DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES
FACT SHEET FOR NPDES PERMIT DEVELOPMENT
NPDES No. NC0003417

Facility Information			
Applicant/Facility	Duke Energy Progress, LLC / H.F. Lee Energy Complex		
Applicant Address:	1199 Black Jack Church Road, Goldsboro, NC 27530		
Facility Address:	1199 Black Jack Church Road, Goldsboro, NC 27530		
Permitted Flow (MGD):	Outfall 001 - 2.16 MGD		
Type of Waste:	Industrial & domestic		
Facility Classification:	Grade I		
Permit Status:	Renewal and Modification		
County:	Wayne		
Miscellaneous			
Receiving Stream:	Neuse River	State Grid:	F26NE
Stream Classification:	WS-IV; NSW	USGS Quad:	NW Goldsboro
Drainage Area (mi^2):	2,050	303(d) Listed?	No, TMDL is in effect for TN
Summer 7Q10 (cfs)	263	Sub-basin/HUC:	030412/03050105
Winter 7Q10 (cfs):	260	Regional Office:	Washington
30Q2 (cfs)	375	Permit Writer:	Teresa Rodriguez
Average Flow (cfs):	1,100	Date:	
IWC (%):	Outfall 001 - 1.3%	SIC/NAICS code	4911 / 2211

SUMMARY

This is a renewal and modification of the Duke Energy permit for the H. F. Lee Energy Complex in Wayne County. The current permit includes three NPDES permitted outfalls (001,002, 003), none of which are flow-limited in the existing permit. One new outfall will be added to the permit (Outfall 004) for the wastewaters generated from the future coal ash beneficiation plant. The Lee Combined Cycle Plant consists of 3 combined cycle combustion turbines brought online in 2012. Also, located on the site is the Wayne County Combustion Turbine Plant/Site which consists of 5 simple cycle combustion turbines, four of them brought online in 2000 and the fifth in 2009. Altogether, the five simple cycle combustion turbines and the three combined cycle combustion turbines generate a total electric capacity of over 1800 Megawatts. All units are capable of firing oil and natural gas.

Previously, the H.F. Lee Energy Complex had three coal-fired units and four oil-fueled combustion turbine units. These were retired in September and October of 2012. The coal-fired generating units and the four oil-fueled combustion turbines have been demolished and the coal pile was recently removed.

The H.F. Lee Combined Cycle Power Plant has more than twice the capacity of the retired coal plant with significant emissions reductions of carbon dioxide, sulfur dioxides, nitrogen oxides, and mercury.

TN BACKGROUND:

While in operation, the coal-fired Steam Electric Plant installed a Rotamix selective catalytic reduction (SCR) system in 2007, in response to air pollution control requirements. This incurred a total nitrogen discharge, and the facility joined the Neuse River Compliance Association (NRCA). The Rotamix selective catalytic reduction (SCR) system used to remove a majority of nitrogen oxides in the Steam Electric Plant was retired in 2012. Even though the facility is currently classified as "non-nutrient bearing", Duke Energy remains a member of the NRCA and its nitrogen discharge is governed by the Compliance Association's permit NCC000001.

RECEIVING WATERS:

Receiving water is the Neuse River. The Neuse River is a class WS-IV; NSW waterbody in the Neuse River Basin. The facility outfalls are located approximately 8-10 miles upstream of Goldsboro's potable water supply intake.

TECHNOLOGY BASED EFFLUENT GUIDELINES:

H.F. Lee is subject to EPA effluent guideline limits per 40 CFR 423 - Steam Electric Power Generating Point Source Category as amended November 3, 2015. The facility is also subject to the Cooling Water Intake Structures Rules (40 CFR 125) effective October 14, 2014 and to the North Carolina Senate Bill 729 - Coal Ash Management Act (CAMA).

OUTFALL DESCRIPTIONS:

Discharges to Outfall 001 Active Ash basin

No process wastewater flows are being sent to the active ash basin. The active ash basin is actually not active but is named that on all the maps in the application and sometimes referred to as the 1982 ash basin. Fly ash and bottom ash wastewaters were sent to this basin when the plant used coal-fired units. Ash transport wastewaters and additional wash waters from the precipitator and air pre-heater that were typically sent to the ash basin have all ceased. Wastewaters from the Filter Plant (water treatment), the Wayne County Combustion Turbine Site, low volume wastes, and other miscellaneous wastes that were once directed to the ash basin have all been redirected to Outfall 002 since 2012.

Duke Energy wants to maintain Outfall 001 for decanting the ash basin which would later be followed by dewatering. Within the next year or two after permit issuance, Duke Energy expects to start groundwater remediation on the eastern side of the ash basin. Extracted groundwater would be treated in the same wastewater treatment system (WTS) as the decant/dewatering wastewaters and discharged through Outfall 001.

No other wastewaters are to be discharged through Outfall 001 to the Neuse River except those treated in the WTS.

Background on previous IWC used for Outfall 001: The historical average flow of the Ash Pond wastewaters discharged to Outfall 001 is 2.5 MGD. Outfall 001 did not have a flow limit, and flows varied. The permit issued in 2010 used an Instream Wastewater Concentration (IWC) of 2.1%, which was determined using a discharge flow of 3.58 MGD. This flow value was the 95'th percentile of the maximum daily effluent flow data collected between 2006 and September 2008.

In 2010, the Whole Effluent Toxicity Testing concentration was changed to 2.1% from 1.41% used in the 2004 permit.

Ash Basin Seeps
The facility identified 9 seeps (all non-engineered). All nine seeps are located around the active ash basin. Seeps will be addressed through Special Order by consent EMC SOC WQ S18-006.

Discharges to Outfall 002 Cooling Pond
The facility uses an existing 545 acre closed-cycle cooling pond with baffled dikes to treat recirculating condenser cooling and process water. Approximately 369 MGD of condenser cooling water is re-circulated in the pond each day. Eleven MGD are lost to evaporation and seepage. The applications states that 3-5 MGD are lost to natural evaporation during times the units are in full operation. Up to 12.7 MGD can be withdrawn from the Neuse as make-up water. Until recently, the Cooling Pond has not had a direct discharge to the Neuse since 1998 and a discharge is only expected during an extremely heavy rainfall event or a hurricane.

Hurricane Matthew hit North Carolina starting on Oct. 8, 2016 and the Neuse River rose above the berm surrounding the H.F. Lee cooling pond. In an article published by the Charlotte Observer on Oct. 12, 2016, USGS said, the Neuse near Goldsboro peaked at 29.7 feet, breaking the record of 28.8 feet set after Hurricane Floyd in 1999. As the Neuse receded, a 50-foot crack developed in the berm surrounding the cooling pond which holds 1.2 billion gallons. Wastewater flowing through the cracked berm discharged to the Neuse River, there has been no estimate on the total volume discharged at this point.

Rain from Hurricane Florence (September 2018) again caused the Neuse River to rise and enter the cooling pond. The cooling pond discharged through the spillway (Outfall 002) during this storm event.

In addition to the recirculating condenser cooling and process water, other wastewaters sent to the cooling pond include: cooling tower blowdown from the Wet Surface Air Cooler and the combined cycle Heat Recovery Steam Generator (HRSG), Wayne County Combustion Turbine Site wastewaters which pass through a sump lift station, reverse osmosis reject wastewaters from the water treatment plant, and Lee Combined Cycle Plant Site wastewaters which are initially treated with an oil/water separator. Sanitary wastewaters are no longer discharged to the cooling pond. Storm water from containment areas and miscellaneous wastewaters as described in the updated permit renewal application submitted on August 31, 2016 are discharged to the cooling pond, as well. On occasion wastewaters from the clarifier in the water treatment plant are sent to the cooling pond. Coal pile runoff, which has ceased, and low volume wastewaters regulated under 40 CFR 423, are discharged to the cooling pond.

Cooling Pond Seeps
The facility identified 15 unpermitted seeps (all non-engineered). All 15 seeps are located around the cooling pond. Seeps will be addresses through Special Order by Consent EMC SOC WQ S18-006.

Discharges to Outfall 002 Cooling Pond or Outfall 003
Outfall 003 was permitted in 2010 in order to prepare for the retirement of the 3 coal-fired units in 2012 and the construction of the natural gas-fired combined cycle generation facility. However, in early 2013 the discharge to Outfall 003 was discontinued after one month due to operational concerns with total suspended solids. Wastewaters were re-routed to the cooling pond from Outfall 003 to accommodate modifications needed to be made to the outfall structure. These modifications were to be conducted after the permit from the US Army Corps of Engineers was secured. Currently no wastewaters are being sent to Outfall 003 which discharges to the Neuse River.

Duke Energy would like the option to send certain waste streams, currently discharged to the Cooling Pond (Outfall 002), to Outfall 003 in emergency conditions only. These waste streams include: cooling tower blowdown from the Wet Surface Air Cooler and the combined cycle Heat Recovery Steam Generator (HRSG), Wayne County Combustion Turbine Site wastewaters which pass through a sump lift station, reverse osmosis reject wastewaters from the water treatment plant, Lee Combined Cycle Plant Site wastewaters which are initially treated with an oil/water separator, low volume wastewaters, and equipment and containment drain wastewaters. The Aug. 31, 2016 application estimated the total average flow to Outfall 003 at 0.5 MGD.

Discharge to proposed Outfall 002A – additional outfall in cooling pond
The heavy rains from Hurricane Matthew (October 2016) caused the Neuse River to rise high enough to enter the cooling pond at H.F. Lee through Outfall 002 and by over topping the cooling pond dike. As a result of the severe weather conditions, the dike of the cooling pond breached in the southeast corner of the pond. Duke Energy is proposing to add a new emergency outfall at the site of the breach. The addition of the new emergency outfall would avoid a scenario where the pond breaches because of the influx of water from the river. The new Outfall, identified as Outfall 002A in the permit, would only be used in the event of severe weather or required maintenance.

Rain from Hurricane Florence (September 2018) again caused the Neuse River to rise and enter the cooling pond. The cooling pond discharged through the spillway during this storm event. The new emergency outfall was not used.

COMPLIANCE REVIEW/PROPOSED ACTIONS

Outfall 001 – Active Ash Basin
This outfall is subject to the Effluent Limitations Guidelines (ELG) in Table 1.
Table 1. ELG Outfall 001 (BPT Low volume waste sources)

Pollutant	Daily Maximum (DM)	Monthly Average (MA)	ELG
TSS	100 mg/l	30 mg/l	40 CFR 423.12 (b) (3) and (4)
Oil & Grease	20 mg/l	15 mg/l	40 CFR 423.12 (b) (3) and (4)
pH	6 to 9 SU		40 CFR 423.12 (b) (1)
PCB's	No discharge of PCB's		40 CFR 423.12 (b) (2)

The facility normally incinerates chemical metal cleaning waste and stated no such wastes have been sent to the 1982 ash basin for disposal.

These Effluent Guidelines are in effect in the current permit and will be maintained for Outfall 001 in the renewal. In 2016, Duke Energy started to decant some wastewaters from the active ash basin but after 3 months, decanting ceased. Upon permit renewal, Duke Energy is planning to begin the Ash Pond decommissioning which will start with decanting followed by dewatering of the active ash basin.

Phase 1. Ash Basin Decanting/Normal Operations at Outfall 001:

To begin decommissioning, bulk and interstitial ash basin water will be decanted from the active ash pond through Outfall 001. If necessary to meet water quality standards, wastewater treatment will be brought onsite to assist in the process. All decant wastewaters would pass through the Wastewater Treatment System (WTS) prior to being discharged through Outfall 001. The WTS will be designed to handle a minimum flow of 500 gpm and a maximum flow of 1500 gpm (2.16 MGD). As stated in the permit renewal, the level of water in the ash pond should not be lowered more than 1 ft/day during the decanting phase.

- DMR review:

Except for the decanting of the active ash basin for 3 months in 2016, there has been no discharge from Outfall 001 since October 2012. The historical average flow from Outfall 001 is 2.5 MGD. DMR data from 2016, 2C data submitted with the November 2012 renewal application, and data from samples of free water located above the settled layer of ash taken on Feb. 15, 2015, were all reviewed. There were no violations of permit limits.

Table 2. 2016 DMR Summary Outfall 001 - Ash Basin Decanting

Parameter	Average	Maximum	Minimum
Flow (MGD)	0.52	0.81	0.026
TSS (mg/l)	<5	7.6	< 5
O & G (mg/l)	< 5	< 5	< 5
Nitrite plus Nitrate (mg/L)	0.012	0.02	0.01
Arsenic (µg/L)	12.9	18.4	5.95
Selenium (µg/L)	10.7	15.4	10.7
Total Nitrogen (mg/l)	0.25	0.35	0.17
Total Phosphorus (mg/l)	0.012	0.015	0.01
pH (S.U.)	7.8	8.7	7.1

Passed 2 of 2 toxicity tests during three months of decant discharge.

- RPA Outfall 001- Ash Basin Decanting:

The need for toxicant limits is based upon a demonstration of reasonable potential to exceed water quality standards, a statistical evaluation that is conducted during every permit renewal utilizing the most recent effluent data for each outfall. The Reasonable Potential Analysis (RPA) is conducted in accordance with 40 CFR 122.44 (d) (i). The NC RPA procedure utilizes the following: 1) 95% Confidence Level/95% Probability; 2) assumption of zero background; 3) use of ½ detection limit for "less than" values; and 4) streamflows used for dilution consideration based on 15A NCAC 2B.0206. Effective April 6, 2016, NC began implementation of dissolved metals criteria in the RPA process in accordance with guidance titled *NPDES Implementation of*

Instream Dissolved Metals Standards, dated June 10, 2016. This guidance is attached to the fact sheet.

A reasonable potential analysis was performed for arsenic, antimony, barium, cadmium, chlorides, chromium, copper, fluoride, lead, mercury, molybdenum, nickel, selenium, sulfate, thallium, and zinc. A reasonable potential analysis was conducted using the maximum effluent value reported from one of the following sources: 2016 DMR data, Nov. 2012 2C application form, and the Ash basin free water samples submitted to DWR on March 11, 2015. Pollutants of concern for the decant wastewater included toxicants with positive detections and associated water quality standards/criteria. The maximum wastewater treatment plant design flow of 2.16 MGD was used in the RPA along with historical 7Q10 and average flow statistics for the Neuse River. Upstream drainage statistics from the Neuse River near Clayton, provided by USGS on May 15, 2009, supported the use of the historical values.

Based on this analysis, the following permitting actions are proposed for this permit:

- Effluent Limit with Monitoring. The following parameters will receive a water quality-based effluent limit (WQBEL) since they demonstrated a reasonable potential to exceed applicable water quality standards/criteria: None.
- Monitoring Only. The following parameters will receive a monitor-only requirement since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria, but the maximum predicted concentration was >50% of the allowable concentration: total selenium.
- No Limit or Monitoring: The following parameters will not receive a limit or monitoring, since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration: antimony, barium, cadmium, chlorides, chromium, copper, fluoride, lead, molybdenum, nickel, sulfate, thallium, and zinc. Mercury and arsenic did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration; however, they continue to be pollutants of concern and monitoring for these parameters was maintained in Outfall 001 as discussed below.
- Summary of new limits added based on RPA: none.
- Summary of existing limits deleted based on RPA: none.

- Toxicity Testing:

Current Requirement: Outfall 001 – Chronic P/F @ 2.1% using Ceriodaphnia, Quarterly
Recommended Requirement: Outfall 001– Chronic P/F @ 1.3% using Ceriodaphnia, Monthly
The new Instream Waste Concentration (IWC) of 1.257%, rounded to 1.3 %, is based on the maximum design flow of 2.16 MGD for the Wastewater Treatment System and the historical summer 7Q10 flow of 263 cfs.

- Mercury Evaluation:

Four samples were provided on mercury as follows:
November 2C application 2C data - < 200 ng/L
March 2015 active ash basin free water samples: <0.5 ng/L, 1.35 ng/L, <0.5 ng/L
Annual average discharge limitations for mercury at Outfall 001 are based on a Technology Based Effluent Limitation (TBEL) of 47 ng/L and a Water Quality Based Effluent Limitation (WQBEL)

of 955 ng/L. The TBEL was established in the 2012 NPDES Mercury TMDL Implementation Strategy and the WQBEL is based on the Water Quality Standard of 12 ng/L divided by the IWC. Data shows Duke Energy can comply with the TBEL during Ash Basin decanting, however, mercury monitoring will be added to the permit since it is a pollutant of concern. No limits are required for mercury.

Table 3. Monitoring Requirements/Proposed Changes Outfall 001 – Ash Basin Decanting

Parameter	Existing Effluent Limit / Monitoring requirements	Changes	Basis
Flow	Monitor	2.16 MGD DM	15A NCAC 2B.0505
TSS	30 mg/l MA 100 mg/l DM	No changes	40 CFR 423.12(b)(3) and (4)
Oil & Grease	15 mg/l MA 20 mg/l DM	No changes	40 CFR 423.12(b)(3) and (4)
Total Selenium and Total Arsenic	Monitor quarterly	Monitor monthly	Pollutant of concern for ash. Selenium based on RPA.
Total Mercury	No requirement	Monthly Monitoring	Pollutant of concern for ash.
Total Hardness	No requirement	Monthly Monitoring	Collect data for RPA
Turbidity	No requirement	Monthly Monitoring	Required by EPA per letter dated Feb. 25, 2009.
Total Nitrogen Total Phosphorus	Weekly Monitoring	Monthly Monitoring	15A NCAC 2B .0500, Neuse Nutrient Management Strategy, NRCA membership
Nitrate/nitrite as N	Weekly Monitoring	Monthly Monitoring	Pollutant of Concern for WS waters
pH	6 to 9 SU	No changes	State WQ standards, 15A NCAC 2B .0200 and 40 CFR 423.12 (b) (1)

Phase II. Ash Basin Dewatering and Groundwater Remediation at Outfall 001:

Secondly, to meet the requirements of the Coal Ash Management Act of 2014, the facility will dewater the ash pond by removing the interstitial water in the ash and then excavate the ash to deposit it in approved landfills. After decanting is completed and when water in the ash settling basin is lowered to within three feet of the ash deposits, the Permittee will begin dewatering. As with decanting, wastewater treatment will be provided if needed. Ash Basin dewatering flows, as well as storm water from the WTS pad area, may be treated at the WTS prior to being discharged through Outfall 001. The facility's discharge rate from the dewatering process is estimated to be 500 gpm to 1500 gpm (2.16 MGD).

Within the first two years after permit issuance, Duke Energy will design an extraction well system to treat contaminated groundwater on the eastern side of the active ash basin. The groundwater will be extracted, pumped to a sump, and treated in the same WTS as the bulk and

interstitial ash basin water. The wastewaters will discharge through Outfall 001 to the Neuse River.

The facility submitted data for the standing surface water in the active ash pond, interstitial water in the ash, and interstitial ash water that was treated by filters of various sizes. The facility's estimated discharge rate for the groundwater extraction is 0.9-1.8 MGD. Groundwater monitoring data from wells on the eastern and southeastern side of the active ash basin were reviewed. To introduce a margin of safety the highest measured concentration of a parameter from the active ash basin or the groundwater wells was used in the reasonable potential analysis. The maximum Wastewater Treatment System design flow of 2.16 MGD was used as the permitted flow.

- RPA Outfall 001- Ash Basin Dewatering:

A reasonable potential analysis was performed for arsenic, antimony, barium, cadmium, chlorides, chromium, cobalt, copper, fluoride, lead, mercury, molybdenum, nickel, selenium, sulfate, thallium, total dissolved solids and zinc
Based on this analysis, the following permitting actions are proposed for the dewatering phase:

- Effluent Limit with Monitoring. The following parameters will receive a water quality-based effluent limit (WQBEL) since they demonstrated a reasonable potential to exceed applicable water quality standards/criteria: arsenic.
- Monitoring Only. The following parameters will receive a monitor-only requirement since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria, but the maximum predicted concentration was >50% of the allowable concentration: none
- No Limit or Monitoring: The following parameters will not receive a limit or monitoring, since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration: antimony, barium, cadmium, chlorides, chromium, cobalt, copper, fluoride, lead, molybdenum, nickel, sulfate, thallium, and zinc. Mercury and selenium did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration; however, they continue to be pollutants of concern and monitoring for these parameters was maintained in Outfall 001.

Monitoring requirements for Outfall 001 – Ash Pond Dewatering and Groundwater Extraction are the same as Table 3 for most parameters. Arsenic limitations have been added and sampling frequencies were increased to weekly for all parameters except nutrients and toxicity.

Phase III. Groundwater Remediation:

Thirdly, after completing the decanting and dewatering of the ash basin groundwater remediation may still be occurring. The groundwater remediation wastewaters will be treated in the WTS prior to being discharged through Outfall 001.

Groundwater extraction will continue at an estimated rate of 0.9-1.8 MGD. To introduce a margin of safety the highest measured concentration of a parameter from the groundwater monitoring wells was used in the reasonable potential analysis.

- RPA Outfall 001- Groundwater Remediation:

A reasonable potential analysis was performed for arsenic, cadmium, copper, nickel, selenium, nitrates, thallium, and zinc.
Based on this analysis, the following permitting actions are proposed for the dewatering phase:

- Effluent Limit with Monitoring. The following parameters will receive a water quality-based effluent limit (WQBEL) since they demonstrated a reasonable potential to exceed applicable water quality standards/criteria: none
- Monitoring Only. The following parameters will receive a monitor-only requirement since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria, but the maximum predicted concentration was >50% of the allowable concentration: none.
- No Limit or Monitoring: The following parameters will not receive a limit or monitoring, since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration: monitoring will be required for parameters of concern even though the maximum predicted was not > 50% (arsenic, cadmium, copper, lead, mercury, barium, and selenium).

Effluent Limits & Monitoring requirements for Outfall 001 – Groundwater Extraction are listed below in Table 4.

Table 4. Effluent Limits & Monitoring Requirements - Proposed discharge to Outfall 001 - Groundwater Remediation:

Parameter	Effluent Limits	Monitoring requirements	Basis
Flow	1.8 MGD	Weekly	15A NCAC 2B.0505 and gw treatment max design
Total arsenic	No limit	Monthly Monitoring	Pollutant of concern for ash.
Total selenium	No limit	Monthly monitoring	Pollutant of concern for ash.
Total mercury	No limit	Monthly monitoring	Pollutant of concern for ash.
Total cadmium	No limit	Monthly monitoring	Pollutant of concern for ash.
Total copper	No limit	Monthly monitoring	Pollutant of concern for ash.
Total lead	No limit	Monthly monitoring	Pollutant of concern for ash.
Total barium	No limit	Monthly monitoring	Pollutant of concern for ash.
Total Hardness	No limit	Monthly monitoring	Collect data for RPA
Turbidity	No limit	Monthly monitoring	Required by EPA letter dated Feb. 25, 2009
Total Nitrogen	No limits	Monthly monitoring	15A NCAC 2B .0500, Neuse Nutrient Management

Total Phosphorus			Strategy, NRCA membership
Nitrate/nitrite as N	No limit	Monthly monitoring	Pollutant of Concern for WS waters
pH	6 to 9 SU	2/Month	State WQ standards, 15A NCAC 2B .0200 and 40 CFR 423.12 (b) (1)

Outfall 002 and 002A Cooling Pond

These outfalls are subject to the Effluent Limitations Guidelines (ELG) in Table 5.

Table 5. ELG Outfall 001 (BPT/BAT for Low volume waste sources, cooling tower blowdown, and coal pile runoff apply)

Pollutant	**Daily Maximum (DM)**	**Monthly Average (MA)**	**ELG**
TSS	50 mg/l	30 mg/L	40 CFR 423.12 (b) (3) and (9)
Oil & Grease	20 mg/l	15 mg/L	40 CFR 423.12 (b) (3)
pH	6 to 9 SU		40 CFR 423.12 (b) (1)
PCB's	No discharge of PCB's		40 CFR 423.12 (b) (2)
Free available chlorine	0.5 mg/L	0.2 mg/L	40 CFR 423.13 (d) (1)
126 priority pollutants	No detectable amount (engineering. calc. allowed)		40 CFR 423.13 (d) (1)
Total Chromium	0.2 mg/L	0.2 mg/L	40 CFR 423.13 (d) (1)
Total Zinc	1.0 mg/L	1.0 mg/L	40 CFR 423.13 (d) (1)
Add footnotes for free chlorine, TRC, and 126 priority pollutants			40 CFR 423.13 (d) (1)

The facility normally incinerates chemical metal cleaning waste and stated no such wastes have been sent to the Cooling Pond for disposal.

There has been no discharge from Outfall 002 since 1998. In October of 2016 heavy rain from Hurricane Matthew caused river water to over-top the cooling pond dike and enter the pond through Outfall 002 structure. The cooing pond breached in the southeast corner and Duke Energy is proposing to add a new emergency outfall at the site of the breach. The new Outfall, identified as Outfall 002A in the permit, will only be used in the event of severe weather or required maintenance.

- DMR review:

Results of a process control sample from the sites cooling pond taken in close proximity to Outfall 002 was submitted with an updated 2C form on March 11, 2015. To introduce a margin of safety the maximum reported concentration of a parameter from the 2C application was used in the reasonable potential analysis. There were no violations of permit limits for Outfall 002 during the last five years.

- RPA Outfall 002- Cooling Pond:

A reasonable potential analysis was performed for arsenic, antimony, barium, cadmium, chromium, copper, fluoride, lead, mercury, molybdenum, nickel, selenium, sulfate, thallium, and zinc.

Based on this analysis, the following permitting actions are proposed for the cooling pond:

- Effluent Limit with Monitoring. The following parameters will receive a water quality-based effluent limit (WQBEL) since they demonstrated a reasonable potential to exceed applicable water quality standards/criteria: total molybdenum
- Monitoring Only. The following parameters will receive a monitor-only requirement since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria, but the maximum predicted concentration was >50% of the allowable concentration: none
- No Limit or Monitoring: The following parameters will not receive a limit or monitoring, since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration: antimony, barium, cadmium, chromium, copper, fluoride, lead, nickel, sulfate, thallium, and zinc. Mercury and arsenic did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration; however, they continue to be pollutants of concern and monitoring for these parameters was included in Outfall 002 and 002A.

Effluent Limitations and Monitoring requirements for Outfall 002 – Cooling Pond are listed below in Table 6.

- Toxicity Testing:

Current Requirement: Outfall 002 – Acute Episodic Toxicity using Fathead Minnow, 24 hr static test, first five discrete discharge events than annually
Recommended Requirement: Outfall 002 – Acute Episodic Toxicity using Fathead Minnow, 24 hr static test, first five discrete discharge events than annually

In addition to a review of the 2C data for Outfall 002, discharge data from cooling pond seeps was evaluated to assess if other parameters should be monitored at Outfall 002. A review of the cooling pond seep data showed significant levels of arsenic, lead, mercury and fluoride. However, antimony, cadmium, and selenium were tested at levels below detection for all cooling pond seeps. Based on the RPA evaluation of the cooling pond seep data and the limited effluent data for Outfall 002, monitoring for arsenic, lead, mercury and fluoride were added to Outfall 002.

Table 6. Monitoring Requirements/ Proposed Changes Outfall 002 – Cooling Pond

Parameter	Existing Effluent limits/Monitoring requirements	Changes	Basis
Flow	Monitor each event	No changes	15A NCAC 2B.0505
TSS	30 mg/l MA 100 mg/l DM	Daily maximum for TSS changed to 50 mg/L	MA - 40 CFR 423.12(b)(4) DM - 40 CFR 423 (b) (9) coal pile runoff was discharged to the cooling pond until recently.l
Oil & Grease	15 mg/l MA 20 mg/l DM	No changes	40 CFR 423.12(b)(4)

Temperature	32.0 °C	No changes	State WQ standards, 15A NCAC 2B .0200
Total chromium	No requirement	Added limits and monitoring 0.2 mg/L MA 0.2 mg/L DM	40 CFR 423.13 (d)(1)
Total zinc	No requirement	Added limits and monitoring 1.0 mg/L MA 1.0 mg/L DM	40 CFR 423.13 (d)(1)
Total iron	Monitor	Eliminate monitoring	State standard removed
Total molybdenum	No requirement	Added limits and monitoring 13,134 µg/L MA 13,134 µg/L DM	Reasonable potential to exceed water quality criteria.
Total arsenic	Monitor	No changes	Pollutant of concern for ash and cooling pond seep discharge
Total lead, mercury, and fluoride.	No requirement	Added event monitoring	Pollutants of concern for ash and cooling pond seep discharge
Total Hardness	No requirement	Added event monitoring	Collect data for RPA
Total Residual Chlorine	No requirement	Added limit and monitoring 28.0 µg/L DM	State WQ standards, 15A NCAC 2B .0200
Free Chlorine	No requirement	Added limits and monitoring 0.2 mg/L MA 0.5 mg/L DM	40 CFR 423.13 (d) (1) and footnotes 40 CFR 423.13 (d) (2) and (3)
pH	6 to 9 SU	No changes	State WQ standards, 15A NCAC 2B .0200

Outfall 002A was given the same Effluent Limitations and Monitoring Requirements as Outfall 002. Duke Energy submitted three analytical test analysis (full effluent pollutant scans) from the discharge at the cooling pond breach in October 2016. The analysis reported most parameters as non-detectable and detected samples were all less than water quality standards/criteria.

Outfall 003- Primarily Combined Cycle Plant Site Wastewaters and Blowdown
This outfall is subject to the Effluent Limitations Guidelines (ELG) in Table 7.

Table 7. ELG Outfall 001 (BPT/BAT for Low volume waste sources and cooling tower blowdown)

Pollutant	**Daily Maximum (DM)**	**Monthly Average (MA)**	**ELG**
TSS	100 mg/l	30 mg/l	40 CFR 423.12 (b) (3)
Oil & Grease	20 mg/l	15 mg/l	40 CFR 423.12 (b) (3)
pH	6 to 9 SU		40 CFR 423.12 (b) (1)
PCB's	No discharge of PCB's		40 CFR 423.12 (b) (2)

Free available chlorine	0.5 mg/L	0.2 mg/L	40 CFR 423.13 (d) (1)
126 priority pollutants	No detectable amount (engineering. calc. allowed)		40 CFR 423.13 (d) (1) and (2)
Total Chromium	0.2 mg/L	0.2 mg/L	40 CFR 423.13 (d) (1)
Total Zinc	1.0 mg/L	1.0 mg/L	40 CFR 423.13 (d) (1)
Add paragraph on free chlorine and TRC			40 CFR 423.13 (d) (2)

The facility normally incinerates chemical metal cleaning waste and stated no such wastes have been sent to the Cooling Pond for disposal.

Outfall 003 first discharged in January 2013 but the discharge was discontinued after one month due to operational concerns. To introduce a margin of safety the maximum reported concentration of a parameter from the Nov. 2012 2C application was used in the reasonable potential analysis. There were no violations of permit limits for Outfall 003 during the last five years.

- RPA Outfall 003- Combined Cycle Plant Site Wastewaters and Blowdown:

A reasonable potential analysis was performed for arsenic, antimony, barium, cadmium, chromium, copper, fluoride, lead, mercury, molybdenum, nickel, selenium, sulfate, thallium, and zinc.
Based on this analysis, the following permitting actions are proposed for Outfall 003:

- Effluent Limit with Monitoring. The following parameters will receive a water quality-based effluent limit (WQBEL) since they demonstrated a reasonable potential to exceed applicable water quality standards/criteria: none
- Monitoring Only. The following parameters will receive a monitor-only requirement since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria, but the maximum predicted concentration was >50% of the allowable concentration: total selenium
- No Limit or Monitoring: The following parameters will not receive a limit or monitoring, since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration: antimony, barium, cadmium, chromium, copper, fluoride, lead, nickel, sulfates, thallium, and zinc. Mercury, molybdenum, and arsenic did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration; however, they continue to be pollutants of concern and monitoring for these parameters was included in Outfall 003 for reasons discussed in Table 8, below.

- Toxicity Testing:

Current Requirement: Outfall 003 – Acute Toxicity using Fathead Minnow, 24 hr static test, first five discrete discharge events than annually
Recommended Requirement: Outfall 003 – Acute Toxicity using Fathead Minnow, 24 hr static test, first five discrete discharge events than annually

Duke Energy proposed having the option to discharge the following waste streams, currently discharged to the Cooling Pond (Outfall 002), to Outfall 003 in emergency conditions only. These waste streams include: cooling tower blowdown from the Wet Surface Air Cooler and the

combined cycle Heat Recovery Steam Generator (HRSG), Wayne County Combustion Turbine Site wastewaters which flow through the sump lift station, reverse osmosis reject wastewaters from the water treatment plant, Lee Combined Cycle Plant Site wastewaters which are initially treated with an oil/water separator, low volume wastewaters, and equipment and containment drain wastewaters. As a result, it is recommended that the same parameters regulated in Outfall 002 be regulated in Outfall 003 along with selenium which is based on the RPA evaluation, above. Parameters required for Sanitary discharges (BOD and fecal coliform) along with the lower TSS limitation for coal pile runoff can be removed since neither of these waste streams will discharge to Outfall 003.

Table 8. Monitoring Requirements/ Proposed discharge to Outfall 003 - Combined Cycle Plant Site Wastewaters and Blowdown

Parameter	Existing Limits/ Monitoring requirements	Changes	Basis
Flow	Monitor each event	No changes	15A NCAC 2B.0505
TSS	30 mg/l MA 100 mg/l DM	No changes	40 CFR 423.12 (b) (3)
Oil & Grease	15 mg/l MA 20 mg/l DM	No changes	40 CFR 423.12 (b) (3)
Total chromium	No requirement	Added limits and monitoring 0.2 mg/L MA 0.2 mg/L DM	Added monitoring and limits per 40 CFR 423.13 (d) (1)
Total zinc	Monthly Monitoring	Added limits 1.0 mg/L MA 1.0 mg/L DM	Maintained monitoring and added limits per 40 CFR 423.13 (d) (1)
Temperature	32.0 °C	No changes	State WQ standards, 15A NCAC 2B .0200
Total selenium	No requirement	Added monitoring	Maximum predicted concentration greater than 50% of the allowable
Total copper	Monthly monitoring	Eliminate monitoring	No RP
Turbidity	No requirement	Monthly Monitoring	Required by EPA per letter dated Feb. 25, 2009.
Total arsenic, Total lead, total molybdenum, total mercury, and fluoride	No requirement	Added quarterly monitoring	Pollutants of concern or metals contained in cooling pond discharge that could be discharged to Outfall 003.
Total Hardness	No requirement	Added quarterly monitoring	Collect data for RPA
Total Residual Chlorine	No requirement	Limit and monitoring 28.0 µg/L DM	State WQ standards, 15A NCAC 2B .0200

Free Chlorine	No requirement	Limit and monitoring 0.2 mg/L MA 0.5 mg/L DM	40 CFR 423.13 (d) (1) and footnotes 40 CFR 423.13 (d) (2) and (3)
pH	6 to 9 SU	No changes	State WQ standards, 15A NCAC 2B .0200

Seep outfalls from the Active Ash Basin:

The Division identified 9 non-engineered discharges from 19 seeps located around the ash settling basins. Seeps will be addressed through Special Order by consent EMC SOC WQ S18-006.

Outfall 004- Beneficiation Plant
A new outfall for the discharge of the ash beneficiation facility is being added to the permit. The facility will install a coal ash beneficiation system for ash reuse. The excavated ash will be re-burned to remove carbon to make the material usable for reuse as a product in cement. Ponded ash will be taken out of the ash basin and placed in an enclosed load-out area before its used in the beneficiation unit. Wastewaters generated include truck wash water, waste water for dust suppression and stormwater that comes in contact with the ash. Wastewaters will be collected in a holding basin and treated in an oil/water separator. Flow is expected to be less than 0.005 MGD. Duke Energy is requesting the option to discharge to the Neuse River or to the cooling pond.

To provide a wastewater characterization Duke Energy submitted data from a similar facility in operation at another site. These data were used to complete an RPA.

A reasonable potential analysis was performed for arsenic, antimony, barium, cadmium, chromium, copper, chlorides, TDS, lead, mercury, nickel, selenium, sulfate, thallium, and zinc. Based on this analysis, the following permitting actions are proposed for Outfall 003:

- Effluent Limit with Monitoring. The following parameters will receive a water quality-based effluent limit (WQBEL) since they demonstrated a reasonable potential to exceed applicable water quality standards/criteria: Mercury.
- Monitoring Only. The following parameters will receive a monitor-only requirement since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria, but the maximum predicted concentration was >50% of the allowable concentration: none.
- No Limit or Monitoring: The following parameters will not receive a limit or monitoring, since they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration: arsenic, antimony, barium, cadmium, chromium, copper, chlorides, TDS, lead, mercury, nickel, selenium, sulfate, thallium, and zinc did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration; however, they continue to be pollutants of concern and monitoring for these parameters was included in Outfall 004 for reasons discussed in Table 9., below.

Table 9. Monitoring Requirements Proposed Beneficiation Plant

Parameter	*Limits/Monitoring requirements*	*Basis*
Flow	Monitor	15A NCAC 2B.0505
pH	6 to 9 S.U.	State WQ standards, 15A NCAC 2B .0200 and 40 CFR 423.12(b)(1)
TSS	30 mg/L MA 100 mg/L DM	40 CFR 423.12(b)(3)
Oil & Grease	15 mg/L MA 20 mg/L DM	40 CFR 423.12(b)(3)
Total Dissolved Solids, Total hardness, chlorides, sulfates, arsenic, selenium, copper, lead, nickel, thallium, and zinc.	Monitor	Parameters of concern
Total Mercury	47 ng/l annual limit	Mercury was detected at 47 ng/l in the effluent to the beneficiation plant used as wastewater characterization.

316(b) REQUIREMENTS:

The site utilizes a 545 acre off-stream closed cycle cooling pond for condenser cooling and process water. Water is withdrawn from the Neuse River to make up losses from the cooling pond. Volume withdrawn is approximately 12 MGD. The permittee shall comply with the Cooling Water Intake Structure Rule per 40 CFR 125.95. The permittee shall submit all the materials required by the Rule 3.5 years from the permit effective date.

The rule requires the Director to establish interim BTA requirements in the permit on a site-specific basis based on the Director's best professional judgment in accordance with §125.90(b) and 40 CFR 401.14. The existing closed-cycle system at HF Lee is one of the pre-approved compliance alternatives for impingement in accordance with §125.94(c)(1). EPA also considered it as a pre-approved BTA for entrainment, but excluded it from the rule due to the cost concerns. Based on this information the DEQ has determined that the existing closed-cycle cooling system meets the requirements for an interim BTA.

INSTREAM MONITORING:

The current permit does not require instream monitoring. The proposed permit will require upstream and downstream, monthly instream monitoring (upstream of Outfall 002 - at the Railroad bridge, and downstream of Outfall 003 – at Stevens Mill Road bridge) for total arsenic, total selenium, total mercury (method 1631E), total chromium, dissolved lead, dissolved cadmium, dissolved copper, dissolved zinc, bromide, total hardness, and total dissolved solids (TDS). In addition the permit requires fish tissue annual monitoring for arsenic, selenium and mercury.

SUMMARY OF PROPOSED CHANGES (Draft permit public noticed on November 9, 2016)

- Effluent Limits and Monitoring Requirements were added for Outfall 001 (Phase II) for the dewatering and groundwater remediation wastewaters to be discharged after decanting of the active ash basin is completed. See condition A. (2).
- Effluent Limits and Monitoring Requirements were added for Outfall 001 for the groundwater remediation and landfill leachate wastewaters to be discharged after

dewatering of the active ash basin is completed. This effluent page for Outfall 001 (Phase III) becomes effective with the commencement and discharge of landfill leachate. See condition A. (3).

- New Outfall effluent pages were added for ash basin seeps: 101A LOLA, 101B LOLA, 102, 109, 118, 125, 126, 103A, and 128. See conditions A. (7.) through A. (15.).
- New Outfall effluent pages were added for cooling pond seeps: CPS-201, CPS-202, CPS-203, CPS-204, CPS-205, CPS-215, CPS-216, CPS-207, CPS-208, CPS-209, CPS-217, CPS-218, CPS-219, CPS-220, and CPS-221. See conditions A. (16.) through A. (30.).
- Effluent Limits and Monitoring Requirements were revised for Outfall 002 as follows:
    - BOD and fecal coliform monitoring were added since sanitary wastewaters discharge to the cooling pond.
    - Monitoring and limitations were added for total chromium, total zinc, free available chlorine, total residual chlorine and no detectable amount of the 126 Priority Pollutants per Effluent Guidelines 40 CFR 423.13 (d)(1) for cooling tower blowdown discharges.
    - The Reasonable Potential Analysis based on limited data from outfall 002 effluent showed molybdenum as a pollutant of concern. Molybdenum monitoring was added to the monitoring requirements.
    - A review of the cooling pond seep data showed arsenic, lead, mercury and fluoride were pollutants of concern, therefore, monitoring for these parameters was added to Outfall 002.
    - The daily limitation for total suspended solids was reduced to 50 mg/L per Effluent Guidelines 40 CFR 423.12 (b)(9) since coal pile runoff has been discharged to the cooling pond for many years. See condition A. (4.).
- Effluent Limits and Monitoring Requirements were added for Duke Energy's proposed cooling pond Outfall to be constructed at the breach. See A. (5.) Effluent Limitations and Monitoring requirements for Outfall 002A. The limitations and monitoring requirements are the same as Outfall 002 except a discharge shall only occur during severe weather events or required maintenance.
- Effluent Limits and Monitoring Requirements were revised for Outfall 003 as follows:
    - Monitoring and limitations were added for total chromium, total zinc, free available chlorine, total residual chlorine and no detectable amount of the 126 Priority Pollutants per Effluent Guidelines 40 CFR 423.13 (d)(1) for cooling tower blowdown discharges.
    - The Reasonable Potential Analysis based on limited data from Outfall 003 effluent showed the maximum predicted concentration for selenium was greater than 50% of the allowable discharge concentration. Selenium monitoring was maintained.
    - Pollutants of concern for Outfall 002 (total arsenic, total lead, total molybdenum, and fluoride) were added since Duke Energy has requested the option of discharging many of the same waste streams to Outfall 003.

  See condition A.(6.).
- Special Condition A. (10.) Total Nitrogen Reopener Clause, in the existing permit, was eliminated since this facility is now classified as "non-nutrient bearing".
- Special Condition A. (11.) Selenium Reopener Clause, in the existing permit, was eliminated since the closure of the coal-fired steam electric plant is complete.

- Special Condition A. (43) Ash Pond Closure was added to the permit to facilitate the decommissioning of the ash ponds.
- Special Condition A. (44) Instream Monitoring was added to the permit to monitor the impact of the discharges on the receiving stream.
- Special Condition A. (46) Applicable State Law was added to the permit to meet the requirements of Senate Bill 729 (Coal Ash Management Act).
- Special Condition A. (47) Domestic Wastewater Treatment Plant was added to the permit to assure compliance with the 40 CFR 133.102.
- Special Condition A. (49) Seep Pollutant Analysis was added to identify all seeps (ash pond seeps and cooling pond seeps) and to list actions to be taken by the Permittee.
- The NC Division of Water Resources NPDES Permitting Unit is required to implement the new dissolved metal standards in all permits public noticed after April 6, 2016. The new standards for most metals include acute standards. Further, the freshwater standards for several metals are expressed as the dissolved form of the metals, and seven metals have hardness-dependent equations. As a result, the permit includes the requirement to sample for hardness at all outfall and instream locations.
- Special Condition A. (40) was added to the permit regarding the submittal of all the required information under 40 CFR 125.95 with the next permit application
- Special Condition A. (48) Electronic Reporting was added to the permit describing requirements for electronic reporting of DMRs. Starting December 21, 2016, federal regulations require electronic submittal of all discharge monitoring reports (DMRs) and specify that, if a state does not establish a system to receive such submittals, then permittees must submit DMRs electronically to the Environmental Protection Agency (EPA). The final NPDES Electronic Reporting Rule was adopted and became effective on December 21, 2015.
- The following special conditions were added to the permit to be consistent with other Duke Energy permits: A. (38) Biocides, A. (32) Additional Conditions and Definitions, A. (50.) Chemical Discharges, A.(45.) Fish Tissue Monitoring Near Ash Pond Discharge, A. (42.) Structural Integrity Inspections of Ash Pond Dam.

SUMMARY OF MODIFICATIONS TO NOVEMBER 2016 DRAFT PERMIT:

- Removed the effluent pages for the seeps outfalls. Seeps will be addresses through Special Order by Consent EMC SOC WQ S18-006.
- Modified Effluent and Monitoring Requirements for Phase III for Outfall 001. Only groundwater will be discharged for Phase III, the landfill will not be constructed.
- Modified outfall 001 (decanting and dewatering) to add monitoring for chromium, lead, cadmium, copper, zinc and TDS.
- Added a footnote to outfall 002 and 002A to allow the facility to discontinue sampling under unsafe conditions.
- Removed monitoring and limits for BOD and fecal coliform from outfall 002 as the wastewater treatment system for domestic wastewaters is no longer in operation. Footnotes addressing domestic wastewater and the special condition addressing Domestic Wastewater Treatment Plant requirements were removed from the permit.
- Added Outfall 004 for the discharge of treated wastewater from the coal ash beneficiation facility.

- Instream sampling special condition was modified to require monthly sampling. The requirement is consistent with other Duke facilities.
- Clean Water Act 316(b) special condition was modified to require the submittal of materials required by the 316(b) rule by 3.5 years from the issuance of the permit and to add language stating that the Division determined that operating and maintaining the existing Closed-cycle recirculating system meets the requirements for an interim BTA.
- A footnote was added for the decanting and dewatering effluent pages that requires the facility to discontinue the discharge if pollutant levels reach 85% of the allowable levels and to report the event to the Division.
- Ash Pond Working Capacity Special Condition was removed as is no longer applicable.