Facility Information

<table>
<thead>
<tr>
<th>Applicant/Facility Name:</th>
<th>Duke Energy Progress, LLC/ L.V. Sutton Energy Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant Address:</td>
<td>801 Sutton Steam Plant Road, Wilmington, NC 28401</td>
</tr>
<tr>
<td>Facility Address:</td>
<td>(same)</td>
</tr>
<tr>
<td>Permitted Flow:</td>
<td>N/A</td>
</tr>
<tr>
<td>Type of Waste:</td>
<td>100 % Industrial</td>
</tr>
<tr>
<td>Facility/Permit Status:</td>
<td>Renewal (WWTP Class I)</td>
</tr>
<tr>
<td>County:</td>
<td>New Hanover</td>
</tr>
</tbody>
</table>

Miscellaneous

<table>
<thead>
<tr>
<th>Receiving Stream:</th>
<th>Cape Fear River (001), Sutton Lake (002, 004, 008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Office:</td>
<td>WiRO</td>
</tr>
<tr>
<td>Stream Classification:</td>
<td>C Sw (001) C (002, 004, 008) SI: 18-(63)</td>
</tr>
<tr>
<td>Quad</td>
<td>J27SW Castle Hayne</td>
</tr>
<tr>
<td>303(d) Listed?:</td>
<td>Yes Impaired for D.O. (Cape Fear River)</td>
</tr>
<tr>
<td>Permit Writer:</td>
<td>Sergei Chernikov, Ph.D.</td>
</tr>
<tr>
<td>Subbasin:</td>
<td>030617 (CPF)</td>
</tr>
<tr>
<td>Date:</td>
<td>March 1, 2017</td>
</tr>
</tbody>
</table>

Drainage Area (mi²):  
Summer 7Q10 (cfs):     | Tidally influenced (Outfall 001); Lake (Outfalls 002, 004, and 008) |
30Q2 (cfs):            | See above                                           |
Average Flow (cfs):    | See above                                           |
IWC (%):               | 100 (all outfalls)                                 |
Primary SIC Code:      |                                                     |

SUMMARY

This is a renewal of the NPDES wastewater permit for L.V. Sutton Energy Complex. Duke Energy Progress Sutton Plant is a natural gas-fired 620 MW combined cycle generation facility. The power block consists of two combustion turbine generators (each with a HRSG – heat recovery steam generator) and one steam turbine generator. Historically, the facility operated 3 coal-fired units. The coal-fired units were shut-down in the fourth quarter of 2013.

The facility is regulated by federal effluent guidelines (40 CFR Part 423 – Steam Electric Power Generating Point Source Category) – BPT/BAT.

On February 11, 2015 the Wilmington Regional Office delineated the Effluent Channel at the Sutton Energy Complex in accordance with the requirements of 15A NCAC 02B .0228. The new Outfall 008 was established to accommodate discharge from this outfall.

Wastewater outfalls:
Outfall 001 – cooling pond discharge, recirculated cooling water, non-contact cooling water, groundwater, landfill leachate, and treated wastewater from Outfall 004 (new ash pond). The new ash pond can discharge directly to Sutton Lake through Outfall 004 or to Cape Fear River through Outfall 001. The Outfall 001 is discharging through the mixing box that was set-up to concurrently discharge ash pond wastewater and water from Sutton Lake. The compliance point for Outfall 001 is located within the mixing box.
Outfall 002 – wastewater associated with the old ash pond. May consist of low volume waste, yard drains, oily waste treatment. Wastewater can be discharged to Sutton Lake or to Cape Fear River through Outfall 001.

Outfall 004 – wastewater associated with the new ash pond. May consist of low volume waste, yard drains, oily waste treatment. Wastewater can be discharged to Sutton Lake or to Cape Fear River through Outfall 001.

Outfall 008 - Primarily consists of recirculating cooling water from the Combined Cycle generation unit, contains flows from internal outfalls 005, 006, 007, 009, and stormwater outfalls.

Internal Outfall 005 – wastewater from the Combined Cycle generation unit.

Internal Outfall 006 - wastewater from the Combined Cycle generation unit.

Internal Outfall 007 – stormwater/wastewater flows from the closure activities for coal-fired units.

Internal Outfall 009 – low volume wastes from a new simple cycle combustion turbine expected to be online in 2017.

Outfall 010 - non-contact stormwater from North Pond Emergency Spillway, the pond will receive stormwater from the coal ash landfill after landfill is capped.

Outfall 011 - non-contact stormwater from South Pond Emergency Spillway, the pond will receive stormwater from the coal ash landfill after landfill is capped.

Stormwater outfalls discharging to the effluent channel and then to Sutton Lake via Outfall 008:

Internal Outfall SW001 – Runoff from the temporary laydown area and the parking lot.

Internal Outfall SW002 – Runoff from the parking lot and Peaker Combustion Turbine area.

Internal Outfall SW003 – Runoff from the parking lot.

Internal Outfall SW004 – Pumped stormwater from the 115 Electrical Switchyard area.

Internal Outfall SW005 – Discharge from the south wet detention basin.

Internal Outfall SW006 – Discharge from the rip rap armored emergency spillway for the north infiltration basin that treats stormwater from a parking lot and surrounding areas.

Internal Outfall SW007 – Runoff from the potential rail loading yard, rail spur, and truck roads installed to transport coal ash from the site.

ASH POND DAMS
Seepage through earthen dams is common and is an expected consequence of impounding water with an earthen embankment. Even the tightest, best-compacted clays cannot prevent some water from seeping through them. Seepage is not necessarily an indication that a dam has structural problems, but should be kept in check through various engineering controls and regularly monitored for changes in quantity or quality which, over time, may result in dam failure. Currently, no seeps have been detected at the site.
The Division conducted EPA-recommended analyses to determine the reasonable potential for toxicants to be discharged at levels exceeding water quality standards/EPA criteria by this facility. For the purposes of the RPA, the background concentrations for all parameters were assumed to be below detections level. The RPA uses 95% probability level and 95% confidence basis in accordance with the EPA Guidance entitled “Technical Support Document for Water Quality-based Toxics Control.” The RPA included evaluation of dissolved metals’ standards, utilizing a default hardness value of 25 mg/L CaCO$_3$ for hardness-dependent metals. The RPA spreadsheets are attached to this Fact Sheet.

a) RPA for Decanting/Normal operation of Ash Pond (Outfall 001, 002, and 004). The long term discharge data on the EPA Form 2C was used, it was supplemented by the analysis of the free standing water in both ash ponds, landfill leachate analysis from similar landfills, and groundwater sampling results. Since the highest available values for each parameter was used, it is assumed that this RPA is applicable to all discharges that represent coal ash contaminated water (outfalls 001, 002, 004). Calculations included: As, Be, Cd, Al, Cr, Cu, F, Pb, Hg, Mo, Ni, Se, Ag, Zn, Ba, Sb and Tl (please see attached). The historic flow of 12.84 MGD was used in the analysis, the groundwater pumping volume of 1.3 MGD and landfill leachate volume of 0.1 MGD was added to the historic flow. The RPA indicated the need for following the water-quality based limits: As, Cu, Ni, and Se.

b) RPA for Dewatering of Ash Pond (Outfall 001 and Outfall 004). To meet the requirements of the Coal Ash Management Act of 2014, the facility needs to dewater ash ponds by removing the interstitial water. The facility’s highest discharge rate from the dewatering process will be 2.1 MGD. The facility submitted data for the standing surface water in the ash ponds, interstitial water in the ash, and interstitial ash water that was treated by filters of various sizes. To evaluate the impact of the dewatering on the receiving stream the RPA was conducted for the wastewater that will be generated by the dewatering process. To introduce the margin of safety, the highest measured concentration for a particular parameter was used. The RPA was conducted for As, Be, Cd, Chlorides, Al, Cr, Cu, F, Pb, Hg, Mo, Ni, Se, Ag, Zn, Ba, Sb and Tl (please see attached). The RPA indicated the need for following water-quality based limits: As, Chlorides, Al, Cu, F, Pb, Hg, Mo, Ni, Se, and Zn.

c) RPA for Combined Cycle Unit (Outfall 008). The RPA was also conducted for the Combined Cycle Unit. Calculations included: As, Be, Cd, Al, Cr, Cu, Pb, Hg, Mo, Ni, Se, Ag, Zn, Ba, Sb and Tl (please see attached). The flow volume of 211 MGD was used in the RPA. The RPA indicated the need for following water-quality based limits: As, Cu, and Se.

The proposed permit requires that EPA methods 200.7 or 200.8 (or the most current versions) shall be used for analyses of all metals except for total mercury.

MERCURY EVALUATION (Outfall 001 normal operation) The State of North Carolina has a state-wide mercury impairment. The TMDL has been developed to address this issue in 2012. The TMDL included the implementation strategy, both documents were approved by EPA in 2012.
The mercury evaluation was conducted in accordance with the Permitting Guidelines for Statewide Mercury TMDL.

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
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<tbody>
<tr>
<td>Annual average concentration (ng/L)</td>
<td>1.69</td>
<td>1.91</td>
</tr>
<tr>
<td>Maximum sampling result (ng/L)</td>
<td>3.43</td>
<td>9.8</td>
</tr>
</tbody>
</table>

Allowable mercury concentration for this facility is 12.0 ng/L. All annual average mercury concentrations are below the allowable level. All maximum sampling results are below the TBEL of 47.0 ng/L. Based on the Permitting Guidelines for Statewide Mercury TMDL, the limits are not required.

**INSTREAM MONITORING - OUTFALL 002**

The permit required semi-annual upstream and downstream monitoring near the ash pond discharge. These monitoring stations have been established through the Lower Cape Fear River Program. The monitored parameters are: total arsenic, total selenium, total mercury (method 1631E), total chromium, dissolved lead, dissolved cadmium, dissolved copper, and dissolved zinc. The results for all parameters are below detection level upstream and downstream of the Outfall 001. It is required that the monitoring of the instream stations will continue during the next permit cycle.

**CWA SECTION 316(a)**

Since the Sutton Lake has been reclassified to the “waters of the State” on November 5, 2014, the facility has to develop a strategy to meet the state temperature standard in Sutton Lake. In order to obtain thermal variance/mixing zone for Lake Sutton/Cape Fear River the facility shall develop and conduct comprehensive 316(a) studies. The 316(a) studies shall be performed in accordance with the Division of Water Resources approved plan. The temperature analysis and the balanced and indigenous study plan shall conform to the specifications outlined in 40 CFR 125 Subpart H and the EPA’s Draft 316(a) Guidance Manual, dated 1977, and the Region 4 letter to NCDENR, dated June 3, 2010.

**CWA SECTION 316(b)**

The permittee shall comply with the Cooling Water Intake Structure Rule per 40 CFR 125.95. The Division approved the facility request for an alternative schedule in accordance with 40 CFR 125.95(a)(2). The permittee shall submit all the materials required by the Rule with the next renewal application.

**TOXICITY TESTING - OUTFALL 001, OUTFALL 002, OUTFALL 004, AND OUTFALL 008**

Current Requirement: Outfall 001, 002, 004, 008 – Acute P/F @ 90% using *Pimephales promelas*

Recommended Requirement: Outfall 001, 002, 004, 008 – Acute P/F @ 90% using *Pimephales promelas*

This facility has passed all toxicity tests during the previous permit cycle, please see attached.

For the purposes of the permitting, the long term average flow was used in conjunction with the 7Q10 summer flow to calculate the percent effluent concentrations to be used for WET.

**COMPLIANCE SUMMARY**

During the last 5 years, the facility has exceeded limit 3 times, please see attached. The limit violations were for Oil and Grease (2 times - Outfall 005) and flow volume (Outfall 001), please see attached.
PERMIT LIMITS DEVELOPMENT

- The temperature limits (Outfall 001 and Outfall 008) are based on the North Carolina water quality standards (15A NCAC 2B .0200).
- The limits for Oil and Grease and Total Suspended Solids (Outfall 001, Outfall 002, Outfall 004, Outfall 005, Outfall 006, Outfall 007, Outfall 008, Outfall 009, Outfall 010, and Outfall 011) are based on the requirements in 40 CFR 423.
- The pH limits (Outfall 001, Outfall 002, Outfall 004, Outfall 005, Outfall 006, Outfall 008, Outfall 009, Outfall 010, and Outfall 011) are based on the North Carolina water quality standards (15A NCAC 2B .0200).
- The Whole Effluent Toxicity limit (Outfall 001, Outfall 002, Outfall 004 and Outfall 008) is based on the requirements of 15A NCAC 2B .0500.
- The Water Quality Based Effluent Limits for Total Arsenic, Total Selenium, Total Copper, and Total Nickel (Outfall 001, Outfall 002, and Outfall 004) are based on the results of the Reasonable Potential Analysis.
- The Water Quality Based Effluent Limits for Total Aluminum, Total Lead, and Chlorides (Outfall 001 – dewatering and Outfall 004 - dewatering) are based on the results of the Reasonable Potential Analysis.
- The turbidity limit (Outfall 001 and Outfall 004-dewatering) is based on North Carolina water quality standards (15A NCAC 2B .0200).
- Limits for Total Copper were added to the permit based on the results of the Reasonable Potential Analysis (Outfall 001, Outfall 002 and Outfall 004).
- Limits for Total Nickel were added to the permit based on the results of the Reasonable Potential Analysis (Outfall 001, Outfall 002 and Outfall 004).
- Limits for Total Iron were removed from the permit based on the updates to the North Carolina standards (Outfall 001, Outfall 002 and Outfall 004).
- Limits for Total Cadmium were removed from the permit based on the results of the Reasonable Potential Analysis (Outfall 001).
- Limits for Total Lead were removed from the permit based on the results of the Reasonable Potential Analysis (Outfall 001-normal operation).
- Limits for Chlorides were added to the permit based on the results of the Reasonable Potential Analysis (Outfall 001 - dewatering).
- Monitoring for Hexavalent Chromium was added to the permit based on the results of the Reasonable Potential Analysis (Outfall 001 - dewatering).
- The daily maximum limit for Total Lead was increased based on the updates to the North Carolina standards (Outfall 001 - dewatering).
- Limits for Total Mercury were removed from the permit based on the results of the Mercury Evaluation (Outfall 001-normal operation, Outfall 002-normal operation, Outfall 004-normal operation).

PROPOSED CHANGES

- A separate effluent page for the dewatering of the New Ash Pond (Outfall 004) was added to the permit (Please see Special Condition A. (5.)).
- The daily maximum limit for Total Arsenic was increased based on the updates to the North Carolina standards (Outfall 001, Outfall 002 and Outfall 004).
- Limits for Total Copper were added to the permit based on the results of the Reasonable Potential Analysis (Outfall 001, Outfall 002 and Outfall 004).
- Limits for Total Nickel were added to the permit based on the results of the Reasonable Potential Analysis (Outfall 001, Outfall 002 and Outfall 004).
- Limits for Total Iron were removed from the permit based on the updates to the North Carolina standards (Outfall 001, Outfall 002 and Outfall 004).
- Limits for Total Cadmium were removed from the permit based on the results of the Reasonable Potential Analysis (Outfall 001).
- Limits for Total Lead were removed from the permit based on the results of the Reasonable Potential Analysis (Outfall 001-normal operation).
- Limits for Chlorides were added to the permit based on the results of the Reasonable Potential Analysis (Outfall 001 - dewatering).
- Monitoring for Hexavalent Chromium was added to the permit based on the results of the Reasonable Potential Analysis (Outfall 001 - dewatering).
- The daily maximum limit for Total Lead was increased based on the updates to the North Carolina standards (Outfall 001 - dewatering).
- Limits for Total Mercury were removed from the permit based on the results of the Mercury Evaluation (Outfall 001-normal operation, Outfall 002-normal operation, Outfall 004-normal operation).
- Limits for Total Arsenic, Total Copper, and Total Selenium were added to the permit based on the results of the Reasonable Potential Analysis (Outfall 008).
- The Acute Toxicity monitoring frequency was reduced to Monthly (Outfall 002 and Outfall 004) to be consistent with other Duke permits.
- The Special Conditions Fish Tissue Monitoring near Ash Pond Discharge and Clean Water Act Section 316(b) have been updated, please see A. (19.) and A. (21.).
- The Clean Water Act Section 316(a) Special Condition was added to the permit, please see A. (20.).
- The Outfall 010 and 011 were added to the permit to accommodate discharges of stormwater from the future coal ash landfill.
- The Ash Pond Closure Special Condition was removed from the permit since the facility submitted Closure Plan in 2016.
- The Biocide Special Condition was updated to be consistent with other Duke permits, please see A. (18.).
- The compliance schedule for Total Copper limit was added (Outfall 008), please see A. (29.).
- The compliance schedule for Total Copper limit and Total Nickel limit were added (Outfall 001).

PROPOSED SCHEDULE
Draft Permit to Public Notice: May 19, 2017 (est.)
Permit Scheduled to Issue: August 7, 2017 (est.)

STATE CONTACT
If you have any questions on any of the above information or on the attached permit, please contact Sergei Chernikov at (919) 807-6386 or sergi.chernikov@ncdenr.gov.