARD IN WILMINGTON AND AT SUNNY POINT OCEAN TERMINAL.

2. EXISTING AND PROPOSED DRAINAGE STRUCTURES ARE AND WILL BE LOCATED AT OR ABOVE THE EXISTING CHANNEL BOTTOM.

3. THE PROJECT AREA IS COMPLETELY INSIDE ANY AEC ZONE.

4. THE ADDED DIAMETER OF PIPE CREATES 2.25 SF OF PERMANENT WETLANDS IMPACT.



OUTLET VIEW

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	
		© 2011 NORRIS & TUNSTALL	

RICE FIELD DRAINAGE STRUCTURE #13
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

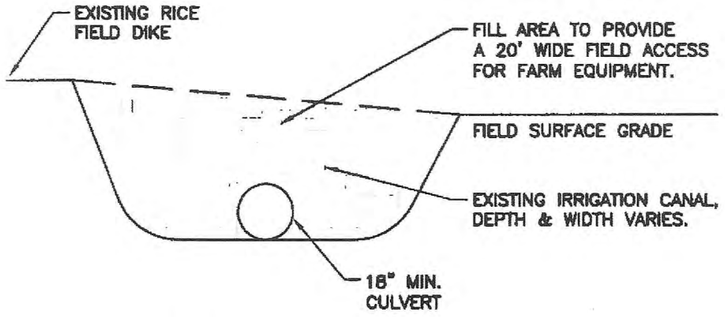
OWNER:
ORTON PLANTATION HOLDINGS, LLC
1251 AVENUE OF THE AMERICAS,
17TH FLOOR
NEW YORK, NEW YORK 10020

NORRIS & TUNSTALL
CONSULTING ENGINEERS, P.C.
1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9653
WILMINGTON, NC, 28403 FAX (910) 343-9804
NAT LICENSE NO. C-3641

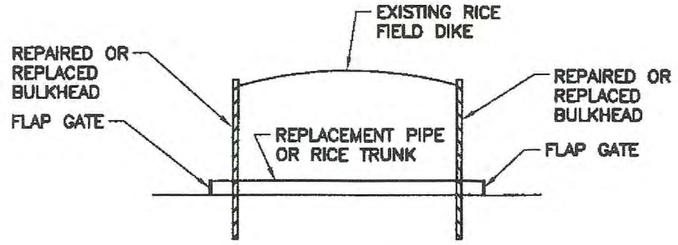
10070

DES.	JPN
DRN.	JPN
CHKD.	EDB
DATE	06/01/11

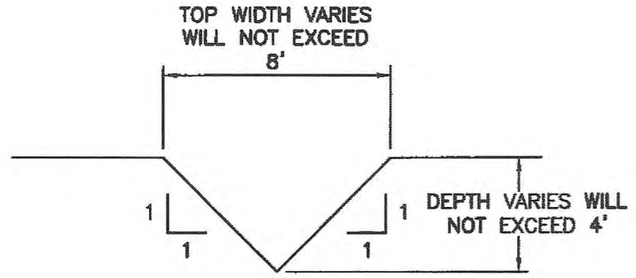
C13



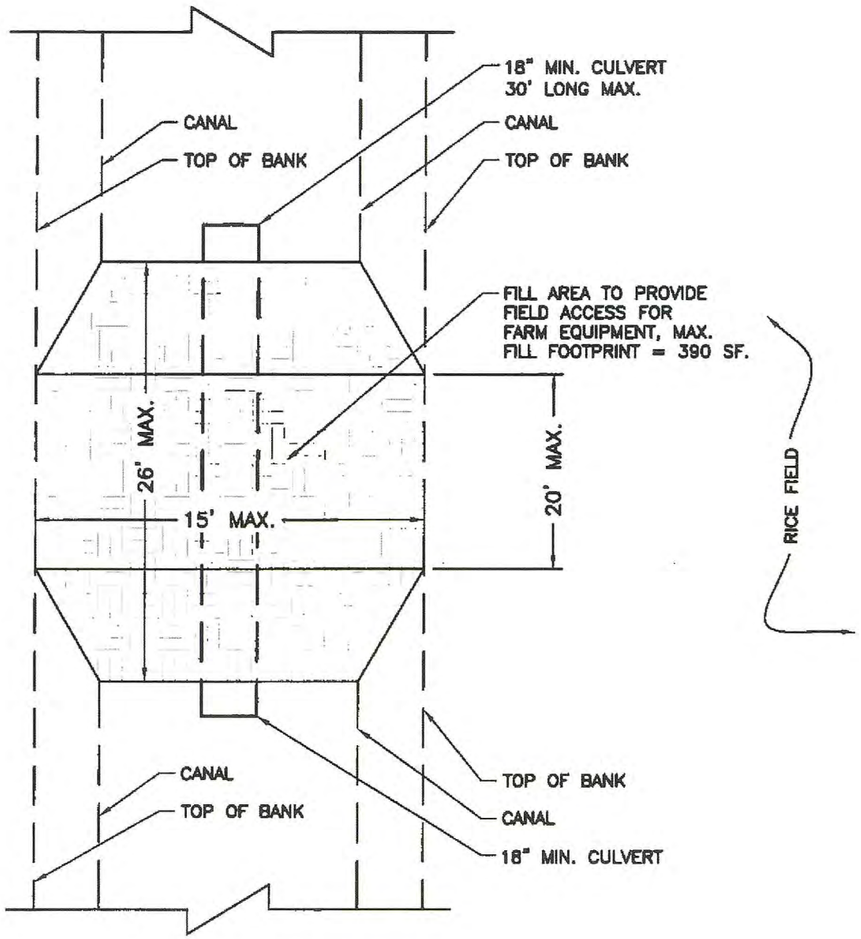
SECTION VIEW



TYPICAL DRAINAGE STRUCTURE
REPLACEMENT CROSS-SECTION
N.T.S.

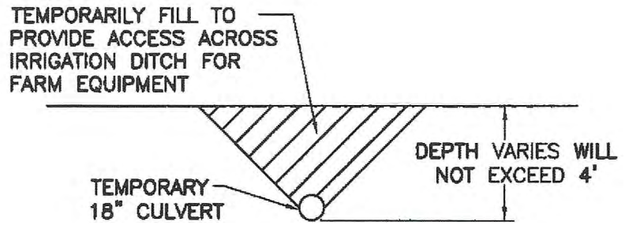


TYPICAL IRRIGATION DITCH DETAIL
N.T.S.

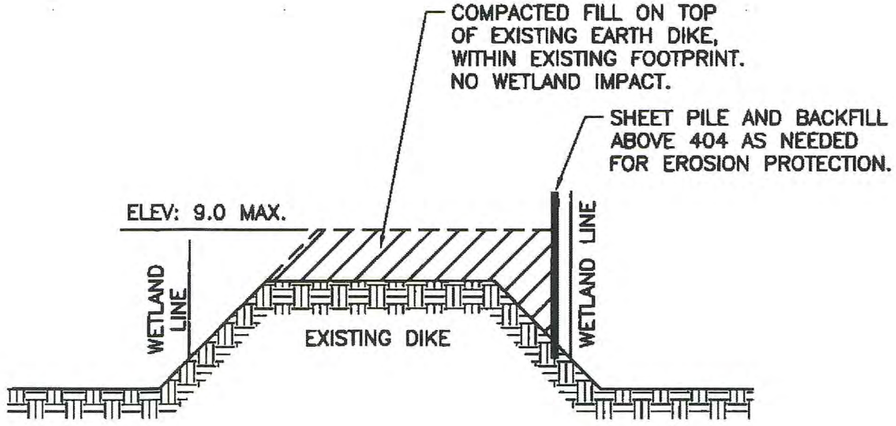


PLAN VIEW

TYPICAL PERMANENT CANAL
CROSSING FOR FIELD ACCESS
N.T.S.



TYPICAL TEMPORARY IRRIGATION DITCH CROSSING FOR FIELD ACCESS
N.T.S.



TYPICAL RICE FIELD DIKE REPAIR TO RAISE ELEVATION
N.T.S.

SYMBOL	DATE	DESCRIPTION	BY

© 2011 NORRIS & TUNSTALL

DETAILS
REPAIR / REPLACEMENT PLAN
ORTON PLANTATION
BRUNSWICK COUNTY NORTH CAROLINA

OWNER:
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1127 FLORAL PARKWAY, SUITE 400 PHONE (910) 343-9833
WILMINGTON, NC, 28403 FAX (910) 343-9804
N&T LICENSE NO. C-3941

10070

DES.	JPN
DRN.	JPN
CHK.	EDS
DATE	08/01/11

C14

Attachment E

U.S. ARMY CORPS OF ENGINEERS
Wilmington District
Compensatory Mitigation Responsibility Transfer Form

Permittee: Orton Plantation Holdings, LLC **Action ID:** SAW-2011-00624
Project Name: Orton Plantation Restoration of Historic Rice Field Operation **County:** Brunswick

Instructions to Permittee: The Permittee must provide a copy of this form to the Mitigation Sponsor, either an approved Mitigation Bank or the North Carolina Ecosystem Enhancement Program (NCEEP), who will then sign the form to verify the transfer of the mitigation responsibility. Once the Sponsor has signed this form, it is the Permittee's responsibility to ensure that to the U.S. Army Corps of Engineers (USACE) Project Manager identified on page two is in receipt of a signed copy of this form before conducting authorized impacts, unless otherwise specified below. If more than one mitigation Sponsor will be used to provide the mitigation associated with the permit, or if the impacts and/or the mitigation will occur in more than one 8-digit Hydrologic Unit Code (HUC), multiple forms will be attached to the permit, and the separate forms for each Sponsor and/or HUC must be provided to the appropriate mitigation Sponsors.

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the appropriate ledger and provide a copy of the signed form to the Permittee and to the USACE Bank/In-Lieu Fee Program Manager. The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation* **8-digit HUC and Basin:** Choose the 8-digit HUC

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-riverine	Non-Riparian	Coastal
			2.41			0.16

*If more than one mitigation sponsor will be used for the permit, only include impacts to be mitigated by this sponsor.

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** Choose the 8-digit HUC

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-riverine	Non-Riparian	Coastal
			2.49			0.32

Mitigation Site Debited: NCEEP
(List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCEEP, list NCEEP. If the NCEEP acceptance letter identifies a specific site, also list the specific site to be debited).

Section to be completed by the Mitigation Sponsor

Statement of Mitigation Liability Acceptance: I, the undersigned, verify that I am authorized to approve mitigation transactions for the Mitigation Sponsor shown below, and I certify that the Sponsor agrees to accept full responsibility for providing the mitigation identified in this document (see the table above), associated with the USACE Permittee and Action ID number shown. I also verify that released credits (and/or advance credits for NCEEP), as approved by the USACE, are currently available at the mitigation site identified above. Further, I understand that if the Sponsor fails to provide the required compensatory mitigation, the USACE Wilmington District Engineer may pursue measures against the Sponsor to ensure compliance associated with the mitigation requirements.

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

_____ _____
Signature of Sponsor's Authorized Representative **Date of Signature**

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

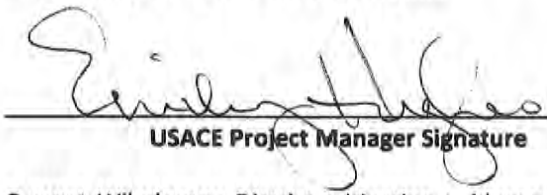
- Once this document has been signed by the Mitigation Sponsor and the USACE is in receipt of the signed form, the Permittee is no longer responsible for providing the mitigation identified in this form, though the Permittee remains responsible for any other mitigation requirements stated in the permit conditions.
- Construction within jurisdictional areas authorized by the permit identified on page one of this form can begin only after the USACE is in receipt of a copy of this document signed by the Sponsor, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein. For authorized impacts conducted by the North Carolina Department of Transportation (NCDOT), construction within jurisdictional areas may proceed upon permit issuance; however, a copy of this form signed by the Sponsor must be provided to the USACE within 30 days of permit issuance. NCDOT remains fully responsible for the mitigation until the USACE has received this form, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein.
- Signed copies of this document must be retained by the Permittee, Mitigation Sponsor, and in the USACE administrative records for both the permit and the Bank/ILF Instrument. It is the Permittee's responsibility to ensure that the USACE Project Manager (address below) is provided with a signed copy of this form.
- If changes are proposed to the type, amount, or location of mitigation after this form has been signed and returned to the USACE, the Sponsor must obtain case-by-case approval from the USACE Project Manager and/or North Carolina Interagency Review Team (NCIRT). If approved, higher mitigation ratios may be applied, as per current District guidance and a new version of this form must be completed and included in the USACE administrative records for both the permit and the Bank/ILF Instrument.

Comments/Additional Conditions:

This form is not valid unless signed by the mitigation Sponsor and USACE Project Manager. For questions regarding this form or any of the conditions of the permit authorization, contact the Project Manager at the address below.

USACE Project Manager: Emily Hughes
USACE Field Office: Wilmington Regulatory Field Office
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

Email: Emily.B.Hughes@usace.army.mil



USACE Project Manager Signature

November 7, 2012
Date of Signature

Current Wilmington District mitigation guidance, including information on mitigation ratios, functional assessments, and mitigation bank location and availability, and credit classifications (including stream temperature and wetland groupings) is available at http://ribits.usace.army.mil.

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at http://regulatory.usace.army.mil/ to complete the survey online.

Attachment F

PERMANENT CONSERVATION EASEMENT

THIS CONSERVATION EASEMENT ("Conservation Easement") made this ____ day of _____, 2012 by and between Orton Plantation Holdings LLC, ("Grantor") and North Carolina Coastal Land Trust ("Grantee").

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

RECITALS

WHEREAS, Grantor owns in fee simple 255.96 acres, more or less, of property situated in Brunswick County, North Carolina, as shown on that certain survey entitled "_____" and dated _____ prepared by _____, and recorded in Plat Cabinet _____, Slide _____, Brunswick County Public Registry (hereinafter referred to as the "Property"). Grantor wishes to convey to Grantee a Conservation Easement over the Property.

WHEREAS, Grantee is a nonprofit corporation or trust whose purpose is the conservation of property, and is qualified to be the holder of a conservation easement pursuant to N.C. Gen. Stat. § 121-35;

WHEREAS, Grantor and Grantee recognize the conservation, scenic, natural, or aesthetic value of the property in its natural state, which includes the following natural communities: forested riverine wetland adjoining a 2.3 mile segment of Allen's Creek and an associated upland buffer ("Conservation Values"). The purpose of this Conservation Easement is to maintain Conservation Values, including wetland and/or riparian resources and other natural values of the Property, and prevent the use or development of the Property for any purpose or in any manner that would conflict with the maintenance of the Property in its natural condition.

WHEREAS, the preservation of the Property is a condition of Department of the Army permit Action ID 2011-00624 issued by the Wilmington District Corps of Engineers, required to mitigate for unavoidable stream and/or wetland impacts authorized by that permit. Grantor and Grantee agree that third-party rights of enforcement shall be held by the U.S. Army Corps of Engineers, Wilmington District and its successor agencies, and that these rights are in addition to, and do not limit, the rights of enforcement under said permit. Grantee's acceptance of this Conservation Easement neither authorizes nor obligates Grantee to enforce rights of the U.S. Army Corps of Engineers under said permit.

WHEREAS, the wetlands, riparian resources, open space and other characteristics of the Property, and its current use and state of improvement, are specifically described in the baseline documentation report for the Property entitled, "Baseline Documentation Report for Allen's Creek – Orton Plantation" (hereinafter referred to as "Report" or "Baseline Documentation Report"), dated _____, 2012, and prepared by Grantee, which is the appropriate basis for monitoring compliance with the objectives of preserving the Conservation Values of the Property in its present state. The Report is not intended to preclude the use of other evidence (e.g.

mitigation plan(s,) that are part of permit Action ID 200200263 referenced above, surveys, appraisals) to establish the present condition of the Property if there is a controversy over its use.

NOW, THEREFORE, for and in consideration of the covenants and representations contained herein and for other good and valuable consideration, the receipt and legal sufficiency of which is hereby acknowledged, Grantor hereby unconditionally and irrevocably grants and conveys unto Grantee, its heirs, successors and assigns, forever and in perpetuity a Conservation Easement of the nature and character and to the extent hereinafter set forth, over the Property described on Exhibit A, together with the right to preserve and protect the conservation values thereof, as follows:

ARTICLE I.

DURATION OF EASEMENT

This Conservation Easement shall be perpetual. This conservation Easement is an easement in gross, runs with the land and is enforceable by Grantee against Grantor, Grantor's personal representatives, heirs, successors and assigns, lessees, agents and licensees.

ARTICLE II.

PROHIBITED AND RESTRICTED ACTIVITIES

Any activity on, or use of, the Property inconsistent with the purpose of this Conservation Easement is prohibited. The Property shall be preserved in its natural condition and restricted from any development that would impair or interfere with the conservation values of the Property.

Without limiting the generality of the foregoing, except as described in the Grantor's Reserved Rights in Article III below, the following activities and uses are expressly prohibited, restricted or reserved as indicated hereunder:

A. Disturbance of Natural Features. Any change disturbance, alteration or impairment of the natural features of the Property, or any intentional introduction of non-native plants and/or animal species is prohibited.

B. Construction. There shall be no constructing or placing of any building, mobile home, asphalt or concrete pavement, billboard or other advertising display, antenna, utility pole, tower, conduit, line, pier, landing, dock or any other temporary or permanent structure or facility on or above the Property.

C. Industrial, Commercial and Residential Use. Industrial, residential and/or commercial activities, including any right of passage for such purposes are prohibited.

D. Agricultural, Grazing and Horticultural Use. Agricultural, grazing, animal husbandry, and horticultural use of the Property are prohibited.

E. Vegetation. There shall be no removal, destruction, harming, cutting or mowing of trees, shrubs, or other vegetation on the Property.

F. Roads and Trails. There shall be no construction of roads, trails or walkways on the property; nor enlargement or modification to existing roads, trails or walkways.

G. Signage. No signs shall be permitted on or over the Property, except the posting of no trespassing signs, signs identifying the conservation values of the Property, signs giving directions or proscribing rules and regulations for the use of the Property and/or signs identifying the Grantor as owner of the property.

H. Dumping or Storage. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery or hazardous substances, or toxic or hazardous waste, or any placement of underground or aboveground storage tanks or other materials on the Property is prohibited.

I. Excavation, Dredging or Mineral Use. There shall be no grading, filling, excavation, dredging, mining or drilling; no removal of topsoil, sand, gravel, rock, peat, minerals or other materials, and no change in the topography of the land in any manner on the Property, except to restore natural topography or drainage patterns.

J. Water Quality and Drainage Pattern. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or related activities, or altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns. In addition, diverting or causing or permitting the diversion of surface or underground water into, within or out of the easement area by any means, removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, is prohibited.

K. Development Rights. No development rights that have been encumbered or extinguished by this Conservation Easement shall be transferred pursuant to a transferable development rights scheme or cluster development arrangement or otherwise.

L. Vehicles. The operation of mechanized vehicles, including, but not limited to, motorcycles, dirt bikes, all-terrain vehicles, cars and trucks is prohibited. Except that the use of vehicles is permitted on roads which are existing or allowed under the terms of this Conservation Easement, on bridges and roads constructed for access to bridges allowed, or as otherwise allowed under the Grantor's Reserved Rights in Article III and under Grantee's Rights in Article IV .

M. Other Prohibitions. Any other use of, or activity on, the Property which is or may become inconsistent with the purposes of this grant, the preservation of the Property substantially in its natural condition, or the protection of its environmental systems, is prohibited.

ARTICLE III

GRANTOR'S RESERVED RIGHTS

The Grantor expressly reserves for itself, its heirs, successors or assigns, the right to continue the use of the property for all purposes not inconsistent with this Conservation Easement, including,

but not limited to, the right to quiet enjoyment of the Property, the rights of ingress and egress, the right to hunt, fish, and hike on the Property, the right to sell, transfer, gift or otherwise convey the Property, in whole or in part, provided such sale, transfer or gift conveyance is subject to the terms of, and shall specifically reference, this Conservation Easement. In addition, the following rights for activities within the Property are expressly reserved to Grantor, its heirs, successors or assigns:

1. The use of periodic controlled burns for forestry and wildlife and vegetative habitat improvement purposes set on adjacent lands which may migrate to the Property;

2. The right to construct and maintain recreational trails and boardwalks, no greater than six feet in width, and not to exceed 10,000 square feet in total area, for recreation of a non-mechanized nature, provided such trails and boardwalks are constructed in accordance with all applicable regulations and required permits from appropriate state and federal agencies;

3. The right to remove or trim trees damaged or killed by storms, lightning strikes, insects or other organisms, disease, or other natural causes, but only in the event that such damaged or diseased trees constitute or are likely to constitute a hazard to life or property;

4. The right to remove beaver dams and other stream obstructions within the Property which occur subsequent to the grant of the Conservation Easement, provided such removal is in accordance with all applicable regulations and required permits from appropriate state and federal agencies;

5. The right to construct and maintain no more than three pile-supported bridges within the property, no more than 16 feet in width and with a minimum 3 feet of clearance above the land surface of the wetlands, including a pile-supported access drive connecting upland areas at the intersection of the Property and the EEP Lilliput Creek Mitigation Site, as is shown and identified in the Report, provided such bridges are constructed in accordance with all applicable regulations and required permits and licenses from appropriate state and federal agencies;

6. The right to construct temporary blinds for hunting purposes, provided such blinds are constructed in accordance with applicable state and federal rules and regulations, and will not include the use of fill material or parking areas, trails or roads for the purpose of allowing vehicular access to the blinds;

7. The right to maintain and replace structures existing on the Property at the time of the grant of the Conservation Easement, including, without limitation, roadways, trails, and culverts, in accordance with all applicable regulations and required permits from appropriate state and federal agencies, as shown in the map attached hereto as Attachment A.

8. The right to operate motorized vehicles and equipment within and across the Property for the purpose of maintenance of structures either existing or permitted within the terms of this Conservation Easement, for the purpose of removing trees, beaver dams

and other stream obstructions, and for general management purposes and uses as allowed under the Grantor's Reserved Rights; provided that no motorized vehicles and equipment may be used for commercial purposes, and motorized vehicles used for hunting or recreation shall not be allowed to leave roadways specifically identified for motorized vehicular use on the map attached hereto as Attachment A ;

9. Placement of artificial cavity boxes to promote wildlife habitat and propagation; and

10. The management and control of invasive or noxious vegetative or insect species which threaten the ecological character of the Property, including physical removal of noxious species above ground level or by hand, and the application of herbicides, insecticides and other pesticides, in accordance with approved labels and FIFRA regulations.

ARTICLE IV.

GRANTEE'S RIGHTS

The Grantee or its authorized representatives, successors and assigns, and the Corps, shall have the right to enter the Property over Grantor's adjacent lands at all reasonable times for the purpose of inspecting said property to determine if the Grantor, or his personal representatives, heirs, successors, or assigns, is complying with the terms, conditions, restrictions, and purposes of this Conservation Easement. The Grantee shall also have the right to enter and go upon the Property for purposes of making scientific or educational observations and studies, and taking samples. The easement rights granted herein include the rights to use motorized vehicles and equipment for the purpose of inspection, monitoring, observation and studies. The easement rights granted herein do not include public access rights.

ARTICLE V

ENFORCEMENT AND REMEDIES

A. To accomplish the purposes of this Easement, Grantee is allowed to prevent any activity on or use of the Property that is inconsistent with the purposes of this Easement and to require the restoration of such areas or features of the Property that may be damaged by such activity or use. Upon any breach of the terms of this Conservation Easement by Grantor that comes to the attention of the Grantee, the Grantee shall notify the Grantor in writing of such breach. The Grantor shall have 30 days after receipt of such notice to correct the conditions constituting such breach. If the breach remains uncured after 30 days, the Grantee may enforce this Conservation Easement by appropriate legal proceedings including damages, injunctive and other relief. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief if the breach of the term of this Conservation Easement is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement. The Grantor and Grantee acknowledge that under such circumstances damage to the Grantee would be irreparable and remedies at law will be inadequate. The rights and remedies of the Grantee provided hereunder shall be in

addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement. The costs of a breach, correction or restoration, including the Grantee's expenses, court costs, and attorneys' fees, shall be paid by Grantor, provided Grantor is determined to be responsible for the breach. The Corps shall have the same right to enforce the terms and conditions of this easement as the Grantee.

B. No failure on the part of the Grantee to enforce any covenant or provision hereof shall discharge or invalidate such covenant or any other covenant, condition, or provision hereof or affect the right to Grantee to enforce the same in the event of a subsequent breach or default.

C. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Property resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, war, acts of God or third parties, except Grantor's lessees or invitees; or from any prudent action taken in good faith by Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life, damage to property or harm to the Property resulting from such causes.

ARTICLE VI

MISCELLANEOUS

A. Warranty. Grantor warrants, covenants and represents that it owns the Property in fee simple, and that Grantor either owns all interests in the Property which may be impaired by the granting of this Conservation Easement or that there are no outstanding mortgages, tax liens, encumbrances, or other interests in the Property which have not been expressly subordinated to this Conservation Easement. Grantor further warrants that there is legal access to the Property, and that Grantee shall have the use of and enjoy all the benefits derived from and arising out of this Conservation Easement, and that Grantor will warrant and defend title to the Property, including access thereto, against the claims of all persons.

B. Subsequent Transfers. The Grantor agrees to incorporate the terms of this Conservation Easement in any deed or other legal instrument that transfers any interest in all or a portion of the Property. The Grantor agrees to provide written notice of such transfer at least thirty (30) days prior to the date of the transfer. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof and shall not be amended, modified or terminated without the prior written consent and approval of the Corps.

C. Assignment. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34, *et seq.* and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

D. Entire Agreement and Severability. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be void or unenforceable by a court of competent jurisdiction, the remainder shall continue in full force and effect.

E. Obligations of Ownership. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantor shall keep the Property free of any liens or other encumbrances for obligations incurred by Grantor. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

F. Extinguishment. In the event that changed conditions render impossible the continued use of the Property for the conservation purposes, this Conservation Easement may only be extinguished, in whole or in part, by judicial proceeding.

G. Eminent Domain. Whenever all or part of the Property is taken in the exercise of eminent domain so as to substantially abrogate the Restrictions imposed by this Conservation Easement, Grantor and Grantee shall join in appropriate actions at the time of such taking to recover the full value of the taking, and all incidental and direct damages due to the taking.

H. Proceeds. This Conservation Easement constitutes a real property interest immediately vested in Grantee. In the event that all or a portion of this Property is sold, exchanged, or involuntarily converted following an extinguishment or the exercise of eminent domain, Grantee shall be entitled to the fair market value of this Conservation Easement. The parties stipulate that the fair market value of this Conservation Easement shall be determined by multiplying the fair market value of the Property unencumbered by this Conservation Easement (minus any increase in value after the date of this grant attributable to improvements) by the ratio of the value of this easement at the time of this grant to the value of the Property (without deduction for the value of this Conservation Easement) at the time of this grant. The values at the time of this grant shall be the values used, or which would have been used, to calculate a deduction for federal income tax purposes, pursuant to Section 170(h) of the Internal Revenue Code (whether eligible or ineligible for such a deduction). Grantee shall use its share of the proceeds in a manner consistent with the purposes of this Conservation Easement.

I. Notification. Any notice, request for approval, or other communication required under this Conservation Easement shall be sent by registered or certified mail, postage prepaid, to the following addresses (or such address as may be hereafter specified by notice pursuant to this paragraph):

To Grantor:
Cassie Gavin
North Carolina Coastal Land Trust
131 Racine Drive, Suite 202

Wilmington NC 28403

To Grantee:
[Name, address]

To the Corps:
[Name, address]

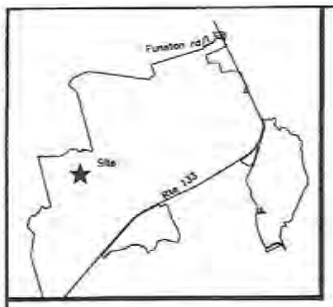
J. Failure of Grantee. If at any time Grantee is unable or fails to enforce this Conservation Easement, or if Grantee ceases to be a qualified holder of a conservation easement, and if within a reasonable period of time after the occurrence of one of these events Grantee fails to make an assignment pursuant to this Conservation Easement, then the Grantee's interest shall become vested in another qualified holder in accordance with an appropriate proceeding in a court of competent jurisdiction.

K. Amendment. This Conservation Easement may be amended, but only in a writing signed by all parties hereto, and provided such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the conservation purposes of this grant.

TO HAVE AND TO HOLD the said rights and easements perpetually unto Grantee for the aforesaid purposes.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

[Signatures of the Grantor and Grantee in appropriate form]



Vicinity Map
(No Scale)

Key Map
(No Scale)

Eagle's Branch
Page 2
Page 3
Page 4
Page 5
Page 6
Kendall
Creek
Allen's Creek
NC 133
River Road
Orton Pond

Conservation Areas

Area A = 28.0± Acres
Area 2 = 228.0± Acres
Total Area =256.0± Acres

LEGEND

- BOUNDARY LINE
- LINE NOT SURVEYED
- CONSERVATION EASEMENT
- CONCRETE MONUMENT FOUND
- STONE MONUMENT FOUND
- IRON PIPE FOUND
- REBAR & CAP SET

NOTES

1. FOR UTILITY MARKING, CALL 811 N.C. ONE CALL NO HOURS (BEFORE ANY DIGGING COMMENCES. UTILITIES ARE NOT SHOWN.
2. BOUNDARY SHOWN HEREON IS REFERENCED TO DEED BOOK 2684, PAGE 302, DEED BOOK 2381, PAGE 1700, PLAT REFERENCES AS SHOWN HEREON AND FIELD LOCATIONS.
3. THE BEARINGS AND COORDINATES SHOWN HEREON ARE REFERENCED TO THE NORTH CAROLINA STATE PLANE SYSTEM (NAD 83 (2002)/NAVD 88) THROUGH CONTROL TIES TO THE NORTH CAROLINA NETWORK RTK STATION USING A TRIMBLE R-8 GNSS RECEIVER ON 07/20/12 - 8/22/12. THE AVERAGE COMBINED FACTOR IS 1.00008132748.
4. BEARINGS AND DISTANCES ALONG THE PROPERTY BOUNDARY FROM SURVEY BY SURVEYONE, PLLC DATED 11/30/12.
5. DISTANCES SHOWN HEREON ARE GROUND.
6. NOTES AND REFERENCES SHOWN ON SHEET 1 APPLY TO ALL SHEETS.
7. ALLEN'S CREEK IS ALSO KNOWN AS KENDALL CREEK
8. CONSERVATION AREAS CONTAIN AT LEAST 182.5 ACRES OF WETLANDS AS DELINEATED BY LAND MANAGEMENT GROUP INC. IN SEPTEMBER–OCTOBER 2012

CERTIFICATE OF ACCURACY & MAPPING

I, CLIFFORD A. WAGNER, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED AS SHOWN HEREON); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION AS SHOWN HEREON; THAT THE RATIO PRECISION AS CALCULATED IS 1:10,000+; THAT THIS MAP MEETS THE REQUIREMENTS OF THE CURRENT STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 22ND DAY OF OCTOBER, A.D., 2012

I FURTHER CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY, SUCH AS RECOMBINATION OF EXISTING PARCELS, OR OTHER DESCRIPTION TO THE DEFINITION OF SUBDIVISION.

CLIFFORD A. WAGNER – PROFESSIONAL LAND SURVEYOR (NO. L-4241)

I HEREBY CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY, SUCH AS RECOMBINATION OF EXISTING PARCELS, OR OTHER DESCRIPTION TO THE DEFINITION OF SUBDIVISION, OR NOT, AN EASEMENT SURVEY.

CLIFFORD A. WAGNER – PROFESSIONAL LAND SURVEYOR (REG. L-4241)

Preliminary Plat Not for recordation, conveyances, or sales

Sheet No. 1/7

SurveyOne, PLLC
100 Middle Street
Castle Hayne, N.C. 28429
Phone: (910) 675-9488
NC License No. P-0339

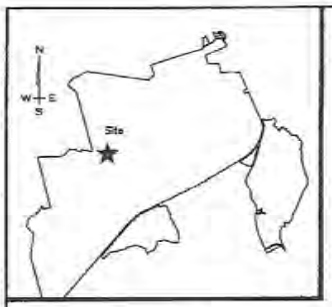
Client:
Belvedere Property Management
1251 Avenue of the Americas
New York, NY 10020

Conservation Easement Plat
Orton Plantation
Southport Township
Brunswick County North Carolina

Revision	By	Date

Drawn By: CW
Checked By: CW
Date:
Job No.:

Exhibit 4 - Page 74



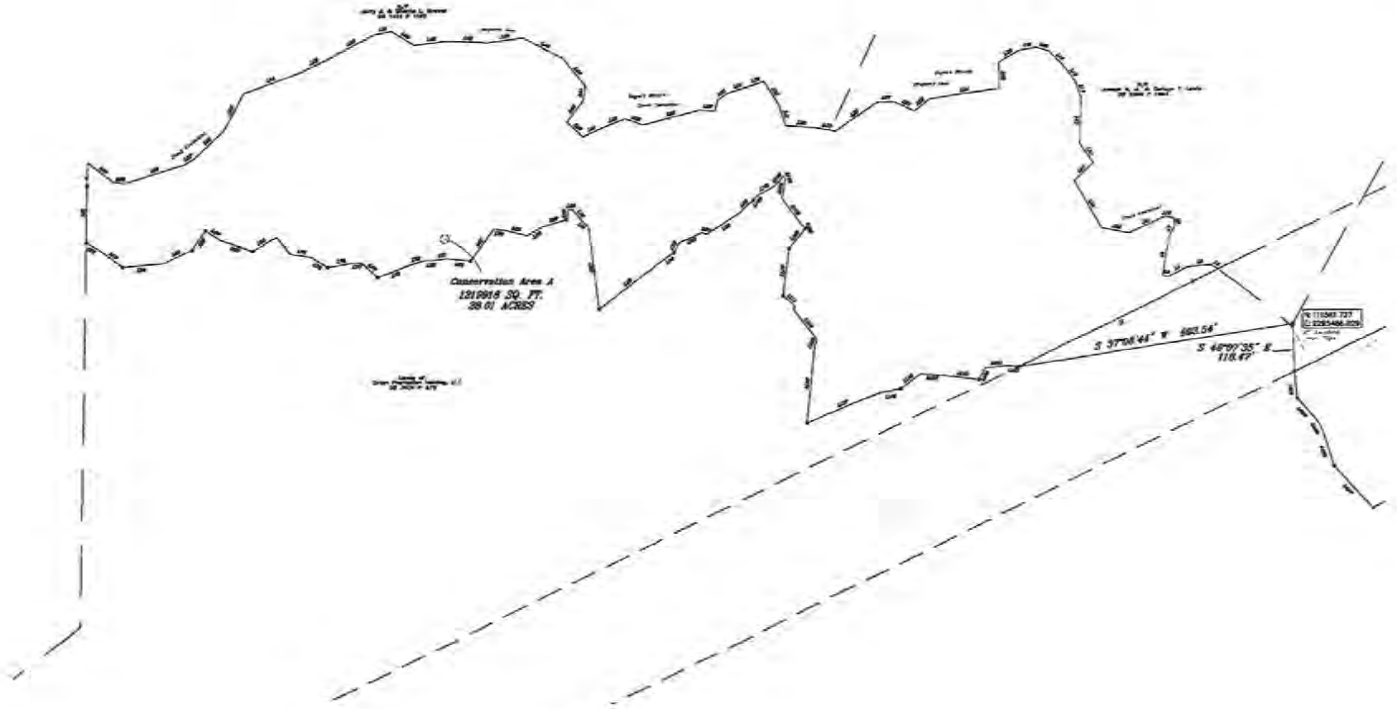
Vicinity Map
(No Scale)





LEGEND

BOUNDARY LINE
LINE NOT SURVEYED
CONSERVATION EASEMENT
CONCRETE MONUMENT FOUND
STONE MONUMENT FOUND
IRON PIPE FOUND
REBAR & CAP SET



Conservation Easement Plat
Orton Plantation
Smithville Township
Brunswick County North Carolina

Client:
Belvedere Property Management
1251 Avenue of The Americas
New York, NY 10020

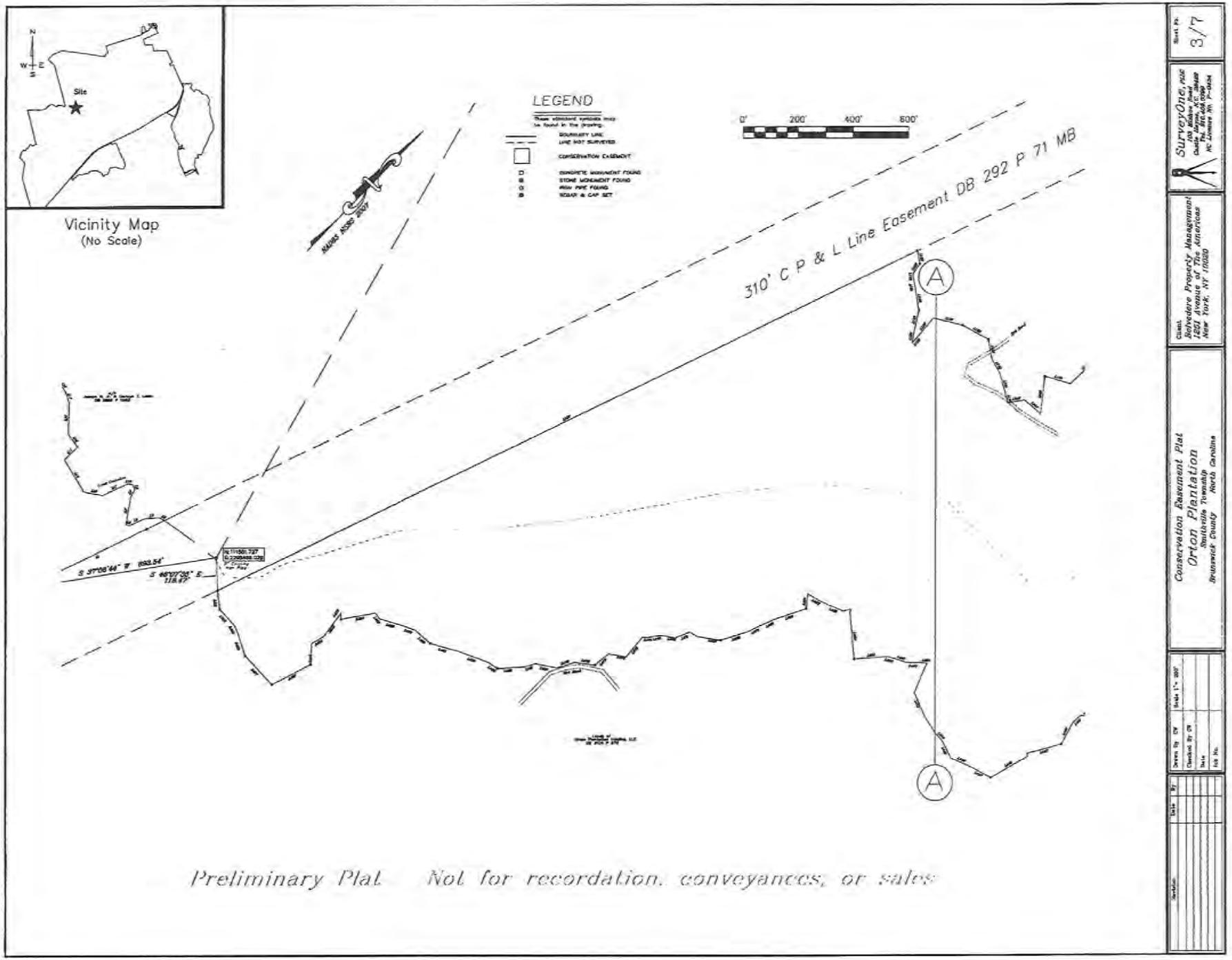
SurveyOne, PLLC
108 Kildaire Road
Cary, NC 27511
Tel. 919.468.0399
NC License No. P-0339

Sheet No. 2/7

Drawn By: CW | Scale: 1"= 200'
Checked By: CW | Date:
Job No.:

Revision | Date | By

Preliminary Plat Not for recordation, conveyances, or sales


Site
Vicinity Map
(No Scale)
LEGEND
0'
200'
400'
600'
310' C P & L Line Easement DB 292 P 71 MB
A
A
Preliminary Plat Not for recordation, conveyances, or sales
SurveyOne, PLLC
Client:
Belvedere Property Management
1251 Avenue of The Americas
New York, NY 10020
Conservation Easement Plat
Orton Plantation
Smithville Township
Brunswick County North Carolina
Sheet No.
3/7

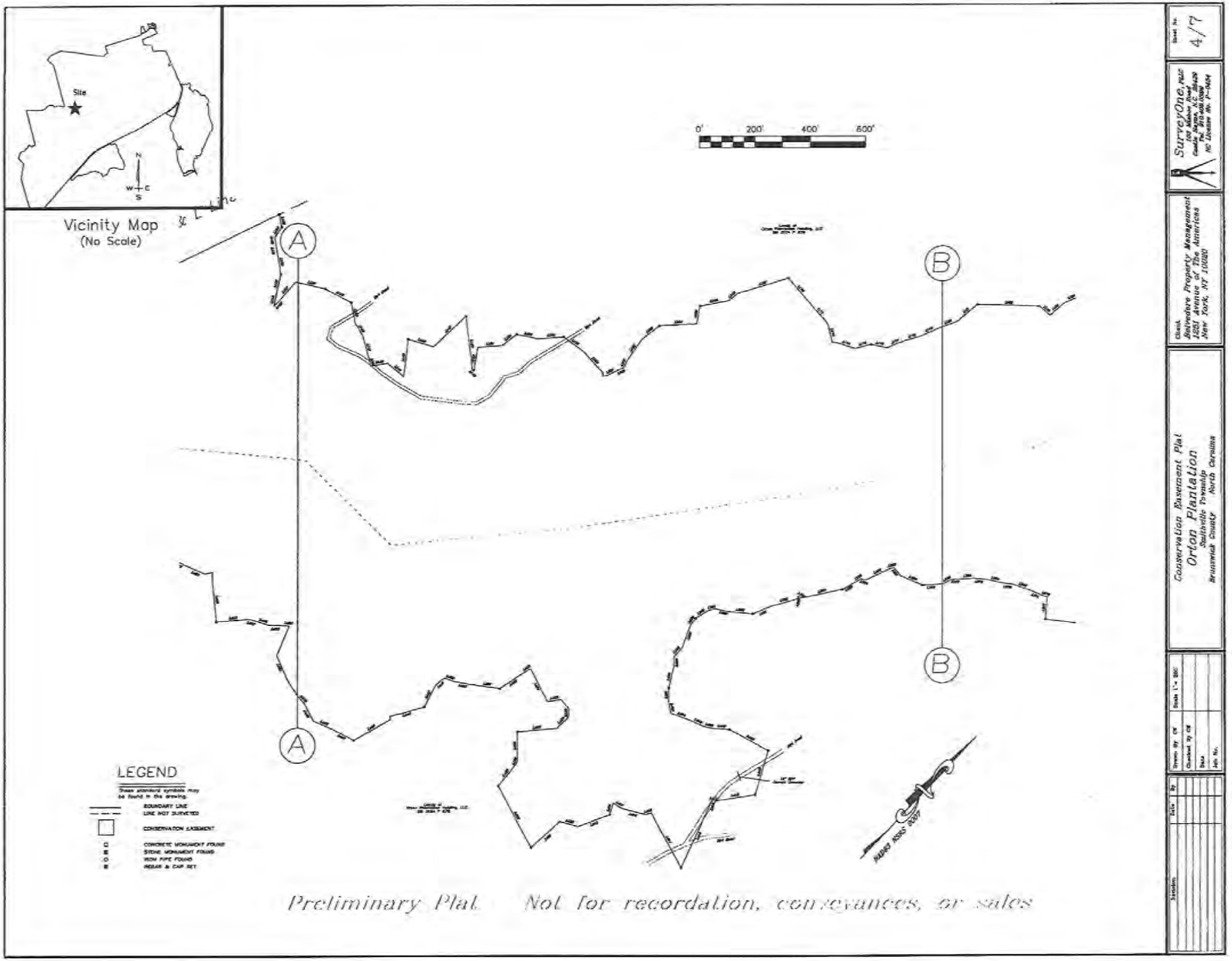
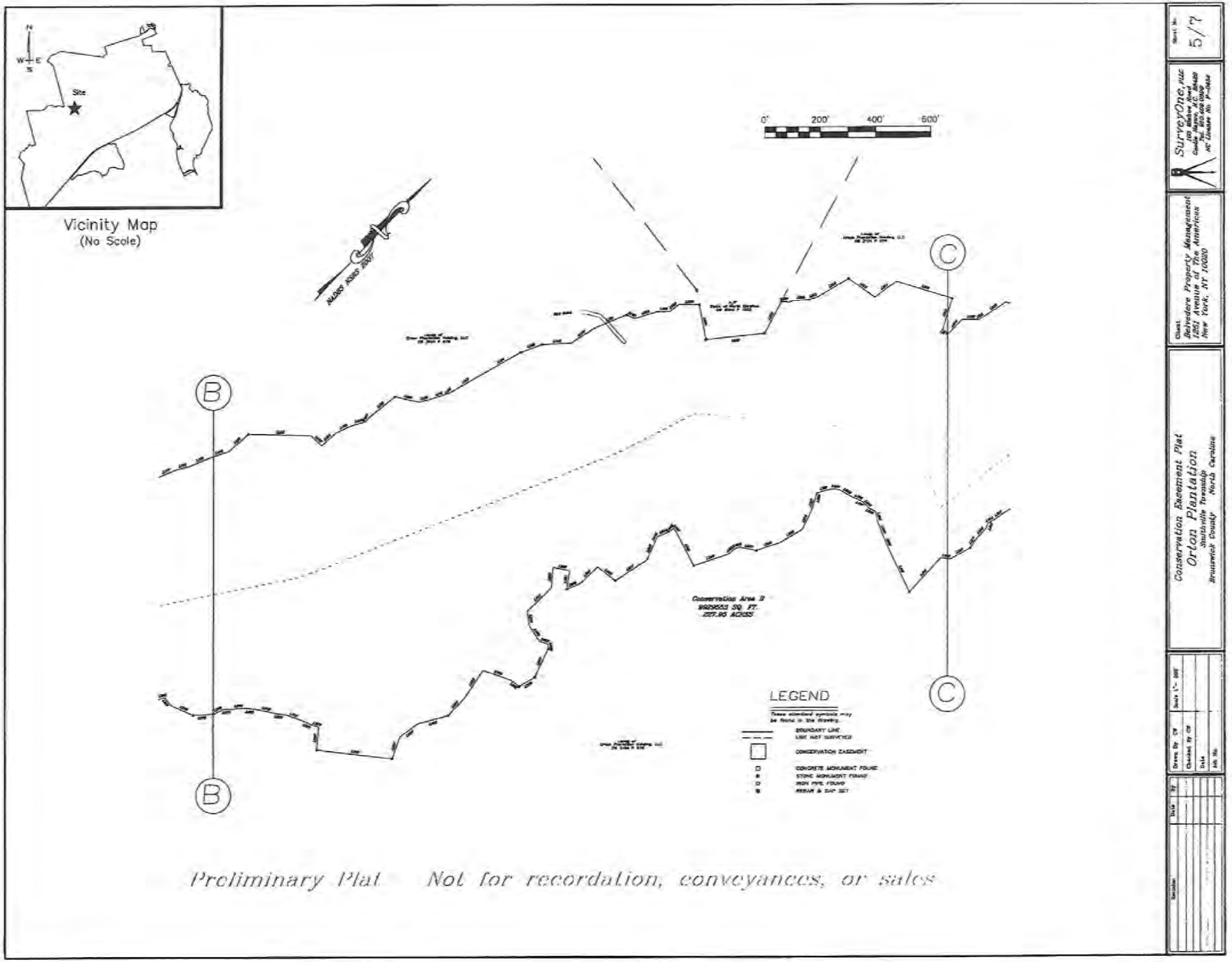
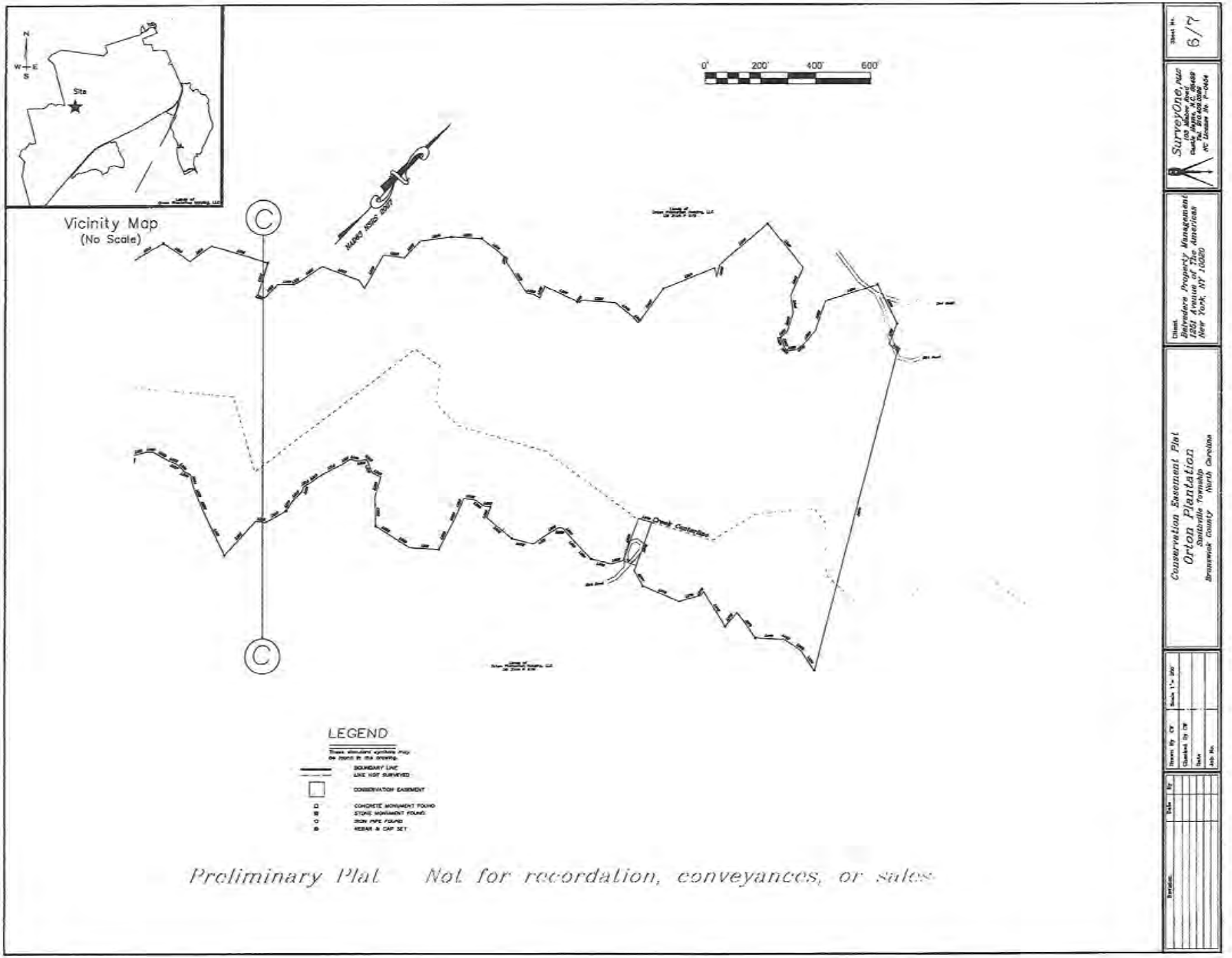
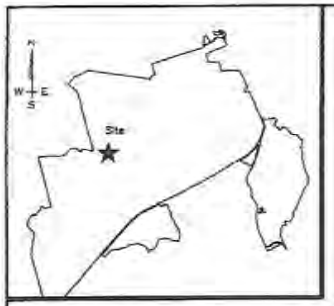


Exhibit 4 - Page 77


Site
Vicinity Map
(No Scale)
0'
200'
400'
600'
B
B
C
C
Conservation Area 2
9629553 SQ. FT.
227.95 ACRES
LEGEND
BOUNDARY LINE
LINE NOT SURVEYED
CONSERVATION EASEMENT
CONCRETE MONUMENT FOUND
STONE MONUMENT FOUND
IRON PIPE FOUND
REBAR & CAP SET
Preliminary Plat Not for recordation, conveyances, or sales
SurveyOne, PLLC
Client:
Belvedere Property Management
1251 Avenue of the Americas
New York, NY 10020
Conservation Easement Plat
Orton Plantation
Smithville Township
Brunswick County North Carolina
Sheet No.
5/7


Vicinity Map
(No Scale)
Site
0'
200'
400'
600'
MUNGO ROAD (SR 1147)
Creek Centerline
LEGEND
BOUNDARY LINE
LINE NOT SURVEYED
CONSERVATION EASEMENT
CONCRETE MONUMENT FOUND
STONE MONUMENT FOUND
IRON PIPE FOUND
REBAR & CAP SET
Preliminary Plat Not for recordation, conveyances, or sales
Conservation Easement Plat
Orton Plantation
Smithville Township
Brunswick County North Carolina
Client:
Belvedere Property Management
1251 Avenue of the Americas
New York, NY 10020
SurveyOne, PLLC
Sheet No.
6/7



Vicinity Map
(No Scale)

Conservation Area "A"

LINE	BEARING	DISTANCE
L1	N 88°15'24" E	353.45'
L2	S 74°27'02" W	28.75'
L3	S 41°11'18" W	56.59'
L4	S 25°49'55" W	54.73'
L5	S 55°15'38" W	14.12'
L6	N 34°41'09" W	96.20'
L7	N 16°26'35" W	50.61'
L8	N 58°20'59" W	17.62'
L9	S 58°32'18" W	13.75'
L10	S 46°22'03" W	9.14'
L11	S 21°37'03" W	96.75'
L12	S 56°15'03" W	68.59'
L13	N 74°50'37" W	135.58'
L14	N 03°56'05" E	66.48'
L15	N 80°15'28" W	256.50'
L16	N 40°38'48" W	114.23'
L17	N 63°31'08" W	44.20'
L18	N 81°21'53" W	42.29'
L19	N 89°15'32" W	57.77'
L20	S 66°10'08" W	33.68'
L21	S 36°21'48" W	40.90'
L22	S 17°13'21" W	57.64'
L23	S 44°43'48" E	65.56'
L24	S 57°38'24" W	176.03'
L25	S 06°59'25" W	48.29'
L26	S 79°27'03" W	56.64'
L27	S 43°25'45" W	41.52'
L28	S 11°50'32" W	104.45'
L29	S 59°47'46" W	48.78'
L30	S 50°20'27" W	76.86'
L31	N 60°40'55" W	35.77'
L32	N 77°05'43" W	76.72'
L33	S 27°41'12" W	39.53'
L34	S 27°21'37" W	53.83'
L35	S 12°56'47" W	38.97'
L36	S 39°09'05" E	27.95'
L37	S 48°23'58" W	40.65'
L38	S 31°06'53" W	143.49'
L39	S 64°56'39" W	46.29'
L40	S 25°11'26" W	66.10'
L41	S 21°10'07" W	54.40'
L42	S 88°29'12" W	53.79'
L43	N 06°52'09" W	65.07'
L44	N 33°16'28" W	37.29'
L45	N 63°21'45" W	87.90'
L46	S 73°18'12" W	114.35'
L47	S 37°45'05" W	88.99'
L48	S 48°44'13" W	39.72'
L49	S 39°17'44" W	82.82'
L50	S 77°38'16" W	66.91'
L51	S 36°54'32" W	43.66'
L52	S 17°46'34" W	122.91'
L53	S 00°40'35" W	86.29'
L54	S 25°36'01" W	146.36'
L55	S 16°12'47" E	130.58'
L56	S 02°26'55" W	99.39'
L57	S 14°13'53" W	39.95'
L58	S 58°16'59" W	154.59'
L59	S 39°39'24" W	29.18'
L60	S 84°09'48" W	60.42'
L61	S 43°14'36" E	199.25'
L62	N 79°43'19" E	35.29'
L63	N 89°55'36" E	74.89'
L64	N 41°05'38" E	99.60'
L65	N 21°29'43" E	78.75'
L66	N 09°39'00" W	58.99'
L67	N 78°27'04" E	42.35'
L68	N 65°11'32" E	86.71'
L69	N 14°49'14" E	57.67'
L70	N 28°12'56" E	10.19'
L71	N 81°59'28" E	4.08'
L72	S 82°09'36" E	49.41'
L73	N 53°19'31" E	51.09'
L74	N 77°57'29" E	49.32'
L75	N 37°04'59" E	68.41'
L76	N 42°40'33" E	33.05'
L77	N 86°18'22" E	54.99'
L78	N 25°46'29" E	84.97'
L79	N 27°49'58" E	33.30'
L80	N 42°39'24" E	36.63'
L81	N 38°04'27" E	23.48'
L82	N 51°29'58" E	58.35'
L83	N 87°36'31" W	97.66'
L84	N 76°18'22" E	54.99'
L85	N 53°53'19" E	21.24'
L86	N 58°23'51" E	63.80'
L87	N 17°02'17" E	41.40'
L88	S 72°37'24" E	64.84'
L89	N 34°49'19" W	24.85'
L90	N 45°48'31" E	10.97'
L91	S 84°36'19" E	36.65'
L92	N 87°53'54" E	21.24'
L93	N 58°23'51" E	63.80'
L94	S 51°44'39" E	202.16'
L95	N 06°19'07" E	127.76'
L96	N 33°33'39" E	43.50'
L97	N 77°05'43" W	76.72'
L98	N 21°55'44" E	60.62'
L99	S 12°56'47" W	38.97'
L100	S 39°09'05" E	27.95'
L101	S 48°23'58" W	40.65'
L102	N 00°17'21" W	33.93'
L103	S 59°22'56" E	52.39'
L104	S 32°39'09" E	44.71'
L105	S 86°59'15" E	83.53'
L106	N 74°54'39" E	6.57'
L107	S 72°59'22" E	5.59'
L108	S 62°40'33" E	9.25'
L109	S 44°22'16" E	62.48'
L110	S 36°58'30" E	116.37'
L111	N 85°51'22" E	37.05'
L112	S 34°41'45" E	9.85'
L113	S 82°05'41" E	93.27'
L114	N 60°49'12" E	1.04'
L115	S 18°54'57" E	10.36'
L116	S 38°47'49" E	194.62'
L117	N 23°07'09" E	193.74'
L118	N 34°50'34" E	92.71'
L119	N 09°43'35" E	57.64'
L120	N 12°47'27" E	4.39'
L121	S 58°16'59" W	2.09'
L122	N 59°06'44" E	56.37'
L123	N 52°08'36" E	86.49'
L124	N 16°48'13" W	32.62'
L125	N 41°25'39" E	57.49'
L126	N 51°16'19" E	36.64'

Conservation Area "B"

LINE	BEARING	DISTANCE
L287	N 89°14'52" E	46.76'
L288	S 17°46'05" W	84.76'
L289	S 50°01'13" W	34.30'
L290	S 81°25'03" E	167.31'
L291	N 69°48'18" W	176.31'
L292	N 67°49'38" W	39.00'
L293	N 65°31'41" W	60.09'
L294	N 56°52'39" W	41.85'
L295	S 71°18'38" W	24.45'
L296	N 87°05'45" W	35.83'
L297	S 73°29'43" W	1.85'
L298	S 69°58'19" W	38.18'
L299	S 75°09'51" W	54.84'
L300	S 49°25'53" W	27.53'
L301	S 31°25'46" W	55.67'
L302	S 39°53'37" E	15.28'
L303	S 67°36'28" E	50.43'
L304	S 18°19'38" E	74.64'
L305	S 15°17'26" W	93.14'
L306	S 27°31'13" W	89.20'
L307	S 58°46'32" W	62.23'
L308	S 36°18'20" W	14.09'
L309	S 89°09'55" W	35.41'
L310	S 27°45'19" W	130.67'
L311	S 14°27'04" W	52.57'
L312	N 71°56'43" E	138.38'
L313	S 39°53'37" E	10.53'
L314	S 18°19'38" E	74.64'
L315	S 24°09'05" W	46.08'
L316	S 27°31'13" W	89.20'
L317	S 12°21'06" E	15.12'
L318	N 69°44'19" W	61.23'
L319	S 58°46'32" W	62.23'
L320	S 36°18'20" W	14.09'
L321	S 27°31'13" W	89.20'
L322	S 12°21'06" E	15.12'
L323	N 69°44'19" W	61.23'
L324	S 24°09'05" W	46.08'
L325	S 18°19'38" E	74.64'
L326	S 39°53'37" E	10.53'
L327	S 73°29'43" W	1.85'
L328	S 69°58'19" W	38.18'
L329	S 75°09'51" W	54.84'
L330	S 49°25'53" W	27.53'
L331	S 31°25'46" W	55.67'
L332	S 39°53'37" E	15.28'
L333	S 67°36'28" E	50.43'
L334	S 18°19'38" E	74.64'
L335	S 15°17'26" W	93.14'
L336	S 27°31'13" W	89.20'
L337	S 58°46'32" W	62.23'
L338	S 36°18'20" W	14.09'
L339	S 89°09'55" W	35.41'
L340	S 27°45'19" W	130.67'
L341	N 71°56'43" E	138.38'
L342	N 88°11'20" W	14.68'
L343	S 01°21'05" W	16.25'
L344	S 24°09'05" W	46.08'
L345	S 12°21'06" E	15.12'
L346	S 89°19'38" E	77.50'
L347	S 12°29'03" W	136.19'
L348	S 89°36'05" W	88.97'
L349	S 01°07'26" W	89.36'
L350	S 27°45'19" W	56.50'
L351	N 34°37'06" W	68.21'
L352	S 37°24'23" W	69.83'
L353	S 39°14'01" E	74.27'
L354	S 61°41'55" W	122.32'
L355	S 53°47'14" E	51.77'
L356	S 77°42'15" E	66.13'
L357	N 64°36'18" E	32.81'
L358	S 46°15'29" E	15.36'
L359	S 18°16'46" E	111.87'
L360	S 16°50'11" W	64.62'
L361	S 82°41'08" W	36.45'
L362	S 54°36'29" W	106.79'
L363	S 89°37'44" E	115.09'
L364	S 80°54'27" E	89.65'
L365	S 36°58'25" W	112.58'
L366	S 18°16'46" E	111.87'
L367	S 24°09'13" E	85.01'
L368	S 52°30'46" W	272.20'
L369	N 09°00'38" W	82.17'
L370	S 63°05'52" W	21.11'
L371	S 69°45'28" W	49.23'
L372	S 64°59'17" W	58.45'
L373	S 53°49'47" W	49.90'
L374	S 06°14'05" W	60.49'
L375	S 38°29'49" W	43.27'
L376	S 42°10'30" W	47.80'
L377	S 45°30'52" W	29.42'
L378	S 20°14'23" W	39.98'
L379	S 42°56'37" W	73.22'
L380	S 69°23'19" W	86.02'
L381	N 84°08'22" W	39.25'
L382	S 84°27'46" W	12.82'
L383	S 23°19'17" W	99.84'
L384	S 84°11'39" W	17.40'
L385	S 13°04'58" W	14.78'
L386	S 16°56'49" W	62.05'
L387	S 34°12'42" W	101.07'
L388	S 78°47'31" W	14.30'
L389	S 20°36'13" E	12.55'
L390	S 30°29'34" W	96.80'
L391	S 25°53'54" W	72.54'
L392	S 51°14'36" W	97.32'
L393	S 58°46'43" W	33.09'
L394	S 33°55'55" W	26.20'
L395	S 12°40'59" W	53.23'
L396	S 85°02'29" E	39.54'
L397	S 23°23'06" E	83.27'
L398	S 85°20'37" E	45.16'
L399	S 45°31'59" E	38.46'
L400	S 30°41'12" E	74.35'
L401	S 43°19'08" E	50.78'
L402	S 56°06'06" E	37.67'
L403	S 80°20'23" E	4.83'
L404	N 65°21'14" E	67.56'
L405	N 69°24'12" E	59.69'
L406	N 57°14'29" E	89.24'
L407	N 59°13'54" E	68.43'
L408	N 74°27'18" E	158.17'
L409	S 27°39'54" E	16.30'
L410	S 37°11'45" W	147.49'
L411	S 47°56'37" W	12.38'
L412	S 28°35'07" E	7.82'
L413	S 19°18'05" E	254.85'
L414	N 73°01'25" W	222.07'
L415	S 25°05'26" W	21.19'
L416	S 66°03'55" W	89.16'
L417	S 72°59'28" W	38.82'
L418	S 27°29'08" E	42.52'
L419	S 26°39'52" W	121.15'
L420	S 58°58'02" W	67.90'
L421	S 03°48'16" W	139.36'
L422	N 72°06'38" W	249.44'
L423	N 04°16'12" W	202.79'
L424	N 25°14'08" W	9.27'
L425	N 43°48'08" W	164.46'
L426	N 41°18'44" E	135.94'
L427	N 65°44'49" E	2.57'
L428	N 02°05'58" W	3.14'
L429	N 08°33'48" E	56.86'
L430	N 41°05'42" W	28.08'
L431	N 69°44'19" W	6.90'
L432	N 85°02'27" W	37.53'
L433	S 37°46'27" W	49.01'
L434	N 71°28'02" W	131.96'
L435	S 14°27'04" W	24.57'
L436	S 12°29'03" W	106.56'
L437	S 53°36'08" W	98.31'
L438	S 35°58'59" W	73.96'
L439	S 66°38'30" W	31.64'
L440	S 21°17'03" W	12.22'
L441	S 04°17'45" W	29.72'
L442	S 12°38'18" E	68.02'
L443	S 31°07'26" W	128.54'
L444	S 78°27'41" W	9.29'
L445	S 57°13'55" E	16.96'
L446	S 16°53'39" W	152.31'
L447	S 73°12'16" W	87.65'
L448	S 69°18'03" W	73.68'
L449	N 76°58'56" W	67.77'
L450	N 86°02'53" W	36.85'
L451	N 77°13'13" W	70.46'
L452	N 67°23'42" W	94.31'
L453	N 21°02'49" W	113.43'
L454	S 58°51'08" W	7.57'
L455	S 47°10'06" W	63.91'
L456	S 63°20'06" W	52.72'
L457	S 61°56'14" W	28.33'
L458	S 49°34'05" W	120.73'
L459	N 49°29'06" W	167.91'
L460	N 32°19'07" W	13.01'
L461	S 21°04'01" W	93.52'
L462	S 31°19'35" W	27.60'
L463	S 76°18'37" W	57.81'
L464	S 37°08'21" E	54.43'
L465	S 27°19'09" W	118.06'
L466	S 22°47'10" W	50.14'
L467	S 21°04'01" W	93.52'
L468	S 29°10'17" W	94.62'
L469	S 54°44'04" W	84.37'
L470	S 76°41'14" W	30.38'
L471	S 27°19'09" W	57.06'
L472	S 34°53'10" W	31.59'
L473	S 38°62'26" W	48.68'
L474	S 44°44'33" W	19.86'
L475	S 04°35'28" E	90.23'
L476	S 55°59'44" W	23.56'
L477	S 04°29'17" W	66.80'
L478	S 52°53'09" W	74.22'
L479	S 28°43'07" W	65.07'
L480	S 57°25'11" W	79.22'
L481	S 89°08'24" W	41.51'
L482	S 43°53'48" W	98.26'
L483	S 79°28'22" W	37.24'
L484	S 66°10'05" W	138.65'
L485	S 61°36'37" W	103.97'
L486	S 86°51'37" W	71.50'
L487	S 50°53'46" W	39.54'
L488	S 62°47'38" W	90.54'
L489	N 79°36'41" W	24.94'
L490	S 35°49'39" W	126.18'
L491	N 44°13'58" W	22.56'
L492	S 08°46'24" E	18.97'
L493	S 07°16'40" E	52.22'
L494	S 15°45'39" W	30.76'
L495	S 48°53'43" E	74.84'
L496	S 18°43'17" W	156.48'
L497	N 87°28'19" W	140.78'
L498	N 62°20'36" W	95.49'
L499	N 73°38'33" W	23.47'
L500	N 88°25'07" W	73.84'
L501	N 59°08'51" W	69.86'

Preliminary Plat — Not for recordation, conveyances, or sales

Client
Belvedere Property Management
1251 Avenue of The Americas
New York, NY 10020

Conservation Easement Plat
Orton Plantation
Smithville Township
Brunswick County North Carolina

Surveyors, PLLC
Professional Land Surveying
Castle Hayne, N.C. 28429
Tel. 910.458.0999
NC License No. P-0468

Sheet No.
7/7

Exhibit 4 - Page 80

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Orton Plantation Holdings, LLC	File Number: 2011-00624	Date: 11/07/2012
Attached is:		See Section below
X	**INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)**	**A**
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Emily B. Hughes, Regulatory Specialist U.S. Army Corps of Engineers, Wilmington District 69 Darlington Avenue Wilmington, North Carolina 28403-1398 Phone: (910) 251-4635	If you only have questions regarding the appeal process you may also contact: Mr. Jason Steele, Administrative Appeal Review Officer CESAD-PDO U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 10M15 Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.		
_____ Signature of appellant or agent.	Date:	Telephone number:

DIVISION ENGINEER:
Commander
U.S. Army Engineer Division, South Atlantic
60 Forsyth Street, Room 9M15
Atlanta, Georgia 30303-3490

Exhibit 5
Orton Bird List

Orton Rookery Birds Species List

	Species	IUCN Red List	Population Status	Orton Rookery
1	American Bittern		Decreasing	Rare
2	Anhinga		Stable	Common
3	Black Rail	**Endangered**	Endangered	Very Rare
4	Black-bellied Whistling Duck		Increasing	Present
5	Black-crowned Night Heron		Unknown	Rare
6	Black-necked stilt		Stable	Common
7	Cattle Egret		Stable	Very Common
8	Clapper Rail		Decreasing	Present
9	Common Gallinule		Unknown	Common
10	Cormorant		Increasing	Common
11	Glossy Ibis		Stable	Rare
12	Great Blue Heron		Increasing	Common
13	Great White Egret		Stable	Common
14	Green Heron		Decreasing	Present
15	Least Bittern		Increasing	Present
16	Little Blue Heron		Decreasing	Common
17	Little Egret		Stable	Common
18	Purple Gallinule		Stable	Common
19	Snowy Egret		Increasing	Common
20	Sora		Stable	Present
21	Tricolored Heron		Decreasing	Common
22	Virginia Rail		Stable	Rare
23	White Ibis		Stable	Very Common
24	Wood Stork	**Regionally Threatened**	Decreasing	Rare
25	Yellow Rail	**Yellow Alert Species**	Decreasing	Very Rare
26	Yellow-crowned Night Heron		Stable	Rare

Not observed at Orton but within Historic Range

27	King Rail	**Orange Alert Species**	Decreasing	Very Rare
28	Reddish Egret	**Near Threatened**	Decreasing	Very Rare

ORTON

Exhibit 6

Orton Comments on Corps Draft EIS (Oct. 31, 2025) (w/o Exhibits)

Docusign Envelope ID: 2E104E47-6268-4CF1-9FA4-718C8EA2E985

Orton Plantation Holdings, LLC

October 31, 2025

Submitted via Fed Ex and Electronically

US Army Corps of Engineers
Wilmington Corps
ATTN: Wilmington Harbor 403
69 Darlington Avenue
Wilmington, NC 28403
WilmingtonHarbor403@usace.army.mil

Dear U.S. Army Corps of Engineers,

Orton Plantation Holdings, LLC ("Orton") respectfully submits these comments on the Section 403 Draft Letter Report and Draft Environmental Impact Statement (collectively, the "Draft EIS" or "DEIS") prepared by the Army Corps of Engineers, Wilmington District (the "Corps") for the Wilmington Harbor Navigation Project, CEQ ID EISX-202-00-K7P-1755163795 (the "Project"). Please add these comments to the administrative record for the Project.

ORTON'S INTEREST IN THE PROJECT

Orton owns the Orton Property, located on the western shore of the Cape Fear River, just north of the historic Brunswick Town. Orton Point sits at the eastern edge of the Property.

The Orton Property is widely regarded as one of the River's most historically significant and intact sites. Founded by Roger Moore in the early 1720s, Orton anchored the first wave of settlement associated with nearby Brunswick Town. The Property predates North Carolina's statehood by more than half a century.

Today, the Orton Property is approximately 14,000 acres, with over 830 acres of the Orton Property listed on the National Register of Historic Places ("NRHP"). The NRHP Boundary includes historic freshwater wetlands, rice fields, a historic system of dikes, revetments and water control structures, and extends 500 feet into the Cape Fear River to protect underwater archeological resources. Orton's restoration and protection of the historic rice field system, the dike and the water control systems recognize and honor the important cultural history of enslaved African Americans working in the antebellum and postbellum period in the South, and whose backbreaking labor created these structures previous to the era of modern machinery. Orton continues to actively support ongoing archaeological field work and research with the University of North Carolina Wilmington into the cultural importance and heritage of enslaved African Americans working in the antebellum and postbellum freshwater wetland rice fields.

I purchased the Orton Property in 2010. I am a lineal descendant of Roger Moore, the founder of the Orton Property. Through Orton Plantation Holdings, LLC, I

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have endeavored to protect, preserve, enhance, and restore the Property and its significant cultural, historic, and environmental resources. I take seriously my role as custodian of the Orton Property's rich cultural, historic, and natural heritage.

In 2012, at Orton's request, the Corps authorized Orton to undertake a comprehensive restoration project at the Property. Orton invested more than $29 million, and significant time and resources over the last fifteen years, to restore 350 acres of the last-remaining, fully intact rice field system in North Carolina, and the historic earthen dike, revetments, and water control structures that protect and support the rice fields. Orton restored and repaired about 6,800 feet of earthen dike, protected about 2,000 feet of the shoreline with a rip-rap revetment, and restored and repaired 13 water control structures.

That work restored and preserved the earthen dike structure along the Cape Fear River front that has been in place since the 1700s, and restored over 350 acres of historically significant rice fields.[1] Orton preserved 187.5 acres of high-quality freshwater wetlands through the grant of a conservation easement to the North Carolina Coastal Land Trust, irrevocably transferring some of its property rights in furtherance of the Corps'-approved restoration plan. In addition to the restoration cost, Orton has incurred more than $5 million to maintain the unique and historic rice fields built by enslaved African Americans over 150 years ago.

Orton has a direct and substantial interest in the Project and its consequences. The Project threatens to damage the Orton Property, the listed cultural and historic resources at the Property, and Orton's significant investment in the preservation, restoration, and protection of those resources. Binding Corps policy requires that the agency conduct detailed, site-specific geotechnical analyses to ensure the dredging will not compromise shoreline stability or critical infrastructure, such as the Orton dike. The Corps has ignored that policy, and ignored the adverse impacts of the Project on the Orton Property.

The maps on the following pages show that Project dredging will occur <u>inside</u> the NRHP Boundary for the Property and adjacent to the listed historic dike at the Orton Property.

Readily available geotechnical data demonstrates that the Corps' proposal to dredge in proximity to the historic earthen dike creates an unacceptable risk of global failure of the dike. Failure of the dike will necessarily result in a collapse of the historic rice fields and the freshwater ecological system at Orton.

The preserved historic rice fields, revetment and dike system, underwater archeological resources, and freshwater water systems and wetlands are the historic and cultural landscape of the Orton Property. But the Corps has failed to acknowledge in the Draft EIS the obvious adverse impacts of the Project on those same resources.

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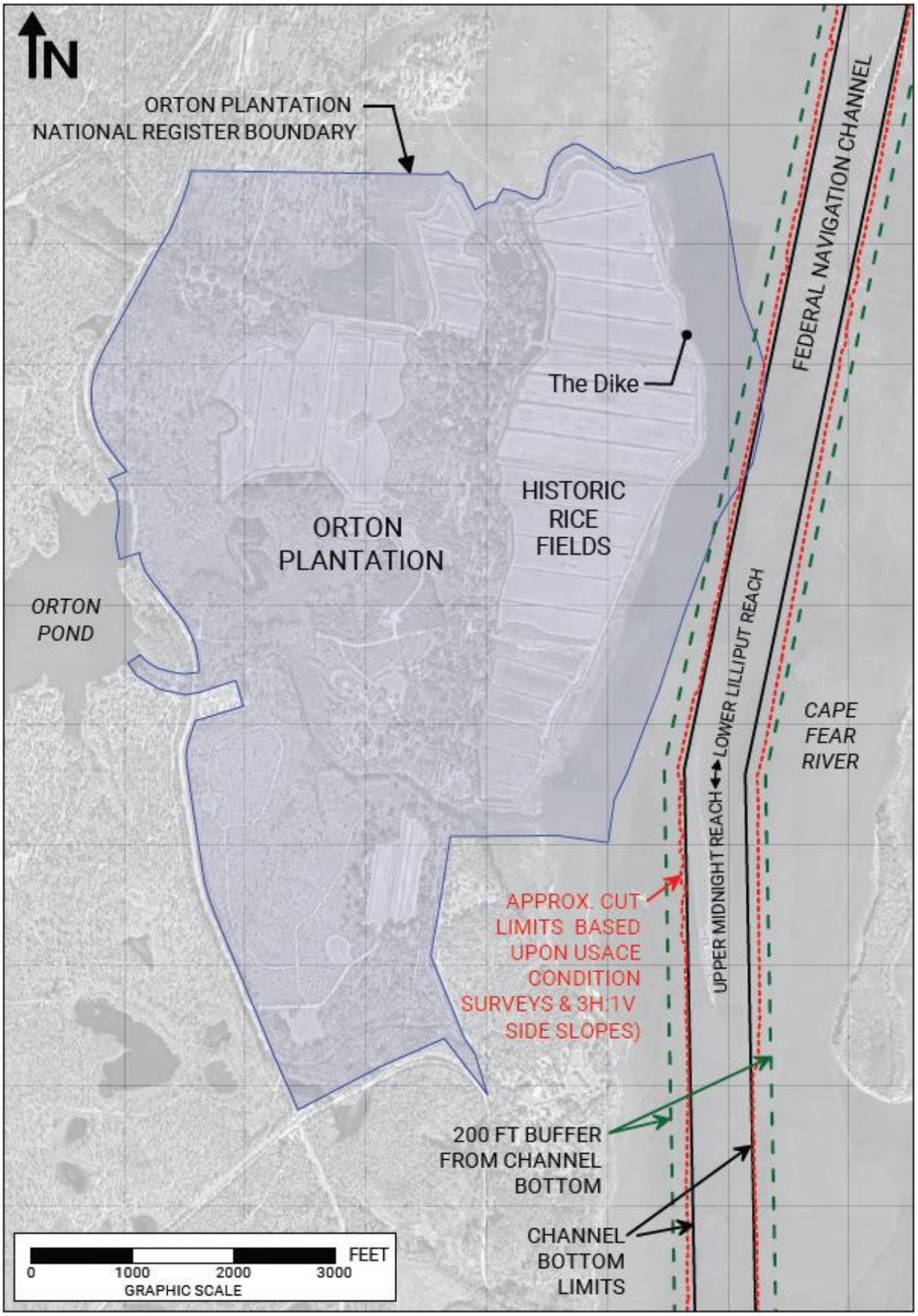
[1] *See generally* Dept. of Army Permit, Permit No. SAW-2011-00624 (Nov. 2012) ("2012 Permit"), attached as Exhibit 4.

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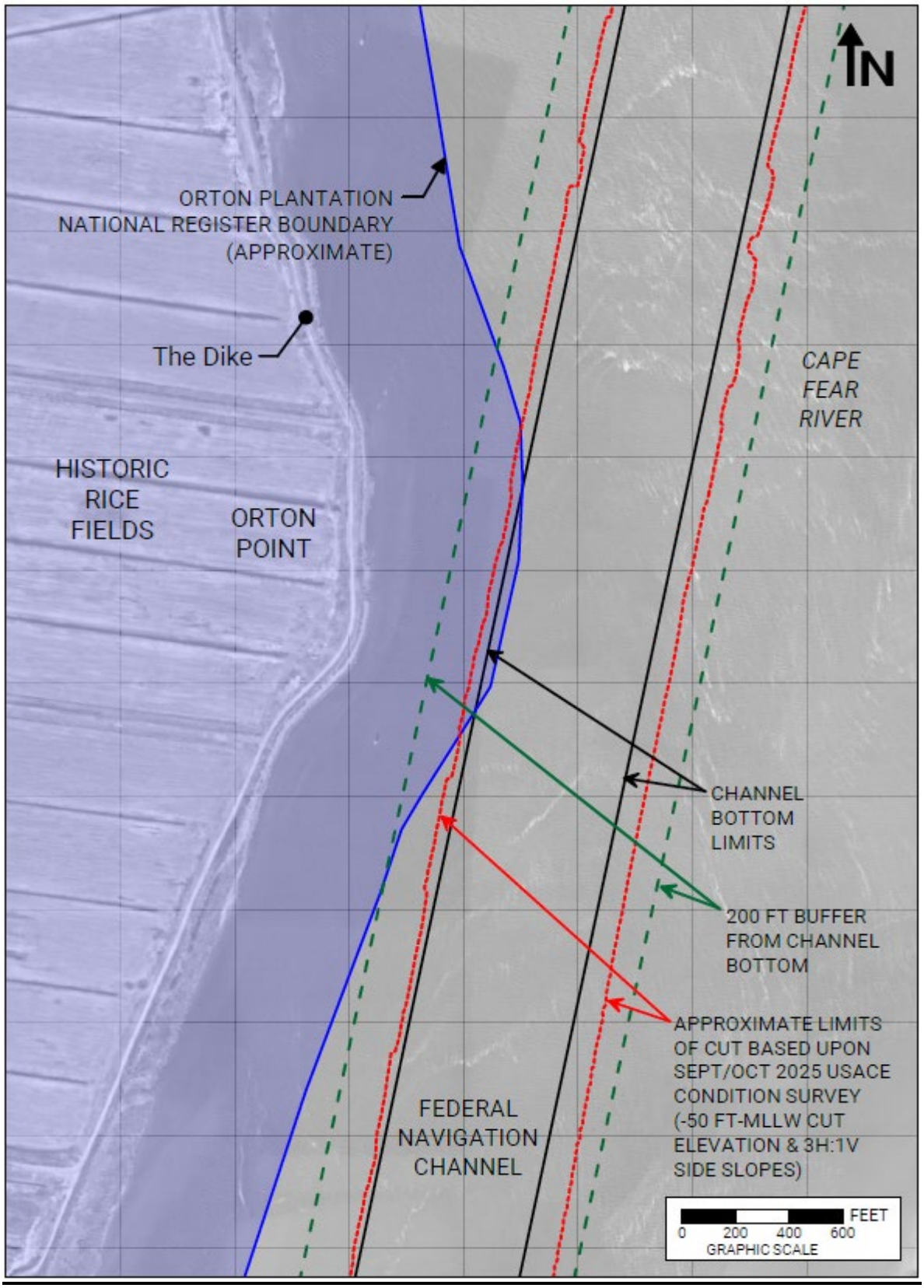
Nor has the Corps acknowledged the unacceptable risk that the Project will cause the failure of the dike that Orton restored. Failure of the dike will result in a cascading series of unacceptable events. It would flood the rice fields and freshwater ponds with saltwater, erasing what stands today as a preserved monument to enslaved African Americans dating back centuries.

Orton submits these comments to urge the Corps to adhere to its legal obligations and prevent the Project from damaging the unique cultural, historical and ecological resources at the Orton Property.

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SUMMARY OF ORTON'S COMMENTS ON THE DRAFT EIS

Summary of Foth and Lynker Technical Reports. Orton retained Foth Infrastructure & Environment, LLC and Lynker Corporation to review the Draft EIS and assess its analysis of the anticipated effects of the Project on the Orton Property. The reports accompany these comments and the content of each report is part of, and incorporated into, these comments. Orton submits the Foth and Lynker Reports as comments on the Draft EIS and requests the Corps to respond to the comments in the Foth and Lynker Reports in the Final EIS. Those comments include, but are not limited to, the following.

1. Foth Report (Exhibit 1)

- The Draft EIS's conclusion that the Project "will not adversely impact the Orton shoreline is misleading and incorrect. The modeling results presented in the DEIS predict an increase in wave heights, a known contributor to marsh shoreline instabilities and erosion, along the Orton shoreline." Foth Report at 2.

- The Draft EIS ignores binding, non-discretionary, agency policy that requires the Corps to conduct site-specific geotechnical analyses to prevent failure of slopes and infrastructure such as the Orton dike. Foth Report at 17.

- The Draft EIS fails to model slope stability within the Lower Lilliput reach, which includes Orton Point and the Orton Property. Foth Report at 12 Available geotechnical data demonstrates that the soils in the vicinity of Orton's historic dike system do not support the construction of a 3H:1V slope. Foth Report at 14.

- The proposed 3:1 side slope for the navigation channel will cut into the toe of the slope supporting the historic Orton dike. Foth Report at 12. The removal of toe material from the existing slope carries significant risk. *Id.*

- The proposed dredging activity adjacent to the Orton Property carries "a high risk of destabilizing the slope" supporting the historic dike system, and creates the potential for a "deep-seated, global failure" of the slope currently supporting the dike. Foth Report at 14.

- The Draft EIS does not analyze the obvious and foreseeable impacts of vibrations during the dredging process on the sensitive soil structure supporting the historic dike system at Orton. Foth Report at 14-15.

- The Blasting Mitigation Plan for the Project fails to address the "structural effect of vibrations on coastal and upland structures," including the Orton Property's historic system of dikes and revetments. Foth Report at 15.

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2. Lynker Report (Exhibit 2)

- The Draft EIS contains "methodological deficiencies, questionable assumptions, and internal inconsistencies that undermine the DEIS's conclusions regarding impacts to coastal processes, bank stability, and estuarine habitats." Lynker Report, Appendix 1 at 1.

- The Draft EIS reaches two contradictory conclusions on the Project's erosive impacts. Lynker Report, Appendix I at 1. On the one hand, the Draft EIS concludes that the Project will have "a net beneficial effect from reduced vessel traffic." *Id.* Other analysis in the Draft EIS, however, demonstrates "increased erosive forces from larger vessels." *Id.* The Draft EIS fails to reconcile these conflicting conclusions.

- The Draft EIS arbitrarily concludes the Project will have a net beneficial impact on shoreline erosion. Lynker Report, Appendix I at 1. The Draft EIS incorrectly relies on the average, annualized change in wave and wake energy to reach this conclusion. *Id.* Erosion, however, "is a threshold-dependent process driven by peak forces from individual vessel transits, not annual averages." *Id*.

- The Draft EIS relies on a single design vessel size to model the wake and erosional energy of future vessel traffic. Lynker Report at 1. That vessel, at 12,400 TEUs, is smaller than the larger vessels using the port today. *Id.* The Corps' reliance on this vessel size is directly contradicted by the stated purpose of the Project to allow the port to accommodate "larger, deeper-draft vessels," as the "number and size of Post-Panamax vessels at the port are expected to increase." Draft EIS at 1-8; Lynker Report, Appendix I at 7-8. "This discrepancy leads to a systemic underestimation of future bank erosion, habitat loss, and required mitigation." Lynker Report, Appendix I at 1.

- The Corps' hydrodynamic modeling wrongly assumes sustained "flat water" conditions, and fails to account for compounding real-world conditions, including wind and tidal influences, that exacerbate wake and wave energy. Lynker Report at 3.

- The Draft EIS effectively ignores and grossly underestimates the Project's adverse impacts on the historic rice fields and freshwater wetlands at the Orton Property from increased saltwater intrusion. Lynker Report at 3-5, Appendix II-III. The Draft EIS ignores the scientifically established historical effects of dredging on saltwater intrusion and propagation in the Cape Fear River and uses a groundwater model that is "grossly oversimplified, relying on static model states and regionally averaged conditions that ignore the

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complex hydrogeology of the project area and the Cape Fear River system more broadly." Lynker Report at 3-5, Appendix II-III.

- The Draft EIS ignores the scientifically established historical negative effects of dredging on saltwater intrusion in the Cape Fear River. Recent numerous peer-reviewed scientific studies confirm that the historical channel deepening of the Cape Fear River "has led to widespread intrusion of saltwater, loss of forested wetlands, and the rapid expansion of 'ghost forests' of dying bald cypress." Lynker Report at 4. These impacts were not accurately assessed in the Corps' prior environmental reviews, and the Draft EIS continues to discount these known impacts. Lynker Report at 4-5.

- The Draft EIS relies on flawed regional groundwater modeling that underestimates the frequency and magnitude of salinity intrusion events, and the localized impact of those events on the freshwater wetlands and historic rice fields at the Orton Property. Lynker Report at 4-5, Appendix II-III. The Corps' groundwater model is "grossly oversimplified, relying on static model states and regionally averaged conditions that ignore the complex hydrogeology of the project area and the Cape Fear River system more broadly." Lynker Report at 4.

- The Draft EIS's flawed analysis of increased wave and wake energy, and failure to accurately account for the compound effects of wind events, storms, tides, and sea-level rise. Lynker Report at 2, 5. "This approach fails to capture the energetic, real-world interactions that can produce rapid water level surges and drive overtopping at the Orton Plantation dike." Lynker Report at 3.

SUMMARY OF LEGAL DEFICIENCIES IN DRAFT EIS

National Environmental Policy Act. The Draft EIS is deficient. The Draft EIS confirms that the Project will cause material adverse direct and indirect impacts to the historically significant rice fields, dike, revetments, and water control structures at the Orton Property. Those direct and indirect impacts are obvious, identified in detail in the Foth and Lynker reports, yet the Draft EIS does not acknowledge or adequately disclose them. Nor does the Draft EIS propose any specific mitigation or design alternatives to avoid, minimize, or mitigate these foreseeable adverse impacts. *See* Foth Report at 18; Lynker Report at 3. The Draft EIS does not satisfy the mandatory requirements of the National Environmental Policy Act ("NEPA") as articulated by the Supreme Court, and prescribed in the Corps' binding NEPA regulations, because it fails to disclose the obvious direct and indirect impacts of the Project on the Orton Property, and it fails to identify practicable mitigation measures to avoid these effects. *See Seven Cnty. Infrastructure Coal. v. Eagle Cnty., Colorado*, 145 S. Ct. 1497, 1512-13 (2025); 33 C.F.R. § 333.61(d), (n).

Coastal Zone Management Act. The Draft EIS demonstrates that the Corps has not fulfilled its mandatory, non-discretionary obligation under the Coastal Zone

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Management Act ("CZMA"). The CZMA requires the Corps to ensure that the Project "shall be carried out in a manner which is consistent to the maximum extent practicable" with North Carolina's Coastal Area Management Act ("CAMA"). 16 U.S.C. § 1456(c)(1)(A). The Corps certified to North Carolina that the Project is consistent with North Carolina's program. DEIS, Appendix N at 17. That determination does not bear scrutiny. The CAMA protects the historic resources at the Orton Property from irreversible damage because they are located in Areas of Environmental Concern. 15A NCAC §§ 7H.0208(a)(2)(C), 7H.0209(d)(7). The Foth and Lynker Reports show that the Project will damage protected resources at Orton. The Draft EIS does not disclose those impacts. The Corps acknowledges that it has not yet determined the Project's effects on historic and cultural resources. The Corps cannot certify that the Project is consistent with the CAMA when it has not actually analyzed whether the Project is consistent with the North Carolina CAMA at the Orton Property. Nor has the Corps demonstrated that the Project will "be carried out in a manner which is consistent to the maximum extent practicable with" North Carolina's CAMA, as required by 16 U.S.C. § 1456(c)(1)(A), when the Corps failed to identify any avoidance or mitigation to prevent the obvious adverse effects of the Project on the protected resources at the Orton Property.

National Historic Preservation Act. The Corps has not fulfilled its mandatory obligations under Section 106 of the National Historic Preservation Act ("NHPA"). The Corps claims that "[t]ime and budgetary constraints" prevented it from identifying and evaluating affected cultural and historical resources or "establish[ing] methods to avoid, minimize, or mitigate those adverse effects, prior to completion of the DEIS." DEIS, Appendix N at 14. Section 106 of the NHPA requires that the Corps consult with Orton and the North Carolina State Historic Preservation Office ("SHPO") to identify and analyze whether the Project will "directly or indirectly" impact the Orton Property, and to identify avoidance and mitigation to prevent these effects. 36 C.F.R. §§ 800.5(a)(1), 800.16(d). That work has not occurred. The Draft EIS incorrectly states that Orton did not respond to the invitation from the Corps to consult under Section 106 on the impacts of the Project on the Orton Property. Orton timely accepted the Corps' invitation on May 30, 2025. The Corps must consult with SHPO and Orton on the Project's foreseeable direct and indirect effects on the Orton Property, and on feasible mitigation measures to avoid these effects.

The duties imposed on the Corps under NEPA, the CZMA, the NHPA and the Corps' own binding policy are mandatory, non-discretionary obligations. The Draft EIS demonstrates that the Corps has not fulfilled its obligations under those statutes and policies. The Project poses obvious risks to the Orton Property that, if the adverse consequences occur, will cause great damage to Orton and to the preserved cultural and historical legacy of enslaved African Americans in the dike, the rice fields, and the supporting water systems.

Orton prepared these comments to identify the shortcomings in the Draft EIS and to aid a productive consultation process with the Corps. The Foth and Lynker Reports identify the Project's adverse effects on the Orton Property. Orton submits these comments and the Foth and Lynker Reports to (i) help the Corps identify in the Final

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EIS the direct and indirect impacts of the Project on the Orton Property that are absent from the Draft EIS, (ii) facilitate a constructive consultation process with the Corps, SHPO, and the State of North Carolina, and (iii) urge the Corps to adopt avoidance and mitigation measures to prevent the obvious adverse effects of the Project on the Orton Property.

DETAILED COMMENTS OF ORTON ON DRAFT EIS

1. The Orton Property is a culturally rich and historically significant property that merits protection.

The Orton Property is nationally recognized as a historic place worthy of preservation. The National Parks Service first listed the house and gardens at the Orton Property in the NRHP in 1973. U.S. Dept. of Interior, National Parks Service, NRHP Ref. No. 73001294 (1973).[2] The National Parks Service expanded the listed boundary for the Orton Property in 2013 to include an additional 826 acres in recognition of the Property's historical significance. U.S. Dept. of Interior, National Parks Service, NRHP Ref. No. 13000698, 37 (2013).[3]

The 2013 NRHP Designation is Exhibit 3 to these comments. It provides over 100 pages of descriptions, pictures, and maps detailing the rich cultural and historical heritage of the Orton Property in support of the NRHP designation.

The NRHP Boundary includes the Orton Property's historic rice fields located along the Cape Fear River. The historic rice fields stand as a preserved monument to centuries of enslaved African Americans. The boundary of the historic designation extends 500 feet into the Cape Fear River to protect identified underwater archaeological resources. 2013 NRHP Designation at 3; *id.* at 107-109 (designation boundary maps). The Cape Fear River Shipping Channel sits only 450 feet from the historical dike and revetment structures that protect the rice fields along the eastern edge of the NRHP Boundary. *Id*. at 11-12.

The NRHP Boundary includes the historically significant rice fields dating back to 1820. *Id.* at 11. The rice fields are "evocative reminders of Orton's statewide significance in the history of rice production in North Carolina." *Id*. at 54.

The rice fields at the Orton Property are iconic. The Orton Property is "visually dominated by its historic rice fields, which exhibit the forms and patterns extant during the period of significance." *Id.* at 4. The historic rice fields provided an economic boom for the plantation in the nineteenth and early twentieth centuries. *Id.* at 3. Orton was

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[2] *Available at*: https://s3.amazonaws.com/NARAprodstorage/opastorage/live/97/7190/47719097/content/electronic-records/rg-079/NPS_NC/73001294.pdf ("1973 NRHP Designation").

[3] *Available a*t: https://files.nc.gov/historic-preservation/nr/BW0717.pdf ("2013 NRHP Designation").

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the first rice plantation in the Lower Cape Fear Region and one of the largest in North Carolina. Orton and other Lower Cape Fear plantations were key factors in maintaining the development and success of the southern-based rice economy.[4]

The water management system of canals, dikes, roads, dams, ditches, and control structures are in and around the rice fields. The water management system itself "survives from the period of significance, having been continuously maintained by a succession of owners," with replacement of more modern materials over time to protect the integrity of the system. 2013 NRHP Designation at 11. Along the eastern side of the NRHP Boundary are the front rice fields separated from the Cape Fear River by earthen dike initially constructed over 250 years ago. *Id*. At the time of construction, an expansive and stable marsh separated and protected the dike system from the open water of the river. *Id*.

The marsh flat has since become unstable and largely disappeared due to the "increased wave action coming from ships in the shipping channel." *Id.* at 11-12. The Orton Property dike and revetment system is now directly exposed to the river's hydraulic forces and the increased wave action coming from the shipping channel. *Id.* at 11-12. Owners of the Orton Property have endeavored to maintain the dike and revetement structures that protect the rice fields from the Cape Fear River. *Id.* at 5, 12. The most recent and most significant of these efforts is the restoration project approved by the Corps in 2012 and initiated, funded, and undertaken by Orton. Orton restored and repaired 6,800 feet of earthen dike, about 2,000 feet of rip rap revetment, 13 water control structures, and 12 field access points, and restored over 350 acres of historic rice fields. *See* Exhibit 4. Orton invested $29 million in the restoration effort and continues to incur on average $1 million per year to maintain the structures. And as a condition of its approval, to offset the loss of wetlands as part of the rice field restoration, Orton executed a permanent conservation easement on the Property to preserve an additional 187.5 acres of high-quality riverine swamp forest wetlands. *Id.* at 9.

Orton's restoration efforts, conducted in coordination with the Corps and State of North Carolina, demonstrate Orton's steadfast commitment to restore and protect the rich historic and cultural heritage of the Orton Property. The Project, however, threatens to cause irreversible damage to the significant cultural, historic, and natural resources at the Orton Property. The Corps cannot and should not ignore the obvious adverse impacts of the Project on the Orton Property, and should implement all feasible and practicable measures to avoid and prevent these impacts.

[4] Island Life NC Magazine, Orton Plantation: A Legacy of the South. *Available at*: https://islandlifenc.com/orton-plantation-a-legacy-of-the-south/.

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Summary of Historic Resources at Orton

- The National Park Service listed 830 acres of the Orton Property on the National Register of Historic Places.
- The NRHP Boundary extends 500 feet into the Cape Fear River to protect identified underwater archaeological resources.
- Orton, in coordination with the Corps, restored and repaired the listed historic resources at the Property.
- The Project will adversely impact these resources without appropriate avoidance and mitigation.

2. The Project will have foreseeable adverse impacts on the Orton Property that must be prevented.

The Foth and Lynker Reports demonstrate that the Project will adversely impact the listed historic resources and ecological integrity of the Orton Property. *See* Exhibits 1 and 2.

The purpose of the Project is to induce and support ship traffic from larger vessels. Draft EIS at 1-8. These larger vessels will necessarily increase wake and wave energy that will increase erosion of the Orton Property's historic dike and revetment system threatening the sustainability of the Property's historic rice fields. Lynker Report, Appendix I at 7-10. Scientifically sound wave and wake modeling that accounts for real-world conditions from wind, tides, storms, and sea-level rise demonstrate that the increased wakes from larger vessels will be amplified even further. *Id.* The result is a significant adverse increase in the erosion rate at Orton. Lynker Report, Appendix I at 11-12.

The channel deepening will continue the troubling historical trend of saltwater intrusion into the coastal shoreline, including the historic rice fields and ecologically significant wetlands at the Orton Property. Lynker Report, Appendix III-IV. Sodium content in the soils of the rice fields "is elevated and worsening, likely due to their proximity to the coast of Cape Fear River" and its increasing salinity level near Orton Point. Lynker Report, Appendix IV at 1. Peer-reviewed scientific studies confirm that the historical channel deepening of the Cape Fear River "has led to widespread intrusion of saltwater, loss of forested wetlands, and the rapid expansion of 'ghost forests' of dying bald cypress." Lynker Report at 4. This increased saltwater intrusion threatens the ecologically significant wetlands adjoining the Orton rice fields. Lynker Report, Appendix III at 9-10.

The dredging design and construction plan present yet another distinct threat of harm to the listed historic resources at the Orton Property. The dredging will occur inside the NRHP Boundary for the Property and impact identified underwater archeological resources. *See* Pages 3-4 (Figures showing dredging footprint relative to

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NRHP Boundary). And dredging adjacent to the historic dike system, without an adequate buffer, carries "a high risk of destabilizing the slope" supporting the dike. Foth Report at 14. The planned dredging will foreseeably result in a risk of direct, acute failure of the dike and a long term risk of instability, and ultimately failure, as the foundation and dike soils are eroded and "the effects of water intrusion, surface sluffing, and flow forces become cumulatively more detrimental and accelerate the rate of structural destabilization." Foth Report at 11-15.

Summary of Foreseeable Adverse Effects at Orton

- Increased vessel size will increase erosion from the wake energy caused by ship traffic in the channel.
- Increased wave size caused by increased vessel size when combined with wind, tides, storms, and sea-level rise will exacerbate this erosive effect.
- The channel deepening will worsen impacts from saltwater intrusion to Orton's historic rice fields and adjoining wetlands.
- The Project's dredging design threatens the near-term and long-term stability of the slope supporting Orton's historic dike and revetment system.

3. The Draft EIS does not satisfy the National Environmental Policy Act.

The Draft EIS is inadequate under NEPA. As the Supreme Court recently ruled, an EIS must analyze the "direct impacts" of a project and disclose a "manageable line" for the analysis of indirect effects with a reasonably close causal relationship to the project. *Seven Cnty. Infrastructure Coal.*, 145 S. Ct. at 1512-13. The EIS must consider, and the Record of Decision must state, "whether the agency has adopted all practicable means to avoid or minimize environmental harm from the alternative selected, and if not, why the agency did not." 40 C.F.R. § 1505.2(a)(3) (2020).

None of the detail about the Orton Property and the obvious impacts of the Project on it, summarized in these comments and in the Foth and Lynker Reports, appear in the Draft EIS. The Draft EIS is deficient because it ignores the obvious adverse direct impacts of the Project on the Orton Property. The Draft EIS fails to establish a reasonable line for the evaluation of the foreseeable indirect Project impacts on the Property. Nor does the Draft EIS analyze any practicable means to avoid or minimize these effects. These are mandatory requirements under NEPA that the Corps has not satisfied. The Final EIS must include an analysis of the Project's effects on the Orton Property. The Final EIS also must consider and state whether the Corps has adopted all practicable means to avoid these effects.

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a. The Corps did not analyze the direct impacts of the Project on the historic resources at the Orton Property.

The Project's dredging plan will directly impact listed historic resources within the NRHP Boundary for the Orton Property. This impact is known and obvious. The Final EIS must analyze and disclose these effects. The Draft EIS does not contain any of that analysis.

The Corps proposes dredging within the Orton Property NRHP Boundary. The NRHP Boundary for the Orton Property extends 500 feet into the Cape Fear River to protect historically significant underwater archaeological resources. 2013 NRHP Designation at 3, 16, 115. Underwater and shoreline investigations conducted in and along the Cape Fear River identified 32 objects of historical significance in this area. *Id.* at 16. The contributing objects include breakwater pilings, dock pilings, ballast piles, and features associated with Orton Point Light—a former lighthouse representing the maritime heritage of the Lower Cape Fear River and the Orton Property. *Id*. at 16, 66.

The Cape Fear River Shipping Channel sits less than 500 feet from Orton Point. *Id.* at 12. The dredging footprint for the Project includes the Channel and a 200-foot lateral buffer to either side of the Channel. DEIS, Appendix E at 27. The dredging footprint overlays and includes the Orton Property NRHP Boundary and the listed underwater archaeological resources protected by that boundary. *See* Pages 3-4 (Figures showing shipping channel and 200-foot lateral dredging boundary overlaying NRHP Boundary).

Failure of the historic dike is a foreseeable direct impact of the proposed dredging design. The proposed design slope for the Project is 3H:1V. Foth Report at 2. Available geotechnical data demonstrates that the soils in the vicinity of Orton's historic dike system do not support the construction of a 3H:1V slope. Foth Report at 2, 14. The proposed dredging activity, accordingly, carries "a high risk of destabilizing the slope" supporting the historic dike system, and creates the potential for a "deep-seated, global failure" of the slope currently supporting the dike. Foth Report at 14. The proposed dredging, within 450 feet of the historic dike, may also "damage lateral support, increasing the risk of slope instability or localized failure, especially in zones with high silt and organic content." Foth Report at 15-16. Binding Corps policy requires the agency to conduct detailed, site-specific geotechnical analyses to ensure the dredging will not compromise the Orton dike. Foth Report at 17 (citing EM 1110-2-5025). The Corps has ignored the policy and failed to conduct that mandatory site-specific analysis, posing adverse impacts to Orton.

Agencies "obviously" must assess the significant direct effects from a project. *Seven Cnty. Infrastructure Coal.*, 145 S. Ct. at 1512. This a bedrock principle of NEPA. 42 U.S.C. § 4332(2)(C)(i). The Corps' own NEPA regulations, which are binding on the agency, require it to address the obvious direct impacts of the Project, including the Project's effects on historical and cultural resources. 33 C.F.R. § 333.61(d). The Draft EIS, however, nowhere identifies, analyzes, or discloses the obvious direct impact that Project dredging – within the NRHP Boundary – will have on listed historic resources at

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the Orton Property. And the Draft EIS fails to analyze or disclose the reasonably foreseeable direct adverse effects of dredging in extreme proximity to a historic earthen dike, despite the fact that the Corps' own guidance cautions against dredging in proximity to infrastructure without detailed analysis and protective setbacks. Foth Report at 17.

The Draft EIS's failure to analyze and disclose the Project's direct impacts to the historic resources at the Orton Property renders the Draft EIS inadequate under NEPA. The Corps cannot defer this analysis to a later consultation stage. To comply with the statute, Supreme Court precedent, and the Corps' binding NEPA regulations, the Final EIS must analyze and disclose the direct effects that dredging will have on the listed underwater archeological resources within the NRHP Boundary for the Orton Property.

b. The Corps must analyze and disclose the reasonably foreseeable indirect effects of the Project on the historic resources at the Orton Property.

The Corps must analyze all Project effects that "are reasonably foreseeable and have a reasonably close causal relationship" to the Project. 33 C.F.R. § 333.61(d). This includes the indirect effects from the Project that will occur later in time if those effects are reasonably foreseeable and have a reasonably close causal relationship to the Project. DEIS at 3-1. Effects are "reasonably foreseeable" when they are "sufficiently likely to occur such that a person of ordinary prudence would take it into account in reaching a decision." 33 C.F.R. § 333.61(n).

The Project will cause multiple obvious adverse indirect effects to the historic and cultural resources at the Orton Property. These include impacts from (i) increased wake activity, (ii) increased salinity, and the (iii) the impacts of channel deepening on the stability of the Orton Property shoreline and the historical water control system it supports.

Increased wake activity from larger vessels will adversely affect the Orton Property's historic dikes, revetments, and water control structures. The Draft EIS states that the purpose of the Project is to allow the port to accommodate "larger, deeper-draft vessels," as the "number and size of Post-Panamax vessels at the port are expected to increase." Draft EIS at 1-8. The economics supporting the Project are "predicated on accommodating a 'forecasted vessel fleet' of larger, more efficient vessels." Lynker Report, Appendix I at 2 (citing DEIS, ES-2, 1-8). The wakes generated by larger vessels in the Cape Fear River will be the primary driver of increased erosive forces on the shoreline of the River. Lynker Report, Appendix I at 7. The DEIS fails to adequately model these erosive impacts. A reasonable, technically sound modeling of these impacts demonstrates that the increased vessel size allowed by the Project will necessarily result in increased erosion that threatens the long-term stability of the Orton Property's historic dike and revetment system. Lynker Report, Appendix I at 8-10.

The Project will increase salinity intrusion in the historic rice fields at the Orton Property. The Orton Property is a "particularly vulnerable area for saltwater intrusion."

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Lynker Report, Appendix II at 1. The Draft EIS relies on flawed groundwater modeling that grossly underestimates the frequency and magnitude of salinity intrusion events, and the impact of those events on the freshwater wetlands and historic rice fields at the Orton Property. Lynker Report, Appendix II at 2-3. Available groundwater data suggests that salinity levels are increasing in the aquifer that feeds the Orton Pond, "and any project-induced changes to this hydrological relationship could accelerate saltwater intrusion to levels that render the pond unusable as an irrigation source for the historic rice fields." Lynker Report, Appendix I at 4. This is in addition to the fact that the foreseeable increased wave and wake energy, and failure to accurately account for wind events, storms, tides, and sea-level rise, will foreseeably increase the frequency of the overtopping events that already occur at the Orton Property, while sodium levels in the historic rice fields "is elevated and worsening." Lynker Report at 2, 5, Appendix IV at 2.

The proposed channel deepening will impact the stability of the Orton Property riverfront shoreline and the stability of the Property's historic dike, revetments, and water control structures. As described in detail above, and in the accompanying Foth Report, the proposed dredging design carries "a high risk of destabilizing the slope" supporting the historic dike system. Foth Report at 3, 14. This risk includes the acute risk that the slope supporting the historic dike will fail as a direct result of the dredging. Foth Report at 14. It also includes the reasonably foreseeable indirect effect that the dike system fails, over time, as a result of decreased slope stability. Foth Report at 11-14. As the foundation and dike soils are eroded, as a result of the dredging and channel widening, "the effects of water intrusion, surface sluffing, and flow forces become cumulatively more detrimental and accelerate the rate of structural destabilization." Foth Report at 11. And the consequences are not limited to destruction of the historic dike, failure of the dike system will necessarily result in a collapse of the historic rice fields and the freshwater ecological system at Orton.

All of these effects are sufficiently likely to occur and have a close causal relationship to the Project. A person of "ordinary prudence" would consider these foreseeable impacts to significant historic and cultural resources when making a decision on project approval and design. 33 C.F.R. § 333.61(n). While the Corps is tasked, in the first instance, with drawing a "manageable line" of analysis that captures the Project's reasonably foreseeable effects, *Seven Cnty. Infrastructure Coal.*, 145 S. Ct. at 1512-13, the line drawn by the Corps as applied to the Orton Property is not manageable nor reasonable. It is non-existent.

The Corps' binding NEPA regulations and the Supreme Court's recent holding in *Seven County Infrastructure Coalition* require that the Corps analyze the Project's reasonably foreseeable indirect effects. The Project will have obvious adverse effects on the listed historic resources at the Orton Property. An analysis of these effects is wholly absent from the Draft EIS. This analysis cannot be deferred. The Final EIS must analyze these reasonably foreseeable indirect effects on the listed historic and cultural resources at the Orton Property to satisfy the agency's obligations under NEPA.

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c. The Corps must analyze and disclose the reasonably foreseeable effects of the Project on the Orton Property's exceptional wetland ecosystem.

Recent peer-reviewed research demonstrates that the historical dredging in the Cape Fear River estuary resulted in significant wetland losses and that projections in the Corps' 1996 EIS for the 2000-2002 Cape Fear River dredging project substantially underestimated the potential for these impacts. Lynker Report, Appendix III at 1. The studies show that the "region has experienced widespread conversion of forested wetlands to emergent marsh and open water, including the formation of 'ghost forests' of dying bald cypress, driven by saltwater intrusion from channel deepening." *Id.*

There are six classified wetlands surrounding the rice fields at the Orton Property. Lynker Report, Appendix III at 6. The Orton wetlands are classified as "Exceptional" under the North Carolina Coastal Region Evaluation of Wetland Significance. Lynker Report, Appendix III at 9. The rating confirms that the wetlands adjacent to Orton's rice fields "are among the most highly valued and functionally important freshwater wetlands in coastal North Carolina," emphasizing "the significance of any potential impact or conversion." Lynker Report, Appendix III at 6. Any "[l]oss or degradation of these wetlands would be a disproportionate harm to regional ecological health and the resilience of Orton's historic rice-field landscape." Lynker Report, Appendix III at 10.

The Draft EIS does not adequately analyze or address the very real risk the Project poses to these ecologically significant wetlands. The Draft EIS, instead, "relies on outdated datasets and coarse-scale regional modeling that does not reflect the current state of the system" and it "underestimates the exposure and sensitivity" of the "Exceptional" wetland system at the Orton Property and the adjacent historic rice fields threatened by the same saltwater intrusion. Lynker Report, Appendix III at 10. The Final EIS must accurately analyze and disclose these foreseeable impacts.

d. The Corps must use sound scientific methodology in the Final EIS.

The Draft EIS is riddled with discrepancies, unfounded assumptions, and flawed scientific methodologies and analyses that do not withstand scrutiny. Those errors cannot support the proposed action. The errors include:

- The arbitrary and incorrect reliance on the average, annualized increase in wave and wake energy to support the conclusion that the Project will have a net beneficial impact on shoreline erosion, when erosion "is a threshold-dependent process driven by peak forces from individual vessel transits, not annual averages." Lynker Report, Appendix I at 1.

- Reliance on a single vessel size that is smaller than the larger vessels using the port today to model the wake and erosional energy of future vessel traffic when the stated purpose of the Project to allow the port to accommodate larger shipping vessels. Lynker Report, Appendix I at 2, 7-8.

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- Reliance on oversimplified hydrodynamic modeling that wrongly assumes sustained "flat water" conditions, and fails to account for real-world and foreseeable future conditions, including wind and tidal influences, that exacerbate wake and wave energy. Lynker Report, Appendix I at 1-2.

- Additional key methodological deficiencies in the Corps' analysis of the project's erosive effects on Orton as summarized in Appendix I, Table 1.2 of the Lynker Report.

- The Draft EIS grossly underestimates the Project's adverse impacts on the historic rice fields and freshwater wetlands at the Orton Property from increased saltwater intrusion and propagation by ignoring the historical effects of dredging on saltwater intrusion in the Cape Fear River and using a groundwater model that is "grossly oversimplified, relying on static model states and regionally averaged conditions that ignore the complex hydrogeology of the project area and the Cape Fear River system more broadly." Lynker Report at 3-5, Appendix II-III.

- The Draft EIS's flawed analysis of increased wave and wake energy, and failure to accurately account for the compounding effects of wind events, storms, tides, and sea-level rise, results in the Draft EIS ignoring the overtopping events that increase salinity in the Orton Property's historic rice fields. Lynker Report at 2, 5.

- The Draft EIS fails to use available geotechnical data to accurately assess the Project's foreseeable impacts on the integrity of the soils and slope supporting the Orton Property's historic dike system. Foth Report at 11-15.

- The Draft EIS ignores and fails to address binding Corps policy that requires site-specific geotechnical analyses to protect adjacent infrastructure and resources during dredging activities. Foth Report at 17.

The Corps must articulate a "satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Manufacturers Ass'n of the United States, Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)).

The Draft EIS fails this test. The Foth and Lynker Reports identify the Draft EIS's methodological errors and oversights in detail. *See* Exhibits 1 and 2. The Foth and Lynker Reports also provide scientifically accepted, reasonable solutions. The Corps must correct these deficiencies in the Final EIS.

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e. The Corps must identify all practicable means to prevent the Project's obvious adverse impacts on the Orton Property.

The Corps' binding NEPA regulations require it to consider mitigation measures that will "avoid" or "minimize" the Project's effects on the Orton Property. 33 C.F.R. § 333.61(g). The ROD must "[s]tate whether the agency has adopted all practicable means to avoid or minimize environmental harm from the [Project], and if not, why the agency did not." 40 C.F.R. § 1505.2(a)(3) (2020).

The Draft EIS does not identify any mitigation for the Orton Property. None. "This omission leaves the only remaining example of historic rice cultivation on the lower Cape Fear River unprotected against the very impacts the DEIS's models underestimate, including accelerated shoreline erosion, dike overtopping, and salinization of freshwater resources." Lynker Report at 3.

That does not satisfy the Corps' NEPA obligations. The Final EIS must analyze the feasible and practicable options to protect the Orton Property and its important historic, cultural, and ecological resources.

<u>Summary of the Corps' Failure to Satisfy the National Environmental Policy Act</u>

- The Draft EIS does not satisfy the Corps' obligations under NEPA.
- The Draft EIS does not analyze the obvious adverse impact of dredging within and adjacent to the Orton Property NRHP Boundary.
- The Draft EIS does not analyze the foreseeable indirect Project impacts of ship traffic, wave energy, erosion and induced salinity on the listed historic resources at the Orton Property.
- The Draft EIS includes no discussion of mitigation measures to protect the Orton Property.
- The analyses and conclusions in the Draft EIS are based on flawed methodologies, obvious oversights, and arbitrary assumptions.
- The Corps cannot defer this analysis under NEPA.
- The Final EIS must analyze the Project's direct and indirect impacts on the Orton Property, rely on rational assumptions, and analyze feasible mitigation measures to avoid these impacts.

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4. The Corps has not satisfied its obligations under the Coastal Zone Management Act.

a. The Coastal Zone Management Act requires the Corps to ensure that the Project is consistent to the maximum extent practicable with the North Carolina Coastal Area Management Act.

The Federal CZMA mandates that a federal project "that affects any land or . . . natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable" with the applicable state coastal zone management program. 16 U.S.C. § 1456(c)(1)(A). This duty applies to the Corps and to this Project. *See* DEIS, Appendix N.

The Corps' CZMA consistency obligation is both a procedural and substantive requirement.

The CZMA procedural requirement mandates that the Corps evaluate the Project's "reasonably foreseeable direct and indirect effects on any coastal use or resource." 15 C.F.R. § 930.33(a)(1). Agency action that "has minimal or no environmental effects may still have effects on a coastal use," including "protection of historic property," if the "activity initiates an event or series of events where coastal effects are reasonably foreseeable." *Id.*

The CZMA substantive requirement mandates that the Corps carry out the Project "in a manner which is consistent to the maximum extent practicable with" the North Carolina CAMA. 16 U.S.C. § 1456(c)(1)(A); 15 C.F.R. § 930.30 (same). The Corps must "consider the enforceable policies of [the CAMA] as requirements to be adhered to in addition to existing Federal agency statutory mandates." 15 C.F.R. § 930.32(a)(2).

b. The North Carolina Coastal Area Management Act protects the historic and ecological resources at the Orton Property.

i. The North Carolina Coastal Area Management Act protects Areas of Environmental Concern.

The North Carolina CAMA governs North Carolina's approved coastal management program. N.C.G.S.A. §§ 113A-100 to 113a-134.9. The CAMA imposes enforceable standards to protect natural, historic, and cultural resources in coastal areas. N.C.G.S.A. § 113A-118(a). The CAMA prohibits development within coastal shoreline and estuarine water Areas of Environmental Concern ("AECs") that will cause irreversible damage to wetland ecosystems and to documented archaeological or historic resources within the AEC. 15A N.C.A.C. §§ 7H.0209(b), (d)(4), (7); 7H.0208(a)(2)(A), (C).

The CAMA regulations explicitly state the ecological significance of protecting coastal shorelines:

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> Development within coastal shorelines influences the quality of estuarine and ocean life and is subject to the damaging processes of shore front erosion and flooding. The coastal shorelines and wetlands contained within them serve as barriers against flood damage and control erosion between the estuary and the uplands.

15A N.C.A.C. 7H.0209(b).

CAMA prohibits development activities within coastal shoreline AECs that will be detrimental to the biological and physical functions of the estuarine and ocean system. "Every effort shall be made by the permit applicant to avoid or minimize adverse impacts of development to estuarine and coastal systems through the planning and design of the development project." *Id.* at § 7H.0209(d). Development within a coastal shoreline AEC "shall not have a significant adverse impact on estuarine and ocean resources," including "development that would directly or indirectly . . . increase shoreline erosion." *Id.* at § 7H.0209(d)(6).

The CAMA regulations similarly describe the ecological significance of estuarine water AECs: "Estuarine waters are the dominant component and bonding element of the entire estuarine and ocean system, integrating aquatic influences from both the land and the sea. Estuaries are among the most productive natural environments of North Carolina." *Id.* at § 7H.0206(b). CAMA is intended to "conserve and manage the important features of estuarine waters so as to safeguard and perpetuate their biological, social, aesthetic, and economic values." *Id.* at § 7H.0206(c). Development in coastline shoreline and estuarine waters AECs must be consistent with the directives and objectives of CAMA. *Id.* at §§ 7H.0209(d); 7H.0206(d).

ii. The Orton Property is in Areas of Environmental Concern and protected by the North Carolina Coastal Area Management Act.

The Orton Property is subject to, and protected by, the North Carolina CAMA. The Orton Property includes lands classified under the CAMA as estuarine water and coastal shoreline AECs. *Id.* §§ 7H.0206(a), 7H.0209(a)(1). The 2012 CAMA permit issued in connection with the 2012 Corps permit at Orton confirms that the CAMA applies to, and protects, the Orton Property. *See* Exhibit 4 at 21 (includes CAMA Permit No. 83-12 issued to Orton for development inside AEC). That permit expressly acknowledges that the Orton Property is an "Area of Environmental Concern" and is protected by North Carolina's CAMA.

The AEC lands at the Orton Property contain documented historic resources. *See* 2013 NRHP Designation at 1 (N.C. Department of Natural and Cultural Resources nomination to include the Orton Property in the NRHP as an area worthy of historic preservation). The CAMA protects these historic resources. N.C.G.S.A. § 113A-102(b)(4)(e). The 2012 CAMA permit, for example, required that Orton avoid the submerged archeological resources within the Orton Property boundary and protect the historic integrity of the rice fields and water management system. *See* Exhibit 4 (CAMA Permit No. 83-12, Conditions 16 and 17).

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The AEC lands at the Orton Property also contain "exceptional" wetland habitat. The Orton wetlands "are among the most highly valued and functionally important freshwater wetlands in coastal North Carolina." Lynker Report, Appendix III at 6. The "loss or degradation" of these wetlands "would be a disproportionate harm to regional ecological health." Lynker Report, Appendix III at 10.

Under the CZMA, the Corps must demonstrate that the direct and indirect effects of the Project will not cause irreversible damage to the exceptional wetlands and to the documented historic resources within the Orton Property AEC lands, including the historic rice fields, water management system, and underwater archaeological resources. 16 U.S.C. § 1456(c)(1)(A); 15A N.C.A.C. §§ 7H.0208(a)(2)(A), (C); 7H.0209(b), (d)(4), (7). The CAMA protects these resources and under the CZMA the Corps must ensure that its Project design does as well. The Corps cannot demonstrate consistency with the CAMA until it undertakes the requisite analysis and demonstrates that the Project's design and mitigation measures will protect these resources.

c. The Project will have obvious impacts on the Orton Property.

The Project will directly and indirectly impact the exceptional wetlands and the listed historic resources within Orton's NRHP Boundary. Indirect effects include both cumulative and secondary effects "resulting from the incremental impact of the federal action when added to other past, present, and reasonably foreseeable actions, regardless of what person(s) undertake(s) such actions." 15 C.F.R. § 930.11(g).

The NRHP Boundary for the Orton Property includes historic rice fields, a historic system of dikes and revetments, and water control structures, and it extends 500 feet into the Cape Fear River to protect historically significant underwater archaeological resources. 2013 NRHP Designation at 3, 16, 115. The Project's direct dredging footprint is <u>inside</u> the Orton Property NRHP Boundary.

The Orton Property contains a comprehensive, intact system of coastal freshwater wetlands. Lynker Report, Appendix III. The wetlands are classified as "Exceptional" under the North Carolina Coastal Region Evaluation of Wetland Significance. Lynker Report, Appendix III at 9. The wetlands at the Orton Property play a critical and significant role in supporting Orton's historic rice fields and the overall ecological integrity of the Property by providing "important ecosystem services." Lynker Report, Appendix III at 2 (detailing the importance of the wetland ecosystem services). The "wetlands regulate temperature, moderate flooding, and trap sediments." *Id.* "As saltwater advances up the Cape Fear River with deeper channel dredging, the loss or conversion of these freshwater wetlands would erode many of these stabilizing functions." *Id.*

The Project will undoubtedly result in "reasonably foreseeable direct and indirect effects" on the wetland ecosystem and the listed historic rice fields, dikes and revetments, water control structures, and underwater archaeological resources at the Orton Property. 15 C.F.R. § 930.33(a)(1). These impacts are obvious and foreseeable. They are explained in detail in the preceding sections and in the accompanying Foth

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and Lynker Reports. *See* Exhibits 1 and 2. The CZMA imposes a substantive obligation on the Corps to mitigate these direct and indirect effects to ensure that the Project is carried out in a manner consistent with the CAMA "to the maximum extent possible." 16 U.S.C. § 1456(c)(1)(A).

d. The Corps has not satisfied its statutory duty under the Coastal Zone Management Act to demonstrate consistency with the North Carolina Coastal Area Management Act.

The Corps claims that the Project is consistent with North Carolina's CAMA as required by the CZMA, 16 U.S.C. § 1456(c)(1)(A). See September 17, 2025 Corps Certification Letter, Draft EIS, Appendix N.[5] That assertion is erroneous and does not withstand review.

The Corps acknowledges in the letter that Project areas are located in several AECs, including estuarine water and coastal shoreline AECs. *Id*. at 14. The Corps concludes:

> the proposed project for the Wilmington Harbor area is consistent, to the maximum extent practicable, with North Carolina's Coastal Management Program. This determination is based on the review of the proposed project against the enforceable policies of the State's coastal management program, which are principally found in Chapter 7 of Title 15A of North Carolina's Administrative Code. The USACE requests that NCDCM concur with this consistency determination.

Id. at 17.

The Draft EIS confirms that the Corps has not satisfied its procedural or substantive duties under the CZMA because it has not yet undertaken the analysis.

i. The Corps has not analyzed the reasonably foreseeable direct and indirect effects of the Project on the Orton Property.

Despite the Project's obvious direct and indirect effects on the Orton Property, the Corps admits that it has not conducted the required CZMA analysis. Simply put, the Corps has made no attempt to analyze the effects of the Project on the historic or wetland resources at Orton that the North Carolina CAMA protects. The Corps admits it has not done the work. It explained that it failed to "sufficiently identify and evaluate cultural resources, fully determine adverse effects of the action alternative on historic properties, or establish methods to avoid, minimize, or mitigate those adverse effects, prior to completion of the DEIS" due to "[t]ime and budgetary constraints." DEIS, Appendix N at 14.

[5] Although the letter is dated September 17, 2025, the North Carolina Division of Coastal Management communicated that the letter was not received until October 17, 2025.

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Perceived time and budgetary constraints do not excuse the Corps from its CZMA consistency duty. The CZMA regulations specify that "[f]ederal agencies shall not use a general claim of a lack of funding or insufficient appropriated funds or failure to include the cost of being fully consistent in Federal budget and planning processes as a basis for being consistent to the maximum extent practicable with an enforceable policy of a management program." 15 C.F.R. § 930.32(a)(3). "A Federal agency cannot avoid any State requirement that it finds burdensome simply by not funding the required action." 65 Fed. Reg. 77,124, 77,134 (Dec. 8, 2000) (preamble to the final rule adopting CZMA regulations).

The Corps cannot logically satisfy its duty under the CZMA to demonstrate consistency with the CAMA "to the maximum extent practicable" based on work it admits it has not performed. The State of North Carolina, Orton, and the public are unable to determine whether the Project is consistent with the historical preservation requirements of the CAMA "to the maximum extent practicable" at sites like Orton within designated AECs unless the Corps first provides an analysis of the Project's direct and indirect effects on those same resources. The Corps' failure to provide this analysis – while claiming it has satisfied it – improperly circumvents the CZMA consistency obligation.

This letter and accompanying Foth and Lynker Technical Reports demonstrate that the direct and indirect effects of the Project will cause irreversible damage to the Orton Property's exceptional wetland ecosystem and to the historically significant rice fields, water management system, and underwater archaeological resources. *See* Exhibits 1 and 2. Those Orton Property resources are located within coastal shoreline and estuarine water AECs and are protected by the CAMA.

To provide a rational predicate to demonstrate consistency with the CAMA, and satisfy its obligation under the CZMA, the Corps first must identify the direct and indirect effects of the Project on the Orton Property. The Draft EIS has not done so. The Corps has not identified the obvious impacts that the Project will have on the wetland and historic resources at the Orton Property. This falls short of the Corps' binding duty under the CZMA to evaluate the Project's "reasonably foreseeable direct and indirect effects on any coastal use or resource" as part of the analysis to determine whether the Project will be carried out in a manner which is "consistent to the maximum extent practicable" with the CAMA. 15 C.F.R. § 930.33(a)(1); 16 U.S.C. § 1456(c)(1)(A).

ii. The Corps has not satisfied its statutory duty to carry out the Project in a manner consistent to the maximum extent practicable with the CAMA's requirements to protect ecological and historic resources in AECs at Orton.

The CZMA requires more than procedural analysis of direct and indirect effects of the Project at Orton. The CZMA consistency requirement mandates that the Project "shall be carried out in a manner which is consistent to the maximum extent practicable" with the CAMA. 16 U.S.C. § 1456(c)(1)(A). The binding federal regulations confirm that the CZMA "was intended to cause substantive changes in Federal agency decision

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making within the context of the discretionary powers residing in such agencies." 15 C.F.R. § 930.32(a)(2). That requires the Corps to identify specific mitigation, avoidance, and protection measures to ensure the Project will not cause irreversible damage to the protected coastal resources within the Orton Property. The Corps has made no attempt to do so in the Draft EIS, and has not complied with 16 U.S.C. § 1456(c)(1)(A).

e. The Corps should work with North Carolina and Orton in good faith to develop appropriate mitigation conditions to demonstrate consistency with the North Carolina Coastal Area Management Act.

The CZMA regulations encourage the Corps to coordinate with North Carolina to informally develop conditions that would allow the state to concur with the federal action. 15 C.F.R. §§ 930.4(a), 930.34(a)(1). This informal coordination is supposed to be conducted prior to the Corps providing the consistency determination to North Carolina, rather than after-the-fact as appears to have occurred here. 15 C.F.R. § 930.34(a)(1). The Corps is encouraged to engage in early consultation with North Carolina and "should obtain the views and assistance of the State agency regarding the means for determining that the proposed activity will be conducted in a manner consistent to the maximum extent practicable with the enforceable policies of a management program." *Id.* § 930.34(d).

To satisfy these coordination directives and the Corps' CZMA consistency obligation, the Corps should work in good faith with the North Carolina Division of Coastal Management to develop specific mitigation, avoidance, and protection measures to ensure the Project will not damage the protected natural, cultural and historic resources within the Orton Property. Orton requests that it participate in these mitigation discussions.

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Summary of the Corps' Failure to Satisfy the Coastal Zone Management Act

- The CZMA requires the Corps to carry out the Project in a manner which is consistent to the "maximum extent practicable" with the North Carolina CAMA.
- The CAMA prohibits development within AECs that will damage historic resources.
- The listed historic resources at the Orton Property are within an AEC and are protected by the CAMA.
- The CAMA also prohibits development that will damage the exceptional wetland ecosystem at the Orton Property.
- The Corps cannot state that the Project is consistent with the CZMA when it admits it has not analyzed the obvious direct and indirect impacts to the protected natural and historic resources at the Orton Property.
- The Corps should meaningfully consult with North Carolina and Orton to develop specific mitigation and avoidance to prevent adverse impacts to the protected resources at the Orton Property.

5. The Corps has not fulfilled its obligations under the National Historic Preservation Act.

Section 106 of the NHPA requires the Corps to analyze whether the Project will "directly or indirectly" impact properties that are listed, or eligible for listing, on the NRHP. 36 C.F.R. §§ 800.5(a)(1), 800.16(d). The Corps must consider all "reasonably foreseeable effects caused by the [Project]," including those "that may occur later in time, be farther removed in distance or be cumulative." *Id.* 800.5(a)(1). The Corps' binding regulations under Section 106 specifically require it to consider the Project's effects "that may occur outside the permit area." 33 C.F.R., part 325, Appendix C, 5(f); *see also Pye v. United States*, 269 F.3d 459, 469 (4th Cir. 2001) ("Even if no shovels or backhoes will touch [an] historic area, damage to historic areas can occur in less direct ways.").

The Draft EIS does not mention or attempt to analyze the obvious adverse impacts the Project will have on the listed historic resources at the Orton Property. That oversight must be corrected in the Final EIS. The direct dredging footprint for the Project is inside the Orton Property NRHP Boundary. The Project will result in readily foreseeable indirect effects on the listed historic rice fields, dikes and revetments, and water control structures at the Orton Property. *See* Pages 5-6, 10-14 (summarizing in detail the foreseeable adverse effects of the Project on the Orton Property); *see also* Exhibits 1 and 2. The only mention of potential impacts to the Orton Property, however, is the result of SHPO identifying the Orton Property as a potentially impacted property to the Corps. DEIS, Appendix E at 32-33.

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The Corps cannot ignore the Project's obvious and foreseeable direct and indirect impacts on the Orton Property. The Corps must analyze whether the Project "may alter, directly or indirectly," any character-defining feature of the historic Orton Property. 36 C.F.R. § 800.5(a)(1) (emphasis added).

a. The Corps must revise the Programmatic Agreement to comply with the requirements of Section 106.

Due to "[t]ime and budgetary constraints," and uncertainty in final Project scope and design, the Corps has not yet conducted "all necessary surveys to sufficiently identify and evaluate cultural resources, fully determine adverse effects of the action alternative on historic properties, or establish methods to avoid, minimize, or mitigate those adverse effects." DEIS, Appendix N at 14, Appendix E at 27. The Corps has deferred these studies and analyses, and the consultation required under the NHPA, until the pre-construction, engineering, and design phase of the Project. DEIS, Appendix E at 1-2. To satisfy its obligations under Section 106, at this stage, the Corps has proposed execution of a Programmatic Agreement with SHPO and other consulting parties.

The Draft EIS incorrectly states that Orton did not respond to the invitation from the Corps to be a consulting party under Section 106 and the Programmatic Agreement. *Id.* at 2, 38. Orton timely accepted the invitation on May 30, 2025, within thirty days of receiving the Corps' letter requesting Orton's participation. Orton requests that the Corps correct that mistake in the Final EIS, engage with Orton on execution of the Programmatic Agreement, and meaningfully consult with Orton and SHPO as required under Section 106 of the NHPA.

Orton provides the following specific comments on the draft Programmatic Agreement.

The Project's Area of Potential Effects must include on-shore and near-shore properties, including the Orton Property. The Corps' preliminary Area of Potential Effects ("APE") for the Project does not comply with federal law. The Corps' preliminary APE is limited to the dredging footprint for the Project. DEIS, Appendix E at 27. Section 106 requires that the Project APE include the "geographic area or areas" within which the Project "may directly or indirectly cause alterations in the character or use of historic properties." 36 C.F.R. § 800.16(d) (emphasis added). The Corps may not arbitrarily limit its analysis to the direct impacts caused within the dredging footprint of the Project and exclude properties like Orton that will obviously be indirectly affected by wave action and other consequences of the Project. *E.g.*, 33 C.F.R., part 325, Appendix C, 5(f) (requiring consideration of effects outside permit area).

North Carolina SHPO made clear in its comments to the Corps that the Project APE needs to include on-shore and near-shore historic properties. DEIS, Appendix E at 32. It is inaccurate for the Programmatic Agreement to state, as proposed by the Corps in the Draft EIS, that the "APE for the Project was determined by the Corps based on Project engineering and design and in consultation with the SHPO." *Id.* at 39. SHPO

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has already stated that it disagrees with the limited APE proposed by the Corps, requested further consultation on this issue, and SHPO conditioned its agreement to enter into the Programmatic Agreement on the understanding that the APE would be determined through that process in consultation with SHPO. *Id.* at 32. The Corps must consult with SHPO on the Project APE to fulfill its obligations under Section 106. 36 C.F.R. § 800.4(a)(1).

Orton agrees with SHPO that Section II of the Programmatic Agreement needs to specifically state that the Project APE will be determined through further consultation with SHPO and other consulting parties, and through site-specific study of the Project's direct and indirect effects on historic properties. *Id.* The Programmatic Agreement cannot adopt and memorialize the legally deficient APE objected to by SHPO.

The Programmatic Agreement must incorporate the binding regulatory definition of adverse effects. The draft Programmatic Agreement does not specifically define adverse effect. The Programmatic Agreement should explicitly incorporate and adopt the definition of "adverse effect" from 36 C.F.R. § 800.5 that defines an adverse effect to include all direct, indirect, and cumulative effects from the Project.

The Corps should clarify the dispute resolution rights of the consulting parties. The Dispute Resolution procedures in Section VIII should be strengthened and clarified. The Section should clarify that any Signatory or Consulting Party may initiate dispute resolution regarding any action proposed or the manner in which the terms of this Agreement are implemented. The Section should require that the Corps provide a written response that includes the rationale for its final decision and consideration of all comments received. The Section should provide the ACHP with sufficient time to make a decision, sixty or ninety days, and make the decision of the ACHP binding on the Corps. The Corps should not be able to ignore the decision of the ACHP as proposed. And finally, the Section should explicitly state that nothing in the Agreement, or in the dispute resolution procedures, operates to waive, limit, or prejudice the rights of any Signatory or Consulting Party to seek judicial review or otherwise challenge any final decision or action taken pursuant to the Agreement in any court of competent jurisdiction.

Orton requests that the Corps adopt its proposed revisions to the Programmatic Agreement and consult with Orton on the Project's effects on the historic Orton Property under the Programmatic Agreement. Orton looks forward to consulting with the Corps and SHPO on feasible avoidance and mitigation measures to prevent these effects.

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Summary of the Corps' Failure to Satisfy the National Historic Preservation Act

- The Orton Property contains approximately 830 acres of shoreline, near-shoreline, and underwater property listed on the NRHP.
- The Project will dredge inside the Orton Property NRHP Boundary.
- The Project's dredging plan directly threatens the integrity of the Orton Property historic dike system.
- The Project will result in readily foreseeable indirect impacts to the listed historic rice fields, dikes, and revetments at the Orton Property.
- The NHPA requires the Corps to consult with SHPO and Orton on the Project's direct and indirect effects on the Orton Property, and on mitigation measures to avoid these effects.
- The Draft EIS incorrectly states that Orton did not respond to the invitation from the Corps to be a consulting party under Section 106 and the Programmatic Agreement.
- The Corps must adopt revisions to the Programmatic Agreement to comply with Section 106 of the NHPA.

6. The Corps must acknowledge the obvious adverse impacts of the Project on the Orton Property in the Final EIS and protect the Property's important historic, cultural, and ecological resources.

NEPA, the NHPA, the CZMA, and the Corps' own binding policy impose mandatory, non-discretionary obligations on the Corps. The Draft EIS demonstrates that the Corps has not fulfilled its obligations under those statutes. The Project poses obvious risks to the Orton Property that, if the adverse consequences occur, will cause great damage to Orton.

The structural integrity of the dike is Orton's number one concern. The Project poses a real and unacceptable risk of catastrophic failure of the dike system. Failure of the dike will result in a cascading series of events including saltwater intrusion into the historic rice fields, rendering them incapable of growing rice and destroying the freshwater ecological water system at the Orton Property. Failure of the dike would flood the rice fields and freshwater ponds with saltwater, erasing what stands today as a preserved monument to enslaved African Americans dating back centuries.

Binding Corps policy requires that the Corps prevent the Project from causing the failure of the dike. That policy requires the agency to conduct detailed, site-specific geotechnical analyses to ensure the dredging will not compromise the Orton dike. The Corps has ignored that policy, and ignored the adverse impacts of the Project on the Orton Property.

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The Corps must describe the obvious adverse impacts of the Project on the Orton Property in the Final EIS. The Final EIS must disclose the adverse impacts of the Project on the unique cultural, historical, and ecological resources at the Orton Property. The Corps must adopt design and implementation measures to protect the Property's important historic, cultural, and ecological resources. NEPA, the NHPA, the CZMA, and the Corps' own binding policies require this.

This is a public project that will use nearly $900 million in public funds for public benefit. The adverse impacts of the Project should not be borne by Orton, a private property owner that is preserving the legacy of our past and protecting a site nationally recognized as an historic place worthy of preservation by listing in the National Register of Historic Places.

We look forward to consulting and coordinating with the Corps to identify appropriate measures to prevent the obvious adverse effects of the Project on the Orton Property.

Sincerely,

DocuSigned by:
Louis Bacon
2FDF73762EAD4CC...

Louis Moore Bacon
Chairman
Orton Plantation Holdings, LLC

cc: Dillon Epp, Orton Property Manager
Henry L. Kitchin Jr, Esq., McGuireWoods LLP
Ezekiel J. Williams, Esq., Williams Weese Pepple & Ferguson

Exhibits:

Exhibit 1: Foth Technical Report

Exhibit 2: Lynker Technical Report

Exhibit 3: 2013 National Park Service National Register of Historic Places Designation at Orton

Exhibit 4: 2012 Corps Permit

From:	Kitchin, Henry L. Jr
To:	DEQ-SVC_DCM.federalconsistencycomments
Cc:	Goebel, Christine A; Dillon Epp; Zeke Williams
Subject:	[External] Wilmington Harbor 403 Draft EIS: Supplemental Comments of Orton Plantation Holdings on State"s Review of Corps" Consistency Determination
Date:	Friday, December 19, 2025 5:30:39 PM
Attachments:	Wilmington Harbor - L to NC DCM - Supplemental Comments 12-19-2025.pdf

CAUTION: External email. Do not click links or open attachments unless verified. Report suspicious emails with the Report Message button located on your Outlook menu bar on the Home tab.

Good afternoon. On behalf of our client Orton Plantation Holdings, LLC, we are submitting the attached supplemental comments letter in connection with the above-referenced matter. We will be sending hard copy of the attached letter to your Morehead City office as well. The attached document is intended to be a supplement to (not a replacement for) our client's earlier comments letter submitted on November 24, 2025.

Please let us know if you have any trouble opening the attachment.

Thank you, and happy holidays to you and your family.

Hal Kitchin

Henry L. Kitchin Jr
Partner
McGuireWoods LLP

300 North Third Street
Suite 320
Wilmington, NC 28401-4099
T: +1 910 254 3822
F: +1 910 254 3823

501 Fayetteville St.
Suite 500
Raleigh, NC 27601
hkitchin@mcguirewoods.com
Bio | VCard | LinkedIn | www.mcguirewoods.com

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Orton Plantation Holdings, LLC

December 19, 2025

Submitted via FedEx and Electronically – Federalconsistencycomments@deq.nc.gov

Cameron Luck, Federal Consistency Coordinator
North Carolina Department of Environmental Quality
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

Re: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project

Dear Mr. Luck:

Orton Plantation Holdings, LLC ("Orton") respectfully supplements its November 24, 2025 comments on the U.S. Army Corps of Engineers federal consistency submission for the proposed Wilmington Harbor Navigation Project (the "Project"). Please add these comments to the administrative record for the State's review of the Corps federal consistency submission.

Please refer to Orton's November 24, 2025 comments for details about Orton's unique, and material, interest in the Project, and Orton's interest in the State's review of the Corps' consistency submission. Those comments demonstrate that the Project threatens to irreversibly damage the Orton Property and its irreplaceable cultural, historic and ecological resources. Those same resources are protected by North Carolina's Coastal Area Management Act. The Project is not, as a result, consistent with North Carolina's coastal program to the maximum extent practicable for the reasons explained in detail in Orton's November 24, 2025 comments.

These supplemental comments delineate additional relevant points, observations and flaws within the Corps' analysis of the economic feasibility of the Project. North Carolina should consider in its review of the Corps consistency submission the extent to which the Corps' economic analysis does not satisfy Corps policies, and is the product of multiple irrational and speculative assumptions. As stated further below, Orton respectfully requests the State to request the Corps to update its economic analysis before proceeding any further with the Project.

The Draft EIS discloses an anticipated benefits-to-cost ratio ("BCR") for the Project of 1.3. *See* Project 403 Letter Report, Attachment 5, at 57. That BCR is extraordinarily low. It is materially lower than other Corps shipping channel dredging projects, for example the Charleston dredging project BCR was 6.4 and the Savannah dredging project BCR was 7.3. The Corps deferred, and has not identified, foreseeable additional and escalating costs (for example, mitigation costs to protect coastal resources). *See* Draft EIS, Appendix N at 14.

Anticipated economic benefits will decline if the Corps corrects the erroneous and speculative assumptions on which the BCR rests. Reductions in container services and volumes in future years and as identified in 2025 will negate benefits. It is obvious that known, future costs will escalate and hoped-for benefits rest on irrational assumptions that will not materialize.

The identified BCR of 1.3 is not rational. If actual costs and future benefits are properly identified, the Project BCR is below 1.0.

The Corps is proposing a Project that will cause great, unnecessary, harm to coastal resources protected by North Carolina's Coastal Area Management Act based on an economic justification that cannot withstand scrutiny. Please refer to Orton's November 24, 2025 comments for specific details about the extent to which the Project will injure and destroy irreplaceable historic, cultural and ecological resources at the Orton Property that are protected by the State's coastal program. Economics do not justify those harms given that the public benefits will not exceed the public costs.

The Corps' binding federal policies require a BCR greater than 1.0. Engineer Regulation (ER) 1105-2-100 § 2-4(c).[1] That directive states that a "project may be said to be worthwhile" only where "the benefits exceed the cost." ER 1105-2-100 § 2-4(c)(2). This Project cannot satisfy that requirement. The Project is infeasible and not "worthwhile" under Corps policy.

Even a cursory analysis of costs by the Corps reveals additional deficiencies underlying the identified 1.3 BCR. The Project has already increased in cost from $846 million (February 2020) to $1.36 billion (September 2025). It is worth noting that the President's Budget BCR threshold to qualify for funding as a Corps of Engineers project is

[1] Available at https://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1105-2-100.pdf.

2.5. The Project, even accepting the faulty 1.3 BCR, cannot satisfy the requisite BCR of 2.5 for future funding. This fact alone makes this Project questionable for any federal funding.

Current economic conditions at Wilmington Harbor, and escalating costs for construction of civil works projects such as deepening projects, suggest a likely increase in cost between the Draft EIS and Pre-Construction Engineering and Design (PED) phases. The Corps of Engineers is required to update the BCR calculation at the PED Phase. ER 1105-2-100, Appendix D § D-4(b), page D-13 ("It is Corps policy to report and maintain current estimates of project benefits, costs, and economic justification ....").

Orton specifically requests the State to request the Corps to update its BCR to reflect current estimates of benefits and costs. Again, that is required by the Corps policy cited above. If calculated now based on 2025 data points the project BCR would reduce below the 1.0 acceptance threshold. In addition to the points previously raised in this letter, the Corps should factor in the following additional points in updating, and reevaluating, its past BCR estimate of 1.3.

The four Asia Container Services noted in the Corps of Engineers Economic Analysis no longer call at the Port of Wilmington. Current data does not demonstrate a need to construct a deepening project responsive to Generation III ships as the design vessel used in the Corps study referenced in the Draft EIS indicates. Those anticipated benefits are not rational.

The Corps must consider Ocean Carrier Alliance realignments. They have concentrated large vessel port calls to East Coast Harbors that have either already achieved 47 Ft. of draft or deeper. The ports whose channels currently have 47 Ft. of water are pursuing deepening projects beyond this depth. That highlights the last generation nature of the Wilmington Harbor Project. It is not economically feasible to chase the past when other ports are preparing for the future. The benefits anticipated to accrue from this Project are speculative given those facts.

Wilmington Harbor's terminal and rail infrastructure does not support high volume, first-in Asia calls due to the lack of dock/terminal space and dual served rail handling capabilities. The width of the current (project without conditions) and proposed channel improvements (project with conditions) does not allow for ships passings in the approach channel due to design vessel beam restrictions established by the NC Harbor Pilots. Again, this is another example of faulty benefit analysis underlying the 1.3 BCR.

Utilizing 2025 baseline data points reflecting current loaded TEU volumes and ocean carrier services at Wilmington Harbor would ensure integrity in future projections throughout the lifecycle of the project. Given the environmental degradation expected from the deepening, it is imperative the study process does not advance until the economics of the project reflect current conditions, factor in all costs (including future mitigation) and eliminate speculative benefit estimates. Again, that reassessment is required by binding Corps policy. ER 1105-2-100, Appendix D § D-4(b), page D-13.

Orton reiterates its request that the State object to the Corps' consistency determination for the reasons stated in Orton's November 24, 2025 comment letter. Separate from that request, Orton respectfully requests the State to request the Corps to update its economic analysis before proceeding further with the Project. This request is critical to Orton and other irreplaceable North Carolina resources protected by the State's Coastal Area Management Act.

Thank you for your prompt attention to this matter.

Sincerely,



Louis Moore Bacon
Chairman
Orton Plantation Holdings, LLC

cc: Dillon Epp, Orton Property Manager
Henry L. Kitchin, Jr., Esq., McGuireWoods LLP
Ezekial J. Williams, Esq., Williams Weese Pepple & Ferguson

From: Pamela Haddock
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 11:04:52 AM

You don't often get email from pghaddock9@gmail.com. Learn why this is important

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Hello,

I am a Wilmington resident and would like to share some comments on the Wilmington Harbor Navigation Project.

I have read information from various sources, and want to take this time because our care and stewardship of the Cape Fear River / port and these valuable resources in and around Wilmington are incredibly important.

I am concerned about flooding, wetlands loss, and PFAS contamination, to the extent that I have not seen a case for this high price to be worthwhile. Is endangering our community worth a business venture risk?

The uniqueness and beauty of the city on the river is part of what brought my family to this area and our pride and love has brought more family here.

Let's not endanger our environment without complete analysis and focus on what makes this place special.

Thank you,
Pamela Haddock
103 Keaton Ave, Wilmington, NC 28403

From: Paul Sommers
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, December 8, 2025 4:30:52 PM

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Dear Division of Coastal Management,

Please reject the Harbor 403 Dredging Project. The arguments in favor of making the harbor channel deeper and wider do not come close to the environmental costs to our region and the commercial costs to our fisheries. I am particularly concerned about additional salt water intrusion as well as adverse impacts of disturbing the river bed and hazardous forever chemicals that are sequestered there. The cost of the project is to be shared by local governments, and our need for a new bridge across the Cape Fear River far exceeds our need for a deepened shipping channel.

Sincerely,
Paul D Sommers
246 Inlet Point Dr
Wilmington, NC 28409

From: jannie.papke@gmail.com
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Port Dredging
Date: Tuesday, December 2, 2025 10:35:09 PM

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Port dredging with the USACE
is only of benefit to cargo ship owners. The risk to the local environment including spreading PFAS dredgings
on the beaches, salt water intrusion and increased flooding in Wilmington compounded by no real benefit to the region.
Therefore, we are TOTALLY against the port dredging.

Ray and Jane Papke
3319 Laughing Gull Terrace
Wilmington, NC 28412
Sent by iPad

From:	Ray Decker
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] Wilmington Harbor Project 403 - Proposed Deeper Dredging
Date:	Tuesday, December 9, 2025 10:06:27 AM

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The proposed dredging of the Cape Fear River to permit deeper draft ships to travel Wilmington is no environmentally sound or economically warranted. The Ports Authority is promoting a significant boost in imports that is not exactly driven by the import data impacted by tariffs. At what point does the Ports Authority's strategy accept the current river status (depth and turnaround area) and make its operation more efficient to achieve greater revenue. If the river and affected ocean area continues to disrupt fragile marine and wildlife communities. Worst is the creeping salinity levels farther inland on the River. This "salt poisoning" of the fresh ecosystem causes a continuing decay and disruption of the wetlands.

The Cape Fear River is critical for the vitality of every community along the river especially Wilmington.

No more Cape Fear River dredging. Hold the 42' current depth and improve the port's operational efficiency and Protect Our Environment.

Ray Decker
Residents - Wilmington NC

From: Rebecca Marks
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, November 24, 2025 9:13:24 AM

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- There is no compelling need for deepening the harbor. The Corps claims that the same amount of cargo will go through the port with or without the deepening, and Wilmington Harbor already accommodates the large ships that the project is designed to handle.
- There is no reason to threaten North Carolina's coastal resources if economic and transportation goals can be accommodated without the deepening project.

- The Wilmington Port Expansion will threaten the very resources our coastal management plan was designed to protect:
    - The expansion will threaten wildlife habitat and coastal towns, increase erosion rates, and increase the need for maintenance dredging.
    - The expansion will destroy more than a thousand acres of freshwater wetlands. The Corps unjustifiably assumes that freshwater wetlands will transition into other types of wetlands without accounting for the loss of habitat and storm protection that freshwater wetlands would provide.
    - The expansion could expose wildlife to extreme PFAS ("forever chemicals") pollution through dredging and disposal of contaminated sediment.
    - Deepening the harbor will adversely impact threatened and endangered species, including sea turtles, especially through the consequent increased amount of regular maintenance dredging.

The proposed Wilmington Harbor expansion would cause irreversible harm to the Cape Fear River, its wildlife, and surrounding communities, all without a compelling public need.



From: Rhonda Waterhouse
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] For the Trees: Strong Opposition to Proposed Deepening of the Cape Fear River
Date: Thursday, December 18, 2025 10:58:00 AM

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Dear North Carolina Department of Environmental Quality,

I am writing to formally oppose the proposed plan to dredge and deepen the Cape Fear River near Wilmington. This project presents serious, long-term risks to the ecological health, climate resilience, and cultural heritage of the Lower Cape Fear region, and I urge NC DEQ to deny or significantly revise any permits associated with this effort.

Ecological Context: A System Already Under Stress

The Cape Fear River estuary is not a blank slate. It is already experiencing significant stress from sea-level rise, saltwater intrusion, habitat loss, and the cumulative impacts of past and ongoing dredging projects. Channel deepening has repeatedly altered hydrology and salinity regimes in ways that push saltwater farther upriver, undermining freshwater wetlands and forests that evolved under very different conditions. Additional dredging would accelerate these processes, compounding damage rather than addressing it.

One visible and alarming consequence of these changes is the rapid expansion of ghost forests—areas where once-thriving coastal forests have died due to increased salinity and altered water levels. I documented this phenomenon in a recent article for *Coastal Review*, which explains how dredging and other human interventions intensify saltwater intrusion and forest loss in the Cape Fear watershed:

https://coastalreview.org/2025/10/cape-fear-ghost-forests-tell-tale-of-ever-saltier-water-upriver/

Peer-reviewed research reinforces these concerns. A study by Kendra Devereaux, Dr. Monica Rother, and colleagues provides direct scientific evidence from the Wilmington area showing how even subtle shifts in hydrology and salinity can kill mature, long-established forests:

https://onlinelibrary.wiley.com/doi/10.1002/ece3.71677

The Irreplaceable Value of Trees—Especially Old-Growth Bald Cypress

Of particular concern is the threat this project poses to forested wetlands and old-growth bald cypress stands. These trees are not interchangeable units of "green infrastructure." Many are centuries old, serving as living archives of regional history while providing critical ecosystem services: carbon storage, flood attenuation, water filtration, wildlife habitat, and shoreline stabilization.

The proposed mitigation measures do not—and cannot—replace these forests. Planting saplings (which is not part of the current mitigation plan) or restoring wetlands elsewhere does

not compensate for the loss of mature bald cypress systems that took hundreds of years to develop. Once these trees are killed by saltwater intrusion, they are effectively gone within any meaningful human or planning timeframe.

Mitigation Promises and the Need for Accountability

Equally troubling is the reliance on mitigation plans that assume future compliance without enforceable accountability. The U.S. Army Corps of Engineers has, in past projects, failed to fully follow through on mitigation commitments, leaving local communities and ecosystems to absorb the consequences. Any project of this scale should include binding, transparent, and independently monitored mechanisms to ensure mitigation is not only promised, but completed, maintained, and effective.

Without such safeguards, mitigation becomes a paper exercise rather than a real offset to ecological harm. NC DEQ should not approve permits based on mitigation assurances that lack enforceability or a clear track record of success.

Contaminants and Public Health: PFAS Concerns

Another critical issue is the disturbance of contaminated sediments. As discussed in a subsequent article I published with WHQR, dredging the Cape Fear River raises serious concerns about PFAS and other persistent pollutants that are already present in the river system. Resuspending these contaminants threatens downstream ecosystems, drinking water sources, and public health:

https://www.whqr.org/local/2025-11-15/the-proposed-plan-to-dredge-the-cape-fear-river-balancing-progress-and-preservation

Any environmental review that does not fully account for PFAS risks—and the long-term costs of spreading them further through the watershed—is incomplete.

Conclusion

The Cape Fear River is a living system, not simply a navigation channel. Its forests, wetlands, and waters support communities, economies, and ecosystems that cannot be easily repaired once damaged. Proceeding with this dredging plan would prioritize short-term industrial convenience over long-term environmental stability and public trust.

I respectfully urge NC DEQ to reject the proposed dredging plan or require a fundamentally different approach—one that prioritizes climate resilience, protects irreplaceable old-growth forests, fully addresses contamination risks, and includes enforceable accountability for mitigation commitments.

Sincerely,

Rhonda L. Waterhouse

Science & Creative Nonfiction Writer
MFA in Creative Nonfiction (Environmental Writing) & Faculty, UNC Wilmington
Faculty, Cleveland Community College
M.Ed. & BS Ed., The Pennsylvania State University

From: Richard Davis
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project")
Date: Monday, November 24, 2025 1:31:33 PM

You don't often get email from richardtrently@gmail.com. Learn why this is important

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This is a great example of wasteful government spending on project that harm the environment, based on flawed economics and provide no benefit to citizens.
Please soundly disapprove this project.
Richard Davis
323 Glendale Arbor Dr SW, Ocean Isle Beach, NC 28469

From: robert parr
To: DEQ-SVC_DCM.federalconsistencycomments
Cc: Robert Parr
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Thursday, December 18, 2025 4:07:38 PM

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To: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project

Re: Objection to Approval of Proposed Cape Fear River Dredging Pending Comprehensive Toxicological Including PFAS Analysis

From: From: Dr. Robert Parr
6706 Falcon Point Road
Wilmington, North Carolina 28411

December 18, 2025

Objection to Approval of Proposed Cape Fear River Dredging Pending Comprehensive Toxicological and PFAS Analysis

I am writing to formally urge the U.S. Army Corps of Engineers (USACE) **not to approve the proposed dredging of the Cape Fear River** until a **complete, transparent, and scientifically rigorous toxicological evaluation of all dredged sediments and dredge spoil has been completed**, and until the **full risks of bioaccumulation and biomagnification in humans and marine organisms have**

been thoroughly assessed and publicly disclosed.

I further oppose any plan that would allow dredge spoil from this project to be placed on **Masonboro Island Coastal Reserve, Carolina, Kure or Oak Island beaches**, and I request **full sediment testing to the maximum anticipated dredging depth for per- and polyfluoroalkyl substances (PFAS)**, with abandonment of the project if elevated concentrations of these or other toxic substances are detected.

Contaminants of Concern in Cape Fear River Sediments
Decades of industrial, municipal, and port-related activities within the Cape Fear River watershed raise substantial concern that sediments targeted for dredging may contain elevated concentrations of toxic contaminants, including but not limited to:

- **Heavy metals** such as lead, mercury, and cadmium
- **Polychlorinated biphenyls (PCBs)**
- **Pesticides and hydrocarbons**, including polycyclic aromatic hydrocarbons (PAHs) such as benzo[a]pyrene
- **Total petroleum hydrocarbons (TPH)**
- **Tributyltin (TBT)** from historical antifouling paint use
- **Dioxins and furans**
- **Nutrients**, ammonia, oil, and grease
- **Per- and polyfluoroalkyl substances (PFAS)**, which are persistent, mobile, and increasingly recognized as serious public health threats[1]

If released or improperly managed, these contaminants can **bioaccumulate in sessile and mobile benthic organisms and fish** posing risks to aquatic ecosystems, wildlife, commercial and recreational fisheries, and human populations.

Bioaccumulation, Biomagnification, and Documented Seafood Contamination

Heavy metals and many organic pollutants are **non-biodegradable** and accumulate in living organisms over time. As contaminants move up the food chain, concentrations increase resulting in the greatest impacts at higher trophic levels[2]:

- **Benthic organisms** (e.g., mussels, crabs, polychaete worms) absorb contaminants directly from sediments and are among the most vulnerable species.
- Scientific literature has demonstrated that **maintenance dredging disrupts benthic infaunal communities**[3].
- **Apex predators**, including large fish, marine mammals, and fish-eating birds, accumulate especially high concentrations of mercury, cadmium, PCBs, and other toxins, increasing the risk of neurological, reproductive, developmental, and carcinogenic effects.
- **Humans**, particularly pregnant women and children, face corresponding health risks through seafood consumption.

These risks are not hypothetical. **Multiple studies and state agency investigations have documented the presence of PFAS compounds in fish and shellfish collected from the Cape Fear River**, demonstrating that these persistent chemicals are already entering the aquatic food web and posing exposure risks to people who consume locally caught seafood[4]. Disturbing contaminated sediments through dredging risks mobilizing additional PFAS into biologically available forms, further exacerbating an already documented public health concern.

PFAS Testing, Data Gaps, and Project Viability
Even more troubling, **no agency, university, or nonprofit has conducted PFAS sediment testing in the precise stretch of the Cape Fear River targeted for excavation**—an area located downstream of **decades of documented legacy and replacement PFAS discharges**[5]. Without this baseline data, regulators and the public cannot determine whether dredging would disturb **concentrated PFOS or PFOA "hotspots,"** both of which are now designated hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[6].
Under the current plan, any contaminated sediment could be **relocated offshore**, directly adjacent to **public beaches already experiencing PFAS-laden sea foam washing ashore**. This approach risks redistributing persistent contaminants into nearshore waters, shorelines, and coastal ecosystems rather than containing them.

Disposal, Reuse, and Environmental Protection Concerns
While management options such as **Confined Disposal Facilities (CDFs)**, **open-water disposal**, and **sediment treatment or remediation** exist, these approaches are only appropriate when dredged material has been thoroughly characterized and demonstrated to be non-toxic or effectively treated[7]. Improper disposal can result in sediment dispersion, ecosystem degradation, and long-term contamination.

Under no circumstances should dredge spoil from the Cape Fear River be placed on or used for:

- **Masonboro Island Coastal Reserve**

Carolina, Kure or Oak Island beaches

These areas are sensitive, publicly owned trust resources and must not be exposed to even potential contamination risks.

Regulatory Framework and Required Testing
As recognized by the U.S. Environmental Protection Agency (EPA) and USACE, dredged material suitability is determined through a **case-by-case, risk-based, tiered testing framework**, rather than universal numerical limits[8]. This framework requires:

- Full chemical characterization of sediments
- **Biological testing (bioassays)** to evaluate toxicity and bioaccumulation
- Consideration of site-specific ecological conditions and sensitive habitats
- Rejection of any material qualifying as toxic or hazardous waste under the **Resource Conservation and Recovery Act (RCRA)**[9]
- A robust **alternatives analysis** identifying practicable, environmentally preferable options

Approval should only be granted if it can be demonstrated conclusively that the proposed dredging will **not result in unacceptable adverse environmental impacts**, either immediately or over the long term.

Conclusion

Until **complete toxicological testing**, **full-depth PFAS sediment analysis**, and **bioaccumulation risk assessments**

are conducted and made publicly available, the proposed Cape Fear River dredging project should **not proceed**. Public trust resources, sensitive coastal ecosystems, and human health must not be placed at risk due to incomplete data or premature approval.

I respectfully request that the U.S. Army Corps of Engineers exercise its full authority and responsibility to protect the environment and public health by **withholding approval** of this project until these concerns are fully and credibly addressed.

Sincerely,

Dr. Robert Parr
Wilmington, North Carolina

Footnotes

<!--[if !supportLists]-->1. <!--[endif]-->U.S. Environmental Protection Agency (EPA), *Contaminants of Concern in Dredged Sediments*; PFAS Technical Fact Sheets.

<!--[if !supportLists]-->2. <!--[endif]-->EPA, *Bioaccumulation and Biomagnification of Environmental Contaminants*.

<!--[if !supportLists]-->3. <!--[endif]-->McCauley, J.E., Parr, R.A., & Hancock, D.R. (1977). *Benthic infauna and maintenance dredging: A case study*. **Water Research**, 11(2), 233–242.

<!--[if !supportLists]-->4. <!--[endif]-->North Carolina Department of Environmental Quality (NCDEQ), North Carolina Department of Health and Human Services (NCDHHS), and academic studies documenting PFAS contamination

in fish and shellfish from the Cape Fear River and associated consumption advisories.

<!--[if !supportLists]-->5. <!--[endif]-->NCDEQ and EPA documentation of historical legacy and replacement PFAS discharges in the Cape Fear River basin.

<!--[if !supportLists]-->6. <!--[endif]-->EPA, *Final Rule Designating PFOA and PFOS as Hazardous Substances under CERCLA* (2024).

<!--[if !supportLists]-->7. <!--[endif]-->U.S. Army Corps of Engineers, *Dredged Material Management and Disposal Guidance*.

<!--[if !supportLists]-->8. <!--[endif]-->EPA/USACE, *Evaluation of Dredged Material Proposed for Discharge in Waters of the United States* (Inland and Ocean Testing Manuals).

<!--[if !supportLists]-->9. <!--[endif]-->Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6901 et seq.

From: Robert Wydra
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Wilmington Harbor
Date: Monday, November 24, 2025 10:06:07 AM

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To Whom it may concern,

Please do not deepen or widen the harbor. The port seems to have plenty of ship traffic in the 400 to 700 foot ship size.It's an expense that's not needed, there are plenty of east coast deep ports closer to the ocean.

Regards,
Bob Wydra

From:	Andy Wood
To:	Luck, Cameron A
Cc:	bagarrow@gmail.com
Subject:	[External] Wilmington Harbor 403
Date:	Sunday, October 26, 2025 10:15:28 AM
Attachments:	CPCG_USACE_Wilmington_Harbor_Comment_Letter_16July2024[1076].pdf

You don't often get email from awood@coastalplaincg.org. Learn why this is important

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Hello Cameron,
My name is Andy Wood and I was recently referred to you by Barbara Garrow (copied here), a Sierra Club member who met you at the recent USCOE information meeting regarding the Wilmington Harbor 403 project. Related, I spoke with the Sierra Club climate group this past week and shared the attached comment letter I provided to USCOE back in 2024, on behalf of Coastal Plain Conservation Group and the Center for Biological Diversity. Barbara suggested I reach out to you and also share the letter for your reference.

I hope this is helpful and I am glad to speak with you about conservation concerns tied to the harbor project, including meaningful mitigation
for observable consequential damages to freshwater resources including saltwater intrusion and drowning of stream, marsh, and swamp forest resulting from past Cape Fear River dredging activities and predicted worsening consequences resulting from expanded dredging.

Thank you Cameron, for your help with protecting our region's natural heritage, and I look forward to staying in touch,
Andy

Unplug. Go Outside. Connect with Nature.

Andy Wood, director
Coastal Plain Conservation Group
PO Box 1008
Hampstead, NC 28443
910-742-2675
awood@coastalplaincg.org

From: robin@greenfield.bz
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Wednesday, December 10, 2025 2:41:54 PM
Attachments: image001.png
Importance: Low

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To Whom it may concern,

I am an economic development consultant, and my firm did the recent Brunswick Business and Industry Development Economic Development Plan, as well as the recent New Hanover County Economic Mobility study. Based on our research and analysis of these counties, and their economic development assets, I understand the extreme importance of the Cape Fear River, to the economic past and future of our Region. Consequently, I strongly recommend to move forward on the additional work to deepen the Cape Fear River. The River is the primary transportation asset in the Region, and as the ships increase in size, we MUST keep up with our ability to service them. The Region's 4-lane roads are in place to primarily connect the Port to its users. Also, the No 1 site selection criteria for most companies that are located within a large radius of Wilmington, is proximity to our Port, to service their supply chain and/or products.

Any impact on the environment that the project creates, is a very small price to pay for the huge benefit this river upgrade provides for the Region's economic future.

Thank you for offering this opportunity to comment on this most important project for our Region.

Robin H. Spinks
Greenfield
The Strategy, Art and Science of Business Locations

910-617-7544
robin@greenfield.bz
www.greenfield.bz

213 Seacrest Drive
Wrightsville Beach, NC 28480

From: ronimurphy9@gmail.com
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Dredging the Cape Fear
Date: Saturday, November 22, 2025 3:31:49 PM

[You don't often get email from ronimurphy9@gmail.com. Learn why this is important at https://aka.ms/LearnAboutSenderIdentification]

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It was disheartening to read about the plans to dredge the river deeper in order to allow larger ships into the port. It seems that the environmental impacts will be far greater than any advantages to Wilmington's economy. Wilmington is experiencing a huge growth which is already impacting the area.

I do not support this project.

Roni Murphy
Cape Resident
Sent from my iPhone

From: Roy Costa
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 3:54:06 PM

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Dear Sirs,

I strongly support the positions of the Conserve the Point-Topsail, North Carolina Coastal Federation, Audubon, and the Cape Fear River Watch organizations in their opposition to the Wilmington Harbor expansion. I, too, vehemently oppose this expansion which would cause irreversible harm to the Cape Fear River, its wildlife, and surrounding communities, all without a proven public need.

North Carolina law declares that "among North Carolina's most valuable resources are its coastal lands and waters…which should be preserved and enhanced." To protect and preserve our coastal resources, the Division of Coastal Management must ensure that projects occurring at the coast are consistent with the State's coastal management plan.

I urge the Division of Coastal Management to uphold NC law to protect and preserve our wildlife and natural resources that are found in our barrier islands, tidal creeks, salt marshes, and wetlands in and around the Wilmington Harbor.

The major reasons for my opposition include:

- There is no compelling need for deepening and widening the harbor. The Corps claims that the same amount of cargo will go through the port with or without the deepening, and Wilmington Harbor already accommodates the large vessels that the project is designed to handle.
- The project is expected to cost more than **$1 billion** and the only benefits identified are cost savings to international shipping companies, not the N.C. Ports Authority, North Carolina communities, or coastal resources.
- The Army Corps' analysis of the Wilmington Port Expansion underestimates the future vulnerability of the Wilmington area and its coastal resources due to sea level rise and coastal flooding.

- The expansion will threaten wildlife habitat and coastal towns, increase erosion rates, and increase the need for maintenance dredging.
- The expansion could destroy more than a thousand acres of freshwater wetlands. The Corps unjustifiably assumes that freshwater wetlands will transition into other types of wetlands without accounting for the loss of habitat and storm protection that freshwater wetlands would provide.
- The expansion could expose wildlife to extreme PFAS ("forever chemicals") pollution through dredging and disposal of contaminated sediment.
- Expanding the harbor will adversely impact threatened and endangered species, including sea turtles, especially through the consequent increased amount of regular

maintenance dredging.

Given the devastating impacts of the project, the Division of Coastal Management must deem the Wilmington Port Expansion inconsistent with the coastal management plan.

I implore the Division of Coastal Management to oppose the Wilmington Harbor dredging project – protect instead of deepening and widening the Cape Fear River.

Sincerely,

Roy Costa

1414 Ocean Blvd

Topsail Beach, N.C. 28445

--

From:	sally meserole
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] Wilmington Harbor project
Date:	Tuesday, December 16, 2025 1:57:34 PM

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Please note me as being opposed to the dredging project. Myriad reasons. It would be an overall net detriment if it were to be implemented.

Sally Meserole
910-612-2441

From: Sam Boyce
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, December 20, 2025 8:21:16 AM

You don't often get email from sdb60411@hotmail.com. Learn why this is important

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Please do NOT move forward with the harbor deepening and widening project.

From the data I have been able to gather, there does not appear to be a true public benefit for the port project. The amount of cargo entering the port is expected to continue growing regardless of whether the port is deeper. So, the $1+ billion dollars spent on the project may be better served on other projects.

In addition, potential environmental impacts are quite significant. Dredge material, potentially containing high levels of PFAs, will expose wildlife to dangerous chemicals. Flooding risks have not been adequately assessed, especially when considering how sea level rise will impact Wilmington's coastal areas. Upstream freshwater wetlands, which provide wildlife habitat, flood mitigation, and recreational opportunities, will be converted or lost, and we do not have a good understanding of how those changes will impact the area.

Given the increased environmental risk and no direct monetary benefits to NC, I recommend pausing this project.

Best Regards,

Sam Boyce
Wilmington, NC Resident

From: Sarah Gilliam
To: DEQ-SVC_DCM.federalconsistencycomments
Cc: Rep. Lindsey Prather; Julie.Mayfield@ncleg.gov
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Monday, November 24, 2025 10:16:34 AM

You don't often get email from monarch.sg0130@gmail.com. Learn why this is important

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Dear North Carolina Division of Coastal Management staff,

I am deeply concerned with the proposed Wilmington Harbor project. I lived in coastal Wilmington for many years before moving to WNC. I visit there often to enjoy the coastal habitat and kayak in the saltmarsh (wetlands), which is a delicate ecosystem that would be devastated by a project like this. The expansion could expose wildlife to extreme PFAS ("forever chemicals") pollution through dredging and disposal of contaminated sediment.

Secondly, there is no compelling need for deepening the harbor. The Corps claims that the same amount of cargo will go through the port with or without the deepening, and Wilmington Harbor already accommodates the large ships that the project is designed to handle.

There is no reason to threaten North Carolina's coastal resources if economic and transportation goals can be accommodated without the deepening project. Please do not move forward with this project.

Thank you for your time, Sarah

Sarah Gilliam
69 English Dr
Candler NC 28715

SOUTHERN ENVIRONMENTAL LAW CENTER

136 East Rosemary Street, Suite 500
Chapel Hill, NC 27514

Telephone 919-967-1450
Facsimile 919-929-9421

November 3, 2025

VIA E-mail

US Army Corps of Engineers
Wilmington District
ATTN: Wilmington Harbor 403
69 Darlington Avenue
Wilmington, NC 28403
WilmingtonHarbor403@usace.army.mil

RE: Southern Environmental Law Center Comments on Wilmington Harbor 403 Draft Letter Report & Environmental Impact Statement

The Southern Environmental Law Center ("SELC") submits these comments on behalf of Audubon North Carolina, Cape Fear River Watch, Center for Biological Diversity, CleanAIRE NC, Defenders of Wildlife, League of Women Voters of Lower Cape Fear, North Carolina Coastal Federation, North Carolina Conservation Network, North Carolina NAACP, and North Carolina Sierra Club, regarding the U.S. Army Corps of Engineers' ("Corps") Draft Environmental Impact Statement ("DEIS")[1] and Draft Letter Report for the Wilmington Harbor, North Carolina Project.[2] We have previously submitted three letters on this project, and because many of the attachments we provided to the Corps in those prior letters were omitted from the DEIS' listed references, we attach and incorporate them by reference here.[3] Further, we provide many new relevant attachments with our comments here, including a technical review of the Corps' DEIS completed by Lynker Corporation, a science and engineering consultant.[4] All attachments are available at links provided at the end of this letter. In the below comments, we reiterate the extensive environmental damage likely to be caused by this project and raise significant questions left unanswered by the DEIS.

I. Introduction

For over six years, the North Carolina Ports Authority has pursued a controversial proposal to expand Wilmington Harbor in response to the Panama Canal's enlargement and the

[1] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Draft Environmental Impact Statement Wilmington Harbor Navigation Project, North Carolina, EISX-202-00-K7P-1755163795 (Sept. 12, 2025) [hereinafter "DEIS"].
[2] U.S. Army Corps of Eng'rs, Draft Letter Report: Wilmington Harbor Section 403 Wilmington Harbor Navigation Project Wilmington, North Carolina (Sept. 5, 2025) [hereinafter "Letter Report"].
[3] Letter from Sierra B. Weaver, et al., S. Env't L. Ctr., to Elden Gatwood, U.S. Army Corps of Eng'rs (Oct. 11, 2019), Attachment 1 [hereinafter "SELC, 2019 Scoping Comments"]; Letter from Ramona H. McGee, et al., S. Env't L. Ctr., to Bret Walters & Suzanne Hill, U.S. Army Corps of Eng'rs (June 30, 2023), Attachment 2 [hereinafter "SELC, 2023 Early Scoping Comments"]; Letter from Hannah M. Nelson, et al., to Daniel H. Hibner and Andrew Stolba, U.S. Army Corps of Eng'rs (July 22, 2024), Attachment 3 [hereinafter "SELC, 2024 Scoping Comments"].
[4] Lynker Corp., Wilmington Harbor Navigation Improvement Project Draft Environmental Impact Statement Technical Review (Oct. 30, 2025), Attachment 4 [hereinafter "Lynker Report"].

resulting increase in larger shipping vessels. The current plan would deepen the harbor from 42 to 47 feet, widen significant portions of the channel by several hundred feet, and extend the harbor's entrance farther offshore.[5] This massive undertaking carries a construction price tag exceeding $1 billion, with an additional $14 million in annual maintenance costs. Yet even these staggering figures fail to capture the full cost of the project—omitting the profound environmental and ecological consequences of altering the Lower Cape Fear River.

Despite years of planning and the enormous financial commitment, the Ports Authority and the Corps have yet to justify the need for such a destructive project. And they offer no clear explanation of how expanding Wilmington Harbor would benefit North Carolina's communities, businesses, or families.

The stakes are high. The Lower Cape Fear River is one of the most ecologically significant and biodiverse river systems in the region. It encompasses estuarine, brackish, and freshwater ecosystems, forming a delicate interface between saltwater and freshwater habitats. When healthy, the river supports robust fish populations and provides important habitat for threatened and endangered species such as piping plovers, red knots, Atlantic and shortnose sturgeon, and several species of sea turtles. Just upstream, the river serves as a drinking water source for over 500,000 residents in Wilmington and surrounding counties. Near the Port, barrier islands, tidal creeks, and marshes support recreational and commercial fisheries and offer irreplaceable natural beauty. The Cape Fear River is not just a waterway—it is a lifeline for Southeastern North Carolina's communities and wildlife. Any decision to alter it must be weighed with care, transparency, and accountability.

Unfortunately, the Corps' Letter Report and DEIS fall far short of the agency's responsibility. Instead of rigorously assessing how the proposed expansion would jeopardize the already vulnerable communities, species, wetlands, shorelines, and ecosystems of the Lower Cape Fear River, the agency largely dismisses these concerns. The Corps relies on erroneous and unexplained assumptions, and fails to disclose or assess the compounding effects of the deepening with the effects of climate change—minimizing how the deepening could worsen storm surge and flooding experienced by local communities. In a troubling attempt to justify these oversights, the Corps argues that because the Cape Fear River is already threatened by climate change, the expansion won't significantly worsen the situation. This logic is not only flawed—it's an attempt to disavow the agency's responsibilities under the National Environmental Policy Act ("NEPA").

Vulnerability is not a license for further harm. The fact that the Cape Fear River is already under stress makes it even more critical to protect, not exploit. The Corps must return to the DEIS and meaningfully address the environmental risks outlined in detail below.

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[5] DEIS, *supra* note 1, at 1-4.

II. The history of the proposed expansion.

In 2019, the North Carolina State Ports Authority began promoting plans to deepen and widen Wilmington Harbor. A year prior, the Water Resources Development Act ("WRDA") had been amended to expand the role of private, nonfederal entities to prepare the feasibility report required by Section 203 of WRDA and submit that report to the Corps.[6] In June 2019, the Ports Authority prepared a feasibility study and draft environmental report pursuant to Section 203 proposing to expand Wilmington Harbor.[7] The Corps responded with significant concerns about the initial 203 Feasibility Report, related to plan formulation, project economics, sea level rise, and compliance with NEPA.[8] As a result, the Corps instructed the Ports Authority to revise its analysis to address the agency's concerns.[9] In September 2019, the Corps initiated a separate NEPA review by announcing its intent to prepare a DEIS for this project.[10]

In late February 2020, the Ports Authority submitted a revised 203 feasibility report to the Corps,[11] and in May 2020, the Corps again responded with significant concerns.[12] The Corps noted continued deficiencies in the treatment of sea level rise, real estate, and economics, and indicated that many assumptions in the Ports Authority's study were not adequately justified. While the Corps ultimately found the proposal "technically sound and feasible," it concluded that "unresolved issues contained within [the] Review Assessment will need to be addressed prior to construction."[13] In December of 2020, the Water Resources Development Act of 2020 ("WRDA 2020") was signed into law, authorizing a series of projects, including the Wilmington Harbor Navigational Improvement Project.[14] The authorization of the Wilmington Harbor expansion was made subject to the resolution of the deficiencies the Corps identified with the 203 Feasibility Report, including the requirement to complete the NEPA review for the project.[15]

On March 10, 2023, the Corps formally withdrew its 2019 scoping notice, explaining "the Section 403 authorization" under WRDA 2020 "is conditioned upon the resolution of

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[6] Pub. L. 115-270 § 1152 (Oct. 23, 2018).
[7] N.C. Ports, Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental Report (June 2019).
[8] U.S. Army Corps of Eng'rs, Wilmington Harbor Navigation Improvement Project Section 203 Feasibility Study/Environmental Report, dated June 2019: Policy Review Assessment (July 2019) [hereinafter "2019 Review Assessment"].
[9] *Id* (stating "the report would need significant revisions before it would be considered to be legally and policy sufficient").
[10] Notice of Intent to Prepare a Draft Environmental Impact Statement (DEIS) for the Wilmington Harbor Navigation Improvement Project Integrated Feasibility Study and Environmental Report, New Hanover and Brunswick Counties, NC, 84 Fed. Reg. 48131 (Sept. 12, 2019).
[11] *See* N.C. Ports, Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental Report (Feb. 2020) [hereinafter "203 Feasibility Report"].
[12] U.S. Army Corps of Eng'rs, Review Assessment of Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental Report (May 2020) [hereinafter "2020 Review Assessment"].
[13] *Id.* at 4.
[14] P. L. 116-260 § 403(a)(5) (Dec. 27, 2020).
[15] *Id.* § 403(b).

comments from the review assessment of the ASA(CW)" from May 2020.[16] The Corps further explained that the agency "will be initiating a separate environmental review process for the Federal action related to the conditional authorization under Section 403 of WRDA of 2020."[17] The Corps held an early scoping comment period in 2023,[18] and initiated formal scoping under NEPA in the summer of 2024.[19]

III. The Corps' current purpose and need statement is too narrow.

Over the past six years, the purported need for the Wilmington Harbor expansion project has shifted drastically. At the outset, the Ports Authority demanded the expansion to accommodate increased imports and job growth.[20] In tandem, the Ports Authority touted the dramatic ultimatum that if Wilmington Harbor was not deepened, shipping companies would completely abandon the Port—threatening economies in Wilmington and across the Southeast.[21] While eye catching, this conclusion was entirely unjustified, drawing significant criticism from the Corps and the public.[22]

Over time, the need for the project dwindled to the point where the current purported purpose and need statement fails to present a compelling reason for federal investment. The Corps now states that the purpose of the project is "to contribute to national economic development ("NED") by addressing transportation inefficiencies for the forecasted vessel fleet, consistent with protecting the Nation's environment."[23] Despite acknowledging that "the same volume of cargo is assumed to move through Wilmington Harbor"[24] with or without the project, the Corps claims the project is necessary to "address the constraints that contribute to inefficiencies in the existing navigation system's ability to safely serve forecasted vessel fleet and cargo types and volumes."[25] The purpose and need statement is inappropriately narrow and not justified by the DEIS.[26] It also directly conflicts with the Ports Authority's goals for the project which remain to "attract more import and export business," and "[b]oost[] job growth."[27]

As a preliminary matter, merely contributing to national economic development is not a proper purpose under the current principles and guidelines governing water resource investment.

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[16] Withdrawal of Notice of Intent to Prepare a Draft Environmental Impact Statement, 88 Fed. Reg. 14993 (Mar. 20, 2023).
[17] *Id.*
[18] U.S. Army Corps of Eng'rs, Notice of Early Scoping Public Comment Period (May 30, 2023).
[19] Intent To Prepare an Environmental Impact Statement (EIS) for a Letter Report for the Wilmington Harbor, North Carolina Project, New Hanover and Brunswick Counties, North Carolina, 89 Fed. Reg. 48602 (June 7, 2024).
[20] *See, e.g.*, 203 Feasibility Report, *supra* note 11, at 185.
[21] *Id.* at 121.
[22] *See, e.g.*, 2019 Review Assessment, *supra* note 8, at 3; 2020 Review Assessment, *supra* note 12, at 25–26.
[23] DEIS, *supra* note 1, at 1-8.
[24] *Id.* at 2-7.
[25] *Id.*
[26] The Ports Authority also appears to be struggling to justify the project. Internal emails show the tension between asking for a deeper Port while also demonstrating that the Port is "handling the volume [of cargo] today." Email from Brian Clark, N.C. Ports Authority, to Hans Bean, N.C. Ports Authority (July 6, 2023), Attachment 5.
[27] *See Harbor Enhancement: Wilmington Harbor Navigation Improvement Project*, N.C. PORTS, https://perma.cc/5YMG-YR39 (last visited Nov. 2, 2025).

Federal projects must focus on a much broader range of issues than national economic development when setting a federal objective, including:

> reflecting national priorities, encouraging economic development, and protecting the environment by seeking to maximize sustainable economic development, seeking to avoid the unwise use of floodplains, and protecting and restoring the functions of natural systems and mitigating unavoidable damage to natural systems.[28]

Nevertheless, and despite this specific instruction, the Corps' sole purpose for this project is to contribute to national economic development—there are no considerations for the environmental, community, or resilience needs around the Port of Wilmington.[29]

Second, and as we have explained in detail through prior comments,[30] there is no explanation for what inefficiencies are occurring or will occur in Wilmington should the Project not proceed. To the contrary, the Ports Authority highlights that Wilmington Port has the "highest container truck gate and crane productivity *on the U.S. East Coast*."[31] In business materials, the Ports Authority claims to have "[t]he fastest turn times on the East Coast," and states the Port is "big ship ready."[32] As the DEIS acknowledges, the Ports Authority continues to complete "improvement" projects that will "increase the efficiency and throughput capacity of the Port of Wilmington" without deepening the channel.[33] Indeed, even letters of support from shippers fail to identify the harbor deepening as necessary to support their economic goals.[34] These accolades and continued enhancement projects directly conflict with the transportation inefficiencies cited as a purported need for deepening Wilmington Harbor.

Articulating a proper purpose and need is not just a paper exercise—it is the first step to identifying reasonable alternatives.[35] By failing to articulate a proper need and limiting the range of alternatives to varying depths of deepening, the Corps wrongly presumes that deepening is the only way to achieve the project's purpose.[36] The narrow purpose and need statement caused the Corps to eliminate without study other alternatives such as widening the channel (without also deepening it), which the agency admits "would allow" the large Post-Panamax III vessels "to use

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[28] U.S. Army Corps of Eng'rs, Final Rule, Corps of Engineers Agency Specific Procedures to Implement the Principles, Requirements, and Guidelines for Federal Investments in Water Resources, 89 Fed. Reg. 103992, 103993 (Dec. 19, 2024).
[29] DEIS, *supra* note 1, at 2-3.
[30] *See* SELC, 2023 Early Scoping Comments, *supra* note 3, at 4–5; SELC, 2024 Scoping Comments, *supra* note 3, at 3–4.
[31] *Fast Facts*, N.C. PORTS, https://perma.cc/8PZG-5R2U (last visited Nov. 2, 2025) (emphasis added).
[32] N.C. Ports, Welcome to North Carolina Ports (2023), Attachment 6.
[33] DEIS, *supra* note 1, at 1-18 ("These without-project condition terminal improvements enhance current terminal operations and efficiency independent of improvements to the federal channel.").
[34] *See* Combined Letters and Emails from Companies to N.C. Ports Authority (2021), Attachment 7.
[35] *City of Carmel-By-The-Sea v. U.S. Dep't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997) ("The stated goal of a project necessarily dictates the range of 'reasonable' alternatives and an agency cannot define its objectives in unreasonably narrow terms"); *see also Webster v. U.S. Dep't of Agric.*, 685 F.3d 411, 422 (4th Cir. 2012) ("a purpose is unreasonable when the agency defines it so narrowly as to allow only one alternative").
[36] DEIS, *supra* note 1, at 2-1 to 2-3; Letter Report, *supra* note 2, at 2-8 to 2-12.

the channel on a regular basis."[37] Another alternative could include moving the container terminal portion of the Port to the river's mouth, an endeavor that the Port of Mobile, Alabama undertook in 2008 to address the inefficiencies of moving large ships up river.[38] Yet another option would be to consider the East Coast ports regionally and evaluate whether it makes more sense (economically and environmentally) for the ports to operate as a hub-and-spoke system thereby removing the constant pressure for each harbor to house the deepest port.

If the project's purpose is honestly to address transportation inefficiencies and thus contribute to national economic development, then the Corps must both provide evidence of inefficiencies and explain why the project will meet other priorities that the agency has mandated drive federal investment.[39] If, on the other hand, the real purpose for the project aligns with the Ports Authority's goals of attracting more import and export business, then the Corps must expand its environmental analysis to address the associated impacts of such growth, including induced development and the water, wildlife, and community impacts that will result from it.[40] Additionally, the Corps must ensure that all feasible alternatives are considered.

Questions

- What evidence of transportation inefficiencies at Wilmington Harbor has the Corps identified?
- How does the Corps rationalize the stated purpose for the Wilmington Harbor expansion with the Corps' current Principles, Requirements, and Guidelines?
- Did the Corps consider moving part of the port to the mouth of the Cape Fear River like other southern riverine ports, including Alabama?

IV. The project's minimal benefits do not justify the extreme costs.

For there to be a federal interest in a water resources project, the benefits to National Economic Development must outweigh the cost to construct and maintain the project.[41] The Corps projects that expanding the harbor will cost more than $1.3 ***billion*** in construction costs

[37] Letter Report, *supra* note 2, at 2-6.
[38] *See The Evolution of containerization in Mobile Bay: From Local Port to Global Gateway*, NAT'L MARITIME MUSEUM OF THE GULF (May 19, 2025), https://perma.cc/P55Y-6WKF; *see also* AL. PORT AUTHORITY, Port of Mobile Map (2024) https://perma.cc/82NL-M3TL; *Alabama Port Authority and APM Terminals Mobile Ink Deal Container Terminal Enters Fourth Expansion*, AL. PORT AUTHORITY (May 19, 2022), https://perma.cc/KP7Q-NE2B.
[39] *See* 89 Fed. Reg. at 103993.
[40] For example, across Southeastern ports we have witnessed that harbor deepening projects are closely followed by induced industrial growth. *See, e.g.*, S. Env't L. Ctr., Map of Savannah Distribution Centers (2025), Attachment 8 (showing that since the deepening project began construction, approximately 251 distribution centers have been developed around Savannah Port). Induced growth leads to serious environmental concerns, like the destruction of wetlands, displacement of wildlife, and increased air and noise pollution. The industrial development also creates more hard concrete surfaces in coastal areas, exacerbating the effects of flooding, storm surge, and sea level rise. If the Corps actually expects imports to increase, it must re-do the environmental analysis taking these—and other concerns—into consideration.
[41] *See* Letter Report, *supra* note 2, at 2-3.

alone.[42] Annual maintenance will tack on an additional $14.4 million per year.[43] Because the Corps acknowledges that the same amount of cargo will move through Wilmington Harbor with or without the expansion,[44] the only identified benefit associated with these significant costs is a reduction in the number of voyages large cargo vessels will have to take each year resulting in "significant cost savings to the shippers."[45] In short, the Corps recommends expanding Wilmington Harbor and damaging extensive environmental resources so that international shipping companies can save a few dollars by putting more cargo on less ships.

The Corps' current benefit-cost-ratio admits that the possible benefits are narrow—the ratio is a mere 1.3, meaning that for every one dollar spent, the Corps expects 1.3 dollars in benefits.[46] For comparison, the Corps predicted a 7.3 benefit-cost-ratio when deepening the Savannah Harbor,[47] and a 6.4 benefit-cost-ratio when deepening Charleston Harbor.[48] Only projects with a benefit-cost-ratio greater than 1.0 are considered justified.[49] With a ratio this low (1.3), practically any increase to the project's costs or reduction in expected benefits could shift the ratio below one, rendering the project infeasible.

a. The project's benefits rely on unsupported assumptions.

As mentioned above, the only purported benefit of expanding Wilmington Harbor is the alleged reduction in costs to shipping companies.[50] Not only does the DEIS fail to connect this benefit to national economic development,[51] the Corps relies on multiple unsupported assumptions to conclude that vessels will in fact increase their loads and reduce their number of voyages each year. For instance, the DEIS assumes the shipping companies will more fully load their ships but does not provide data on how much more capacity each type of vessel can (or will) carry into Wilmington Harbor if they do not have to light-load.[52]

Rather than provide actual data to support its assumption, the Corps used a model to predict the number of each type of vessel that would call with or without the project. That model

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[42] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report: Attachment 4 – Cost Appendix (Sept. 5, 2025), at 12.
[43] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report: Attachment 5 – Economic Considerations (Sept. 5, 2025), at 58.
[44] *Id.* at 32 ("In the [future] without and in the future with project conditions, the same volume of cargo is assumed to move through Wilmington Harbor . . . ").
[45] *Id.* at 49.
[46] *Id.* at 57, 58.
[47] *What is SHEP?*, U.S. ARMY CORPS OF ENG'RS, https://www.sas.usace.army.mil/Missions/Civil-Works/Savannah-Harbor-Expansion/What-is-SHEP/ (last visited Nov. 2, 2025).
[48] Jackie Pennoyer, *Final Harbor Deepening Contracts Awarded*, U.S. ARMY CORPS OF ENG'RS (Dec. 22, 2020), https://www.sac.usace.army.mil/Media/News-Stories/Article/2454681/final-harbor-deepening-contracts-awarded/. While these were the BCRs the Corps identified in both projects, we note that they were likely inflated to serve the associated port's benefits. That said, even assuming some inflation of benefits, the BCRs are significantly higher than the one calculated for the Wilmington Harbor expansion.
[49] Attachment 5 – Economic Considerations, *supra* note 43, at 1.
[50] *Id.* at 49.
[51] *Id* (failing to connect any benefits to the national economy and stating that the only economic benefits are to international shipping companies).
[52] *See id.* at 48 (explaining assumptions without justifications).

projected that if Wilmington Harbor is deepened, the number of Post-Panamax I (smaller vessels) would drastically decrease from 237 without the expansion to 115 vessels with the expansion, and the number of Post-Panamax III (large vessels) would remain the same at 103 vessels.[53] The Corps uses those projections to determine that shipping companies will reduce the number of voyages on smaller ships and instead put more cargo on larger ships.[54] But the model used is fundamentally flawed. Currently, only **one** Post-Panamax I is part of the Asia/USEC fleet,[55] and the Corps acknowledges that the vast majority of new Post-Panamax ships being built and deployed are Generation III.[56] Nevertheless, the Corps' model predicts that without the project, in 2036, the number of Post-Panamax I in rotation **will jump from one to 237 vessels**.[57] Said differently, in 2021 (the base year for the Corps economic analysis), Post-Panamax I vessels made up 1.1% of the Post-Panamax fleet, but by 2036, Post-Panamax I vessels would make up a staggering 47% of the fleet calling to Wilmington.[58] At the same time, Post-Panamax III vessels, which made up 94% of the fleet in 2021, would only account for 20% of the fleet in 2036.[59] In short, the Corps artificially inflates the number of Post-Panamax I vessels that would call at Wilmington without the expansion, contrary to industry trends.[60]

Wrongly assuming that there will be more Post-Panamax I vessels is not a minor error. The Corps' cost-benefits-ratio resulted from reduced *number* of vessels calling in Wilmington with the deepening, as compared with the no action alternative.[61] They reached that conclusion by showing a shift from Post-Panamax I to Post-Panamax III.[62] But the Corps' concludes that "modifications to the channel framework at Wilmington alone will not be sufficient to cause changes in the vessel fleet servicing the U.S."[63] Therefore if—as is likely given industry trends—more cargo would simply be loaded on to the Post Panamax III vessels in circulation under the no action alternative, the comparative cost savings with the expansion would be reduced.

Additionally, the DEIS does not explain how the reduction of vessel voyages can or will be implemented.[64] Currently, all Asia/USEC services are provided on a weekly basis and each of

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[53] *Id.* at 55.
[54] Attachment 5 – Economic Considerations, *supra* note 43, at 49.
[55] *Id.* at 48.
[56] *Id.* at 42.
[57] *Id.* at 48.
[58] *Id.*
[59] *Id.*
[60] *See, e.g.*, DEIS, *supra* note 1, at 1-8.
[61] Attachment 5 – Economic Considerations, *supra* note 43, at 49.
[62] We note that the Corps' economic projections of number of vessels at varying depths deceptively *does not* include the depth identified as the preferred alternative in the DEIS. *See id.* at pg. 55 (showing vessel projections for 46 feet and 48 feet).
[63] *Id.* at 59.
[64] *See generally id* (failing to provide an explanation for how vessel traffic will shift based on the change in loading more cargo onto fewer shifts).

these vessels follow a multiport rotation, with Wilmington included as a mid-port.[65] If the Corps is to assume that fewer vessels are calling in Wilmington, there must be a similar assumption that fewer vessels will call at Savannah, Charleston, or any other port within Wilmington's rotation. The DEIS does not explain how that pattern will (or even could) change. To the contrary, the agency acknowledges that "the number" of Post-Panamax vessels calling to the Port are expected to increase in the future with or without the expansion.[66]

In summary, the Corps assumes (without providing any evidence to support) that shipping companies will opt to both (1) increase the amount of cargo per vessel and (2) reduce the number of vessels currently calling to Wilmington Port. The Corps relies on those assumptions to calculate its benefit-cost-ratio and to evaluate environmental impacts of the project. These assumptions are questionable and misleading, and they likely do not accurately reflect what will actually occur in Wilmington. The Corps must justify or revise its assumptions before moving forward with a final decision.

b. If the Corps' assumptions prove inaccurate, the environmental impacts of the project will be more severe.

Relying on the conclusion that shipping companies will send more cargo on less ships has serious consequences for the Corps' environmental analysis. Throughout the DEIS, the Corps minimizes environmental impacts of the project by claiming that fewer vessels will be traversing the channel leading to less environmental damages. For instance, the Corps concluded that the stress put on river shorelines from vessel wakes would be reduced when compared to the no action alternative because fewer ships would be passing through the channel and therefore creating less wakes.[67] The Corps also determined that air emissions would decrease under the deepening alternatives because less vessel traffic would result in less air pollution.[68] And the Corps predicted that certain species would be at less risk of vessel strikes due to less frequent traffic.[69] As it stands, the Corps has not explained its assumption that shipping companies will consolidate more cargo onto less ships, which in turn taints the DEIS's discussion of environmental impacts.

c. Other environmental issues that must factor into the cost-benefit analysis.

Other environmental issues are relevant to the Corps' economic analysis and could drive down the benefit-cost-ratio. For instance, the Corps assumes that "approximately half" of the material taken from the harbor due to deepening "would be placed in a beneficial way," either through the creation of mudflats in the river's estuary, placement on bird islands, or placement on

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[65] *See, e.g.*, *Transpacfic Services Update – Amberjack & Emerald*, MSC (Feb. 19, 2023), https://perma.cc/J6VA-A6MW (showing historic route of EC2 indicating that Wilmington is a middle port of call).
[66] Letter Report, *supra* note 2, at 1-23.
[67] DEIS, *supra* note 1, at 3-23.
[68] *Id.* at 3-70.
[69] *Id.* at ES-3, 3-89.

nearby beaches.[70] Reusing dredged material in this alleged beneficial way drives down the cost of the project because it reduces the distance that dredging vessels have to travel to place materials.[71] But the Corps assumes that it *can* beneficially reuse this material without comprehensively studying what is in the sediment or whether the beneficial use plans will be approved. Because so much surrounding the beneficial use of sediment is uncertain, the Corps should have evaluated the cost of the project with and without the beneficial use to more transparently evaluate whether the project is feasible to move forward.

Considering whether beneficial use is even possible is particularly important here because (as discussed in more detail below) the sediment in the lower Cape Fear River is highly contaminated with per- and polyfluoroalkyl substances ("PFAS") from upstream industries.[72] The Corps did not analyze any existing PFAS data, nor did it collect its own.[73] This is highly problematic because in 2024, the U.S. Environmental Protection Agency ("EPA") classified two particularly harmful PFAS compounds (PFOA and PFOS) as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), or Superfund Law.[74] Dredging and disposing of hazardous waste requires particular care during both construction and placement—and managing hazardous waste can significantly drive up the costs of a project. States who are leaders in addressing PFAS contamination have restricted the use of PFAS-laden dredged material for beneficial use.[75] For example, Michigan prohibits disposal in open water when PFAS levels exceed state thresholds, and the state requires extensive testing and mitigation measures be taken if the material is to be used for beneficial use.[76]

While North Carolina does not yet have the same policy, research consistently shows that PFAS are impacting wildlife in the Lower Cape Fear River—including shorebirds, alligators, and fish.[77] Material contaminated with toxic PFAS chemicals should not be placed on bird islands,

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[70] *Id.* at 2-16 to 2-18.
[71] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix D: Beneficial Use Plan (Sept. 5, 2025), at pg. 15-16.
[72] Megumi S. Shimizu et al., *Distribution of Legacy and Emerging Per- and Polyfluoroalkyl Substances in Riverine and Coastal Sediments of Southeastern North Carolina, USA*, 11 ENV'T SCI. PROCESSES & IMPACTS (June 3, 2022), Attachment 9; Saleeby, Brittany, et al., *Isomers of Emerging Per- and Polyfluoroalkyl Substances in Water Sediment From the Cape Fear River, North Carolina, USA*, 262 CHEMOSPHERE 128359 (2021), Attachment 10; *see also* Harfmann, Jennifer, et al., *Sorption of Hexafluoropropylene Oxide Dimer Acid to Sediments: Biogeochemical Implications and Analytical Considerations*, ACS EARTH SPACE CHEM (2021), Attachment 11; *see also* N.C. DEQ, PFAS Sediment Study – Performed January 2021 to August 2021 (2021), Attachment 12.
[73] *See* DEIS, *supra* note 1, at 3-61 to 3-66 (describing impacts to sediment and the affected environment under each alternative and failing to even mention PFAS, much less analyze the impacts of the pollutants).
[74] Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances, 89 Fed. Reg. 39124, 39125 (May 8, 2024); *see also EPA's Principal Claim of PFAS Progress is Untrue*, PUBLIC EMPLOYEES FOR ENV'T RESPONSIBILITY (Oct. 29, 2025), https://perma.cc/F8X8-BATR (providing evidence that PFOA and PFOS continue to be used and released into the environment by industries).
[75] Mich., Department of Environment, Great Lakes, and Energy Sediment Dredging Guidance (June 13, 2025), Attachment 13, at 6.
[76] *Id.* at 4, 6–7.
[77] Anna R. Robuck, et al., Legacy and Novel Per- and Polyfluoroalkyl Substances in Juvenile Seabirds from the U.S. Atlantic Coast, 54 ENV'T SCI. & TECH 12938 (Sept. 2020), https://pubs.acs.org/doi/pdf/10.1021/acs.est.0c01951; Univ. of RI, PFAS in Seabirds: Narragansett Bay, Massachusetts Bay, Cape Fear, SCI. DAILY (Sept. 23, 2020),

estuaries where young fish grow, or beaches where sea turtles nest, all of which is currently proposed in the DEIS. Because the Corps has not studied the levels of PFAS in the material that will be dredged, it does not know how it will be able to dispose of the material, whether the agency will be able to meet standards of sediment compatibility, and most importantly, whether it will be able to beneficially reuse the sediment—or whether the reuse would cause consequent harm. If the agency cannot (or if it is required by the state to mitigate effects of using that material), the costs of the project will drastically increase.[78]

In addition, and again as discussed in more detail below, the mitigation planned to address wetland and aquatic resource impacts is vastly inadequate. Addressing that deficiency will require additional mitigation measures to be implemented. Mitigation is factored into the benefit-cost-ratio[79] and, therefore, an increase in mitigation costs will disrupt the Corps' conclusion that this project results in a net gain. Finally, the Corps' economics analysis should also consider the negative economic impacts to fisheries, decreases in tourism and recreation dollars, incremental increases in flooding damages, and impaired ecosystem services from destroyed or damaged natural resources.[80]

In summary, the Corps' economics analysis relies on significant assumptions that are not supported within the DEIS. The Corps must revise these assumptions or provide support for them before moving forward with a decision on this project.

Questions

- What is the Corps' basis for concluding that shipping companies will both (1) increase capacity on vessels and (2) decrease the number of vessels calling to Wilmington Harbor?
- Why does the Corps assume that the number of Post-Panamax I vessels will increase substantially without the project? In particular, please explain the jump from one to 237 Post-Panamax I vessels listed in Table 5.38 in Attachment 5 – Economic Considerations.
- What would the cost of deepening Wilmington Harbor be if the Corps could not beneficially reuse some or all of the sediment?

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https://perma.cc/S3ZS-NZ7K; Guillette et al., Blood Concentrations of Per- and Polyfluoroalkyl Substances Are Associated with Autoimmune Like Effects in American Alligators From Wilmington, North Carolina, FRONTIER TOXICOLOGY 4:1010185 (Oct. 20, 2022), https://perma.cc/T95J-RH2G; T.C. Guillette, et al., Elevated levels of per- and polyfluoroalkyl substances in Cape Fear River Striped Bass (Morone saxatilis) are associated with biomarkers of altered immune and liver function, 136 ENV'T IN'TL 105358 (Mar. 2020), https://perma.cc/8523-J7EF; Tracey Peake, High Levels of PFAS Affect Immune, Liver Functions in Cape Fear River Striped Bass, N.C. STATE (Feb. 7, 2020), https://news.ncsu.edu/2020/02/pfas-striped-river-bass/; *NCDHHS Recommends Limiting Fish Consumption From the Middle and Lower Cape Fear River Due to Contamination With "Forever Chemicals,"* N.C. DEP'T HEALTH & HUMAN SERVS. (July 13, 2023), https://perma.cc/E8FU-N69H [hereinafter "Cape Fear Fish Consumption Advisories"].

[78] Appendix D: Beneficial Use Plan, *supra* note 71, at 17.

[79] U.S. Army Corps of Eng'rs, Attachment 4 – Cost Appendix (Sept. 5, 2025), at 2 (listing mitigation as a factor in project cost).

[80] *See* U.S. Army Corps of Eng'rs, Planning Guidance Notebook Regs. 1105-2-100 (Apr. 22, 2000), at C-15 (explaining that environmental resources should be monetary value "based upon the contribution the resources makes to the Nation's economy"), https://perma.cc/2Y5J-U2R4.

- Why did the Corps not consider negative impacts to local economies in Wilmington, including local fisheries and ecotourism businesses?
- What would the Corps' response be if the costs for the project were to outweigh the benefits? Said another way, if the BCR drops below 1, could the Corps continue to recommend this project?

V. The Corps cannot use sea level rise to excuse the project's impacts.

At the outset, we appreciate the Wilmington District's use of the Corps' High scenario for evaluating sea-level rise impacts for this project. Having the High scenario underpin the DEIS should help facilitate a sounder project and the development of more resilient mitigation measures. Unfortunately, the Corps has misused these projections. Rather than utilize sound science to thoroughly and comprehensively evaluate how this project will impact the Lower Cape Fear River, the Corps used the projections to entirely obfuscate the project's impacts. For example, the DEIS acknowledges that deepening Wilmington Harbor will increase the mean high-water level throughout the project area, increase peak water levels (by more than 3%), and expand the total area that will be flooded by rising tides.[81] But the agency diminishes these impacts by stating that the increases are minimal "when compared to the substantial influence of sea level change."[82]

In reaching this conclusion, the DEIS compares the immediate increases caused by the project (based on mean tidal datum values using average water levels from 1983 to 2001)[83] to sea levels projections for 2086.[84] But impacts from this project will be felt much sooner, with construction expected to be completed in 2036. Instead of comparing the project's impacts solely against sea levels in 2086, at the end of the project's life, the Corps should have compared the impacts of the project against sea levels in 2036 to give an honest comparison of the project's impacts against sea levels at that time. Said differently, what the Corps considers a "negligible" impact compared to projected sea levels of 3.77 feet in 2086 would likely be more significant compared with a the much lower projected sea level of less than a foot in 2036. While it is true that sea-level rise will have massive impacts on the Wilmington area, so too will this project within the shorter term. The Corps cannot use future sea-level rise impacts over the next five decades to dodge this Project's many impacts on a much shorter timescale. The Corps must fully consider and evaluate the impacts this project will have on the human and natural environment without brushing aside impacts because they are less than future sea-level rise projections.

Most importantly, the Corps must consider how sea-level rise will interact with the deepening project and exacerbate flooding events that will create compounding and increasingly severe impacts. The Cape Fear Basin is especially vulnerable to compound flooding events— or

[81] DEIS, *supra* note 1, at 3-60 to 3-61.
[82] *Id.* at 3-61.
[83] *Id.* at 3-59.
[84] *Id.* at 3-60.

floods caused by multiple factors.[85] However, the DEIS fails to adequately address these dynamics. It treats sea-level rise as a static, isolated phenomenon rather than a dynamic force that will continuously impact tidal ranges, compound flooding, and the resulting need for maintenance dredging. This failure leads to a drastic underestimation of the risks to Wilmington and the communities that call this area their home.

For instance, the Corps entirely dismisses the increase in mean high water caused by the project, arguing that sea level rise will overshadow its effects. What the Corps fails to consider in that conclusion, however, is that even an increase of 0.11 feet (as expected from the deepening) will drastically accelerate the rate of high-tide flooding. Peer-reviewed research has demonstrated that the volume of water flowing through the river's channel is a dominant driver of chronic low-level flooding—particularly in estuarine environments like the Lower Cape Fear River.[86] This means that even a "modest" increase in water flowing through the Lower Cape Fear River creates a substantial risk to Wilmington communities—especially in the downtown area.

Beyond mean high water, the Corps fails to account for other hydrodynamic consequences of the project. Deepening a channel like Wilmington's reduces friction through the water system making it easier for more water to flood into the channel—especially during storm conditions.[87] This causes a nonlinear increase in the tidal range and flooding risk,[88] resulting in "higher water levels, faster currents, and longer-lasting inundation farther inland."[89] A recent study of tidal conditions in Jacksonville, Florida show when shallow estuaries are deepened, they provide less protection against "long-waves" or storm induced flooding which can pose a significant risk to the communities nearby.[90] Similarly, a study on channel deepening in Louisiana showed that deepening allows more water to flood the system during a storm event, drastically increasing the flooded area around the channel.[91] When sea level rise is considered alongside the deepening project, there are increased flood risks caused by a larger, more powerful storm surge.[92]

Despite well-established research showing that flood risks are not static, but are indeed a culmination of many factors, the DEIS critically does *not* take into account how the combination of channel deepening, tidal amplification, storm surge, vessel wakes, and sea-level rise will

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[85] Avanitka Gori, Ning Lin, & James Smith, *Assessing Compound Flooding From Landfalling Tropical Cyclones on the North Carolina Coast*, 56 WATER RESOURCES RESEARCH 1 (2020), Attachment 14.
[86] *See* Kelly McKeon & Christopher G. Piecuch, *Compound Minor Floods and the Role of Discharge in the Delaware River Estuary*, 130 JGR OCEANS 1 (2025), Attachment 15.
[87] Lynker Report, *supra* note 4, at 4; Ramin Familkhalili, Stefan A. Talke & David A. Jay, *Tide-storm Surge Interactions in Highly Altered Estuaries: How Channel Deepening Increases Surge Vulnerability*, 125 JGR OCEANS 1, 15 (2020), Attachment 16.
[88] *Tide-storm Surge Interactions*, *supra* note 87, at 2.
[89] Lynker Report, *supra* note 4, at 8.
[90] Stefan A. Talke & David A. Jay, *Changing Tides: The Role of Natural and Anthropogenic Factors*, 12 ANN. REV. OF MARINE SCI. 121, 132–33 (2020), Attachment 17.
[91] Maqsood Mansur, Julia Hopkins & Qin Chen, *Estuarine Response to Storm Surge and Sea-level Rise Associated with Channeling Deepening: A Flood Vulnerability Assessment of Southwest Louisiana, USA*, 116 NAT. HAZARDS 3879, 3889 (2023), Attachment 18.
[92] *Id* at 3890.

create greater impacts on the project area—impacts that are both more environmentally and economically damaging.[93] We urge the Corps to model this Project in a way that takes into account these compounding effects so that the agency and the public may better understand the impacts this Project will have in the region.

Unfortunately, the Corps' failure to meaningfully study and integrate sea level rise and compound effects into the NEPA analysis leads to questionable conclusions throughout the DEIS. For example, the Corps tries to claim that sea level rise "could lead to a reduction in required maintenance due to increased depth in the channel."[94] This statement is not only a disingenuous attempt to spin sea level rise as a positive impact for the community, it is also fundamentally wrong. Sea level rise does not simply mean that water levels will increase evenly throughout the channel and not impact anything else. Sea level rise changes the ebbs and flows of the tidal range and will drastically impact sediment transport in the system thereby making maintenance dredging less effective.[95] Also, as discussed above, the reduced friction in the channel caused by dredging can exacerbate upstream flooding and erosion, amplifying sediment movement in the project area.[96] In other words, the Corps will be required to perform *more* maintenance dredging in the project area as sea levels continue to rise. This is a project impact and cost that was not considered throughout the DEIS.

As we have raised extensively in our prior comments, the area surrounding Wilmington Harbor is extremely vulnerable to sea level rise and changing tidal patterns.[97] So while we appreciate the Corps' acknowledgement that sea levels are indeed going to rise and pose significant threats to the Wilmington area, the agency cannot use those existing threats to mask the impacts of this project. Rather than using sea level rise data as a static factor to compare the project impacts against, the Corps must weave sea level rise into its analysis studying how—when viewed together—the project may exacerbate the risks associated with changing sea levels, including substantial flooding risks to the Wilmington community. This transparency is critical to the environmental and cost analyses present throughout the DEIS.

Questions

- Why did the Corps not consider or model the compound relationship between sea-level rise, the deepening project itself, and flooding events?
- Why did the Corps not complete a joint hazard probability distribution analysis to accurately demonstrate the total expected damage from compounding flood and storm events?

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[93] Lynker Report, *supra* note 4, at 8. As further explained in the report, even the Corps' storm surge modeling from Hurricane Helene suffers from this failure to recognize the compounding and variable nature of such events.
[94] DEIS, *supra* note 1, at 3-72.
[95] Lynker Report, *supra* note 4, at 4; Jana R. Cox et al., *Effects of Sea-Level Rise on Dredging and Dredged Estuary Morphology*, 127 J. OF GEOPHYSICAL RSCH.: EARTH SURFACE 1, 2 (2022), Attachment 19.
[96] *Tide-storm Surge Interactions*, *supra* note 87, at 2.
[97] SELC, 2023 Early Scoping Comments, *supra* note 3, at 5–7; SELC, 2024 Scoping Comments, *supra* note 3, at 7–10.

- Why did the Corps not complete hydrodynamic modeling that integrate compounding factors like wind and river volume to calculate the peak water level risk associated with deepening Wilmington Harbor?
- Did the Corps review studies that show deepening projects reduce friction throughout the channel thereby increasing flood risks and storm surge penetration? If so, why were those conclusions not included in the DEIS?
- What would the increased costs of maintenance dredging be if sea level rise increases sedimentation and erosion throughout the channel?
- What would be the projected difference in the numbers of days communities and businesses will feel impacts of flooding with or without the project?

VI. The DEIS fails to adequately address devastating environmental impacts.

The purpose of NEPA is "[t]o declare a national policy which will encourage productive and enjoyable harmony between man and his environment."[98] NEPA demands: (1) thoughtful, informed agency decisionmaking, and (2) making information available to the public at a meaningful time.[99] NEPA is an "action-forcing" statute[100] and achieves its goals by requiring agencies to take a "hard look"[101] at the "reasonably foreseeable environmental effects of the proposed agency action,"[102] and to "ensure scientific integrity" in their analyses by "mak[ing] use of reliable data and resources."[103] An EIS must do more than list potential impacts—it must rigorously analyze their scope, severity, and cumulative effects, using the best available information. When "essential to a reasoned choice among alternatives," an agency must undertake new technical or scientific research.[104] By requiring thorough consideration and disclosure of environmental impacts and alternatives, NEPA serves as a "democratic decisionmaking tool:" it "ensures that the agency will not act on incomplete information" and "permits the public . . . to react to the effects of a proposed action at a meaningful time."[105]

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[98] 42 U.S.C. § 4321; *Hughes River Watershed Conservancy v. Glickman*, 81 F.3d 437, 443 (4th Cir. 1996) ("NEPA declares a national policy of protecting and promoting environmental quality.").
[99] *See* 42 U.S.C. § 4332; *see also Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989); *Seven Cnty. Infrastructure Coal. v. Eagle Cnty., Colorado*, 145 S. Ct. 1497, 1507 (2025).
[100] *Kleppe v. Sierra Club*, 427 U.S. 390, 409 (1976).
[101] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989)
[102] 42 U.S.C. § 4332(C)(i).
[103] *Id.* §§ 4332(D), (F).
[104] *Id.* § 4336(3)(B).
[105] *N.C. Wildlife Fed'n. v. N.C. DOT*, 677 F.3d 596, 601–02 (4th Cir. 2012) (citations omitted).

For over five years, we have raised significant concerns with the potential environmental impacts of the proposed expansion, identifying specific effects and issues the Corps must consider in its DEIS. Unfortunately, the DEIS fails to adequately review and disclose pertinent impacts, including those relevant to our previously raised concerns.

a. Underrepresented Wetland Impacts and Inadequate Mitigation Measures

Wilmington is located within the North Carolina Coastal Plain, a region that is marked by a vast array of wetlands.[106] In addition to their role as hotspots for biodiversity, wetlands also provide shoreline stabilization, natural water filtration systems, storm buffers, and flood reduction services.[107] Freshwater wetlands also provide economic benefits for their role as nurseries for commercially important fish and shellfish.[108]

Despite the billions of dollars in services they provide,[109] thousands of acres of wetlands are being lost in North Carolina.[110] Most of this loss has occurred within coastal watersheds like the Cape Fear due to development, sea level rise, and climate change.[111] Additionally, hundreds of thousands of acres of wetlands have been converted or disturbed into different types of wetlands which result in "altered ecosystem function . . . and loss of important habitat."[112] As changes in interpretation of federal law[113] and consequent state law changes[114] rollback protections for many wetlands across southeastern North Carolina, it is critically important that the Corps not damage even more for an unnecessary deepening project.

Our past comments have raised concerns about this Project's potential to exacerbate marsh migration and cause wetland loss. At the outset, as raised earlier in this comment, we have concerns with the wetland loss from this project being diminished as compared to long-term wetland loss projected from sea level rise. Again, the Corps cannot use sea level rise as a basis to excuse the impacts of this project. In addition, we also raise concern with the use of outdated wetland conditions data as a basis for its analysis that does not take into account years of erosion, development, and wetland conversion within the region.[115] The use of outdated data as a baseline for the DEIS's modeling likely masks the project's impacts to wetlands.

Beyond the modeling data, the DEIS posits that the Project would result in the conversion of 1,071 acres of tidal freshwater wetlands to higher salinity wetlands under a no sea level rise

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[106] *Assessment of Change in North Carolina's Outer Coastal Plain Wetlands*, NORTH CAROLINA WETLANDS (July 2024) at 11, Attachment 20.
[107] *Id.*
[108] *Id*.
[109] *Id* (noting that the functions provided by wetlands are estimated to be worth $25.6 billion).
[110] *The Status and Trends of Wetland Loss and Legal Protection in North Carolina*, N.C. STATE EXTENSION, https://perma.cc/P9K2-JTEW (last visited Oct. 16, 2025).
[111] *Id.*
[112] *Id*.
[113] *See Sackett v. EPA*, 598 U.S. 651, 679 (2023) (limiting the scope to wetlands within the purview of the Clean Water Act to those with a "continuous surface connection" with a water of the United States).
[114] *See* 2023 Sess. L. 63 § 15.(c) (June 12, 2023).
[115] Lynker Report, *supra* note 4, at 14.

modeling.[116] The wetland loss under higher sea level rise projections is much higher. This assumption suffers from several flaws. First, the DEIS erroneously concludes that wetlands will convert to higher salinity wetland types. The DEIS seems to assume, without any explanation, that the acres of wetlands lost under any of the alternatives and different sea level rise scenarios will essentially be canceled out by acres of (different types) of wetlands gained elsewhere.[117] Further, the DEIS assumes that wetlands will be able to migrate into new areas without impediments—an assumption that is unfounded given the level of existing and projected development in the action area. Indeed, the DEIS provides no explanation of *where* these newly created wetlands will be.

While the DEIS posits that the wetlands will merely be converted to higher salinity wetland types, thus minimizing some environmental impacts, converted wetland habitats would result in an altered ecosystem function than existed before. The loss of freshwater wetlands would directly impact both the health of North Carolina's fishery resources and the natural filtration system wetlands provide. Moreover, conversion may accelerate upstream saltwater intrusion that would lead to the further spread of ghost forests in the region.[118] Even bald cypress trees that have adapted to survive in somewhat higher salinity environments along Smith Creek at the upper portions of the Lower Cape Fear are threatened by the permanently increased salinity that this deepening project would cause, rendering them more sensitive to climate variability.[119] Increased ghost forests lead to a decrease in ecosystem services, including protection from storm impacts and habitat for wildlife.[120] It's not just a problem of creating ghost forests. It's a problem of losing a critically important ecosystem. The loss of freshwater wetlands is exacerbated by the inadequate mitigation measures provided for by the DEIS, as described in greater detail below.

Questions

- Why does the Corps assume that for every acre of wetland lost, an acre will be gained somewhere else? Where will the new wetlands be created?
- Why did the Corps use wetland condition data from 2016-2017 to make impact calculations?

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[116] DEIS, *supra* note 1, at 3-56.
[117] *See id.* at Table 3-34 (depicting wetlands changes under the no action alternative, where under SLC1 891 wetlands would be lost vs. 891 gained; under SLC2 2337 wetlands would be lost, vs. 2338 gained; and under SLC3 9,628 wetlands would be lost vs. 9,628 gained); Table 3-35 (depicting wetlands changes under the Action Alternatives, where under SLC0 with AA1 1,275 wetlands would be lost and 1,276 would be gained; and under SLC3 with AA1 1,214 wetlands would be lost and 1,214 wetlands would be gained).
[118] *See* Jessica Lynn Magolan and Joanne Nancie Halls, *A Multi-Decadal Investigation of Tidal Creek Wetland Changes, Water Level Rise, and Ghost Forests*, 12 REMOTE SENSING 1141 (2020), Attachment 21.
[119] Kendra Devereux et al., *Tree-Ring and Sediment Analyses Reveal Processes of Bald Cypress Ghost Forest Formation From Dredging in the Cape Fear River, North Carolina, USA*, 15 ECOLOGY & EVOLUTION 1, 14 (2025), Attachment 22.
[120] *Id.*

b. Inadequate Modeling for Vessel Wake Impacts & Coastal Erosion

The Corps repeatedly states that deepening the Wilmington Harbor will allow larger, more heavily loaded ships to enter the Port. In particular, the DEIS focuses on an increase of Post-Panamax ships calling into Wilmington, a class of ships that can hold up to 15,000 twenty-foot equivalent units ("TEUs").[121] The Corps notes that Wilmington is accommodating Post-Panamax III ships "at the present time" that can be loaded to 14,220 TEUs.[122]

As we have raised in our past comments, larger ships create larger vessel wakes that will lead to greater coastal erosion and threaten shoreline stability. However, the DEIS fails to calculate vessel wake analysis using the largest ships *that already enter* the Port[123] and the types of ships the Corps projects will increase in the Port with this deepening. Although the purpose of the project is to allow more heavily loaded Post-Panamax III ships which can be loaded up to 15,000 TEUs, the DEIS vessel wake model is calibrated for a 12,400 TEU vessel.[124] Using an undersized vessel to calculate vessel wake underestimates the impacts ships projected to call to the Port will have on shoreline erosion.[125]

In addition to using an inadequate vessel size, the Corps misapplies its sediment transport models to predict the type and extent of erosion that will be caused by vessel wakes. The Corps uses sand transport models that are designed to predict erosion on sandy beaches, rather than riverbanks.[126] Physics of riverbanks are fundamentally different than those on sandy beaches and therefore the models are unreliable, if not meaningless.[127] On top of this, while the Corps acknowledges that sediment forecasts are highly sensitive to grain size, the agency only looks at a single grain size when evaluating the extent erosion can be expected to occur.[128] And the Corps' model only assumes 1 to 2 inches in tidal increase, even though the agency acknowledges that the area could see a tidal increase of 3.77 feet by 2086.[129] All of these factors lead to an unreliable analysis. The Corps must revisit its erosion analysis using different or modified models that more accurately represent the movement of sediment in the *river* itself.[130]

And even for the areas where a sandy-beach model would be appropriate, the Corps did not look at site-specific data or modeling. At Baldhead Shoal Reaches 3 and 4 (the most dynamic

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[121] Attachment 5 – Economic Considerations, *supra* note 43, at 23.
[122] *Id.* at 26.
[123] Given that these ships are already using the port, the Corps could have—and should have—used data from these and the other smaller ships to inform its analysis here.
[124] DEIS, *supra* note 1, at 3-21; U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix B-VIII: Vessel Wake Model Secondary Wave Calculations (July 16, 2025), at 2.
[125] Lynker Report, *supra* note 4, at 8.
[126] *Id.* at 2.
[127] *Id.*
[128] *Id.* at 3; U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix B: Model Documentation (July 24, 2025), at B-206.
[129] Appendix B: Model Documentation, *supra* note 128, at B-184.
[130] While we note that the Corps validated the model for the Anchorage Basin, the variance for the model was nearly 400% signaling that it was not an accurate or useful model. DEIS, *supra* note 1, at 1-5, Lynker Report, *supra* note 4, at 3.

portions of the project area), the Corps used erosion data from other beaches that have different characteristics.[131] This decision likely underestimates the sediment movement that will occur near Bald Head and the amount of maintenance dredging that will be needed to maintain this part of the channel.[132]

Finally, the DEIS and the hydrodynamic analysis also fail to consider the aggregate impact of thousands of vessel wakes and sea-level rise over five decades. Rather, the vessel wake modeling only simulates the shoreline impact of single events,[133] and even then, the Corps obscures the data from those conclusions by reporting them in annual averages.[134] Erosion is driven by peak bed shear stress during a wake event and thus cannot be fully understood in averages. For example, at Fort Caswell, peak bed shear stress is expected to *double* under the Corps' preferred alternative, but that threat to that portion of the channel is hidden by presenting the data in averages.[135] In short, the Corps' modeling and data culmination does not take into account how repeated vessel wakes in conjunction with sea-level rise will have long-term impacts on coastal erosion.[136] We urge the Corps to conduct vessel wake modeling that both uses a more accurate vessel size that reflects the ships anticipated to enter the Wilmington Port and considers the aggregate impacts of numerous vessel wakes and sea-level rise.

Questions

- Why did the Corps not use a 15,000 TEU vessel—the size of vessel the harbor expansion is allegedly designed to accommodate—for conducting vessel wake and shoreline erosion modeling? Why did the Corps not use the size vessel that currently calls in Wilmington?
- Why did the Corps present bed shear stress in averages, masking the total impact?
- How does the Corps find additional clearance and less severe bed shear stress if the entire project's goal is to allow ships to come more fully loaded (thus causing the ships to sink downward)?
- Why did the Corps not use a bank stability model that better reflected the physical properties of the Cape Fear River instead of the sand-beach models that the Corps used for its erosion calculations?

c. Lack of Testing for PFAS or Forever Chemicals

As we have raised in our past comments, the water and sediment of the Lower Cape Fear River are contaminated with PFAS, a large group of toxic chemicals that have severe health impacts, even at low levels, in humans and animals.[137] In particular, PFAS exposure has been

[131] DEIS, *supra* note 1, at 3-20.
[132] Lynker report, *supra* note 4, 2.
[133] DEIS, *supra* note 1, at 3-6.
[134] *Id.* at 3-20 to 3-24.
[135] *See* Appendix B: Model Documentation, *supra* note 128, at B-258, Table 11-7 (showing that maximum bed shear stress doubles between current conditions and the deepening alternative).
[136] Lynker Report, *supra* note 4, 1–3.
[137] *See, e.g.*, Zeyan Lew, Houman Goudarzi & Youssef Oulhote, *Developmental Exposures to Perfluoroalkyl Substances (PFASs): An Update of Associated Health Outcomes*, 5 CURRENT ENV'T HEALTH REPS. 1 (2023).

linked to cancer, developmental delays, reduced vaccine response, and decreased fertility in humans.[138] Unlike other chemicals, PFAS take thousands of years to break down which increases the risk of exposure and bioaccumulation in the environment. Both North Carolina and the federal government have responded to the threats that PFAS pose. In 2023, North Carolina issued fish consumption guidance for certain species in the Middle and Lower Cape Fear River.[139] In addition, the EPA has classified two PFAS as hazardous under CERCLA and has established drinking water standards for PFOA and PFOS.[140]

Although we have repeatedly urged the Corps to fully consider whether this Project may increase the levels of PFAS and other contaminants in the Cape Fear River ecosystem, the DEIS dismisses any effect the Project may have on exposing or distributing hazardous, toxic and radioactive waste. The Corps' most recent sampling of the dredged material was done in 2020 within the ODMDS and tested for "PCBs, pesticides, semi-volatile organics (SVOAs), metals, total organic carbon, and butyl-ins."[141] Since then, research has uncovered extensive PFAS pollution in the Cape Fear River.[142] This pollution is comprised of legacy (long-chain PFAS) and new chemistries that companies have recently switched to.[143] There is no evidence that the Corps researched this existing data or conducted sampling of the water, dredged material, or riverbank for any type of PFAS that contaminates the footprint of this project. Given that this material is to be used on bird islands, estuaries (where young fish will feed, forage, and grow), and public beaches, the Corps should conduct PFAS testing of the dredged material and shoreline deposits of the Cape Fear before further exposing people and wildlife to hazardous materials.[144]

Additionally, as mentioned earlier, the Corps' cost calculations for this project assume that the dredged material can be placed on beaches, subtidal areas, and bird islands that are close to where the material is being dredged. Should the material be unsuitable for beneficial use, the material would have to be transported offshore several miles and dumped within the ODMDS.[145] Transporting and dumping tens of millions of tons of dredged material would cause the cost of this project to increase significantly and make the project economically infeasible. As such, the Corps should have fully considered scenarios where dredged material could not be used for beneficial use.

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[138] *Our Current Understanding of the Human Health and Environmental Risks of PFAS*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas (last visited Oct. 16, 2025).
[139] Cape Fear Fish Consumption Advisories, *supra* note 77.
[140] *See* PFAS National Primary Drinking Water Regulation, 89 Fed. Reg. 32532 (Apr. 26, 2024); Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances, 89 Fed. Reg. 39124, 39125 (May 8, 2024).
[141] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix P: Wilmington Site Management and Monitoring Plan for Offshore Disposal at 18 (2023).
[142] *See* Megumi, *supra* note 72; Saleeby, *supra* note 72; *see also* Harfmann, *supra* note 72.
[143] Saleeby, *supra* note 72, at 3–7.
[144] This testing must take place even though the Corps routinely dredges the area. Because the Corps intends to deepen and widen the Harbor, it will encounter sediment that has been previously undisturbed and is likely highly contaminated.
[145] Appendix D: Beneficial Use Plan, *supra* note 71, at 17.

Questions

- Did the Corps conduct any testing for PFAS within the dredging area? If not, why did the Corps not conduct this testing?
- Why did the Corps not consider existing data regarding levels of PFAS in the sediment in the Lower Cape Fear River?
- How will the Corps' economic analysis be impacted if the agency cannot beneficially reuse sediment that contains PFAS contamination?

d. Noncomprehensive Groundwater Modeling

We have also raised concerns about the ways this Project could lead to saltwater intrusion into regional aquifers that impact both human communities and wildlife. In particular, harbor deepening projects generally can cause contamination of surface and groundwater. We urged the Corps to meaningfully evaluate these impacts, and the agency has failed to do so here.

At the outset, we call attention to the fact that the groundwater model the agency selected is a "yardstick" model, meaning "it is not precise enough to answer specific, localized questions." [146] Perhaps more significantly, as the Corps admits, the model "was not calibrated to predict salinity changes," and thus "salinity results are uncertain, and saltwater may move at different rates than the model suggests."[147] And to make matters worse, despite the recognition that they can influence groundwater conditions "the model does not simulate daily tidal fluctuations, storm events, or seasonal variations."[148] Despite these fatal flaws, the Corps relies on this model to conclude that salinity impacts to groundwater are "minor" particularly when compared to the threats posed by sea level rise.[149] A model this vague and imprecise cannot be used for a project area this important.[150] Additionally, the groundwater model figures (referenced in Appendix C) are not in the DEIS or attached documents, seriously inhibiting the public's review and analysis of this admittedly fault groundwater model.

Even without the Corps' groundwater model data, it is clear that the DEIS does not fully consider the risk posed by saltwater intrusion into groundwater. The Corps acknowledges that salinity in groundwater is influenced by sea level rise and groundwater pumping, but the agency fails to show how deepening the channel would or would not add additional stress to a degraded groundwater system. Rather, the DEIS assumes that the Cape Fear is a gaining river that would not impact aquifers at all. Communities in this part of the state are well aware this is not always the case. Indeed, one of the main reasons many of the groundwater wells are contaminated with toxic PFAS is because Chemours contaminated the Cape Fear River, and the pollution spreads

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[146] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix C: Geology and Geotechnical Engineering at C-15 (2025).
[147] *Id.*
[148] *Id.*
[149] DEIS, *supra* note 1, at 3-68.
[150] *See* Lynker Report, *supra* note 4, at 12; Christian D. Langevin et al., DOCUMENTATION FOR THE MODFLOW 6 GROUNDWATER FLOW MODEL (2017).

from surface water to groundwater.[151] In addition, it is well-documented that coastal rivers like the Cape Fear River can influence groundwater during storm surges and high tides (elements that the Corps' model explicitly did not evaluate).[152]

The DEIS also assumes a static salinity boundary and average seasonal stress over a 50-year period.[153] These assumptions fail to take into account the scenarios where groundwater intrusion are the most likely, such as during prolonged periods of drought and increased pumping during the summer months.[154] By failing to look at seasonal differences, the Corps "obscures the most dangerous scenario: summer conditions when maximum tourist pumping coincides with hurricane season, storm surge, and lowest natural recharge–exactly when breached confining units from deepening would create maximum vulnerability."[155] Ignoring these conditions (by averaging pumping across the seasons), the Corps concludes that deepening Wilmington Harbor will not worsen saltwater intrusion. This is likely false, dangerously disregards the communities who rely on groundwater for drinking water, and ignores threats to wildlife from severe salinity impacts. The DEIS thus inadequately considers risks to groundwater, and the Corps should use more robust modeling to fully consider potential impacts of this Project.

Questions

- Why did the Corps choose the groundwater model used for this DEIS? How does the Corps justify the use of a model that cannot predict site specific impacts?
- Why did the Corps not consider information showing that pollution spreads from the Cape Fear River to groundwater, indicating the river does indeed influence groundwater at times?
- Why did the Corps average seasonal stress to groundwater rather than consider seasonal variations?
- Did the Corps consider and compare impacts from the last deepening on groundwater?

d. Species of Concern

The current discussions in the DEIS and corresponding appendices omit and downplay critical details to understanding the full scope of harms to wildlife. While the DEIS and corresponding biological assessments do acknowledge some adverse effects on listed species, the previously described errors in modeling and other impacts analyses mean that even those staggering effects are likely underestimates. Worse, the Corps fails to disclose necessary

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[151] Letter from Sushma Masemore, NC DEQ to Seth Bailey, Chemours Fayetteville Works (July 3, 2025), Attachment 23; Geosyntec Consultants, Assessment of Table 3+ PFAS in New Hanover, Brunswick, Columbus, and Pender Counties at 49 (Sept. 20, 2024), Attachment 24 (explaining that during flood conditions the Cape Fear River can influence groundwater and this is a likely route of groundwater PFAS contamination).
[152] *See* Anner Paldor and Holly A. Michael, *Storm Surges Cause Simultaneous Salinization and Freshening of Coastal Aquifers, Exacerbated by Climate Change*, 57 WATER RESOURCES RESEARCH 1 (2021) (noting that modeling has shown that storm surges cause saltwater to infiltrate into aquifers), Attachment 25.
[153] Lynker Report, *supra* note 4, at 11.
[154] *Id.* at 14.
[155] *Id.*

information about the scope and likely impacts to threatened and endangered species from dredging, and completely omits analysis about other vulnerable species.

i. Effects of Cascading Modeling Errors

As an initial matter, modeling assumptions throughout the DEIS taint the Corps' assessment of species impacts. If more ships will call at the Port than the Corps assumes, that will correspond to greater vessel strike risks as well as additional wake and erosion impacts that harm important habitat. Even if the Corps' assumptions that fewer but larger ships will call at the Port are correct, if the ships that do call at the Port are larger than the design vessel used in the Corps' modeling, those impacts would be correspondingly more severe. As is, ship wakes have directly harmed and washed away migratory waterbird nests—but the DEIS failed to consider such impacts at all. Such underlying flaws and assumptions taint the Corps' consideration of species impacts.

A particularly troubling example is the Corps' cursory dismissal of any harm to the critically endangered magnificent ramshorn, largely based on the Corps' current tidal and groundwater modeling. As described above, those models and consequent conclusions are flawed, meaning the Corps' conclusion that saltwater intrusion into the two lakes where the ramshorn may occur (and which are designated critical habitat) must be revisited as well. Indeed, the U.S. Fish and Wildlife Service recognized when it listed the magnificent ramshorn that dredging and consequent saltwater intrusion have long been threats to the species.[156]

Similarly, the DEIS downplays impacts to migratory waterbirds—including the federally threatened red knot and piping plover—largely based on its coastal erosion models and predictions. As explained in greater detail in the attached Lynker report, these analyses suffer from "critical methodological deficiencies that likely lead to an underestimation of key environmental risks."[157] These include how the Corps used an "uncalibrated model and misleading annualized metrics" to support its conclusion that erosion will decrease.[158] The flaws in that erosion discussion carryover to the consideration of waterbird impacts, which are heavily premised on the belief erosion will decrease. And assumptions about alleged beneficial use of dredged material regardless of its PFAS-contamination status means that those possible "benefits" to birds are likely overstated.

The cascading errors described in preceding sections about hydrodynamic modeling and water quality monitoring also taint the DEIS's consideration of habitat suitability, since those habitat suitability indices were developed based on those modeling results.[159] The habitat suitability indices models also contain their own unfounded assumptions, including completely

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[156] Endangered Species Status for Magnificent Ramshorn and Designation of Critical Habitat, 88 Fed. Reg. 56471, 56476 (Aug. 18, 2023).
[157] Lynker Report, *supra* note 4, at 1.
[158] *Id.* at 2.
[159] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix H: Aquatic Habitat Suitability at 2-3 (2025).

removing substrate information for the Atlantic sturgeon models because "spawning habitat substrate is not expected to be impacted by the project."[160] This assumption is never justified and would seem to run counter to the impacts of increased dredging of such substrate and "established evidence that sturgeon eggs require clean gravel or sand for adhesion and oxygenation, and that fine sediment deposition can bury eggs."[161]

ii. Unexplained and Unexamined Dredging Impacts

First, the DEIS fails to indicate *when* dredging for project construction and maintenance will occur—which is critical to understanding the scope of impacts, as the Corps is well aware.[162] Dredging operations during sea turtle nesting season, for example, can be especially harmful as sea turtles approaching beaches to nest are vulnerable to being sucked into and killed by damaging hopper dredges. The Corps should commit to its traditional hopper dredging window of November 1 to April 30 to avoid sea turtle season and the consequent higher risk of sea turtle takes. At a minimum, even if the Corps refuses to adhere to this protective, science-backed seasonal window, the Corps must explain the time of year when the Corps will dredge for project construction in order to understand the consequent harm to sea turtles, sturgeon, and other species that can be maimed and killed by hopper dredges in particular.

Further, neither the DEIS nor the accompanying appendices make any attempt to disclose the number of turtle takes from dredging activities in Wilmington Harbor that has occurred in the past or is likely to occur in the future as a result of project construction. This not a difficult disclosure to make: the Corps has *decades* of its own, directly on-point data about takes of threatened and endangered species during dredging operations at Wilmington Harbor to inform this analysis.[163] Specifically, the Corps maintains the Operations and Dredging Endangered Species System, or "ODESS" website,[164] where it tracks listed species takes from dredging operations. That data shows that between the years of 1994 and 2020, more than 70% of the turtle takes occurred outside of the dredging window.[165] Yet the Corps does not provide or analyze any of this information in the instant documents. The website includes information about the time of year of the dredging and the amounts being dredged, all of which is relevant to understanding possible takes from the proposed project.

Next, the DEIS fails to provide information about the expected incremental increase in regular maintenance dredging as a result of the expanded navigation channel footprint post-construction. While the DEIS offers that maintenance dredging costs are expected to be $14 million annually, there is no information about how the volume of material dredged or the

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[160] *Id.* at 12 (Attachment 1: HSI Methodology).
[161] Lynker Report, *supra* note 4, at 15.
[162] *E.g. Cape Fear River Watch v. United States Army Corps of Eng'rs*, 2022 WL 4468268 (E.D.N.C. 2022).
[163] *Id.* at *12 (noting the Corps had "substantial additional evidence in the record" regarding endangered species takes "that could be the subject of more robust analysis regarding potential effects on wildlife").
[164] *Operations and Dredging Endangered Species System (ODESS)*, U.S. ARMY CORPS OF ENG'RS, https://odess.usace.army.mil/ (last visited Nov. 2, 2025).
[165] *See, e.g.*, Letter from Andrew Hutson, Audubon North Carolina, to Emily Hughes, U.S. Army Corps of Eng'rs (Oct. 2, 2020), https://perma.cc/MB4L-BDLV (summarizing ODESS turtle take data).

number of days of dredging will increase during regular maintenance dredging operations post-project. This information about the effects of increased maintenance dredging is necessary to understand the full scope of increased risk to sea turtles, sturgeon, and other marine wildlife.

The Corps also cannot hide increases in expected take due to a larger maintenance dredged area by deferring to the South Atlantic Regional Biological Opinion ("SARBO"). Throughout the DEIS and the accompanying Biological Assessment for NMFS, the Corps refers heavily to the 2020 SARBO. In the DEIS, the Corps repeatedly states that "[i]mpacts from maintenance dredging would remain consistent with the determinations made in the 2020 SARBO . . . ."[166] But the now five-years-old 2020 SARBO never considered a larger Wilmington Harbor's maintenance dredging needs.[167]

Additionally, the SARBO is a programmatic review of a broad geographic scope and nature different than the project-specific analysis the Corps must conduct here.[168] The 2020 SARBO does *not* cover new project construction like the instant expansion. The 2020 SARBO itself admits that it provides only a high level, generalized review that requires later, project-specific review[169] In fact, at one point, the 2020 SARBO even highlights Wilmington Harbor as an example where certain mitigation measures may not be effective (due to its unique characteristics) and may lead to more unobserved sea turtle injuries and deaths, which underscores the need for a thorough project-specific analysis here.[170] Despite this, the Corps relies on the 2020 SARBO's general recommendations in its biological assessment prepared for NMFS—suggesting that they can satisfy the Corps' obligations for this NEPA process.[171] They do not. In this environmental review under NEPA, the Corps must disclose and assess the impacts that would be a direct result of the deepening—including increased risks to threatened and endangered species from project construction and increased maintenance dredging due to the expansion.

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[166] *E.g.*, DEIS, *supra* note 1, at 3-15 (regarding sea turtles), 3-16 (regarding impacts to Giant Manta Ray).
[167] *See* U.S. Army Corps of Eng'rs, *South Atlantic Regional Biological Opinion for Dredging and Material Placement Activities in the Southeast United States* at 17–18 (2020) ("While it is anticipated that activities covered by this Opinion will continue to occur with the same frequency and volume as they have historically . . . .") [hereinafter "SARBO"].
[168] *Id.* at 13 ("NMFS uses programmatic consultations to evaluate the effects of authorizing certain categories of frequently occurring activities . . . where the specifics of any individual future project . . . are not definitely known at the time of the programmatic consultation[.]").
[169] *Id.* at 69 (explaining the Corps must "conduct a project-specific review of all project details to ensure compliance with all applicable PDCs" prior to authorizing an activity under the SARBO).
[170] *Id.* at 330 (explaining how hopper dredging mitigation techniques are ineffective at Wilmington reducing the ability to observe and prevent take of endangered species).
[171] *E.g.* U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix N: Environmental Compliance Documentation at 20 ("The project will follow Project Design Criteria that are included in the SARBO as described by species in Section F.5 below."), 44–45 ("Section 5 identifies the effects that may occur as a result of the activities covered under this assessment in Section F.2, *as described and limited by the PDCs from the 2020 SARBO*." (emphasis added)).

iii. Missing Species Analyses

The DEIS also fails to account entirely for impacts to specific listed and unlisted but vulnerable species.

As noted in previous comments, the U.S. Fish and Wildlife Service listed the eastern black rail as threatened under the Endangered Species Act ("ESA") in 2020.[172] And yet the DEIS and corresponding FWS consultation appendix do not mention the bird at all. The Eastern black rail is a notoriously secretive marsh bird that has historically been found in the Wilmington area.[173] Indeed, the draft recovery plan for the Eastern black rail indicates that the entire coast of North Carolina—including the Wilmington and Lower Cape Fear area—is within the current range of the Eastern black rail.[174] Under both NEPA and the ESA, the Corps should consider impacts of the harbor expansion to this rare, imperiled bird.

As for species that are not listed under the ESA, the DEIS does little more than provide a list of some species that inhabit the project area and then conclude mammalian species specifically would be able to move away from the destroyed habitat to other nearby habitat, some habitat might be affected by salinity changes, and beach placement would "provide protection to the beach and dune systems."[175] The DEIS makes no mention of what the many non-mammalian species could expect in terms of direct effects, and doesn't address whether there is even suitable adjacent habitat for those mammalian species to move to. Further, the list of species is incomplete and fails to include species that commenters have specifically raised in the past, like the rare skipper,[176] Venus flytrap, or the increasingly imperiled diamondback terrapin, a state-listed Species of Greatest Conservation Need in North Carolina that is known to be threatened by harbor dredging.[177]

Questions

- How much will maintenance dredging needs increase in terms of volume of material dredged and likely days of dredging?
- What environmental window will the Corps adhere to for hopper dredging associated with project construction?
- How many federally protected sea turtles and sturgeon does the Corps anticipate taking as a result of project construction? Does the Corps have species take data from the last deepening, and if so, what does it show?

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[172] *See* SELC, 2023 Early Scoping Comments, *supra* note 3, at 10; SELC, 2024 Scoping Comments, *supra* note 3, at 11.
[173] eBird Range Data, "eBird Screenshot 2025-10-28 111610," Attachment 26 (showing known occurrences in Wilmington area); eBird New Hanover Bird List at 25, Attachment 27.
[174] U.S. Fish & Wildlife Serv., *Draft Recovery Plan for Eastern Black Rail* at Figure 1 (2025), Attachment 28
[175] DEIS, *supra* note 1, at 3-80.
[176] *See* 2023 Scoping Comments, *supra* note 3, at 11; 2024 Scoping Comments, *supra* note 3, at 11.
[177] Theodore Castro-Santos et al., *Assessing risks from harbor dredging to the northernmost population of diamondback terrapins using acoustic telemetry*, 42 ESTUARIES & COASTS 378 (Nov. 29, 2018), Attachment 29.

- Why does the Corps not acknowledge direct loss of migratory birds' eggs and chicks from ship wakes and other project-related impacts?
- Did the Corps consider and compare impacts from the last deepening on habitat and species?

e. Air Quality

The Ports Authority has made repeated statements about growing the Wilmington Port in order to accommodate "growth of cargo volumes, expanding the global coverage of vessel services [and] engaging and supporting state-wide economic development projects."[178] Refrigeration yard and railway expansion projects are already underway.[179] Moreover, the Ports Authority has stated that harbor deepening specifically would result in a more efficient Port that would "attract more import and export business"[180] and has noted that a key objective of the harbor deepening would be to "accommodate recent and anticipated growth in cargo vessel traffic."[181]

As addressed earlier, the Corps' baseline assumption for the Project–that the deepening would not result in an increase of ships or tonnage–is incompatible with statements made by the Ports Authority and other projects being completed at the Port. The baseline assumption of no net growth is also incompatible with the experiences of other southeastern ports that underwent deepening projects. Savannah,[182] Charleston,[183] and Norfolk[184] have all experienced an increase in the amount of cargo and ships after deepening projects were completed. This assumption has led the Corps to the conclusion that this Project "would result in less ships coming into the Wilmington Port, causing indirect effects to air quality by decreasing vessel emissions over

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[178] Statements by Stephanie Ayers, Wilmington Urban Area Metropolitan Planning Organization Board Meeting Minutes at 4 (May 29, 2024), Attachment 30.

[179] Mara McJilton, *Port of Wilmington expands refrigeration yard, adds cold treatment facility at Lewis Nursery and Farms to increase imports of fresh produce*, WECT NEWS 6 (Dec. 13, 2023), https://perma.cc/DT76-VNUU, Attachment 31; *and* Emma Dill, *Port's Intermodal Rail Yard Project on Track for 2026 Completion*, WILMINGTONBIZ (May 12, 2025), https://www.wilmingtonbiz.com/ports_intermodal_rail_yard_project_on_track_for_2026_completion/2025/05/12/ports_intermodal_rail_yard_project_on_track_for_2026_completion/26551, Attachment 32.

[180] *Harbor Enhancement*, NORTH CAROLINA PORTS, https://perma.cc/Y77T-9CZM (last visited Oct. 16, 2025).

[181] *Id.*

[182] *Container volumes up 12.5% compared to last year*, GEORGIA PORTS (Feb. 25, 2025), https://perma.cc/WWT6-6ZS3 (noting that Savannah saw an increase of over 600,000 TEUs in one year and the port intends to add three large ship berths to accommodate an increase in large ships calling to the port, all after deepening was completed in 2022), Attachment 33.

[183] Claire Weber, *'Big deal!': Charleston Harbor deepening project complete with final $21.26M funding*, ABC 4, (Aug. 18, 2025), https://abcnews4.com/newsletter-daily/big-deal-charleston-harbor-deepening-project-complete-with-final-2128m-funding-lindsey-graham-south-carolina-port-authority-barbara-melvin-east-coast-wciv-abc-news-4-8-18-2025 (noting that after the deepening project was completed, the Charleston port saw an increase from 25 to 28 services per week), Attachment 34.

[184] Elizabeth Lake, *Port of Virginia channel widening boosts ship traffic*, VIRGINIA BUSINESS (April 30, 2025), https://perma.cc/T9N3-LMXF (noting that the Port of Virginia has seen cargo volume increase by 2% and ship calls increase by 5% since the deepening project only a year prior), Attachment 35.

time."[185] History shows that port deepening projects lead to an increase in traffic. The Corps must square this conclusion with these comparable results at other ports and the Port Authority's own statements on this project. Further, the Corps should model how air quality may be impacted by induced growth caused by this project.

Questions

- How does the Corps reconcile the baseline assumptions of this project—that there will not be an increase of ships into the Wilmington Port—with the history of port expansions in the southeast?
- Similarly, how does the Corps reconcile that this Project will not lead to an increase in ships with the North Carolina Port Authority's advertisement of this project as prompting an expansion of vessels and cargo?

f. Community Impacts and Cultural Resources

The Wilmington and the Lower Cape Fear River region have likely been continually occupied by humans since 10,000 BP (before present).[186] Indigenous people have hunted, farmed, and foraged within the region for millennia. European colonization of the region began in the 16th century, which eventually saw the rise and growth of the Cape Fear region into the Revolutionary War and serving as an important port city during the Civil War.[187] For over 10,000 years, Wilmington and the Lower Cape Fear region have been central locations for cultural and historic moments that have shaped the region. Seven sites along the Cape Fear are currently listed in the National Register of Historic Places.[188] Moreover, archeological research has unearthed countless artifacts that reflect the long history of the Cape Fear.[189] And the Gullah Geechee Cultural Heritage Corridor, a Congressionally designated Natural Heritage Area[190] recognizing the important historic and cultural contributions of the Gullah Geechee people, encompasses the Wilmington area.[191]

Under the National Historic Preservation Act, federal agencies are required to "take into account the effects of their undertakings" on historic resources.[192] Section 106 requires the federal agency to consult with the state historic preservation officer, Indigenous tribes, local governments, and individuals who have an interest in the property.[193] The federal agency must

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[185] DEIS, *supra* note 1, at 3-71.
[186] *Id.* at 3-30.
[187] *Id.*
[188] *National Register Database and Research*, NAT. PARK SERV., https://perma.cc/5XE6-E3QD (last visited Oct. 28, 2025); *see also* DEIS, *supra* note 1, at 3-32.
[189] *See, e.g., Archaeologists discover four at-risk shipwrecks on colonial waterfront at Brunswick Town/Fort Anderson Historic Site*, ECU (Aug. 4, 2025), https://perma.cc/9PSK-59HE.
[190] 54 U.S.C. § 120102 (b).
[191] *Gullah Geechee Cultural Heritage Corridor*, NAT. PARK SERV., https://www.nps.gov/places/gullah-geechee-cultural-heritage-corridor.htm (last visited Oct. 31, 2025); *Who we are*, GULLAH GEECHEE CULTURAL HERITAGE CORRIDOR, https://perma.cc/KHN6-E5WT (last visited Nov. 3, 2025).
[192] 36 C.F.R. § 800.1(a).
[193] *Id.* § 800.2(c).

first identify the historic properties[194] and then assess whether their project will result in adverse effects to that property.[195] Agencies typically do this as part of their NEPA review, which then gives the public an opportunity to review and comment on the affected historic resources.

Here, however, the Corps has not yet identified the historic properties nor conducted any review of potential effects to these resources because of alleged "[b]udget and schedule constraints."[196] The Corps has instead deferred the requirements of the NHPA to the pre-construction, engineering, and design phase.[197] Doing so, however, deprives the public of an opportunity to provide meaningful feedback on possible effects to historic resources. Once the Corps has completed the required review and consultations, it should disclose the results to the public with an opportunity for comment.

Further, the Corps has failed to acknowledge possible impacts to the Gullah Geechee Cultural Heritage Corridor. When Congress established the Corridor, it directed federal agencies to consult with the National Park Service and the Gullah Geechee Cultural Heritage Corridor Commission when "conducting or supporting activities directly affecting the Heritage Corridor."[198] We urge the Corps to engage in the necessary coordination to ensure the project "will not have an adverse effect on the Heritage Corridor."[199]

Finally, the Corps should consider impacts to lower income and communities of colors surrounding the Wilmington Harbor. All of the census tracts bordering the Port, particularly those east of the Cape Fear River, rank "high" on CDC's social vulnerability index, with high rates of poverty and high rates of uninsured.[200] Most of these census tracts also rank high on the health vulnerability index. The census tract south, downstream of the Port, has a high prevalence of asthma, coronary heart disease, and diabetes.[201] The communities in this area are burdened with dozens of existing polluting facilities, including multiple pre-regulatory landfill sites and dozens of hazardous waste sites.[202] Numerous air polluting facilities operate or store materials nearby, including asphalt and cement companies, oil and gas companies, and a wood pellet manufacturer.[203] Due to these cumulative impacts and vulnerabilities, the Corps should consider, at a minimum, the disproportionate impacts to these communities from increased land-based

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[194] *Id.* **§** 800.4(b).
[195] *Id.* **§** 800.5.
[196] DEIS, *supra* note 1, at 3-32.
[197] *Id.*
[198] National Heritage Areas Act of 2006, Pub. L. No. 109-338, § 295H, 120 Stat. 1783.
[199] *Id.*
[200] *See Place and Health – Geospatial Research, Analysis, and Services Program (GRASP)*, ATSDR, https://www.atsdr.cdc.gov/place-health/php/eji/eji-explorer.html (last visited Oct. 31, 2025) (search 2202 Burnett Blvd, Wilmington, NC, 28401 into left-hand search box; click through census tracts around port).
[201] *See id.*
[202] *See Environmental*, N.C. ENV'T JUSTICE HUB, https://perma.cc/W5RL-D4F5 (last visited Oct. 31, 2025) (turn on all layers; search 2202 Burnett Blvd, Wilmington, NC, 28401 into the right-hand search box; click colored parcels that appear on map).
[203] *Id.*

traffic, toxic air pollution, water quality impacts, and potential displacement as a result of induced growth from the harbor expansion.[204]

Questions

- Why didn't the Corps delay publication of the DEIS until it could complete the required National Historic Preservation Act consultation and provide the public an opportunity to provide feedback during this NEPA process?
- Why did the Corps not consider how the expansion might affect the Gullah Geechee Cultural Heritage Corridor?

VII. The DEIS Provides Inadequate Mitigation Measures Under the Water Resources Development Act

The Water Resources Development Act ("WRDA") requires that "any water resources project" submitted to Congress for authorization must contain "a recommendation with a specific plan to mitigate for damages to ecological resources, including terrestrial and aquatic resources, and fish and wildlife losses created by such project" or a determination that the project will not negatively impact "ecological resources."[205] Mitigation plans must contain, "at a minimum," (1) a monitoring plan to ensure the success of the mitigation, (2) "the criteria for ecological success," (3) what land will be acquired for the mitigation plan, (4) the "types and amounts" of restoration to be done and the "functions and values" that will result, and (5) a contingency plan should the mitigation be ineffective.[206] Corps guidance further states that mitigation should be designed so that a project plan "will not have more than negligible adverse impacts on ecological resources."[207] Here, the DEIS proposes four mitigation sites for "unavoidable wetland and aquatic impacts."[208]

a. The mitigation measures are insufficient to address wetland loss and conversion.

If a project is expected to impact wetlands, Corps guidance urges that wetland impacts be "fully mitigated" with a goal of "no net loss to wetlands."[209] At the outset, the Corps' calculations make unfounded assumptions that the number of wetlands lost by this project will be precisely cancelled out by wetlands gained elsewhere.[210] The Corps calculates that the loss of 1,275 acres of tidal fresh and oligohaline wetlands will be conveniently replaced by 1,276 acres of mesohaline, polyhaline, and euhaline wetland types.[211] Given the rapid development in the

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[204] *See* SELC, 2023 Early Scoping Comments, *supra* note 3, at 12.
[205] 33 U.S.C. § 2283 (d)(1).
[206] Water Resources Development Act, Pub. L. No. 110-114, §§ 2036(b)(i)–(v) (2007).
[207] Planning Guidance Notebook, *supra* note 80, at C-15 to C-16 (2000).
[208] DEIS, *supra* note 1, at 2-19.
[209] *Planning Guidance Notebook*, *supra* note 80, at C-17.
[210] DEIS, *supra* note 1, at 3-56.
[211] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix I: Wetland Impact Assessment and 404(b)(1) at I-6 (2025).

area, sea level rise, and impacts from climate change at large, it cannot be assumed that wetlands will easily replace themselves as the Corps' calculations assume.

Even accepting this dubious assumption that there will be no net loss in total wetlands, the Corps' own calculations show a stark loss of wetland types important for fish and biological diversity and a loss in functional value.[212] The transition to higher salinity wetland types is linked to an increase in invasive species (such as phragmites), a decrease in native species, and a decrease in regeneration and recruitment of fish.[213] The Corps' presented mitigation efforts, however, are insufficient to address this projected conversion and the cascading effects that would accompany it.

The DEIS presents two primary mitigation strategies and sites: conservation of the Black River corridor and habitat restoration and enhancement of Eagle Island/Alligator Creek.[214]

First, the Corps proposes to conserve 553 acres of old-growth swamp forest in the Black River Corridor.[215] While we acknowledge that the preservation of old-growth forest is vitally important for habitat connectivity and water quality, the proposal suffers from two primary deficiencies. One, the acreage conserved is insufficient given the loss of over 1,000 acres of freshwater wetlands, even when combined with the restoration and enhancement measures described below. Additionally, the Corps does not present criteria for ecological success as required by WRDA for mitigation plans. Instead, the Corps states that criteria is not needed because "mitigation is restricted to the preservation of wetlands."[216] We urge the Corps to create criteria that can aid in the most effective conservation of the Black River Corridor.

The DEIS also presents Eagle Island/Alligator Creek as a restoration and enhancement site of approximately 120 acres. One strategy presented is the removal and replacement of phragmites, an invasive and aggressive reed grass that displaces native plant species. There are several deficiencies with this proposal. Although the site is approximately 500 acres and contains roughly 300 acres of phragmites-dominant wetlands, the DEIS mitigation strategy is the removal of phragmites in an approximately 24-acre area of the site.[217] Given how aggressively phragmites can regrow, it is highly unlikely the removal of only a small portion of the plant's footprint at the site will be successful.

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[212] *Id.* at I-15.
[213] *Id.* at I-16.
[214] DEIS, *supra* note 1, at 2-19.
[215] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix M: Wetland and Fish Passage Mitigation Plan at M-27 (2025).
[216] *Id.* at M-49.
[217] *See id.* at M-23 (stating that the Eagle Island/Alligator Creek site "comprises 588 acres across five parcels. . . . and consists of approximately 384 acres of Phragmites marsh.") and DEIS, *supra* note 1, at 3-28 (noting that the "removal of approximately 24 acres of low quality, invasive phragmites stands and replacement with tidal pools and native vegetation" would have "beneficial incidental impacts.").

Moreover, the mitigation strategy envisions subsequent herbicide treatments to control phragmites returning.[218] To begin with, neither the DEIS nor the Appendix provide any information as to the type of herbicide that will be applied to the site. Herbicide can be harmful to ecosystems; especially given that the site could be utilized by sensitive species like the piping plover, red knot, and American alligator,[219] the Corps must provide further information on the herbicide that may be applied on the site.

Further, the DEIS and Mitigation Appendix state that the herbicide will be "reapplied as necessary,"[220] but details buried in an attachment to the Mitigation Appendix estimate the cost based solely on two herbicide applications being conducted one year apart.[221] This reapplication schedule would be insufficient to control the spread of phragmites in the site. The mitigation plan should take a long-term, holistic view of phragmites control into account in order to appropriately design and estimate the costs of this project and meet the requirements of WRDA. Finally, the Appendix also fails to provide a plan should the mitigation efforts be unsuccessful—an important requirement of WRDA. As such, the Corps must develop a robust contingency plan should the mitigation strategy fail.

The mitigation measures for wetland loss are not adequate to address the loss of ecologically more functional wetlands within the range of the project. Nor do these mitigation measures satisfy the Corps' objective of "no net loss of wetlands" when developing mitigation strategies.[222] Thus, the Corps should consider more robust, effective mitigation measures for wetland conversion that will truly result in no net loss of wetlands.

b. The mitigation measures are insufficient to address impacts to aquatic resources.

The other two sites, Lock and Dam 1 & 2 Fish Passages, are aquatic habitat improvement sites intended to mitigate impacts to "primary and secondary nursery habitats, essential fish habitat, and critical habitat."[223] The Corps calculates that this project will result in a 4.5% net decrease in available habitat for important fish species, including the Atlantic sturgeon, blueback herring, and the striped bass.[224] To offset some of the harms to fish species that actually are acknowledged in the DEIS, the Corps includes mitigation plans that would involve creating fish passage structures at the first two dams on the Lower Cape Fear River.

While we appreciate the possibility of facilitating fish passage around these barriers to natural fish migration, the DEIS and accompanying appendix only provides very high-level review and design concepts that call into question the efficacy of the proposed measures—and fail to meet the requirements of preparing mitigation plans under WRDA. It's not clear that the

[218] Appendix M, *supra* note 215, at M-44.
[219] *Id.* at C.3 (Appendix C).
[220] *Id.* at M-44.
[221] *Id.* at C.3 (Appendix C).
[222] *Planning Guidance Notebook*, *supra* note 80, at C-17.
[223] DEIS, *supra* note 1, at 2-20; Appendix M, *supra* note 215, at M-10.
[224] Appendix M, *supra* note 215, at M-20 (Table 9).

Corps even did any field work to assess the feasibility of the proposed bypass measures. And the Corps does not provide any analysis to establish the proposed measures would be appropriate for all target species. The Corps cannot ensure the likely success of these proposed bypass measures if it does not demonstrate whether these measures would even work.

Even so, the limited design details raise questions as to their functions and value. For example, for Lock and Dam 1, the Corps proposes to use an existing ditch that enters the river several thousand feet downstream of the dam that would then connect to the proposed bypass structure upstream of the dam. But the Corps apparently does not even know if the target fish species swim into the ditch,[225] calling into question whether fish would even use the bypass, especially since the entry would be several thousand feet downriver from the dam. It is also not clear how deep the bypass would be, which is a critical consideration for sturgeon which are benthic and require deeper waters to travel.

The Corps seems to be taking an approach of building the aquatic mitigation measures first and seeing if they will even work later, rather than creating a mitigation plan that is designed for success from the start. For example, the proffered ecological success criteria—"evidence of target species using bypass channel" and "the rock rapid structure"—are aimed at a threshold question of whether these are even viable mitigation measures to consider. Further, they contain no connection back to the quantified "lost functions and values of the habitat", [226] any consideration of *how many* fish would be using the measure, or even whether the measures will successfully enable and encourage fish to travel upstream.[227] In other words: as drafted, spotting a single sturgeon in the bypass channel might meet this criterion.

The Corps should conduct appropriate field review in addition to providing additional design details and reasons about why they believe the proposed measures would actually benefit sturgeon, shad, bass, and other target fish species.

Questions

- Why did the Corps decide to provide wetland mitigation that did not equal the number of wetlands projected to be lost due to the Project?
- What type of herbicide would be used in the phragmites treatment area?
- Why does the phragmites mitigation plan only include 24 acres of a 500-acre area?
- Given how aggressive phragmites grow, why do the calculations for the cost of the mitigation area only include two years of treatment?

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[225] *Id.* at M-39 (stating without any elaboration that "it is assumed the target species are already swimming into the ditch from the river.").
[226] *See* 33 U.S.C. § 2283(d)(3)(B) ("the criteria for ecological success by which the mitigation will be evaluated and determined to be successful based on replacement of lost functions and values of the habitat, including hydrologic and vegetative characteristics").
[227] 33 U.S.C. § 2283 (d)(3)(B)(v)(III) (mitigation plans must contain a description of "the functions and values that will result from the plan").

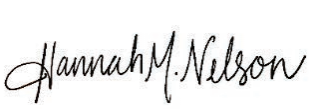
- Why did the Corps not include ecological success criteria for the Black River Corridor site?
- Did the Corps conduct any studies as to whether target fish species would use the proposed fish passages?

VIII. Conclusion

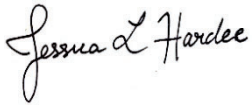
The Draft Letter Report and Draft EIS reveal that this project is likely infeasible, unnecessary, and extraordinarily damaging to the environment. The costs of this harbor expansion continue to climb as the alleged need and purported benefits simultaneously dwindle. On top of the questionable economic considerations, the project would come with a host of permanent harms to the natural environment of the Lower Cape Fear, cherished by locals and tourists alike. As the DEIS acknowledges, "unacceptable" effects include "adverse impacts that would not be tolerated by regulatory agencies, the local community, or society in general."[228] Between the meager, unjustified project benefits and the burden to local communities from flooding and other environmental damage, this project is hardly "acceptable." The Corps must go back to the drawing board to justify the escalating costs of the project against the questionable benefits and rectify the many errors and omissions in the economics and environmental analyses identified above. The stakes are too high to push forward this damaging and expensive project without that thorough, honest assessment.

We appreciate the opportunity to provide comments regarding the proper scope for the Corps' NEPA analysis and 403 Letter Report. We look forward to remaining engaged with the Corps and other agencies through the environmental review process. If you have any questions regarding this letter, please contact us at 919-967-1450 or *hnelson@selc.org*.

Sincerely,



Hannah Nelson



Jessica Hardee



Ramona H. McGee

Southern Environmental Law Center
136 E. Rosemary Street, Suite 500
Chapel Hill, NC 27514

[228] DEIS, *supra* note 1, at 2-3.

On behalf of:

Audubon North Carolina
Zach Wallace | Policy Director

Cape Fear River Watch
Kemp Burdette | Cape Fear Riverkeeper

Center for Biological Diversity
Will Harlan | Southeast Director

CleanAIRE NC
Jeff Robbins | Executive Director

Defenders of Wildlife
Ben Prater | Southeast Program Director

League of Women Voters of Lower Cape Fear
Beth Hansen | Environment Chair

North Carolina Coastal Federation
Kerri Allen | Coastal Management Program Director

North Carolina Conservation Network
Grady McCallie | Policy Director

North Carolina NAACP
Deborah Maxwell | President

North Carolina Sierra Club
Erin Carey | State Conservation Policy Director

Cc:

Justin McCorcle, District Counsel, U.S. Army Corps of Engineers,
justin.p.mccorcle@usace.army.mil

Brian Clark, Executive Director, N.C. State Ports Authority
brian.clark@ncports.com

Tancred Miller, Director, Division of Coastal Management, NC DEQ
tancred.miller@deq.nc.gov

Daniel Govoni, Federal Consistency Coordinator, Division of Coastal Management, NC DEQ
daniel.govoni@deq.nc.gov

Richard Rogers, Director, Division of Water Resources, NC DEQ
richard.rogers@deq.nc.gov

Marc Recktenwald, Director, Division of Mitigation Services, NC DEQ
marc.recktenwald@deq.nc.gov

Kathy Rawls, Director, Division of Marine Fisheries, NC DEQ
kathy.rawls@deq.nc.gov

Kyle Briggs, Executive Director, NC Wildlife Resources Commission
kyle.briggs@ncwildlife.org

Jennifer M. Archambault, Acting Field Supervisor, US Fish and Wildlife Service
jennifer_archambault@fws.gov

Pace Wilber, Acting Assistant Regional Administrator and Atlantic and Caribbean Branch Chief, NOAA Fisheries
pace.wilber@noaa.gov

Dennis Klemm, Branch Chief/Sea Turtle Recovery (Acting Assistant Regional Administrator/Protected Resources), NOAA Fisheries
dennis.klemm@noaa.gov

Attachments available at the following links:

- Attachments for SELC's 2025 DEIS Comments:
https://southernenvironment.sharefile.com/d-s22d1dc0b55564813bf2147d6e6e7873b

- Attachments for SELC's 2024 Scoping Comments:
https://southernenvironment.sharefile.com/d-s14b473447fbb4d0d8bf582eba0dd30e2

- Attachments for SELC's 2023 Early Scoping Comments:
https://southernenvironment.sharefile.com/d-sfbe078fed9234ccdb28ffbe5733a4773

- Attachments for SELC's 2019 Scoping Comments are provided in Attachment 1 of this letter.

SOUTHERN ENVIRONMENTAL LAW CENTER

136 East Rosemary Street, Suite 500
Chapel Hill, NC 27514

Telephone 919-967-1450
Facsimile 919-929-9421

November 10, 2025

[Corrected from original November 3, 2025 submission]

VIA E-mail

US Army Corps of Engineers
Wilmington District
ATTN: Wilmington Harbor 403
69 Darlington Avenue
Wilmington, NC 28403
WilmingtonHarbor403@usace.army.mil

RE: [Corrected] Southern Environmental Law Center Comments on Wilmington Harbor 403 Draft Letter Report & Environmental Impact Statement

The Southern Environmental Law Center ("SELC") submits these comments on behalf of Audubon North Carolina, Cape Fear River Watch, Center for Biological Diversity, CleanAIRE NC, Defenders of Wildlife, League of Women Voters of Lower Cape Fear, North Carolina Coastal Federation, North Carolina Conservation Network, North Carolina NAACP, and North Carolina Sierra Club, regarding the U.S. Army Corps of Engineers' ("Corps") Draft Environmental Impact Statement ("DEIS")[1] and Draft Letter Report for the Wilmington Harbor, North Carolina Project.[2] We have previously submitted three letters on this project, and because many of the attachments we provided to the Corps in those prior letters were omitted from the DEIS' listed references, we attach and incorporate them by reference here.[3] Further, we provide many new relevant attachments with our comments here, including a technical review of the Corps' DEIS completed by Lynker Corporation, a science and engineering consultant.[4] All attachments are available at links provided at the end of this letter. In the below comments, we reiterate the extensive environmental damage likely to be caused by this project and raise significant questions left unanswered by the DEIS.

[1] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Draft Environmental Impact Statement Wilmington Harbor Navigation Project, North Carolina, EISX-202-00-K7P-1755163795 (Sept. 12, 2025) [hereinafter "DEIS"].
[2] U.S. Army Corps of Eng'rs, Draft Letter Report: Wilmington Harbor Section 403 Wilmington Harbor Navigation Project Wilmington, North Carolina (Sept. 5, 2025) [hereinafter "Letter Report"].
[3] Letter from Sierra B. Weaver, et al., S. Env't L. Ctr., to Elden Gatwood, U.S. Army Corps of Eng'rs (Oct. 11, 2019), Attachment 1 [hereinafter "SELC, 2019 Scoping Comments"]; Letter from Ramona H. McGee, et al., S. Env't L. Ctr., to Bret Walters & Suzanne Hill, U.S. Army Corps of Eng'rs (June 30, 2023), Attachment 2 [hereinafter "SELC, 2023 Early Scoping Comments"]; Letter from Hannah M. Nelson, et al., to Daniel H. Hibner and Andrew Stolba, U.S. Army Corps of Eng'rs (July 22, 2024), Attachment 3 [hereinafter "SELC, 2024 Scoping Comments"].
[4] Lynker Corp., Wilmington Harbor Navigation Improvement Project Draft Environmental Impact Statement Technical Review (Oct. 30, 2025), Attachment 4 [hereinafter "Lynker Report"].

I. Introduction

For over six years, the North Carolina Ports Authority has pursued a controversial proposal to expand Wilmington Harbor in response to the Panama Canal's enlargement and the resulting increase in larger shipping vessels. The current plan would deepen the harbor from 42 to 47 feet, widen significant portions of the channel by several hundred feet, and extend the harbor's entrance farther offshore.[5] This massive undertaking carries a construction price tag exceeding $1 billion, with an additional $14 million in annual maintenance costs. Yet even these staggering figures fail to capture the full cost of the project—omitting the profound environmental and ecological consequences of altering the Lower Cape Fear River.

Despite years of planning and the enormous financial commitment, the Ports Authority and the Corps have yet to justify the need for such a destructive project. And they offer no clear explanation of how expanding Wilmington Harbor would benefit North Carolina's communities, businesses, or families.

The stakes are high. The Lower Cape Fear River is one of the most ecologically significant and biodiverse river systems in the region. It encompasses estuarine, brackish, and freshwater ecosystems, forming a delicate interface between saltwater and freshwater habitats. When healthy, the river supports robust fish populations and provides important habitat for threatened and endangered species such as piping plovers, red knots, Atlantic and shortnose sturgeon, and several species of sea turtles. Just upstream, the river serves as a drinking water source for over 500,000 residents in Wilmington and surrounding counties. Near the Port, barrier islands, tidal creeks, and marshes support recreational and commercial fisheries and offer irreplaceable natural beauty. The Cape Fear River is not just a waterway—it is a lifeline for Southeastern North Carolina's communities and wildlife. Any decision to alter it must be weighed with care, transparency, and accountability.

Unfortunately, the Corps' Letter Report and DEIS fall far short of the agency's responsibility. Instead of rigorously assessing how the proposed expansion would jeopardize the already vulnerable communities, species, wetlands, shorelines, and ecosystems of the Lower Cape Fear River, the agency largely dismisses these concerns. The Corps relies on erroneous and unexplained assumptions, and fails to disclose or assess the compounding effects of the deepening with the effects of climate change—minimizing how the deepening could worsen storm surge and flooding experienced by local communities. In a troubling attempt to justify these oversights, the Corps argues that because the Cape Fear River is already threatened by climate change, the expansion won't significantly worsen the situation. This logic is not only flawed—it's an attempt to disavow the agency's responsibilities under the National Environmental Policy Act ("NEPA").

[5] DEIS, *supra* note 1, at 1-4.

Vulnerability is not a license for further harm. The fact that the Cape Fear River is already under stress makes it even more critical to protect, not exploit. The Corps must return to the DEIS and meaningfully address the environmental risks outlined in detail below.

II. The history of the proposed expansion.

In 2019, the North Carolina State Ports Authority began promoting plans to deepen and widen Wilmington Harbor. A year prior, the Water Resources Development Act ("WRDA") had been amended to expand the role of private, nonfederal entities to prepare the feasibility report required by Section 203 of WRDA and submit that report to the Corps.[6] In June 2019, the Ports Authority prepared a feasibility study and draft environmental report pursuant to Section 203 proposing to expand Wilmington Harbor.[7] The Corps responded with significant concerns about the initial 203 Feasibility Report, related to plan formulation, project economics, sea level rise, and compliance with NEPA.[8] As a result, the Corps instructed the Ports Authority to revise its analysis to address the agency's concerns.[9] In September 2019, the Corps initiated a separate NEPA review by announcing its intent to prepare a DEIS for this project.[10]

In late February 2020, the Ports Authority submitted a revised 203 feasibility report to the Corps,[11] and in May 2020, the Corps again responded with significant concerns.[12] The Corps noted continued deficiencies in the treatment of sea level rise, real estate, and economics, and indicated that many assumptions in the Ports Authority's study were not adequately justified. While the Corps ultimately found the proposal "technically sound and feasible," it concluded that "unresolved issues contained within [the] Review Assessment will need to be addressed prior to construction."[13] In December of 2020, the Water Resources Development Act of 2020 ("WRDA 2020") was signed into law, authorizing a series of projects, including the Wilmington Harbor Navigational Improvement Project.[14] The authorization of the Wilmington Harbor expansion was made subject to the resolution of the deficiencies the Corps identified with the 203 Feasibility Report, including the requirement to complete the NEPA review for the project.[15]

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[6] Pub. L. 115-270 § 1152 (Oct. 23, 2018).
[7] N.C. Ports, Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental Report (June 2019).
[8] U.S. Army Corps of Eng'rs, Wilmington Harbor Navigation Improvement Project Section 203 Feasibility Study/Environmental Report, dated June 2019: Policy Review Assessment (July 2019) [hereinafter "2019 Review Assessment"].
[9] *Id* (stating "the report would need significant revisions before it would be considered to be legally and policy sufficient").
[10] Notice of Intent to Prepare a Draft Environmental Impact Statement (DEIS) for the Wilmington Harbor Navigation Improvement Project Integrated Feasibility Study and Environmental Report, New Hanover and Brunswick Counties, NC, 84 Fed. Reg. 48131 (Sept. 12, 2019).
[11] *See* N.C. Ports, Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental Report (Feb. 2020) [hereinafter "203 Feasibility Report"].
[12] U.S. Army Corps of Eng'rs, Review Assessment of Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental Report (May 2020) [hereinafter "2020 Review Assessment"].
[13] *Id.* at 4.
[14] P. L. 116-260 § 403(a)(5) (Dec. 27, 2020).
[15] *Id.* § 403(b).

On March 10, 2023, the Corps formally withdrew its 2019 scoping notice, explaining "the Section 403 authorization" under WRDA 2020 "is conditioned upon the resolution of comments from the review assessment of the ASA(CW)" from May 2020.[16] The Corps further explained that the agency "will be initiating a separate environmental review process for the Federal action related to the conditional authorization under Section 403 of WRDA of 2020."[17] The Corps held an early scoping comment period in 2023,[18] and initiated formal scoping under NEPA in the summer of 2024.[19]

III. The Corps' current purpose and need statement is too narrow.

Over the past six years, the purported need for the Wilmington Harbor expansion project has shifted drastically. At the outset, the Ports Authority demanded the expansion to accommodate increased imports and job growth.[20] In tandem, the Ports Authority touted the dramatic ultimatum that if Wilmington Harbor was not deepened, shipping companies would completely abandon the Port—threatening economies in Wilmington and across the Southeast.[21] While eye catching, this conclusion was entirely unjustified, drawing significant criticism from the Corps and the public.[22]

Over time, the need for the project dwindled to the point where the current purported purpose and need statement fails to present a compelling reason for federal investment. The Corps now states that the purpose of the project is "to contribute to national economic development ("NED") by addressing transportation inefficiencies for the forecasted vessel fleet, consistent with protecting the Nation's environment."[23] Despite acknowledging that "the same volume of cargo is assumed to move through Wilmington Harbor"[24] with or without the project, the Corps claims the project is necessary to "address the constraints that contribute to inefficiencies in the existing navigation system's ability to safely serve forecasted vessel fleet and cargo types and volumes."[25] The purpose and need statement is inappropriately narrow and not justified by the DEIS.[26] It also directly conflicts with the Ports Authority's goals for the project which remain to "attract more import and export business," and "[b]oost[] job growth."[27]

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[16] Withdrawal of Notice of Intent to Prepare a Draft Environmental Impact Statement, 88 Fed. Reg. 14993 (Mar. 20, 2023).
[17] *Id.*
[18] U.S. Army Corps of Eng'rs, Notice of Early Scoping Public Comment Period (May 30, 2023).
[19] Intent To Prepare an Environmental Impact Statement (EIS) for a Letter Report for the Wilmington Harbor, North Carolina Project, New Hanover and Brunswick Counties, North Carolina, 89 Fed. Reg. 48602 (June 7, 2024).
[20] *See, e.g.*, 203 Feasibility Report, *supra* note 11, at 185.
[21] *Id.* at 121.
[22] *See, e.g.*, 2019 Review Assessment, *supra* note 8, at 3; 2020 Review Assessment, *supra* note 12, at 25–26.
[23] DEIS, *supra* note 1, at 1-8.
[24] *Id.* at 2-7.
[25] *Id.*
[26] The Ports Authority also appears to be struggling to justify the project. Internal emails show the tension between asking for a deeper Port while also demonstrating that the Port is "handling the volume [of cargo] today." Email from Brian Clark, N.C. Ports Authority, to Hans Bean, N.C. Ports Authority (July 6, 2023), Attachment 5.
[27] *See Harbor Enhancement: Wilmington Harbor Navigation Improvement Project*, N.C. PORTS, https://perma.cc/5YMG-YR39 (last visited Nov. 2, 2025).

As a preliminary matter, merely contributing to national economic development is not a proper purpose under the current principles and guidelines governing water resource investment. Federal projects must focus on a much broader range of issues than national economic development when setting a federal objective, including:

> reflecting national priorities, encouraging economic development, and protecting the environment by seeking to maximize sustainable economic development, seeking to avoid the unwise use of floodplains, and protecting and restoring the functions of natural systems and mitigating unavoidable damage to natural systems.[28]

Nevertheless, and despite this specific instruction, the Corps' sole purpose for this project is to contribute to national economic development—there are no considerations for the environmental, community, or resilience needs around the Port of Wilmington.[29]

Second, and as we have explained in detail through prior comments,[30] there is no explanation for what inefficiencies are occurring or will occur in Wilmington should the Project not proceed. To the contrary, the Ports Authority highlights that Wilmington Port has the "highest container truck gate and crane productivity *on the U.S. East Coast*."[31] In business materials, the Ports Authority claims to have "[t]he fastest turn times on the East Coast," and states the Port is "big ship ready."[32] As the DEIS acknowledges, the Ports Authority continues to complete "improvement" projects that will "increase the efficiency and throughput capacity of the Port of Wilmington" without deepening the channel.[33] Indeed, even letters of support from shippers fail to identify the harbor deepening as necessary to support their economic goals.[34] These accolades and continued enhancement projects directly conflict with the transportation inefficiencies cited as a purported need for deepening Wilmington Harbor.

Articulating a proper purpose and need is not just a paper exercise—it is the first step to identifying reasonable alternatives.[35] By failing to articulate a proper need and limiting the range of alternatives to varying depths of deepening, the Corps wrongly presumes that deepening is the only way to achieve the project's purpose.[36] The narrow purpose and need statement caused the

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[28] U.S. Army Corps of Eng'rs, Final Rule, Corps of Engineers Agency Specific Procedures to Implement the Principles, Requirements, and Guidelines for Federal Investments in Water Resources, 89 Fed. Reg. 103992, 103993 (Dec. 19, 2024).
[29] DEIS, *supra* note 1, at 2-3.
[30] *See* SELC, 2023 Early Scoping Comments, *supra* note 3, at 4–5; SELC, 2024 Scoping Comments, *supra* note 3, at 3–4.
[31] *Fast Facts*, N.C. PORTS, https://perma.cc/8PZG-5R2U (last visited Nov. 2, 2025) (emphasis added).
[32] N.C. Ports, Welcome to North Carolina Ports (2023), Attachment 6.
[33] DEIS, *supra* note 1, at 1-18 ("These without-project condition terminal improvements enhance current terminal operations and efficiency independent of improvements to the federal channel.").
[34] *See* Combined Letters and Emails from Companies to N.C. Ports Authority (2021), Attachment 7.
[35] *City of Carmel-By-The-Sea v. U.S. Dep't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997) ("The stated goal of a project necessarily dictates the range of 'reasonable' alternatives and an agency cannot define its objectives in unreasonably narrow terms"); *see also Webster v. U.S. Dep't of Agric.*, 685 F.3d 411, 422 (4th Cir. 2012) ("a purpose is unreasonable when the agency defines it so narrowly as to allow only one alternative").
[36] DEIS, *supra* note 1, at 2-1 to 2-3; Letter Report, *supra* note 2, at 2-8 to 2-12.

Corps to eliminate without study other alternatives such as widening the channel (without also deepening it), which the agency admits "would allow" the large Post-Panamax III vessels "to use the channel on a regular basis."[37] Another alternative could include moving the container terminal portion of the Port to the river's mouth, an endeavor that the Port of Mobile, Alabama undertook in 2008 to address the inefficiencies of moving large ships up river.[38] Yet another option would be to consider the East Coast ports regionally and evaluate whether it makes more sense (economically and environmentally) for the ports to operate as a hub-and-spoke system thereby removing the constant pressure for each harbor to house the deepest port.

If the project's purpose is honestly to address transportation inefficiencies and thus contribute to national economic development, then the Corps must both provide evidence of inefficiencies and explain why the project will meet other priorities that the agency has mandated drive federal investment.[39] If, on the other hand, the real purpose for the project aligns with the Ports Authority's goals of attracting more import and export business, then the Corps must expand its environmental analysis to address the associated impacts of such growth, including induced development and the water, wildlife, and community impacts that will result from it.[40] Additionally, the Corps must ensure that all feasible alternatives are considered.

Questions

- What evidence of transportation inefficiencies at Wilmington Harbor has the Corps identified?
- How does the Corps rationalize the stated purpose for the Wilmington Harbor expansion with the Corps' current Principles, Requirements, and Guidelines?
- Did the Corps consider moving part of the port to the mouth of the Cape Fear River like other southern riverine ports, including Alabama?

IV. The project's minimal benefits do not justify the extreme costs.

For there to be a federal interest in a water resources project, the benefits to National Economic Development must outweigh the cost to construct and maintain the project.[41] The

[37] Letter Report, *supra* note 2, at 2-6.
[38] *See The Evolution of containerization in Mobile Bay: From Local Port to Global Gateway*, NAT'L MARITIME MUSEUM OF THE GULF (May 19, 2025), https://perma.cc/P55Y-6WKF; *see also* AL. PORT AUTHORITY, Port of Mobile Map (2024) https://perma.cc/82NL-M3TL; *Alabama Port Authority and APM Terminals Mobile Ink Deal Container Terminal Enters Fourth Expansion*, AL. PORT AUTHORITY (May 19, 2022), https://perma.cc/KP7Q-NE2B.
[39] *See* 89 Fed. Reg. at 103993.
[40] For example, across Southeastern ports we have witnessed that harbor deepening projects are closely followed by induced industrial growth. *See, e.g.*, S. Env't L. Ctr., Map of Savannah Distribution Centers (2025), Attachment 8 (showing that since the deepening project began construction, approximately 251 distribution centers have been developed around Savannah Port). Induced growth leads to serious environmental concerns, like the destruction of wetlands, displacement of wildlife, and increased air and noise pollution. The industrial development also creates more hard concrete surfaces in coastal areas, exacerbating the effects of flooding, storm surge, and sea level rise. If the Corps actually expects imports to increase, it must re-do the environmental analysis taking these—and other concerns—into consideration.
[41] *See* Letter Report, *supra* note 2, at 2-3.

Corps projects that expanding the harbor will cost more than $1.3 ***billion*** in construction costs alone.[42] Annual maintenance will tack on an additional $14.4 million per year.[43] Because the Corps acknowledges that the same amount of cargo will move through Wilmington Harbor with or without the expansion,[44] the only identified benefit associated with these significant costs is a reduction in the number of voyages large cargo vessels will have to take each year resulting in "significant cost savings to the shippers."[45] In short, the Corps recommends expanding Wilmington Harbor and damaging extensive environmental resources so that international shipping companies can save a few dollars by putting more cargo on less ships.

The Corps' current benefit-cost-ratio admits that the possible benefits are narrow—the ratio is a mere 1.3, meaning that for every one dollar spent, the Corps expects 1.3 dollars in benefits.[46] For comparison, the Corps predicted a 7.3 benefit-cost-ratio when deepening the Savannah Harbor,[47] and a 6.4 benefit-cost-ratio when deepening Charleston Harbor.[48] Only projects with a benefit-cost-ratio greater than 1.0 are considered justified.[49] With a ratio this low (1.3), practically any increase to the project's costs or reduction in expected benefits could shift the ratio below one, rendering the project infeasible.

a. The project's benefits rely on unsupported assumptions.

As mentioned above, the only purported benefit of expanding Wilmington Harbor is the alleged reduction in costs to shipping companies.[50] Not only does the DEIS fail to connect this benefit to national economic development,[51] the Corps relies on multiple unsupported assumptions to conclude that vessels will in fact increase their loads and reduce their number of voyages each year. For instance, the DEIS assumes the shipping companies will more fully load their ships but does not provide data on how much more capacity each type of vessel can (or will) carry into Wilmington Harbor if they do not have to light-load.[52]

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[42] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report: Attachment 4 – Cost Appendix (Sept. 5, 2025), at 12.
[43] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report: Attachment 5 – Economic Considerations (Sept. 5, 2025), at 58.
[44] *Id.* at 32 ("In the [future] without and in the future with project conditions, the same volume of cargo is assumed to move through Wilmington Harbor . . . ").
[45] *Id.* at 49.
[46] *Id.* at 57, 58.
[47] *What is SHEP?*, U.S. ARMY CORPS OF ENG'RS, https://www.sas.usace.army.mil/Missions/Civil-Works/Savannah-Harbor-Expansion/What-is-SHEP/ (last visited Nov. 2, 2025).
[48] Jackie Pennoyer, *Final Harbor Deepening Contracts Awarded*, U.S. ARMY CORPS OF ENG'RS (Dec. 22, 2020), https://www.sac.usace.army.mil/Media/News-Stories/Article/2454681/final-harbor-deepening-contracts-awarded/. While these were the BCRs the Corps identified in both projects, we note that they were likely inflated to serve the associated port's benefits. That said, even assuming some inflation of benefits, the BCRs are significantly higher than the one calculated for the Wilmington Harbor expansion.
[49] Attachment 5 – Economic Considerations, *supra* note 43, at 1.
[50] *Id.* at 49.
[51] *Id* (failing to connect any benefits to the national economy and stating that the only economic benefits are to international shipping companies).
[52] *See id.* at 48 (explaining assumptions without justifications).

Rather than provide actual data to support its assumption, the Corps used a model to predict the number of each type of vessel that would call with or without the project. That model projected that if Wilmington Harbor is deepened, the number of Post-Panamax I (smaller vessels) would drastically decrease from 237 without the expansion to 115 vessels with the expansion, and the number of Post-Panamax III (large vessels) would remain the same at 103 vessels.[53] The Corps uses those projections to determine that shipping companies will reduce the number of voyages on smaller ships and instead put more cargo on larger ships.[54] But the model used is fundamentally flawed. Currently, only **one** Post-Panamax I is part of the Asia/USEC fleet,[55] and the Corps acknowledges that the vast majority of new Post-Panamax ships being built and deployed are Generation III.[56] Nevertheless, the Corps' model predicts that without the project, in 2036, the number of Post-Panamax I in rotation **will jump from one to 237 vessels**.[57] Said differently, in 2021 (the base year for the Corps economic analysis), Post-Panamax I vessels made up 1.1% of the Post-Panamax fleet, but by 2036, Post-Panamax I vessels would make up a staggering 47% of the fleet calling to Wilmington.[58] At the same time, Post-Panamax III vessels, which made up 94% of the fleet in 2021, would only account for 20% of the fleet in 2036.[59] In short, the Corps artificially inflates the number of Post-Panamax I vessels that would call at Wilmington without the expansion, contrary to industry trends.[60]

Wrongly assuming that there will be more Post-Panamax I vessels is not a minor error. The Corps' cost-benefits-ratio resulted from reduced *number* of vessels calling in Wilmington with the deepening, as compared with the no action alternative.[61] They reached that conclusion by showing a shift from Post-Panamax I to Post-Panamax III.[62] But the Corps' concludes that "modifications to the channel framework at Wilmington alone will not be sufficient to cause changes in the vessel fleet servicing the U.S."[63] Therefore if—as is likely given industry trends—more cargo would simply be loaded on to the Post Panamax III vessels in circulation under the no action alternative, the comparative cost savings with the expansion would be reduced.

Additionally, the DEIS does not explain how the reduction of vessel voyages can or will be implemented.[64] Currently, all Asia/USEC services are provided on a weekly basis and each of

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[53] *Id.* at 55.
[54] Attachment 5 – Economic Considerations, *supra* note 43, at 49.
[55] *Id.* at 48.
[56] *Id.* at 42.
[57] *Id.* at 48.
[58] *Id.*
[59] *Id.*
[60] *See, e.g.*, DEIS, *supra* note 1, at 1-8.
[61] Attachment 5 – Economic Considerations, *supra* note 43, at 49.
[62] We note that the Corps' economic projections of number of vessels at varying depths deceptively *does not* include the depth identified as the preferred alternative in the DEIS. *See id.* at pg. 55 (showing vessel projections for 46 feet and 48 feet).
[63] *Id.* at 59.
[64] *See generally id* (failing to provide an explanation for how vessel traffic will shift based on the change in loading more cargo onto fewer shifts).

these vessels follow a multiport rotation, with Wilmington included as a mid-port.[65] If the Corps is to assume that fewer vessels are calling in Wilmington, there must be a similar assumption that fewer vessels will call at Savannah, Charleston, or any other port within Wilmington's rotation. The DEIS does not explain how that pattern will (or even could) change. To the contrary, the agency acknowledges that "the number" of Post-Panamax vessels calling to the Port are expected to increase in the future with or without the expansion.[66]

In summary, the Corps assumes (without providing any evidence to support) that shipping companies will opt to both (1) increase the amount of cargo per vessel and (2) reduce the number of vessels currently calling to Wilmington Port. The Corps relies on those assumptions to calculate its benefit-cost-ratio and to evaluate environmental impacts of the project. These assumptions are questionable and misleading, and they likely do not accurately reflect what will actually occur in Wilmington. The Corps must justify or revise its assumptions before moving forward with a final decision.

b. If the Corps' assumptions prove inaccurate, the environmental impacts of the project will be more severe.

Relying on the conclusion that shipping companies will send more cargo on less ships has serious consequences for the Corps' environmental analysis. Throughout the DEIS, the Corps minimizes environmental impacts of the project by claiming that fewer vessels will be traversing the channel leading to less environmental damages. For instance, the Corps concluded that the stress put on river shorelines from vessel wakes would be reduced when compared to the no action alternative because fewer ships would be passing through the channel and therefore creating less wakes.[67] The Corps also determined that air emissions would decrease under the deepening alternatives because less vessel traffic would result in less air pollution.[68] And the Corps predicted that certain species would be at less risk of vessel strikes due to less frequent traffic.[69] As it stands, the Corps has not explained its assumption that shipping companies will consolidate more cargo onto less ships, which in turn taints the DEIS's discussion of environmental impacts.

c. Other environmental issues that must factor into the cost-benefit analysis.

Other environmental issues are relevant to the Corps' economic analysis and could drive down the benefit-cost-ratio. For instance, the Corps assumes that "approximately half" of the material taken from the harbor due to deepening "would be placed in a beneficial way," either through the creation of mudflats in the river's estuary, placement on bird islands, or placement on

[65] *See, e.g.*, *Transpacfic Services Update – Amberjack & Emerald*, MSC (Feb. 19, 2023), https://perma.cc/J6VA-A6MW (showing historic route of EC2 indicating that Wilmington is a middle port of call).
[66] Letter Report, *supra* note 2, at 1-23.
[67] DEIS, *supra* note 1, at 3-23.
[68] *Id.* at 3-70.
[69] *Id.* at ES-3, 3-89.

nearby beaches.[70] Reusing dredged material in this alleged beneficial way drives down the cost of the project because it reduces the distance that dredging vessels have to travel to place materials.[71] But the Corps assumes that it *can* beneficially reuse this material without comprehensively studying what is in the sediment or whether the beneficial use plans will be approved. Because so much surrounding the beneficial use of sediment is uncertain, the Corps should have evaluated the cost of the project with and without the beneficial use to more transparently evaluate whether the project is feasible to move forward.

Considering whether beneficial use is even possible is particularly important here because (as discussed in more detail below) the sediment in the lower Cape Fear River is highly contaminated with per- and polyfluoroalkyl substances ("PFAS") from upstream industries.[72] The Corps did not analyze any existing PFAS data, nor did it collect its own.[73] This is highly problematic because in 2024, the U.S. Environmental Protection Agency ("EPA") classified two particularly harmful PFAS compounds (PFOA and PFOS) as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), or Superfund Law.[74] Dredging and disposing of hazardous waste requires particular care during both construction and placement—and managing hazardous waste can significantly drive up the costs of a project. States who are leaders in addressing PFAS contamination have restricted the use of PFAS-laden dredged material for beneficial use.[75] For example, Michigan prohibits disposal in open water when PFAS levels exceed state thresholds, and the state requires extensive testing and mitigation measures be taken if the material is to be used for beneficial use.[76]

While North Carolina does not yet have the same policy, research consistently shows that PFAS are impacting wildlife in the Lower Cape Fear River—including shorebirds, alligators, and fish.[77] Material contaminated with toxic PFAS chemicals should not be placed on bird islands,

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[70] *Id.* at 2-16 to 2-18.
[71] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix D: Beneficial Use Plan (Sept. 5, 2025), at pg. 15-16.
[72] Megumi S. Shimizu et al., *Distribution of Legacy and Emerging Per- and Polyfluoroalkyl Substances in Riverine and Coastal Sediments of Southeastern North Carolina, USA*, 11 ENV'T SCI. PROCESSES & IMPACTS (June 3, 2022), Attachment 9; Saleeby, Brittany, et al., *Isomers of Emerging Per- and Polyfluoroalkyl Substances in Water Sediment From the Cape Fear River, North Carolina, USA*, 262 CHEMOSPHERE 128359 (2021), Attachment 10; *see also* Harfmann, Jennifer, et al., *Sorption of Hexafluoropropylene Oxide Dimer Acid to Sediments: Biogeochemical Implications and Analytical Considerations*, ACS EARTH SPACE CHEM (2021), Attachment 11; *see also* N.C. DEQ, PFAS Sediment Study – Performed January 2021 to August 2021 (2021), Attachment 12.
[73] *See* DEIS, *supra* note 1, at 3-61 to 3-66 (describing impacts to sediment and the affected environment under each alternative and failing to even mention PFAS, much less analyze the impacts of the pollutants).
[74] Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances, 89 Fed. Reg. 39124, 39125 (May 8, 2024); *see also EPA's Principal Claim of PFAS Progress is Untrue,* PUBLIC EMPLOYEES FOR ENV'T RESPONSIBILITY (Oct. 29, 2025), https://perma.cc/F8X8-BATR (providing evidence that PFOA and PFOS continue to be used and released into the environment by industries).
[75] Mich., Department of Environment, Great Lakes, and Energy Sediment Dredging Guidance (June 13, 2025), Attachment 13, at 6.
[76] *Id.* at 4, 6–7.
[77] Anna R. Robuck, et al., Legacy and Novel Per- and Polyfluoroalkyl Substances in Juvenile Seabirds from the U.S. Atlantic Coast, 54 ENV'T SCI. & TECH 12938 (Sept. 2020), https://pubs.acs.org/doi/pdf/10.1021/acs.est.0c01951; Univ. of RI, PFAS in Seabirds: Narragansett Bay, Massachusetts Bay, Cape Fear, SCI. DAILY (Sept. 23, 2020),

estuaries where young fish grow, or beaches where sea turtles nest, all of which is currently proposed in the DEIS. Because the Corps has not studied the levels of PFAS in the material that will be dredged, it does not know how it will be able to dispose of the material, whether the agency will be able to meet standards of sediment compatibility, and most importantly, whether it will be able to beneficially reuse the sediment—or whether the reuse would cause consequent harm. If the agency cannot (or if it is required by the state to mitigate effects of using that material), the costs of the project will drastically increase.[78]

In addition, and again as discussed in more detail below, the mitigation planned to address wetland and aquatic resource impacts is vastly inadequate. Addressing that deficiency will require additional mitigation measures to be implemented. Mitigation is factored into the benefit-cost-ratio[79] and, therefore, an increase in mitigation costs will disrupt the Corps' conclusion that this project results in a net gain. Finally, the Corps' economics analysis should also consider the negative economic impacts to fisheries, decreases in tourism and recreation dollars, incremental increases in flooding damages, and impaired ecosystem services from destroyed or damaged natural resources.[80]

In summary, the Corps' economics analysis relies on significant assumptions that are not supported within the DEIS. The Corps must revise these assumptions or provide support for them before moving forward with a decision on this project.

Questions

- What is the Corps' basis for concluding that shipping companies will both (1) increase capacity on vessels and (2) decrease the number of vessels calling to Wilmington Harbor?
- Why does the Corps assume that the number of Post-Panamax I vessels will increase substantially without the project? In particular, please explain the jump from one to 237 Post-Panamax I vessels listed in Table 5.38 in Attachment 5 – Economic Considerations.
- What would the cost of deepening Wilmington Harbor be if the Corps could not beneficially reuse some or all of the sediment?

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https://perma.cc/S3ZS-NZ7K; Guillette et al., Blood Concentrations of Per- and Polyfluoroalkyl Substances Are Associated with Autoimmune Like Effects in American Alligators From Wilmington, North Carolina, FRONTIER TOXICOLOGY 4:1010185 (Oct. 20, 2022), https://perma.cc/T95J-RH2G; T.C. Guillette, et al., Elevated levels of per- and polyfluoroalkyl substances in Cape Fear River Striped Bass (Morone saxatilis) are associated with biomarkers of altered immune and liver function, 136 ENV'T IN'TL 105358 (Mar. 2020), https://perma.cc/8523-J7EF; Tracey Peake, High Levels of PFAS Affect Immune, Liver Functions in Cape Fear River Striped Bass, N.C. STATE (Feb. 7, 2020), https://news.ncsu.edu/2020/02/pfas-striped-river-bass/; *NCDHHS Recommends Limiting Fish Consumption From the Middle and Lower Cape Fear River Due to Contamination With "Forever Chemicals,"* N.C. DEP'T HEALTH & HUMAN SERVS. (July 13, 2023), https://perma.cc/E8FU-N69H [hereinafter "Cape Fear Fish Consumption Advisories"].

[78] Appendix D: Beneficial Use Plan, *supra* note 71, at 17.

[79] U.S. Army Corps of Eng'rs, Attachment 4 – Cost Appendix (Sept. 5, 2025), at 2 (listing mitigation as a factor in project cost).

[80] *See* U.S. Army Corps of Eng'rs, Planning Guidance Notebook Regs. 1105-2-100 (Apr. 22, 2000), at C-15 (explaining that environmental resources should be monetary value "based upon the contribution the resources makes to the Nation's economy"), https://perma.cc/2Y5J-U2R4.

- Why did the Corps not consider negative impacts to local economies in Wilmington, including local fisheries and ecotourism businesses?
- What would the Corps' response be if the costs for the project were to outweigh the benefits? Said another way, if the BCR drops below 1, could the Corps continue to recommend this project?

V. The Corps cannot use sea level rise to excuse the project's impacts.

At the outset, we appreciate the Wilmington District's use of the Corps' High scenario for evaluating sea-level rise impacts for this project. Having the High scenario underpin the DEIS should help facilitate a sounder project and the development of more resilient mitigation measures. Unfortunately, the Corps has misused these projections. Rather than utilize sound science to thoroughly and comprehensively evaluate how this project will impact the Lower Cape Fear River, the Corps used the projections to entirely obfuscate the project's impacts. For example, the DEIS acknowledges that deepening Wilmington Harbor will increase the mean high-water level throughout the project area, increase peak water levels (by more than 3%), and expand the total area that will be flooded by rising tides.[81] But the agency diminishes these impacts by stating that the increases are minimal "when compared to the substantial influence of sea level change."[82]

In reaching this conclusion, the DEIS compares the immediate increases caused by the project (based on mean tidal datum values using average water levels from 1983 to 2001)[83] to sea levels projections for 2086.[84] But impacts from this project will be felt much sooner, with construction expected to be completed in 2036. Instead of comparing the project's impacts solely against sea levels in 2086, at the end of the project's life, the Corps should have compared the impacts of the project against sea levels in 2036 to give an honest comparison of the project's impacts against sea levels at that time. Said differently, what the Corps considers a "negligible" impact compared to projected sea levels of 3.77 feet in 2086 would likely be more significant compared with a the much lower projected sea level of less than a foot in 2036. While it is true that sea-level rise will have massive impacts on the Wilmington area, so too will this project within the shorter term. The Corps cannot use future sea-level rise impacts over the next five decades to dodge this Project's many impacts on a much shorter timescale. The Corps must fully consider and evaluate the impacts this project will have on the human and natural environment without brushing aside impacts because they are less than future sea-level rise projections.

Most importantly, the Corps must consider how sea-level rise will interact with the deepening project and exacerbate flooding events that will create compounding and increasingly severe impacts. The Cape Fear Basin is especially vulnerable to compound flooding events— or

[81] DEIS, *supra* note 1, at 3-60 to 3-61.
[82] *Id.* at 3-61.
[83] *Id.* at 3-59.
[84] *Id.* at 3-60.

floods caused by multiple factors.[85] However, the DEIS fails to adequately address these dynamics. It treats sea-level rise as a static, isolated phenomenon rather than a dynamic force that will continuously impact tidal ranges, compound flooding, and the resulting need for maintenance dredging. This failure leads to a drastic underestimation of the risks to Wilmington and the communities that call this area their home.

For instance, the Corps entirely dismisses the increase in mean high water caused by the project, arguing that sea level rise will overshadow its effects. What the Corps fails to consider in that conclusion, however, is that even an increase of 0.11 feet (as expected from the deepening) will drastically accelerate the rate of high-tide flooding. Peer-reviewed research has demonstrated that the volume of water flowing through the river's channel is a dominant driver of chronic low-level flooding—particularly in estuarine environments like the Lower Cape Fear River.[86] This means that even a "modest" increase in water flowing through the Lower Cape Fear River creates a substantial risk to Wilmington communities—especially in the downtown area.

Beyond mean high water, the Corps fails to account for other hydrodynamic consequences of the project. Deepening a channel like Wilmington's reduces friction through the water system making it easier for more water to flood into the channel—especially during storm conditions.[87] This causes a nonlinear increase in the tidal range and flooding risk,[88] resulting in "higher water levels, faster currents, and longer-lasting inundation farther inland."[89] A recent study of tidal conditions in Jacksonville, Florida show when shallow estuaries are deepened, they provide less protection against "long-waves" or storm induced flooding which can pose a significant risk to the communities nearby.[90] Similarly, a study on channel deepening in Louisiana showed that deepening allows more water to flood the system during a storm event, drastically increasing the flooded area around the channel.[91] When sea level rise is considered alongside the deepening project, there are increased flood risks caused by a larger, more powerful storm surge.[92]

Despite well-established research showing that flood risks are not static, but are indeed a culmination of many factors, the DEIS critically does *not* take into account how the combination of channel deepening, tidal amplification, storm surge, vessel wakes, and sea-level rise will

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[85] Avanitka Gori, Ning Lin, & James Smith, *Assessing Compound Flooding From Landfalling Tropical Cyclones on the North Carolina Coast*, 56 WATER RESOURCES RESEARCH 1 (2020), Attachment 14.
[86] *See* Kelly McKeon & Christopher G. Piecuch, *Compound Minor Floods and the Role of Discharge in the Delaware River Estuary*, 130 JGR OCEANS 1 (2025), Attachment 15.
[87] Lynker Report, *supra* note 4, at 4; Ramin Familkhalili, Stefan A. Talke & David A. Jay, *Tide-storm Surge Interactions in Highly Altered Estuaries: How Channel Deepening Increases Surge Vulnerability*, 125 JGR OCEANS 1, 15 (2020), Attachment 16.
[88] *Tide-storm Surge Interactions*, *supra* note 87, at 2.
[89] Lynker Report, *supra* note 4, at 8.
[90] Stefan A. Talke & David A. Jay, *Changing Tides: The Role of Natural and Anthropogenic Factors*, 12 ANN. REV. OF MARINE SCI. 121, 132–33 (2020), Attachment 17.
[91] Maqsood Mansur, Julia Hopkins & Qin Chen, *Estuarine Response to Storm Surge and Sea-level Rise Associated with Channeling Deepening: A Flood Vulnerability Assessment of Southwest Louisiana, USA*, 116 NAT. HAZARDS 3879, 3889 (2023), Attachment 18.
[92] *Id* at 3890.

create greater impacts on the project area—impacts that are both more environmentally and economically damaging.[93] We urge the Corps to model this Project in a way that takes into account these compounding effects so that the agency and the public may better understand the impacts this Project will have in the region.

Unfortunately, the Corps' failure to meaningfully study and integrate sea level rise and compound effects into the NEPA analysis leads to questionable conclusions throughout the DEIS. For example, the Corps tries to claim that sea level rise "could lead to a reduction in required maintenance due to increased depth in the channel."[94] This statement is not only a disingenuous attempt to spin sea level rise as a positive impact for the community, it is also fundamentally wrong. Sea level rise does not simply mean that water levels will increase evenly throughout the channel and not impact anything else. Sea level rise changes the ebbs and flows of the tidal range and will drastically impact sediment transport in the system thereby making maintenance dredging less effective.[95] Also, as discussed above, the reduced friction in the channel caused by dredging can exacerbate upstream flooding and erosion, amplifying sediment movement in the project area.[96] In other words, the Corps will be required to perform *more* maintenance dredging in the project area as sea levels continue to rise. This is a project impact and cost that was not considered throughout the DEIS.

As we have raised extensively in our prior comments, the area surrounding Wilmington Harbor is extremely vulnerable to sea level rise and changing tidal patterns.[97] So while we appreciate the Corps' acknowledgement that sea levels are indeed going to rise and pose significant threats to the Wilmington area, the agency cannot use those existing threats to mask the impacts of this project. Rather than using sea level rise data as a static factor to compare the project impacts against, the Corps must weave sea level rise into its analysis studying how—when viewed together—the project may exacerbate the risks associated with changing sea levels, including substantial flooding risks to the Wilmington community. This transparency is critical to the environmental and cost analyses present throughout the DEIS.

Questions

- Why did the Corps not consider or model the compound relationship between sea-level rise, the deepening project itself, and flooding events?
- Why did the Corps not complete a joint hazard probability distribution analysis to accurately demonstrate the total expected damage from compounding flood and storm events?

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[93] Lynker Report, *supra* note 4, at 8. As further explained in the report, even the Corps' storm surge modeling from Hurricane Helene suffers from this failure to recognize the compounding and variable nature of such events.
[94] DEIS, *supra* note 1, at 3-72.
[95] Lynker Report, *supra* note 4, at 4; Jana R. Cox et al., *Effects of Sea-Level Rise on Dredging and Dredged Estuary Morphology*, 127 J. OF GEOPHYSICAL RSCH.: EARTH SURFACE 1, 2 (2022), Attachment 19.
[96] *Tide-storm Surge Interactions*, *supra* note 87, at 2.
[97] SELC, 2023 Early Scoping Comments, *supra* note 3, at 5–7; SELC, 2024 Scoping Comments, *supra* note 3, at 7–10.

- Why did the Corps not complete hydrodynamic modeling that integrate compounding factors like wind and river volume to calculate the peak water level risk associated with deepening Wilmington Harbor?
- Did the Corps review studies that show deepening projects reduce friction throughout the channel thereby increasing flood risks and storm surge penetration? If so, why were those conclusions not included in the DEIS?
- What would the increased costs of maintenance dredging be if sea level rise increases sedimentation and erosion throughout the channel?
- What would be the projected difference in the numbers of days communities and businesses will feel impacts of flooding with or without the project?

VI. The DEIS fails to adequately address devastating environmental impacts.

The purpose of NEPA is "[t]o declare a national policy which will encourage productive and enjoyable harmony between man and his environment."[98] NEPA demands: (1) thoughtful, informed agency decisionmaking, and (2) making information available to the public at a meaningful time.[99] NEPA is an "action-forcing" statute[100] and achieves its goals by requiring agencies to take a "hard look"[101] at the "reasonably foreseeable environmental effects of the proposed agency action,"[102] and to "ensure scientific integrity" in their analyses by "mak[ing] use of reliable data and resources."[103] An EIS must do more than list potential impacts—it must rigorously analyze their scope, severity, and cumulative effects, using the best available information. When "essential to a reasoned choice among alternatives," an agency must undertake new technical or scientific research.[104] By requiring thorough consideration and disclosure of environmental impacts and alternatives, NEPA serves as a "democratic decisionmaking tool:" it "ensures that the agency will not act on incomplete information" and "permits the public . . . to react to the effects of a proposed action at a meaningful time."[105]

[98] 42 U.S.C. § 4321; *Hughes River Watershed Conservancy v. Glickman*, 81 F.3d 437, 443 (4th Cir. 1996) ("NEPA declares a national policy of protecting and promoting environmental quality.").
[99] *See* 42 U.S.C. § 4332; *see also Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989); *Seven Cnty. Infrastructure Coal. v. Eagle Cnty., Colorado*, 145 S. Ct. 1497, 1507 (2025).
[100] *Kleppe v. Sierra Club*, 427 U.S. 390, 409 (1976).
[101] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989)
[102] 42 U.S.C. § 4332(C)(i).
[103] *Id.* §§ 4332(D), (F).
[104] *Id.* § 4336(3)(B).
[105] *N.C. Wildlife Fed'n. v. N.C. DOT*, 677 F.3d 596, 601–02 (4th Cir. 2012) (citations omitted).

For over five years, we have raised significant concerns with the potential environmental impacts of the proposed expansion, identifying specific effects and issues the Corps must consider in its DEIS. Unfortunately, the DEIS fails to adequately review and disclose pertinent impacts, including those relevant to our previously raised concerns.

a. Underrepresented Wetland Impacts and Inadequate Mitigation Measures

Wilmington is located within the North Carolina Coastal Plain, a region that is marked by a vast array of wetlands.[106] In addition to their role as hotspots for biodiversity, wetlands also provide shoreline stabilization, natural water filtration systems, storm buffers, and flood reduction services.[107] Freshwater wetlands also provide economic benefits for their role as nurseries for commercially important fish and shellfish.[108]

Despite the billions of dollars in services they provide,[109] thousands of acres of wetlands are being lost in North Carolina.[110] Most of this loss has occurred within coastal watersheds like the Cape Fear due to development, sea level rise, and climate change.[111] Additionally, hundreds of thousands of acres of wetlands have been converted or disturbed into different types of wetlands which result in "altered ecosystem function . . . and loss of important habitat."[112] As changes in interpretation of federal law[113] and consequent state law changes[114] rollback protections for many wetlands across southeastern North Carolina, it is critically important that the Corps not damage even more for an unnecessary deepening project.

Our past comments have raised concerns about this Project's potential to exacerbate marsh migration and cause wetland loss. At the outset, as raised earlier in this comment, we have concerns with the wetland loss from this project being diminished as compared to long-term wetland loss projected from sea level rise. Again, the Corps cannot use sea level rise as a basis to excuse the impacts of this project. In addition, we also raise concern with the use of outdated wetland conditions data as a basis for its analysis that does not take into account years of erosion, development, and wetland conversion within the region.[115] The use of outdated data as a baseline for the DEIS's modeling likely masks the project's impacts to wetlands.

Beyond the modeling data, the DEIS posits that the Project would result in the conversion of 1,071 acres of tidal freshwater wetlands to higher salinity wetlands under a no sea level rise

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[106] *Assessment of Change in North Carolina's Outer Coastal Plain Wetlands*, NORTH CAROLINA WETLANDS (July 2024) at 11, Attachment 20.
[107] *Id*.
[108] *Id*.
[109] *Id* (noting that the functions provided by wetlands are estimated to be worth $25.6 billion).
[110] *The Status and Trends of Wetland Loss and Legal Protection in North Carolina*, N.C. STATE EXTENSION, https://perma.cc/P9K2-JTEW (last visited Oct. 16, 2025).
[111] *Id*.
[112] *Id*.
[113] *See Sackett v. EPA*, 598 U.S. 651, 679 (2023) (limiting the scope to wetlands within the purview of the Clean Water Act to those with a "continuous surface connection" with a water of the United States).
[114] *See* 2023 Sess. L. 63 § 15.(c) (June 12, 2023).
[115] Lynker Report, *supra* note 4, at 14.

modeling.[116] The wetland loss under higher sea level rise projections is much higher. This assumption suffers from several flaws. First, the DEIS erroneously concludes that wetlands will convert to higher salinity wetland types. The DEIS seems to assume, without any explanation, that the acres of wetlands lost under any of the alternatives and different sea level rise scenarios will essentially be canceled out by acres of (different types) of wetlands gained elsewhere.[117] Further, the DEIS assumes that wetlands will be able to migrate into new areas without impediments—an assumption that is unfounded given the level of existing and projected development in the action area. Indeed, the DEIS provides no explanation of *where* these newly created wetlands will be.

While the DEIS posits that the wetlands will merely be converted to higher salinity wetland types, thus minimizing some environmental impacts, converted wetland habitats would result in an altered ecosystem function than existed before. The loss of freshwater wetlands would directly impact both the health of North Carolina's fishery resources and the natural filtration system wetlands provide. Moreover, conversion may accelerate upstream saltwater intrusion that would lead to the further spread of ghost forests in the region.[118] Even bald cypress trees that have adapted to survive in somewhat higher salinity environments along Smith Creek at the upper portions of the Lower Cape Fear are threatened by the permanently increased salinity that this deepening project would cause, rendering them more sensitive to climate variability.[119] Increased ghost forests lead to a decrease in ecosystem services, including protection from storm impacts and habitat for wildlife.[120] It's not just a problem of creating ghost forests. It's a problem of losing a critically important ecosystem. The loss of freshwater wetlands is exacerbated by the inadequate mitigation measures provided for by the DEIS, as described in greater detail below.

Questions

- Why does the Corps assume that for every acre of wetland lost, an acre will be gained somewhere else? Where will the new wetlands be created?
- Why did the Corps use wetland condition data from 2016-2017 to make impact calculations?

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[116] DEIS, *supra* note 1, at 3-56.
[117] *See id.* at Table 3-34 (depicting wetlands changes under the no action alternative, where under SLC1 891 wetlands would be lost vs. 891 gained; under SLC2 2337 wetlands would be lost, vs. 2338 gained; and under SLC3 9,628 wetlands would be lost vs. 9,628 gained); Table 3-35 (depicting wetlands changes under the Action Alternatives, where under SLC0 with AA1 1,275 wetlands would be lost and 1,276 would be gained; and under SLC3 with AA1 1,214 wetlands would be lost and 1,214 wetlands would be gained).
[118] *See* Jessica Lynn Magolan and Joanne Nancie Halls, *A Multi-Decadal Investigation of Tidal Creek Wetland Changes, Water Level Rise, and Ghost Forests*, 12 REMOTE SENSING 1141 (2020), Attachment 21.
[119] Kendra Devereux et al., *Tree-Ring and Sediment Analyses Reveal Processes of Bald Cypress Ghost Forest Formation From Dredging in the Cape Fear River, North Carolina, USA*, 15 ECOLOGY & EVOLUTION 1, 14 (2025), Attachment 22.
[120] *Id.*

b. Inadequate Modeling for Vessel Wake Impacts & Coastal Erosion

The Corps repeatedly states that deepening the Wilmington Harbor will allow larger, more heavily loaded ships to enter the Port. In particular, the DEIS focuses on an increase of Post-Panamax ships calling into Wilmington, a class of ships that can hold up to 15,000 twenty-foot equivalent units ("TEUs").[121] The Corps notes that Wilmington is accommodating Post-Panamax III ships "at the present time" that can be loaded to 14,220 TEUs.[122]

As we have raised in our past comments, larger ships create larger vessel wakes that will lead to greater coastal erosion and threaten shoreline stability. However, the DEIS fails to calculate vessel wake analysis using the largest ships *that already enter* the Port[123] and the types of ships the Corps projects will increase in the Port with this deepening. Although the purpose of the project is to allow more heavily loaded Post-Panamax III ships which can be loaded up to 15,000 TEUs, the DEIS vessel wake model is calibrated for a 12,400 TEU vessel.[124] Using an undersized vessel to calculate vessel wake underestimates the impacts ships projected to call to the Port will have on shoreline erosion.[125]

In addition to using an inadequate vessel size, the Corps misapplies its sediment transport models to predict the type and extent of erosion that will be caused by vessel wakes. The Corps uses sand transport models that are designed to predict erosion on sandy beaches, rather than riverbanks.[126] Physics of riverbanks are fundamentally different than those on sandy beaches and therefore the models are unreliable, if not meaningless.[127] On top of this, while the Corps acknowledges that sediment forecasts are highly sensitive to grain size, the agency only looks at a single grain size when evaluating the extent erosion can be expected to occur.[128] And the Corps' model only assumes 1 to 2 inches in tidal increase, even though the agency acknowledges that the area could see a tidal increase of 3.77 feet by 2086.[129] All of these factors lead to an unreliable analysis. The Corps must revisit its erosion analysis using different or modified models that more accurately represent the movement of sediment in the *river* itself.[130]

And even for the areas where a sandy-beach model would be appropriate, the Corps did not look at site-specific data or modeling. At Baldhead Shoal Reaches 3 and 4 (the most dynamic

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[121] Attachment 5 – Economic Considerations, *supra* note 43, at 23.
[122] *Id.* at 26.
[123] Given that these ships are already using the port, the Corps could have—and should have—used data from these and the other smaller ships to inform its analysis here.
[124] DEIS, *supra* note 1, at 3-21; U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix B-VIII: Vessel Wake Model Secondary Wave Calculations (July 16, 2025), at 2.
[125] Lynker Report, *supra* note 4, at 8.
[126] *Id.* at 2.
[127] *Id.*
[128] *Id.* at 3; U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix B: Model Documentation (July 24, 2025), at B-206.
[129] Appendix B: Model Documentation, *supra* note 128, at B-184.
[130] While we note that the Corps validated the model for the Anchorage Basin, the variance for the model was nearly 400% signaling that it was not an accurate or useful model. DEIS, *supra* note 1, at 1-5, Lynker Report, *supra* note 4, at 3.

portions of the project area), the Corps used erosion data from other beaches that have different characteristics.[131] This decision likely underestimates the sediment movement that will occur near Bald Head and the amount of maintenance dredging that will be needed to maintain this part of the channel.[132]

Finally, the DEIS and the hydrodynamic analysis also fail to consider the aggregate impact of thousands of vessel wakes and sea-level rise over five decades. Rather, the vessel wake modeling only simulates the shoreline impact of single events,[133] and even then, the Corps obscures the data from those conclusions by reporting them in annual averages.[134] Erosion is driven by peak bed shear stress during a wake event and thus cannot be fully understood in averages. For example, at Fort Caswell, peak bed shear stress is expected to *double* under the Corps' preferred alternative, but that threat to that portion of the channel is hidden by presenting the data in averages.[135] In short, the Corps' modeling and data culmination does not take into account how repeated vessel wakes in conjunction with sea-level rise will have long-term impacts on coastal erosion.[136] We urge the Corps to conduct vessel wake modeling that both uses a more accurate vessel size that reflects the ships anticipated to enter the Wilmington Port and considers the aggregate impacts of numerous vessel wakes and sea-level rise.

Questions

- Why did the Corps not use a 15,000 TEU vessel—the size of vessel the harbor expansion is allegedly designed to accommodate—for conducting vessel wake and shoreline erosion modeling? Why did the Corps not use the size vessel that currently calls in Wilmington?
- Why did the Corps present bed shear stress in averages, masking the total impact?
- How does the Corps find additional clearance and less severe bed shear stress if the entire project's goal is to allow ships to come more fully loaded (thus causing the ships to sink downward)?
- Why did the Corps not use a bank stability model that better reflected the physical properties of the Cape Fear River instead of the sand-beach models that the Corps used for its erosion calculations?

c. Lack of Testing for PFAS or Forever Chemicals

As we have raised in our past comments, the water and sediment of the Lower Cape Fear River are contaminated with PFAS, a large group of toxic chemicals that have severe health impacts, even at low levels, in humans and animals.[137] In particular, PFAS exposure has been

[131] DEIS, *supra* note 1, at 3-20.
[132] Lynker report, *supra* note 4, 2.
[133] DEIS, *supra* note 1, at 3-6.
[134] *Id.* at 3-20 to 3-24.
[135] *See* Appendix B: Model Documentation, *supra* note 128, at B-258, Table 11-7 (showing that maximum bed shear stress doubles between current conditions and the deepening alternative).
[136] Lynker Report, *supra* note 4, 1–3.
[137] *See, e.g.*, Zeyan Lew, Houman Goudarzi & Youssef Oulhote, *Developmental Exposures to Perfluoroalkyl Substances (PFASs): An Update of Associated Health Outcomes*, 5 CURRENT ENV'T HEALTH REPS. 1 (2023).

linked to cancer, developmental delays, reduced vaccine response, and decreased fertility in humans.[138] Unlike other chemicals, PFAS take thousands of years to break down which increases the risk of exposure and bioaccumulation in the environment. Both North Carolina and the federal government have responded to the threats that PFAS pose. In 2023, North Carolina issued fish consumption guidance for certain species in the Middle and Lower Cape Fear River.[139] In addition, the EPA has classified two PFAS as hazardous under CERCLA and has established drinking water standards for PFOA and PFOS.[140]

Although we have repeatedly urged the Corps to fully consider whether this Project may increase the levels of PFAS and other contaminants in the Cape Fear River ecosystem, the DEIS dismisses any effect the Project may have on exposing or distributing hazardous, toxic and radioactive waste. The Corps' most recent sampling of the dredged material was done in 2020 within the ODMDS and tested for "PCBs, pesticides, semi-volatile organics (SVOAs), metals, total organic carbon, and butyl-ins."[141] Since then, research has uncovered extensive PFAS pollution in the Cape Fear River.[142] This pollution is comprised of legacy (long-chain PFAS) and new chemistries that companies have recently switched to.[143] There is no evidence that the Corps researched this existing data or conducted sampling of the water, dredged material, or riverbank for any type of PFAS that contaminates the footprint of this project. Given that this material is to be used on bird islands, estuaries (where young fish will feed, forage, and grow), and public beaches, the Corps should conduct PFAS testing of the dredged material and shoreline deposits of the Cape Fear before further exposing people and wildlife to hazardous materials.[144]

Additionally, as mentioned earlier, the Corps' cost calculations for this project assume that the dredged material can be placed on beaches, subtidal areas, and bird islands that are close to where the material is being dredged. Should the material be unsuitable for beneficial use, the material would have to be transported offshore several miles and dumped within the ODMDS.[145] Transporting and dumping tens of millions of tons of dredged material would cause the cost of this project to increase significantly and make the project economically infeasible. As such, the Corps should have fully considered scenarios where dredged material could not be used for beneficial use.

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[138] *Our Current Understanding of the Human Health and Environmental Risks of PFAS*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas (last visited Oct. 16, 2025).
[139] Cape Fear Fish Consumption Advisories, *supra* note 77.
[140] *See* PFAS National Primary Drinking Water Regulation, 89 Fed. Reg. 32532 (Apr. 26, 2024); Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances, 89 Fed. Reg. 39124, 39125 (May 8, 2024).
[141] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix P: Wilmington Site Management and Monitoring Plan for Offshore Disposal at 18 (2023).
[142] *See* Megumi, *supra* note 72; Saleeby, *supra* note 72; *see also* Harfmann, *supra* note 72.
[143] Saleeby, *supra* note 72, at 3–7.
[144] This testing must take place even though the Corps routinely dredges the area. Because the Corps intends to deepen and widen the Harbor, it will encounter sediment that has been previously undisturbed and is likely highly contaminated.
[145] Appendix D: Beneficial Use Plan, *supra* note 71, at 17.

Questions

- Did the Corps conduct any testing for PFAS within the dredging area? If not, why did the Corps not conduct this testing?
- Why did the Corps not consider existing data regarding levels of PFAS in the sediment in the Lower Cape Fear River?
- How will the Corps' economic analysis be impacted if the agency cannot beneficially reuse sediment that contains PFAS contamination?

d. Noncomprehensive Groundwater Modeling

We have also raised concerns about the ways this Project could lead to saltwater intrusion into regional aquifers that impact both human communities and wildlife. In particular, harbor deepening projects generally can cause contamination of surface and groundwater. We urged the Corps to meaningfully evaluate these impacts, and the agency has failed to do so here.

At the outset, we call attention to the fact that the groundwater model the agency selected is a "yardstick" model, meaning "it is not precise enough to answer specific, localized questions." [146] Perhaps more significantly, as the Corps admits, the model "was not calibrated to predict salinity changes," and thus "salinity results are uncertain, and saltwater may move at different rates than the model suggests."[147] And to make matters worse, despite the recognition that they can influence groundwater conditions "the model does not simulate daily tidal fluctuations, storm events, or seasonal variations."[148] Despite these fatal flaws, the Corps relies on this model to conclude that salinity impacts to groundwater are "minor" particularly when compared to the threats posed by sea level rise.[149] A model this vague and imprecise cannot be used for a project area this important.[150] Additionally, the groundwater model figures (referenced in Appendix C) are not in the DEIS or attached documents, seriously inhibiting the public's review and analysis of this admittedly fault groundwater model.

Even without the Corps' groundwater model data, it is clear that the DEIS does not fully consider the risk posed by saltwater intrusion into groundwater. The Corps acknowledges that salinity in groundwater is influenced by sea level rise and groundwater pumping, but the agency fails to show how deepening the channel would or would not add additional stress to a degraded groundwater system. Rather, the DEIS assumes that the Cape Fear is a gaining river that would not impact aquifers at all. Communities in this part of the state are well aware this is not always the case. Indeed, one of the main reasons many of the groundwater wells are contaminated with toxic PFAS is because Chemours contaminated the Cape Fear River, and the pollution spreads

[146] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix C: Geology and Geotechnical Engineering at C-15 (2025).
[147] *Id.*
[148] *Id.*
[149] DEIS, *supra* note 1, at 3-68.
[150] *See* Lynker Report, *supra* note 4, at 12; Christian D. Langevin et al., DOCUMENTATION FOR THE MODFLOW 6 GROUNDWATER FLOW MODEL (2017).

from surface water to groundwater.[151] In addition, it is well-documented that coastal rivers like the Cape Fear River can influence groundwater during storm surges and high tides (elements that the Corps' model explicitly did not evaluate).[152]

The DEIS also assumes a static salinity boundary and average seasonal stress over a 50-year period.[153] These assumptions fail to take into account the scenarios where groundwater intrusion are the most likely, such as during prolonged periods of drought and increased pumping during the summer months.[154] By failing to look at seasonal differences, the Corps "obscures the most dangerous scenario: summer conditions when maximum tourist pumping coincides with hurricane season, storm surge, and lowest natural recharge–exactly when breached confining units from deepening would create maximum vulnerability."[155] Ignoring these conditions (by averaging pumping across the seasons), the Corps concludes that deepening Wilmington Harbor will not worsen saltwater intrusion. This is likely false, dangerously disregards the communities who rely on groundwater for drinking water, and ignores threats to wildlife from severe salinity impacts. The DEIS thus inadequately considers risks to groundwater, and the Corps should use more robust modeling to fully consider potential impacts of this Project.

Questions

- Why did the Corps choose the groundwater model used for this DEIS? How does the Corps justify the use of a model that cannot predict site specific impacts?
- Why did the Corps not consider information showing that pollution spreads from the Cape Fear River to groundwater, indicating the river does indeed influence groundwater at times?
- Why did the Corps average seasonal stress to groundwater rather than consider seasonal variations?
- Did the Corps consider and compare impacts from the last deepening on groundwater?

d. Species of Concern

The current discussions in the DEIS and corresponding appendices omit and downplay critical details to understanding the full scope of harms to wildlife. While the DEIS and corresponding biological assessments do acknowledge some adverse effects on listed species, the previously described errors in modeling and other impacts analyses mean that even those staggering effects are likely underestimates. Worse, the Corps fails to disclose necessary

[151] Letter from Sushma Masemore, NC DEQ to Seth Bailey, Chemours Fayetteville Works (July 3, 2025), Attachment 23; Geosyntec Consultants, Assessment of Table 3+ PFAS in New Hanover, Brunswick, Columbus, and Pender Counties at 49 (Sept. 20, 2024), Attachment 24 (explaining that during flood conditions the Cape Fear River can influence groundwater and this is a likely route of groundwater PFAS contamination).
[152] *See* Anner Paldor and Holly A. Michael, *Storm Surges Cause Simultaneous Salinization and Freshening of Coastal Aquifers, Exacerbated by Climate Change*, 57 WATER RESOURCES RESEARCH 1 (2021) (noting that modeling has shown that storm surges cause saltwater to infiltrate into aquifers), Attachment 25.
[153] Lynker Report, *supra* note 4, at 11.
[154] *Id.* at 14.
[155] *Id.*

information about the scope and likely impacts to threatened and endangered species from dredging, and completely omits analysis about other vulnerable species.

i. Effects of Cascading Modeling Errors

As an initial matter, modeling assumptions throughout the DEIS taint the Corps' assessment of species impacts. If more ships will call at the Port than the Corps assumes, that will correspond to greater vessel strike risks as well as additional wake and erosion impacts that harm important habitat. Even if the Corps' assumptions that fewer but larger ships will call at the Port are correct, if the ships that do call at the Port are larger than the design vessel used in the Corps' modeling, those impacts would be correspondingly more severe. As is, ship wakes have directly harmed and washed away migratory waterbird nests—but the DEIS failed to consider such impacts at all. Such underlying flaws and assumptions taint the Corps' consideration of species impacts.

A particularly troubling example is the Corps' cursory dismissal of any harm to the critically endangered magnificent ramshorn, largely based on the Corps' current tidal and groundwater modeling. As described above, those models and consequent conclusions are flawed, meaning the Corps' conclusion that saltwater intrusion into the two lakes where the ramshorn may occur (and which are designated critical habitat) must be revisited as well. Indeed, the U.S. Fish and Wildlife Service recognized when it listed the magnificent ramshorn that dredging and consequent saltwater intrusion have long been threats to the species.[156]

Similarly, the DEIS downplays impacts to migratory waterbirds—including the federally threatened red knot and piping plover—largely based on its coastal erosion models and predictions. As explained in greater detail in the attached Lynker report, these analyses suffer from "critical methodological deficiencies that likely lead to an underestimation of key environmental risks."[157] These include how the Corps used an "uncalibrated model and misleading annualized metrics" to support its conclusion that erosion will decrease.[158] The flaws in that erosion discussion carryover to the consideration of waterbird impacts, which are heavily premised on the belief erosion will decrease. And assumptions about alleged beneficial use of dredged material regardless of its PFAS-contamination status means that those possible "benefits" to birds are likely overstated.

The cascading errors described in preceding sections about hydrodynamic modeling and water quality monitoring also taint the DEIS's consideration of habitat suitability, since those habitat suitability indices were developed based on those modeling results.[159] The habitat suitability indices models also contain their own unfounded assumptions, including completely

[156] Endangered Species Status for Magnificent Ramshorn and Designation of Critical Habitat, 88 Fed. Reg. 56471, 56476 (Aug. 18, 2023).
[157] Lynker Report, *supra* note 4, at 1.
[158] *Id.* at 2.
[159] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix H: Aquatic Habitat Suitability at 2-3 (2025).

removing substrate information for the Atlantic sturgeon models because "spawning habitat substrate is not expected to be impacted by the project."[160] This assumption is never justified and would seem to run counter to the impacts of increased dredging of such substrate and "established evidence that sturgeon eggs require clean gravel or sand for adhesion and oxygenation, and that fine sediment deposition can bury eggs."[161]

ii. Unexplained and Unexamined Dredging Impacts

First, the DEIS fails to indicate *when* dredging for project construction and maintenance will occur—which is critical to understanding the scope of impacts, as the Corps is well aware.[162] Dredging operations during sea turtle nesting season, for example, can be especially harmful as sea turtles approaching beaches to nest are vulnerable to being sucked into and killed by damaging hopper dredges. The Corps should commit to its traditional hopper dredging window of November 1 to April 30 to avoid sea turtle season and the consequent higher risk of sea turtle takes. At a minimum, even if the Corps refuses to adhere to this protective, science-backed seasonal window, the Corps must explain the time of year when the Corps will dredge for project construction in order to understand the consequent harm to sea turtles, sturgeon, and other species that can be maimed and killed by hopper dredges in particular.

Further, neither the DEIS nor the accompanying appendices make any attempt to disclose the number of turtle takes from dredging activities in Wilmington Harbor that has occurred in the past or is likely to occur in the future as a result of project construction. This not a difficult disclosure to make: the Corps has *decades* of its own, directly on-point data about takes of threatened and endangered species during dredging operations at Wilmington Harbor to inform this analysis.[163] Specifically, the Corps maintains the Operations and Dredging Endangered Species System, or "ODESS" website,[164] where it tracks listed species takes from dredging operations. That data shows that between the years of 1994 and 2020, more than 70% of the turtle takes occurred outside of the dredging window.[165] Yet the Corps does not provide or analyze any of this information in the instant documents. The website includes information about the time of year of the dredging and the amounts being dredged, all of which is relevant to understanding possible takes from the proposed project.

Next, the DEIS fails to provide information about the expected incremental increase in regular maintenance dredging as a result of the expanded navigation channel footprint post-construction. While the DEIS offers that maintenance dredging costs are expected to be $14 million annually, there is no information about how the volume of material dredged or the

[160] *Id.* at 12 (Attachment 1: HSI Methodology).
[161] Lynker Report, *supra* note 4, at 15.
[162] *E.g. Cape Fear River Watch v. United States Army Corps of Eng'rs*, 2022 WL 4468268 (E.D.N.C. 2022).
[163] *Id.* at *12 (noting the Corps had "substantial additional evidence in the record" regarding endangered species takes "that could be the subject of more robust analysis regarding potential effects on wildlife").
[164] *Operations and Dredging Endangered Species System (ODESS)*, U.S. ARMY CORPS OF ENG'RS, https://odess.usace.army.mil/ (last visited Nov. 2, 2025).
[165] *See, e.g.*, Letter from Andrew Hutson, Audubon North Carolina, to Emily Hughes, U.S. Army Corps of Eng'rs (Oct. 2, 2020), https://perma.cc/MB4L-BDLV (summarizing ODESS turtle take data).

number of days of dredging will increase during regular maintenance dredging operations post-project. This information about the effects of increased maintenance dredging is necessary to understand the full scope of increased risk to sea turtles, sturgeon, and other marine wildlife.

The Corps also cannot hide increases in expected take due to a larger maintenance dredged area by deferring to the South Atlantic Regional Biological Opinion ("SARBO"). Throughout the DEIS and the accompanying Biological Assessment for NMFS, the Corps refers heavily to the 2020 SARBO. In the DEIS, the Corps repeatedly states that "[i]mpacts from maintenance dredging would remain consistent with the determinations made in the 2020 SARBO . . . ."[166] But the now five-years-old 2020 SARBO never considered a larger Wilmington Harbor's maintenance dredging needs.[167]

Additionally, the SARBO is a programmatic review of a broad geographic scope and nature different than the project-specific analysis the Corps must conduct here.[168] The 2020 SARBO does *not* cover new project construction like the instant expansion. The 2020 SARBO itself admits that it provides only a high level, generalized review that requires later, project-specific review[169] In fact, at one point, the 2020 SARBO even highlights Wilmington Harbor as an example where certain mitigation measures may not be effective (due to its unique characteristics) and may lead to more unobserved sea turtle injuries and deaths, which underscores the need for a thorough project-specific analysis here.[170] Despite this, the Corps relies on the 2020 SARBO's general recommendations in its biological assessment prepared for NMFS—suggesting that they can satisfy the Corps' obligations for this NEPA process.[171] They do not. In this environmental review under NEPA, the Corps must disclose and assess the impacts that would be a direct result of the deepening—including increased risks to threatened and endangered species from project construction and increased maintenance dredging due to the expansion.

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[166] *E.g.*, DEIS, *supra* note 1, at 3-15 (regarding sea turtles), 3-16 (regarding impacts to Giant Manta Ray).
[167] *See* U.S. Army Corps of Eng'rs, *South Atlantic Regional Biological Opinion for Dredging and Material Placement Activities in the Southeast United States* at 17–18 (2020) ("While it is anticipated that activities covered by this Opinion will continue to occur with the same frequency and volume as they have historically . . . .") [hereinafter "SARBO"].
[168] *Id.* at 13 ("NMFS uses programmatic consultations to evaluate the effects of authorizing certain categories of frequently occurring activities . . . where the specifics of any individual future project . . . are not definitely known at the time of the programmatic consultation[.]").
[169] *Id.* at 69 (explaining the Corps must "conduct a project-specific review of all project details to ensure compliance with all applicable PDCs" prior to authorizing an activity under the SARBO).
[170] *Id.* at 330 (explaining how hopper dredging mitigation techniques are ineffective at Wilmington reducing the ability to observe and prevent take of endangered species).
[171] *E.g.* U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix N: Environmental Compliance Documentation at 20 ("The project will follow Project Design Criteria that are included in the SARBO as described by species in Section F.5 below."), 44–45 ("Section 5 identifies the effects that may occur as a result of the activities covered under this assessment in Section F.2, *as described and limited by the PDCs from the 2020 SARBO.*" (emphasis added)).

iii. Missing Species Analyses

The DEIS also fails to account entirely for impacts to specific listed and unlisted but vulnerable species.

As noted in previous comments, the U.S. Fish and Wildlife Service listed the eastern black rail as threatened under the Endangered Species Act ("ESA") in 2020.[172] And yet the DEIS and corresponding FWS consultation appendix do not mention the bird at all. The Eastern black rail is a notoriously secretive marsh bird that has historically been found in the Wilmington area.[173] Indeed, the draft recovery plan for the Eastern black rail indicates that the entire coast of North Carolina—including the Wilmington and Lower Cape Fear area—is within the current range of the Eastern black rail.[174] Under both NEPA and the ESA, the Corps should consider impacts of the harbor expansion to this rare, imperiled bird.

As for species that are not listed under the ESA, the DEIS does little more than provide a list of some species that inhabit the project area and then conclude mammalian species specifically would be able to move away from the destroyed habitat to other nearby habitat, some habitat might be affected by salinity changes, and beach placement would "provide protection to the beach and dune systems."[175] The DEIS makes no mention of what the many non-mammalian species could expect in terms of direct effects, and doesn't address whether there is even suitable adjacent habitat for those mammalian species to move to. Further, the list of species is incomplete and fails to include species that commenters have specifically raised in the past, like the rare skipper,[176] Venus flytrap, or the increasingly imperiled diamondback terrapin, a state-listed Species of Greatest Conservation Need in North Carolina that is known to be threatened by harbor dredging.[177]

Questions

- How much will maintenance dredging needs increase in terms of volume of material dredged and likely days of dredging?
- What environmental window will the Corps adhere to for hopper dredging associated with project construction?
- How many federally protected sea turtles and sturgeon does the Corps anticipate taking as a result of project construction? Does the Corps have species take data from the last deepening, and if so, what does it show?

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[172] *See* SELC, 2023 Early Scoping Comments, *supra* note 3, at 10; SELC, 2024 Scoping Comments, *supra* note 3, at 11.
[173] eBird Range Data, "eBird Screenshot 2025-10-28 111610," Attachment 26 (showing known occurrences in Wilmington area); eBird New Hanover Bird List at 25, Attachment 27.
[174] U.S. Fish & Wildlife Serv., *Draft Recovery Plan for Eastern Black Rail* at Figure 1 (2025), Attachment 28
[175] DEIS, *supra* note 1, at 3-80.
[176] *See* 2023 Scoping Comments, *supra* note 3, at 11; 2024 Scoping Comments, *supra* note 3, at 11.
[177] Theodore Castro-Santos et al., *Assessing risks from harbor dredging to the northernmost population of diamondback terrapins using acoustic telemetry*, 42 ESTUARIES & COASTS 378 (Nov. 29, 2018), Attachment 29.

- Why does the Corps not acknowledge direct loss of migratory birds' eggs and chicks from ship wakes and other project-related impacts?
- Did the Corps consider and compare impacts from the last deepening on habitat and species?

e. Air Quality

The Ports Authority has made repeated statements about growing the Wilmington Port in order to accommodate "growth of cargo volumes, expanding the global coverage of vessel services [and] engaging and supporting state-wide economic development projects."[178] Refrigeration yard and railway expansion projects are already underway.[179] Moreover, the Ports Authority has stated that harbor deepening specifically would result in a more efficient Port that would "attract more import and export business"[180] and has noted that a key objective of the harbor deepening would be to "accommodate recent and anticipated growth in cargo vessel traffic."[181]

As addressed earlier, the Corps' baseline assumption for the Project–that the deepening would not result in an increase of ships or tonnage–is incompatible with statements made by the Ports Authority and other projects being completed at the Port. The baseline assumption of no net growth is also incompatible with the experiences of other southeastern ports that underwent deepening projects. Savannah,[182] Charleston,[183] and Norfolk[184] have all experienced an increase in the amount of cargo and ships after deepening projects were completed. This assumption has led the Corps to the conclusion that this Project "would result in less ships coming into the Wilmington Port, causing indirect effects to air quality by decreasing vessel emissions over

[178] Statements by Stephanie Ayers, Wilmington Urban Area Metropolitan Planning Organization Board Meeting Minutes at 4 (May 29, 2024), Attachment 30.
[179] Mara McJilton, *Port of Wilmington expands refrigeration yard, adds cold treatment facility at Lewis Nursery and Farms to increase imports of fresh produce*, WECT NEWS 6 (Dec. 13, 2023), https://perma.cc/DT76-VNUU, Attachment 31; *and* Emma Dill, *Port's Intermodal Rail Yard Project on Track for 2026 Completion*, WILMINGTONBIZ (May 12, 2025), https://www.wilmingtonbiz.com/ports_intermodal_rail_yard_project_on_track_for_2026_completion/2025/05/12/ports_intermodal_rail_yard_project_on_track_for_2026_completion/26551, Attachment 32.
[180] *Harbor Enhancement*, NORTH CAROLINA PORTS, https://perma.cc/Y77T-9CZM (last visited Oct. 16, 2025).
[181] *Id.*
[182] *Container volumes up 12.5% compared to last year*, GEORGIA PORTS (Feb. 25, 2025), https://perma.cc/WWT6-6ZS3 (noting that Savannah saw an increase of over 600,000 TEUs in one year and the port intends to add three large ship berths to accommodate an increase in large ships calling to the port, all after deepening was completed in 2022), Attachment 33.
[183] Claire Weber, *'Big deal!': Charleston Harbor deepening project complete with final $21.26M funding*, ABC 4, (Aug. 18, 2025), https://abcnews4.com/newsletter-daily/big-deal-charleston-harbor-deepening-project-complete-with-final-2128m-funding-lindsey-graham-south-carolina-port-authority-barbara-melvin-east-coast-wciv-abc-news-4-8-18-2025 (noting that after the deepening project was completed, the Charleston port saw an increase from 25 to 28 services per week), Attachment 34.
[184] Elizabeth Lake, *Port of Virginia channel widening boosts ship traffic*, VIRGINIA BUSINESS (April 30, 2025), https://perma.cc/T9N3-LMXF (noting that the Port of Virginia has seen cargo volume increase by 2% and ship calls increase by 5% since the deepening project only a year prior), Attachment 35.

time."[185] History shows that port deepening projects lead to an increase in traffic. The Corps must square this conclusion with these comparable results at other ports and the Port Authority's own statements on this project. Further, the Corps should model how air quality may be impacted by induced growth caused by this project.

Questions

- How does the Corps reconcile the baseline assumptions of this project—that there will not be an increase of ships into the Wilmington Port—with the history of port expansions in the southeast?
- Similarly, how does the Corps reconcile that this Project will not lead to an increase in ships with the North Carolina Port Authority's advertisement of this project as prompting an expansion of vessels and cargo?

f. Community Impacts and Cultural Resources

The Wilmington and the Lower Cape Fear River region have likely been continually occupied by humans since 10,000 BP (before present).[186] Indigenous people have hunted, farmed, and foraged within the region for millennia. European colonization of the region began in the 16th century, which eventually saw the rise and growth of the Cape Fear region into the Revolutionary War and serving as an important port city during the Civil War.[187] For over 10,000 years, Wilmington and the Lower Cape Fear region have been central locations for cultural and historic moments that have shaped the region. Seven sites along the Cape Fear are currently listed in the National Register of Historic Places.[188] Moreover, archeological research has unearthed countless artifacts that reflect the long history of the Cape Fear.[189] And the Gullah Geechee Cultural Heritage Corridor, a Congressionally designated Natural Heritage Area[190] recognizing the important historic and cultural contributions of the Gullah Geechee people, encompasses the Wilmington area.[191]

Under the National Historic Preservation Act, federal agencies are required to "take into account the effects of their undertakings" on historic resources.[192] Section 106 requires the federal agency to consult with the state historic preservation officer, Indigenous tribes, local governments, and individuals who have an interest in the property.[193] The federal agency must

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[185] DEIS, *supra* note 1, at 3-71.
[186] *Id.* at 3-30.
[187] *Id.*
[188] *National Register Database and Research*, NAT. PARK SERV., https://perma.cc/5XE6-E3QD (last visited Oct. 28, 2025); *see also* DEIS, *supra* note 1, at 3-32.
[189] *See, e.g., Archaeologists discover four at-risk shipwrecks on colonial waterfront at Brunswick Town/Fort Anderson Historic Site*, ECU (Aug. 4, 2025), https://perma.cc/9PSK-59HE.
[190] 54 U.S.C. § 120102 (b).
[191] *Gullah Geechee Cultural Heritage Corridor*, NAT. PARK SERV., https://www.nps.gov/places/gullah-geechee-cultural-heritage-corridor.htm (last visited Oct. 31, 2025); *Who we are*, GULLAH GEECHEE CULTURAL HERITAGE CORRIDOR, https://perma.cc/KHN6-E5WT (last visited Nov. 3, 2025).
[192] 36 C.F.R. **§** 800.1(a).
[193] *Id.* **§** 800.2(c).

first identify the historic properties[194] and then assess whether their project will result in adverse effects to that property.[195] Agencies typically do this as part of their NEPA review, which then gives the public an opportunity to review and comment on the affected historic resources.

Here, however, the Corps has not yet identified the historic properties nor conducted any review of potential effects to these resources because of alleged "[b]udget and schedule constraints."[196] The Corps has instead deferred the requirements of the NHPA to the pre-construction, engineering, and design phase.[197] Doing so, however, deprives the public of an opportunity to provide meaningful feedback on possible effects to historic resources. Once the Corps has completed the required review and consultations, it should disclose the results to the public with an opportunity for comment.

Further, the Corps has failed to acknowledge possible impacts to the Gullah Geechee Cultural Heritage Corridor. When Congress established the Corridor, it directed federal agencies to consult with the National Park Service and the Gullah Geechee Cultural Heritage Corridor Commission when "conducting or supporting activities directly affecting the Heritage Corridor."[198] We urge the Corps to engage in the necessary coordination to ensure the project "will not have an adverse effect on the Heritage Corridor."[199]

Finally, the Corps should consider impacts to lower income and communities of colors surrounding the Wilmington Harbor. All of the census tracts bordering the Port, particularly those east of the Cape Fear River, rank "high" on CDC's social vulnerability index, with high rates of poverty and high rates of uninsured.[200] Most of these census tracts also rank high on the health vulnerability index. The census tract south, downstream of the Port, has a high prevalence of asthma, coronary heart disease, and diabetes.[201] The communities in this area are burdened with dozens of existing polluting facilities, including multiple pre-regulatory landfill sites and dozens of hazardous waste sites.[202] Numerous air polluting facilities operate or store materials nearby, including asphalt and cement companies, oil and gas companies, and a wood pellet manufacturer.[203] Due to these cumulative impacts and vulnerabilities, the Corps should consider, at a minimum, the disproportionate impacts to these communities from increased land-based

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[194] *Id.* **§** 800.4(b).
[195] *Id.* **§** 800.5.
[196] DEIS, *supra* note 1, at 3-32.
[197] *Id.*
[198] National Heritage Areas Act of 2006, Pub. L. No. 109-338, § 295H, 120 Stat. 1783.
[199] *Id.*
[200] *See Place and Health – Geospatial Research, Analysis, and Services Program (GRASP)*, ATSDR, https://www.atsdr.cdc.gov/place-health/php/eji/eji-explorer.html (last visited Oct. 31, 2025) (search 2202 Burnett Blvd, Wilmington, NC, 28401 into left-hand search box; click through census tracts around port).
[201] *See id.*
[202] *See Environmental*, N.C. ENV'T JUSTICE HUB, https://perma.cc/W5RL-D4F5 (last visited Oct. 31, 2025) (turn on all layers; search 2202 Burnett Blvd, Wilmington, NC, 28401 into the right-hand search box; click colored parcels that appear on map).
[203] *Id.*

traffic, toxic air pollution, water quality impacts, and potential displacement as a result of induced growth from the harbor expansion.[204]

Questions

- Why didn't the Corps delay publication of the DEIS until it could complete the required National Historic Preservation Act consultation and provide the public an opportunity to provide feedback during this NEPA process?
- Why did the Corps not consider how the expansion might affect the Gullah Geechee Cultural Heritage Corridor?

VII. The DEIS Provides Inadequate Mitigation Measures Under the Water Resources Development Act

The Water Resources Development Act ("WRDA") requires that "any water resources project" submitted to Congress for authorization must contain "a recommendation with a specific plan to mitigate for damages to ecological resources, including terrestrial and aquatic resources, and fish and wildlife losses created by such project" or a determination that the project will not negatively impact "ecological resources."[205] Mitigation plans must contain, "at a minimum," (1) a monitoring plan to ensure the success of the mitigation, (2) "the criteria for ecological success," (3) what land will be acquired for the mitigation plan, (4) the "types and amounts" of restoration to be done and the "functions and values" that will result, and (5) a contingency plan should the mitigation be ineffective.[206] Corps guidance further states that mitigation should be designed so that a project plan "will not have more than negligible adverse impacts on ecological resources."[207] Here, the DEIS proposes four mitigation sites for "unavoidable wetland and aquatic impacts."[208]

a. The mitigation measures are insufficient to address wetland loss and conversion.

If a project is expected to impact wetlands, Corps guidance urges that wetland impacts be "fully mitigated" with a goal of "no net loss to wetlands."[209] At the outset, the Corps' calculations make unfounded assumptions that the number of wetlands lost by this project will be precisely cancelled out by wetlands gained elsewhere.[210] The Corps calculates that the loss of 1,275 acres of tidal fresh and oligohaline wetlands will be conveniently replaced by 1,276 acres of mesohaline, polyhaline, and euhaline wetland types.[211] Given the rapid development in the

[204] *See* SELC, 2023 Early Scoping Comments, *supra* note 3, at 12.
[205] 33 U.S.C. § 2283 (d)(1).
[206] Water Resources Development Act, Pub. L. No. 110-114, §§ 2036(b)(i)–(v) (2007).
[207] Planning Guidance Notebook, *supra* note 80, at C-15 to C-16 (2000).
[208] DEIS, *supra* note 1, at 2-19.
[209] *Planning Guidance Notebook*, *supra* note 80, at C-17.
[210] DEIS, *supra* note 1, at 3-56.
[211] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix I: Wetland Impact Assessment and 404(b)(1) at I-6 (2025).

area, sea level rise, and impacts from climate change at large, it cannot be assumed that wetlands will easily replace themselves as the Corps' calculations assume.

Even accepting this dubious assumption that there will be no net loss in total wetlands, the Corps' own calculations show a stark loss of wetland types important for fish and biological diversity and a loss in functional value.[212] The transition to higher salinity wetland types is linked to an increase in invasive species (such as phragmites), a decrease in native species, and a decrease in regeneration and recruitment of fish.[213] The Corps' presented mitigation efforts, however, are insufficient to address this projected conversion and the cascading effects that would accompany it.

The DEIS presents two primary mitigation strategies and sites: conservation of the Black River corridor and habitat restoration and enhancement of Eagle Island/Alligator Creek.[214]

First, the Corps proposes to conserve 553 acres of old-growth swamp forest in the Black River Corridor.[215] While we acknowledge that the preservation of old-growth forest is vitally important for habitat connectivity and water quality, the proposal suffers from two primary deficiencies. One, the acreage conserved is insufficient given the loss of over 1,000 acres of freshwater wetlands, even when combined with the restoration and enhancement measures described below. Additionally, the Corps does not present criteria for ecological success as required by WRDA for mitigation plans. Instead, the Corps states that criteria is not needed because "mitigation is restricted to the preservation of wetlands."[216] We urge the Corps to create criteria that can aid in the most effective conservation of the Black River Corridor.

The DEIS also presents Eagle Island/Alligator Creek as a restoration and enhancement site of approximately 120 acres. One strategy presented is the removal and replacement of phragmites, an invasive and aggressive reed grass that displaces native plant species. There are several deficiencies with this proposal. Although the site is approximately 500 acres and contains roughly 300 acres of phragmites-dominant wetlands, the DEIS mitigation strategy is the removal of phragmites in an approximately 24-acre area of the site.[217] Given how aggressively phragmites can regrow, it is highly unlikely the removal of only a small portion of the plant's footprint at the site will be successful.

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[212] *Id.* at I-15.
[213] *Id.* at I-16.
[214] DEIS, *supra* note 1, at 2-19.
[215] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix M: Wetland and Fish Passage Mitigation Plan at M-27 (2025).
[216] *Id.* at M-49.
[217] *See id.* at M-23 (stating that the Eagle Island/Alligator Creek site "comprises 588 acres across five parcels. . . . and consists of approximately 384 acres of Phragmites marsh.") and DEIS, *supra* note 1, at 3-28 (noting that the "removal of approximately 24 acres of low quality, invasive phragmites stands and replacement with tidal pools and native vegetation" would have "beneficial incidental impacts.").

Moreover, the mitigation strategy envisions subsequent herbicide treatments to control phragmites returning.[218] To begin with, neither the DEIS nor the Appendix provide any information as to the type of herbicide that will be applied to the site. Herbicide can be harmful to ecosystems; especially given that the site could be utilized by sensitive species like the piping plover, red knot, and American alligator,[219] the Corps must provide further information on the herbicide that may be applied on the site.

Further, the DEIS and Mitigation Appendix state that the herbicide will be "reapplied as necessary,"[220] but details buried in an attachment to the Mitigation Appendix estimate the cost based solely on two herbicide applications being conducted one year apart.[221] This reapplication schedule would be insufficient to control the spread of phragmites in the site. The mitigation plan should take a long-term, holistic view of phragmites control into account in order to appropriately design and estimate the costs of this project and meet the requirements of WRDA. Finally, the Appendix also fails to provide a plan should the mitigation efforts be unsuccessful—an important requirement of WRDA. As such, the Corps must develop a robust contingency plan should the mitigation strategy fail.

The mitigation measures for wetland loss are not adequate to address the loss of ecologically more functional wetlands within the range of the project. Nor do these mitigation measures satisfy the Corps' objective of "no net loss of wetlands" when developing mitigation strategies.[222] Thus, the Corps should consider more robust, effective mitigation measures for wetland conversion that will truly result in no net loss of wetlands.

b. The mitigation measures are insufficient to address impacts to aquatic resources.

The other two sites, Lock and Dam 1 & 2 Fish Passages, are aquatic habitat improvement sites intended to mitigate impacts to "primary and secondary nursery habitats, essential fish habitat, and critical habitat."[223] The Corps calculates that this project will result in a 4.5% net decrease in available habitat for important fish species, including the Atlantic sturgeon, blueback herring, and the striped bass.[224] To offset some of the harms to fish species that actually are acknowledged in the DEIS, the Corps includes mitigation plans that would involve creating fish passage structures at the first two dams on the Lower Cape Fear River.

While we appreciate the possibility of facilitating fish passage around these barriers to natural fish migration, the DEIS and accompanying appendix only provides very high-level review and design concepts that call into question the efficacy of the proposed measures—and fail to meet the requirements of preparing mitigation plans under WRDA. It's not clear that the

[218] Appendix M, *supra* note 215, at M-44.
[219] *Id.* at C.3 (Appendix C).
[220] *Id.* at M-44.
[221] *Id.* at C.3 (Appendix C).
[222] *Planning Guidance Notebook*, *supra* note 80, at C-17.
[223] DEIS, *supra* note 1, at 2-20; Appendix M, *supra* note 215, at M-10.
[224] Appendix M, *supra* note 215, at M-20 (Table 9).

Corps even did any field work to assess the feasibility of the proposed bypass measures. And the Corps does not provide any analysis to establish the proposed measures would be appropriate for all target species. The Corps cannot ensure the likely success of these proposed bypass measures if it does not demonstrate whether these measures would even work.

Even so, the limited design details raise questions as to their functions and value. For example, for Lock and Dam 1, the Corps proposes to use an existing ditch that enters the river several thousand feet downstream of the dam that would then connect to the proposed bypass structure upstream of the dam. But the Corps apparently does not even know if the target fish species swim into the ditch,[225] calling into question whether fish would even use the bypass, especially since the entry would be several thousand feet downriver from the dam. It is also not clear how deep the bypass would be, which is a critical consideration for sturgeon which are benthic and require deeper waters to travel.

The Corps seems to be taking an approach of building the aquatic mitigation measures first and seeing if they will even work later, rather than creating a mitigation plan that is designed for success from the start. For example, the proffered ecological success criteria—"evidence of target species using bypass channel" and "the rock rapid structure"—are aimed at a threshold question of whether these are even viable mitigation measures to consider. Further, they contain no connection back to the quantified "lost functions and values of the habitat", [226] any consideration of *how many* fish would be using the measure, or even whether the measures will successfully enable and encourage fish to travel upstream.[227] In other words: as drafted, spotting a single sturgeon in the bypass channel might meet this criterion.

The Corps should conduct appropriate field review in addition to providing additional design details and reasons about why they believe the proposed measures would actually benefit sturgeon, shad, bass, and other target fish species.

Questions

- Why did the Corps decide to provide wetland mitigation that did not equal the number of wetlands projected to be lost due to the Project?
- What type of herbicide would be used in the phragmites treatment area?
- Why does the phragmites mitigation plan only include 24 acres of a 500-acre area?
- Given how aggressive phragmites grow, why do the calculations for the cost of the mitigation area only include two years of treatment?

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[225] *Id.* at M-39 (stating without any elaboration that "it is assumed the target species are already swimming into the ditch from the river.").
[226] *See* 33 U.S.C. § 2283(d)(3)(B) ("the criteria for ecological success by which the mitigation will be evaluated and determined to be successful based on replacement of lost functions and values of the habitat, including hydrologic and vegetative characteristics").
[227] 33 U.S.C. § 2283 (d)(3)(B)(v)(III) (mitigation plans must contain a description of "the functions and values that will result from the plan").

- Why did the Corps not include ecological success criteria for the Black River Corridor site?
- Did the Corps conduct any studies as to whether target fish species would use the proposed fish passages?

VIII. Conclusion

The Draft Letter Report and Draft EIS reveal that this project is likely infeasible, unnecessary, and extraordinarily damaging to the environment. The costs of this harbor expansion continue to climb as the alleged need and purported benefits simultaneously dwindle. On top of the questionable economic considerations, the project would come with a host of permanent harms to the natural environment of the Lower Cape Fear, cherished by locals and tourists alike. As the DEIS acknowledges, "unacceptable" effects include "adverse impacts that would not be tolerated by regulatory agencies, the local community, or society in general."[228] Between the meager, unjustified project benefits and the burden to local communities from flooding and other environmental damage, this project is hardly "acceptable." The Corps must go back to the drawing board to justify the escalating costs of the project against the questionable benefits and rectify the many errors and omissions in the economics and environmental analyses identified above. The stakes are too high to push forward this damaging and expensive project without that thorough, honest assessment.

We appreciate the opportunity to provide comments regarding the proper scope for the Corps' NEPA analysis and 403 Letter Report. We look forward to remaining engaged with the Corps and other agencies through the environmental review process. If you have any questions regarding this letter, please contact us at 919-967-1450 or *hnelson@selc.org*.

Sincerely,

Hannah Nelson Jessica Hardee Ramona H. McGee

Southern Environmental Law Center
136 E. Rosemary Street, Suite 500
Chapel Hill, NC 27514

[228] DEIS, *supra* note 1, at 2-3.

On behalf of:

Audubon North Carolina
Zach Wallace | Policy Director

Cape Fear River Watch
Kemp Burdette | Cape Fear Riverkeeper

Center for Biological Diversity
Will Harlan | Southeast Director

CleanAIRE NC
Jeff Robbins | Executive Director

Defenders of Wildlife
Ben Prater | Southeast Program Director

League of Women Voters of Lower Cape Fear
Beth Hansen | Environment Chair

North Carolina Coastal Federation
Kerri Allen | Coastal Management Program Director

North Carolina Conservation Network
Grady McCallie | Policy Director

North Carolina NAACP
Deborah Maxwell | President

North Carolina Sierra Club
Erin Carey | State Conservation Policy Director

Cc:

Justin McCorcle, District Counsel, U.S. Army Corps of Engineers,
justin.p.mccorcle@usace.army.mil

Brian Clark, Executive Director, N.C. State Ports Authority
brian.clark@ncports.com

Tancred Miller, Director, Division of Coastal Management, NC DEQ
tancred.miller@deq.nc.gov

Daniel Govoni, Federal Consistency Coordinator, Division of Coastal Management, NC DEQ
daniel.govoni@deq.nc.gov

Richard Rogers, Director, Division of Water Resources, NC DEQ
richard.rogers@deq.nc.gov

Marc Recktenwald, Director, Division of Mitigation Services, NC DEQ
marc.recktenwald@deq.nc.gov

Kathy Rawls, Director, Division of Marine Fisheries, NC DEQ
kathy.rawls@deq.nc.gov

Kyle Briggs, Executive Director, NC Wildlife Resources Commission
kyle.briggs@ncwildlife.org

Jennifer M. Archambault, Acting Field Supervisor, US Fish and Wildlife Service
jennifer_archambault@fws.gov

Pace Wilber, Acting Assistant Regional Administrator and Atlantic and Caribbean Branch Chief, NOAA Fisheries
pace.wilber@noaa.gov

Dennis Klemm, Branch Chief/Sea Turtle Recovery (Acting Assistant Regional Administrator/Protected Resources), NOAA Fisheries
dennis.klemm@noaa.gov

Attachments available at the following links:

- Attachments for SELC's 2025 DEIS Comments:
https://southernenvironment.sharefile.com/d-s22d1dc0b55564813bf2147d6e6e7873b

- Attachments for SELC's 2024 Scoping Comments:
https://southernenvironment.sharefile.com/d-s14b473447fbb4d0d8bf582eba0dd30e2

- Attachments for SELC's 2023 Early Scoping Comments:
https://southernenvironment.sharefile.com/d-sfbe078fed9234ccdb28ffbe5733a4773

- Attachments for SELC's 2019 Scoping Comments are provided in Attachment 1 of this letter.

SOUTHERN ENVIRONMENTAL LAW CENTER

136 East Rosemary Street, Suite 500
Chapel Hill, NC 27514

Telephone 919-967-1450
Facsimile 919-929-9421

December 19, 2025

Submitted via electronic mail

Cameron Luck
Federal Consistency Coordinator
Division of Coastal Management
North Carolina Department of Environment Quality
400 Commerce Avenue
Morehead City, NC 28557
Federalconsistencycomments@deq.nc.gov
cameron.luck@deq.nc.gov

Re: Comments on Federal Consistency Review for the U.S. Army Corps of Engineers' Wilmington Harbor 403 Navigation Project

Dear Mr. Luck:

The Southern Environmental Law Center ("SELC") submits these comments on behalf of Audubon North Carolina, Cape Fear River Watch, Center for Biological Diversity, CleanAIRE NC, Defenders of Wildlife, NAACP North Carolina State Conference, North Carolina Coastal Federation, North Carolina Conservation Network, and North Carolina Sierra Club, to assist in the N.C. Department of Environmental Quality-Division of Coastal Management's ("DCM") determination of whether the U.S. Army Corps of Engineers' ("Corps") Wilmington Harbor 403 Navigation Project ("the Project") is consistent with the North Carolina coastal management plan ("CMP").[1] As explained throughout the letter, the Project conflicts with the State's CMP in several critical ways, and DCM should object to the Corps' determination.

The Corps proposes an economically infeasible and wholly unnecessary project that could devastate the natural resources that make coastal North Carolina unique. The Project has drawn broad opposition, as evidenced by resolutions issued by Southport,[2] the Village of Bald Head Island,[3] and Kure Beach,[4] and by the unanimous community opposition at the public hearing held by DCM. And it is no wonder why. For the mere purpose of saving shipping

[1] *See* Letter from Bret Walters, U.S. Army Corps of Eng'rs, to Cameron Luck, N.C. Division of Coastal Mgmt. (Sept. 18, 2025) [hereinafter Consistency Determination Letter]. According to N.C. DEQ staff, while the letter is dated September 18, 2025, DCM did not receive the Corps' consistency determination until October 17, 2025.
[2] *See* City of Southport, Resolution #25-1202.01: A Resolution of the Southport Board of Aldermen Urging Robust Mitigation, Long-Term Monitoring, and Adaptive Management For the Wilmington Harbor 403 Project (Dec. 2, 2025), https://perma.cc/693K-U8JS.
[3] Village of Bald Head Island, Resolution #2025-1207: A Resolution of the Village of Bald Head Island Council Urging Robust Mitigation, Long-Term Monitoring, and Adaptive Management for the Wilmington Harbor 403 Project (Dec. 12, 2025), https://perma.cc/H6QP-RH5L.
[4] Town of Kure Beach, Resolution R25-12: Resolution Urging Robust Mitigation, Long-Term Monitoring, and Adaptive Management for the Wilmington Harbor 403 Project (Dec. 15, 2025), https://perma.cc/DAG2-D4CA.

companies an unidentified amount of money, the Corps proposes to destroy more than 1,000 acres of wetlands, risk harm to threatened and endangered species, threaten groundwater quality, and increase coastal and riverine erosion—all while exacerbating the effects of sea level rise in the Wilmington area. Our organizations highlighted these and other harms that would likely result from this proposed expansion in comments submitted to the Corps on November 3, 2025 on its Draft Environmental Impact Statement ("DEIS"), which are incorporated by reference.[5]

As enshrined in our Coastal Area Management Act, "[a]mong North Carolina's most valuable resources are its coastal lands and waters,"[6] and the Lower Cape Fear River system is no exception. It encompasses estuarine, brackish, and freshwater ecosystems, forming a delicate interface between saltwater and freshwater habitats. When healthy, the river supports robust fish populations and provides important habitat for threatened and endangered species such as piping plovers, red knots, Atlantic and shortnose sturgeon, and several species of sea turtles. Near the Port, barrier islands, tidal creeks, and marshes support recreational and commercial fisheries and offer irreplaceable natural beauty. To protect these critical coastal resources, and to ensure compliance with the State's CMP, we urge DCM to object to the Corps' consistency certification and find that the Project is inconsistent with the enforceable policies of the State's CMP, including for the following reasons:

- The Project would exacerbate the impacts of sea level rise on coastal resources and communities, leading to increased flooding and reduced ecosystem resiliency;
- The Project would adversely impact the State's fisheries by destroying wetlands and other nursery habitat and exposing juvenile fish to toxic chemicals;
- The Project would threaten areas of environmental concern including coastal wetlands, estuarine waters, and public trust areas;
- The Project would harm wildlife resources, including threatened and endangered species, by increasing salinity upstream of the project area, increasing erosion in habitat areas, and exposing wildlife to the risks associated with increased amounts of maintenance dredging; and
- The Project's economic and ecological costs outweigh any purported benefits.

I. The Coastal Zone Management Act Requires DCM to Prioritize the Protection of the State's Coastal Resources When Making a Consistency Determination.

The federal Coastal Zone Management Act of 1972 ("CZMA") was created by Congress to encourage states to develop coastal planning programs that "will preserve, protect, and restore the environment of their coastal zones."[7] Congress found, among other things, that there are

[5] Letter from Hannah Nelson et al., SELC, to U.S. Army Corps of Engr'rs (Nov. 10, 2025), Exhibit 1 [hereinafter SELC, DEIS Comments].
[6] N.C. Gen. Stat. § 113A-102(a).
[7] *Shanty Town Assocs. Ltd. P'ship v. EPA*, 843 F.2d 782, 793 (4th Cir. 1988); *see also* 16 U.S.C. § 1452, *AES Sparrows Point LNG, LLC v. Smith*, 527 F.3d 120, 123 (4th Cir. 2008); *City of Sausalito v. O'Neill*, 386 F.3d 1186,

"important ecological, cultural, historic, and esthetic values in the coastal zone," and "habitat areas of the coastal zone…are ecologically fragile and consequently extremely vulnerable to destruction by man's alterations."[8] Thus, the CZMA contains clear policy directives including to "preserve, protect, and where possible, [] restore or enhance" coastal resources; and to encourage states to develop CMPs that "achieve wise use" of coastal resources while giving "full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development."[9]

Coastal states have "substantial and significant interests in the protection, management, and development" of resources in the exclusive economic zone that are best served by state involvement in plans that impact coastal resources, as well as the development of state CMPs.[10] Accordingly, the CZMA applies to any activity within a state's coastal zone that may reasonably affect any coastal resource or coastal use and requires that such activity be consistent "to the *maximum extent practicable*" with the State CMP.[11] The maximum extent practicable means "fully consistent with the enforceable policies of management programs."[12]

North Carolina's CMP is comprised of the N.C. Coastal Area Management Act ("CAMA") and the rules promulgated thereunder, the N.C. Dredge and Fill Law, the Coastal Resources Commission ("CRC") regulations, and local land-use plans of the State's coastal counties and municipalities. The State's CMP also incorporates by reference the Coastal Habitat Protection Plan ("CHPP")[13] and the Fisheries Reform Act,[14] which provide vital protections for endangered species, coastal habitat, and the State's fisheries, respectively.[15]

CAMA establishes the State's goal to "preserv[e] and manag[e] the natural ecological conditions" of the coastal resources, to "safeguard and perpetuate their natural productivity," and to insure "the orderly and balanced use and preservation of [the State's] coastal resources on behalf of the people of North Carolina and the nation."[16] CAMA includes clear requirements

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1201 (9th Cir. 2004) ("The purpose of the Coastal Zone Management Act ("CZMA") is to "preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations.'"); *Friends of the Earth v. U.S. Navy*, 841 F.2d 927, 935 (9th Cir. 1988) ("The Coastal Zone Management Act (CZMA) was enacted to encourage wise use of coastal resources through state adoption and implementation of management programs for the coastal zone.").

[8] 16 U.S.C. §§ 1451(d)–(e).

[9] *Id.* §§ 1452(1)–(2).

[10] *Id.* § 1451(m).

[11] *Id.* § 1456(c)(1)(A) (emphasis added); *see also* 15 C.F.R. § 930.30 ("The provisions of this subpart are intended to assure that all Federal agency activities including development projects affecting any coastal use or resource will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of approved management programs."); *Shanty Town Assocs. Ltd. P'ship*, 843 F.2d at 793 ("Once a state has an approved management plan in place, the Act requires all federal agencies that conduct or support activities directly affecting the coastal zone to see that those activities are carried out in a way which is, to the maximum extent practicable, consistent with that state plan.").

[12] 15 C.F.R. § 930.32(a)(1).

[13] N.C. DEQ, North Carolina Coastal Habitat Protection Plan Amendment (2021), https://perma.cc/7B57-DDKY [hereinafter NC CHPP].

[14] Fisheries Reform Act of 1997, 1997 N.C. Laws 400.

[15] *See, e.g.*, 15A N.C. Admin. Code 7H.0501 (referencing natural and cultural resource areas, including endangered and threatened species and their habitat), 7H.0506 (referencing coastal complex natural areas, which support endangered and threated species).

[16] N.C. Gen. Stat. § 113A-102(b).

about when DCM must not approve a project,[17] which are expanded upon in the relevant CRC regulations. The State's Dredge and Fill Law similarly lists out circumstances under which DCM may not allow a project to proceed, including when "there will be significant adverse effect of the proposed dredging and filling on the use of the water by the public," "there will be significant adverse effect on the value and enjoyment of the property of any riparian owners," and when "there will be significant adverse effect on wildlife or fresh water, estuarine or marine fisheries."[18]

As a steward of the State's natural resources, DCM must be guided by both state and federal policy directives, as well as *all* implementing provisions of the State's CMP when making its consistency determination. As detailed below, the Project would damage coastal resources—contrary to these state statutes, regulations, and policies established to protect the State's special coastal resources.

II. Errors From the Corps' DEIS Inhibit DCM's Ability to Make an Informed Consistency Determination.

In its consistency determination, the Corps relies on the analyses in the DEIS prepared under the National Environmental Policy Act ("NEPA"). The DEIS problematically depended on flawed and unjustified assumptions that mask—or even entirely alter—the true impacts associated with the proposed expansion of Wilmington Harbor. Incorporating those assumptions into the consistency determination creates a chain of compounding errors that prevent DCM from fully evaluating whether the Project is consistent with North Carolina's CMP.

For example, the Corps concludes without any basis that fewer ships will enter the Port if Wilmington Harbor is expanded.[19] This will result in transportation efficiencies because—as the Corps assumes—the shipping companies will bring the same amount of cargo with less frequent visits on larger ships.[20] But the agency does not provide evidence that this can or will ever happen.[21] Currently, all Asia/USEC services are provided on a weekly basis and each of these vessels follow a multiport rotation, with Wilmington included as a mid-port.[22] If the Corps is to assume that fewer vessels are calling in Wilmington, there must be a similar assumption that fewer vessels will call at Savannah, Charleston, or any other port within Wilmington's rotation. The DEIS does not explain how that pattern will (or even could) change. To the contrary, the DEIS explicitly states that "modifications to the channel framework at Wilmington alone will not

[17] *Id.* § 113A-120(a).
[18] *Id.* § 113-229 (e).
[19] *See* SELC, DEIS Comments, *supra* note 5, at 7–9.
[20] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Draft Environmental Impact Statement Wilmington Harbor Navigation Project, North Carolina, EISX-202-00-K7P-1755163795 at 2-7 (Sept. 12, 2025) [hereinafter DEIS].
[21] *See generally* U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report: Attachment 5 – Economic Considerations at 59 (Sept. 5, 2025) (failing to provide an explanation for how vessel traffic will shift based on the change in loading more cargo onto fewer shifts) [hereinafter Economic Considerations]; *see also* SELC, DEIS Comments, *supra* note 5, at 7–9.
[22] *See, e.g.*, *Transpacific Services Update – Amberjack & Emerald*, MSC (Feb. 19, 2023), https://perma.cc/J6VA-A6MW (showing historic route of EC2 indicating that Wilmington is a middle port of call).

be sufficient to cause changes in the vessel fleet servicing the U.S.,"[23] signaling that deepening Wilmington Harbor will not change the type or rotation of vessels calling to the east coast.

Relying on the unjustified conclusion that shipping companies will send more cargo on less ships has serious consequences for the Corps' environmental analysis and consequently DCM's consistency determination. Throughout the DEIS and its consistency document, the Corps minimizes environmental impacts of the Project by claiming that fewer vessels will be traversing the channel leading to less environmental damage. For instance, the Corps concluded that the stress put on river shorelines from vessel wakes would be reduced when compared to the no action alternative because fewer ships would be passing through the channel and therefore creating less wakes.[24] The Corps also determined that air emissions would decrease under the deepening alternatives because less vessel traffic would result in less air pollution.[25] And the Corps predicted that certain species would be at less risk of vessel strikes due to less frequent traffic.[26] As it stands, the Corps has not explained its assumption that shipping companies will consolidate more cargo onto less ships, which taints the DEIS's discussion of environmental impacts, and thus prohibits a thorough consistency review by DCM.

Unfortunately, other errors in the DEIS provide compounding consequences here. For instance, the agency modeled wake and erosion impacts using a vessel that is *smaller* than those that currently call to the Port. The proposed expansion is purportedly being sought to allow for the use of large Post-Panamax ships, a class of ships that can hold up to 15,000 twenty-foot equivalent units ("TEUs").[27] The Corps notes that Wilmington is already accommodating Post-Panamax III ships "at the present time" that can be loaded to 14,220 TEUs.[28] Nevertheless, the agency modeled wake and erosion impacts using a 12,400 TEU vessel. Doing so severely minimizes the erosive force on the river's shoreline, resulting in an underestimation of sediment impacts, the need for routine maintenance dredging, and any accompanying wildlife concerns.[29]

Additionally, the Corps ignored groundwater impacts by selecting a "yardstick" model, which the Corps admits means that "it is not precise enough to answer specific, localized questions." [30] The model "was not calibrated to predict salinity changes"—thus "salinity results are uncertain, and saltwater may move at different rates than the model suggests."[31] To make matters worse, despite the recognition that they can influence groundwater conditions "the model does not simulate daily tidal fluctuations, storm events, or seasonal variations."[32] Nevertheless, the Corps relied on the model to determine groundwater impacts will be "minor."[33] And even this

[23] Economic Considerations, *supra* note 21, at 59.
[24] DEIS, *supra* note 20, at 3-23; Consistency Determination Letter, *supra* note 1, at 14.
[25] DEIS, *supra* note 20, at 3-70.
[26] *Id.* at ES-3, 3-89.
[27] Economic Considerations, *supra* note 21, at 23.
[28] *Id.* at 26.
[29] SELC, DEIS Comments, *supra* note 5, at 18–19; Lynker Corp., Wilmington Harbor Navigation Improvement Project Draft Environmental Impact Statement Technical Review at 4 (Oct. 30, 2025), at 1–3, provided as Attachment 4 to Exhibit 1 [hereinafter Lynker Report]
[30] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix C: Geology and Geotechnical Engineering, at C-15 (2025).
[31] *Id.*
[32] *Id.*
[33] DEIS, *supra* note 20, at 3-68.

failure pales in comparison to the Corps' absolute refusal to evaluate whether per- and polyfluoroalkyl substances ("PFAS" or "forever chemicals") are present in the sediment that will be dredged up and beneficially used in the lower estuaries and bird islands.[34] The agency assumes that all material can be beneficially reused and that it will not harm fish, birds, or other exposed wildlife.[35] That might not be certain, but the agency did not even look at existing information, much less collect its own.[36]

Modeling assumptions made throughout the DEIS corrupt the Corps' determination that impacts to coastal resources will be consistent with the State's CMP. While many of these are discussed in greater detail below, we call out these compounding errors to encourage DCM to request the additional data, revised models, or other evidence necessary to make an informed decision. If the Corps cannot provide such information, DCM must find the Project inconsistent with the State's CMP.

III. The Wilmington Harbor 403 Navigation Project Would Result in Significant Impacts to the State's Coastal Resources and is Inconsistent with the State's CMP.

The proposed expansion of Wilmington Harbor violates or otherwise implicates multiple provisions of the CMP (many of which the Corps' consistency determination did not acknowledge), including provisions of the CAMA, N.C. Gen. Stat. §§ 113A-102(b), 113A-120(a), 113A-113; sections of the N.C. Dredge and Fill Law, N.C. Gen. Stat. § 113-229(e); the CHPP, and multiple CRC Regulations, 15A N.C. Admin. Code 07H.0203, .0205, .0206, .0207, .0208, .0209, .0303, .0312, .0505, .0506, .0701, .1805; 15A N.C. Admin. Code 07M.0701.

a. <u>The Project will exacerbate the impacts of sea level rise.</u>

North Carolina has integrated resiliency considerations into its CMP, in particular through its Coastal Habitat Protection Plan.[37] In that plan, the State has acknowledged that coastal resources like wetlands, dunes, and coastal forests are critical for protecting wildlife and communities from the changing climate.[38] As the CHPP explains, "[i]mpacts from climate change including sea level rise (SLR) will affect all coastal habitats and species throughout NC,"[39] and "repeated impacts and compounding losses from the effects of climate change . . . can be catastrophic not only to the coastal communities, but to the coastal habitats and the ecosystem services they support."[40]

New Hanover County too has recognized storm surge and flooding have a "great effect on the natural environment, which can include the change of the physical landscape as a result of erosion and sand migration."[41] The county acknowledges that these impacts threaten natural

[34] *Id.* at 3-7.
[35] *Id.* at 3-58.
[36] SELC, DEIS Comments, *supra* note 5, at 10, 20.
[37] *See* NC CHPP, *supra* note 13, at 29–38.
[38] *Id.* at 31.
[39] *Id.* at 29.
[40] *Id.* at 30.
[41] New Hanover County, *Comprehensive Plan 2016* (Nov. 30, 2016), at PDF 74 [hereinafter New Hanover County Land Use Plan].

habitats and could lead to the destruction of homes, businesses, and major infrastructure.[42] Recognizing that existing coastal resources are both susceptible to climate change and valuable tools in maintaining healthy watersheds and habitats, the county has made it a goal to "promote environmentally responsible growth" and "conserve environmentally critical areas."[43]

Despite the importance of ensuring resilient ecosystems and wildlife habitat, the Corps dismisses the Project's impacts on estuaries, wetlands, and shorelines under the guise that they will be "minimal" when they are compared to the impacts caused by sea level rise.[44] In short, the Corps hides behind sea level rise as a way to excuse and ignore project impacts. This is misleading to both DCM and the public, and it is not the robust analysis necessary to determine if the $1.3 billion Project is consistent with the State's CMP.

In the DEIS, the Corps acknowledges that the Project will increase the mean high water level, but the agency fails to take the critical step of evaluating whether that impact (and other changes) will exacerbate the effects of already rising tides. Research tells us it will. Deepening a channel like Wilmington's reduces friction through the water system making it easier for more water to flood into the channel—especially during storm conditions.[45] This causes a nonlinear increase in the tidal range and flooding risk,[46] resulting in "higher water levels, faster currents, and longer-lasting inundation farther inland."[47] A recent study of tidal conditions in Jacksonville, Florida show when shallow estuaries are deepened, they provide less protection against "long-waves" or storm induced flooding which can pose a significant risk to the communities nearby.[48] Similarly, a study on channel deepening in Louisiana showed that deepening allows more water to flood the system during a storm event, drastically increasing the flooded area around the channel.[49] When sea level rise is considered alongside the deepening project, there are increased flood risks caused by a larger, more powerful storm surge.[50]

Indeed, this pattern is likely already happening in Wilmington. As one oceanography professor wrote to the Corps during the DEIS comment period, "the previous harbor deepening project, which took place in 2000-2005 may have caused a more-than-doubled increase in the rate of [sea level rise] in the Cape Fear River."[51] To reach that conclusion, tidal gauges across North Carolina's coast were compared and the rate of sea level rise acceleration in Wilmington exceeded others in the State.[52] But because the Corps failed to include that data or any such

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[42] *Id.*
[43] *Id.* at PDF 119.
[44] Consistency Determination Letter, *supra* note 1, at 15; DEIS, *supra* note 20, at 3-60 to 3-61.
[45] Lynker Report, *supra* note 29, at 4; Ramin Familkhalili, Stefan A. Talke & David A. Jay, *Tide-storm Surge Interactions in Highly Altered Estuaries: How Channel Deepening Increases Surge Vulnerability*, 125 JGR OCEANS 1, 15 (2020), provided as Attachment 16 to Exhibit 1.
[46] *Tide-storm Surge Interactions* at 2.
[47] Lynker Report, *supra* note 29, at 8.
[48] Stefan A. Talke & David A. Jay, *Changing Tides: The Role of Natural and Anthropogenic Factors*, 12 ANN. REV. OF MARINE SCI. 121, 132–33 (2020), provided as Attachment 17 to Exhibit 1.
[49] Maqsood Mansur, Julia Hopkins & Qin Chen, *Estuarine Response to Storm Surge and Sea-level Rise Associated with Channeling Deepening: A Flood Vulnerability Assessment of Southwest Louisiana, USA*, 116 NAT. HAZARDS 3879, 3889 (2023), provided as Attachment 18 to Exhibit 1.
[50] *Id.* at 3890.
[51] Email from Frederick Bingham to U.S. Army Corps of Engr'rs (Nov. 1, 2025), Exhibit 2.
[52] *Id.*

analysis in the DEIS and consistency determination, neither the public nor DCM are able to review the impacts the previous deepening had on sea level rise.

Increased flooding threatens not only the communities nearby, but "will impact the distribution, range, and abundance of coastal habitats and the species that use them for nursery, forage, spawning, and refuge."[53] North Carolina has set a goal to make habitats and ecosystems more resilient,[54] and New Hanover County recognizes that this type of resiliency is important for both the natural environment and the local economy.[55] The expansion of Wilmington Harbor is not consistent with those goals.

Increased water levels bring additional concerns. Sea level rise changes the ebbs and flows of the tidal range and will drastically impact sediment transport in the system thereby making maintenance dredging less effective.[56] Also, as discussed above, the reduced friction in the channel caused by dredging can exacerbate upstream flooding and erosion, amplifying sediment movement in the project area.[57] In other words, the Corps will likely be required to perform more maintenance dredging in the project area as sea levels continue to rise. Maintenance dredging in estuarine environments like the lower Cape Fear River poses severe threats to estuarine habitats and the juvenile fish, endangered Atlantic sturgeon, and threatened and endangered sea turtles that spend time there.

In the DEIS and briefly in the consistency determination, the Corps treats sea level rise as a static phenomenon separate from the Project, rather than one that will interplay with the impacts from deepening Wilmington Harbor.[58] When considered together, it becomes clear that the Project will likely make our coastal resources and communities less resilient to the changing climate. The Project is inconsistent with the goals and priorities in the Coastal Habitat Protection Plan and the New Hanover County Land Use Plan, and thus with the CMP.

b. <u>The Project would adversely impact the State's fisheries and is therefore inconsistent with the CMP.</u>

North Carolina's commercial and recreational fishing industries are worth millions of dollars and represent a way of life for thousands throughout the State. In 2021, the landing revenue for just ten key commercial fisheries in North Carolina totaled over $90 million.[59] Recreational fishing represented over $1 billion in revenue.[60] When drafting CAMA, the General

[53] NC CHPP, *supra* note 13, at 32–33.
[54] *Id.* at 32.
[55] New Hanover County Land Use Plan, *supra* note41 41, at PDF 74, 119.
[56] Lynker Report, *supra* note 29, at 4; Jana R. Cox et al., *Effects of Sea-Level Rise on Dredging and Dredged Estuary Morphology*, 127 J. OF GEOPHYSICAL RSCH.: EARTH SURFACE 1, 2 (2022), provided as Attachment 19 to Exhibit 1.
[57] *Tide-storm Surge Interactions*, *supra* note 45, at 2.
[58] *See* Lynker Report, *supra* note 29, at 3.
[59] U.S. Dep't of Com., *Fisheries Economics of the United States 2021: Economic and Sociocultural Status and Trends Series* (March 2024), at 152, Exhibit 3; *see also* Eric Edwards et al., *North Carolina's Wild Caught Fishing Industry Economic Impact Assessment* (2021), at 3, Exhibit 4 (noting that for the South Coast counties of New Hanover, Brunswick, Pender, and Onslow in North Carolina, commercial fishery landings totaled approximately $13,000,000).
[60] *Fisheries Economics of the United States* at 153.

Assembly emphasized the value of the State's fisheries when they found that coastal regions "are among the most biologically productive regions of this State and of the nation."[61] The General Assembly concluded that coastal and estuarine waters "provide almost ninety percent (90%) of the most productive sport fisheries on the east coast" and represent an area that "should be preserved and enhanced."[62] New Hanover County is no stranger to the importance of these fisheries. For over ten years, New Hanover County is consistently one of the top five counties with the most residents with coastal recreational fishing licenses in the entire state.[63] Likewise, the county has millions of dollars in commercial landings each year.[64] The New Hanover County land use plan recognizes the importance of the county's waters as containing "significant public fishing resources"[65] and encourages the preservation and restoration of waterways.

The Cape Fear River is home to a wide array of fish, including economically important fisheries as well as threatened and endangered species. As raised previously, the Corps' Project would severely harm the State's valuable fisheries and important fish habitat within the Project's footprint.[66] First, the Project would lead to a devastating loss of freshwater wetlands that serve as nurseries for fish and shellfish species.[67] Striped bass, Atlantic surgeon, shad, and blueback herring are all species that spend at least some portion of their life cycle in the freshwater wetlands this Project is set to adversely impact.[68] The Corps' projections indicate that there will be a decrease in the amount of available habitat for these species at the egg, larval, and spawning stages.[69] For example, the Corps projects that suitable habitat for striped bass at the larval stage will decrease by 6.5% and habitat for juvenile blueback herring with decrease by 5.9%.[70] Given the modeling errors and erroneous assumptions the Corps has made in other areas of the DEIS, these projections likely underestimate the true loss to these species. Nevertheless, a loss of habitat is more devastating when combined with the impacts of climate change, the introduction of invasive species, and overfishing.[71] That is precisely the reality for these species: all of these fisheries are in states of population decline and are consistently listed as depleted in North Carolina.[72]

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[61] N.C. Gen. Stat. § 113A-102(a).
[62] *Id.*
[63] N.C. Div. of Marine Fisheries, *2024 License & Statistics Annual Report* (Nov. 2024), at VI-26 (Table VI.14), Exhibit 5.
[64] Alan Bianchi, *An Economic Profile Analysis of the Commercial Fishing Industry of North Carolina Including Profiles for the Coastal Fishing Counties* (Sept. 2003) at 80, Exhibit 6.
[65] New Hanover County Land Use Plan, *supra* note 41, at PDF 120.
[66] SELC, DEIS Comments, *supra* note 5, at 10–11.
[67] DEIS, *supra* note 20, at 3-56.
[68] *Id.* at 3-19.
[69] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix M: Wetland and Fish Passage Mitigation Plan at M-20 (2025).
[70] *Id.*
[71] Kyle T. Rachels & J. Michael Fisk II, *Fisheries Resources of the Cape Fear River* (2021), at 7, https://perma.cc/3DVV-ZDB2 (noting that in a study of Cape Fear River fish, most fish species were primarily threatened by habitat and water quality degradation, invasive species, and the impacts of climate change).
[72] *See* N.C. Division of Marine Fisheries, *2024 Fishery Management Plan Review* (August 2025), https://perma.cc/5DEX-JBRH (showing that striped bass have had a fishing moratorium in place for over fifteen years because of population concerns; Atlantic sturgeon stock is depleted and a coastwide fishing moratorium has been in place since 1998; shad populations are "depleted"; and blueback herring have low abundance and an accompanying harvest moratorium).

PFAS contamination presents yet another problem for these fisheries. It is well known that the Cape Fear River is contaminated with PFAS, a large group of toxic chemicals that have severe health impacts, even at low levels, in humans and animals.[73] PFAS have been found in the tissue of fish taken from several stretches of the Cape Fear River.[74] Since 2023, the North Carolina Department of Health and Human Services has put in place a fish consumption advisory for the middle and lower Cape Fear River due to exposure concerns to PFOS found in sampled fish.[75] Despite the widespread contamination in the Cape Fear, the Corps has not tested the sediment they propose to dredge then place in estuarine areas[76] for PFAS to determine whether the reuse would cause consequent harm. Rather, the Corps' most recent sampling of the dredged material was done in 2020 within the ocean dredged material disposal site and tested for "PCBs, pesticides, semi-volatile organics (SVOAs), metals, total organic carbon, and butyl-ins."[77] Should the material be contaminated, the dredging process and so-called beneficial use placement will likely expose the fish of the Cape Fear to PFAS and further exacerbate harms to each species' health. Likewise, potential PFAS contamination could also threaten the health of people and wildlife who may consume these fish. Without adequate testing of this dredged material, this Project could adversely impact the State's fisheries and be inconsistent with the State's CMP.

c. The Project would threaten areas of environmental concern and is thus inconsistent with the State's CMP.

The natural environments surrounding the Wilmington Harbor boast spectacular barrier islands, tidal creeks, and marsh ecosystems rife with wildlife and natural resources. The State's CMP recognizes the diversity of habitats along the coast and designates areas of environmental concern ("AECs") in coastal wetlands, estuarine waters, public trust areas, coastal shorelines, and natural and cultural resource areas. The CRC must "conserve and manage [AECs] so as to safeguard and perpetuate their biological, social, economic and aesthetic values, and to coordinate and establish a management system capable of conserving and utilizing [AECs] as a natural resource essential to the functioning of the entire [ecosystem]."[78]Any development—defined as "any activity . . . involving . . . dredging; filling; . . . removal of clay, silt, sand, gravel or minerals" within an AEC—must be compatible with the AEC's management objective.[79]

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[73] *See, e.g.*, Zeyan Lew, Houman Goudarzi & Youssef Oulhote, *Developmental Exposures to Perfluoroalkyl Substances (PFASs): An Update of Associated Health Outcomes*, 5 CURRENT ENV'T HEALTH REPS. 1 (2023), https://perma.cc/6UM8-59Q8; *Our Current Understanding of the Human Health and Environmental Risks of PFAS*, U.S. EPA, https://perma.cc/DQH8-ZHBK (last visited Dec. 16, 2025).

[74] *See* Frannie Nilsen, *2022 Water and Fish Collection Project – Status Update* (Feb. 8, 2023), Exhibit 7 (showing heightened PFAS levels in fish species of the upper Cape Fear River, including striped bass, redear sunfish, and largemouth bass); Frannie Nilsen, *DEQ Water and Fish Study Presentation: Saltwater Samples* (Oct. 1, 2025), Exhibit 8, (showing PFAS levels for saltwater species, including southern flounder and red drum, was elevated).

[75] *NCDHHS Recommends Limiting Fish Consumption From the Middle and Lower Cape Fear River Due to Contamination With "Forever Chemicals,"* N.C. Dep't Health & Human Servs. (July 13, 2023), https://perma.cc/E8FU-N69H.

[76] DEIS, *supra* note 20, at 2-14 to 2-19; 3-61 to 3-66.

[77] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix P: Wilmington Site Management and Monitoring Plan for Offshore Disposal at 18 (2023).

[78] 15A N.C. Admin. Code 07H.0205(c) (addressing coastal wetlands), .0203 (addressing the estuarine and ocean system), .0206(c) (addressing estuarine waters), .0209(c) (addressing coastal shorelines); *see also* N.C. Gen. Stat. § 113A-113.

[79] N.C. Gen. Stat. § 113A-103(5)(a).

Management objectives vary dependent on the classification of AEC,[80] but for any category, DCM must attempt to "minimize the likelihood of significant loss of private property and public resources."[81] Activities occurring outside of AECs that impact AECs must also adhere to use standards set for each type of AEC.

The Corps' Project would adversely affect, at a minimum, the Coastal Wetlands, Estuarine Waters, and Public Trust AECs in direct contradiction to the State's mandate to safeguard these resources.[82] A discussion of a select few of these AECs is below.

i. Coastal Wetlands

Coastal Wetlands AECs are defined as "any salt marsh or other marsh subject to regular or occasional flooding by tides" and contain certain marsh plants listed in regulations.[83] The CRC did not understate the importance of wetlands; not only are coastal wetlands recognized as significant for their importance for food chains and fisheries, but also for their function as "barriers against flood damage" and controlling erosion.[84] The first priority for any land use is the conservation of existing wetlands.[85] In 2024, Governor Roy Cooper further reinforced the importance of North Carolina's wetland ecosystems with an executive order with the explicit purpose of conserving and restoring wetlands through the State.[86] And in New Hanover County, the land use plan discourages any type of development activity in wetlands and calls for the preservation of existing wetlands within the county.[87]

Despite the billions of dollars in services they provide,[88] thousands of acres of wetlands are being lost in North Carolina.[89] Most of this loss has occurred within coastal watersheds due to development, sea level rise, and climate change.[90] Additionally, hundreds of thousands of acres of wetlands have been converted or disturbed into different types of wetlands which result

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[80] For example, Estuarine and Ocean AECs, which include Public Trust AECs, must be maintained so as to protect public access to recreation, and must be conserved and managed "so as to safeguard and perpetuate their biological, economic, and aesthetic value." 15A N.C. Admin. Code 07H.0203; .0207(c). Ocean Hazard Area AECs, which include Inlet Hazard Area AECs, were established to, among other things, "preserv[e] the natural ecological conditions of the barrier dune and beach systems. *Id.* at 07H.0303(b).

[81] *Id.* at 07H.0203 ("It is the objective of the Coastal Resources Commission to conserve and manage estuarine waters, coastal wetlands, public trust areas, and estuarine and public trust shorelines, as an interrelated group of AECs, so as to safeguard and perpetuate their biological, social, economic, and aesthetic values and to ensure that development occurring within these AECs is compatible with natural characteristics so as to minimize the likelihood of significant loss of private property and public resources.").

[82] Consistency Determination Letter, *supra* note 1, at 14–15.

[83] 15A N.C. Admin. Code 07H.0205(a).

[84] *Id.* at 07H.0205(b).

[85] *Id.* at 07H.0205(d).

[86] *See* N.C. Governor, Roy Cooper, Executive Order 305: An Order to Protect and Restore North Carolina's Critical Natural and Working Lands (Feb. 12, 2024), Exhibit 9.

[87] New Hanover County Land Use Plan, *supra* note 41, at PDF 139.

[88] *Assessment of Change in North Carolina's Outer Coastal Plain Wetlands*, North Carolina Wetlands (July 2024) at 11, https://perma.cc/5FBR-VSXM (noting that the functions provided by wetlands are estimated to be worth $25.6 billion).

[89] *The Status and Trends of Wetland Loss and Legal Protection in North Carolina*, N.C. State Extension, https://perma.cc/P9K2-JTEW (last visited Dec. 11, 2025).

[90] *Id.*

in "altered ecosystem function . . . and loss of important habitat."[91] The proposed expansion of Wilmington Harbor would exacerbate the state-wide loss; under a no sea level rise scenario, the Corps posits that 1,071 acres of tidal freshwater wetlands will be lost and converted to higher salinity type wetlands.[92] As changes in interpretation of federal law[93] and consequent state law changes[94] rollback protections for many wetlands across southeastern North Carolina, it is critically important that DCM not approve additional destruction of wetlands for an unnecessary deepening project. Doing so would be inconsistent with the State's CMP.

ii. Estuarine Waters

Under CRC regulations, the estuarine waters are defined as "all the waters of the Atlantic Ocean within the boundary of North Carolina and all the waters of the bays, sounds, rivers and tributaries thereto seaward of the dividing line between coastal fishing waters and inland fishing waters."[95] As noted above, North Carolina's estuaries provide habitat for a diverse array of wildlife and nearly 90% of the State's commercial fisheries.[96] The CRC recognized the significance of these waters for the State's fisheries, as regulations assert that estuaries are "among the most productive natural environments of North Carolina. They support the valuable commercial and sport fisheries of the coastal area."[97] The CRC established that the management objective for Estuarine Waters AECs is to "safeguard and perpetuate their biological, social, aesthetic, and economic values."[98] Uses of the estuarine and coastal waters must be consistent with this purpose, and the "highest priority" in the management of the waters is the "conservation of . . . their vital components."[99] New Hanover County's local land use plan is especially concerned with preserving the county's estuaries through thoughtful development strategies[100] and implementing a robust water quality monitoring program for estuarine waters.[101]

We have discussed at length the impacts that this Project will have on the natural resources in its footprint, especially within the estuarine waters.[102] However, the Corps purports that compared to sea level rise projections for the area in 2086, this Project will have minimal

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[91] *Id.*
[92] DEIS, *supra* note 20, at 3-56.
[93] *See Sackett v. EPA*, 598 U.S. 651, 679 (2023) (limiting the scope to wetlands within the purview of the Clean Water Act to those with a "continuous surface connection" with a water of the United States); *Updated Definition of "Waters of the United States,"* 90 Fed. Reg. 52498, 52499 (Nov. 20, 2025) (proposed rule seeking to further limit the scope of the Clean Water Act to wetlands with a continuous surface water connection with a traditional navigable water).
[94] *See* 2023 Sess. L. 63 § 15.(c) (June 12, 2023) (adopting the federal definition of wetlands for state level protections).
[95] 15A N.C. Admin. Code 07H.0206(a).
[96] U.S. Geological Survey, *North Carolina Wetland Resources in National Water Summary-Wetland Resources* at 297, https://www.fws.gov/sites/default/files/documents/National-Water-Summary-Wetland-Resources-North-carolina.pdf (noting that "[a]bout 90 percent of [North Carolina's] commercial fish harvest is derived from estuary dependent species.")
[97] 15A N.C. Admin. Code 07H.0206(b).
[98] *Id.* at .0206(c).
[99] *Id.* at .0206(d).
[100] New Hanover County Land Use Plan, *supra* note 41, at PDF 135.
[101] *Id.* at PDF pg. 141.
[102] *See* SELC, DEIS Comments, *supra* note 5, at 18–20.

impacts on dissolved oxygen, water temperature, salinity, and total suspended solids.[103] However, as we established prior,[104] the Corps cannot hide the very real impacts of this Project behind the impacts that sea level rise will have. Further, changes to any one of these factors would mean additional harm to the Lower Cape Fear's estuarine waters, including for their valuable use as shell-fishing waters. The Corps has not demonstrated that this Project will not harm the estuarine waters of the State and thus this Project is inconsistent with the State's CMP.

iii. Public Trust Areas

The Public Trust Areas AECs are those areas reserved for the public's use in which the public has "acquired rights by prescription, custom, usage, dedication, or any other means."[105] The CRC has made clear the management objectives of these areas is to "protect public rights for navigation and recreation and to conserve and manage the public trust areas so as to safeguard and perpetuate their biological, economic and aesthetic value."[106] "In the absence of overriding public benefit," any development that stands to damage this type of AEC must satisfy the use standards provided in CRC regulations.[107] For beach fill projects in particular, all "material placed in the water and along the shoreline shall be clean sand."[108]

The Corps erroneously concludes that this Project will not have "any negative impacts to public trust areas."[109] To begin with, the purported need of this Project is to allow larger, heavier loaded ships to enter the Wilmington Port. However, larger ships create larger vessel wakes that will lead to greater coastal erosion and threaten shoreline stability.[110] As we raised prior, the Corps' modeling for erosion impacts of this Project are calibrated with too small of a ship and do not take into account the cumulative impacts of thousands of vessel wakes.[111] Given these issues with the modeling, the Corps' erosion analysis is unreliable and cannot give the true sense of how this Project could exacerbate coastal erosion, especially within public trust areas. In fact, the limited available data shows erosive force could double in certain areas, presenting conditions that could similarly threaten nearby beaches.[112] This Project is not consistent with the CMP, as it will likely contribute to coastal erosion and does not support the conservation and management of public trust areas.

There are further impacts to public trust areas. The Corps explains that the Project would involve the placement of millions of tons of sand on public beaches, including on Oak Island, Bald Head Island, and Caswell Beach.[113] However, as we raised prior,[114] the Corps has failed to test the dredged material for PFAS. Although we have repeatedly urged the Corps to fully

[103] Consistency Determination Letter, *supra* note 1, at 15.
[104] SELC, DEIS Comments, *supra* note 5, at 12–14.
[105] 15A N.C. Admin. Code 07H.0207(a).
[106] *Id.* at 07H.0207(c).
[107] *Id.* at 07H.0207(d).
[108] *Id.* at 07H.0208(b)(8)(A)(ii).
[109] Consistency Determination Letter, *supra* note 1, at 15.
[110] *See* SELC, DEIS Comments, *supra* note 5, at 18–19; Lynker Report, *supra* note 29, at 1–3.
[111] SELC, DEIS Comments, *supra* note 5, at 15.
[112] *Id.* at 19.
[113] *See* U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report Appendix D: Beneficial Use Plan at 16 (Sept. 5, 2025).
[114] SELC, DEIS Comments, *supra* note 5, at 19–20.

consider whether this Project may increase the levels of PFAS and other contaminants in the Cape Fear River ecosystem, the DEIS dismisses any effect the Project may have on exposing or distributing hazardous, toxic and radioactive waste. There is no evidence that the Corps researched existing data or conducted sampling of the water, dredged material, or riverbank for any type of PFAS that contaminates the footprint of this Project.[115]

Although clean is not defined in the CRC's regulations, PFAS contamination would almost certainly render the material outside the scope of "clean" as required under the Public Trust Areas AEC use standards. The Corps must be required to test the dredged material in order to find the proposed beach fill (and other proposed reuses) consistent with protecting public trust resources for the enjoyment of the people and the State's CMP at large.

d. <u>The Project would harm North Carolina's threatened and endangered species and other wildlife resources and is therefore inconsistent with the State's CMP.</u>

The legislative findings and purposes for the State's Coastal Management Program, found at N.C. General Statutes § 113A-102, specifically identify "[p]rotection, preservation, and conservation of natural resources including . . . fish and wildlife" as a priority. The enforceable policies of the State's CMP reflect this emphasis by including important protections and considerations for imperiled species and their habitat.[116]

As detailed in our comments on the DEIS, the proposed expansion of Wilmington Harbor is likely to affect numerous threatened and endangered species and harm important habitats supporting these populations. The Cape Fear River and surrounding areas to be affected by the Project are home to no fewer than *thirty-one* ESA-listed species and formally designated critical habitat for five species.[117] The Corps' DEIS acknowledges the Project is likely to adversely affect *ten* of these threatened and endangered species in the project area—and the true toll is likely higher, given the omissions and errors in the DEIS, as highlighted in the attached comments.[118]

For example, the DEIS obscured impacts to wildlife and coastal natural resources relevant to DCM's consideration. As explained in our DEIS comments, the Corps failed to mention the federally and state threatened Eastern black rail which has historically been found in the Wilmington area.[119] Further, the DEIS made no mention of state-listed species and provided only a non-exhaustive smattering of non-listed wildlife species that may inhabit the area, omitting species like the iconic Venus flytrap and the state-listed Species of Greatest Conservation Need diamondback terrapin.[120] As to the species that are mentioned, the DEIS

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[115] *Id.* at 20.
[116] *See*, *e.g.*, 15A N.C. Admin. Code 07H.0505 (describing areas that sustain remnant species, including rare, threatened, or endangered species), .0506 (referencing coastal complex natural areas, which can support endangered and threated species); .0312(4)(a) (imposing seasonal restrictions on excavation and fill projects in order to protect threatened and endangered species and wildlife habitat); .1805(e) (prohibiting bulldozing in Ocean Hazard AECs between April 1 and November 15 to protect threatened and endangered species).
[117] DEIS, *supra* note 20, at 3-85 to 3-87 (species under FWS's jurisdiction), 3-13 to 3-14 (species under NMFS' jurisdiction).
[118] SELC, DEIS Comments, *supra* note 5, at 22–27.
[119] *Id.* at 26.
[120] *Id.*

gave only a cursory discussion of general impacts for mammalian species, without any discussion of direct effects to non-mammalian species. The Corps' consistency determination includes the claim that the proposed expansion "would not adversely affect any biota recognized by the State as a species of concern."[121] Despite reaching this conclusion, neither the consistency determination nor the DEIS ever discuss State species of concern. Without sufficient information about affected species, DCM cannot find this Project consistent with the CMP's aim to conserve coastal wildlife and habitat.

The DEIS was also opaque about the timing of dredging operations and the anticipated increased volume of maintenance dredging a larger harbor would necessitate. As detailed in our DEIS comments,[122] this information is critical to understanding the full scope of impacts from the Project. As DCM is aware, dredging during summer months can be particularly harmful to nesting sea turtles and other coastal wildlife that may be maimed and killed by hopper dredges.[123] In the past, DCM, the Division of Marine Fisheries, and the Wildlife Resources Commission have all raised concerns about the possible harmful effects of hopper dredging during such a timeframe, and as a result, the agencies have typically adhered to a hopper dredging window of December 1 through April 15 each year.[124] Indeed, a federal court ruled the Corps failed to adequately review and justify its attempt to abandon that traditional dredging window for maintenance dredging in Wilmington Harbor, and as a result, the agency must abide by that window until it completes a more thorough review of the environmental impacts of removing that window.[125]

Here, the Corps has not offered any such commitment. While its list of minimization measures includes a dredging timeframe item, the only seasonal restriction mentioned is for *pipeline* dredging from Reaves point to Wilmington.[126] As DCM is aware, pipeline dredging does not pose the same type or magnitude of impacts associated with hopper dredging. Because the Corps plans to utilize hopper dredging during construction and maintenance of the proposed expansion,[127] the agency must commit to abiding by the traditional hopper dredging window for

[121] Consistency Determination Letter, *supra* note 1, at 18.
[122] SELC, DEIS Comments, *supra* note 5, at 24–25.
[123] *Id.* at 24.
[124] *E.g.* N.C. DCM, Consistency Concurrence Concerning the U.S. Army Corps of Engineers (Corps) Proposed Wilmington and Morehead City Harbor Year-Round Dredging and Bed Leveling, New Hanover and Carteret Counties, North Carolina (DCM #2020045) (Dec. 23, 2020), Exhibit 10; Letter from Daniel Govoni, N.C. DEQ, to Jennifer Owens, U.S. Army Corps of Eng'rs (Feb. 12, 2020), Exhibit 11; Letter from Michael Regan, N.C. Secretary of Environmental Quality & James Trogdon, N.C. Secretary of Transportation, to General Holland, U.S. Army Corps of Eng'rs (Nov. 15, 2019), Exhibit 12; Letter from Daniel Govoni, N.C. DEQ, to Jennifer Owens, U.S. Army Corps of Eng'rs (Mar. 2, 2018), Exhibit 13; *see also* Letter from Daniel Govoni, N.C. DEQ, to Elden Gatwood, U.S. Army Corps Eng'rs (Dec. 31, 2020), Exhibit 14. We note that On November 10, 2025, we sent an email and updated set of comments to correct an inadvertent typographical error listing the dredging window dates as Nov. 1 to Apr. 30 in our original comments. Due to technological problems, the updated comments unfortunately continued to list the incorrect dates. We apologize for the inconsistency and acknowledge that the current hopper dredging window is December 1 through April 15.
[125] *Cape Fear River Watch v. United States Army Corps of Eng'rs*, No. 7:21-CV-138-FL, 2022 WL 4468268 (E.D.N.C. Sept. 26, 2022).
[126] Consistency Determination Letter, *supra* note 1, at 13.
[127] DEIS, *supra* note 20, at 2-10; 2-12 to 2-13.

construction and maintenance of the Project for DCM to find the Project consistent with the State's CMP.

Finally, the Corps' modeling errors mean that the DEIS's projected impacts are at best uncertain, and at worst, much more severe than depicted. For example, it is well understood that larger ships would lead to larger vessel wakes which can cause overwash and destroy shorebird nests, including state and federal species of concern.[128] Such impacts are already happening under current conditions, but the DEIS and accompanying appendices relied on the wrong size of design vessel—using on a smaller vessel than the 15,000 TEU ships the expansion is designed to accommodate—to predict future tidal impacts.[129] Similarly, errors and assumptions made in the Corps' review of issues such as saltwater intrusion or sea level rise likewise have a domino effect on its consideration of impacts to species, since the species impacts are premised on (and consequently, tainted by) these other reviews.

Because the Project would harm fish and other wildlife resources, including threatened and endangered species, it is inconsistent with the State's CMP. DCM should object to the Corps' Consistency Determination on this, and other grounds, or at the very least, require the Corps to commit to hopper dredging only during the scientifically backed dredging window.

e. <u>The costs of the Project likely outweigh the benefits.</u>

To the extent DCM balances economic considerations when evaluating whether a project is consistent with the State's CMP, the lack of economic benefits associated with the Wilmington Harbor expansion provides further evidence that this Project does not align with the State's goals. The Corps projects that expanding the harbor will cost more than $1.3 ***billion*** in construction costs alone.[130] Annual maintenance will tack on an additional $14.4 million per year.[131] Because the Corps acknowledges that the same amount of cargo will move through Wilmington Harbor with or without the expansion,[132] the only identified benefit associated with these significant costs is a reduction in the number of voyages large cargo vessels will have to take each year resulting in "significant cost savings to the shippers."[133] There's no evidence those cost savings will be shifted to the communities of the Wilmington area, North Carolinians more broadly, or even the national economy. In short, the Corps recommends expanding the Harbor and damaging extensive coastal resources so that international shipping companies can save money by putting more cargo on less ships.

The Corps' current benefit-cost-ratio admits that the possible benefits are narrow—the ratio is a mere 1.3, meaning that for every one dollar spent, the Corps expects 1.3 dollars in benefits.[134] With a ratio this low, practically any increase in the Project's costs or reduction in expected benefits could shift the ratio below one, meaning the projects costs will outweigh any

[128] Lynker Report, *supra* note 45, at 1–3.
[129] *See* SELC, DEIS Comments, *supra* note 5, at 18–19.
[130] U.S. Army Corps of Eng'rs, Wilmington Harbor 403 Letter Report: Attachment 4 – Cost Appendix at 12 (Sept. 5, 2025).
[131] Economic Considerations, *supra* note 21, at 58.
[132] *Id.* at 32 ("In the [future] without and in the future with project conditions, the same volume of cargo is assumed to move through Wilmington Harbor . . . ").
[133] *Id.* at 49.
[134] *Id.* at 57, 58.

benefits. As detailed in the attached DEIS comments, the Corps' economic analysis relies on multiple unsupported assumptions regarding shipping trends, the availability of beneficial reuse, and minimal mitigation measures.[135] If those assumptions prove wrong, the Project's cost could skyrocket. Given this, at least one expert in port economics has confirmed that the Project will actually cost more than it is worth.[136]

As DCM approaches its decision, it is critical that the agency understand that expanding Wilmington Harbor will cost North Carolina millions of dollars (not including the cost of damaged ecosystem services) with very little, if any, benefit to the State. These costs when paired with the associated environmental damage are not justifiable by the information provided by the Corps in the consistency determination or the DEIS. For this reason, too, the Project is inconsistent with North Carolina's CMP.

***

The above impacts are substantial on their own, but when considered together create cumulative impacts that could have far-reaching implications on North Carolina's coastal resources. The Corps fails to discuss the cumulative impacts expected from the proposed expansion,[137] signaling yet another way the agency's proposal is inconsistent with the CMP.[138]

IV. Minimization Measures Proposed by the Corps are Insufficient to Mitigate Impacts on Coastal Resources.

CAMA regulations include clear provisions about minimizing and mitigating impacts to coastal resources:

> It is the policy of the State of North Carolina to *require* that adverse impacts to coastal lands and waters be mitigated or minimized through proper planning, site selection, compliance with standards for development, and creation or restoration of coastal resources. Coastal ecosystems *shall* be protected and maintained as complete and functional systems by mitigating the adverse impacts of development as much as feasible by enhancing, creating, or restoring areas with the goal of improving or maintaining ecosystem function and areal proportion.[139]

The regulation further requires that "any potential losses" be offset through mitigation and specifies that a proposal can resort to mitigation measures "only after all other reasonable means of avoidance and minimizing such losses have been exhausted."[140]

As discussed throughout these comments and our comments on the DEIS, the Corps' proposal fails to avoid and minimize many impacts. The Corps' Consistency Determination lists

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[135] SELC, DEIS Comments, *supra* note 5, at 6–11.
[136] Letter from William P. H. Cary, Brooks Pierce, to U.S. Army Corps of Eng'rs (Nov. 17, 2025), at 8, Exhibit 15 (attaching an economic analysis prepared by Dr. Asaf Ashar, an expert with experience evaluating port projects).
[137] *See generally* Consistency Determination Letter, *supra* note 1.
[138] N.C. Gen. Stat. § 113A-120(a)(10).
[139] 15A N.C. Admin. Code 07M.0701(a) (emphasis added).
[140] *Id.* at 07M.0701(b).

a scant six minimization measures,[141] most of which defer to generally applicable or programmatic requirements from other agencies rather than any project-specific avoidance or minimization actions. For example, the first minimization measure is to adhere to the existing requirements in the 2020 SARBO.[142] This is not a good faith attempt to minimize *this* Project's impacts, as the 2020 SARBO is a regional document that contains broad programmatic requirements, many of which largely loosened protections for natural resources when compared to earlier biological opinions. The 2020 SARBO's requirements also only apply to maintenance activities, and the document does not set forth parameters for new project construction like the proposed expansion.[143] Making matters more concerning, the 2020 SARBO acknowledges that Wilmington Harbor is unique and that certain mitigation measures may not be effective in the project area.[144]

In addition to the inadequate minimization and avoidance efforts, the Corps' proposed mitigation measures fail to sufficiently offset the losses of coastal resources, particularly to wetlands and species.[145] For instance, the DEIS predicts that the Project will cause the loss of 1,071 acres of tidal freshwater wetlands.[146] While the DEIS asserts these will be replaced by an equal number of higher salinity wetland types, the DEIS does not explain how or where these conversions would occur, and the DEIS minimizes and overlooks the impacts of the loss of the tidal freshwater wetlands.[147] Wetland types are not interchangeable in terms of ecosystem services, particularly if the wetlands are also changing location. But against this loss of more than 1,000 acres of tidal freshwater wetlands, the Corps proposes mitigation amounting to roughly a combined total of 673 acres.[148] And the proposed mitigation is of questionable efficacy.[149] These measures are insufficient—in quantity and quality—to fulfill CAMA's mitigation requirements.

Further, the proposed aquatic resources mitigation measures, at Locks and Dams 1 & 2, suffer from a lack of specificity, leaving questions as to the efficacy of the proposal. For example, as highlighted in our DEIS comments, it is not clear the proposed measures at Lock and

[141] The Corps correctly does not characterize its plans to dispose of sediment on bird islands and beaches as a minimization measure itself. We underscore that these "beneficial use plans" should not be considered minimization or mitigation because the placement is a necessary byproduct of the harmful act of dredging. Further, the placement itself is not necessarily beneficial or minimizing harm. For example, the planned bird island sand placement simply continues the standard, already-occurring practice of placing sediment on Ferry Slip and South Pelican Islands up to their existing permitted size and provides no benefit to any of the other eight bird islands in the project area. Meanwhile, the nature of the majority of fine material placement is unproven and vaguely described, is unlikely to address identified habitat needs, and at some sites would endanger existing shellfish resources.
[142] Consistency Determination Letter, *supra* note 1, at 13.
[143] U.S. Army Corps of Eng'rs, *South Atlantic Regional Biological Opinion for Dredging and Material Placement Activities in the Southeast United States* 16 (2020), https://perma.cc/X2BL-VXSV.
[144] *Id.* at 330 (explaining how hopper dredging mitigation techniques are ineffective at Wilmington reducing the ability to observe and prevent take of endangered species).
[145] *See generally* SELC, DEIS Comments, *supra* note 5, at 30–33 (detailing inadequate mitigation measures).
[146] DEIS, *supra* note 20, at 3-56.
[147] SELC, DEIS Comments, *supra* note 5, at 17, 30.
[148] *Id.* at 31.
[149] *Id.* at 31–32.

Dam 1 would even be used by the target fish species,[150] falling short of the requirement to "enhance coastal resources and offset any potential losses" to these aquatic resources.[151]

The limited and inadequate avoidance, minimization, and mitigation measures render the expansion proposal inconsistent with the State's CMP.

V. Conclusion

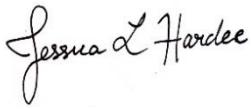
For the reasons discussed above, the Corps' Wilmington Harbor 403 Navigation Project is inconsistent with the specific enforceable policies of the State's CMP. The deepening and widening of Wilmington Harbor would adversely impact the coastal resources that DCM is obligated to preserve and enhance. We strongly urge DCM to object to the consistency determination.

Should DCM nonetheless find the harmful Harbor expansion project consistent, the agency must ensure that the Corps incorporates robust mitigation measures that address all the above discussed impacts. These mitigation measures should include, but cannot be limited to: flood mitigation in downtown Wilmington and surrounding areas, large-scale living shoreline investments to combat storm surge, the enhancement or preservation of fishery habitat in other parts of the river system, conservation of significant acreage of coastal wetlands, and researching and funding projects identified by state resources agencies that would protect threatened and endangered species. Thank you for your consideration of these comments. If you have any questions regarding this letter, please contact us at 919-967-1450 or *hnelson@selc.org*.

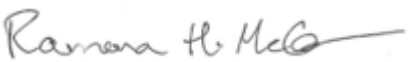
Sincerely,



Hannah Nelson



Jessica Hardee



Ramona H. McGee

Southern Environmental Law Center
136 E. Rosemary Street, Suite 500
Chapel Hill, NC 27514

On behalf of:

Audubon NC
Zach Wallace | Policy Director

[150] *Id.* at 32–33.
[151] 15A N.C. Admin. Code 07M.0701(b).

Cape Fear River Watch
Kemp Burdette | Executive Director & Cape Fear Riverkeeper

Center for Biological Diversity
Will Harlan | Southeast Director

CleanAIRE NC
Jeff Robbins | Executive Director

Defenders of Wildlife
Ben Prater | Southeast Program Director

NAACP North Carolina State Conference
Deborah Dicks Maxwell | President

North Carolina Coastal Federation
Kerri Allen | Coastal Management Program Director

North Carolina Conservation Network
Grady McCallie | Policy Director

North Carolina Sierra Club
Erin Carey | State Conservation Policy Director

With copy, via e-mail to:

Christine A. Goebel, Assistant General Counsel, NC DEQ
christine.goebel@deq.nc.gov

Justin McCorcle, District Counsel, U.S. Army Corps of Engineers
justin.p.mccorcle@usace.army.mil

Brian Clark, Executive Director, N.C. State Ports Authority
brian.clark@ncports.com

Tancred Miller, Director, Division of Coastal Management, NC DEQ
tancred.miller@deq.nc.gov

Kathy Rawls, Director, Division of Marine Fisheries, NC DEQ
kathy.rawls@deq.nc.gov

Kyle Briggs, Executive Director, NC Wildlife Resources Commission
kyle.briggs@ncwildlife.org

[Exhibits]

From: Sheila Stubbs
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency:USAGE Wilmington Harbor403 Navigation project
Date: Sunday, November 23, 2025 2:34:18 PM

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My name is Sheila Stubbs, and am a resident of New Hanover County. I would like to take this opportunity to express my concern about the proposed project to widen and deepen the Cape Fear River.

I cannot figure out any benefits this project would have for our community. The expense of dredging the river is huge with a very small return on the expense. Who profits? I can think of no positives to this but many negatives. It will do irreparable damage to the vital ecosystem of our marshes. Not just valued for their beauty but also that it supports an abundance of animals and vegetation. I had the pleasure of experiencing this first hand when I attended a river cruise sponsor and narrated by Autobahn. The project would harm the islands and coast line on which many important bird species build nests. This project would further harm trees and vegetation as it would allow salt water further up the river.

Another concern is where will the dredged material be deposited? It will contain many dangerous forever chemicals that, unfortunately, are buried in the river bottom.

Increased flooding to our communities will increase. Add this to sea level rise caused by global warming and the increase in size and number of catastrophic storms and it is adding to a recipe for disaster.

So to conclude, this is a project we don't need, has no benefit to our area and could do irreversible harm to the health of our beautiful river and all that live here.

Thank You

Sheila Stubbs
707 Glenarthur Drive
Wilmington, N.C. 28412

From: Sherry Anderson
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] "Federal Consistency:USACE Wilmington Harbor 403 Navigation Project
Date: Monday, December 8, 2025 5:39:12 PM

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I STRONGLY OPPOSE THE DREDGING OF THE CAFE FEAR RIVER!!!!!

local consensus is the Port dredging with the USACE is only of benefit to cargo ship owners. The risk to the local environment including spreading PFAS dredgings
on the beaches, salt water intrusion and increased flooding in Wilmington compounded by no real benefit to the region.

If the city of Wilmington is truly trying to establish a reputation as a wonderful place to visit, then let's not destroy our downtown and natural areas to cater to big business. We really DON"T need to have the ability to dock larger cargo ships here. Let them go places where they can be handled without damaging our quality of life and native environment.

Sherry Anderson
Wilmington 28412

From: sdragos@aol.com
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency:USACE Wilmington Harbor 403 Navigation Project
Date: Monday, December 15, 2025 4:40:04 PM

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To Whom It May Concern:

I agree with the editorial "City fights back against a concerning harbor project" and the article "Harbor project draws opposition", both found on The State Port Pilot OPINION page 4A, December 10, 2025.

I have lived in St. James Plantation for 18 years and, needless to say, I am concerned about our environment, the flooding caused by rain and high winds, and the pollution of our rivers and ponds.

Please count me as opposed to the plans to dredge and "...widen portions of the Wilmington Harbor navigation channel..." for obvious environmental and quality of life concerns of residents who live adjacent to the Cape Fear River.

PLEASE FORWARD THE NOTICE OF THE DECISION REGARDING THIS MATTER TO ME AT
sdragos@aol.com.

Stephen Dragos
3491 Beaver Creek Drive SE
Southport, NC 28461

From:	Stephen Roberts
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] Federal Consistency 403 Harbor Program
Date:	Monday, December 15, 2025 9:59:07 AM

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Do not dredge the cape fear river.
Thank you
Steve Roberts
Wilmington NC
Sent from my iPad

From:	Steve McNair
To:	DEQ-SVC_DCM.federalconsistencycomments
Subject:	[External] "Federal Consistency:USACE Wilmington Harbor 403 Navigation Project.
Date:	Wednesday, December 3, 2025 2:36:58 PM

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to whom it may concern concern:
We should all be concerned about an effort to dredge the Wilmington harbor.
Sent from my iPhone

The Nature Conservancy
Protecting nature. Preserving life.™

The Nature Conservancy
North Carolina Chapter
220 Blackwell Street, Suite 200
Durham, NC 27701-2394

tel (919) 403.8558
fax (919) 403-0379

nature.org/northcarolina

Dec 5, 2025

Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Federal Consistency Coordinator,
400 Commerce Avenue,
Morehead City, NC 28557

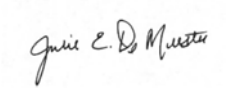
Dear North Carolina Department of Environmental Quality, Division of Coastal Management,

Thank you for the opportunity to provide comments on the Federal Consistency of the USACE Wilmington Harbor 403 Navigation Project. The Nature Conservancy (TNC) has worked with USACE for decades, including extensive collaboration in the Cape Fear River since 2016. TNC submitted comments to the USACE Draft EIS, which are copied below for your reference. The main thrust of the comments include: (1) there are on-going engineering and outreach efforts to improve the locks and dams, and picking engineering designs outside of this process reduces the likelihood of USACE mitigation project success, (2) USACE funded fish research has documented shad, striped bass, and sturgeon near all three locks and dams, and USACE should add mitigation options for lock and dam 3, (3) USACE likely underestimated the damage caused by deepening, as sturgeon are found throughout the impact area. Also, USACE's salt water and sea level rise modeling was opaque, and the impacts are likely greater than modeled, and (4) USACE used low values for land protection purchases that are likely unrealistic in today's market.

TNC was under time constraints to draft comments to USACE. After submitting, TNC recognized additional relevant information. This includes that there is a fall sturgeon spawning migration in the Cape Fear River (data from UNC-Wilmington Sharf lab), and construction impacts should be reduced during this time. Additionally, USACE should sample the substrate of the deepening area and test it for contaminants. The Cape Fear River is known to have forever chemicals and the deepening may re-suspend previously latent contaminants. This should be carefully considered before construction. If construction proceeds, damages should be properly mitigated.

TNC's more detailed comments to USACE are below, including detailed findings about fisheries data. TNC appreciates DEQ's involvement in this effort and is available for follow-up support.

Sincerely,



The Nature Conservancy
North Carolina Chapter
220 Blackwell Street, Suite 200
Durham, NC 27701-2394

tel (919) 403.8558
fax (919) 403-0379

nature.org/northcarolina

Julie DeMeester, Ph.D.
Director of Water and Coastal Programs,
The Nature Conservancy, North Carolina Business Unit
julie.demeester@tnc.org

TNC's Comments Submitted to USACE

U.S. Army Corps of Engineers – Wilmington District
ATTN: Wilmington Harbor 403 Draft EIS
69 Darlington Avenue
Wilmington, NC 28403

RE: Comments of The Nature Conservancy on the Wilmington Harbor 403 Draft Environmental Impact Statement (EIS) and Appendices, Wetland and Fish Passage Mitigation Plan

Dear U.S. Army Corps of Engineers – Wilmington District:

Thank you for the opportunity to provide input to the Wilmington Harbor Draft Environmental Impact Statement (EIS) and accompanying Draft Mitigation Plan. The Nature Conservancy (TNC) recognizes the impact this project will have in the region, and we see meaningful opportunity to improve both the Draft EIS and Draft Mitigation Plan with research supported mitigation strategies that support both the communities, species, and environment. We appreciate the opportunity to submit comments.

TNC is a global conservation organization dedicated to conserving the lands and waters on which all life depends, and the largest environmental non-profit with a long history of working with the US Army Corps of Engineers (USACE). Guided by science, we create innovative, on-the-ground solutions to the world's toughest challenges so that nature and people can thrive together. TNC has protected 745,000 acres across North Carolina. Through a holistic conservation approach, we work across the state with four water-focused strategies: improving flows, aquatic connectivity, healthy functioning floodplains and wetlands, and healthy upstream forests.

The following sections lay out our understanding of the relevant history and background and our recommendations to improve the assumptions and recommended actions in the Draft EIS and accompanying Draft Mitigation Plan.

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Background of TNC's long-time partnership with USACE and extensive conservation in the Cape Fear River Basin

TNC's direct work with USACE

TNC's work includes nationwide efforts with USACE that span decades. One such effort started in 1998 whereby TNC and USACE wanted to jointly improve the ecological condition of the Green River in Kentucky. This led to a formal Memorandum of Understanding between USACE and TNC in 2002 to be nationwide partners in the Sustainable Rivers Program. The mission of the Sustainable Rivers Program is to "improve the health and life of rivers by changing water infrastructure operations to restore and protect ecosystems, while maintaining or enhancing other project benefits."[1] There were 8 original rivers in the program, including the Roanoke River in North Carolina. The North Carolina Chapter of TNC and USACE Wilmington District worked together (and still do) for decades on the Roanoke River to update the Water Control Manual in 2016 to more naturally mimic river flows. ***The momentum from this work led to the 2017 inclusion of the Cape Fear River in the Sustainable Rivers Program.***

TNC and the USACE spent two years analyzing conditions in the Cape Fear and gathering stakeholders to draft e-flow release scenarios out of Jordan Dam[2,3]. Backed by extensive science, TNC and the USACE started testing e-flows out of Jordan Dam in 2020 to improve two downstream conditions. In the spring, we release large amounts of water from Jordan Dam to submerge three downstream locks and dams (LDs) so diadromous fish reach their historic spawning grounds. In the hot summer months, we conduct smaller water releases to mix the water and reduce potential for harmful algal blooms. Flow prescriptions are carried out in direct collaboration with, and including feedback from, over 35 organizations and basin partnership groups including downstream drinking water utilities that serve ***almost one million people***.

USACE has invested over $1,550,000 in studying the efficacy of these e-flows and nature-like fishway evaluations, and TNC has similarly invested over $300,000. We have successfully used e-flows to submerge the LDs every year since implementation began. We have an extensive team of researchers engaged in the effort. For fisheries, this includes Clemson University, UNC-Wilmington, NC Wildlife Resources Commission, and NC Division of Marine Fisheries.

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[1] https://www.hec.usace.army.mil/sustainablerivers/history/

[2] Cape Fear River Sustainable Rivers Program (CFRSRP). 2019a. Environmental Flows Recommendation Workshop Summary. The Nature Conservancy/United States Army Corps of Engineers. www.hec.usace.army.mil/sustainablerivers/publications/

[3] Cape Fear River Sustainable Rivers Program (CFRSRP). 2019b. Identifying Environmental Flow Requirements for the Cape Fear River: Background Literature Review and Summary. The Nature Conservancy/United States Army Corps of Engineers www.hec.usace.army.mil/sustainablerivers/publications/

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USACE's own sponsored research documented important findings relevant to Harbor Deepening Mitigation Options:

- The rock ramp at LD1, even after its modification in 2021, has not effectively passed fish at desirable levels during normal flow levels.[4] Especially important to note, there is only one documented instance of the endangered Atlantic sturgeon using the rock ramp during normal flow conditions.[5]
- E-flow pulses successfully submerged the LDs every year, including drought years.[6] Shad, striped bass, and sturgeon are well-documented using the e-flow pulses to get over the LDs.[7,8] Shad and striped bass are regularly documented moving past LD3, and a tagged sturgeon passed LD3 in fall 2024 during high discharge conditions.[9]
- E-flow pulses in the late summer have effectively mixed the water column and reduced the potential for algal blooms. This has directly benefited the downstream drinking water utilities.
- E-flow pulses are weather dependent. They are a great tool in the toolkit, but the percentage of time that USACE can conduct e-flow pulses is a small fraction of time during the fish migration. Meaningful mitigation strategies from the Harbor Deepening are important to fish migration over the LDs.[10]

The Sustainable Rivers Program USACE and TNC leadership team recognized the important work occurring in North Carolina and has regularly highlighted the Cape Fear effort in nationwide write-ups, conferences, and webinars to teach other rivers nationwide. ***The Harbor Deepening Mitigation efforts should build on the Sustainable Rivers Program Cape Fear effort, which has been a positive way for previously disparate organizations to engage together in the basin.***

TNC's additional protection, restoration, and partnership work in the Cape Fear River Basin

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[4] Bunch A. 2024. Evaluating novel approaches for improving anadromous fish passage in coastal rivers. All Dissertations. 3576. https://open.clemson.edu/all_dissertations/3576
[5] University of North Carolina at Wilmington, unpublished data.
[6] Bunch, A., T. Farmer, K. Rachels, et al. 2025. Dam Submergence Flows: An Environmental Flow Prescription Designed to Aid Migratory Fish Passage. *River Research and Applications* 1–11. https://doi.org/10.1002/rra.70041.
[7] Raabe J., J. Hightower, T. Ellis, J. Facendola. 2019. Evaluation of Fish Passage at a Nature-Like Rock Ramp Fishway on a Large Coastal River. *Transactions of the American Fisheries Society.* 148(4):798–816. https://doi.org/10.1002/tafs.10173
[8] Bunch A. 2024. Evaluating novel approaches for improving anadromous fish passage in coastal rivers. All Dissertations. 3576. https://open.clemson.edu/all_dissertations/3576
[9] University of North Carolina at Wilmington, unpublished data.
[10] Bunch, A., T. Farmer, K. Rachels, et al. 2025. Dam Submergence Flows: An Environmental Flow Prescription Designed to Aid Migratory Fish Passage. *River Research and Applications* 1–11. https://doi.org/10.1002/rra.70041.

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In addition to direct work with USACE, TNC has a lengthy history in the Cape Fear River Basin spanning more than four decades of collaboration with federal and state agencies, local governments, universities, and non-governmental partners to conserve and restore the river's ecological integrity. Our portfolio in the basin includes land protection, forest restoration, wetland restoration, extensive mainstem and floodplain water modeling, fisheries, and leadership in basin-wide planning.

TNC started work in the Cape Fear River Basin in 1977 when it first received 13,850 acres of the Green Swamp. To date, TNC has protected over 109,626 acres throughout the Cape Fear River Basin, breaking down to be 49,269 acres on the NE Cape Fear, 14,317 acres on the Black River and South Rivers, 1,221 acres on the mainstem Cape Fear, and the remainder acreage in uplands. We still manage over 6,000 acres on the Black River, with land containing some of the oldest trees in the world being dated at over 2,300 years old.[11] Beyond protection, TNC long recognized the need for forest and wetland restoration. We have completed thousands of acres of forest and wetland restoration, especially from the Sandhills region to the mouth of the Cape Fear. Together, this gives TNC expertise to advise on land protection and restoration mitigation strategies.

TNC has also been a regular leader in partnerships. In 2006, TNC was a founding member of the Cape Fear Arch Conservation Collaboration, which had a goal to protect the Cape Fear region's natural resources. Turning more directly towards water connectivity in the Cape Fear, TNC joined the Cape Fear River Partnership in 2011 with over 30 other partners (including USACE), which increased the chapter's work to include fish passage and water quality work. Recognizing that flooding and water quality are critical issues in the basin, TNC co-created and funded the largest watershed model that exists of the Cape Fear River Basin to analyze water quantity and incoming nutrients in the Cape Fear River at the point of Wilmington's drinking supply intake.[12] There are over 2900 sub-basins in the model that can be manipulated with scenario interventions to look for flood risk reduction opportunities. The model is peer-reviewed and being integrated into basin-wide flood efforts.

Important Momentum that can Improve the Draft Mitigation Plan

Importantly to this Harbor Deepening Mitigation plan, the momentum from the Sustainable Rivers Program e-flow work, wetland restorations, and the extensive basin stakeholder

[11] Stahle, D., et al. Tree-ring analysis of ancient baldcypress trees and subfossil wood. *Quaternary Science Reviews* 34 (2012): 1-15. https://doi.org/10.1016/j.quascirev.2011.11.005

[12] Schaffer-Smith D., J. DeMeester, D. Tong, et al. 2023. Landscape pollution source dynamics highlight priority locations for basin-scale interventions to protect water quality under hydroclimatic variability. Earth's Future. 11:e2022EF003137. https://doi.org/10.1029/2022EF003137

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engagement around the LDs **led TNC to receive a $7.8 million grant from the National Oceanic and Atmospheric Administration**. This work, launched in 2024 and going to 2028, specifically engages the entire basin by expanding engineering design concepts at all three LDs. It continues the extensive fisheries research previously funded by the Sustainable Rivers Program and ERDC and also incorporates over 17,000 acres of wetland restoration efforts throughout the NE Cape Fear and mainstem. ***TNC's pressing recommendation is to use the science and on-going funded efforts to find the best mitigation options in the basin. Specific comments are below.***

TNC Comments on the Draft Environmental Impact Findings

General clarifications

USACE spent significant time and resources to estimate the impacts of harbor deepening. TNC appreciates the modeling that included sea level rise and the changing salinity zone. The modeling is complex, and it would greatly help if the USACE write-up would provide more details so external scientists can understand the methods. For example, USACE implies that harbor deepening will reduce the impacts of sea level rise salinity issues, but it is hard to follow the model assumptions and process that led to this finding. Also, USACE used the average median salinity values during the growing season to estimate impacts. **The typical toxicity relationship for plants and aquatic animals would include a concentration over a given time**, for instance a 1 ppt over 5 days, not a single median value. All models have their limitations and TNC recognizes that USACE modeled the scenarios with the tools available. Yet, the reality of the many confounding variables means the on-the-ground outcomes are likely different than the modeled estimates. ***TNC recommends that USACE use the highest impact estimates, which at times requires looking through model outputs differently for each species or wetland impacts.***

Aquatic Impacts

The Draft EIS and Appendix H indicate that channel deepening and sea level rise will shift salinity zones further upstream in the Cape Fear River, converting freshwater spawning and nursery habitats into oligohaline or mesohaline zones (Appendix H §H.3.3, p.6). This shift poses a significant risk to anadromous fish species such as Atlantic Sturgeon, American Shad, Blueback Herring, and Striped Bass, whose eggs and larvae are highly sensitive to salinity. Exposure to elevated salinity too early in development can result in osmotic stress, reduced hatching success, and larval mortality (Appendix M §5.2, p.M-19). Habitat modeling shows

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losses of up to 7.5% in habitat units for early life stages of these species under the preferred alternative, with most losses attributed to increased salinity intrusion (Appendix H Table 4, p.6).

In its final recommendation, USACE assumed that sea level rise was less critical to anadromous fish because the proposed mitigation options would expand their habitat. Yet, in addition to sea level rise and salinity implications, section 3.10 references the likely future warmer air temperatures, which will also likely increase in water temperature (climate change water temperature impacts not modeled). This shift makes it less predictable to understand the full habitat use across all life stages that might be impacted by the deepening, especially when compounded by water depth and salinity changes. Furthermore, vessel traffic and larger vessels reaching closer to the bottom can cause direct mortality to sturgeon from vessel strikes, and juvenile sturgeon have been documented in the location of ship movement[13] This demonstrates that the on-the-ground situation is dynamic and complicated. ***Therefore, TNC recommends that USACE clarify its treatment of sea level rise scenarios and, if SLR3 modeling indicates the need for greater Habitat Units (HUs) for anadromous fish (especially Atlantic sturgeon), incorporate those SLR3 results when assessing project impacts on anadromous species.***

Wetland Impacts

Salinity shifts also pose a significant risk to freshwater wetland forests and vegetation, including swamp forests, freshwater marshes, and cattail-dominated wetlands. These habitats are vulnerable to even modest increases in salinity, which can lead to hydrologic stress, reduced regeneration and recruitment, and eventual conversion to brackish marsh dominated by invasive species such as *Phragmites australis* (Appendix I §5.2, p.15). Approximately 1,071 acres of tidal freshwater wetlands are projected to convert to oligohaline zones under the preferred alternative and current climate conditions, with nearly half of this occurring in swamp forest habitat (Appendix I §6.1, p.17). These changes threaten the structural integrity and biodiversity of wetland ecosystems, decreases resilience of seedling and sapling survivability and will likely result in a greater extent of ghost forests over time through prolonged exposure to increased salinity (Appendix I §5.2, p.15; §6.1, p.17). In addition, this increased salinity has been shown to stunt basal area tree growth for Bald Cypress in older stands even at the lower levels of oligohaline salinity thresholds.[14] These findings underscore the need for robust mitigation and

[13] University of North Carolina at Wilmington, unpublished data

[14] Day R., A. From, D. Johnson, K. Krauss. 2024. Interactive Effects of Salinity and Hydrology on Radial Growth of Bald Cypress (Taxodium distichum (L.) Rich.) in Coastal Louisiana, USA. Forests.15:1258 https://doi.org/10.3390/f15071258

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monitoring strategies to protect critical freshwater spawning habitats and wetland ecosystems with a plan for adaptive management should certain thresholds be passed during monitoring.

At present, USACE has proposed monitoring activities for wetland mitigation sites that depend upon visual assessment for evidence of problem area identification (Appendix M §15.1.1; Table 20 & 21, p.M-49-50). Due to uncertainties in the model predicting impacts, USACE additionally outlines water quality monitoring to verify unexpected changes in the salinity isopleth that would require corrective actions for implementation should impacts be significantly different than predicted (Appendix M §15.3.1; Table 23, p.M-52; §15.3.3 p.M-52). Yet, no quantitative monitoring salinity threshold has been identified. ***TNC recommends establishing salinity monitoring thresholds based on the most vulnerable freshwater species tolerance levels that would trigger adaptive management and contingency funding for corrective actions should the threshold be passed.***

TNC Comments on the Draft Mitigation Actions

Aquatic mitigation comments:

As described in the background section, TNC and partners have extensive research on fish usage of the LDs as well as on-going work that includes engineering designs at all three LDs. This includes a $7.8 million NOAA grant, of which significant resources are going towards fish research, engineering designs with multiple updated alternatives, and basin stakeholder buy-in. The Harbor Deepening EIS process did not include time for basin stakeholders to weigh in on the proposed LD mitigation options. ***TNC recommends that USACE utilize the extensive on-going collaborative efforts with basin stakeholders to find the best mitigation strategies and avoid future implementation opposition rather than being prescriptive with mitigation selections and the associated prescriptive engineering designs.***

Prioritize Ecological Uplift that aligns with Science Research, and Includes Options that Require Approvals

TNC appreciates the USACE effort to categorize environmental impacts from the Harbor Deepening. Yet, the real impacts are complicated, correlated with other basin-wide conditions, and likely underestimated. For instance, Appendix M Table 14 references sturgeon credits that were previously allocated from the harbor deepening in 1996. Yet, research shows that the nature-like fishway did not effectively pass sturgeon at LD-1, so these past credits did not achieve their ecological goal. USACE removed several mitigation options based on constraints around authorities. TNC works with partners throughout the basin who are committed to working

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through the authorization, re-authorization, or de-authorization process. Many of the best ecological options require a change in authority, yet these options are the most cost-effective and best ecological way to mitigate for the impacts of deepening. TNC recognizes that any change in authorization requires basin-wide partner agreement. Still, ***TNC recommends that USACE prioritize mitigation options on the best ecological uplift and does not eliminate options due to authorities, especially since past mitigation options fell short of their desired benefit.***

The importance of including LD-3:

The Draft EIS currently conveys that LD-1 and LD-2 act as complete barriers and that mitigation at LD-3 would only be necessary if American shad and striped bass were able to reach its base. Over the past two decades, a cadre of researchers including TNC, the North Carolina Wildlife Resources Commission,[15] North Carolina State University,[16], the University of North Carolina at Wilmington[17], have used telemetry, environmental DNA (eDNA), and studies on fish population status and trends at LD-1, LD-2, and LD-3. **The findings demonstrate that American shad and striped bass consistently migrate to the base of LD-3 under current conditions and in all historical evaluations.** During years of conservation locking and intermittent natural high flows or e-flows, Atlantic sturgeon (a single fish in fall 2024)[18], American shad and striped bass have moved above LD-3.

Appendix M acknowledges potential uplift at LD-3 yet excludes it from the recommended plan due to dependency on downstream LDs. However, Appendix M Table 14 quantifies substantial habitat units (HUs) at LD-3, emphasizing the ecological value of full longitudinal reconnection. The LDs currently have poorly functioning lock chambers, which are frequently blocked with silt or broken. USACE spent $6 million in 2023 to improve the LD lock chambers. Despite regular locking, LD2 and LD3 gates are already inoperable due to siltation. Without conservation locking, fish are not able to pass LD3 without dam submergence flows which are subject to precipitation in the upper basin[19]. A full range of mitigation options would provide extensive

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[15] Boggs A, and K. Rachels. 2021. Cape Fear River anadromous fish stock assessment. NCWRC. Federal Aid in Sport Fish Restoration. Final Report. Raleigh, NC.

[16] Smith, J. and J. Hightower. 2012. Effect of Low-Head Lock-and-Dam Structures on Migration and Spawning of American Shad and Striped Bass in the Cape Fear River, North Carolina. Transactions of the American Fisheries Society. 141:402-413. https://doi.org/10.1080/00028487.2012.667043

[17] Bunch A. 2024. Evaluating novel approaches for improving anadromous fish passage in coastal rivers. All Dissertations. 3576. https://open.clemson.edu/all_dissertations/3576

[18] University of North Carolina at Wilmington, unpublished data

[19] Bunch A. 2024. Evaluating novel approaches for improving anadromous fish passage in coastal rivers. All Dissertations. 3576. https://open.clemson.edu/all_dissertations/3576

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habitat gains in the river. ***TNC strongly recommends mitigation at LD-3 that utilizes engineering options that emerge throughout the NOAA-funded grant effort.***

There are better options for the Lock & Dam #1 (LD-1) bypass channel

As part of the TNC-received NOAA grant, TNC initiated land surveys, HEC RAS modeling, and fish-passage modeling throughout the surrounding lands adjacent to the LDs. Recent acoustic telemetry studies confirm that **Atlantic sturgeon**, striped bass, and American shad actively use the existing canal and tributaries on the north side of LD-1, and all three species have used these channels to successfully pass upstream of LD-1 during periods of elevated river flow[20].

Initial modeling reactivated select tributaries to analyze the desirable length, slope, water velocity, and attractant flow that would enable fish to use these bypass channels on the north-side property during normal flows. Compared to these preliminary findings, USACE's drafted mitigation for a bypass channel on LD-1 would limit fish from using it because it is too short, does not have enough attractant flow, continues to include a barrier at the outlet, and because fish could still get stranded in the existing man-made canal.

USACE also assumes $45,000 to buy access rights to enable the bypass channel and significant costs to dig parts of the bypass connection. It is unclear whether the cost estimate is suitable based on what would practically be needed to complete a successful bypass. TNC expects to have a full engineering design plan by early 2027, which includes vetting with local property owners and basin stakeholders. This is a high priority project for TNC. ***TNC recommends keeping LD-1 bypass recommendations broad and outcome-focused, not prescriptive on engineering details.***

The LD-2 Mitigation Option is prescriptive and likely inadequate for the Ecological Uplift Required

Appendix M recommends a rock-ramp with boulder clusters at LD-2 but does not provide slope, length, crest drop, rock sizing/roughness, or modeled passage hydraulics (Appendix M §9.4.2, p.41; Fig. 12 p.51). The design ignores existing data and research already completed at the LD-1 ramp and it ignores a 1+ million-dollar investment by NC Dept Of Environmental Quality and USFWS that drafted advanced rock ramp designs at LD-2 and LD-3. Of critical importance to harbor deepening, multiple basin stakeholders, including a state agency, requested more engineering designs beyond the rock ramp concepts because of the low efficacy at LD-1 and the high cost of rock ramp installation. In 2023 the USFWS initiated further design concepts at LD-2

[20] University of North Carolina at Wilmington, unpublished data

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that included lowering the dam. TNC's NOAA grant is to enhance designs at LD-2 and LD-3 while continuing to engage with basin stakeholders to reach consensus.

As previously described in the background section, a multi-year evaluation reported raw upstream passage efficiency of 19–25% for striped bass and failure to meet an 80% criterion. The 2021 modification to the fishway did not substantially improve passage efficiency[21.]. Atlantic Sturgeon appear to require large e-flow events to successfully navigate the rock ramp, with only a single documented instance of a tagged sturgeon using the ramp under average flow conditions..[22]

Appendix M (§9.3.3, p.35) indicates that bypass alternatives were screened out for the northern floodplain due to limited data. TNC's NOAA-funded work is evaluating bypass channels on both sides of LD-2. We are also investigating lowering LD-2 and relying on past rock ramp designs in conjunction with other measures. Our goal is to maximize the ecological gains while also balancing costs and constraints.

USACE included statements that a rock ramp alternative could be substituted during the Preconstruction Engineering and Design phase if it is less expensive, lower risk, and only if a non-federal sponsor accepts perpetual operations and maintenance. **TNC recommends clarifying this language to expand the ecological options allowable, and that responsibilities for long-term operations and maintenance align with ownership and statutory obligations.** Since these structures are currently owned by the USACE, it would be appropriate for USACE to retain O&M responsibility unless a formal disposition transfers ownership to another entity. Also, an alternative should be considered if it is the same cost and the same risk. Clear guidance on this point would help reduce uncertainty and ensure consistency with mitigation objectives.

TNC recommends keeping LD-2 mitigation options broad and outcome-focused, utilizing TNC and other partner engineering designs, and removing the burden on a non-federal entity if a better option is determined.

Establish passage metrics for success:

Appendix M identifies monitoring and adaptive management, but success criteria for fish passage are qualitative (evidence of target species using the structures) rather than quantitative. This implies that the success criteria could be based on a single individual fish of the target species using a structure. Standard fish passage evaluations of structural design are based on

[21] Bunch A. 2024. Evaluating novel approaches for improving anadromous fish passage in coastal rivers. All Dissertations. 3576. https://open.clemson.edu/all_dissertations/3576
[22] University of North Carolina at Wilmington, unpublished data

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passage efficiency (the percentage of fish that passed), not solely on species presence. For example, the effectiveness of a single passing fish out of 100 individuals directly downstream is estimated to be a 1% passage efficiency, which is extremely low and mitigation would be deemed ineffective. These metrics should exceed those evaluated during previous conservation locking, and if the new passage mitigation underperforms, revert back to conservation locking at all LDs or adaptively manage to further enhance the new passage structure. ***TNC recommends establishing quantitative success criteria (e.g., ≥80% passage for each target species[23]), with adaptive management triggers and contingency funding.***

The timing of mitigation implementation

Finally, mitigation should occur before or concurrently with the harbor deepening project construction (Appendix M §6, p. 20) as is required by the WRDA Act of 1986. ***TNC supports concurrent implementation and request confirmation that fish passage mitigation will be funded and constructed concurrently with harbor channel deepening.***

Importance of Freshwater Wetland Mitigation

As outlined in the background section, TNC has strong expertise in land protection, wetland restoration, and general conservation. This includes an extensive history of Cypress swamp forest protection along the Black River and over 6,000 acres held at present in fee within the corridor. Our comments stem from recent protection efforts in the Black River. ***TNC recommends that USACE utilize the extensive protection & restoration knowledge of conservation stakeholders in the lower Cape Fear Basin regarding wetland mitigation.***

Swamp wetland protection in the Black River Corridor is a sound mitigation strategy

Appendix I outlines functional wetland habitat loss of 1,071 acres associated with inland movement of the salt wedge due to proposed harbor deepening under current sea level conditions, with swamp forests accounting for over half of the predicted area. Protection of intact swamp forests outside of the new predicted freshwater/oligohaline mixing zone has been identified in Appendix M as a mitigative priority. In addition, persistent emergent wetland migration is expected due to sea level rise resulting even more saltwater intrusion inland[24] This

[23] Raabe J., J. Hightower, T. Ellis, J. Facendola. 2019. Evaluation of Fish Passage at a Nature-Like Rock Ramp Fishway on a Large Coastal River. *Transactions of the American Fisheries Society.* 148(4):798–816. https://doi.org/10.1002/tafs.10173

[24] Magolan J., and J. Halls. 2020. A Multi-Decadal Investigation of Tidal Creek Wetland Changes, Water Level Rise, and Ghost Forests. Remote Sensing. 12(7):1141. https://doi.org/10.3390/rs12071141

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sea level rise, as depicted in Figure 5 of Appendix I will cause compounding effects in the future post harbor deepening, most profoundly affecting the NE Cape Fear River (Appendix I §5.1.3, p.I-12).

Appendix M identifies a total of 7 proposed mitigation options for wetland impact as a result of project implementation with initial screening carrying forward Measures 5, 8, & 9. (Appendix M §9.1.11, p.24). Measure 5, the protection of intact swamp forest in the Black River Corridor, sits outside the identified area of salinity impact due to both harbor deepening and sea level rise. Therefore, protection in the Black River Corridor would continue to provide functional wetland benefit beyond the scope of the Wilmington Harbor Deepening project in future sea level rise conditions based on modeling results compared to similar stands of intact swamp forest in the lower Cape Fear Basin. ***TNC supports the inclusion of Black River Corridor protection as the preferred swamp forest wetland mitigation strategy.***

Funding available for mitigation is unclear and real estate costs for mitigation projects are underestimated

Attachment 6 Real Estate Plan, while meant for planning purposes, includes a baseline cost estimate for mitigation, total costs do not reflect the plan costs with contingency outlined in the 2020 Integrated Section 203 Study & Environmental Report for the Wilmington Harbor. With a harbor deepening to ~47 feet, the original report indicates a mitigation cost with contingency of approximately $89,836,000.00 and land cost of $25,470,000.00 (Executive Summary; Table ES-4, p. ES-10). The baseline cost estimate summary for mitigation with contingency laid out in the Real Estate Plan lists a value approximately one third of this original cost (Attachment 6 §11.0; Table 3, p.9). Additionally, the Cost Appendix separately estimates the expense of land preservation associated with mitigation projects and is not accurately reflected in the Mitigation Appendix (Appendix M §10; Table 15 & 16, p.M-43; Attachment 4 §4, p.11). It is unclear what is the true investment for compensatory mitigation, specifically to fully compensate for the unavoidable impacts of project implementation.

Appendix M includes an estimate of real estate cost per paired wetland mitigation strategies (Appendix M §10; Table 15, p. M-43). Of the 4 Measures carried forward, the Black River Corridor is the only mitigation strategy where an exact mitigation site has not been determined yet provides an estimate cost for land protection. Additionally, Attachment 6 states that potential properties were identified for cost estimating purposes (Attachment 6 §21.4, p.17). At present, real estate costs associated with protection of swamp wetland in the Black River Corridor are stated to be approximately $810.00 per acre (Appendix M §10; Table 15, p. M-43).

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While we agree that further outreach is necessary to assess real estate acquisition and implementation of the proposed mitigation plan, TNC believes that this estimate provided does not reflect actual real estate costs of feasible property acquisitions within said corridor. TNC has extensive land protection expertise along the Black River Corridor and believes a median dollar value of $2,450 per acre more accurately reflects real estate values in the area. More specifically, USACE could expect to pay $1,000 per acre for properties without legal access and $2,500 per acre for those with legal access. These values are based on appraisals associated with TNC Black River swamp wetland protection projects in the last 5 years. Because the mitigation strategy associated with this corridor is solely based on land acquisition and protection, ***TNC recommends clear language related to full costs associated with compensatory mitigation and further analysis of $ per acre value for the mitigation strategy on the Black River Corridor.***

Mitigation projects requiring protection are not readily obvious on the real estate acquisition schedule

Appendix M states within the objectives that "acquisition of lands or interests in lands for mitigation must be acquired before construction of the project commences or concurrently with acquisition of lands and interests in lands for other project purposes..." (Appendix M §6, p. M-21). The real estate acquisition schedule lays out Notice to Proceed (NTP) with acquisition in February 2027 and awards for construction in January 2030 (Attachment 6 §16.0; Table 4, p.11). At present, it is unclear within the Real Estate Plan whether the NTP with acquisition includes protection associated with required mitigation project and does not include reference to Section 906(a)(1) of the 1986 Water Resources Development Act (WRDA) anywhere within the document. ***TNC reaffirms support for concurrent implementation and requests confirmation that wetland mitigation will be funded and acquired before or concurrently with harbor deepening in accordance with Section 906(a)(1) of the 1986*** *WRDA* ***as amended.***

<u>Final thoughts on costs mitigation activities</u>

To truly achieve the ecological mitigation needs that offset the harbor deepening described in the EIS, TNC reiterates the need to include LD-3 mitigation and accurately capture real-estate costs, both of which entail more funds. The Draft EIS Section 203 Report Table ES-4 estimated $89.8M for mitigation and $12.1M for monitoring, with real estate costs at $25.47M for wetland protection. In the EIS Appendix M Table 4.1, USACE reduces their mitigation estimates to $60,080,000 for all mitigation options and $8,355,000 for real estate costs with no mentioned monitoring dollars. ***TNC recommends that USACE supports mitigation funding at the upper end of the stated estimates across project documents. TNC has indicated that actual mitigation costs may exceed current projections, and aligning with the highest estimate would help ensure ecological goals are met effectively and without compromise.***

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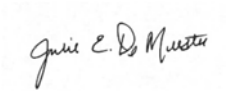
The Nature Conservancy
North Carolina Chapter
220 Blackwell Street, Suite 200
Durham, NC 27701-2394

tel (919) 403.8558
fax (919) 403-0379

nature.org/northcarolina

Thank you for the opportunity to comment. TNC looks forward to working with the Wilmington District and our state and federal partners to deliver ecological outcomes that achieve safe, timely, and effective migration while supporting the region's economic and community needs.

Sincerely,



Julie DeMeester, Ph.D.
Director of Water and Coastal Programs,
The Nature Conservancy, North Carolina Business Unit
julie.demeester@tnc.org

Substantive Comments on *Attachment 5 to Wilmington Harbor 403 Letter Report*

The following substantive comments are for the document *Attachment 5 Economic Considerations to Wilmington Harbor 403 Letter Report* Draft 09/05/2025 My contact information is Tim Holder, 7601 Quail Woods Road, Wilmington, NC, timholder@verizon.net, 571-346-9758. In a separate document I am also submitting editorial comments.

The HarborSym model is the one certified by the USACE (page 49 footnote). Attachment 5 pages 49-53 describes the workings of the model and in pages following describes inputs and outputs in appropriate detail. However, what happens in the model is not apparent. Without knowing what assumptions, algorithms and equations are used it is hard to know the validity of the cost benefit analysis and therefore the conclusions. The inner workings of the model should be peer reviewed by economists with expertise in this kind of modeling. These issues should be addressed.

On page 57 under Section 5.3.3.4 Benefit Cost Analysis, the second sentence reads, "The costs include all economic cost such as..." and then lists several cost items, but does not include environmental costs.

On page 57 the last paragraph states that "the final array of alternatives underwent detailed analysis, including full consideration of environmental impact as presented in Draft EIS." You should make explicit how you made "full consideration of environmental impact".

- Explain in detail how each resource in Table 4-1 of the Draft EIS, titled "Impacts to resources under each alternative" is considered;
- Quantify in dollars each environmental resource where possible;
- Then add the sum of them as a separate line item to Table 5.45;
- Evaluate qualitatively, where a resource cannot be quantified in dollars;
- Explain how these environmental considerations are integrated with the forecast dollar amounts.
- Revise the benefit-to-cost ratio and the conclusions accordingly.

Also on page 57 the last paragraph, the third sentence reads: "Estimated first costs include the cost to construct, Real Estate cost, relocation costs, environmental mitigation cost, Preconstruction Engineering and Design (PED) and Construction Management (CM) cost;". Each of these costs should be presented as line items in a separate table.

Likewise, on page 57 in the last paragraph, the second to last line identifies "environmental mitigation costs" which are combined with other project first costs. These should be broken out on its own line item and discussed in the narrative.

For Tables 5.45 and 5.46 I suggest including data for depths of 45 and 48 feet; these are the concluding tables and are too important to leave out. However, I recognize that only alternatives for depths of 46 and 47 feet are analyzed in the DEIS.

In Table 5.46, the BCR's for -46 and -47 feet are both 1.3. You need to carry out the BCR's to decimals to the point that differentiate the two alternatives.

It seems like the reports goes into great detail with many tables of data for 56 pages then compresses data in the last three pages where there should be more detail to justify the conclusions.

A recent Star News article quotes Kerri Allen, coastal advocate with the NC Coastal Federation (*Star News*, October 14, 2025, page 2A). I agree with those comments and I repeat them here.

> Wilmington is a niche port when compared to its larger port neighbors, handling a fraction of the cargo they do, and is already highly efficient and has enough access to meet the needs of its shipping clients.
>
> Savannah, for example, handled nearly 5.25 million containers in the 2023-24 fiscal year. Charleston handled 2.5 million, while Wilmington handled 320,000 containers.
>
> Where is the justification for needing to receive a fully loaded ship? [The preferred alternative costs] $1.35 billion with Washington picking up 75% of that cost. [That] is a lot to spend on a project that might not be required. Right now it seems this project is tipped in favor of corporate shipping interests and against taxpayers and the environment.

I have raised some fundamental concerns about the economic analysis and environmental organizations have raised fundamental concerns about environmental issues. Responses to my comments above could alter the conclusions. Therefore I request hat the USACE respond to these issues in a supplemental Attachment 5 and associated DEIS. These then could be reviewed by stakeholders and the public before the Final EIS is issued.

From: Tom B
To: DEQ-SVC_DCM.federalconsistencycomments
Subject: [External] Federal Consistency: USACE Wilmington Harbor 403 Navigation Project
Date: Saturday, November 22, 2025 3:27:16 PM

You don't often get email from lt_barnett@yahoo.com. Learn why this is important

CAUTION: External email. Do not click links or open attachments unless verified. Report suspicious emails with the Report Message button located on your Outlook menu bar on the Home tab.

I support the project. With the additional revenue from fuller container ships, NHC should impose fees for road improvements in the area.

Tom Barnett

RESOLUTION #2026- 0104

RESOLUTION TO JOIN REGIONAL STATEMENT REGARDING THE UNITED STATES ARMY CORPS OF ENGINEERS' DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE WILMINGTON HARBOR PROJECT

WHEREAS, the United States Army Corps of Engineers ("USACE") has released a Draft Environmental Impact Statement ("DEIS") and Draft Letter Report ("DLR") for the deepening and widening of the Cape Fear River channel from the ocean to the Wilmington Harbor ("Wilmington Harbor Project"); and

WHEREAS, the Village of Bald Head Island has provided comments on the DEIS and DLR voicing concerns with the Corps' analysis and with the anticipated impacts of the Wilmington Harbor Project to the Village; and

WHEREAS, other municipalities have voiced similar concerns about the DEIS and DLR and the project's impacts; and

WHEREAS, the City of Southport has prepared a Joint Regional Statement voicing such concerns in the form of **Exhibit A** hereto, which shall be sent to the North Carolina Congressional Delegation, the Governor of North Carolina, the North Carolina General Assembly, the USACE, the North Carolina Department of Environmental Quality, the North Carolina State Ports Authority, and the Brunswick County Legislative Delegation with the intention of neighboring municipalities joining Southport as signatories to the Joint Regional Statement; and

WHEREAS, the Village desires to join the Regional Statement.

NOW, THEREFORE, BE IT RESOLVED by the Village Council of the Village of Bald Head Island that:

1) The Village shall join as a signatory in the Joint Regional Statement regarding the Wilmington Harbor Project, substantially in the form attached hereto as **Exhibit A**.

ADOPTED THIS the 16th day of January 2026.

VILLAGE OF BALD HEAD ISLAND SEAL NORTH CAROLINA

Peter Quinn, Mayor

ATTEST:

Darcy Sperry, Village Clerk

Exhibit A

Joint Regional Statement

North Carolina Congressional Delegation

Governor, North Carolina

North Carolina General Assembly

US Army Corps of Engineers

North Carolina Department of Environmental Quality

North Carolina State Ports Authority

Brunswick County Legislative Delegation

As municipalities and stewards of taxpayer, cultural and environmental resources in the Lower Cape Fear region, we have come together to express our shared concerns regarding the U.S. Army Corps of Engineers' recently released Draft Environmental Impact Statement ("DEIS") for the proposal to deepen and widen the Cape Fear River channel from the ocean to the Wilmington Harbor (the "Wilmington Harbor Project").

While each of our communities may experience different localized impacts, we are united in calling upon the Corps, the Ports Authority (as Project Sponsor), and the State of North Carolina to ensure that prior to advancing the deepening project to the Final Environmental Impact phase, **an updated Economic Assessment be conducted reflecting 2025 volumes and ocean carrier profiles for the Port of Wilmington, focusing on container activity.**

Our concerns regarding the feasibility of this project must be addressed before additional studies attempt to identify an adaptive management plan and ongoing monitoring. We believe the impacts of this proposed project cannot adequately or successfully be mitigated given existing challenges in the Cape Fear River and surrounding communities.

The specific economic factors raising red flags include:

- The extremely slim margin of feasibility with a Benefit to Cost Ratio of 1.3;
- The Office of Management and Budget BCR threshold of 2.5 to qualify for federal funding;
- Ocean Carrier Services highlighted in the Economic Assessment as justification for the deepening stopped calling Wilmington in May 2025;
- Ocean Carrier Alliances have realigned and are inaccurate in the Corps study; and
- The Operations & Maintenance dollars used in the annual cost equation seem low given the $18 Million contract just awarded for maintenance dredging.

We are aware that the Corps will be required to update the BCR during the Pre-Construction Engineering and Design phase (when other costs excluded from this current cost estimate are

included such as real estate acquisition, mitigation and ongoing monitoring) but the current state of play with escalating project costs and lower volumes at the NC Ports Authority, demand this should be updated now. It would require minimal effort to do so and is the responsible path for the Corps of Engineers.

A 47-Foot Project is a last generation deepening project as surrounding Top 10 container ports are either deeper or have already achieved this proposed depth; and are currently seeking further deepening.

We must ask ourselves, Is North Carolina prepared to pay the entire cost of the project if federal dollars don't materialize?

Our citizens deserve the ability to evaluate this project on clear and accurate economic data. As the Independent External Peer Review Panel stated in its Report on the Draft Letter Report and Draft EIS, there is uncertainty associated with the calculations of the future benefits of the project. This uncertainty is caused, in part, by the lack of publicly available data related to future shipping forecast, which is an essential part of the Corps' future benefits calculation. It is premature to attempt to address the tremendously negative environmental impacts of deepening to 47-Feet without confirmation the project has a positive benefit to cost ratio that merits federal funding.

Any future studies, **should they be warranted after a thorough, timely economic assessment**, must address a comprehensive, long-term, and fully funded Adaptive Management and Monitoring plan.

The DEIS not only lacks accurate economic data, it also relies upon inaccurate environmental modeling. The Independent Review Panel concluded that shoaling rates discussed in the Draft EIS may have been overestimated by as much as 50%. The DEIS also fails to identify detrimental impacts to shorelines along the twenty-eight miles of the Cape Fear River, and proposes only two mitigation measures with the approximate cost of $60 million, with no monitoring plan proposed beyond evaluating the effectiveness of these two limited actions.

By comparison, when the Savannah Harbor was deepened, that project cost approximately $900 million, of which $500 million was dedicated specifically to mitigation and ten years of post-construction monitoring. The Wilmington Harbor DEIS contains no comparable commitments.

We emphasize that the Lower Cape Fear functions as a single coastal system, and the strength of our shared regional economy depends on the health of our surrounding environment. What happens to the channel impacts every community.

We support responsible maritime infrastructure that strengthens our state's economy. But we cannot accept a project that lacks accurate economic data to determine feasibility and ignores the long-term financial commitment to provide environmental safeguards necessary to protect our shorelines, habitats, riverfronts, infrastructure, and citizens.

Through this Joint Regional Statement, we affirm our unified commitment to stewardship, resilience, and the responsible management of the Lower Cape Fear and our taxpayer resources—today and for generations to come.

The Town of Caswell Beach North Carolina

A RESOLUTION OF THE CAWELL BEACH BOARD OF COMMISSIONERS URGING ROBUST MITIGATION, LONG-TERM MONITORING, AND ADAPTIVE MANAGEMENT FOR THE WILMINGTON HARBOR 403 PROJECT

Resolution # 2025-08

WHEREAS, the Town of Caswell Beach is located at the confluence of the Cape Fear River and the Atlantic Ocean, a uniquely sensitive estuarine environment that supports diverse wildlife, coastal communities, and natural systems; and

WHEREAS, the proposed Wilmington Harbor 403 Project seeks to deepen, widen, or otherwise modify the federal navigation channel, changes that may significantly alter hydrodynamic patterns, sediment transport, and shoreline stability in the Lower Cape Fear River region; and

WHEREAS, these alterations have the potential to increase erosion risk to sensitive shorelines, marsh platforms, and riverfront areas, and increase the likelihood of subsidence of adjacent riverbed and shoreline areas into the dredge prism, particularly within and adjacent to the Town of Caswell Beach, threatening natural buffers that protect homes, public spaces, cultural resources, and community infrastructure; and

WHEREAS, the region's barrier and estuarine islands - including Battery Island, Shellbed Island, and others- play a critical ecological role in supporting fisheries, marsh nurseries, colonial waterbirds, and migratory shorebirds; and

WHEREAS, Battery Island in particular is recognized as one of the most significant colonial waterbird nesting sites on the East Coast, and in total all bird nesting islands on the Lower Cape Fear River provide habitat for approximately 30% of North Carolina's nesting coastal waterbird population, and are highly vulnerable to erosion, sea level rise, and habitat loss that may be exacerbated by channel deepening activities; and

WHEREAS, the environment surrounding Caswell Beach is an essential part of the town's core values, contributing to residents' quality of life, recreational enjoyment, cultural heritage, and longstanding community identity rooted in conservation and stewardship; and

WHEREAS, the economic resilience of Caswell Beach is directly connected to the integrity of its surrounding natural resources, with tourism, recreation, and property values all depending on a healthy, stable coastal environment; and

WHEREAS, any federal navigation project that increases environmental risk must include robust mitigation, long-term monitoring, and adaptive management measures proportionate to both the scale of the project and the sensitivity of the affected ecosystems and communities; and

WHEREAS, the billion-dollar Savannah Harbor Expansion Project (SHEP) spent approximately 500 million on mitigation and included funding for post-construction monitoring and adaptive management, ensuring that resources would be available to modify or enhance mitigation if environmental conditions changed unexpectedly; and

WHEREAS, the non-federal sponsor for SHEP, acting through the Georgia Ports Authority, agreed to set aside, **in** advance, their cost-shared portion of the monitoring and adaptive management funds in an escrow account upon approval of the project, guaranteeing rapid response capability and honoring

The Town of Caswell Beach North Carolina

the principle that those benefiting from the project must share responsibility for preventing or repairing environmental harm; and

WHEREAS, projects such as the Wilmington Harbor 403 effort must match or exceed this level of commitment by establishing a dedicated and adequately funded adaptive management program that extends over the full period of environmental risk, not only the construction phase or initial years of project operation; and

WHEREAS, safeguarding Caswell Beach's environment, wildlife habitats, and economic well-being requires that mitigation and monitoring measures be both enforceable and financially secure before any project authorization or construction proceeds.

NOW, THEREFORE, BE IT RESOLVED that the Town of Caswell Beach urges state and federal decision-makers, including the U.S. Army Corps of Engineers and the North Carolina General Assembly, to require a comprehensive, long-term, and fully funded environmental mitigation and adaptive management plan for the Wilmington Harbor 403 Project, modeled on or exceeding the commitments made in the Savannah Harbor Expansion Project; and

BE IT FURTHER RESOLVED that the Town of Caswell Beach calls for the establishment of a dedicated adaptive management fund, placed in escrow prior to construction and sized proportionally to the project's potential impacts, ensuring that corrective actions, ecological restoration, and shoreline protections can be implemented promptly whenever monitoring indicates environmental degradation; and

BE IT FURTHER RESOLVED that the Town of Caswell Beach urges all agencies and project sponsors to protect Battery Island and the surrounding Cape Fear River islands as irreplaceable ecological assets, ensuring that mitigation measures fully safeguard the habitats supporting 30% of North Carolina's coastal shorebird population; and

BE IT FINALLY RESOLVED that copies of this Resolution be forwarded to the North Carolina General Assembly, the North Carolina Congressional Delegation, the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, the Brunswick County delegation, and other relevant agencies, urging their support in ensuring that environmental protection, community values, and economic resilience remain at the forefront of all decisions related to the Wilmington Harbor 403 Project.

Approved and adopted by the Town of Caswell Beach Board of Commissioners on this 18th of December 2025.

Mayor George Kassler

ATTEST:

Town Clerk Beth Usery, MMC, CMC

KURE BEACH TOWN COUNCIL
TOWN OF KURE BEACH, NC

RESOLUTION R25-12

RESOLUTION URGING ROBUST MITIGATION, LONG-TERM MONITORING, AND ADAPTIVE MANAGEMENT FOR THE WILMINGTON HARBOR 403 PROJECT

WHEREAS, the Town of Kure Beach is located at the confluence of the Cape Fear River and the Atlantic Ocean, a uniquely sensitive estuarine environment that supports diverse wildlife, coastal communities, and natural systems; and

WHEREAS, the proposed Wilmington Harbor 403 Project seeks to deepen, widen, or otherwise modify the federal navigation channel, changes that may significantly alter hydrodynamic patterns, sediment transport, and shoreline stability in the Lower Cape Fear River region; and

WHEREAS, these alterations have the potential to increase erosion risk to sensitive shorelines, marsh platforms, and riverfront areas, and increase the likelihood of subsidence of adjacent riverbed and shoreline areas into the dredge prism, particularly within and adjacent to the Town of Kure Beach, threatening natural buffers that protect homes, public spaces, cultural resources, and community infrastructure; and

WHEREAS, the region's barrier and estuarine islands-including Battery Island, Shell bed Island, and others-play a critical ecological role in supporting fisheries, marsh nurseries, colonial waterbirds, and migratory shorebirds; and

WHEREAS, Battery Island in particular is recognized as one of the most significant colonial waterbird nesting sites on the East Coast, and in total all bird nesting islands on the Lower Cape Fear River provide habitat for approximately 30% of North Carolina's nesting coastal waterbird population, and are highly vulnerable to erosion, sea level rise, and habitat loss that may be exacerbated by channel deepening activities; and

WHEREAS, the environment surrounding Kure Beach is an essential part of the city's core values, contributing to residents' quality of life, recreational enjoyment, cultural heritage, and long-standing community identity rooted in conservation and stewardship; and

WHEREAS, the economic resilience of Kure Beach is directly connected to the integrity of its surrounding natural resources, with tourism, recreation, waterfront businesses, and property values all depending on a healthy, stable coastal environment; and

KURE BEACH TOWN COUNCIL
TOWN OF KURE BEACH, NC

RESOLUTION R25-12

WHEREAS, any federal navigation project that increases environmental risk must include robust mitigation, long-term monitoring, and adaptive management measures proportionate to both the scale of the project and the sensitivity of the affected ecosystems and communities; and

WHEREAS, the billion-dollar Savannah Harbor Expansion Project (SHEP) spent approximately 500 million on mitigation and included funding for post-construction monitoring and adaptive management, ensuring that resources would be available to modify or enhance mitigation if environmental conditions changed unexpectedly; and

WHEREAS, the non-federal sponsor for SHEP, acting through the Georgia Ports Authority, agreed to set aside, **in** advance, their cost-shared portion of the monitoring and adaptive management funds in an escrow account upon approval of the project, guaranteeing rapid response capability and honoring the principle that those benefiting from the project must share responsibility for preventing or repairing environmental harm; and

WHEREAS, projects such as the Wilmington Harbor 403 effort must match or exceed this level of commitment by establishing a dedicated and adequately funded adaptive management program that extends over the full period of environmental risk, not only the construction phase or initial years of project operation; and

WHEREAS, safeguarding Southport's environment, wildlife habitats, and economic well-being requires that mitigation and monitoring measures be both enforceable and financially secure before any project authorization or construction proceeds;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Kure Beach formally that the Town of Kure Beach urges state and federal decision-makers, including the U.S. Army Corps of Engineers and the North Carolina General Assembly, to require a **comprehensive, long-term, and fully funded environmental mitigation and adaptive management plan** for the Wilmington Harbor 403 Project, modeled on or exceeding the commitments made in the Savannah Harbor Expansion Project; and

BE IT FURTHER RESOLVED that the Town of Kure Beach calls for the establishment of a **dedicated adaptive management fund,** placed in escrow prior to construction and sized proportionally to the project's potential impacts, ensuring that corrective actions, ecological restoration, and shoreline protections can be implemented promptly whenever monitoring indicates environmental degradation; and

KURE BEACH TOWN COUNCIL
TOWN OF KURE BEACH, NC

RESOLUTION R25-12

BE IT FURTHER RESOLVED that the Town of Kure Beach urges all agencies and project sponsors to protect Battery Island and the surrounding Cape Fear River islands as irreplaceable ecological assets, ensuring that mitigation measures fully safeguard the habitats supporting 30% of North Carolina's coastal shorebird population; and

BE IT FINALLY RESOLVED that copies of this Resolution be forwarded to the North Carolina General Assembly, the North Carolina Congressional Delegation, the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, the Brunswick County delegation, and other relevant agencies, urging their support **in** ensuring that environmental protection, community values, and economic resilience remain at the forefront of all decisions related to the Wilmington Harbor 403 Project.

ADOPTED, this 15th day of December 2025.

Allen Oliver, Mayor

Attest: Beth Chase, Town Clerk

Town of Leland

Resolution R-25-101

Introduced By: Town Council
Date: December 18, 2025

Resolution R-25-101 Requesting Further Review and Consideration of the Wilmington Harbor 403 Project

WHEREAS, the Town of Leland is located in the lower Cape Fear River basin in southeastern North Carolina with multiple tributaries of the River meandering through its community, as well as sensitive estuarine watersheds that supports diverse wildlife and interconnected natural systems; and

WHEREAS, the proposed Wilmington Harbor 403 Project would involve extensive modifications to the federal navigation channel, including deepening or widening, which may influence hydrodynamic conditions, sediment movement, and shoreline stability within the Lower Cape Fear River region; and

WHEREAS, such changes may present potential risks to superficial and deep aquifers used for potable water sources and further increase salt intrusion into the groundwater and marshes adjacent to the River, while migrating the subsequent plume of brackish water further upstream into the River tributaries that will potentially harm plant and animal ecosystems; and

WHEREAS, such changes may present potential risks of disturbing per- and polyfluoroalkyl substances (PFAS) layers and coal ash sediments, along with other contaminants or toxic substances, that have been released into the River and deposited in the riverbed, adding to the distribution of, and the human interaction with, these substances that pose potential health risks; and

WHEREAS, such changes may present potential risks to sensitive shorelines, marsh platforms, and riverfront areas, including increased erosion or subsidence in areas within and adjacent to coastal and river-based communities, potentially affecting natural buffers that help protect residences, public spaces, cultural resources, and community infrastructure; and

WHEREAS, federal navigation projects that may pose environmental risks are most effective when accompanied by thoughtful mitigation, long-term monitoring, and adaptive management measures that are proportionate to the scale of the project and the sensitivity of affected ecosystems and communities; and

WHEREAS, the natural environment surrounding the Town of Leland is central to the community's values and identity, contributing to residents' quality of life, recreational opportunities, cultural heritage, and long-standing commitment to conservation and environmental stewardship; and

WHEREAS, the health of the surrounding coastal and riverine environment supports tourism, recreation, regional economic activity, and property values that contribute to Leland's overall economic resilience; and

WHEREAS, the Wilmington Harbor 403 Project will allow larger cargo vessels to navigate the twenty-six mile journey in and out of the Cape Fear River and therefore theoretically increase ship traffic to the North Carolina State Ports – Wilmington facility as a new category of vessels will be introduced into the economic viability analysis, in direct conflict with the assumption stated in the Draft Environmental Impact Statement produced by the U.S. Army of Corps of Engineers that more cargo will be sent on fewer ships; and

WHEREAS, the Wilmington Harbor 403 Project's secondary impacts would potentially include promotion of increased activity at the Ports facility, which in turn will create additional traffic from heavy truck loads on local roads, bridges, and other critical infrastructure that will be significantly subsidized by local taxpayers for repair, maintenance, and replacement.

NOW, THEREFORE, BE IT RESOLVED that the Town of Leland respectfully requests that state and federal decision-makers, including the U.S. Army Corps of Engineers and the North Carolina General Assembly, give due and careful consideration by prioritizing the protection of the citizens of the Lower Cape Fear region and the State's coastal and natural resources when determining consistency with the State's Coastal Management Plan and review of the Draft Environmental Impact Statement for the Wilmington Harbor 403 Project; and

BE IT FURTHER RESOLVED that copies of this Resolution be submitted to the North Carolina General Assembly, the North Carolina Congressional Delegation, the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, the Brunswick County legislative delegation, and other relevant agencies, for their consideration as decisions related to the Wilmington Harbor 403 Project move forward.

Adopted by Town Council on this 18th day of December, 2025.

Brenda Bozeman, Mayor

Sabrena A. Reinhardt, Town Clerk

TOWN OF LELAND NORTH CAROLINA Chartered 1999

City of Southport

December 17, 2025

Via Email

NC Department of Environmental Quality
Division of Coastal Management
ATTN: Federal Consistency Coordinator
400 Commerce Avenue
Morehead City, NC 28557
Federalconsistencycomments@deq.nc.gov

Re: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project

Dear Federal Consistency Coordinator,

Please accept these comments on behalf of the City of Southport in connection with the Wilmington Harbor 403 project as part of the Federal Consistency determination being performed by DCM.

The City of Southport is a coastal community residing along the Cape Fear River and associated Port of Wilmington shipping channel near the Battery Island and Lower Swash Reaches. This point of the channel includes a jug-handle turn around Battery Island and the eastern end of Caswell Beach and is a critical section of channel that will undergo some of the most radical changes with the proposed Wilmington Harbor 403 project. Not only will this curve be widened by 500 feet in places, it will also be 6 feet deeper in rocky areas (currently max 46' depth, potential new depth with rock of 52'). These changes are proposed to allow for New-Panamax/Ultra Post Panamax ships to call upon the Port of Wilmington and grow our local Port Industry with global trends. It is extremely important for our local economy to keep the Port of Wilmington competitive and ultimately that means growth of the Port itself as well as access facilities. However, these expansions and scaling operations need to thoroughly vet all options and weigh environmental and municipal impacts vs overall gains from the project.

Southport has several concerns regarding impacts to their shoreline, waterfront properties, and natural environments. The City would also like to propose an alternate route to be investigated, saving nearly a mile of transit, providing a more direct route between the Baldhead-Caswell and Snows March reaches. Previous reconnaissance was done in this area in relation to the Southport Port initial investigations and it was deemed a plausible route for further investigation. Results of this geotechnical work associated with the feasibility studies of the North Carolina International Port project are likely still available for review with the NC Port Authority. Project comments and suggestions are discussed below:

- The primary concern of Southport is continued and magnified ship wake impacts to its shorelines as Ultra Post Panamax ships sail past. Increased wake activity will exacerbate the ongoing erosional trend along Bay Street and further impact the integrity of its infrastructure along the shoreline parallel to the Cape Fear River/shipping channel. Bay Street has endured long term erosion due to wake impacts from the existing ship size and traffic, impacting the integrity of the sidewalk, pavement, and utilities. The City was forced to implement emergency measures (riprap/shoreline hardening to combat wake induced erosion) and is undergoing a more significant shoreline stabilization program to mitigate the impacts of ongoing erosion. The image below shows ongoing erosional issues along Southport shoreline and is further discussed below. These ongoing stabilization efforts not only cause monetary burden to the City of Southport, but also lead to shoreline hardening and habitat loss. The existing sandy portions of the beach are utilized by large congregations of White Ibis, Brown Pelicans, and other critical shorebirds—wake induced erosion will threaten this habitat not only through shoreline stabilization methods but also through erosional losses and shoreline encroachment onto established roadbeds and sidewalk infrastructure.



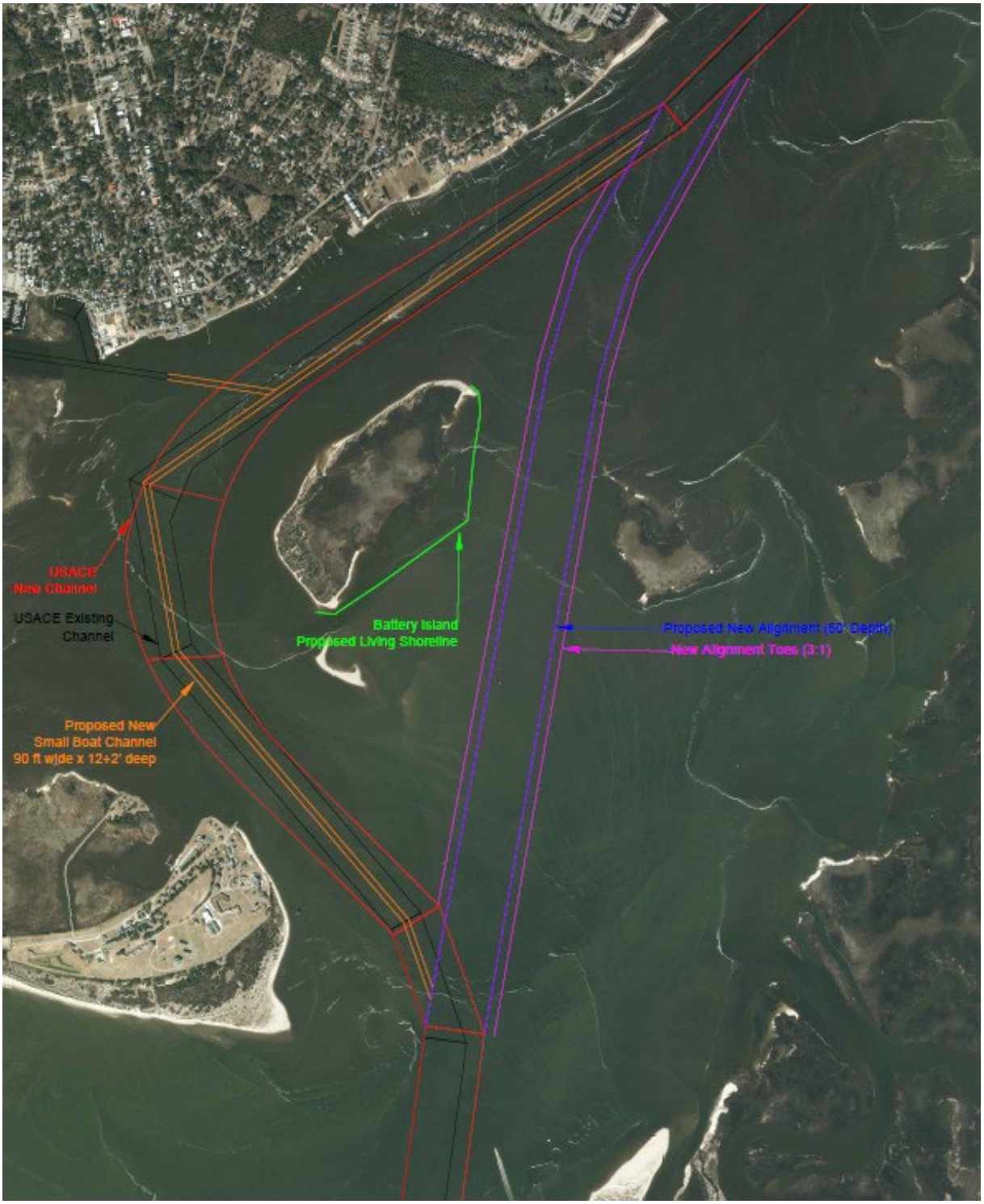
- The proposed channel alignment encroaches 400 feet closer to the Southport shoreline when compared to the current position. Although wake analysis was performed as part of the DEIS, Southport has concern over the parameters that were used to run this analysis. It appears that the frequency of passing ships was matched to the current TEU load the port of Wilmington experiences. Because the total freight inflow remained constant, the number of ships traversing the channel was reduced, thereby reduced to total frequency of wake impacts. The concern is that while this trend may hold true initially, ultimately the Port of Wilmington is a business and will likely look to maximize its potential capacity. The combination of navigability provided with this 403 Project, current and future landside expansions (as discussed in the DEIS), the potential addition of rail systems connecting Wilmington to Raleigh/Washington DC/Richmond/New York City (Southeastern North Carolina Passenger Rail Feasibility Study, NCDOT 2024), and the Wilmington, NC Rail Realignment Project (USDOT, Federal Railroad Administration) would all combine to greatly increase the overall capability of the Port of Wilmington. If the landside of operations can service a greater region and move TEU's more effectively it would lead to the increase of ships calling on the Port of Wilmington and likely drastically increase the wake influenced erosion on the shoreline. Limiting the number of passing ships in the DEIS is very likely underestimating the overall effects of ship wakes and overall energy impacting the adjacent shorelines. A more accurate approach to overall potential wake impacts would be to match ship traffic with the maximum capacity of the Port of Wilmington if all cranes were busy at all times.
- Additional concerns are focused around the overall alignment and its proximity to the Southport shoreline. As mentioned, and shown above, the shoreline along Bay Street in Southport has continued to experience wake induced erosion leading to the hardening (via rip rap and bulkhead) of the majority of the shoreline. In fact, of the 2,500 feet of shoreline between S Atlantic Avenue and the American Fish Company restaurant, only 900 feet of it is natural sandy beach (35 percent) remains. Southport is undergoing a shoreline stabilization study to mitigate the effects of ongoing erosion along 1,700 feet riverfront shoreline. The roadway and sidewalk structure along Bay Street have both been previously compromised by ongoing erosion. Water and sewer utilities, including a sanitary sewer pump station, that reside along the shoreline of Bay Street are at risk of adverse impacts if the wake induced erosion continues or worsens. Two separate projects are currently in the permitting phase with expected 2026 construction to reinforce the shoreline and protect it from wake and ship surge induced erosion. This included a series of breakwaters and backfill, rock revetment improvements and a stemmed breakwater along 1,700 feet of shoreline. A secondary project involving rip-rap/living shoreline along 725 feet of residential properties north of S. Atlantic Avenue is also in the permitting phase.

The proposed channel alignment is 400 feet closer to the Southport shoreline along Bay Street and is comprised of a jug handle turn around Battery Island, past Caswell Beach, and then out to sea past Baldhead Island. This large turn may exacerbate the wake problems as ships maneuver around the bend

and rotate almost perpendicular to the design channel. Any tug or push boat assistance in the turn will add to localized wake and prop wash erosion. Considering a 3H:1V side slope along the Lower Swash reach (and 5H:1V south of this location), the daylight line for this channel will be almost 700 feet closer to the Southport fishing pier. This portion of navigation channel is also used extensively by the Baldhead Island Ferry system and the wider channel area will allow the ferries to run closer to the Southport and Battery Island shorelines. The deepening and widening project brings about wake and shoreline consequences, in addition to that of the Post Panamax ships, caused by other local boat traffic that will be much closer to existing shorelines. As these wakes continue to negatively impact the riverfront shoreline, additional riprap and shoreline hardening tactics may be needed. Unfortunately, the armoring of a shoreline to protect critical infrastructure leads to habitat loss and creates an unnatural environment. The City of Southport aims to be proactive in maintaining as much natural environment as possible with its shoreline stabilization projects, but exponentially increasing wake energy along the shoreline may necessitate the use of shoreline armoring rather than softer solutions.



- In 2006, the NC State Ports Authority investigated the potential of constructing a North Carolina International Terminal on the property it purchased just north of Southport, between the Archer Daniels Midland Terminal and the Duke Nuclear Energy Plant. While the original proposal fizzled out by 2012, there was some renewed interest based upon the NCSPA 2015 strategic report and suggestions by Senator Lee regarding reopening an inlet at the southern end of Fort Fisher. Part of the original geotechnical work conducted in 2006-2008 for the NCIT project involved finding top of rock depths around this S Turn or Jug Handle turn. Jet probes were collected around the existing channel location (west of Battery Island) as well as a new cut through orientation to the east of Battery Island. Results of these probes exist in reports held by the NC State Port in Wilmington and indicate that top of rock depths are generally below required grade east of Battery Island. The image below shows a proposed alternative that should be investigated for impacts and cost savings—it truncates approximately 1 mile of channel from the existing bend and dredge material is predominantly beach quality sand,enough to beneficially use to renourish all of the Brunswick County beaches, infill a portion of the existing shipping channel, and bolster the bird roosting habitat along Battery Island. This alignment would also reduce wave impacts to Caswell Beach and Southport, while also simplifying overall navigation for ships entering the shipping channel. A living shoreline structure along the eastern edge of Battery Island would help combat erosion and preserve the rebuilt habitat. The image below shows the general orientation and design of a cut through channel. For continuity with the offshore channel segments, channel width was kept at 800 to 900 feet, however to minimize environmental impacts this width can likely be reduced to match the interior segment widths of 500 wide given the linear nature of this proposed alternative channel alignment.



CITY OF SOUTHPORT
1029 N. HOWE STREET • SOUTHPORT, NORTH CAROLINA 28461
www.cityofsouthport.com • PHONE: (910) 457-7900 • FAX: (910) 457-7905

- Additionally, Southport has concerns in relation to the increased channel prism and associated tidal, storm surge, and flooding implications associated with a larger volume of water entering and exiting the river. An increase in tidal range will exacerbate nuisance flooding during high tide cycles and will inundate storm water drains causing additional streetside flooding. What impacts to hurricane storm surge can be expected with the enlarged tidal prism in comparison to current surge models? Will lower category hurricanes cause storm surges on par with what a major hurricane would produce with the current channel dimensions? Alternatively, do low tide cycles allow more water to flow out of the interior basins and cause navigation issues for inland basins, personal docks, and interior channels?

- A final concern regards increased shoaling near the confluence of the Battery Island Reach and the AIWW and in the vicinity of the Southport Yacht Basin. Due to channel orientation and hydrodynamic flow, this area appears primed to become a hotspot shoaling area and becoming a detriment to local navigation. The Southport Yacht Basin, a federally authorized channel, is currently silted in, well beyond its authorized depth of 12.0 feet MLLW, and Southport is actively pursuing permits at its own cost to restore navigation within the Corps channel. The City has concerns that the proposed 403 project would exacerbate the shoaling issues and cause further burden upon Southport to continue to maintain its local infrastructure. Environmental risks associated with increased shoaling would include sedimentation over SAV and PNA oyster reefs, degradation of water quality, reduced flushing of tidal creeks due to reduction of water flow, and increased dredging impacts to invertebrate colonies to remove shoals and restore navigation and estuary flushing.

In summary, the City of Southport does not believe all alternatives have been fully vetted through the EIS process and deficiencies exist in the current impact analysis, particularly in the parameters utilized to run wake and ship surge impact models and economic outlook. Southport is already obligating significant financial resources into combatting ongoing shoreline erosion since the Wilmington Harbor 96 Act Deepening, including emergency measures to protect critical infrastructure along Bay Street. The 403 improvement plan will likely aggravate these conditions and trigger additional financial burdens on the City and endanger natural shoreline along the riverbank due to larger and more frequent ship traffic and associated destructive wakes. Long term shoaling and sedimentation trends will be accelerated and cause navigation issues within the commercial district and safe refuge of the Southport Yacht Basin while also potentially reducing water quality and estuary flushing. The City of Southport urges the Division of Coastal Management to require the USACE to explore all channel alignment alternatives for feasibility and fully vet adverse impacts based upon expanded land side Port capabilities as well as include erosion mitigation measures for adjacent shorelines of communities impacted by the 403 deepening project.

Finally, as a show of the City's concerns associated with the overall environmental, hydrodynamic, and economic impacts stemming from the proposed Wilmington Harbor 403 Project, a public hearing was held on December 2, 2025, at the City of Southport Community Building. The hearing included comments by the City engineer, Audubon Society, NC Coastal Federation, coastal attorneys, and the public in regard to potential environmental, morphological, and economic implications from moving forward with the project as proposed. This hearing resulted in adapting Resolution #25-1202.01 addressing the need for:

1. A comprehensive, long-term, and fully funded environmental mitigation and adaptive management plan
2. A dedicated adaptive management fund
3. Implementing mitigation measures that fully safeguard local environmentally critical habitats
4. All stakeholders and relevant agencies keep environmental protection, community values, and economic resilience at the forefront of all decision making associated with the Wilmington Harbor 403 Project.

A copy of the City of Southport Resolution is attached to these comments for your review.

Sincerely,

Jamie Pratt, MS, PG, PE
TI Coastal Services

Robert A. Jarvis, PE
Southport City Engineer

Resolution #25-1202.01

A RESOLUTION OF THE SOUTHPORT BOARD OF ALDERMEN URGING ROBUST MITIGATION, LONG-TERM MONITORING, AND ADAPTIVE MANAGEMENT FOR THE WILMINGTON HARBOR 403 PROJECT

WHEREAS, the City of Southport is located at the confluence of the Cape Fear River and the Atlantic Ocean, a uniquely sensitive estuarine environment that supports diverse wildlife, coastal communities, and natural systems; and

WHEREAS, the proposed Wilmington Harbor 403 Project seeks to deepen, widen, or otherwise modify the federal navigation channel, changes that may significantly alter hydrodynamic patterns, sediment transport, and shoreline stability in the Lower Cape Fear River region; and

WHEREAS, these alterations have the potential to increase erosion risk to sensitive shorelines, marsh platforms, and riverfront areas, and increase the likelihood of subsidence of adjacent riverbed and shoreline areas into the dredge prism, particularly within and adjacent to the City of Southport, threatening natural buffers that protect homes, public spaces, cultural resources, and community infrastructure; and

WHEREAS, the region's barrier and estuarine islands—including Battery Island, Shellbed Island, and others—play a critical ecological role in supporting fisheries, marsh nurseries, colonial waterbirds, and migratory shorebirds; and

WHEREAS, Battery Island in particular is recognized as one of the most significant colonial waterbird nesting sites on the East Coast, and in total all bird nesting islands on the Lower Cape Fear River provide habitat for approximately 30% of North Carolina's nesting coastal waterbird population, and are highly vulnerable to erosion, sea level rise, and habitat loss that may be exacerbated by channel deepening activities; and

WHEREAS, the environment surrounding Southport is an essential part of the city's core values, contributing to residents' quality of life, recreational enjoyment, cultural heritage, and long-standing community identity rooted in conservation and stewardship; and

WHEREAS, the economic resilience of Southport is directly connected to the integrity of its surrounding natural resources, with tourism, recreation, waterfront businesses, and property values all depending on a healthy, stable coastal environment; and

WHEREAS, any federal navigation project that increases environmental risk must include robust mitigation, long-term monitoring, and adaptive management measures proportionate to both the scale of the project and the sensitivity of the affected ecosystems and communities; and

WHEREAS, the billion-dollar Savannah Harbor Expansion Project (SHEP) spent approximately 500 million on mitigation and included funding for post-construction monitoring and adaptive management, ensuring that resources would be available to modify or enhance mitigation if environmental conditions changed unexpectedly; and

WHEREAS, the non-federal sponsor for SHEP, acting through the Georgia Ports Authority, agreed to set aside, in advance, their cost-shared portion of the monitoring and adaptive

management funds in an escrow account upon approval of the project, guaranteeing rapid response capability and honoring the principle that those benefiting from the project must share responsibility for preventing or repairing environmental harm; and

WHEREAS, projects such as the Wilmington Harbor 403 effort must match or exceed this level of commitment by establishing a dedicated and adequately funded adaptive management program that extends over the full period of environmental risk, not only the construction phase or initial years of project operation; and

WHEREAS, safeguarding Southport's environment, wildlife habitats, and economic well-being requires that mitigation and monitoring measures be both enforceable and financially secure before any project authorization or construction proceeds;

NOW, THEREFORE, BE IT RESOLVED that the City of Southport urges state and federal decision-makers, including the U.S. Army Corps of Engineers and the North Carolina General Assembly, to require a **comprehensive, long-term, and fully funded environmental mitigation and adaptive management plan** for the Wilmington Harbor 403 Project, modeled on or exceeding the commitments made in the Savannah Harbor Expansion Project; and

BE IT FURTHER RESOLVED that the City of Southport calls for the establishment of a **dedicated adaptive management fund**, placed in escrow prior to construction and sized proportionally to the project's potential impacts, ensuring that corrective actions, ecological restoration, and shoreline protections can be implemented promptly whenever monitoring indicates environmental degradation; and

BE IT FURTHER RESOLVED that the City of Southport urges all agencies and project sponsors to protect Battery Island and the surrounding Cape Fear River islands as irreplaceable ecological assets, ensuring that mitigation measures fully safeguard the habitats supporting 30% of North Carolina's coastal shorebird population; and

BE IT FINALLY RESOLVED that copies of this Resolution be forwarded to the North Carolina General Assembly, the North Carolina Congressional Delegation, the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, the Brunswick County delegation, and other relevant agencies, urging their support in ensuring that environmental protection, community values, and economic resilience remain at the forefront of all decisions related to the Wilmington Harbor 403 Project.

Approved and adopted by the City of Southport Board of Aldermen on this 2nd of December 2025.

R. B. Cox

Mayor, City of Southport

ATTEST:

Joni Devinney

City Clerk, City of Southport

CITY OF SOUTHPORT CORPORATE SEAL 1792 NORTH CAROLINA

700 Sunset Boulevard North • Sunset Beach, NC 28468
Telephone: 910-579-6297 • Fax: 910-579-1840
Website: www.sunsetbeachnc.gov • Email: kklamar@sunsetbeachnc.gov

Kenneth J. Klamar, Interim Town Administrator

January 14, 2026

Governor Josh Stien
Congressman David Rouzer
Senator Bill Rabon
Senator Thom Tillis
Senator Ted Budd
Representative William Miller
Mr. Linwood Peele
Mr. Reid Wilson
Director Daniel O'Hannon
Ms. Renita McNeill

Sent via email

Dear Governor Stein et al.,

The Town of Sunset Beach has adopted a resolution urging state and federal agencies to require robust environmental safeguards for the Wilmington Harbor 403 Navigation Project. This project proposes deepening and widening the federal navigation channel in the Lower Cape Fear River, which could significantly alter hydrodynamics, sediment transport, and shoreline stability, increasing erosion risks to sensitive habitats, and community infrastructure.

Our position emphasizes:

- **Comprehensive Mitigation and Monitoring:** Any federal navigation project that increases environmental risk must include enforceable, long-term mitigation and monitoring measures proportionate to the scale of the project and the sensitivity of affected ecosystems.
- **Adaptive Management Funding:** We call for a dedicated, adequately funded adaptive management program, modeled on or exceeding commitments made in the Savannah Harbor Expansion Project, with funds placed in escrow prior to construction to ensure rapid response capability.
- **Protection of Critical Habitats:** Battery Island and surrounding Cape Fear River islands, which support approximately 30% of North Carolina's coastal waterbird population, must be safeguarded through robust mitigation measures.

We urge your support in ensuring that environmental protection, community values, and economic resilience remain at the forefront of all decisions related to the Wilmington Harbor 403 Project.

Thank you for your attention to this critical matter.

Sincerely,

Kenneth J. Klamar
Interim Town Administrator
Town of Sunset Beach, NC

A RESOLUTION OF THE TOWN OF SUNSET BEACH TOWN COUNCIL URGING ROBUST MITIGATION, LONG-TERM MONITORING, AND ADAPTIVE MANAGEMENT FOR THE WILMINGTON HARBOR 403 PROJECT

WHEREAS, the TOWN OF SUNSET BEACH is located at the confluence of the Cape Fear River and the Atlantic Ocean, a uniquely sensitive estuarine environment that supports diverse wildlife, coastal communities, and natural systems; and

WHEREAS, the proposed Wilmington Harbor 403 Project seeks to deepen, widen, or otherwise modify the federal navigation channel, changes that may significantly alter hydrodynamic patterns, sediment transport, and shoreline stability in the Lower Cape Fear River region; and

WHEREAS, these alterations have the potential to increase erosion risk to sensitive shorelines, marsh platforms, and riverfront areas, and increase the likelihood of subsidence of adjacent riverbed and shoreline areas into the dredge prism, particularly within and adjacent to the TOWN OF SUNSET BEACH, threatening natural buffers that protect homes, public spaces, cultural resources, and community infrastructure; and

WHEREAS, the region's barrier and estuarine islands—including Battery Island, Shellbed Island, and others—play a critical ecological role in supporting fisheries, marsh nurseries, colonial waterbirds, and migratory shorebirds; and

WHEREAS, Battery Island in particular is recognized as one of the most significant colonial waterbird nesting sites on the East Coast, and in total all bird nesting islands on the Lower Cape Fear River provide habitat for approximately 30% of North Carolina's nesting coastal waterbird population, and are highly vulnerable to erosion, sea level rise, and habitat loss that may be exacerbated by channel deepening activities; and

WHEREAS, the environment surrounding TOWN OF SUNSET BEACH is an essential part of the city's core values, contributing to residents' quality of life, recreational enjoyment, cultural heritage, and longstanding community identity rooted in conservation and stewardship; and

WHEREAS, the economic resilience of TOWN OF SUNSET BEACH is directly connected to the integrity of its surrounding natural resources, with tourism, recreation, waterfront businesses, and property values all depending on a healthy, stable coastal environment; and

WHEREAS, any federal navigation project that increases environmental risk must include robust mitigation, long-term monitoring, and adaptive management measures proportionate to both the scale of the project and the sensitivity of the affected ecosystems and communities; and

WHEREAS, the billion-dollar Savannah Harbor Expansion Project (SHEP) spent approximately 500 million on mitigation and included funding for post-construction monitoring and adaptive management, ensuring that resources would be available to modify or enhance mitigation if environmental conditions changed unexpectedly; and

WHEREAS, the non-federal sponsor for SHEP, acting through the Georgia Ports Authority, agreed to set aside, in advance, their cost-shared portion of the monitoring and adaptive management funds in an escrow account upon approval of the project, guaranteeing rapid response capability and honoring the principle that those benefiting from the project must share responsibility for preventing or repairing environmental harm; and

WHEREAS, projects such as the Wilmington Harbor 403 effort must match or exceed this level of commitment by establishing a dedicated and adequately funded adaptive management program that extends over the full period of environmental risk, not only the construction phase or initial years of project operation; and

WHEREAS, safeguarding the TOWN OF SUNSET BEACH's environment, wildlife habitats, and economic well-being requires that mitigation and monitoring measures be both enforceable and financially secure before any project authorization or construction proceeds;

NOW, THEREFORE, BE IT RESOLVED that the TOWN OF SUNSET BEACH urges state and federal decision-makers, including the U.S. Army Corps of Engineers and the North Carolina General Assembly, to require a comprehensive, long-term, and fully funded environmental mitigation and adaptive management plan for the Wilmington Harbor 403 Project, modeled on or exceeding the commitments made in the Savannah Harbor Expansion Project; and

BE IT FURTHER RESOLVED that the TOWN OF SUNSET BEACH calls for the establishment of a dedicated adaptive management fund, placed in escrow prior to construction and sized proportionally to the project's potential impacts, ensuring that corrective actions, ecological restoration, and shoreline protections can be implemented promptly whenever monitoring indicates environmental degradation; and

BE IT FURTHER RESOLVED that the TOWN OF SUNSET BEACH urges all agencies and project sponsors to protect Battery Island and the surrounding Cape Fear River islands as irreplaceable ecological assets, ensuring that mitigation measures fully safeguard the habitats supporting 30% of North Carolina's coastal shorebird population; and

BE IT FINALLY RESOLVED that copies of this Resolution be forwarded to the North Carolina General Assembly, the North Carolina Congressional Delegation, the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, the Brunswick County delegation, and other relevant agencies, urging their support in ensuring that environmental protection, community values, and economic resilience remain at the forefront of all decisions related to the Wilmington Harbor 403 Project.

Approved and adopted by the TOWN OF SUNSET BEACH Town Council on this 12th day of 2026.

D. Shannon Phillips
Mayor, Town of Sunset Beach

Official Seal
Town of Sunset Beach NC

ATTEST:

Deputy Town Clerk, Town of Sunset Beach

The Village of Bald Head Island

December 18, 2025

Secretary D. Reid Wilson
N.C. DEQ Administration
1601 Mail Service Center
Raleigh, NC 27699-1601

Subject: Transmittal of Village of Bald Head Island Resolution – Wilmington Harbor 403 Project

Dear Secretary Wilson:

On behalf of the Village of Bald Head Island, please find enclosed a copy of Resolution No. 2025-1201, adopted by the Village Council at its regular meeting on Friday, December 12, 2025**.**

Through this Resolution, the Village formally urges state and federal decision-makers to require robust mitigation, long-term monitoring, and enforceable adaptive management measures associated with the proposed Wilmington Harbor 403 Project to deepen the shipping channel. The Council's action reflects the Village's longstanding commitment to protecting Bald Head Island's sensitive coastal resources, and the community infrastructure, and economic resilience.

The Village respectfully requests that this Resolution be included in the official project record and considered as deliberations on the Wilmington Harbor 403 Project move forward.

Thank you for your time and consideration. Please do not hesitate to contact the Village should you have any questions or require additional information.

Sincerely,

Peter Quinn
Mayor
Village of Bald Head Island

cc: Village Council
Christine Goebel, Assistant General Counsel
Enclosure: Resolution No. 2025-1201

P.O. Box 3009 • BALD HEAD ISLAND, NC 28461
(910) 457-9700 • FAX (910) 457-6206 • WEBSITE: http://www.villagebhi.org

Resolution # 2025-1207

A RESOLUTION OF THE VILLAGE OF BALD HEAD ISLAND COUNCIL URGING ROBUST MITIGATION, LONG-TERM MONITORING, AND ADAPTIVE MANAGEMENT FOR THE WILMINGTON HARBOR 403 PROJECT

WHEREAS, Bald Head Island is located at the confluence of the Cape Fear River and the Atlantic Ocean, a uniquely sensitive estuarine environment that supports diverse wildlife, coastal communities, and natural systems; and

WHEREAS, the proposed Wilmington Harbor 403 Project seeks to deepen, widen, or otherwise modify the federal navigation channel; and

WHEREAS, earlier Harbor deepening projects have caused extensive damage to Bald head Island and its protective shoals, requiring the Village of Bald Head Island to expend millions of dollars of public funds to alleviate the harm; and

WHEREAS, after consultation with respected experts, it appears highly probable that the Wilmington Harbor 403 Project will continue to significantly alter hydrodynamic patterns, sediment transport, and shoreline stability in the Lower Cape Fear River region and the ocean front at Bald Head Island, to the continuing detriment of the Village and Island; and

WHEREAS, these Project impacts are likely to increase erosion risk to sensitive shoals, shorelines, marsh platforms, and riverfront areas, and increase the likelihood of subsidence of adjacent shoreline areas into the dredge prism, particularly along the ocean beaches at Bald Head where severe erosion has been experienced from the prior projects, threatening natural buffers that protect homes, public spaces, cultural resources, and community infrastructure; and

WHEREAS, experience since the last deepening project has shown that the periodic maintenance dredging of the Channel likewise has deleterious impacts to the adjacent shoals, shorelines, beaches and dunes, such that Project impacts can be expected to persist for the full fifty-year life of the Project; and

WHEREAS, the region's waters and barrier and estuarine islands play a critical ecological role in supporting threatened and endangered species of sea turtles, fisheries, marsh nurseries, colonial waterbirds, and migratory shorebirds; and

WHEREAS, those sensitive areas provide important habitat for numerous species, including sea turtles and approximately 30% of North Carolina's nesting coastal waterbird population, and are highly vulnerable to erosion, sea level rise, and habitat loss that may be exacerbated by channel deepening activities; and

WHEREAS, the ocean environment, beaches, and dunes at Bald Head are an essential part of the Island's core values, contributing to residents' quality of life, recreational enjoyment, cultural heritage, and longstanding community identity rooted in conservation and stewardship; and

WHEREAS, the economic resilience of the Village is directly connected to the integrity of its surrounding natural resources, with tourism, recreation, waterfront businesses, and property values all depending on a healthy, stable coastal environment; and

WHEREAS, any federal navigation project that increases environmental risk must include robust mitigation, long-term monitoring, and adaptive management measures proportionate to both the scale of the project and the sensitivity of the affected ecosystems and communities; and

WHEREAS, the billion-dollar Savannah Harbor Expansion Project (SHEP) spent approximately $500 million on mitigation and included funding for post-construction monitoring and adaptive management, ensuring that resources would be available to modify or enhance mitigation if environmental conditions changed unexpectedly; and

WHEREAS, the non-federal sponsor for SHEP, acting through the Georgia Ports Authority, agreed to set aside, in advance, their cost-shared portion of the monitoring and adaptive management funds in an escrow account upon approval of the project, guaranteeing rapid response capability and honoring the principle that those benefiting from the project must share responsibility for preventing or repairing environmental harm; and

WHEREAS, projects such as the Wilmington Harbor 403 effort must match or exceed this level of commitment by establishing a dedicated and adequately funded adaptive management program that extends over the full period of environmental risk—i.e., the life of the Project—not only the construction phase or initial years of Project operation; and

WHEREAS, following the last deepening project, the Village learned the expensive lesson that unfunded assurances of remediation for project impacts may not be legally enforceable, leaving the Village with the financial burden of funding the needed remediation; and

WHEREAS, safeguarding Bald Head's environment, wildlife habitats, and economic well-being therefore requires that mitigation and monitoring measures be both enforceable and financially secure before any project authorization or construction proceeds.

NOW, THEREFORE, BE IT RESOLVED that the Village of Bald Head Island urges state and federal decision-makers, including the U.S. Army Corps of Engineers and the North Carolina General Assembly, to require a **comprehensive, long-term, and fully funded environmental mitigation and adaptive management plan** for the Wilmington Harbor 403 Project, modeled on or exceeding the commitments made in the Savannah Harbor Expansion Project; and

BE IT FURTHER RESOLVED that the Village of Bald Head Island calls for the establishment of a **dedicated adaptive management fund,** placed in escrow prior to construction and sized proportionally to the Project's potential impacts, ensuring that corrective actions, ecological restoration, and shoreline protections can be implemented promptly whenever monitoring indicates environmental degradation; and

BE IT FURTHER RESOLVED that the Village of Bald Head Island urges all agencies and project sponsors to protect all Bald Head Island and Cape Fear River areas of environmental

concern as irreplaceable ecological assets, ensuring that mitigation measures fully safeguard those resources; and

BE IT FINALLY RESOLVED that copies of this Resolution be forwarded to the North Carolina General Assembly, the North Carolina Congressional Delegation, the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, the Brunswick County delegation, and other relevant agencies, urging their support in ensuring that environmental protection, community values, and economic resilience remain at the forefront of all decisions related to the Wilmington Harbor 403 Project.

Approved and adopted by the Village of Bald Head Island Council on this 12th of December 2025.

Peter Quinn, Mayor

ATTEST:

Darcy Sperry, Village Clerk

VILLAGE OF BALD HEAD ISLAND
SEAL
NORTH CAROLINA

WILMINGTON CHAMBER OF COMMERCE

December 8, 2025

Federal Consistency Coordinator
North Carolina Department of Environmental Quality
400 Commerce Avenue
Morehead City, NC 28557

Re: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project

Dear Federal Consistency Coordinator:

Thank you for the opportunity to submit written comments on the Wilmington Harbor Navigation Improvement Project. As President and CEO of the Wilmington Chamber of Commerce, I am writing to convey our strong support for deepening the Cape Fear River from 42 to 47 feet. The Wilmington Chamber represents more than 1,000 member businesses whose success is directly shaped by the strength of our region's infrastructure and the competitiveness of North Carolina's economy. The proposed deepening is a critical investment that will influence both for decades to come.

For more than 300 years, Wilmington has served as a working harbor, an economic gateway that has shaped our region and supported commerce across North Carolina. Today, our port remains a statewide asset with national significance, connecting North Carolina businesses to global markets.

The proposed deepening is not simply about accommodating larger ships. It is about safeguarding our competitiveness. For decades, North Carolina has made disciplined, strategic investments in highways, rail, air connectivity, and port infrastructure. Deepening the harbor is the next essential step to ensure these investments continue to provide returns for employers, workers, and communities across the state.

NC Ports has positioned Wilmington as a boutique, high-performance gateway with world-class cold-chain capabilities. With more than 1,400 refrigerated plugs and plans to exceed 2,000, along with expanded reefer racks, on-site USDA inspection, and cold-treatment certification available in only a handful of states, Wilmington is rapidly becoming a preferred point of entry and export for high-value agricultural,

pharmaceutical, and life-science products. These capabilities support an agriculture sector that contributes $111 billion annually to North Carolina's economy and sustain logistics operations that reach far beyond the Cape Fear region.

The U.S. Army Corps of Engineers found that both a 46-foot and 47-foot deepening are economically justified using its well-established methodology. This analytical framework is used consistently across the country to evaluate federal navigation projects and incorporates costs, benefits, vessel behavior, trade flows, and long-term economic trends. Assertions that the economic benefits are negligible disregard the Corps' rigorous analysis and the broader economic context in which modern ports operate.

The 47-foot alternative best aligns with North Carolina's long-range economic strategy. It will reduce logistics costs, improve export competitiveness, increase throughput, and strengthen supply chains that serve the Mid-Atlantic and Southeastern United States. Most importantly, it ensures that North Carolina remains competitive at a time when peer ports, both public and private, are deepening, widening, and modernizing to meet global shipping requirements.

A modern port is fundamental to future-proofing our economy. Without the deepening project, North Carolina risks losing market share to ports that are already preparing for the next generation of vessels. The global shipping industry continues to trend toward larger, more efficient ships that require deeper channels and improved navigation. Failure to act would shift cargo, investment, and job creation to competitor states.

The Wilmington Chamber of Commerce supports thoughtful environmental review and responsible management of our natural resources. We recognize DEQ's important role in ensuring that economic progress and environmental protection move forward together. The long-term success of Wilmington Harbor depends on this balance, and we remain committed to serving as a constructive partner in this process.

Deepening Wilmington Harbor is vital to the economic resilience of Wilmington, the Cape Fear region, and the State of North Carolina. It is a strategic investment that will strengthen supply chains, support statewide industry sectors, and enhance North Carolina's standing in the global marketplace. For these reasons, the Wilmington Chamber of Commerce respectfully urges the Department to approve the Wilmington Harbor Navigation Improvement Project.

Thank you for your careful consideration. Please do not hesitate to contact me if you require additional information.

Sincerely,



Natalie English
President & CEO
Wilmington Chamber of Commerce