Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

WILLIAM F. LANE
General Counsel

TO: The Coastal Resources Commission

FROM: Christine A. Goebel, DEQ Assistant General Counsel

DATE: November 15, 2018 (for the November 27-29, 2018 CRC Meeting)

RE: **Variance Request by the Town of Caswell Beach (CRC-VR-18-06)**

Petitioner Town of Caswell Beach ("Town") owns oceanfront property south of the Oak Island Lighthouse on Caswell Beach Road. The property is located within the Commission's Ocean Hazard Area of Environmental Concern ("AEC"). This area of Nags Head is subject to a "static line" following a large-scale beach nourishment project in 2009, and the average annual erosion rate is 2'/year.

In trying to address frequent stormwater flooding along Caswell Beach Road, and specifically in the 300- and 400- block area, the Town has worked with an engineering company and with DOT officials to investigate possible solutions to the issue. Following the approval of funding by DOT in July of 2018, in October of 2018, the Town filed a CAMA Minor Permit application seeking to construct a Dune Infiltration System ("DIS") consisting of approximately 525 sq. ft. of chambers buried under the existing dune, where collected stormwater from the road would be pumped and treated. On October 17, 2018, DCM denied the permit application as the proposed DIS was not located landward of the applicable oceanfront erosion setback from the static line. On October 17, 2018, the Town filed this variance petition to request the Commission vary the oceanfront setback rules so it can develop the DIS as proposed.

The following additional information is attached to this memorandum:

Attachment A: Relevant Rules
Attachment B: Stipulated Facts
Attachment C: Petitioner's Positions and Staff's Responses to Variance Criteria
Attachment D: Petitioner's Variance Request Materials
Attachment E: Stipulated Exhibits including powerpoint

cc(w/enc.): Justin Humphries, Esq., Petitioner's Counsel, electronically
Mary Lucasse, Special Deputy AG and CRC Counsel, electronically

RELEVANT STATUTES OR RULES **APPENDIX A**

15A NCAC 07H .0301 OCEAN HAZARD CATEGORIES

The next broad grouping is composed of those AECs that are considered natural hazard areas along the Atlantic Ocean shoreline where, because of their special vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could unreasonably endanger life or property. Ocean hazard areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative and soil conditions indicate a substantial possibility of excessive erosion or flood damage.

15A NCAC 07H .0302 SIGNIFICANCE OF THE OCEAN HAZARD CATEGORY

(a) The primary causes of the hazards peculiar to the Atlantic shoreline are 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 significant 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, therefore, because of both the severity of the hazards and the intensity of interest in the areas.

(b) The location and form of the various hazard area landforms, 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 appropriate location of structures on and near these landforms must be reviewed carefully in order to avoid their loss or damage. As a whole, the same flexible nature of these landforms which presents hazards to development situated immediately on them 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. (The role of each landform is described in detail in Technical Appendix 2 in terms of the physical processes most important to each.) Overall, however, the energy dissipation and sand storage capacities of the landforms are most essential for the maintenance of the landforms' protective function.

15A NCAC 07H .0303 MANAGEMENT OBJECTIVE OF OCEAN HAZARD AREAS

(a) The CRC recognizes that absolute safety from the destructive forces indigenous to the Atlantic 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 to provide management policies and standards for ocean hazard areas that serve to eliminate unreasonable 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 purpose of these Rules shall be to further the goals set out in G.S. 113A-102(b), with particular attention to minimizing losses to life and property resulting from storms and long-term erosion, preventing encroachment of permanent structures on public beach areas, preserving the natural ecological conditions of the barrier dune and beach systems, and reducing the public costs of inappropriately sited development. Furthermore, it is the objective of the Coastal Resources Commission to protect present common-law and statutory public rights of access to and use of the lands and waters of the coastal area.

15A NCAC 07H .0304 AECS WITHIN OCEAN HAZARD AREAS

The ocean hazard AECs contain all of the following areas:

(1) Ocean Erodible Area. This is the area where there exists a substantial possibility of excessive erosion and significant shoreline fluctuation. The oceanward boundary of this area is the mean low water line. The landward extent of this area is the distance landward from the first line of stable and natural vegetation as defined in 15A NCAC 07H .0305(a)(5) to the recession line established by multiplying the long term annual erosion rate times 90; provided that, where there has been no long term erosion or the rate is less than two feet per year, this distance shall be set at 120 feet landward from the first line of stable natural vegetation. For the purposes of this Rule, the erosion rates are the long-term average based on available historical data. The current long-term average erosion rate data for each segment of the North Carolina coast is depicted on maps entitled “2011 Long-Term Average Annual Shoreline Rate Update” and approved by the Coastal Resources Commission on May 5, 2011 (except as such rates may be varied in individual contested cases or in declaratory or interpretive rulings). In all cases, the rate of shoreline change shall be no less than two feet of erosion per year. The maps are available without cost from any Local Permit Officer or the Division of Coastal Management on the internet at http://www.nccoastalmanagement.net.

15A NCAC 07H .0305 GENERAL IDENTIFICATION AND DESCRIPTION OF LANDFORMS

(a) This Paragraph describes natural and man-made features that are found within the ocean hazard area of environmental concern.

(1) Ocean Beaches. Ocean beaches are lands consisting of unconsolidated soil materials that extend from the mean low water line landward to a point where either: (A) the growth of vegetation occurs; or (B) a distinct change in slope or elevation alters the configuration of the landform, whichever is farther landward.

(2) Nearshore. The nearshore is the portion of the beach seaward of mean low water that is characterized by dynamic changes both in space and time as a result of storms.

(3) Primary Dunes. Primary dunes are the first mounds of sand located landward of the ocean beaches having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet. Primary dunes extend landward to the lowest elevation in the depression behind that same mound of sand (commonly referred to as the "dune trough.")

(4) Frontal Dunes. The frontal dune is the first mound of sand located landward of the ocean beach that has stable and natural vegetation present.

(5) Vegetation Line. The vegetation line refers to the first line of stable and natural vegetation, which shall be used as the reference point for measuring oceanfront setbacks. This line represents the boundary between the normal dry sand beach, which is subject to constant flux due to waves, tides, storms and wind, and the more stable upland areas. The vegetation line is generally located at or immediately oceanward of the seaward toe of the frontal dune or erosion escarpment. The Division of Coastal Management or Local Permit Officer shall determine the location of the stable and natural vegetation line based on visual observations of plant composition and density. If the vegetation has been planted, it may be considered stable when the majority of the plant stems are from continuous rhizomes rather than planted individual rooted sets. Planted vegetation may be considered natural when the majority of the plants are mature and additional species native to the region have been recruited, providing stem and rhizome densities that are similar to adjacent areas that are naturally occurring. In areas where there is no stable and natural vegetation present, this line may be established by interpolation between the nearest adjacent stable natural vegetation by on-ground observations or by aerial photographic interpretation.

(6) Static Vegetation Line. In areas within the boundaries of a large-scale beach fill project, the vegetation line that existed within one year prior to the onset of project construction shall be defined as the "static vegetation line." The "onset of project construction" shall be defined as the date sediment placement begins, with the exception of projects completed prior to the effective date of this Rule, in which case the award of the contract date will be considered the onset of construction. A static vegetation line shall be established in coordination with the Division of Coastal Management using on-ground observation and survey or aerial imagery for all areas of oceanfront that undergo a large-scale beach fill project. Once a static vegetation line is established,

and after the onset of project construction, this line shall be used as the reference point for measuring oceanfront setbacks in all locations where it is landward of the vegetation line. In all locations where the vegetation line as defined in this Rule is landward of the static vegetation line, the vegetation line shall be used as the reference point for measuring oceanfront setbacks. A static vegetation line shall not be established where a static vegetation line is already in place, including those established by the Division of Coastal Management prior to the effective date of this Rule. A record of all static vegetation lines, including those established by the Division of Coastal Management prior to the effective date of this Rule, shall be maintained by the Division of Coastal Management for determining development standards as set forth in Rule .0306 of this Section. Because the impact of Hurricane Floyd (September 1999) caused significant portions of the vegetation line in the Town of Oak Island and the Town of Ocean Isle Beach to be relocated landward of its pre-storm position, the static line for areas landward of the beach fill construction in the Town of Oak Island and the Town of Ocean Isle Beach, the onset of which occurred in 2000, shall be defined by the general trend of the vegetation line established by the Division of Coastal Management from June 1998 aerial orthophotography.

(7) Beach Fill. Beach fill refers to the placement of sediment along the oceanfront shoreline. Sediment used solely to establish or strengthen dunes shall not be considered a beach fill project under this Rule. A "large-scale beach fill project" shall be defined as any volume of sediment greater than 300,000 cubic yards or any storm protection project constructed by the U.S. Army Corps of Engineers.

(8) Erosion Escarpment. The normal vertical drop in the beach profile caused from high tide or storm tide erosion.

(9) Measurement Line. The line from which the ocean hazard setback as described in Rule .0306(a) of this Section is measured in the unvegetated beach area of environmental concern as described in Rule .0304(3) of this Section. Procedures for determining the measurement line in areas designated pursuant to Rule .0304(3) of this Section shall be adopted by the Commission for each area where such a line is designated pursuant to the provisions of G.S. 150B. These procedures shall be available from any local permit officer or the Division of Coastal Management. In areas designated pursuant to Rule .0304(3)(b) of this Section, the Division of Coastal Management shall establish a measurement line that approximates the location at which the vegetation line is expected to reestablish by: (A) determining the distance the vegetation line receded at the closest vegetated site to the proposed development site; and (B) locating the line of stable and natural vegetation on the most current pre-storm aerial photography of the proposed development site and moving this line landward the distance determined in Subparagraph (a)(1) of this Rule. The measurement line established pursuant to this process shall in every case be located landward of the average width of the beach as determined from the most current pre-storm aerial photography.

(10) Development Line. The line established in accordance with 15A NCAC 07J .1300 by local governments representing the seaward-most allowable location of oceanfront development. In areas that have development lines approved by the CRC, the vegetation line or measurement line

shall be used as the reference point for measuring oceanfront setbacks instead of the static vegetation line, subject to the provisions of Rule 07H .0306(a)(2) of this Section.

(b) For the purpose of public and administrative notice and convenience, each designated minor development permit-letting agency with ocean hazard areas may designate, subject to CRC approval in accordance with the local implementation and enforcement plan as defined in 15A NCAC 07I .0500, an identifiable land area within which the ocean hazard areas occur. This designated notice area must include all of the land areas defined in Rule .0304 of this Section. Natural or man-made landmarks may be considered in delineating this area.

15A NCAC 07H .0306 GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS

(a) In order to protect life and property, all development not otherwise specifically exempted or allowed by law or elsewhere in the Coastal Resources Commission's rules shall be located according to whichever of the following is applicable:

(1) The ocean hazard setback for development shall be measured in a landward direction from the vegetation line, the static vegetation line, or the measurement line, whichever is applicable.

(2) In areas with a development line, the ocean hazard setback shall be set in accordance with Subparagraphs (a)(3) through (9) of this Rule. In no case shall new development be sited seaward of the development line.

(3) In no case shall a development line be created or established on state owned lands or oceanward of the mean high water line or perpetual property easement line, whichever is more restrictive.

(4) The ocean hazard setback shall be determined by both the size of development and the shoreline long term erosion rate as defined in Rule .0304 of this Section. "Development size" is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

(A) The total square footage of heated or air-conditioned living space;

(B) The total square footage of parking elevated above ground level; and

(C) The total square footage of non-heated or non-air-conditioned areas elevated above ground level, excluding attic space that is not designed to be load-bearing.

Decks, roof-covered porches, and walkways shall not be included in the total floor area unless they are enclosed with material other than screen mesh or are being converted into an enclosed space with material other than screen mesh.

(5) With the exception of those types of development defined in 15A NCAC 07H .0309, no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback. This includes roof overhangs and elevated structural components that are cantilevered, knee braced, or otherwise extended beyond the support of pilings or footings. The ocean hazard setback shall be established based on the following criteria:

(A) A building or other structure less than 5,000 square feet requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

15A NCAC 07H .0309 USE STANDARDS FOR OCEAN HAZARD AREAS: EXCEPTIONS

(a) The following types of development shall be permitted seaward of the oceanfront setback requirements of Rule .0306(a) of the Subchapter if all other provisions of this Subchapter and other state and local regulations are met:

(1) campsites;
(2) driveways and parking areas with clay, packed sand or gravel;
(3) elevated decks not exceeding a footprint of 500 square feet;
(4) beach accessways consistent with Rule .0308(c) of this Subchapter;
(5) unenclosed, uninhabitable gazebos with a footprint of 200 square feet or less;
(6) uninhabitable, single story storage sheds with a foundation or floor consisting of wood, clay, packed sand or gravel, and a footprint of 200 square feet or less;
(7) temporary amusement stands;
(8) sand fences; and
(9) swimming pools.

In all cases, this development shall be permitted only if it is landward of the vegetation line or static vegetation line, whichever is applicable; involves no alteration or removal of primary or frontal dunes which would compromise the integrity of the dune as a protective landform or the dune vegetation; has overwalks to protect any existing dunes; is not essential to the continued existence or use of an associated principal development; is not required to satisfy minimum requirements of local zoning, subdivision or health regulations; and meets all other non-setback requirements of this Subchapter.

STIPULATED FACTS **ATTACHMENT B**

1. Petitioner, the Town of Caswell Beach ("Petitioner" or "Town") owns a 5.3-acre undeveloped oceanfront parcel located south of the Oak Island Lighthouse on Caswell Beach Road ("Road") within the Town's limits (the "Site"). The Site is bordered by the Atlantic Ocean to the south, Caswell Beach Road to the north, 217 Caswell Beach Road (Gary Studer) to the west and 301 Caswell Beach Road (Brian Murphy) to the east. The Site can be seen on ground level and aerial photography in the attached Powerpoint Presentation. A copy of the deed is attached.

2. Near the Site, Caswell Beach Road is a low spot where stormwater tends to collect. The Town has installed trench drains along the road in order to try and alleviate the flooding. Town Manager Chad Hicks has observed that during moderate rain events of 6" or more, the flooded roadway is impassable to low-clearance vehicles for up to 8 hours. In severe rain events, the road can be impassable to low-clearance vehicles for as much as two days. Additionally, the lowest-lying area in the 300 and 400 blocks of the Road can become impassable to high-clearance vehicles.

3. In addition to the trench drains, the Town temporarily uses portable pumps and fire trucks to pump stormwater off the road and into the sound or to the dunes following larger storm events. Town officials estimate that they use pumps to clear the road approximately four times per year on average.

4. Emergency services within the Town are provided by Brunswick County. Kat Corrigan, the EMS Operations Manager for Brunswick County expressed her concern about the ability to address emergencies within the Town's limits during storm events, due to road flooding. A copy of her statement is attached as a stipulated exhibit.

5. Aerial photographs attached as part of the Powerpoint Presentation were taken by NOAA immediately following Hurricane Florence and show flooding on Caswell Beach Road. Additional ground-level photographs included in the Powerpoint Presentation show instances of flooding on Caswell Beach Road.

6. Since at least 2005, North Carolina Department of Transportation ("NCDOT") and North Carolina State University ("NCSU") have worked together on developing and installing Dune Infiltration Systems ("DIS") as a low-cost way to address stormwater runoff issues on roads.

7. There is currently a similar DIS installed in Kure Beach, which re-directs stormwater from three existing stormwater outfalls at K Avenue into a 26-chamber DIS. This project received a variance from the Commission's oceanfront erosion setback rule in 2008. A copy of the Commission's Final Order in the 2008 Variance is attached.

8. Since 2017, officials with the Town and NCDOT have been discussing ways to address the flooding on Caswell Beach Road. A chain of emails from May of 2018 show communication between NCDOT and Town officials, attached as a stipulated exhibit.

9. Town officials met with resource agency representatives on March 16, 2017 to discuss floodwater pumping and the ability to receive a DWR permit to pump stormwater off the road. A copy of the meeting attendees and the project narrative are attached as stipulated exhibits.

10. The Town of Caswell Beach engaged the engineering firm W.K. Dickson to evaluate the effect of infiltrating stormwater pumped from the flooding areas on Caswell Beach Road to the proposed DIS at the Site and evaluate the quantity of water for the effect on the site's groundwater table. After performing these tests, it was determined in the October 20, 2018 Report, attached as a stipulated exhibit, that the water table mounding does not extend to Caswell Beach Road or to the neighboring properties and that the mound height is below ground.

11. At the July 2018 meeting of the NC Board of Transportation, the Board approved $500,000 to be spent on the proposed project as part of NCDOT's High Impact-Low Cost program. Copies of the relevant portion of the July 2018 Board of Transportation minutes are attached as a stipulated exhibit, as are the relevant portion of the August 2018 minutes which confirm the Board's approval and delegation to the Secretary for approval of this project. A copy of the budget for the Dune Infiltration Project is attached as a stipulated exhibit and estimates that the Project can be completed within the amount approved for the project by NCDOT.

12. On August 28, 2018, NCDOT and Town officials met to discuss the project and visit the Site. A copy of the meeting minutes is attached as a stipulated exhibit, and note that the project is proposed to have a project bid in February 2019 and a start date in May 2019.

13. At this Site, the Town proposes a project that contains approximately 525 sq. ft. of buried infiltration high-density polyethylene chambers (approximately 105 chambers) that can store the stormwater until it can be absorbed by the groundwater after filtering through the dune sand. After the infiltration chambers are installed, they will be connected to the line that will run the length of Caswell Beach Road, which is approximately 1.25 miles. The project will begin at the Duke Energy Nuclear Pumping Station and run to the United States Coast Guard Station Oak Island. Following construction, the dune will be rebuilt on top of the chambers and vegetation will be planted. A copy of the project narrative is attached as a stipulated exhibit.

14. On or about October 17, 2018, the Town, through its Town Manager Chad Hicks, submitted a CAMA Minor Permit Application to DCM, through the Wilmington Regional Office. A copy of the Town's application materials is attached as a stipulate exhibit.

15. As part of the CAMA Minor Permit review process, the Town gave notice to the two adjacent riparian owners to the Site, Gary Studer and Brian Murphy. Copies of the email notice and responses are attached as stipulated exhibits.

16. Effective in 1979, the Commission adopted an erosion setback requirement that applies to structures along the oceanfront, within the Ocean Hazard Area of Environmental Concern ("AEC"). Rule 15A NCAC 7H .0306(a) The proposed development must be set back at a distance of 30-times the long-term annual erosion rate from the applicable vegetation line. Rule 15A NCAC 7H .0306(a)(1). At this Site, the long-term annual erosion rate is 2'/year and so the applicable setback is 60' from the applicable vegetation line.

17. Before the Town's large-scale beach nourishment project in 2009, the first line of stable and natural vegetation ("FLSNV") was surveyed for post-project use as the static vegetation line, from which oceanfront erosion setbacks are measured in a landward direction. Aerial photographs of the Site with historic shorelines overlain are attached as stipulated exhibits.

18. The proposed project would be located landward of the static vegetation line (where the FLSNV was surveyed in 2009 before the Town's large-scale nourishment project). The proposed project would be located waterward of the applicable 60' setback from the static vegetation line.

19. On October 17, 2018, DCM, through Field Representative Tara MacPherson, denied the Town's minor permit application because the proposed development was inconsistent with Rule 15A NCAC 7H .0306(a)(2) and NCGS 113A-120(a)(8). A copy of the denial letter is attached as a stipulated exhibit.

20. The Town seeks a variance from the Commission's oceanfront erosion setback rules found at 15A NCAC 7H .0306(a)(2) in order to develop the proposed stormwater infiltration system as proposed. A copy of the Town's October 17, 2018 Variance Petition is attached as Attachment D.

21. The Town is represented by Justin Humphries, Esq. and DCM Staff are represented by DEQ Asst. General Counsel Christine Goebel, Esq.

22. The Town stipulates that the proposed project is inconsistent with the oceanfront erosion setbacks of 15A NCAC 7H .0306(a)(2).

23. As part of the variance process, the Town has notified the adjacent riparian owners that they are seeking this variance. Copies of this notice are attached as stipulated exhibits.

Stipulated Exhibits:

1. Deed to the Site
2. Statement of Kat Corrigan, Brunswick County EMS Operations Manager
3. 2008 CRC Variance Order to Town of Kure Beach
4. May 2018 email chain between Town and NCDOT
5. March 16, 2017 scoping meeting attendance list and project narrative
6. October 20, 2018 report by W.K. Dickson to Town
7. July 2018 NC Board of Transportation agenda, and August minutes reflecting approval
8. NCDOT's proposed project budget breakdown
9. August 28, 2018 meeting minutes for NCDOT and Town meeting
10. Project narrative for DIS proposal
11. CAMA Minor Permit Application materials
12. Email notice of CAMA permit application to adjacent owners
13. Aerial photos of the Site, overlain with historic shorelines
14. October 17, 2018 CAMA permit denial letter
15. Notice to adjacent neighbors of this variance request
16. Powerpoint showing the Site, including pictures of past flooding events

PETITIONER'S and STAFF'S POSITIONS **ATTACHMENT C**

I. Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? If so, the petitioner must identify the hardships.

Petitioners' Position: Yes.

The Town of Caswell Beach has a rare opportunity to secure funding that will alleviate dangerous stormwater flooding along the low-lying areas and land surface along Caswell Beach Road. The areas of flooding cut off the Town, US Coast Guard Station Oak Island and the North Carolina Baptist Assembly from essential emergency services, sometimes for days at a time.

With the proposed Dune Infiltrating System (DIS) floodwater will be cleared from the road way with 12 hours in the critical flooding areas and filtered into the subsurface sand instead of being pumped for days into the ocean and marsh. This system will work best as presented in the maps provided to our Local Permit Officer.

Staff's Position: Yes.

The Town seeks a variance from the Commission's oceanfront setback rules which require development to be landward of the 60' setback as measured from the applicable static vegetation line. The Commission's Ocean Hazard rules are intended to protect oceanfront dunes by keeping significant development landward of these important features, and also to minimize losses to property from storms and long-term erosion. In this case, the dune infiltration system (DIS) is designed to be buried under the dunes near the location of the floodwater collection point and to filter stormwater underneath the dunes. Also, the existing dune will be reconstructed and revegetated over the top of the DIS after the system is put in place. As the proposed DIS is designed to work within/under the dunes, a strict application of the ocean erosion setback causes the Town unnecessary hardships.

II. Do such hardships result from conditions peculiar to the petitioner's property, such as location, size, or topography of the property? Explain.

Petitioner's Position: Yes.

The property in question is the only available property with the size and topography to accommodate this project. There are no properties left in Caswell Beach that are undeveloped and none that have as much acreage as the proposed site for the stormwater dune infiltration system.

Staff's Position: Yes.

Staff agree that the Town's hardships result from conditions peculiar to the Town's property, where there do not appear to be properties that are large enough to accommodate a DIS but are also wide enough to locate them more than 60' from the static line, that are also in the area of Caswell Beach Road where the flooding is most problematic. Additionally, Staff note that Caswell Beach is located on a narrow peninsula, limiting the placement of both a main east-west road and the development of a DIS that could also meet the setback.

III. Do the hardships result from the actions taken by the Petitioner? Explain.

Petitioners' Position: No.

There is nothing the Town of Caswell Beach has done that in anyway cause this hardship.

Staff's Position: No.

Staff agree that the Town's hardships do not result from their actions. On this narrow peninsula, there are limited options for addressing flooding along Caswell Beach Road. While pumping the stormwater into the sound or the ocean is an option, it takes a while for the pumps to lower the water to allow safe use of the road, limiting emergency access, while also impacting water quality. This DIS design would work to reduce or eliminate the need for pumping stormwater off Caswell Beach Road, and would have limited long-term impacts on the existing dune within the setback.

IV. Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards, or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Petitioners' Position: Yes.

The CAMA development rules are put in place to protect the safety and property of the people of North Carolina. Although this system is technically development it is more of an underground utility that will be used to mitigate flooding dangers in the town. Should the system be overtaken by a natural disaster there would be no danger to the public as in the case of a structure washing away.

This project will also serve public safety and welfare in several ways. By removing flooded stormwater from Caswell Beach Road emergency crews and vehicles will be able to access the residents, US Coast Guard Station Oak Island, and the NC Baptist Assembly.

The Town of Caswell Beach feels that justice is preserved by allowing a variance to be issued for this project. We do not foresee how this project could be of detriment to the State of North Carolina.

Staff's Position: Yes.

Staff contends that granting a variance in order to vary the Commission's oceanfront erosion setback rules to allow the development of the DIS is consistent with the spirit, purpose, and intent of the Commission's rules where the spirit of the oceanfront erosion setback rules is to protect oceanfront dune systems and to locate development more landward to reduce storm impacts. In this case, the impacts to the dune system will be short-term as the existing dune will be rebuilt and revegetated after installation of the DIS. Also, the risk of impacts to the DIS will be reduced because it will be buried under the dune. The proposed DIS system will address public safety and welfare by both limiting the need to close Caswell Beach Road due to stormwater flooding, and by reducing water quality impacts where the amount of stormwater needed to be pumped off the road will be reduced or eliminated. Locating the DIS within the existing dune in the setback area will only cause short-term impacts to the protective nature of the oceanfront dune. Staff agree that granting a variance would preserve substantial justice where the CAMA statute makes exceptions for buried utilities, but which do not include this new DIS system technology, despite the similarities in purpose.

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ATTACHMENT D:

PETITIONERS' VARIANCE REQUEST MATERIALS

CAMA VARIANCE REQUEST FORM

DCM FORM 11
DCM FILE No.: CaoB 18-01

PETITIONER'S NAME Town of Caswell Beach
COUNTY WHERE THE DEVELOPMENT IS PROPOSED Brunswick

Pursuant to N.C.G.S. § 113A-120.1 and 15A N.C.A.C. 07J .0700 *et seq.,* the above named Petitioner hereby applies to the Coastal Resources Commission (CRC) for a variance.

VARIANCE HEARING PROCEDURES

A variance petition will be considered by the CRC at a regularly scheduled meeting, heard in chronological order based upon the date of receipt of a complete petition. 15A N.C.A.C. 07J .0701(e). A complete variance petition, as described below, must be *received* by the Division of Coastal Management (DCM) a minimum of six (6) weeks in advance of the first day of a regularly scheduled CRC meeting to be eligible for consideration by the CRC at that meeting. 15A N.C.A.C. 07J .0701(e). The final set of stipulated facts must be agreed to at least four (4) weeks prior to the first day of a regularly scheduled meeting. 15A N.C.A.C. 07J .0701(e). The dates of CRC meetings can be found at DCM's website: **www.nccoastalmanagement.net**

If there are controverted facts that are significant in determining the propriety of a variance, or if the Commission determines that more facts are necessary, the facts will be determined in an administrative hearing. 15A N.C.A.C. 07J .0701(b).

VARIANCE CRITERIA

The petitioner has the burden of convincing the CRC that it meets the following criteria:

(a) Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? Explain the hardships.

(b) Do such hardships result from conditions peculiar to the petitioner's property such as the location, size, or topography of the property? Explain.

(c) Do the hardships result from actions taken by the petitioner? Explain.

(d) Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Please make your written arguments that Petitioner meets these criteria on a separate piece of paper.
The Commission notes that there are some opinions of the State Bar which indicate that non-attorneys may not represent others at quasi-judicial proceedings such as a variance hearing before the Commission. These opinions note that the practice of professionals, such as engineers, surveyors or contractors, representing others in quasi-judicial proceedings through written or oral argument, may be considered the practice of law. Before you proceed with this variance request, you may wish to seek the advice of counsel before having a non-lawyer represent your interests through preparation of this Petition.

For this variance request to be complete, the petitioner must provide the information listed below. The undersigned petitioner verifies that this variance request is complete and includes:

____ The name and location of the development as identified on the permit application;

____ A copy of the permit decision for the development in question;

____ A copy of the deed to the property on which the proposed development would be located;

____ A complete description of the proposed development including a site plan;

____ A stipulation that the proposed development is inconsistent with the rule at issue;

____ Proof that notice was sent to adjacent owners and objectors*, as required by 15A N.C.A.C. 07J .0701(c)(7);

____ Proof that a variance was sought from the local government per 15A N.C.A.C. 07J .0701(a), if applicable;

____ Petitioner's written reasons and arguments about why the Petitioner meets the four variance criteria, listed above;

____ A draft set of proposed stipulated facts and stipulated exhibits. Please make these verifiable facts free from argument. Arguments or characterizations about the facts should be included in the written responses to the four variance criteria instead of being included in the facts.

____ This form completed, dated, and signed by the Petitioner or Petitioner's Attorney.

**Please contact DCM or the local permit officer for a full list of comments received on your permit application. Please note, for CAMA Major Permits, the complete permit file is kept in the DCM Morehead City Office.*

Due to the above information and pursuant to statute, the undersigned hereby requests a variance.

Signature of Petitioner or Attorney	Date: 10-17-18
Printed Name of Petitioner or Attorney: Chad Hicks	Email address of Petitioner or Attorney: chicks@caswellbeach.org
Mailing Address: 1100 Caswell Beach Rd,	Telephone Number of Petitioner or Attorney: (910) 200-3217
City: Caswell Beach State: NC Zip: 28465	Fax Number of Petitioner or Attorney: (866) 271-3641

RECEIVED

OCT 17 2018

DCM WILMINGTON, NC

VARIANCE CRITERIA

The petitioner has the burden of convincing the CRC that it meets the following criteria:

(a) Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? Explain the hardships.

Yes. The Town of Caswell Beach has a rare opportunity to secure funding that will alleviate dangerous stormwater flooding along the low-lying areas and land surface along Caswell Beach Road. The areas of flooding cut off the Town, US Coast Guard Station Oak Island and the North Carolina Baptist Assembly from essential emergency services, sometimes for days at a time.

With the proposed Dune Infiltrating System (DIS) floodwater will be cleared from the road way within 12 hours in the critical flooding areas and filtered into the subsurface sand instead of being pumped for days into the ocean and marsh. This system will work best as presented in the maps provided to our Local Permit Officer.

(b) Do such hardships result from conditions peculiar to the petitioner's property such as the location, size, or topography of the property? Explain.

Yes. The property in question is the only available property with the size and topography to accommodate this project. There are no properties left in Caswell Beach that are undeveloped and none that have as much acreage as the proposed site for the stormwater dune infiltration system.

(c) Do the hardships result from actions taken by the petitioner? Explain.

No. There is nothing the Town of Caswell Beach has done that in anyway cause this hardship.

(d) Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Yes. The CAMA development rules are put in place to protect the safety and property of the people of North Carolina. Although this system is technically development it is more of an underground utility that will be used to mitigate flooding dangers in the town. Should the system be overtaken by a natural disaster there would be no danger to the public as in the case of a structure washing away.

This project will also secure public safety and welfare in several ways. By removing flooded stormwater from Caswell Beach Road emergency crews and vehicles will be able to access the residents, US Coast Guard Station Oak Island, and the NC Baptist Assembly.

The Town of Caswell Beach feels that justice is preserved by allowing a variance to be issued for this project. We do not foresee how this project could be of detriment to the State of North Carolina.

VARIANCE APPLICATION

1. The project is a stormwater dune infiltration system that will be placed outside of the 60' static line in the 300 block of Caswell Beach Road.

2. Permit decision to be provided by LPO.

3. Deed attached.

4. Site plan attached. This project is approximately 525' feet of buried infiltration chambers that store water until it can be absorbed by the ground. This water is filtered through the sand before entering the water table. A pipe will be used that runs the length of Caswell Beach Road and to the infiltration system to transport the flood water. The system will be buried, and all dunes and plantings restored so that no evidence of the project will be visible.

5. The proposed project is outside of the static line but is within the 60' buffer making it inconstant with CAMA development rules. We request a variance to allow the project to be built inside the buffer zone.

6. Certified receipts attached.

7. Local government variance is not applicable.

8. The answers to the 4 variance criteria are attached.

9. Facts on project

   a. Caswell Beach Road floods during storm events.
   b. Flooding on Caswell Beach Road prevents emergency responders from accessing residents in need.
   c. The project will be below ground and not visible.
   d. Flood water pumped into the infiltration containers are filtered before entering the natural water table.
   e. Caswell Beach has funding available to install project and eliminate dangerous flooding on Caswell Beach Road during most storm events.
   f. Caswell Beach Road floods several times per year.
   g. The project cannot be practically moved from the proposed location and work as designed.
   h. The proposed project will be outside of the static line.
   i. This project poses no danger or hindrances to the public.
   j. This is an innovative project that is not harmful to the environment.
   k. The project consists of approximately 525 square feet of underground piping and infiltration chambers.

ATTACHMENT E:

STIPULATED EXHIBITS INCLUDING POWERPOINT

Brunswick County—Register of Deeds
Robert J. Robinson
Inst #217753 Book 1971 Page 315
06/30/2004 10:46:19am Rec# 95229

RET Elva Jess
TOTAL 38 REV ____ TC# 1
REC# ____ CK AMT ____ CK# ____
CASH ____ REF ____ BY ____

	TS	ACR	MAP	CP	ITEM	SPL
(B)	3	C	25I6	A	001	0160
(C)	3	C	25IN	B	037	C

QUITCLAIM DEED

The UNITED STATES OF AMERICA, acting by and through the Secretary of the Interior, acting by and through the Southeast Regional Director, National Park Service, under and pursuant to the power and authority contained in the provisions of the Federal Property and Administrative Services Act of 1949 (63 Stat. 377), as amended, and particularly as amended by Public Law 485, 91st Congress, and regulations and orders promulgated thereunder (hereinafter designated "Grantor"), for and in consideration of the perpetual use of the hereinafter described premises for public park and public recreation area purposes by the Town of Caswell Beach, North Carolina (hereinafter designated "Grantee"), released and quitclaimed to Grantee, and to its successors and assigns, subject to the reservations, exceptions, restrictions, conditions and covenants hereinafter expressed and set forth, all Grantor's right, title and interest in and to the following approximately 5.71 acres of described property, known as the Oak Island Light Tower, North Carolina, located at 300 A Caswell Beach Road, Caswell Beach, North Carolina 28465, more particularly described as follows:

Parcel "B"

Beginning at an iron rod in the northern right-of-way of N.C. Highway 133, the southeast corner of Lot 15, Block 3, Section "B" of Caswell Beach as recorded at Map Book 1, Page 123 of the Brunswick County Registry, having N.C. 1927 grid coordinates of N: 53314.49 E: 2292711.08 and being located South 74 degrees 50 minutes 39 seconds West 135.55 feet from USC&G monument "catwalk" on the Oak Island Lighthouse and further being in the western line of properties belonging to the U.S. Coast Guard; thence with said western line and the eastern line of the aforementioned Lot 15, North 19 degrees 30 minutes 56 seconds East 81.89 feet to an iron rod, the beginning corner of Parcel "A"; thence with parcel "A" South 75 degrees 23 minutes 28 seconds East 185.17 feet to an iron rod, a corner of parcel "A"; thence, South 14 degrees 36 minutes 32 seconds West 81.59 feet to an iron rod in the northern right-of-way of N.C. Highway 133, a corner of Parcel "A"; thence with the northern right-of-way of said Highway 133, North 75 degrees 23 minutes 28 seconds West 192.17 feet to the Point of Beginning. Being part of lands belonging to the U.S. Coast Guard described as the Oak Island Life Boat Station, District 5, C.G. Dated 1-17-39, under title "A" Property Report of the Brunswick County Registry containing 0.35 acres more or less and being all of Parcel "B".

Parcel "C"

Beginning at an iron pipe in the southern right-of-way of N.C. Highway 133, the northeast corner of Lot 1, Block 3, Section B, of Caswell Beach as recorded at Map Book 1, Page 123, of the Brunswick County Registry, said point being further located in the western line of lands belonging to the U.S. Coast Guard, and being South 19 degrees 31 minutes 25 seconds West 61.71 feet from a concrete monument, the southwest corner of Parcel "B", having N.C. 1927 grid coordinates of N:53314.49 E:2292711.08, South 74 degrees 50 minutes 39 seconds West 135.55 feet from USC&G Monument "Catwalk" on the Oak Island Lighthouse; thence

form the beginning, with said U.S. Coast Guard's western line and eastern line of said Lot 1 South 19 degrees 26 minutes 52 seconds West 136.61 feet to a concrete monument in said line; thence continuing, South 19 degrees 59 minutes 32 seconds East 233.35 feet to a point where said western line of U.S. Coast Guard lands intersects with the mean high water mark of the Atlantic Ocean; thence with said high water mark South 74 degrees 44 minutes 02 seconds East 564.31 feet to a point in the eastern line of the aforementioned U.S. Coast Guard lands; thence with said eastern line North 37 degrees 29 minutes 55 seconds East 266.43 feet to an iron pipe, the southwest corner of Lot 9, Block 2, Section "B" of Caswell Beach as recorded at Map Book 1, Page 123 of the Brunswick County Registry; thence with the eastern line of the U.S. Coast Guard's lands and the western line of said Lot 9 North 37 degrees 29 minutes 55 seconds East 142.70 feet to an iron rod in the southern right-of-way of N.C. Highway 133, the northwest corner of Lot 9; thence with the southern right-of-way of N.C. Highway 133, North 75 degrees 33 minutes 24 seconds East 690.0 feet to the Point of Beginning; being part of lands belonging to the U.S. Coast Guard described as the Oak Island Life Boat Station, district 5, C.G., dated 7-17-39, under Title "A" Property Report of the Brunswick County Registry, containing 5.36 acres more or less and being all of parcel "C".

This conveyance is made subject to any and all existing rights-of-way, easements and covenants and agreements affecting the above-described premises, whether or not the same now appear of record, including but not limited to the following:

1. A permit issued on March 1, 2002 to the Army Corps of Engineers for placement of an antenna on the light tower.

2. An easement conveyed to the Town of Caswell Beach on July 11, 1991 for the placement and maintenance of water service equipment.

3. An easement conveyed to Southern Bell Telephone and Telegraph Company on July 29, 1983.

To Have and to Hold the hereinbefore described property, subject to the reservations, exceptions, restrictions, conditions and covenants herein expressed and set forth unto the Grantee, its successors and assigns, forever.

Pursuant to authority contained in the Federal Property and Administrative Services Act of 1949, as amended, and applicable rules, regulations and orders promulgated thereunder, the General Services Administration determined the subject property to be surplus to the needs of the United States of America and assigned the property to the Department of the Interior for further conveyance to the Town of Caswell Beach, North Carolina.

It is agreed and understood by and between the Grantor and Grantee, and the Grantee, by its acceptance of this deed, does acknowledge its understanding of the agreement, and does covenant and agree for itself, and its successors and assigns, forever, as follows:

1. The property shall be used and maintained for the public purposes for which it was conveyed in perpetuity as set forth in the Program of Utilization and Plan contained in the application, submitted by the Grantee on June 23, 2003, which program and plan may be amended from time to time at the request of either the Grantor or Grantee, with the written concurrence of the other party, and such amendments shall be added to and become a part of the original application.

2. The Grantee shall, within 6 months of the date of this deed of conveyance, erect and maintain a permanent sign or marker near the point of principal access to the conveyed area which says:

> This park land was acquired through the FEDERAL LANDS TO PARKS PROGRAM of the United States Department of the Interior, National Park Service, for the public's recreational use and enjoyment.

3. The property shall not be sold, leased, assigned, or otherwise disposed of except to another eligible governmental agency that the Secretary of the Interior agrees in writing can assure the continued use and maintenance of the property for public park or public recreational purposes subject to the same terms and conditions in the original instrument of conveyance. Any mortgage, lien, or any other encumbrance not wholly subordinate to the reverter interest of the Grantor shall constitute an impermissible disposal. However, this provision shall not preclude the Grantee and its successors or assigns from issuing revenue or other bonds related to the use of the property to the extent that such bond shall not in any way restrict, encumber, or constitute a lien on the property. Further, nothing in this provision shall preclude the Grantee from providing related recreational facilities and services compatible with the approved application, through concession agreements entered into with third parties, provided prior concurrence to such agreements is obtained in writing from the Secretary of the Interior.

4. From the date of this conveyance, the Grantee, its successors and assigns, shall submit biennial reports to the Secretary of the Interior, setting forth the use made of the property during the preceding 2-year period, and other pertinent data establishing its continuous use for the purposes set forth above, for ten consecutive reports and as further determined by the Secretary of the Interior.

5. All revenue received by the Grantee through concession agreements, use permits, or other fees generated by activities on the property shall be used only for the implementation of an approved Program of Utilization or the operation of park and recreation facilities and programs on the property. After the Program of Utilization is completed, and as long as the property is properly and sufficiently operated and maintained, the revenue may be used for other public park and recreational purposes by the Grantee. Any revenue received by the Grantee which is generated on or by the operation of the property shall not be used for non-recreational purposes. Any revenue received by the Grantee which is generated through the operation of the property shall be listed and accounted for in its biennial reports to the National Park Service.

6. The Grantor, and any representative it may so delegate, shall have the right of entry upon said premises at any time to conduct inspections of the property for the purpose of evaluating the Grantee's compliance with the terms and conditions of this deed.

7. The Grantee agrees that the U.S. Coast Guard (USCG) retains the unrestricted right: (a) to an "arc of visibility" easement; (b) to add a communications tower(s) and associated buildings and equipment and make any changes to the property as may be necessary for the USCG National Distress System; (C) to keep the aid to navigation and associated equipment in the light tower structure; (d) of access and ingress at all times for USCG personnel to service, add to, maintain, operate, repair and replace the aid to navigation and any associated equipment; and (e) to relocate or add any aids to navigation, or make any changes on any portion of the property as may be necessary for navigational purposes.

8. As part of the consideration for the Deed, the Grantee covenants and agrees for itself, its successors and assigns, that (1) the program for or in connection with which this Deed is made will be conducted in compliance with, and the Grantee, its successors and assigns, will comply with all requirements imposed by or pursuant to the regulations of the Department of the Interior in effect on the date of this Deed (43 C.F.R. Part 17) issued under the provisions of Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d-1); (2) this covenant shall be subject in all respects to the provisions of said regulations; (3) the Grantee, its successors and assigns, will promptly take and continue to take such action as may be necessary to effectuate this covenant; (4) the United States shall have the right to seek judicial enforcement of this covenant, and (5) the Grantee, its successors and assigns, will (a) obtain from each other person (any legal entity) who, through contractual or other arrangements with the Grantee, its successors and assigns, is authorized to provide services or benefits under said program, a written agreement pursuant to which such other person shall, with respect to the services or benefits which he is authorized to provide, undertake for himself the same obligations as those imposed upon the Grantee, its successors and assigns, by this covenant, and (b) furnish a copy of such agreement to the Secretary of the Interior, or his successor; and that this covenant shall run with the land hereby conveyed, and shall in any event, without regard to technical classification or designation, legal or otherwise, be binding to the fullest extent permitted by law and equity for the benefit of, and in favor of the Grantor and enforceable by the Grantor against the Grantee, its successors and assigns.

9. The Grantee agrees to comply with the requirements of Public Law 90-480 (82 Stat. 718), the Architectural Barriers Act of 1968, as amended by Public Law 91-205 of 1970 (84 Stat. 49), and the Americans with Disabilities Act of 1990 (104 Stat. 337) to assure that development of facilities on conveyed surplus properties for public park and recreation purposes are accessible to the physically handicapped; and, further assure in accordance with Public Law 93-112, the Rehabilitation Act of 1973 (87 Stat. 394), that no otherwise qualified handicapped individual shall solely by reasons of his handicap be excluded from the participation in, be denied benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

10. The Grantee, by acceptance of this deed, acknowledges that it has received the following notice of hazardous substance activity and reservation of access by the Grantor concerning the herein described lands. Each of these statements is given by the Grantor in compliance with Section 120(h)(3) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9620(h)(3):

(A) NOTICE Regarding Hazardous Substance Activity. Pursuant to 40 C.F.R. 373.2 and Section 120(h)(3)(A)(I) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA)(42 U.S.C. § 9620(h)(3)(A)(I), and based upon a complete search of agency files, the United States gives notice that no hazardous substances have been released or disposed of or stored for one year or more on the conveyed property.

(B) CERCLA Covenant. The Grantor warrants that all remedial action necessary to protect human health and the environment has been taken before the date of this conveyance. Grantor warrants that it shall take any additional response action found to be necessary after the date of this conveyance regarding hazardous substances located on the subject property on the date of this conveyance.

(1) This covenant shall not apply:

(a) in any case in which Grantee, its successors or assigns, or any successor in interest to the subject property or part thereof is a Potentially Responsible Party (PRP) with respect to the subject property immediately prior to the date of this conveyance; or

(b) to the extent but only to the extent that such additional response action or part thereof found to be necessary is the result of an act or failure to act of the Grantee, its successors or assigns, or any party in possession after the date of this conveyance that either:

(I) results in a release or threatened release of a hazardous substance that was not located on the subject property on the date of this conveyance; or

(ii) causes or exacerbates the release or threatened release of a hazardous substance the existence and location of which was known and identified to the applicable regulatory authority as of the date of this conveyance.

(2) In the event Grantee, its successors or assigns, seeks to have Grantor conduct any additional response action, and, as a condition precedent to Grantor incurring any additional cleanup obligation or related expenses, Grantee, its successors or assigns, shall provide Grantor 45 days written notice of such a claim. In order for the 45-day period to commence, such notice must include credible evidence that:

(a) the associated contamination existed prior to the date of this conveyance; and

(b) the need to conduct any additional response action or part thereof was not the result of any act or failure to act by the Grantee, it successors or assigns, or any party in possession.

(C) Access. Grantor reserves a right of access to all portions of the subject property for environmental investigation, rededication or other corrective action. This reservation includes the right of access to and use of available utilities at reasonable cost to Grantor. These rights shall be exercisable in any case in which a remedial action, response action or corrective action is found to be necessary, or in which access is necessary to carry out a remedial action, response action, or corrective action on adjoining property. Pursuant to this reservation, the United States of America, and its respective officers, agents, employees, contractors and subcontractors shall have the right (upon reasonable advance written notice to the record title holder) to enter upon the subject property and conduct investigations and surveys, to include drilling, test-pitting, bores, data and records compilation and other activities related to environmental investigation, and to carry out remedial or removal actions as required or necessary, including but not limited to the installation and operation of monitoring wells and pump wells, and treatment facilities. Any such entry, including such activities, responses or remedial actions, shall be coordinated with Grantee, its successors and assigns, and shall be performed in a manner that minimizes interruption with activities of authorized occupants.

11. Grantee acknowledges that this property is eligible for listing on the National Register of Historic Places. Grantee shall be on the lookout for archeological artifacts during any construction activities and shall take appropriate action should any artifacts be discovered. Grantee shall comply with the provisions of 36 C.F.R. Part 800, regarding protection of historic and cultural properties. Grantee's development plans shall avoid sites identified by a Cultural Resources Assessment of the property, and, prior to any alteration or construction on the property, Grantee shall consult with the North Carolina State Historic Preservation Office.

12. The Grantee agrees that the structure situated on the said property will be preserved and maintained in accordance with plans approved in writing by the North Carolina State Historic Preservation Office and development of the property shall be in compliance with the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings and the development plans shall be approved by the North Carolina State Historic Preservation Office.

13. The Grantee agrees to comply with the National Environmental Policy Act of 1969, as amended, the 1977 Amendments to the Federal Water Pollution Control Act (Clean Water Act of 1977), the Federal Disaster Protection Act of 1973 (87 Stat. 975), Executive Order 11288, Executive Order 11990 (May 24, 1977) for Protection of Wetlands and Executive Order 11988 (May 24, 1977) for Floodplain Management, where and to the extent said Amendments and Orders are applicable to the property herein conveyed, and Grantee shall be subject to any use restrictions issued under said Amendments and Orders.

14. The structure on this site was erected prior to 1978, at which time the use of lead-based paint (LBP) was common throughout the United States, including on government buildings. The age of the structure on the subject property suggests that there is a likelihood that LBP is present on this structure. While there have been significant efforts to limit dosages of lead in the workplace, these efforts to date have not identified the historical use of LBP as requiring special measures. Therefore no action has been taken with regard to LBP. The Grantee acknowledges that there is LBP on the structure and will comply with the regulations regarding LBP. Further, the Grantee shall be responsible for abating all LBP hazards prior to occupancy of the property by children six (6) years of age and under, as described in 24 C.F.R. § 35.24.

15. The Grantee shall comply with all applicable Federal, State, and local laws, regulations and standards that are or may become applicable to the Grantee's activities on the property being conveyed.

15. In the event there is a breach of any of the conditions and covenants herein contained by the Grantee, its successors and assigns, whether caused by the legal or other inability of the Grantee, its successors and assigns, to perform said conditions and covenants, or otherwise, all right, title and interest in and to said premises shall revert to and become the property of the Grantor at its option, which in addition to all other remedies for such breach shall have the right of entry upon said premises, and the Grantee, its successors and assigns, shall forfeit all right, title and interest in said premises and in any and all of the tenements, hereditaments and appurtenances thereunto belonging; provided, however, that the failure of the Secretary of the Department of the Interior to require in any one or more instances complete performance of any of the conditions or covenants shall not be construed as a waiver or relinquishment of such future performance, but the obligation of the Grantee, its successors and assigns, with respect to such future performance shall continue in full force and effect. The Grantee, by its acceptance of this deed, covenants and agrees for itself, and its successors and assigns, that in the event the Grantor exercises its option to revert all right, title, and interest in the property to the Grantor, or the Grantee voluntarily returns title to the property in lieu of a reverter, then the Grantee shall provide protection to and maintenance of said property at all times until such time as the title is actually reverted or returned to and accepted by the Grantor, including the period of any notice of intent to revert. Such protection and maintenance shall, at a minimum, conform to the standards prescribed by the General Services Administration in its Federal Property Management Regulations, 41 C.F.R. 101 - 47.402, in effect at the time of the reversion.

IN WITNESS WHEREOF, the Grantor has caused these presents to be executed in its name and on its behalf this the 18TH day of JUNE, 2004.

UNITED STATES OF AMERICA
acting by and through the
Secretary of the Interior

Inst # 217753 Book 1971Page: 322

Through:

Regional Director
Southeast Region
National Park Service

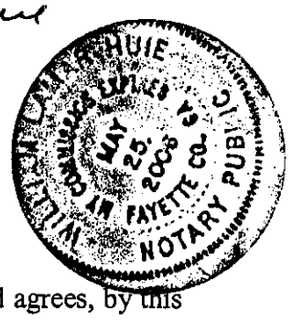
WITNESSES:

By: Wallace C. Brittain
Wallace C. Brittain
Chief, Recreation and
Conservation Division

STATE OF GEORGIA)
)ss
COUNTY OF FULTON)

On this 18TH day of JUNE, 2004, before me, the subscriber, personally appeared Wallace C. Brittain, National Park Service, of the United States Department of the Interior, a governmental agency of the United States of America, and known to me to be the same person described in and who executed the foregoing instrument, as the act and deed of the United States of America, for and on behalf of the Secretary of the Interior, duly designated, empowered and authorized so to do by said Secretary and he acknowledges that he executed the foregoing instrument for and on behalf of the United States of America for the purposes and uses therein described.

William Lamar Hutie
NOTARY PUBLIC



My commission expires:

May 25, 2006

The foregoing conveyance is hereby accepted and the undersigned agrees, by this acceptance, to assume and be bound by all the obligations, conditions, covenants and agreements therein contained.

TOWN OF CASWELL
STATE OF NORTH CAROLINA

Inst # 217753 Book 1971Page: 323

Judith A. Roney

By: _____
Harry Q. Simmons, Jr.
Mayor

TOWN OF CASWELL BEACH CHARTERED 1975 NORTH CAROLINA

STATE OF NORTH CAROLINA)
)ss
COUNTY OF BRUNSWICK)

On this 25th day of June, 2004, before me, the undersigned Officer, personally appeared Harry Q. Simmons, Jr., to me known and known to me to be the same person whose name is subscribed to the foregoing acceptance, who being by me duly sworn, did depose and say that he is Mayor of the Town of Caswell Beach, North Carolina, that he is duly designated, empowered and authorized by Resolution/Certification of Authority to Acquire Property of the Town Council of the Town of Caswell Beach, North Carolina, which resolution was presented and adopted on June 12, 2003, to execute the foregoing acceptance and sign his name thereto; and that he signed his name thereto and acknowledges that he executed the foregoing instrument for and on behalf of the Town of Caswell Beach, North Carolina, for the purposes and uses therein described.

Linda C. Bethune
NOTARY PUBLIC

LINDA C. BETHUNE NOTARY PUBLIC BRUNSWICK COUNTY, N. C.

My Commission expires:

08-04-2007

STATE OF NORTH CAROLINA
COUNTY OF BRUNSWICK

The Foregoing (or annexed) Certificate(s) of William Lamar Huie, Linda C. Bethune

Notary(ies) Public is (are) Certified to be Correct.
This Instrument was filed for Registration on this 30 Day of June, 2004
in the Book and page shown on the First Page hereof.

Robert J. Robinson
ROBERT J. ROBINSON, Register of Deeds

Brunswick County

Emergency Services

(910)253-5383
Phone

(910)253-4451
Fax

October 26, 2018

To: Chad Hicks
From: Kat Corrigan, EMS Operations Manager
Subject: Flooding on Caswell Beach Road

Flooding can cause significant response delays for patients in affected areas. Significant flooding can prevent emergency vehicles from gaining access to persons with medical or other emergencies. Life saving measures could have a negative outcome with delayed response or inability to access. Additionally, flooded roads could have unforeseen hazards to include washouts, sinkholes, downed limbs, among other issues. These conditions can delay or prevent emergency response and access. Historic flooding has been seen in this area and causes these delayed responses. Brunswick County Emergency Services is concerned with the ability to address emergencies in Caswell Beach town limits during storm events.

ROY COOPER
ATTORNEY GENERAL

State of North Carolina
Department of Justice
PO Box 629
Raleigh, North Carolina
27602

Reply to:
Jennie W. Hauser
Environmental Division
9001 Mail Service Center
Raleigh, NC 27699-9001
Tel: (919)716-6600
Fax: (919)716-6767
jhauser@ncdoj.gov

October 29, 2008

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Mr. Henry E. Beeker, Jr.
Town of Kure Beach
117 Settlers Lane
Kure Beach, North Carolina 28449

K Ave + Atlantic Ave Outfalls

Re: Variance Request to Coastal Resources Commission
By Henry E. Beeker, Jr./Town of Kure Beach
CRC-VR-08-45

Dear Mr. Beeker:

At its September 24, 2008 meeting, the Coastal Resources Commission voted to grant the above referenced variance request. Attached is a copy of the Final Order, signed by the Chairman of the Coastal Resources Commission. Prior to undertaking the development for which you sought a variance, you must first obtain a CAMA permit from your local permitting authority or the Division of Coastal Management.

Sincerely,

Jennie Wilhelm Hauser
Special Deputy Attorney General
Counsel to the Commission

c: Amanda P. Little
Angela Willis, DCM Morehead City
Robert R. Emory, Jr., Chairman

STATE OF NORTH CAROLINA

COUNTY OF NEW HANOVER

IN THE MATTER OF:)
PETITION FOR VARIANCE)
BY TOWN OF KURE BEACH)

BEFORE THE NORTH CAROLINA
COASTAL RESOURCES COMMISSION
CRC-VR-08-45

FINAL ORDER

This matter was heard on oral arguments and stipulated facts at the regularly scheduled meeting of the North Carolina Coastal Resources Commission (hereinafter CRC) on September 24, 2008, in Sunset Beach, North Carolina pursuant to N.C.G.S. § 113A-120.1 and 15A NCAC 7J.0700, et seq. Assistant Attorney General Amanda Little appeared for the Department of Environment and Natural Resources, Division of Coastal Management; Mason Herndon, the North Carolina Division of Transportation (NCDOT) Division 3 Environmental Officer and applicant for the permit as the authorized agent of the Town of Kure Beach, appeared on behalf of Petitioner.

Upon consideration of the record documents and the arguments of the parties, the CRC adopts the following:

STIPULATED FACTS

1. Petitioner, the Town of Kure Beach owns the ocean outfall at K Avenue and Atlantic Ave. ("the project site"), Kure Beach, New Hanover County, NC.

2. The Town of Kure Beach has a number of stormwater outfalls that discharge onto the beach, sometimes directly flowing into the ocean with little infiltration into the sand.

3. The Department of Environment and Natural Resources, Division of Environmental Health-Shellfish Sanitation and Recreational Water Quality Section monitors the State's waters

by regular bacteriological testing. Due to the elevated bacteria levels in nearby swimming areas, Petitioner proposes to install a dune infiltration system at the project site to improve stormwater treatment at the existing outfall on Kure Beach.

4. In 2005, NCDOT, North Carolina State University (NCSU) and the Town of Kure Beach began collaborating to address the water quality issues associated with existing stormwater outfalls on the beach. The existing ocean outfalls carry runoff from US-421 and surrounding roads, parking lots, and rooftops. The Town requested assistance from NCSU Department of Biological and Agricultural Engineering to design a low-cost, effective alternative to treat this runoff. The result was the design of a Dune Infiltration System (DIS). Two of these systems were installed in February 2006 to capture stormwater runoff from the L Ave. outfall and the M Ave. outfall. Since their installation these systems have been monitored following storm events. Water quality testing of collected samples showed the systems to be very efficient in reducing stormwater flow and bacterial transport to the ocean areas.

5. Petitioner, through its authorized agent, applied for a CAMA Minor Development Permit to install a dune infiltration system (DIS) to treat stormwater at the existing K Ave. outfall. The application was dated May 13, 2008, and the project will be funded by NCDOT. The project proposes the installation of 26 stormchambers for stormwater storage and infiltration, a splitter box, and modification or retro-fit of existing drop inlets and outfall pipe. The design will divert inflow from 3 outfalls near K Avenue into a single DIS, and by combining these outfalls into one system, will allow for subsurface infrastructure to be avoided.

6. The project site is located within the Ocean Erodible Area of Environmental Concern (AEC) and the High Hazard Flood AEC, subcategories of the Ocean Hazard AEC designated by

the Coastal Resources Commission (CRC) in Rule 15A NCAC 7H .0304.

7. Effective in 1979, the CRC adopted an erosion setback requirement that applies to structures along the oceanfront. Rule 15A NCAC 7H .0306(a). The general rule is that development must be set back at a distance of 30 times the long-term annual erosion rate from the applicable vegetation line. Rule 15A NCAC 7H .0306(a)(1).

8. The annual long-term erosion rate at this property is 2 feet per year, making the ocean erosion setback for the property 60 feet from the static vegetation line.

9. The existing outfall terminates at the bulkhead along Atlantic Avenue. The Kure Beach static line is also located along this bulkhead; however, a well established dune system, frontal dune and first line of stable natural vegetation extend approximately 85 feet oceanward of the bulkhead, and the improvements needed at the project site must be made at the central collection point of the outfall within the ocean front setback.

10. Petitioner proposes to restore the disturbed area at the project site to natural contours and to replant with native species of vegetation.

11. The N.C. Division of Coastal Management Representative, Stephen Lane, denied the minor permit application by letter dated July 2, 2008, because the proposed development was inconsistent with Rule 15A NCAC 7H .0306(a)(3).

12. Petitioner filed this variance request on July 15, 2008, seeking relief from strict application of the Ocean Hazard AEC erosion setback rules and the exceptions to those rules in 15A NCAC 7H .0306(a) and .0309.

CONCLUSIONS OF LAW

1. The CRC has jurisdiction over the parties and the subject matter.

2. All notices for the proceeding were adequate and proper.

3. The Petitioner has demonstrated that strict application of certain of the CRC's Rules to the permit application will result in unnecessary hardship. Strict application of Rule 15A NCAC 7H .0306(a); .0309; .0601 would cause an unnecessary hardship because Petitioner would be unable to locate the Dune Infiltration System at any other location on the property.

4. The Petitioner has demonstrated that this hardship results from conditions peculiar to Petitioner's property such as the location, size, or topography of the property. The Petitioner's property is located oceanward of the existing roads, and the Dune Infiltration System must be situated where the existing outfall terminates at the bulkhead along Atlantic Avenue; however, the improvements needed at the project site must be made at the central collection point of the outfall within the ocean front setback. As a result, portions of Petitioner's proposed stormwater improvement project must take place, if at all, within the setback mandated by the CRC's rules.

5. The Petitioner has demonstrated that this hardship does not result from actions the Town has taken.

6. The Petitioner has demonstrated (a) that the requested variance is consistent with the spirit, purpose and intent of the Commission's rules, (b) that it will secure public safety and welfare, and (c) that it will preserve substantial justice. The proposed project will be consistent with the spirit, purpose, and intent of the CRC's rules in that Petitioner is seeking to install a system to provide treatment and disposal of stormwater, to remove stormwater discharge from the public beach, and, hopefully, to improve conditions for swimming at Kure Beach. Moreover,

installation of the Dune Infiltration System will afford an additional opportunity for NCDOT's study of such systems. The Town seeks to install the DIS to improve the existing stormwater treatment in order to improve overall water quality in the Town of Kure Beach.

ORDER

THEREFORE, the variance from 15A NCAC 7H .0306(a); .0309; and .0601 is GRANTED.

The granting of this variance does not relieve Petitioner of the responsibility to obtain a CAMA permit from the proper permitting authority.

This variance is based upon the Stipulated Facts set forth above. The Commission reserves the right to reconsider the granting of this variance and to take any appropriate action should it be shown that any of the above Stipulated Facts is not true.

This the 29th day of October, 2008.

Robert R. Emory, Jr., Chairman
Coastal Resources Commission

CERTIFICATE OF SERVICE

This is to certify that I have this day served the foregoing FINAL AGENCY DECISION upon the parties by the methods indicated below:

Henry E. Beeker, Jr. Town of Kure Beach 117 Settlers Lane Kure Beach, NC 28449	CERTIFIED MAIL/ RETURN RECEIPT REQUESTED
A.A. Canoutas, Esq. 4506 W. Cascade Road Wilmington, NC 28412-6825	U.S. Mail
Amanda P. Little Assistant Attorney General N.C. Department of Justice	(Electronic mail and Hand Delivery)
Pamela A. Jones Certified Paralegal N.C. Department of Justice	(Electronic mail and Hand Delivery)
James H. Gregson Angela Willis Division of Coastal Management 400 Commerce Avenue Morehead City, NC 28557	(Electronic Mail and U.S. Mail)

This the 29th day of October, 2008.

Jennie Wilhelm Hauser
Special Deputy Attorney General
N.C. Department of Justice
P.O. Box 629
Raleigh, NC 27602
Counsel to the Commission

SIGN UP SHEET
SCOPING MEETING

Caswell Beach Drainage Project Scoping Meeting
Caswell Beach
Brunswick County

3/16/2017

Name	Agency	Phone	Email
Cameron Weaver	NCDEQ-DEACS	910-796-7303	Cameron.Weaver@ncdenr.gov
*Shane Staples	DCM-Fisheries	252-948-3950	Shane.Staples@ncdenr.gov
*Ken Riley	NOAA-NMF	252-728-8750	Ken.Riley@noaa.gov
X Kathy Matthews	US FWS	919-856-4520 x 27	Kathryn_Matthews@fws.gov
*Maria Dunn	NC WRC	252-948-3916	Maria.Dunn@ncwildlife.org
Debbie Wilson	DCM	910-796-7266	Debra.Wilson@ncdenr.gov
Jeremy Humphrey	DMF-Shellfish	910-796-7287	Jeremy.Humphrey@ncdenr.gov
Tyler Crumbley	USACE	910-251-4170	Tyler.Crumbley@usace.army.mil
X Chad Coburn	DWR-401	910-796-7379	Chad.Coburn@ncdenr.gov
*Deborah Ahlers	Town of Caswell Beach	910-471-6578	DAhlers@caswellbeach.org
Carter Hubard	WK Dickson	910-742-4200	tchubard@wkdickson.com
George Kassler	Town of Caswell Beach	910-278-5471	GKassler@caswellbeach.org
Dan ONeill	Town of Caswell Beach	704-614-1633	DOneill@caswellbeach.org
Brooks Surgan	DCM	910-796-7270	Brooks.Surgan@ncdenr.gov
Jim Gregson	DWR	910-796-7386	Jim.Gregson@ncdenr.gov
Chad Hicks	Town of Caswell Beach	910-200-3217	Chicks@caswellbeach.org
JD Potts	DMF-Shellfish	252-808-8154	J.Potts@ncdenr.gov
*Conference line X Not Available			

NCDENR
WILMINGTON REGIONAL OFFICE
127 CARDINAL DRIVE
WILMINGTON, NC 28405
910-796-7215, FAX 910-350-2004

From: Kimes, D. Chad
To: Deborah Ahlers
Cc: Marks, Caitlin M; Pytcher, Alan; Hughes, Benjamin T; Vancleef, Ronald T
Subject: Caswell Beach Infiltration Project- High Impact- Low Cost Project
Date: Friday, May 25, 2018 10:44:10 AM
Attachments: image002.png

Mayor Ahlers,

At this time, it is anticipated that we will have $500,000 funded to assist with the proposed infiltration system to improve drainage along Caswell beach road. This will be approved at our July Board of Transportation meeting.

This project will need to be started within one year of the official funding date, and completed within 2 years. It is our plans to do a reimbursable agreement with the Town, where the Town performs the work and we reimburse once the work is complete.

I recommend we have a meeting in the next few weeks so we can coordinate all of our efforts. I have copied our folks that will be involved with the project.

Thank you!

Chad Kimes, PE
Deputy Division Engineer
Division 3
North Carolina Department of Transportation

910 341 2000 office
910 675 0143 fax
ckimes@ncdot.gov

5501 Barbados Blvd.
Castle Hayne, NC 28429

From: Barbour, Cheryl K
Sent: Friday, May 18, 2018 4:28 PM
To: Marks, Caitlin M <cmmarks@ncdot.gov>; Norman, Patrick A <pnorman@ncdot.gov>
Cc: Pytcher, Alan <apytcher@ncdot.gov>; Kimes, D. Chad <ckimes@ncdot.gov>
Subject: RE: HI/LC Fund Request

Caitlin – we'll need an updated request form for WBS 47931 with the update figures. I will show it on the Board agenda as transferring $490,428.56 from WBS 80084 but the increase on WBS 47931 will be for $500k to zero out your FY 2019 HI/LC funds.

Thanks –

Cheryl

From: Marks, Caitlin M
Sent: Friday, May 18, 2018 1:22 PM
To: Norman, Patrick A <pnorman@ncdot.gov>
Cc: Pytcher, Alan <apytcher@ncdot.gov>; Barbour, Cheryl K <cherylbarbour@ncdot.gov>; Kimes, D. Chad <ckimes@ncdot.gov>
Subject: RE: HI/LC Fund Request

Hello,

Following up on this fund request: We have heard back from Chad and he would like us to take $500,000.00 from the NC133 project (WBS 80084) and apply it to the Caswell Beach Road Project (WBS 47931). Our understanding is that this will appear on the July BOT meeting. I am attaching an updated estimate for Caswell Beach Rd that includes the planning and design (previously we submitted only the construction budget). Please let us know if there is any additional documentation needed on our end to make this request.

Also, I remember Cheryl telling us there was roughly $9,000.00 left in our budget that wasn't spent. Can you show me where I see this in SAP? If that's the case, we could technically pull $500,000.00 less the ~$9,000.00 amount from NC133 and add that plus the ~$9,000 to Caswell to total $500,000.00. I can do the math and resubmit the request if you can remind me of the balance number again.

Thanks for all of your help on this!

Caitlin

From: Marks, Caitlin M
Sent: Friday, May 11, 2018 7:46 AM
To: Norman, Patrick A <pnorman@ncdot.gov>
Cc: Pytcher, Alan <apytcher@ncdot.gov>; Barbour, Cheryl K <cherylbarbour@ncdot.gov>
Subject: RE: HI/LC Fund Request

Thanks, Patrick. We talked to Cheryl yesterday and are working with our Deputy Division Engineer to see how he wants to proceed and will be in touch with you and Cheryl. Thanks!

041

North Carolina Department of Environmental Quality
SCOPING MEETING REQUEST

Please complete all the information below. Call and email the appropriate coordinator with the completed form.

- ***Asheville Region - Alison Davidson 828-296-4698; alison.davidson@ncdenr.gov***
- ***Fayetteville and Raleigh Regions - David Lee 919-791-4204; david.lee@ncdenr.gov***
- ***Mooresville and Winston-Salem Regions – Marcia Allocco 704-235-2107; marcia.allocco@ncdenr.gov***
- ***Washington Region - Lyn Hardison 252-948-3842; lyn.hardison@ncdenr.gov***
- ***Wilmington Region - Cameron Weaver 910-796-7303; cameron.weaver@ncdenr.gov***

Project Name: Caswell Beach Road Drainage Project County: Brunswick

Applicant: Town of Caswell Beach Company: _____

Address: 1100 Caswell Beach Road City: Caswell Beach State: NC Zip: 28465

Phone: 910-278-5471 Fax: 866-271-3641 Email: chicks@caswellbeach.org

Physical Location of Project: Locations Along Caswell Beach Road

Engineer/Consultant: Carter Hubard Company: WK Dickson

Address: 909 Market Street City: Wilmington State: NC Zip: 28401

Phone: 910-762-4200 Fax: _____ Email: tchubard@wkdickson.com

Please provide a DETAILED project narrative, pdf site plan and a vicinity map with road names along with this Request form.
The project narrative should include the following when available:

Existing Conditions- List of existing permits, previous project name(s) or owner name(s), existing compliance or pollution incidents, current conditions or development on site, size of tract, streams or wetlands on site*, stream name and classification, historical significance of property, seasonal high water table elevation, riparian buffers, areas of environmental concern, setbacks

Proposed- **Full scope of project** with development phase plan, acreage to be disturbed, wetlands to be disturbed, waste treatment & water supply proposed, soils report availability, % impervious surface, stormwater treatment and number of bmps, public or private funding.
**Relative To Wetlands – Federal and coastal wetlands must be delineated by a US Army Corps Regulatory Official, Coastal Management Field Rep or a qualified environmental consultant prior to undertaking work such as filling, excavating or land clearing. The delineations must be approved by the US Army Corps of Engineers (USACE) and/or the Division of Coastal Management. Wetland delineations are valid for a period not to exceed five years from date of USACE approval.*

Please provide estimated investment & expected employment numbers: $ 1,000,000 , 10 Jobs

For the scoping meeting, it is best to provide a list of questions and topics of concern. It is helpful to know what you hope to gain from the meeting. Please have thoughts and presentations organized as much as possible to make the best use of time.

Agencies Involved: Check all agencies that may be involved with project:

☒ Marine Fisheries ☒ National Marine Fisheries ☒ U.S. Fish & Wildlife ☒ NC Wildlife Resources

☒ Coastal Management ☒ Land Resources ☒ Stormwater ☒ Erosion Control) ☒ U.S. Army Corps of Engineers

☒ Shellfish Sanitation ☒ Water Resources: (☒ 401/buffer ☐ NPDES ☐ Non-discharge ☐ Public Water Supply)

☐ Air Quality ☐ Solid Waste ☐ UST ☐ Hazardous Waste _____

☐ Other _____ ☐ Other _____

☐ Other _____ ☐ Other _____

☐ Other _____

Project Narrative

The Town of Caswell Beach is currently exploring options to remove stormwater flooding from Caswell Beach Road. Caswell Beach Road (State Road 1100) runs approximately three mile from the Town limits to the North Carolina Baptist Assembly and is geographically located between the Atlantic Ocean and Intracoastal Waterway Marsh System. Caswell Beach Road serves approximately 240 residential properties, United States Coast Guard Station Oak Island, Duke Energy Nuclear Pumping Station, and the North Carolina Baptist Assembly. The North Carolina Baptist Assembly provides religious retreat services for up to 1500 people onsite at any given time. This road provides the only ingress/egress for vehicles serving the above locations.

Due to stormwater flooding Caswell Beach Road becomes impassable to low clearance vehicles after minor storm events and impassable to high clearance emergency vehicles after moderate to major storm events.

The Town of Caswell Beach is exploring stormwater pumping options to relieve this problem. Town contracted engineers, WK Dickson of Wilmington, and stormwater expert, Dr. William Hunt of North Carolina State University, agree that in addition to the best stormwater management practices the Town has already adopted the installation of pumping stations in the critical flooding areas are the only solution to the flooding problem. At this time the Town respectfully requests a determination from the State of North Carolina as to whether or not a permit can be issued for this project.

Existing Conditions

The Town has installed and maintains drainage and infiltration basin in the right of way of Caswell Beach Road. These apparatuses do not provide the necessary amount of stormwater control to allow the road to remain passable during rain events. The road is situated between the dunes and the marsh in an area approximately 500 feet wide. The high water table in this area makes further stormwater control by infiltration impractical.

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BOARD OF TRANSPORTATION MEETING

June 28, 2018

ITEM H

NCDOT JULY 2018 BOARD OF TRANSPORTATION AGENDA
Funds Request
Division-wide Small Construction, Statewide Contingency,
Public Access, Economic Development, High Impact/Low Cost

According to Executive Order No. 2 and G.S. 143B-350(g), the Board is requested to concur with staff recommendation and delegate authority to the Secretary to approve funds for specific Division-wide Small Construction / Statewide Contingency projects.

County	Description	Type	Amount
Div 1 Chowan	Realign intersection at NC-37/32 and SR 1108 (Indian Trail Rd) to allow safe turning movements WBS 80059	High Impact / Low Cost TOTAL	$450,000.00 $450,000.00
Div 1 Hertford	Town of Ahoskie – WBS 80061 was established (02/18) to construct 3 lane section on NC 42 from New Bridge over Ahoskie Creek to South of US 13 for approximately 1600 feet Reduce funds	High Impact / Low Cost TOTAL	($755,000.00) ($755,000.00)
Div 1 Martin	WBS 80085 was established (02/18) to construct a superstreet on US-17 from Hampton Ct to SR 1119 (Ralph Taylor Road) Increase funds	High Impact / Low Cost TOTAL	$61,619.78 $61,619.78
Div 1 Tyrrell	Town of Columbia – Construct approximately 1,250 ft of concrete sidewalk along US-64 Bus in front of middle school & high school WBS 80092	High Impact / Low Cost TOTAL	$50,000.00 $50,000.00
Div 3 Brunswick	Town of Caswell Beach – Caswell Beach Rd infiltration Stormwater Management Project; Install infiltration basins along Caswell Beach Rd at 4 locations WBS 47931	High Impact / Low Cost TOTAL	$500,000.00 $500,000.00
Div 3 Brunswick	WBS 80084 was established (02/18) for roadway repair at the intersection of SR 1521 (Funston Road SE) approximately 1 mile in each direction to correct flooding issues Reduce funds & transfer to WBS 47931	High Impact / Low Cost TOTAL	($490,428.56) ($490,428.56)

ITEM H

NCDOT JULY 2018 BOARD OF TRANSPORTATION AGENDA
Funds Request
Division-wide Small Construction, Statewide Contingency, Public Access, Economic Development, High Impact/Low Cost

County	Description	Type	Amount
Div 3 Duplin	Patch and resurface the existing drive and replace existing driveway pipe at Lyman VFD located on SR 1801 (Lyman Rd) 0.2 miles from NC-111 towards SR 1815 WBS 48169	Contingency TOTAL	$65,000.00 $65,000.00
Div 7 Alamance	Town of Haw River – WBS 3607.3.08 was established (08/11) for widening, curb & gutter, and construction of sidewalk along NC-49 (Main St) between Lang and Stone St (Improvements to Main St sidewalk between Stone St and John Robert Watkins bridge) Increase funds	Contingency TOTAL	$20,000.00 $20,000.00
Div 7 Caswell	Town of Milton – Install pedestrian crossing, flashers, new sidewalk, and repair & replace existing sidewalk along and across NC-57 (Broad St) and SR 1614 (Fairview Dr) WBS 48166	Contingency TOTAL	$100,000.00 $100,000.00
Div 7 Guilford	City of Greensboro – Data collection regarding the use of the Greensboro Intermodal yard to assess the operational efficiencies and road access to the yard, estimation of container and trailer volumes over a defined forecast period, and identification of alternatives to handle expected volumes WBS 48185	Economic Development TOTAL	$250,000.00 $250,000.00
Div 9 Rowan	City of China Grove – Installation of 18" and 24" HDPE pipe culverts, curb and gutter, sidewalks, and asphalt patching on SR 2739 (Main St) WBS 48233	Contingency TOTAL	$98,000.00 $98,000.00
Div 10 Cabarrus	Town of Harrisburg – WBS 44833 was established (06/16) for the realignment of Saddle Creek at NC-49 Increase funds	Econ Development TOTAL	$119.602.33 $119,602.33

ITEM H

NCDOT JULY 2018 BOARD OF TRANSPORTATION AGENDA
Funds Request
Division-wide Small Construction, Statewide Contingency,
Public Access, Economic Development, High Impact/Low Cost

Deletions:

Div 1, Dare County – WBS 80066 was established (02/18) for drainage rehabilitation in the Buxton area of Fessenden Center; completed with alternate fund source

Summary:

Number of Divisions	**5**	
Number of Projects	**12**	
Small Construction Commitment		**$0.00**
Public Access Commitment		**$0.00**
Contingency Commitment		**$283,000.00**
Economic Development Commitment		**$369,602.33**
High Impact/Low Cost Commitment		**($183,808.78)**
	TOTAL	**$468,793.55**

INDEX

BOARD OF TRANSPORTATION MEETING

June 28, 2018

BOARD OF TRANSPORATATION MEETING

June 28, 2018

Call to Order

Chairman Fox called the meeting of the Board of Transportation to order at 9:01 a.m. on Thursday, June 28, 2018, in Wilmington, North Carolina with the following members present: Fox, Szlosberg-Landis, Moran, Taft, Alford, Hunt, Molamphy, Pope, Clarke, Debnam, Overholt, Lathrop and Zimmer.

Board Members Jordan and Wells called in to the meeting.

Board Members Tulloss, Wells, Perkins, and Tarleton were absent.

Swearing in of two new members of the Board of Transportation and three members transitioning positions on the Board.

- **Thomas Taft, Jr. – Division 2**
- **Michael Alford – Division 3**
- **Hugh Overholt - From Division 2 to At-Large, Rural**
- **Landon Zimmer – From Division 3 to At-Large, State Ports and Aviation**
- **Grady Hunt – From At-Large, Rural to Division 6**

Ethics Statement

Chairman Fox read the Ethics Statement advising any Board Member that may have any conflict of interest or appearance of conflict to abstain from participation in that particular item and to file the proper paper work with the Secretary to the Board.

Approval – Minutes of the May 31, 2018 Board Meeting

The minutes of the May 31, 2018, Board of Transportation meeting were unanimously approved upon a motion by Board Member Clarke, seconded by Board Member Overholt.

Road and Bridge Naming Honorary Designations

Chairman Fox welcomed all guests and proceeded with the following Road and Bridge Naming Honorary Designations.

ITEM H

NCDOT JULY 2018 BOARD OF TRANSPORTATION AGENDA
Funds Request
Division-wide Small Construction, Statewide Contingency,
Public Access, Economic Development, High Impact/Low Cost

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INDEX

BOARD OF TRANSPORTATION MEETING

August 2, 2018

BOARD OF TRANSPORATATION MEETING

August 2, 2018

Call to Order

Chairman Fox called the meeting of the Board of Transportation to order at 9:00 a.m. on Thursday, August 2, 2018, in Raleigh, North Carolina with the following members present: Moran, Overholt, Taft, Alford, Tulloss, Szlosberg-Landis, Hunt, Fox, Molamphy, Wells, Bowles, Lathrop, Tarleton, Clarke and Debnam.

No member of the Board called in to the meeting.

Board members Zimmer, Jordan, Perkins, and Pope were absent.

The Honorable Mark A. Davis conducted the swearing in ceremony of Samuel Bowles, a new member of the Board of Transportation, representing Division 10.

Ethics Statement

Chairman Fox read the Ethics Statement advising all members of the Board that may have any conflict of interest or appearance of conflict to abstain from participation in that particular item and to file the proper paper work with the Secretary to the Board of Transportation.

Approval – June 28, 2018 Board Meeting Minutes

The minutes of the June 28, 2018, Board of Transportation meeting were unanimously approved upon a motion by Board Member Tarleton, seconded by Board Member Overholt.

Secretary's Remarks

Secretary Trogdon welcomed Mr. Samuel Bowles as the newest member of the Board. He introduced Darryl Bass, the new Director for Human Resources. Secretary Trogdon presented Tracy Dodson, former board member representing division 10, with a Road Gang Award in acknowledgement of her service to the Board since 2015. Secretary Trogdon presented Jay Swain, division engineer for division 13 the Road Gang Award in

CASWELL BEACH ROAD DUNE INFILTRATION SYSTEM PROJECT BUDGET

DATE: 10/26/2018 **Site 5: 299 Caswe**

ITEM NO.	ITEM DESCRIPTION	SCHEDULED QUANTITIES	UNIT	UNIT PRICE	TOTAL AMOUNT
1	Mobilization (5% of Total Cost)	1	LS	$8,112.11	$8,112.11
2	Clearing and Grubbing (Including shrub removal)	0.3	AC	$7,000.00	$2,024.79
3	Pump Input Port	4	EA	$2,000.00	$8,000.00
4	Furnish and Install Dune Infiltration System	105	EA	$900.00	$94,500.00
5	Dune Replanting	0.3	AC	$17,000.00	$4,917.36
6	Influent Line	220	LF	$40.00	$8,800.00
7	Remove and Replace Boardwalk	1	LS	$15,000.00	$15,000.00
8	Traffic Control	1	LS	$5,000.00	$5,000.00
9	Erosion Control	1	LS	$4,000.00	$4,000.00
10	Force Main Cleaning and Testing	1	LS	$5,000.00	$5,000.00
11	Force Main Isolation Valve Cut In	2	EA	$7,500.00	$15,000.00
12	Parking Area Cleanup	1	LS	$5,000.00	$5,000.00

Construction Subtotal	**$175,354.26**
Contingency	**$34,229.15**
Professional Services	**$140,130.00**
Force Main	**$150,000.00**
Total Project Cost	**$499,713.41**

WK Dickson Co., Inc.
300 N. Third Street, Ste 301
Wilmington NC 28401
910-762-4200
NC LC. No. F-0374

ECS MID-ATLANTIC, LLC "Setting the Standard for Service"
Geotechnical • Construction Materials • Environmental • Facilities

October 30, 2018

Mr. Carter Hubard, P.E.
WK Dickson & Co., Inc.
300 N. Third Street, Suite 301
Wilmington, North Carolina 28401

ECS Project No. 47-6645

Re: Dune Infiltration System Groundwater Mounding Evaluation
Caswell Beach Dune Infiltration Site
Caswell Beach, Brunswick County, North Carolina

Dear Mr. Hubard:

ECS Mid-Atlantic, LLC and ECS Southeast, LLP (ECS) are pleased to submit this report summarizing preliminary findings from a Dune Infiltration System Groundwater Mounding Evaluation conducted at the Caswell Beach Dune Infiltration site (i.e., site or subject site), located at 299 Caswell Beach Road, Caswell Beach, North Carolina (Figure 1). ECS was requested to observe the seasonal high water table (SHWT) and to perform infiltration testing within and in proximity to the proposed dune infiltration system (DIS) area at the subject site. This information was then used in conjunction with DIS plans provided by the Client to assess groundwater mounding height beneath and in proximity to the proposed DIS during storm events, during which time water would be pumped into the DIS. ECS understands that further work regarding groundwater mounding separation from the base of the proposed DIS and groundwater mounding elevations in comparison to surface elevations may be requested in the future. The purpose of our preliminary Groundwater Mounding Evaluation was to provide an initial estimation of groundwater mounding height that could result from stormwater pumping to the proposed DIS.

Proposed Dune Infiltration System Layout

The Client has provided ECS with site plans and aerial photography depicting the proposed footprint and layout of the DIS. The DIS would have an area of approximately 11,000 square feet and would have dimensions of approximately 247.6 feet in length by 44.4 feet in width. The system would be comprised of three rows of infiltration chambers. Each row would contain approximately 35 chambers and the system would consist of approximately 105 chambers in total. Each domed infiltration chamber would be seven feet in length, five feet in width at the base, and three feet in height. The chambers would be installed within a 2-foot thick layer of gravel. The footprint of the proposed DIS is shown in Figure 2.

Field Methodology & Findings

ECS mobilized to the site to conduct field work on July 10–11, 2018. ECS conducted an evaluation of the subsurface soil and groundwater conditions at six test boring locations,

which are referred to as borings I-1 through I-6 and are shown in Figure 2. The purpose of test boring installation and testing was to obtain information pertaining to soil composition, depth to groundwater, depth to the SHWT, and infiltration rate.

ECS conducted subsurface evaluation by advancing a hand auger boring to depths of 9.58–10.83 feet below ground surface (bgs) at each of the test boring locations. ECS visually classified the soils and obtained representative samples of each soil type encountered. Depth to groundwater and depth to the SHWT was also measured in each boring. Following installation, surface elevations at each boring location were measured by the Client and were provided to ECS. A summary of test boring information is provided as Table 1 and completed Infiltration Testing Forms that include soil composition data and other pertinent information are included as Appendix A.

Table 1: Test boring information and descriptions.

Test Boring	Boring Surface Elevation[a] (ft amsl[b])	Boring Depth (ft bgs[c])	Soil Description
I-1	13.397	10.83	Tan/grey medium- to coarse-grained sand
I-2	12.096	9.58	Tan/grey medium- to coarse-grained sand
I-3	12.139	10.17	Tan/grey medium- to coarse-grained sand
I-4	12.600	10.42	Tan/grey medium- to coarse-grained sand
I-5	13.949	10.83	Tan/grey medium- to coarse-grained sand
I-6	16.661	10.83	Tan/grey medium- to coarse-grained sand

[a]As surveyed by WK Dickson & Co., Inc.
[b]ft amsl = feet above mean sea level
[c]ft bgs = feet below ground surface

ECS measured depth to groundwater using an electronic water level meter and depth to the SHWT in each boring. Depth to groundwater ranged from 9.33–10.83 feet bgs and depth to the SHWT ranged from 8.33–9.83 feet bgs (Table 2). Groundwater and SHWT elevations were then calculated based on depth to groundwater/SHWT data and surveying data provided by the Client. Groundwater elevations in borings I-1 through I-6 ranged from 1.97–6.16 feet above mean sea level (amsl) and SHWT elevations ranged from 2.64–7.33 feet amsl (Table 2). A map showing groundwater equipotential contours and flow direction, based on groundwater levels measured on July 10–11, 2018, is included as Figure 3. Likewise, a map showing SHWT equipotential contours and flow direction is included as Figure 4. It can be observed in Figures 3 and 4 that the overall direction of groundwater flow, as measured during field activities, and SHWT flow are similar. In general, groundwater flows from the eastern and western margins of the focus area toward the center of the focus area. A north-to-south component of flow appears to exist at the western portion of the focus area and the gradient at the eastern portion of the focus area appears to be steeper than the gradient at the western portion of the focus area.

Table 2: Test boring data and infiltration testing summary.

Test Boring	Depth to Groundwater[a] (ft bgs[b])	Groundwater Elevation (ft amsl[c])	Depth to SHWT[d] (ft bgs)	SHWT Elevation (ft amsl)	Measured Infiltration Rate[e] (ft/day)	Estimated Horizontal Hydraulic Conductivity[f] (ft/day)
I-1	10.50	2.90	8.33	5.06	54.46	108.9
I-2	9.33	2.76	8.33	3.76	56.02	112.0
I-3	10.17	1.97	9.50	2.64	59.86	119.7
I-4	10.42	2.18	9.58	3.02	52.86	105.7
I-5	10.83	3.12	9.83	4.12	58.38	116.8
I-6	10.50	6.16	9.33	7.33	57.96	115.9

[a]As measured by ECS on July 10–11, 2018
[b]ft bgs = feet below ground surface
[c]ft amsl = feet above mean sea level
[d]SHWT = seasonal high water table
[e]Refers to vertical infiltration rate, as measured by ECS
[f]Refers to horizontal groundwater flow, which was estimated using vertical infiltration rate data and an estimated vertical/horizontal anisotropic ratio of 0.5.

ECS conducted infiltration testing using a compact constant head permeameter at borings located slightly offset from their respective hand auger test boring location. The purpose of infiltration testing was to estimate subsurface vertical infiltration rates. Infiltration tests are typically conducted at depths two feet above the SHWT or in the most restrictive soil horizon. Tests in clayey conditions are conducted for durations of up to 30 minutes. Infiltration testing yielded rates ranging from 52.86–59.86 feet/day, as shown in Table 2. Vertical infiltration rate data were then used to estimate horizontal hydraulic conductivity values, which were used in groundwater mounding calculations. Using a vertical to horizontal anisotropic ratio of 0.5, based on the permeable and unconsolidated nature of the soil, ECS estimates that hydraulic conductivity at the boring locations ranges from approximately 105.7–119.7 feet day, as shown in Table 2. These values indicate that hydraulic conductivity is fairly uniform at the tested boring locations.

Groundwater Mounding Evaluation

ECS used field data collected as part of this study to conduct a groundwater mounding evaluation of the proposed DIS. The purpose of the evaluation was to estimate groundwater mounding height beneath and in proximity to the proposed DIS during storm events, during which time water would be pumped into the DIS. Per conversations with the Client, ECS conducted the mounding analysis under the assumption that the system would receive water at a rate of 1,000 gallons per minute (gpm) for a duration of 200 minutes, which is expected to be the system's peak flow rate.

The mounding analysis was conducted using a U.S. Geological Survey (USGS) spreadsheet solving the Hantush (1967) equation for groundwater mounding beneath an infiltration basin. The USGS mounding spreadsheet is capable of calculating maximum groundwater mounding heights across an impacted area at the end of a recharge event and is not designed to calculate the rate of groundwater mounding subsidence.

Necessary parameters to solve the Hantush equation are listed below and were quantified as follows:

- Recharge Rate and Duration: ECS used a recharge rate of 17.5 feet/day applied to an 11,000-square foot area, which is the estimated area of the proposed DIS. This recharge rate multiplied by the DIS area equates to a total system inflow of 1,000 gpm. The recharge duration was assumed to be 200 minutes, per conversations with the Client.
- Infiltration Basin Dimensions: The infiltration basin was assumed to have dimensions of 247.6 feet length by 44.4 feet width, per site plans provided by the Client.
- Horizontal Hydraulic Conductivity: The site's horizontal hydraulic conductivity was assumed to be 105.7 feet/day, which is the lowest derived value at the site. The lowest value was used to provide a conservative estimate of groundwater mounding height.
- Specific Yield: The aquifer's specific yield was estimated as 0.31, which was based on typical values for similar soil types published within USGS reporting by Johnson (1963).
- Initial Saturated Aquifer Thickness: The aquifer's initial saturated thickness, which represents the thickness of the aquifer's saturated zone prior to receiving recharge water, was estimated to be 27.2 feet. This value was used based on offsite geotechnical boring log data obtained by ECS as part of a different project, where the borings were installed approximately 0.75-mile west of the subject site. Boring log data from this offsite property indicates that a more restrictive silty sand/sandy silt layer is present at a depth of approximately 38 feet bgs. As such, the depth to the aquifer's base at the subject site was assumed to be 38 feet. Subtracting the greatest depth to groundwater measured at the site (10.83 feet) from the depth to the aquifer's base yielded a saturated thickness value of 27.2 feet.

The USGS spreadsheet was programmed to calculating groundwater mounding heights at distance intervals of 10–30 feet from the center of the basin. Calculated mound heights were entered into a GIS database and were used to interpolate mound heights across much of the site. Table 3 summarizes estimated groundwater mound heights from the center of the DIS and Figure 5 depicts groundwater mound height equipotential contours.

Table 3: Summary of estimated groundwater mounding heights.

Distance from Center of DIS[a] (feet)	Estimated Groundwater Mound Height (feet)	
	Perpendicular from Basin's Long Axis	Perpendicular from Basin's Short Axis
10	3.844	4.028
20	3.276	4.022
40	1.814	3.989
60	0.893	3.903
80	0.392	3.703
100	0.155	3.265
120	0.055	2.323
140	0.019	1.085
160	0.007	0.472
180	0.004	0.192
200	0.003	0.073
220	0.003	0.026
240	0.003	0.010

[a]DIS = dune infiltration system

Conclusions

ECS is pleased to submit this report summarizing preliminary findings from a Dune Infiltration System Groundwater Mounding Evaluation conducted at the Caswell Beach Dune Infiltration site, located at 299 Caswell Beach Road, Caswell Beach, North Carolina. ECS was requested to observe the SHWT and to perform infiltration testing within and in proximity to the proposed DIS area at the subject site. This information was then used in conjunction with DIS plans provided by the Client to assess groundwater mounding height beneath and in proximity to the proposed DIS during storm events, during which time water would be pumped into the DIS. ECS understands that further work regarding groundwater mounding separation from the base of the proposed DIS and groundwater mounding elevations in comparison to surface elevations may be requested in the future. The purpose of our preliminary Groundwater Mounding Evaluation was to provide an initial estimation of groundwater mounding height that could result from stormwater pumping to the proposed DIS.

ECS conducted field work at the site on July 10–11, 2018. Six test borings were installed at the site using a hand auger. Soils were visually classified and depth to groundwater and depth to the SHWT was measured in each boring. Soils encountered in the borings generally consisted of tan/grey medium- to coarse-grained sand. ECS measured depth to groundwater using an electronic water level meter and depth to the SHWT in each boring. Depth to groundwater ranged from 9.33–10.83 feet bgs and depth to the SHWT ranged from 8.33–9.83 feet bgs. Groundwater and SHWT elevations were plotted on aerial imagery and were used to construct groundwater and SHWT equipotential maps. These maps show that the overall direction of groundwater flow, as measured during field activities, and SHWT flow are similar. In general, groundwater flows from the eastern and western margins of the focus area toward the center of the focus area. A north-to-south component of flow appears to exist at the

western portion of the focus area and the gradient at the eastern portion of the focus area appears to be steeper than the gradient at the western portion of the focus area.

ECS also conducted infiltration testing using a compact constant head permeameter at borings located slightly offset from their respective hand auger test boring location. The purpose of infiltration testing was to estimate subsurface vertical infiltration rates. Infiltration testing yielded rates ranging from 52.86–59.86 feet/day. Vertical infiltration rate data were then used to estimate horizontal hydraulic conductivity values, which were used in groundwater mounding calculations. Using a vertical to horizontal anisotropic ratio of 0.5, based on the permeable and unconsolidated nature of the soil, ECS estimates that hydraulic conductivity at the boring locations ranges from approximately 105.7–119.7 feet day.

Field data were used to conduct a groundwater mounding evaluation of the proposed DIS. The purpose of the evaluation was to estimate groundwater mounding height beneath and in proximity to the proposed DIS during storm events, during which time water would be pumped into the DIS. Per conversations with the Client, ECS conducted the mounding analysis under the assumption that the system would receive water at a rate of 1,000 gallons per minute (gpm) for a duration of 200 minutes, which is expected to be the system's peak flow rate. The mounding analysis was conducted using a USGS spreadsheet solving the Hantush (1967) equation for groundwater mounding beneath an infiltration basin. Parameter values for recharge rate and duration, infiltration basin dimensions, horizontal hydraulic conductivity, specific yield, and initial saturated aquifer thickness were input to the spreadsheet. Resulting groundwater mound heights ranged from approximately 4.03 feet at the center of the DIS to less than 0.01 feet at a distance of 200 feet from the center of the DIS. Overall, groundwater mound height is predicted to decline rapidly beyond the outer margins of the DIS.

ECS understands that further work regarding groundwater mounding separation from the base of the proposed DIS and groundwater mounding elevations in comparison to surface elevations may be requested in the future. It is recommended that six supplemental borings be installed at the site, at locations previously provided to the Client, to expand the focus area of the evaluation. Currently, the portion of the site where groundwater and SHWT elevations can be projected is limited to the focus area polygon comprising the area between existing borings I-1 through I-6. The recommended supplemental borings would expand the focus area and would allow for the interpolation of groundwater and SHWT elevations at further reaches of the site. This data could then be used in conjunction with groundwater mound heights to assess groundwater mound separation distances from DIS components and the ground surface.

Limitations

The work performed in conjunction with this project, and the data developed, are intended as a description of available information at the tested locations indicated and the dates specified. Generally accepted industry standards were used in the preparation of this report. Results from future testing may vary significantly as a result of natural conditions, a changing environment, or the limits of analytical capabilities. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a specific location not evaluated. Actual conditions may vary.

ECS appreciates the opportunity to assist WK Dickson & Co., Inc. with this Dune Infiltration System Groundwater Mounding Evaluation. Please feel free to contact ECS at (540) 785-6624 if you have any comments or questions regarding this report.

Sincerely,
ECS Mid-Atlantic, LLC

Michael L. Maloy, CPG
Principal Geologist

Thomas P. Nelson, CPG
Senior Hydrogeologist

Figures

Figure 1: Site Location Map

Caswell Beach Dune Infiltration Site
299 Caswell Beach Road, Caswell Beach, NC

Legend

Site Boundary

N

0 0.5 1 2 Miles

ECS Project No. 47-6645

Figure 2: Site Layout Map & Testing Locations

Caswell Beach Dune Infiltration Site
299 Caswell Beach Road, Caswell Beach, NC

Legend

- Site Boundary
- Dune Infiltration System Footprint
- Test Boring

N

0 75 150 300 Feet

ECS Project No. 47-6645

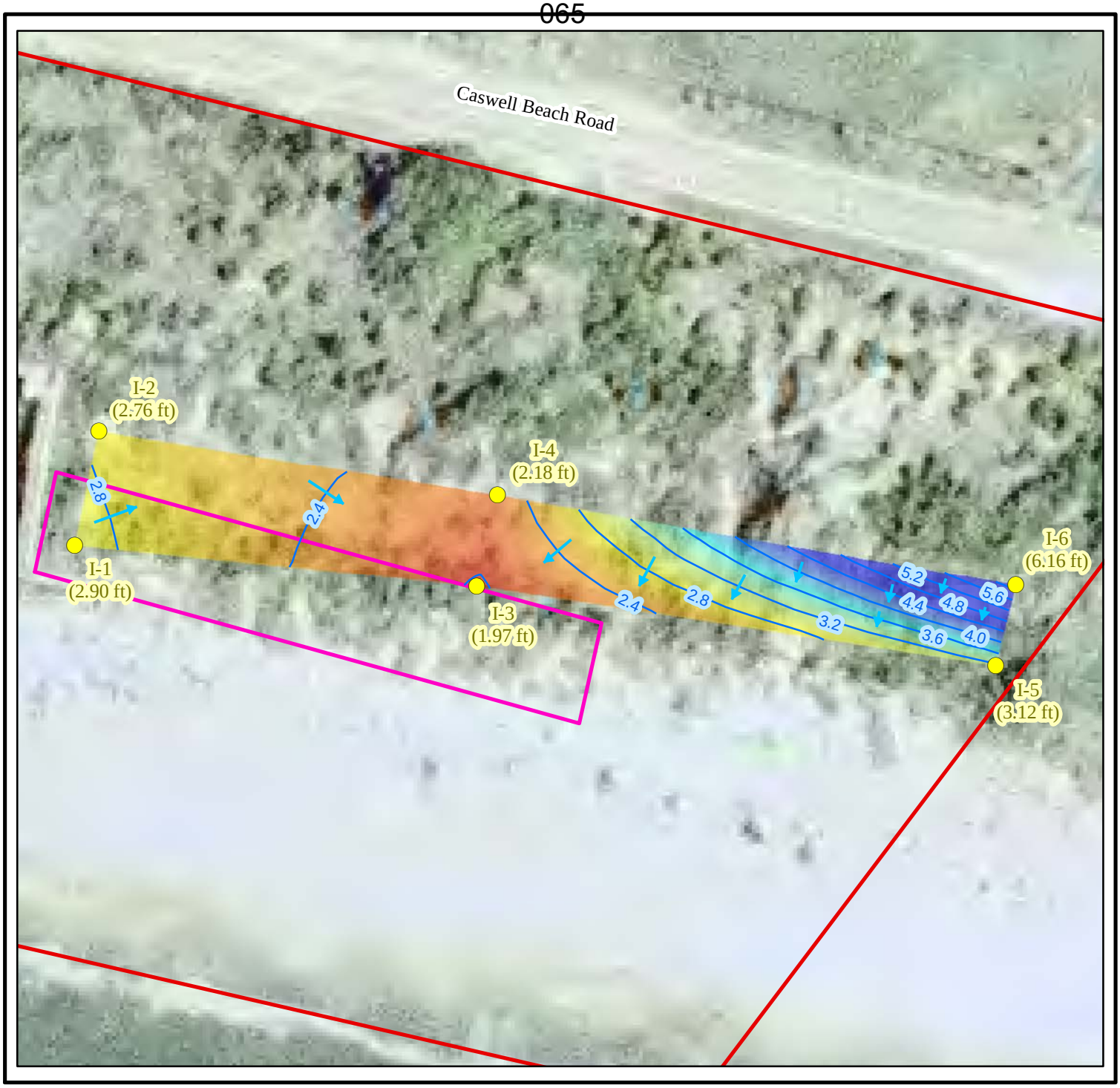


Figure 3: Groundwater Equipotential Map

Caswell Beach Dune Infiltration Site
299 Caswell Beach Road, Caswell Beach, NC

Legend

- Site Boundary
- Test Boring
- Dune Infiltration System Footprint
- Groundwater Equipotential Contour (C.I. = 0.4 ft)
- Groundwater Flow Direction

Groundwater Elevation

High : 6.16 ft. amsl

Low : 1.97 ft. amsl

0 50 100 200 Feet

N

Map Notes:
Groundwater elevations are in units of feet above mean sea level

ECS Project No. 47-6645

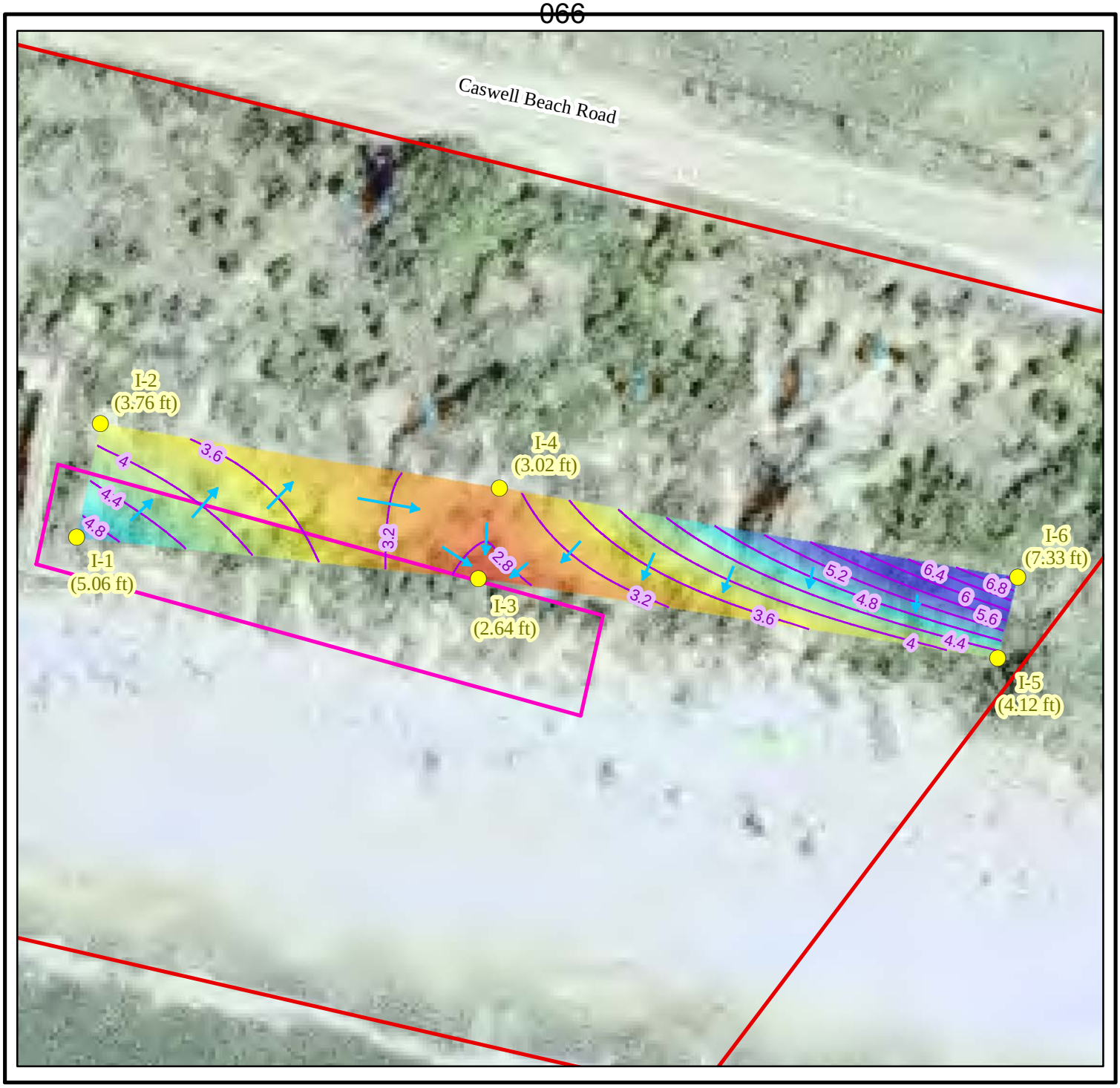


Figure 4: Seasonal High Water Table Equipotential Map

Caswell Beach Dune Infiltration Site
299 Caswell Beach Road, Caswell Beach, NC

Legend

- Site Boundary
- Test Boring
- Dune Infiltration System Footprint
- SHWT Equipotential Contour (C.I. = 0.4 ft.)
- SHWT Flow Direction

SHWT Elevation

High : 7.33 ft. amsl

Low : 2.64 ft. amsl

0 50 100 200 Feet

N

Map Notes:
SHWT elevations are in units of feet above mean sea level

ECS Project No. 47-6645

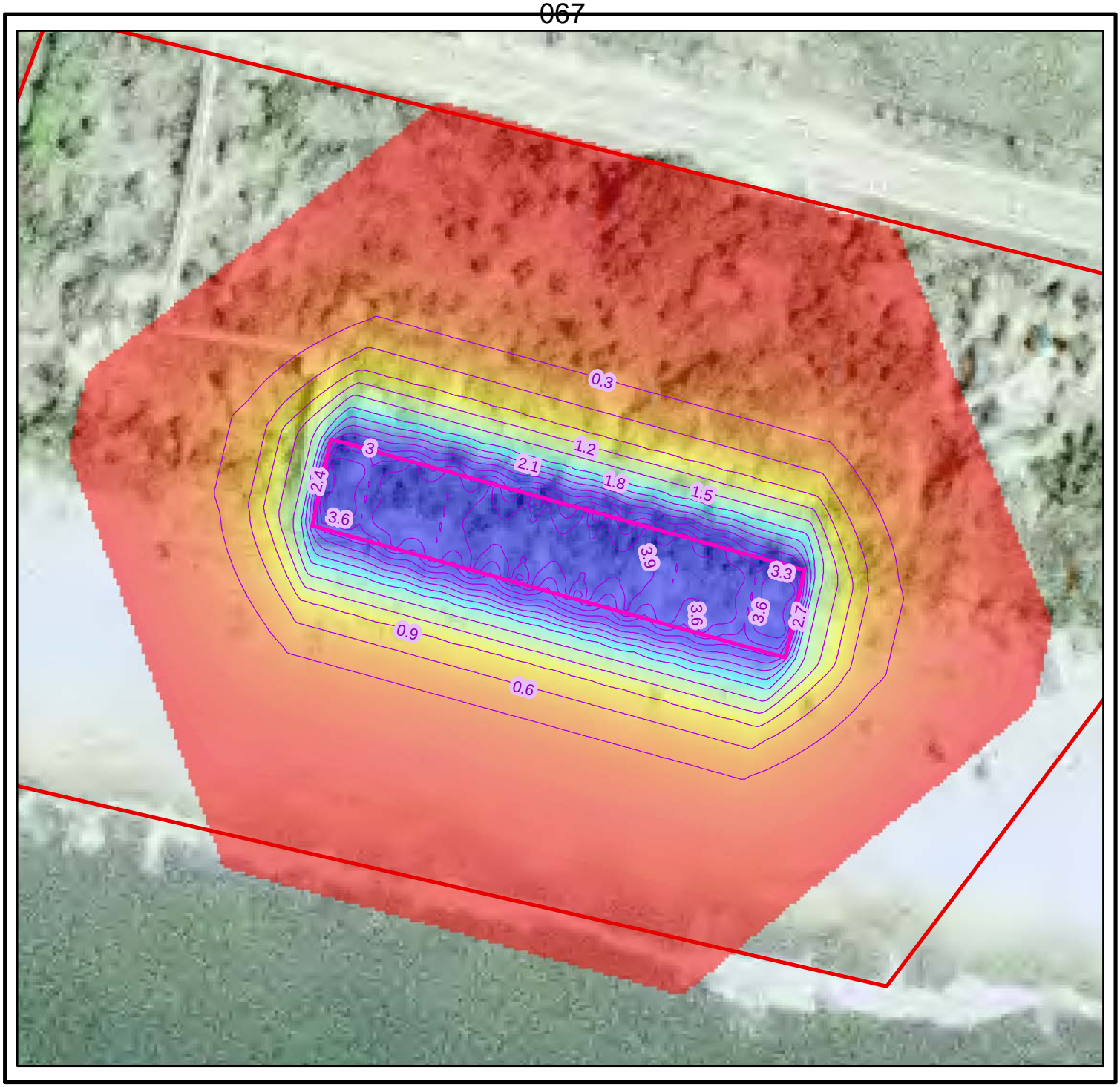


Figure 5: Estimated Groundwater Mounding Height Map

Caswell Beach Dune Infiltration Site
299 Caswell Beach Road, Caswell Beach, NC

Legend

- Site Boundary
- Dune Infiltration System Footprint
- Groundwater Mound Height Contour (C.I. = 0.3 ft)

Estimated Groundwater Mound Height

High : 4.03 ft.

Low : 0.00 ft.

0 50 100 200 Feet

N

Map Note:
(1) Values represent estimated groundwater mound heights, not groundwater elevations.

ECS Project No. 47-6645

Appendix A

Infiltration Testing Forms

Infiltration Testing Form
Caswell Beach Infiltration Study
Caswell Beach, Brunswick County, North Carolina
ECS Project No. 47-6645 & 49-7321
July 10th – 11th, 2018

Location	Depth	USCS	Soil Description
I-1	0-130”	SP	Tan/gray medium to coarse SAND

Seasonal High Water Table was estimated to be at 100 inches below the existing grade elevation.
Groundwater was encountered at 126 inches below the existing grade elevation.
Test was conducted at 70 inches below existing grade elevation
Infiltration Rate: 27.23 inches per hour
Ground elevation is 13.397’

Location	Depth	USCS	Soil Description
I-2	0-115”	SP	Tan/gray medium to coarse SAND

Seasonal High Water Table was estimated to be at 100 inches below the existing grade elevation.
Groundwater was encountered at 112 inches below the existing grade elevation.
Test was conducted at 60 inches below existing grade elevation
Infiltration Rate: 28.01 inches per hour
Ground elevation is 12.096’

Location	Depth	USCS	Soil Description
I-3	0-122”	SP	Tan/gray medium to coarse SAND

Seasonal High Water Table was estimated to be at 114 inches below the existing grade elevation.
Groundwater was encountered at 122 inches below the existing grade elevation.
Test was conducted at 48 inches below existing grade elevation
Infiltration Rate: 29.93 inches per hour
Ground elevation is 12.139’

Infiltration Testing Form
Caswell Beach Infiltration Study
Caswell Beach, Brunswick County, North Carolina
ECS Project No. 47-6645 & 49-7321
July 10th – 11th, 2018

Location	Depth	USCS	Soil Description
I-4	0-125”	SP	Tan/gray medium to coarse SAND

Seasonal High Water Table was estimated to be at 115 inches below the existing grade elevation.
Groundwater was encountered at 125 inches below the existing grade elevation.
Test was conducted at 36 inches below existing grade elevation
Infiltration Rate: 26.43 inches per hour
Ground elevation is 12.60’

Location	Depth	USCS	Soil Description
I-5	0-130”	SP	Tan/gray medium to coarse SAND

Seasonal High Water Table was estimated to be at 118 inches below the existing grade elevation.
Groundwater was encountered at 130 inches below the existing grade elevation.
Test was conducted at 24 inches below existing grade elevation
Infiltration Rate: 29.19 inches per hour
Ground elevation is 13.949’

Location	Depth	USCS	Soil Description
I-6	0-130”	SP	Tan/gray medium to coarse SAND

Seasonal High Water Table was estimated to be at 112 inches below the existing grade elevation.
Groundwater was encountered at 126 inches below the existing grade elevation.
Test was conducted at 60 inches below existing grade elevation
Infiltration Rate: 28.98 inches per hour
Ground elevation is 16.661’

MEETING MINUTES

WK DICKSON
community infrastructure consultants

909 Market Street, Wilmington, North Carolina 28401 910-762-4200

Caswell Beach Road Stormwater Management Project
NC DOT Project Review

DATE: AUGUST 28, 2018, 10 AM

WKD #: 20170196.00.RA

Meeting Participants:

- Ben Hughes, PE, District Engineer, NC DOT
- Ron Van Cleef – Division Project Engineer, NC DOT
- Anthony Law, Assistant Division Construction Engineer, NC DOT
- Chad Kimes, PE, Deputy Division Engineer, NCDOT
- Caitlin Marks, PE, Division Project Manager, NC DOT
- Chad Hicks, Town Administrator
- Deborah Ahlers, Mayor
- Carter Hubard, PE – Project Engineer, WK Dickson

Meeting Summary

In the past year the Town has had storm events that have flooded Caswell Beach Road causing the road to be impassable. Vehicles have been stranded and accidents have occurred. The Town has problems with ponded water in these areas for many years.

The Town has relied on temporary pumping of the water towards the sound or to the dunes but with limited success as the discharge of water near the flooded areas limits the effectiveness of pumping. The Town has installed trench drains (in the flood prone areas which do not have outlets).

WK Dickson has been working with the Town to reduce the impacts of flooding. A Clean Water Management Trust Fund application has been submitted for a dune infiltration system DIS. The DIS plan was originally to drawdown stormwater from four areas of Caswell Beach Road and discharge below ground in four dune infiltration systems located south of each area between the frontal dunes. The concept has been presented to regulatory agencies in a scoping meeting with positive response. The Town has approached property owners to check the owner's willingness to grant easement. Due to some reluctance by property owners, the Town

has decided to pursue using a parcel of Town property across from the Lighthouse. WK Dickson has evaluated the site and confirmed that a dune infiltration system is feasible by testing and analysis of the seasonal high-water table, insitu permeability, and groundwater mounding analysis. The 8-inch reuse main that was constructed as part of the sewer project is being considered to convey the stormwater from the flooding areas to the DIS system. The subject reuse main is inactive due to Oak Island discharging treated effluent at the golf course rather than the previously planned location at the Baptist Assembly. Pressure testing of the reuse main will be needed and valves added.

NCDOT has committed to assist with funding of this project as a high impact low cost project. The funding schedule is to have the project bid in February with a start date in May. The encroachment agreement can be simplified if the connection to the reuse force main is a near side tap and the planned pump suction piping is located below ground or with break away stand pipe 10 feet clear of the recovery zone. Caitlin Marks will be tracking the project costs and schedule. Ron Van Cleef will be the DOT project manager. A summary report is needed for DOT use in documenting the effectiveness of the project.

WK Dickson will be working on the design and permitting of the project. Permitting anticipated is a CAMA minor permit. A cost estimate will be provided by the end of October.

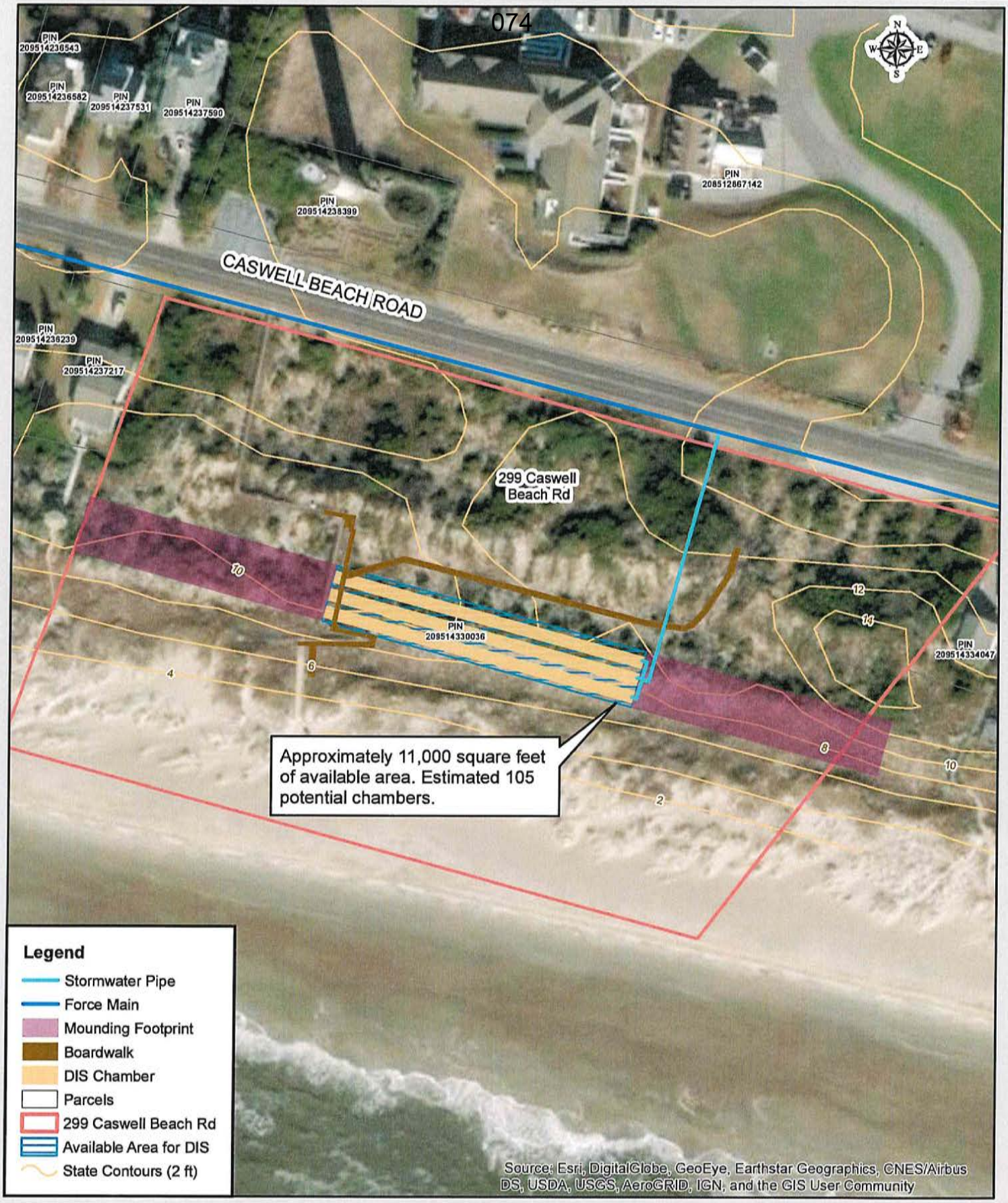
(Following the meeting, DOT representatives visited the project area)

WK DICKSON
community infrastructure consultants

Caswell Beach Road Stormwater Management Project
Dune Infiltration System
Figure 1 - Vicinity Map

N W E S

0 300 600 Feet
1 in = 600 ft



WK DICKSON
community infrastructure consultants

Caswell Beach Road Stormwater Management Project
Figure 6 - Proposed Project Aerial Map
Site 5 - 299 Caswell Beach Rd

0 50 100 Feet
1 in = 100 ft

Project Narrative

The Town of Caswell Beach is currently exploring options to remove stormwater flooding from Caswell Beach Road. Caswell Beach Road (State Road 1100) runs approximately three miles from the Town limits to the North Carolina Baptist Assembly and is geographically located between the Atlantic Ocean and Intracoastal Waterway Marsh System. Caswell Beach Road serves approximately 240 residential properties, United States Coast Guard Station Oak Island, Duke Energy Nuclear Pumping Station, and the North Carolina Baptist Assembly. The North Carolina Baptist Assembly provides religious retreat services for up to 1500 people onsite at any given time. This road provides the only ingress/egress for vehicles serving the above locations.

Due to stormwater flooding Caswell Beach Road becomes impassable to low clearance vehicles after minor storm events and impassable to high clearance emergency vehicles after moderate to major storm events.

The Town of Caswell Beach contracted engineers, WK Dickson of Wilmington to help devise a solution for this flooding problem. It was determined that the best solution to remove and filter the water would be a dune infiltration system. This system will consist of approximately 525' of buried infiltration chambers. The water would enter the chambers and from there leach into the ground water table after being filtered by stone and sand. The water will be piped to the central infiltration site by pump.

Existing Conditions

The Town has installed and maintains drainage and infiltration basin in the right of way of Caswell Beach Road. These apparatuses do not provide the necessary amount of stormwater control to allow the road to remain passable during heavy rain events. The road is situated between the dunes and the marsh in an area approximately 500 feet wide. The high-water table in this area makes further stormwater control by infiltration on the roadside impractical.

Justin Humphries <jhumphries@kinglawonline.com>

CAMA Variance Caswell Beach

1 message

Carter Hubard <tchubard@wkdickson.com> Wed, Oct 31, 2018 at 2:00 PM
To: Justin Humphries <justin@kinglawonline.com>, "dahlers@caswellbeach.org" <dahlers@caswellbeach.org>, Chad Hicks <chicks@caswellbeach.org>
Cc: Marc Horstman <mhorstman@wkdickson.com>

Justin,

The proposed dune infiltration system chamber material is high density polyethylene

T. Carter Hubard, P.E.
Project Manager
WK Dickson & Co., Inc.
300 N. Third Street, Suite 301 (We've moved! Note our new address.)
Wilmington, NC 28401
O 910-762-4200
Direct 910-442-1850

Mob 910-520-2734
Email: tchubard@wkdickson.com
www.wkdickson.com

Locality Town of Caswell Beach Permit Number CaB 18-01

Ocean Hazard ✓ Estuarine Shoreline ____ ORW Shoreline ____ Public Trust Shoreline ____ Other ____

(For official use only)

GENERAL INFORMATION

LAND OWNER

Name Town of Caswell Beach

Address 1100 Caswell Beach Rd.

City Caswell Beach State NC Zip 28465 Phone 910-278-5471

Email Chicks@caswellbeach.org

AUTHORIZED AGENT

Name Chad Hicks ↑ Same

Address ____

City ____ State ____ Zip ____ Phone ____

Email ____

LOCATION OF PROJECT: (Address, street name and/or directions to site. If not oceanfront, what is the name of the adjacent waterbody.) South of Lighthouse on Long Bay 251NB037 Parcel ID #

DESCRIPTION OF PROJECT: (List all proposed construction and land disturbance.) See attached 11,000sq Ft Disturbed

SIZE OF LOT/PARCEL: ____ square feet 5.3 acres

PROPOSED USE: Residential ☐ (Single-family ☐ Multi-family ☐) Commercial/Industrial ☐ Other ☒

COMPLETE EITHER (1) OR (2) BELOW (*Contact your Local Permit Officer if you are not sure which AEC applies to your property*):

1) **OCEAN HAZARD AECs: TOTAL FLOOR AREA OF PROPOSED STRUCTURE:** 5225 square feet (includes air conditioned living space, parking elevated above ground level, non-conditioned space elevated above ground level but excluding non-load-bearing attic space)

2) **COASTAL SHORELINE AECs:** SIZE OF BUILDING FOOTPRINT AND OTHER IMPERVIOUS OR BUILT UPON SURFACES: ____ square feet (includes the area of the roof/drip line of all buildings, driveways, covered decks, concrete or masonry patios, etc. that are within the applicable AEC. Attach your calculations with the project drawing.)

STATE STORMWATER MANAGEMENT PERMIT: Is the project located in an area subject to a State Stormwater Management Permit issued by the NC Division of Water Quality?

YES ____ NO ____

If yes, list the total built upon area/impervious surface allowed for your lot or parcel: ____ square feet.

RECEIVED

OCT 16 2018

DCM WILMINGTON, NC

OTHER PERMITS MAY BE REQUIRED: The activity you are planning may require permits other than the CAMA minor development permit, including, but not limited to: Drinking Water Well, Septic Tank (or other sanitary waste treatment system), Building, Electrical, Plumbing, Heating and Air Conditioning, Insulation and Energy Conservation, FIA Certification, Sand Dune, Sediment Control, Subdivision Approval, Mobile Home Park Approval, Highway Connection, and others. Check with your Local Permit Officer for more information.

STATEMENT OF OWNERSHIP:
I, the undersigned, an applicant for a CAMA minor development permit, being either the owner of property in an AEC or a person authorized to act as an agent for purposes of applying for a CAMA minor development permit, certify that the person listed as landowner on this application has a significant interest in the real property described therein. This interest can be described as: (check one)

____an owner or record title, Title is vested in Town of Caswell Beach, see Deed Book 30 page 545 in the Brunswick County Registry of Deeds.

____an owner by virtue of inheritance. Applicant is an heir to the estate of _____; probate was in _____ County.

____if other interest, such as written contract or lease, explain below or use a separate sheet & attach to this application.

NOTIFICATION OF ADJACENT PROPERTY OWNERS:
I furthermore certify that the following persons are owners of properties adjoining this property. I affirm that I have given **ACTUAL NOTICE** to each of them concerning my intent to develop this property and to apply for a CAMA permit.

	(Name)	(Address)
(1)	Gary Studer	217 Caswell Beach Rd.
(2)	Brian Murphy	301 Caswell Beach Rd
(3)		
(4)		

ACKNOWLEDGEMENTS:
I, the undersigned, acknowledge that the land owner is aware that the proposed development is planned for an area which may be susceptible to erosion and/or flooding. I acknowledge that the Local Permit Officer has explained to me the particular hazard problems associated with this lot. This explanation was accompanied by recommendations concerning stabilization and floodproofing techniques.

I furthermore certify that I am authorized to grant, and do in fact grant, permission to Division of Coastal Management staff, the Local Permit Officer and their agents to enter on the aforementioned lands in connection with evaluating information related to this permit application.

This the 16 day of Oct, 20 18

_____
Landowner or person authorized to act as his/her agent for purpose of filing a CAMA permit application

This application includes: *general information (this form), a site drawing as described on the back of this application, the ownership statement, the Ocean Hazard AEC Notice where necessary, a check for $100.00 made payable to the locality, and any information as may be provided orally by the applicant. The details of the application as described by these sources are incorporated without reference in any permit which may be issued. Deviation from these details will constitute a violation of any permit. Any person developing in an AEC without permit is subject to civil, criminal and administrative action.*

OCEAN HAZARD AEC NOTICE

Project is in an: ✓ **Ocean Erodible Area** ____ **High Hazard Flood Area** ____ **Inlet Hazard Area**

Property Owner: Town of Caswell Beach

Property Address: 300 A Caswell Beach Rd. Caswell Beach, NC 28465

Date Lot Was Platted: 4-02

This notice is intended to make you, the applicant, aware of the special risks and conditions associated with development in this area, which is subject to natural hazards such as storms, erosion and currents. The rules of the Coastal Resources Commission require that you receive an AEC Hazard Notice and acknowledge that notice in writing before a permit for development can be issued.

The Commission's rules on building standards, oceanfront setbacks and dune alterations are designed to minimize, but not eliminate, property loss from hazards. By granting permits, the Coastal Resources Commission does not guarantee the safety of the development and assumes no liability for future damage to the development. Permits issued in the Ocean Hazard Area of Environmental Concern include the condition that structures be relocated or dismantled if they become imminently threatened by changes in shoreline configuration. The structure(s) must be relocated or dismantled within two (2) years of becoming imminently threatened, and in any case upon its collapse or subsidence.

The best available information, as accepted by the Coastal Resources Commission, indicates that the annual long-term average ocean erosion rate for the area where your property is located is 2 feet per year.

The rate was established by careful analysis of aerial photographs of the coastline taken over the past 50 years.

Studies also indicate that the shoreline could move as much as 3-7 feet landward in a major storm.

The flood waters in a major storm are predicted to be about 4-16 feet deep in this area.

Preferred oceanfront protection measures are beach nourishment and relocation of threatened structures. Hard erosion control structures such as bulkheads, seawalls, revetments, groins, jetties and breakwaters are prohibited. Temporary sand bags may be authorized under certain conditions.

The applicant must acknowledge this information and requirements by signing this notice in the space below. Without the proper signature, the application will not be complete.

[signature] 10-17-18

Property Owner Signature *Date*

SPECIAL NOTE: This hazard notice is required for development in areas subject to sudden and massive storms and erosion. Permits issued for development in this area expire on December 31 of the third year following the year in which the permit was issued. Shortly before work begins on the project site, the Local Permit Officer must be contacted to determine the vegetation line and setback distance at your site. If the property has seen little change since the time of permit issuance, and the proposed development can still meet the setback requirement, the LPO will inform you that you may begin work. Substantial progress on the project must be made within 60 days of this setback determination, or the setback must be re-measured. Also, the occurrence of a major shoreline change as the result of a storm within the 60-day period will necessitate re-measurement of the setback. It is important that you check with the LPO before the permit expires for official approval to continue the work after the permit has expired. Generally, if foundation pilings have been placed and substantial progress is continuing, permit renewal can be authorized. It is unlawful to continue work after permit expiration.

For more information, contact:

Tara MacPherson

Local Permit Officer

127 Cardinal Dr. Ext

Address

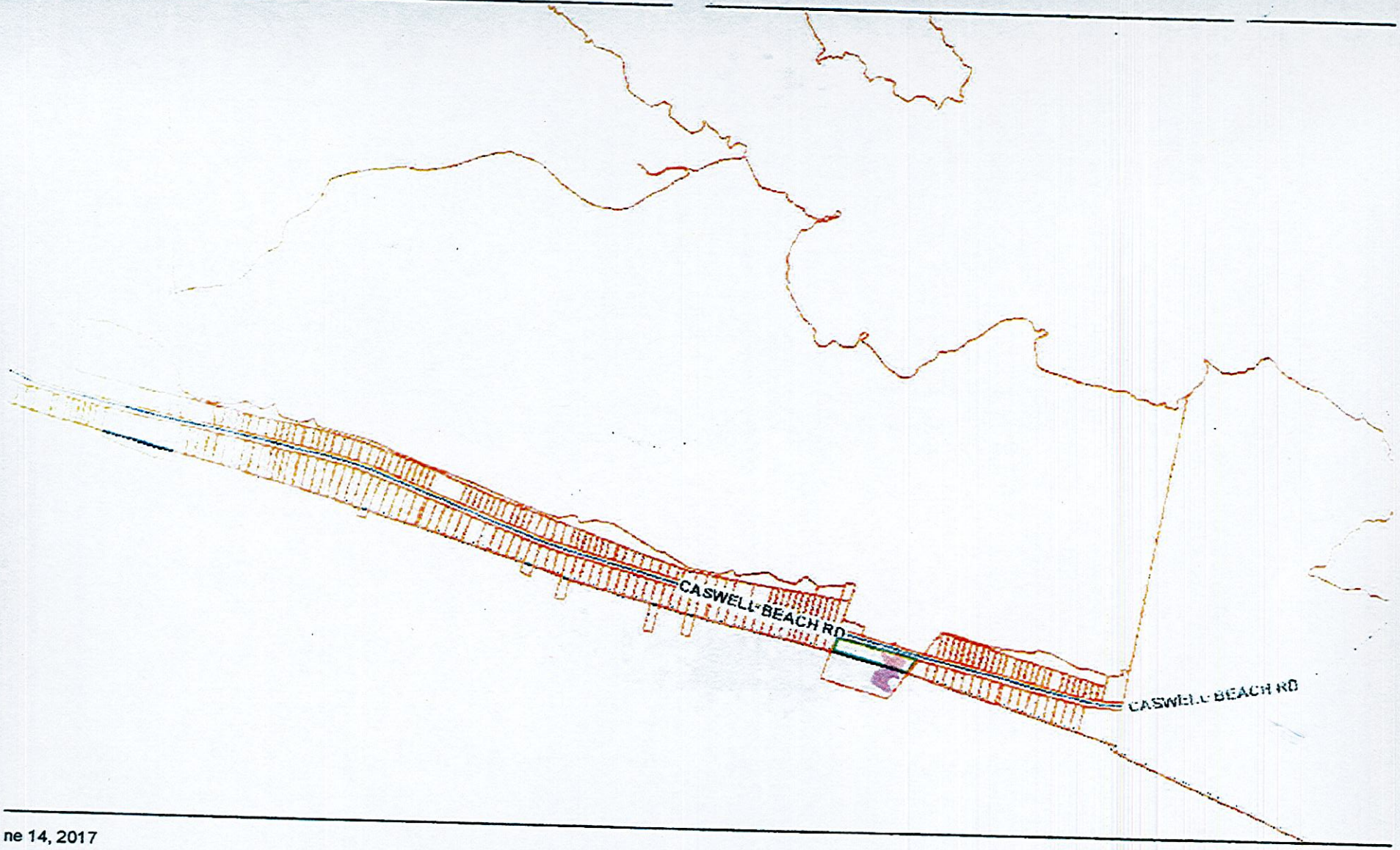
Wilmington NC

Locality

910 796-7425

Phone Number

Brunswick Count GIS Data Viewer



ne 14, 2017

oads
- Interstate
- US Hwy
- NC Hwy
- State Road
- Minor

Parcels
- Condo
- Parcel

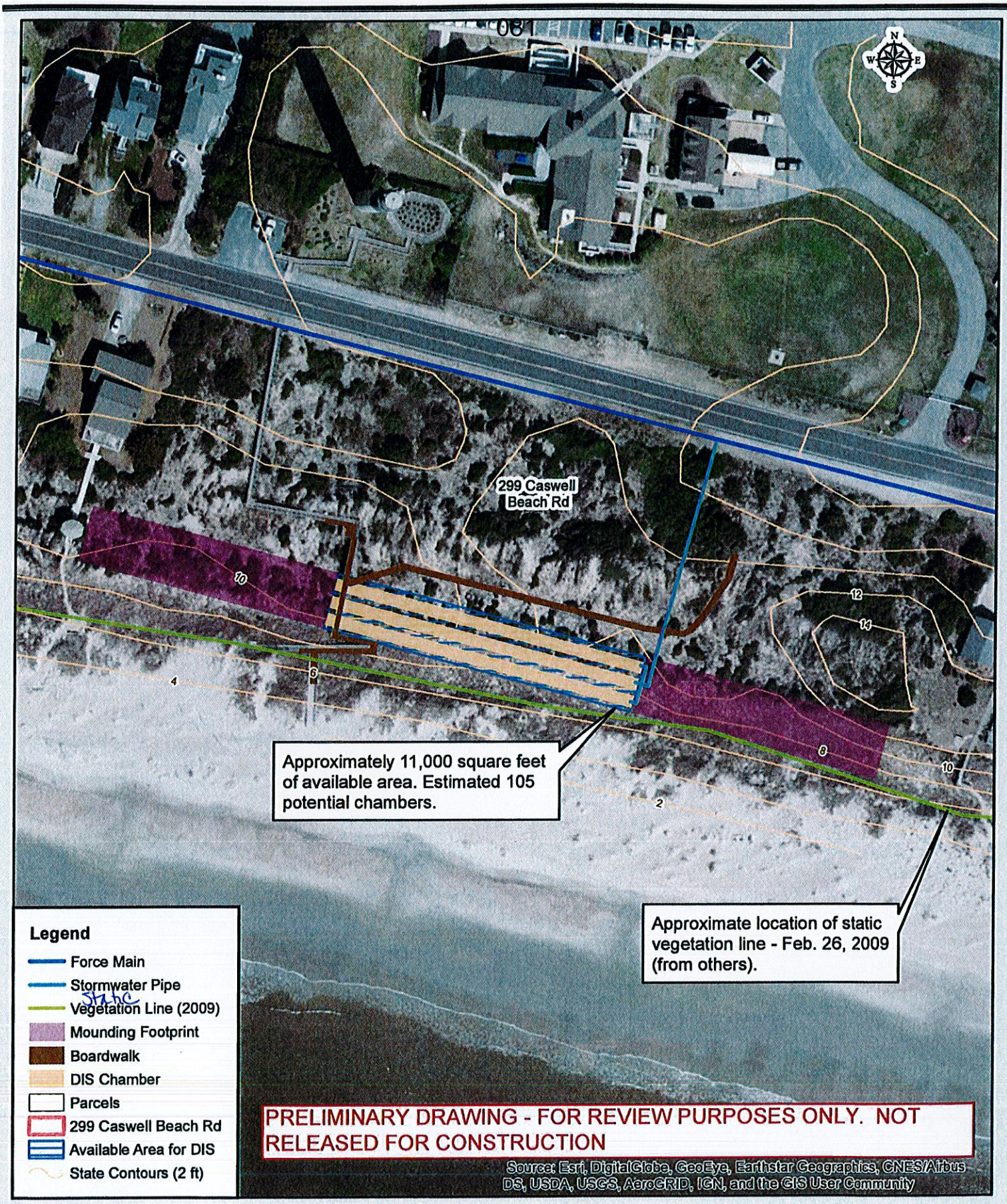
- County Boundary

1:15,373

0 0.125 0.25 0.5 mi

0 0.2 0.4 0.8 km

Brunswick County

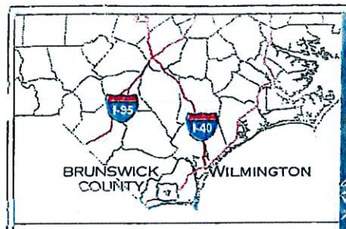


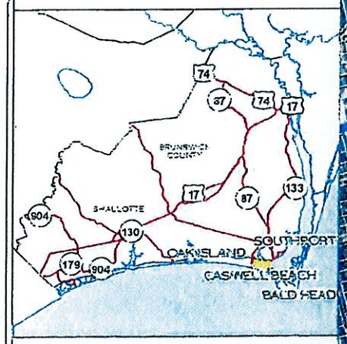
WK DICKSON
community infrastructure consultants

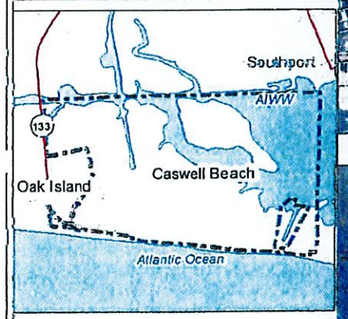
Caswell Beach Road Stormwater Management Project
Figure 6 - Proposed Project Aerial Map
Site 5 - 299 Caswell Beach Rd

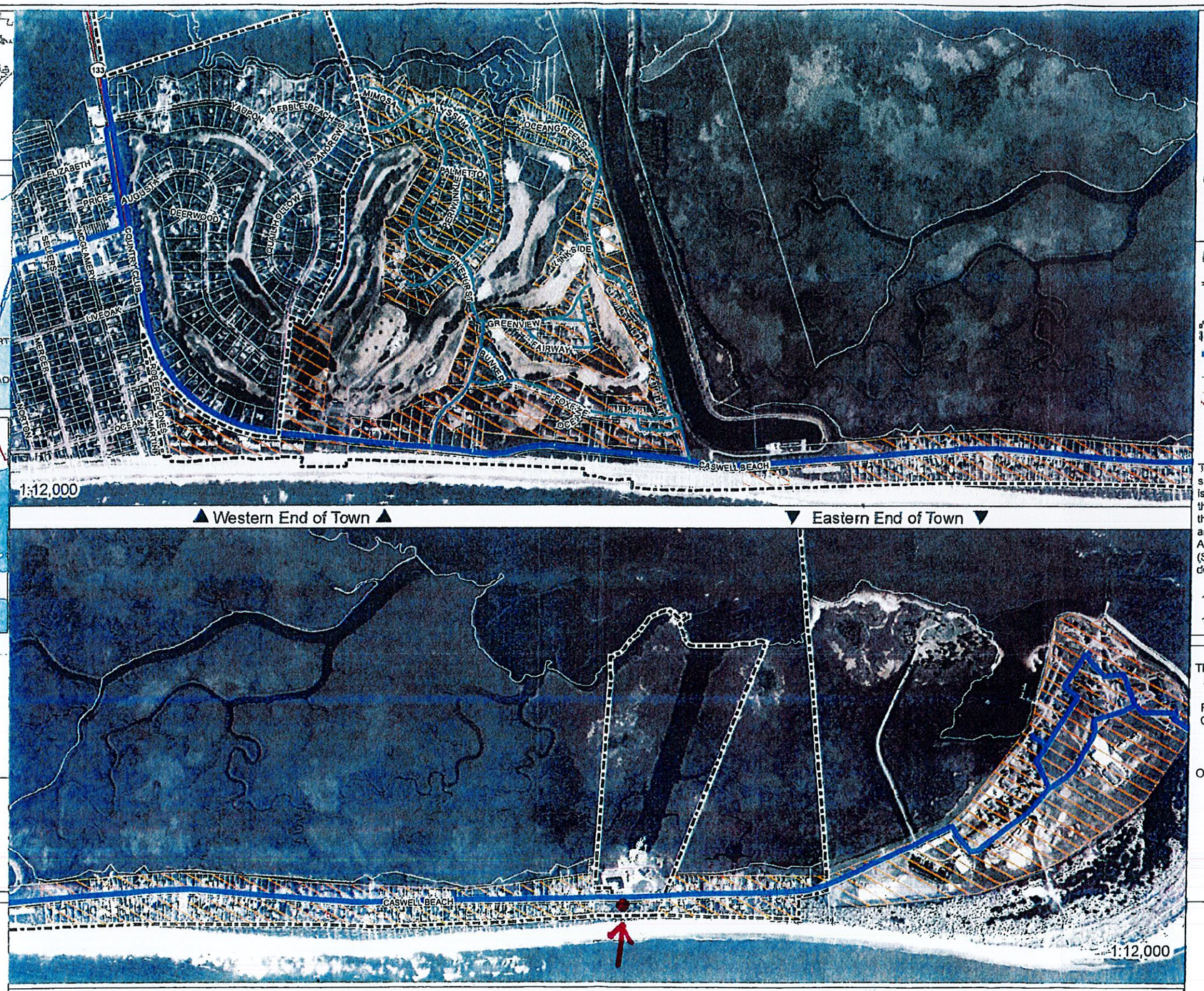
0 50 100 Feet
1 in = 100 ft

Location Map "A"









Map is to be used for general informational purposes only. Spatial data used to generate this map was gathered from disparate sources and represent a condition at a fixed period in time. 100% accuracy of spatial data to current circumstances cannot be guaranteed.

CAPE FEAR COUNCIL OF GOVERNMENTS

Map prepared by:
Scott Logel
Cape Fear Council of Governments
1480 Harbour Drive
Wilmington, NC 28401

0 1,250 2,500 5,000 7,500 10,000 Feet

0 0.25 0.5 1 1.5 2 Miles

NORTH

Town of Caswell Beach

2006/2007 CAMA Land Use Plan

Community Facilities (Existing Water System and Planned Sewer Service Area) Map

Legend

- Primary Road
- Roads
- Municipal Limits
- Main Distribution Lines
- Distribution Lines
- Water and Sewer Service Boundary

IMPORTANT NOTE:

The water and sewer service boundary shown on this map is a generalization and is not site specific. It is intended to show that the planned sewer service will serve the existing platted and developable lots, and will not encroach into "Conservation Areas" or "Commercial Recreation Areas" (See Section 9 and Map 12 for a description of those areas).

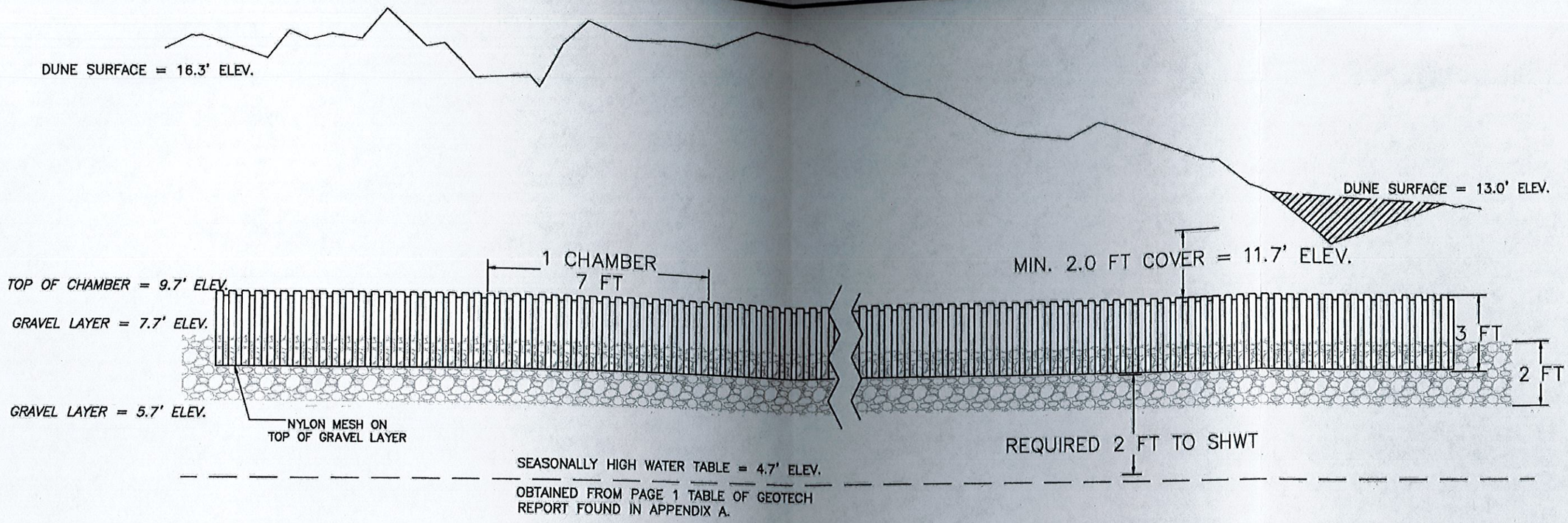
1 inch equals 1,000 feet

1 inch equals 0.19 miles

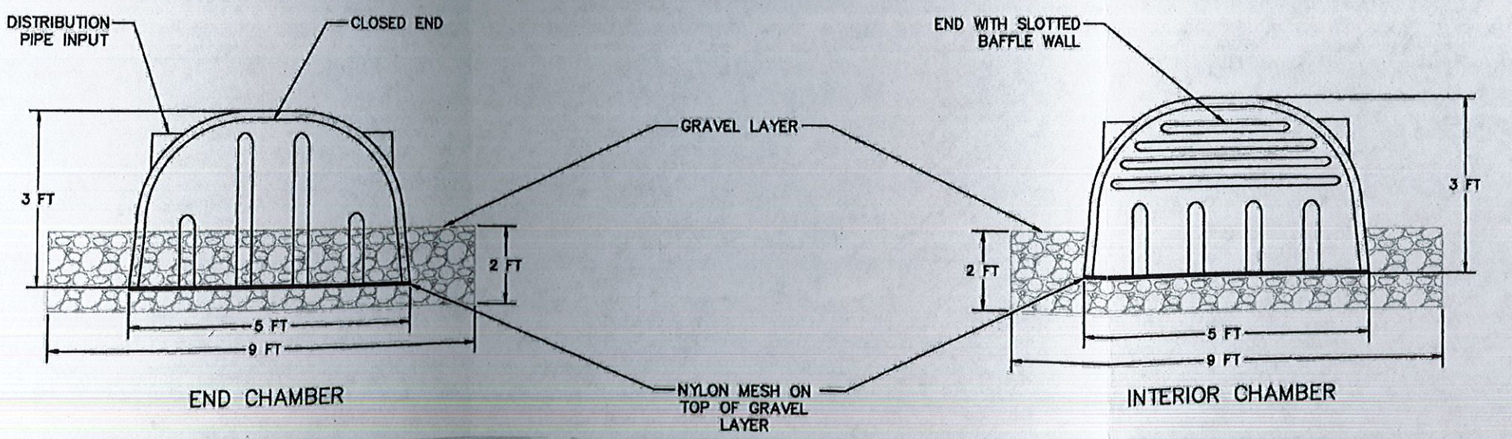
The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through fundsprovided by the Coastal Zone Management Act of 1972, as amended, which is administered by the office of Ocean and Coastal Resources Management, National Oceanic and Atmospheric Administration.

Map Created 1/6/07

MAP 11



NOTES:
1. THE ELEVATIONS SHOWN ON THIS FIGURE ARE APPROXIMATE AND ARE PROVIDED FOR RELATIVE REFERENCE ONLY. THESE ELEVATIONS AND MEASURE-DOWNS WERE OBTAINED FROM COUNTY GIS DATA SOURCE AND SHOULD NOT BE USED FOR ANY DETAILED DESIGN OR INSTALLATION ACTIVITIES. IT IS RECOMMENDED THAT A MORE DETAILED SITE SURVEY BE PERFORMED BY A NC LICENSED PROFESSIONAL LAND SURVEYOR BEFORE ANY DESIGN PLANS ARE GENERATED.



PRELIMINARY DRAWING- FOR REVIEW PURPOSES ONLY. NOT RELEASED FOR CONSTRUCTION.

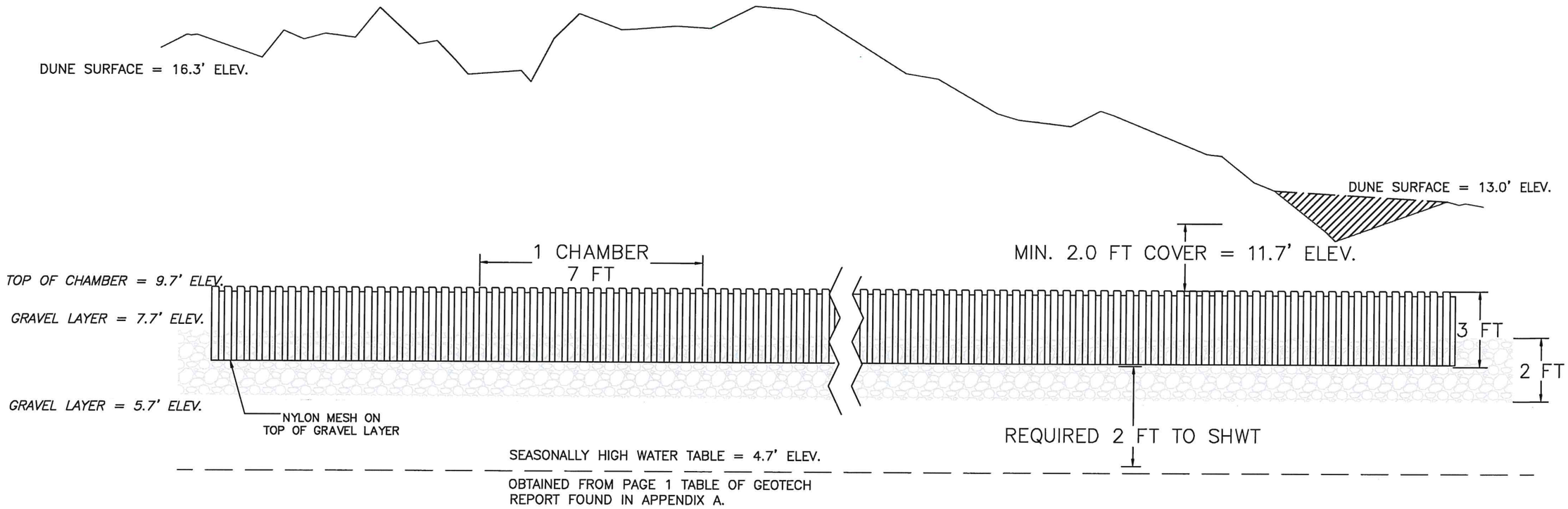
RECEIVED
OCT 16 2018
DCM WILMINGTON, NC

NTS

FIGURE 10 - SITE 5
APPROXIMATE DUNE INFILTRATION SYSTEM PROFILE
CASWELL BEACH ROAD STORMWATER MANAGEMENT PROJECT

The Town of Caswell Beach

WK DICKSON
community infrastructure consultants
720 CORPORATE CENTER DRIVE
RALEIGH, NC 27607
(919) 782-0495
NC LICENSE NO. F-0374
Office Locations:
North Carolina
South Carolina
Georgia



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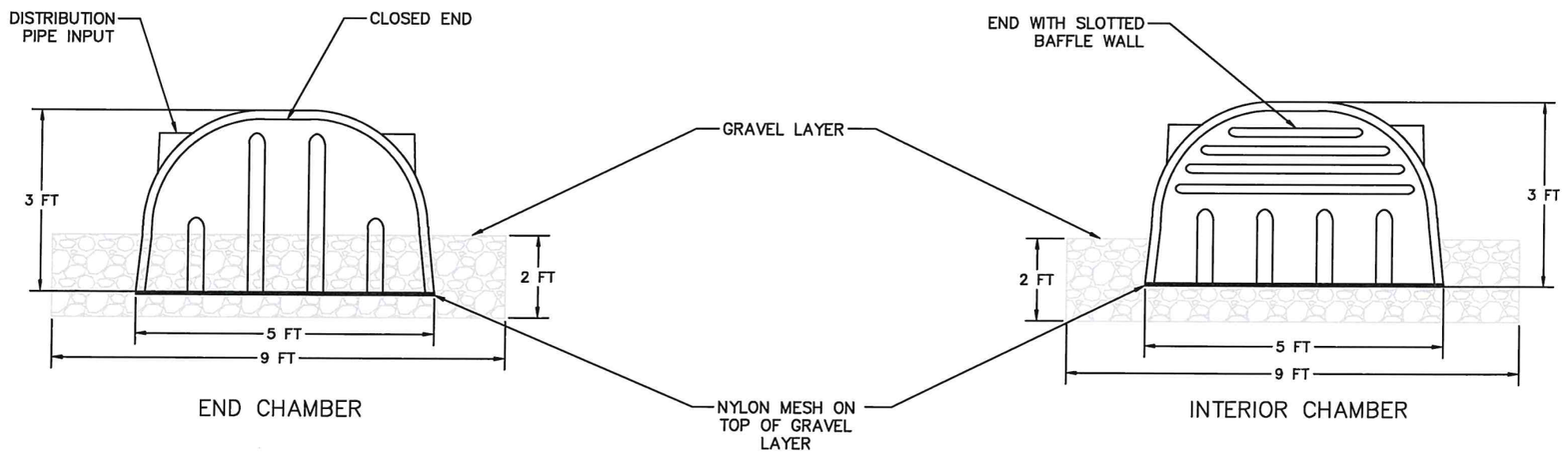
1. THE ELEVATIONS SHOWN ON THIS FIGURE ARE APPROXIMATE AND ARE PROVIDED FOR RELATIVE REFERENCE ONLY. THESE ELEVATIONS AND MEASURE-DOWNS WERE OBTAINED FROM COUNTY GIS DATA SOURCE AND SHOULD NOT BE USED FOR ANY DETAILED DESIGN OR INSTALLATION ACTIVITIES. IT IS RECOMMENDED THAT A MORE DETAILED SITE SURVEY BE PERFORMED BY A NC LICENSED PROFESSIONAL LAND SURVEYOR BEFORE ANY DESIGN PLANS ARE GENERATED.



PRELIMINARY DRAWING- FOR REVIEW PURPOSES ONLY. NOT RELEASED FOR CONSTRUCTION.

NTS

The Town of Caswell Beach North Carolina

FIGURE 10 - SITE 5
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CASWELL BEACH ROAD STORMWATER MANAGEMENT PROJECT

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community infrastructure consultants
720 CORPORATE CENTER DRIVE
RALEIGH, NC 27607
(919) 782-0495
NC LICENSE NO. F-0374
Office Locations:
North Carolina
South Carolina
Georgia

Chad Hicks

From: Murphy, Brian @ Washington DC <Brian.Murphy@cbre.com>
Sent: Monday, October 15, 2018 6:24 PM
To: Chad Hicks
Subject: Re: Stormwater Issue on Caswell Beach Road

Chad, Please forward me a copy of the engineering report for my review. Also, when the engineers indicated that the dune infiltration system would have no impact on my property, do you know if they were aware that I have a basement and that it had been flooded previously when the Town pumped water into those dunes on a prior occasion? If they were aware of this when making the assessment that the system would not negatively impact my property then I support the Town's efforts providing, as you and I just discussed, the Town assumes liability for future flooding and agrees to discontinue pumping activities if the pumping causes my property to flood.

Thanks

Sent from my iPhone

On Oct 15, 2018, at 4:08 PM, Chad Hicks <chicks@caswellbeach.org> wrote:

> Hello Brian,
> I hate to throw this at you like this but I need a huge favor. We think that we have been awarded a grant from NCDOT that would alleviate the severe flooding on Caswell Beach Road. The proposed project that NCDOT would fund is to have the 3 areas that pond on CBR pumped into a dune infiltration system that would be installed on the lighthouse property dunes. This system would not be visible and will be underground. All dunes will be replaced and revegetated as soon as the project is installed. Here is my problem. I have until tomorrow to submit to CAMA "No Objection" from the adjacent property owners. I know this is fast but I give you my word that this system will not be visible and the property will be restored to prior condition. I have attached a map that shows where the project will be placed. Please feel free to call me at 910-200-3217 if you have any questions. Once again I apologize for the short notice.
> Thank you,
> Chad Hicks
>
> <Proposed Project Stormwater.pdf>

Chad Hicks

From: Gary Studer <gary.studer@yahoo.com>
Sent: Tuesday, October 16, 2018 9:19 AM
To: Chad Hicks
Subject: Re: Proposed Project

Thanks much. Does the grant include the replacement of dunes and revegetating, or is that the Town's responsibility?

That's a good timetable if the grant comes through as projected. Slow time of year, tourist-wise. I guess all we have to contend with is the bridge!

On Tuesday, October 16, 2018, 8:47:51 AM EDT, Chad Hicks <chicks@caswellbeach.org> wrote:

Hello Gary,
Thanks for the quick response. The force main is the reclaimed water line that was installed but never put into operation. The mounding is the limit of water that would travel from the infiltration basins. The water in the chambers is absorbed into the sand and filtered and eventually ends in the groundwater. If we get this grant we hope to start in February and be done in 6 weeks. I will certainly keep you in the loop of this project. And once again thanks for you quick reply!
Chad

-----Original Message-----
From: Gary Studer <gary.studer@yahoo.com>
Sent: Monday, October 15, 2018 5:08 PM
To: Chad Hicks <chicks@caswellbeach.org>
Subject: Re: Proposed Project

Thanks for sharing this with us. We have no objection to the plan as presented. We do, however, have a couple of informational questions on the attachment..

Is the Force Main (heavy blue line) the existing sewer line?
What are the mounding footprints (purple areas)? We are not familiar with that term.
Where does the water go from the chambers?

If the Town is awarded the grant, when is the projected start date and completion date?

Please continue to keep us informed on the project. Hopefully, this will eliminate this long-time problem.

Gary and Judy

On Mon, 10/15/18, Chad Hicks <chicks@caswellbeach.org> wrote:

Subject: Proposed Project
To: "Gary Studer" <gary.studer@yahoo.com>
Date: Monday, October 15, 2018, 4:05 PM

Hello Gary,
I hate to throw this at
you like this but I need a huge favor. We think that we have been awarded a grant from NCDOT that would alleviate the stormwater ponds on Caswell Beach Road. The proposed project that NCDOT would fund is to have
the 3 areas that pond on CBR pumped into a dune infiltration system that would be installed on the lighthouse property dunes. This system would not be visible and will be underground. All dunes will be replaced and revegetated as soon as the project is installed.
Here is my problem. I have until tomorrow to submit to CAMA "No Objection" from the adjacent property owners. I know this is fast but I give you my word that this system will not be visible and the property will be restored to prior condition. I have attached
a map that shows where the project will be placed. Please feel free to call me at 910-200-3217 if you have any questions. Once again I apologize for the short notice.

Thank you,
Chad Hicks

CASWELL BEACH RD

Parcel: 251NB037

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Static Vegetation Line
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Legend

Parcel: 251NB037

Parcels

Static Vegetation Line

Shorelines

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1982 - 1995

1996 - 2004

2005 - 2016

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Feet

2008 Background Imagery

October 25, 2018

NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557

Contact: ken.richardson@ncdenr.gov - 252-808-2808

CASWELL BEACH RD

Parcel: 251NB037

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Static Vegetation Line
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Legend

- Parcel: 251NB037
- Parcels
- Static Vegetation Line

Shorelines

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- 1945 - 1981
- 1982 - 1995
- 1996 - 2004
- 2005 - 2016

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Feet

2009 Background Imagery

October 25, 2018

NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557

Contact: ken.richardson@ncdenr.gov - 252-808-2808

090

CASWELL BEACH RD

Parcel: 251NB037

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- Parcel: 251NB037
- Parcels
- Static Vegetation Line

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2016 Background Imagery

October 25, 2018

NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557

Contact: ken.richardson@ncdenr.gov - 252-808-2808

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CASWELL BEACH RD

Parcel: 251NB037

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Parcel: 251NB037

Parcels

Static Vegetation Line

Shorelines

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2005 - 2016

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2008 Background Imagery

October 25, 2018

NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557

Contact: ken.richardson@ncdenr.gov - 252-808-2808

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CASWELL BEACH RD

Parcel: 251NB037

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October 25, 2018

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0 65 130 260 390 520
Feet

2016 Background Imagery

October 25, 2018

NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557

Contact: ken.richardson@ncdenr.gov - 252-808-2808

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

October 17, 2018

Town of Caswell beach
c/o Chad Hicks
1100 Caswell Beach Road
Caswell Beach, NC 28465

RE: DENIAL OF CAMA MINOR DEVELOPMENT
PERMIT APPLICATION NUMBER- CasB 18-01
PROJECT ADDRESS: Parcel ID 251NB037 Caswell Beach, NC

Dear Mr. Hicks:

After reviewing your application in conjunction with the development standards required by the Coastal Area Management Act (CAMA), it is my determination that no permit shall be granted for the project which you have proposed.

This decision is based on my findings that your request violates NCGS 113A-120(a)(8) which requires that all applications be denied which are inconsistent with CAMA guidelines. Specifically, the development for which you applied consists of the construction of a Dune Infiltration System, located within the 60 ft. Ocean Hazard Setback adjacent to the Atlantic Ocean.

Upon Review, I have determined the requested scope of work is inconsistent with 15 NCAC 07H .0306(a)(2) GENERAL USE STANDARDS OF OCEAN HAZARD AREAS, which states: "***With the exception of those types of development defined in 15A NCAC 07H .0309, no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback distance***"; and 15 NCAC 07H .0309(a) USE STANDARDS FOR OCEAN HAZARD AREAS: EXCEPTIONS, which states: "***The following types of development shall be permitted seaward of the oceanfront setback requirements of Rule .0306(a) of the Subchapter if all other provisions of this Subchapter and other state and local regulations are met: (1) campsites; (2) driveways and parking areas with clay, packed sand or gravel; (3) elevated decks not exceeding a footprint of 500 square feet; (4) beach accessways consistent with Rule .0308(c) of this Subchapter; (5) unenclosed, uninhabitable gazebos with a footprint of 200 square feet or less; (6) uninhabitable, single-story storage sheds with a foundation of floor consisting of wood, clay, packed sand or gravel, and a footprint of 200 square feet or less; (7) temporary amusement stands; (8) sand fences; and (9) swimming pools***".

Should you wish to appeal my decision or request a variance from the Coastal Resources Commission please contact me so I can provide you with the proper forms. The Division of Coastal Management must receive appeal notices within twenty (20) days of the date of this letter in order to be considered.

If you have any questions regarding this decision, please feel free to call me at (910) 796.7425.

Sincerely,

Tara MacPherson
Field Specialist

Cc: C. Goebel, NCDEQ-OGC
Braxton Davis, NC DCM, Morehead City
WiRo Files

Town of Caswell Beach
1100 Caswell Beach Road • Caswell Beach, NC 28465
(910) 278-5471 • Fax: 1-866-271-3641 • Website: www.caswellbeach.org

October 17, 2018

Dear Mr. Studer,

Thank you for your support of our stormwater project that will be located adjacent to your property. Because part of this project is within the 60' buffer of the static line we are required to seek a variance from CAMA to proceed with this project. North Carolina law requires us to notify you of our intention to seek the variance. If you have any objections to the project you may contact a representative from CAMA and voice those concerns. We will be seeking the variance from the Coastal Resource Commission at the November 28-29 meeting. This meeting will be held at:

DoubleTree
2717 W. Fort Macon Rd.
Atlantic Beach, NC 28512

You may also contact our Local Permit Officer, Ms. Tara MacPherson at the address below:

Field Specialist
NC Division of Coastal Management
Department of Environmental Quality
910 796-7425 office
910 395-3964 fax
127 Cardinal Drive Ext
Wilmington, NC 28405

Thank you again for your help and consideration on this matter.

Sincerely,

Chad Hicks
Town of Caswell Beach

Town of Caswell Beach
1100 Caswell Beach Road • Caswell Beach, NC 28465
(910) 278-5471 • Fax: 1-866-271-3641 • Website: www.caswellbeach.org

October 17, 2018

Dear Mr. Murphy,

Thank you for your support of our stormwater project that will be located adjacent to your property. Because part of this project is within the 60' buffer of the static line we are required to seek a variance from CAMA to proceed with this project. North Carolina law requires us to notify you of our intention to seek the variance. If you have any objections to the project you may contact a representative from CAMA and voice those concerns. We will be seeking the variance from the Coastal Resource Commission at the November 28-29 meeting. This meeting will be held at:

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910 796-7425 office
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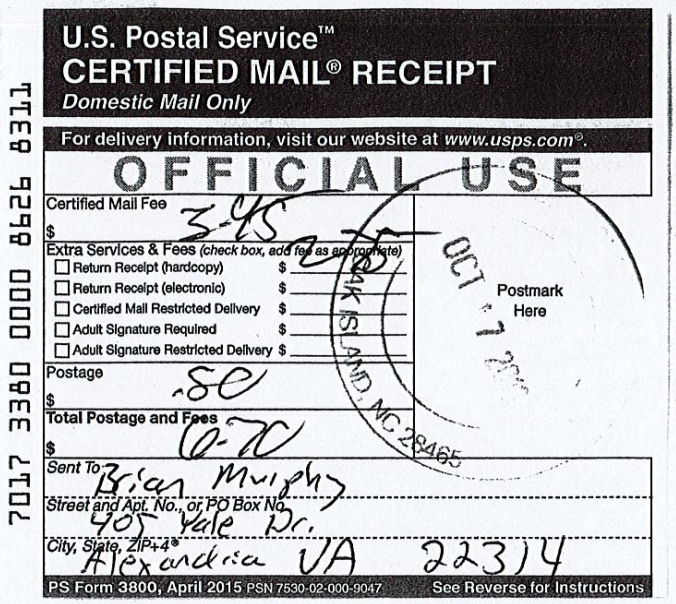
Wilmington, NC 28405

Thank you again for your help and consideration on this matter.

Sincerely,

Chad Hicks
Town of Caswell Beach



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Extra Services & Fees (check box, add fee as appropriate)
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage $ .80

Total Postage and Fees $ 6.70

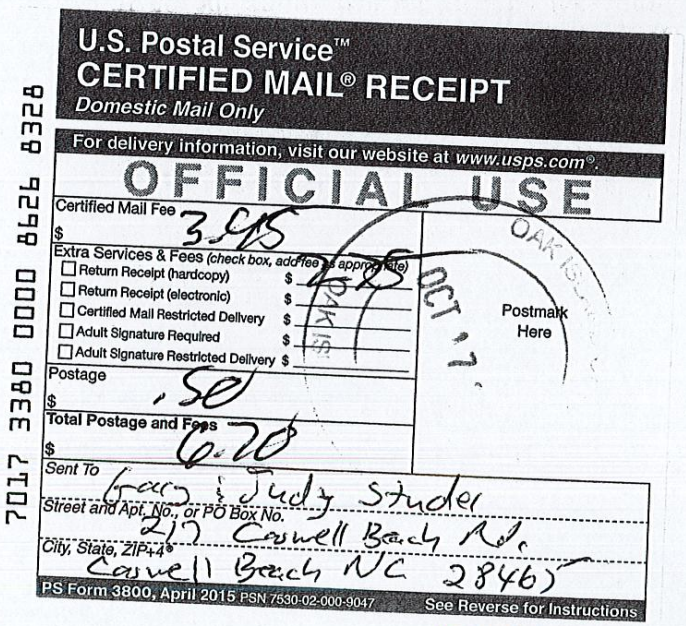
Sent To: Brian Murphy
Street and Apt. No., or PO Box No.: 405 Yale Dr.
City, State, ZIP+4®: Alexandria VA 22314

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 3380 0000 8626 8311

OAK ISLAND, NC 28465 OCT 17 2018

Postmark Here



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Certified Mail Fee $ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage $ .80

Total Postage and Fees $ 6.70

Sent To: Gary & Judy Studer
Street and Apt. No., or PO Box No.: 217 Caswell Beach Rd.
City, State, ZIP+4®: Caswell Beach NC 28465

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 3380 0000 8626 8328

OAK ISLAND, NC 28465 OCT 17 2018

Postmark Here

RECEIVED
OCT 17 2018
DCM WILMINGTON, NC

Goebel, Christine A

From: Chad Hicks <chicks@caswellbeach.org>
Sent: Thursday, November 1, 2018 3:57 PM
To: 'gary.studer@yahoo.com'
Cc: Goebel, Christine A; Justin Humphries
Subject: [External] Caswell Beach Variance Request - Meeting Venue Change

Dear Gary & Judy Studer

RE: Caswell Beach CAMA Coastal Resources Commission (CRC) variance request; change of meeting location.

We have been informed that the venue for the CRC meeting at which the Town of Caswell Beach CAMA variance request (for our Dune Infiltration project) will be held, has been changed from the Double Tree Hotel in Atlantic Beach to: **Brick Landing Plantation in Ocean Isle Beach.**

The Double Tree hotel will be closed until Spring due to damage from Hurricane Florence.

On the current draft agenda for the CRC meeting, variances are scheduled to start around 3pm on Tuesday, November 27th and will proceed in the order received (Zito, Lampley, Town of Caswell Beach) if all 3 go forward.

If the times or venue change again before November 27th we will notify you by email.

Thank you so very much for your understanding and assistance.

Cordially,
Deborah

Deborah Ahlers, Mayor
On behalf of Chad Hicks, Town Manager

PS Chad is out of the country on vacation

Goebel, Christine A

From: Chad Hicks <chicks@caswellbeach.org>
Sent: Thursday, November 1, 2018 3:53 PM
To: Murphy, Brian @ Washington DC
Cc: Goebel, Christine A; Justin Humphries
Subject: [External] Caswell Beach Variance Request - Meeting Venue Change

Dear Brian Murphy

RE: Caswell Beach CAMA Coastal Resources Commission (CRC) variance request; change of meeting location.

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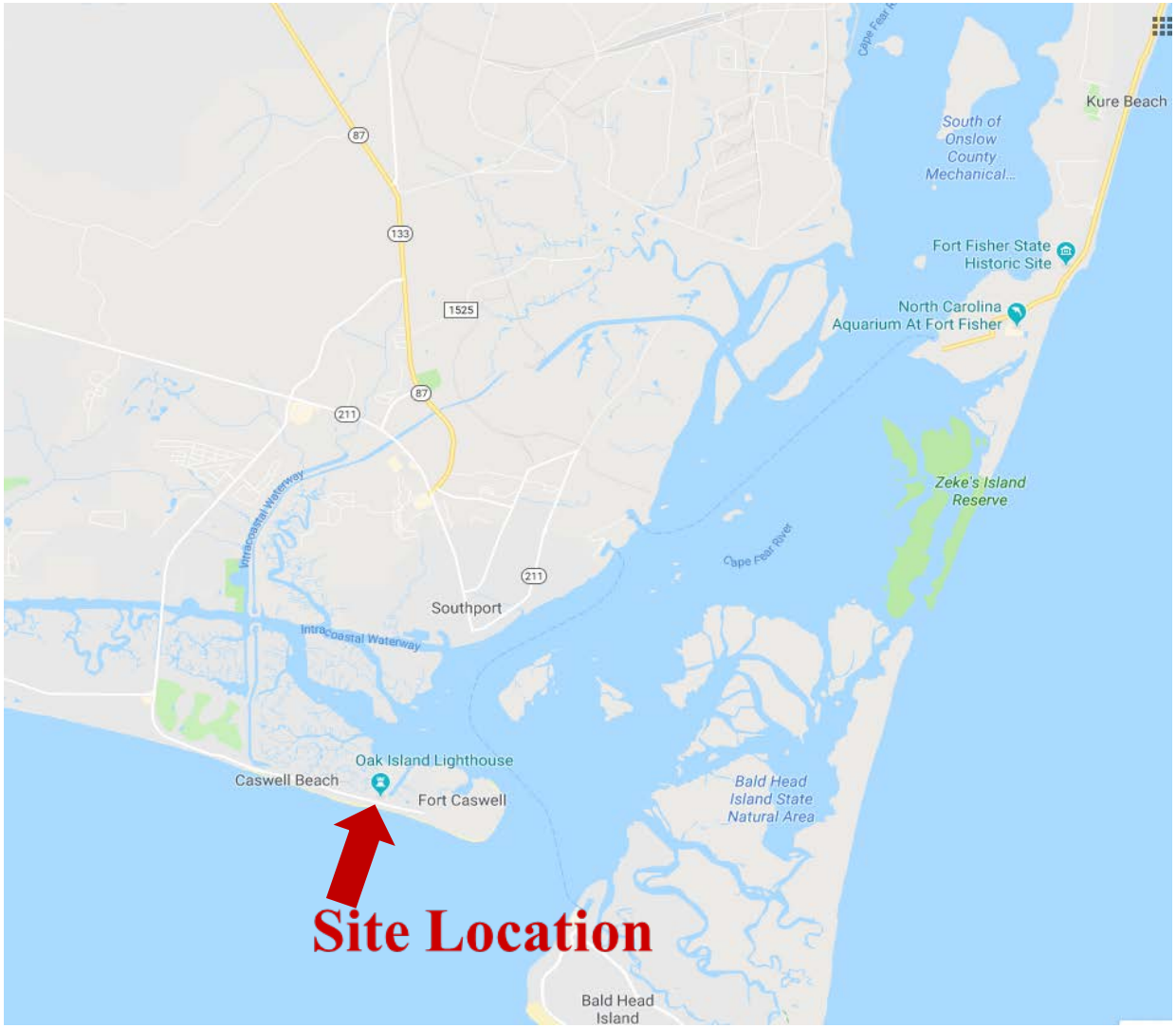
Cordially,
Deborah

Deborah Ahlers, Mayor
On behalf of Chad Hicks, Town Manager

PS Chad is out of the country on vacation

Caswell Beach Variance Request

November___, 2018

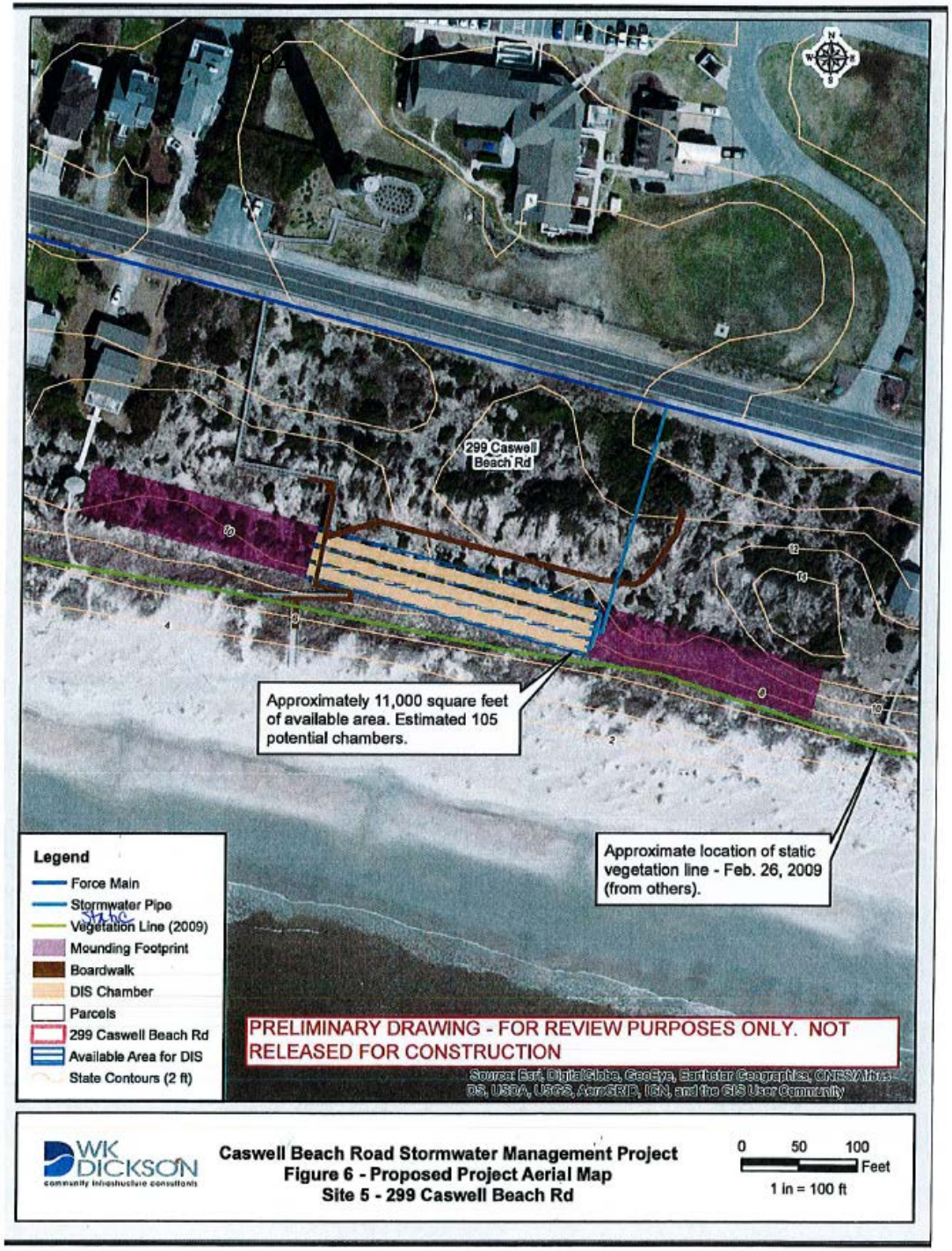


Department of Environmental Quality


View of Site Parcel Boundary
Google Earth
102
N
1100
Caswell Beach Rd
~60 ft. setback from the
Static Line
Existing Town Public
Beach Accessway
Existing Feb. 2009 Static Line
© 2018 Google

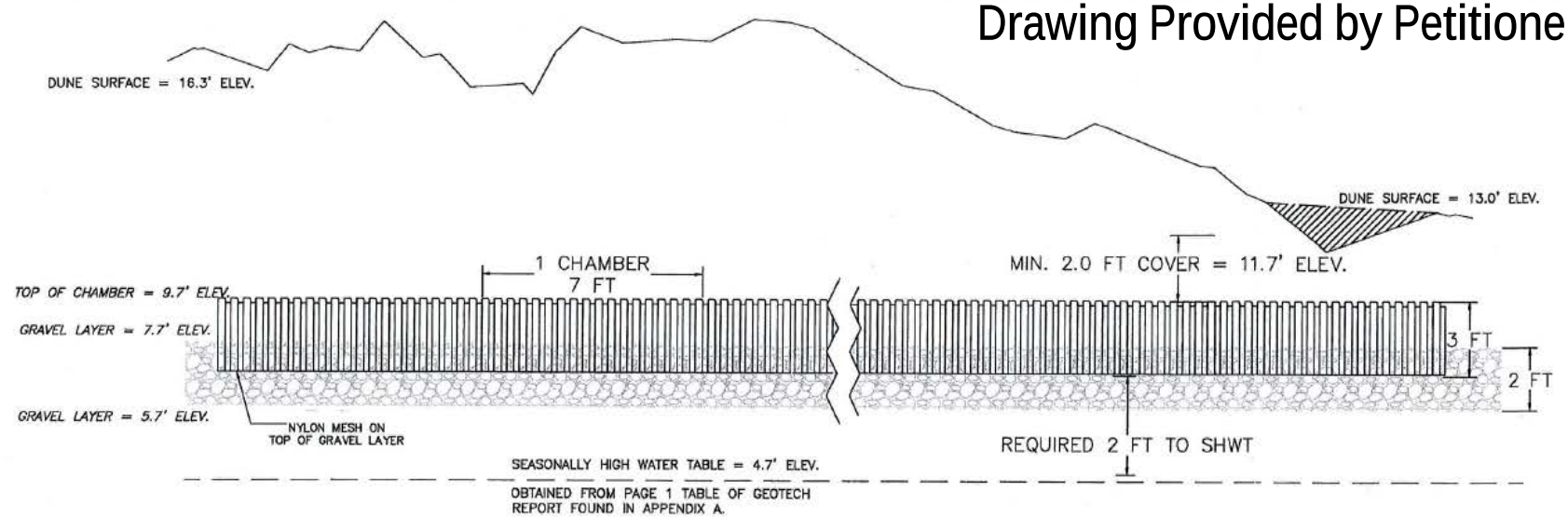

View of Project Site
NOAA Photography
September 17, 2018
N
United States
Coast Guard
Station Oak Island
Oak Island Light
Caswell Beach Rd
Site Location

Proposed Dune Infiltration Project
CAMA Permit Denial
18-01

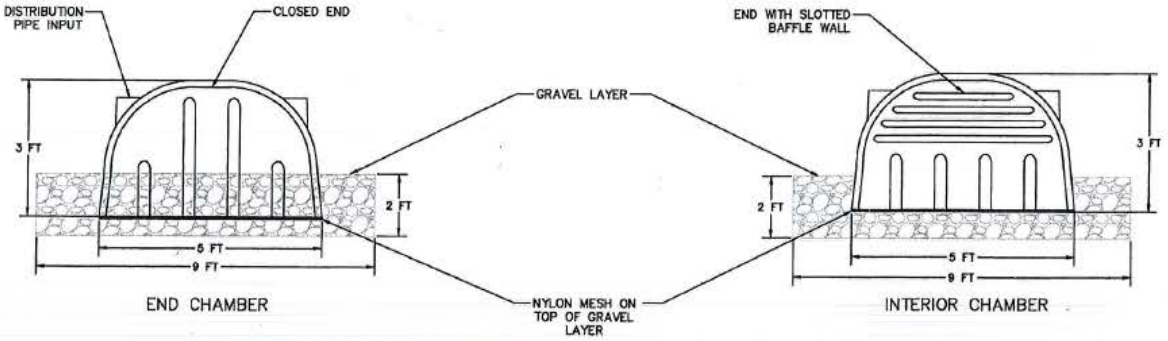


Department of Environmental Quality

Proposed Infiltration Chambers
Drawing Provided by Petitioner



NOTES:
1. THE ELEVATIONS SHOWN ON THIS FIGURE ARE APPROXIMATE AND ARE PROVIDED FOR RELATIVE REFERENCE ONLY. THESE ELEVATIONS AND MEASURE-DOWNS WERE OBTAINED FROM COUNTY GIS DATA SOURCE AND SHOULD NOT BE USED FOR ANY DETAILED DESIGN OR INSTALLATION ACTIVITIES. IT IS RECOMMENDED THAT A MORE DETAILED SITE SURVEY BE PERFORMED BY A NC LICENSED PROFESSIONAL LAND SURVEYOR BEFORE ANY DESIGN PLANS ARE GENERATED.



RECEIVED
OCT 16 2018
DCM WILMINGTON, NC

PRELIMINARY DRAWING- FOR REVIEW PURPOSES ONLY. NOT RELEASED FOR CONSTRUCTION.

NTS

Caswell Beach

FIGURE 10 - SITE 5
APPROXIMATE DUNE INFILTRATION SYSTEM PROFILE
CASWELL BEACH ROAD STORMWATER MANAGEMENT PROJECT

WK DICKSON
community infrastructure consultants
720 CORPORATE CENTER DRIVE
RALEIGH, NC 27607
(919) 782-0495
NC LICENSE NO. F-0374
Office Locations:
North Carolina
South Carolina
Georgia

View of Flooding on Caswell beach Road Post-Hurricane Matthew and Florence Photos Provided by Petitioner

Department of Environmental Quality


View facing east of Flooding on Caswell beach Road
Post-Hurricane Florence
Photos Provided by Petitioner

View of Project Site Facing East
DCM Photos
11/6/18

View of Project Site Facing Southeast
DCM Photos
11/6/18

View of Project Site Facing Southwest
DCM Photos
11/6/18