


DENR/DEMLR
FACT SHEET FOR NPDES STORMWATER PERMIT DEVELOPMENT
 NPDES No. NCS000580

Facility Information			
Applicant/Facility Name:	Duke Energy Progress, Inc./ Mayo Electric Generating Plant		
Applicant Address:	410 South Wilmington Street, Raleigh, NC 27601		
Facility Address:	10660 Boston Road, Roxboro, NC 27574		
Permitted Flow:	N/A (Stormwater Discharges Only)		
Industrial Activities:	Primary SIC Code: 4911 – Electric Services		
Permit Status:	New NPDES Stormwater Permit		
County:	Person County		
Miscellaneous			
Receiving Stream:	Mayo Creek	Regional Office:	Asheville
Stream Classification:	WS-V	State Grid / USGS Quad:	
303(d) Listed?	Hg, statewide	Permit Writer:	Mike Randall
Subbasin:	22-58-15-(0.5)	Date:	August 23, 2016
			
Facility Location: Lat. 36° 31' 17" N Long. 78° 53' 39" W			

BACKGROUND

The Mayo Electric Generating Plant (Mayo) is a dual boiler coal fired electric generating plant with a net generating capacity of 745 megawatts.

Four areas of coal handling include the coal car unloading area, transfer boom, conveyor belt system and coal pile.

Coal Car Unloading Area

Coal cars are positioned over a below grade open transfer pit. The unloading area is equipped with a dust suppression system that is used to minimize the generation of dust during coal car unloading. Water spray nozzles are positioned such that as coal cars are unloaded into the transfer pit, the spray suppresses dust. Various conditions such as wind, rain, and the condition of coal dictate the need for dust suppression. Stormwater drainage from the area flows (via the ash pond) to NPDES wastewater discharge point, 002.

Transfer Boom

The transfer boom is another area where there is a potential to create dust. In order to minimize dust the boom is raised or lowered. Stormwater drainage from the area flows (via the ash pond) to NPDES wastewater discharge point, 002.

Conveyor Belt

The conveyor belt system is covered to reduce dust. Efforts are in place to ensure the conveyor belts remain covered. Stormwater drainage from the area flows (via the ash pond) to NPDES wastewater discharge point, 002.

Coal Pile

The coal pile is known as a “live pile.” This is because of the way the coal is fed or reclaimed to the unit or boilers. Coal is pulled from the bottom of the pile and therefore reduces dust. Stormwater that comes into contact with the coal pile is routed to (via the ash pond) to NPDES wastewater discharge point, 002. Stormwater drainage from the area flows (via the ash pond) to NPDES wastewater discharge point, 002.

In the spring of 2009 the FGD system went into service. The FGD system requires individual storage piles limestone and gypsum. These storage piles are located west of the powerhouse block near railroad tracks. Stormwater from this area and stormwater that comes in contact with the coal pile is routed (via the ash pond) to NPDES wastewater discharge point, 002. Limestone and gypsum are transported to and from the storage piles via haul trucks. Gypsum haul trucks are required to be rinsed to remove residual prior to leaving the plan area. The truck rinse activity is conducted inside a containment that processes the used water through an oil water separator that is routed (via the ash pond) to NPDES wastewater discharge point, 002. During transportation, the haul trucks are required to be covered.

In 2010, a hydrated lime injection system was added for flue gas conditioning. The system consists of a silo, truck unloading and injection equipment. The truck unloading area includes secondary containment. Hydrated lime is delivered by closed tankers.

In 2011, magnesium hydroxide and calcium carbonate systems were added to reduce coal combustion boiler slag impact. The truck unloading area consists of a secondary containment system with a sump that allows released chemicals to be collected and pumped into the storage tank. After evaluation rain water is released outside the containment via sheet runoff.

FACILITY STORMWATER DRAINAGE

Outfall 004

Outfall 004 is located on the northeast side of the facility and drains to the reservoir through catch basins and the stormwater sewer conveyance system. The drainage area for outfall 004 is primarily the loading dock and outside storage area. Materials stored in the area include empty lubricant drums, structural steel, pipes and large equipment. There is a concrete unloading area and the rest is comprised of loose gravel. There is a small shed for hazardous waste, chemicals and oils. A portion of the outside storage area is dedicated for construction project laydown area. The concrete truck washout area is controlled to ensure no free flowing liquids leave the area or comes into contact with stormwater runoff.

Outfall 005

Outfall 005 is located on the northeast side of the facility and is the end point of the plant’s primary stormwater sewer system. Drainage area includes area around the boilers and turbine buildings, precipitators, and the roofs of the machine shops, administration building, warehouse, parking lot, and water supply treatment, ash storage silo, hydrated lime silo, and transformers. Also, is a grassed area used as a marshalling area for construction activities and maintenance projects, and for a future Unit 2. The area is primarily gravel and grass. Potential pollutants for outfall 005 include coal, coal ash, and sediment. Mobil equipment is also a potential source of pollutants.

In 2004 SCR installation included anhydrous ammonia storage tanks and a truck unloading area. Secondary containment is provided for the storage tanks and unloading area. Secondary containment is routed to the ash pond to NPDES wastewater discharge point 002.

During the 2009 FGD Scrubber installation an additional transformer was added. The transformer was installed with secondary containment routed to the existing oil water drainage and separation system. The renovations also included the dry flyash collection system with load out and wheel wash system.

In 2010, hydrated lime injection system was added for flue gas conditioning. The system includes a silo, truck unloading equipment, and injection equipment. Secondary containment is provided for the truck unloading area. Closed tanker trucks deliver hydrated lime.

Cooling tower Area - Outfall 006 a, b, c, d, and e.

Out fall 006 is located at the eastern end of the site and drains the area around the cooling towers, including the roof of the chemical feed buildings and associated roads and parking areas. In the cooling tower area there are five separate outfalls, Outfall 006 a, b, c, d, and e. Stormwater runoff is collected in catch basins and conveyed to swales before collecting in a reservoir. The cooling tower has a basin for recirculating cooling water and therefore does not directly contribute to stormwater runoff. Potential pollutants include sediment and mist from the cooling water tower. Mobil equipment is also a potential source of pollutants.

Drainage are from Railroad Area - Outfall 007 a and b - removed in February 2001.

Main Plant Entrance Road - Outfall 010

The first 100 yards of the main plant entrance road, starting at the Boston Road and main plant road intersection and traveling toward the plant, drains to the ash pond. The remaining drainage are drains to Mayo Lake. The central drainage point for the road is located at a low point south of the entrance to the picnic area entrance. The main plant entrance road was added to the Stormwater Pollution Prevention Plan (SWPPP) due to limestone and gypsum truck traffic in the spring of 2009. Potential pollutants could be coal ash, limestone, gypsum, petroleum, and hydrated lime. Limestone delivery trucks are covered. Gypsum trucks leaving with produce are washed and rinsed before leaving the plant area.

In 2009, Daily inspections of the plant entrance was established.

In 2010, the installation of the hydrated lime injection system for flue gas conditioning resulted in increased truck traffic.

In 2011, coal conditioning system were installed to improve coal combustion. The material is delivered via closed tanker trucks.

BEST MANAGEMENT PRACTICES (BMPS)

Specific containment and diversion measures include:

- Segregation of the work area
- Covering or enclosing the work area
- Diking the work area
- Diversion of stormwater runoff
- Dust Control

Structural BMPs included:

- 2004 SCR installation including secondary containment for anhydrous ammonia storage tanks and unloading area.
- 2009 FGD Scrubber, secondary containment for transformer and double walled mobile equipment fuel tank, FGD drainage recycle system, covered dump trucks for flyash delivery, truck wheel wash system with discharge to wastewater discharge point 002.
- 2010 closed tanker and secondary containment for hydrated lime.
- 2011 closed tanker and secondary containment for coal conditioning system (magnesium hydroxide and calcium carbonate), secondary containment for truck unloading and product tanks.
- Secondary containment for all above ground stationary oil storage tanks.

Periodic vacuuming of storm drain catch basins are conducted in high risk areas.

WHY THIS FACILITY IS SUBJECT TO A PERMIT

Federal NPDES regulations define **stormwater discharge associated with industrial activity** in 40 CFR §122.26 (b)(14) as:

“the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under this part 122. For the categories of industries identified in this section, the term includes, but is not limited to, storm water [sic] discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and **areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water**. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant’s industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water [sic] drained from the above described areas.”

PROPOSED MONITORING FOR STORMWATER DISCHARGES

The Division considered potential pollutants from past and present industrial activities (coal-fired electric generation, plant decommissioning, and future ash removal) and data submitted in the application submitted October 13, 2014. Sampling for outfall 010 included O&G, COD, TSS, Total Nitrogen, Total Phosphorus, pH, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chlorides, Chromium, Cobalt, Copper, Fluoride, Iron, Lead, and Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc, Aluminum, Color, Herbicides, Magnesium, Nitrate, and TKN.

Unlike most stormwater permits in its program, the Division is proposing a permit structure with outfall-specific monitoring for discharges. Parameters are based on potential pollutants in the

drainage area, sampling results, and in some cases, dependent upon future activities (e.g., ash removal through the drainage area). Below is a table of the proposed monitoring for each outfall at the site. All outfalls ultimately discharge to Mayo Reservoir.

Stormwater Discharge Outfall (SDO) Monitoring	
Outfall 004, 005, Outfall 006 (a, b, c, d, and e) and Outfall 010	
Total Suspended Solids (TSS)	Semi-annual monitoring (<i>quarterly if coal or ash transport</i>). BASIS: Potential pollutant from drainage area and BMP effectiveness indicator.
Priority Pollutant Metals Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, and Zn.	Quarterly monitoring <i>only if coal or coal ash transported through this drainage area</i> . BASIS: Coal combustion waste (CCW) constituents; includes metals incorporated into the coal ash monofill constructed for the company's Mayo Steam Electric Plant.
Boron	Quarterly monitoring <i>only if coal or coal ash transported through this drainage area</i> . BASIS: Coal combustion waste (CCW) constituent / coal tracer.
pH	Quarterly monitoring <i>only if coal or coal ash transported through this drainage area</i> . BASIS: Pollutant indicator and important to interpreting toxicity potential of metals.

STORMWATER BENCHMARKS AND TIERED RESPONSE

Rather than limits, North Carolina NPDES Stormwater permits contain benchmark concentrations. Stormwater benchmarks are numerical action levels for stormwater monitoring. **Benchmarks are not effluent limits, and benchmark exceedances are not permit violations.** Benchmarks provide facilities a tool for assessing the significance of pollutants in stormwater discharges and the effectiveness of best management practices (BMPs). Benchmark concentrations are intended as guidelines for the facility's development and implementation of the Stormwater Pollution Prevention Plan (SPPP).

Benchmark exceedances require the permittee to increase monitoring, increase management actions, increase record keeping, and/or install stormwater BMPs in a tiered program. The permit establishes a tiered approach to specify actions the permittee must take in response to analytical results above benchmark concentrations (Part II, Section B., following Table 10). The tiered structure of the permit provides the permittee and NCDEMLR wide flexibility to address issues that may arise with one or more parameters and/or outfalls.

Metals benchmarks are calculated to mimic acute water quality standards and with the guidance of NC's Division of Water Resources (DWR). NC DWR follows established federal procedures for calculating acute standards when developing the benchmarks. Just like the acute standards, metals benchmarks normally reflect one half of the calculated Final Acute Value (the "½ FAV"). In most cases, translation into total recoverable values is based on an assumed hardness of 25 mg/l and a total suspended solids (TSS) concentration of 10 mg/l. Acute standards protect aquatic life from negative impacts of short-term exposure to higher levels of chemicals where the discharge enters a waterbody. The Stormwater Permitting Program applies this approach because of the ephemeral nature of rainfall events.

The Division may evaluate results to determine if a smaller suite of parameters for some outfalls is adequate to characterize potential pollution or BMP effectiveness. For example, one or more metals or other parameters may serve as an adequate tracer for the presence of ash pollution during disturbance or ash removal in specific drainage areas at this site. For parameters that do not have a stormwater benchmark, the Division may develop a benchmark value if appropriate toxicity data

become available or if rising trends in concentrations suggest a persistent source. A summary of the benchmarks in the draft permit, and their basis, is below:

Parameter	Benchmark	Basis
Antimony (Sb), mg/L (Total)	0.09	Acute Aquatic Criterion, ½ FAV
Arsenic (As), mg/L (Total)	0.34	Acute Aquatic Criterion, ½ FAV
Beryllium (Be), mg/L (Total)	0.065	Acute Aquatic Criterion, ½ FAV
Cadmium (Cd), mg/L (Total)	0.003	Acute Aquatic Criterion, ½ FAV
Chromium (Cr), mg/L (Total)	0.9	½ FAV, based on (Cr III + Cr VI) acute thresholds and assumption that industrial activities here are not a source of hexavalent chromium.
Copper (Cu), mg/L (Total)	0.010	Acute Aquatic Criterion, ½ FAV
Lead (Pb), mg/L (Total)	0.075	Acute Aquatic Criterion, ½ FAV
Mercury (Hg), ng/L (Total)	N/A	Monitoring only, CCW/Coal Constituent. Hg influenced by regional transport and wet deposition. Values above 12 ng/L (NC WQ standard) should be noted on the DMR but do not trigger Tier Responses.
Nickel (Ni), mg/L (Total)	0.335	Acute Aquatic Criterion, ½ FAV
Polychlorinated biphenyl compounds (PCBs), µg/L	Detected	NC Water Quality Standards vs. present Arochlors quantitation levels (higher than standard)
Selenium (Se), mg/L (Total)	0.056	½ FAV, NC-specific, based on 1986 Study on Se impacts in North Carolina
Silver (Ag), mg/L (Total)	0.0003	Acute Aquatic Criterion, ½ FAV. (The Division notes this value is below the practical quantitation level (PQL) of 1 µg/L of EPA Method 200.8)
Boron (B), mg/L	N/A	Monitoring only, CCW/Coal Constituent. Narrative National Recommended Water Quality Criterion.
Thallium (Tl), mg/L (Total)	N/A	Monitoring Only, CCW/Coal constituent. National Recommended Human Health Criterion.
Zinc (Zn), mg/L (Total)	0.126	Acute Aquatic Criterion, ½ FAV
Total Suspended Solids (TSS), mg/L	100	National Urban Runoff Program (NURP) Study, 1983
Non-Polar Oil & Grease, EPA Method 1664 (SGT-HEM), mg/L	15	Review of other state's daily maximum benchmark concentration for this more targeted O&G; NC WQ Standard that does not allow oil sheen in waters.
pH	6-9	NC Water Quality Standard (Range)

STORMWATER POLLUTION PREVENTION PLAN

The proposed permit conditions reflect the Environmental Protection Agency's (EPA) and North Carolina's pollution prevention approach to stormwater permitting. The Division maintains that implementation of Best Management Practices (BMPs) and traditional stormwater management practices that control the source of pollutants meets the definition of Best Available Technology (BAT) and Best Conventional Pollutant Control Technology (BCT). The permit conditions are not numeric effluent limitations but are designed to be flexible requirements for implementing site-specific plans to minimize and control pollutants in stormwater discharges associated with the industrial activity. Title 40 Code of Federal Regulations (CFR) §122.44(k)(2) **authorizes the use of BMPs in lieu of numeric effluent limitations in NPDES permits when the agency finds**

numeric effluent limitations to be infeasible. The agency may also impose BMP requirements which are "reasonably necessary" to carry out the purposes of the Act under the authority of 40 CFR 122.44(k)(3). The conditions proposed in this draft permit are included under the authority of both of these regulatory provisions. In essence, the pollution prevention and BMP requirements operate as limitations on effluent discharges that reflect the application of BAT/BCT.

The permit proposes some language specific to coal fired power plants (and in particular, to those plants being decommissioned). Determining specific BMPs that are appropriate for the site and activities are the permittee's responsibility, and the permit strives not to limit what BMPs can be used. The permittee should also refer to the BMPs described in both EPA's Multi-Sector Permit (MSGP) and Industrial Stormwater Fact Sheet for Steam Electric Power Generating Facilities (Sector O) for guidance on pollution prevention measures.

It is important to note that the majority of stormwater at this facility is ultimately routed into the waste treatment system (ash pond), and those discharges are regulated by the NPDES *wastewater* permit.

MERCURY MONITORING REQUIREMENTS

The proposed permit requires mercury to be measured in stormwater samples by EPA Method 1631E, which can detect levels as low as 0.5 ng/l. This requirement is consistent with recent federal rule-making that requires NPDES permittees to monitor discharges with sufficiently sensitive test procedures approved under 40 CFR §136. Modifications to 40 CFR §122.44(i) require a method that has a minimum level (ML) at or below the effluent limit (not applicable here), or the lowest minimum level (ML) of EPA approved analytical methods for the measured parameter. Based on results, Method 1631E will be required to quantify levels in these discharges. NC DEMLR understands that this method is more costly and requires a more intensive sampling protocol than most other parameters, and that fish tissue sampling will be provided during the permit cycle. Therefore, no benchmark applies that would trigger tiered response actions. Proposed permit provisions also allow the permittee to use field blank and/or method blank concentrations to adjust reported mercury levels as long as documented is submitted with the Data Monitoring Report (DMR).

FLEXIBILITY IN TIER RESPONSES

Tier Two actions (upon two consecutive benchmark exceedances at an outfall) proposed in this draft permit differs slightly from the Program's standard template and includes **step 6**. That step provides an opportunity for the permittee to propose an **alternative monitoring plan for approval** by the Region:

Alternatively, in lieu of steps 2 and 3, the permittee may, after two consecutive exceedances, exercise the option of contacting the DEMLR Regional Engineer as provided below in Tier Three. The Regional Engineer may direct the response actions on the part of the permittee as provided in Tier Three, including reduced or additional sampling parameters or frequency.

If pursuing the alternative above after two consecutive exceedances, the permittee may propose an **alternative monitoring plan** for approval by the Regional Engineer.

The permit therefore allows the permittee to petition the Regional Office for monitoring changes *sooner than Tier Three* (upon any four benchmark exceedances) and gives guidance on one option to take. For example, the permittee may request that mercury only be monitored semi-annually under the tiers, or that only parameters over the benchmark be monitored more frequently. In this way, changes to the monitoring scheme for any outfall could be handled outside of a permit modification.

OTHER PROPOSED REQUIREMENTS

- It is standard for Stormwater Pollution Prevention Plan (SPPP) requirements to include an annual certification that stormwater outfalls have been evaluated for the presence of *non-stormwater* discharges, and if any are identified, how those discharges are permitted or otherwise authorized. The draft permit requires this **facility to submit the first certification to DEMLR no later than 90 days after the effective date of the permit** (Part II, Section A.).
- Requirement to submit a request for permit modification if the facility identifies or creates any new outfalls, removes outfalls, or alters any drainage area that changes potential pollutants. This site may trigger this requirement during demolition or ash removal activities.
- Standard text that allows a permittee to forgo collecting samples outside of regular operating hours was omitted in Part II because this power plant is not currently operating. The Division expects the permittee to apply best professional judgment and consider the safety of its personnel in fulfilling sampling obligations under the permit.
- Proposed federal regulations will require electronic submittal of all discharge monitoring reports (DMRs). 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 Division anticipates that these regulations will be adopted and is beginning implementation. Permit provisions addressing this impending requirement is included in Part III, Section B. (General Conditions), 3.e.
- Quarterly Qualitative/Visual Monitoring to assure regular observation of outfalls throughout year.

SECTION D ELECTRONIC REPORTING OF MONITORING REPORTS [G.S. 143-215.1(b)]

Federal regulations require electronic submittal of all discharge monitoring reports (DMRs) and program reports and specify that, if a state does not establish a system to receive such submittals, then permittees must submit monitoring data and reports electronically to the Environmental Protection Agency (EPA). The final NPDES Electronic Reporting Rule was adopted and became effective on December 21, 2015.

PROPOSED SCHEDULE FOR PERMIT ISSUANCE:

Draft Permit to Public Notice: [Date]
Permit Scheduled to Issue: [Date]

STATE CONTACT:

If you have any questions about any of the above information or the attached permit, please contact Mike Randall at (919) 807-6374 or mike.randall@ncdenr.gov.