

#40

**STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY**

PERMIT

TO DISCHARGE WASTEWATER UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provision of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by the North Carolina Environmental Management Commission, and the Federal Water Pollution Control Act, as amended,

Carolina Power and Light d/b/a/ Progress Energy Carolinas, Inc.

is hereby authorized to discharge wastewater from a facility located at the

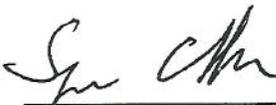
Mayo Steam Electric Generating Plant
off of US Highway 501
northeast of Roxboro
Person County

to receiving waters designated as the Mayo Reservoir in the Roanoke River Basin in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III, and IV hereof.

The permit shall become effective **January 1, 2008**.

This permit and the authorization to discharge shall expire at midnight on **March 31, 2012**.

Signed this day **December 14, 2007**.

for 

Coleen H. Sullins, Director
Division of Water Quality
By Authority of the Environmental Management Commission

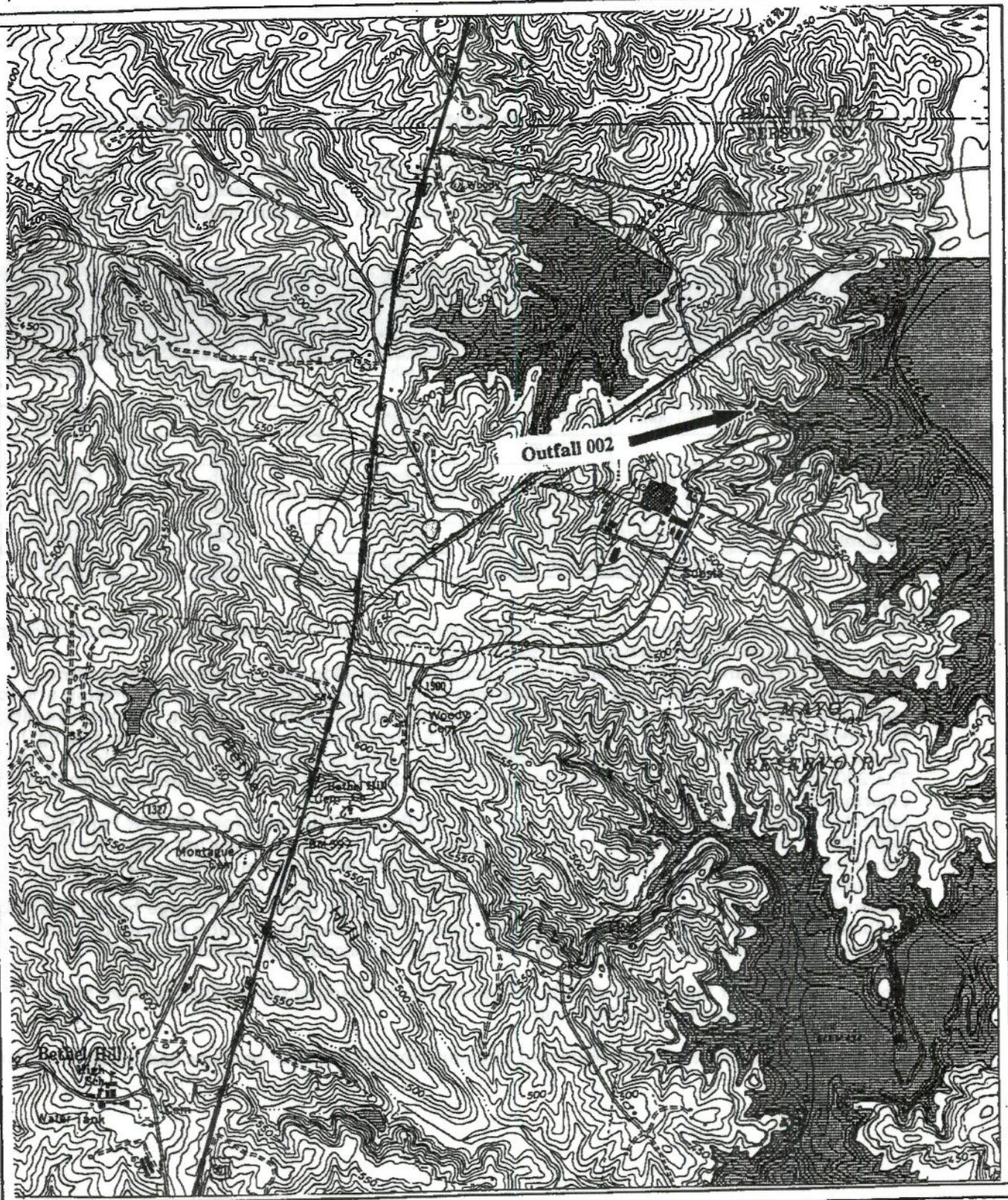
SUPPLEMENT TO PERMIT COVER SHEET

All previous NPDES Permits issued to this facility, whether for operation or discharge are hereby revoked. As of this permit issuance, any previously issued permit bearing this number is no longer effective. Therefore, the exclusive authority to operate and discharge from this facility arises under the permit conditions, requirements, terms, and provisions included herein.

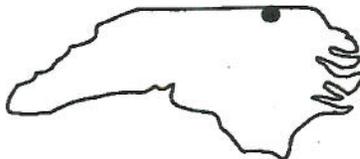
Carolina Power and Light d/b/a/ Progress Energy Carolinas, Inc.

is hereby authorized to:

1. Continue to operate the following systems located at **Mayo Steam Electric Generating Plant**, off of US Highway 501, northeast of Roxboro, Person County:
 - **Cooling Tower System (Outfall 001).** Less than once per year the cooling towers and circulating water system are drained by gravity and discharged directly to Mayo Reservoir.
 - **Ash Pond Treatment System (Outfall 002).** Outfall 002 discharges directly to Mayo Reservoir. The ash pond receives ash transport water, coal pile runoff, stormwater runoff, cooling tower blowdown, and various low volume wastes such as boiler blowdown, oily waste treatment, wastes/backwash from the water treatment processes, plant area wash down water, equipment heat exchanger water, and treated domestic wastewater.
 - **Internal Outfall 008.** Cooling tower blowdown is directly discharged to the ash pond. Cooling tower blowdown is usually mixed with ash sluice water prior to discharge to the ash pond. Cooling tower blowdown is indirectly discharged to Mayo Reservoir via the ash pond treatment system (Outfall 002).
 - **Internal Outfall 009.** Discharge from the FGD blowdown treatment system.
 - **Stormwater Discharge System** The facility is permitted to discharge stormwater to Mayo Reservoir through the following outfalls:
 - **Outfall 004** - Drainage from the outside storage area.
 - **Outfall 005** - Drainage from the industrial area and the oil/bottled gas storage area.
 - **Outfalls 006a, 006b, 006c, 006d, 006e** - Drainage from the cooling tower(s) chemical feed building structure and the cooling tower area.
2. Discharge from said treatment works and/or outfalls at the locations specified on the attached maps into Mayo Reservoir, which is classified as WS-V waters in the Roanoke River Basin.



Latitude: 36° 32' 03"
 Longitude: 78° 53' 27"
 USGS Quad #: A23SW
 River Basin #: 03-02-05
 Receiving Stream: Mayo Reservoir
 Stream Class: WS-V



CP&L
 Mayo Steam Electric Plant
 Person County
 NC0038377

A. (1) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS [001]

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 001 (Cooling Tower System)**. **Monitoring is required only during discharge events to the Mayo reservoir.** Such discharges shall be limited and monitored by the Permittee as specified below:

PARAMETER	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location
Flow			Daily	Pump Logs or similar readings	Effluent
Free Available Chlorine ²	200 µg/L	500 µg/L	Weekly	Grab	Effluent
Time of Chlorine Addition ²		2 hours	Weekly	Logs	
Total Chromium ³	0.2 mg/L	0.2 mg/L	2 / Month	Grab	Effluent
Total Zinc ³	1.0 mg/L	1.0 mg/L	2 / Month	Grab	Effluent
Priority Pollutants ³	No Detectable Amount		Annual	Grab	Effluent
pH	> 6.0 and < 9.0 standard units		Weekly	Grab	Effluent

Notes:

1. Samples taken in compliance with the monitoring requirements listed above shall consist of cooling tower effluent prior to its discharge to Mayo Reservoir.
2. Monitoring is required only if chlorine-based compounds is added to the system. Neither free available chlorine nor total residual chlorine may be discharged from any single generating unit for more than two hours per day, unless the Permittee demonstrates to the Division of Water Quality that discharge for more than two hours is required for macroinvertebrate control. The 500 µg/l limitation is an instantaneous maximum and is to be measured during the chlorine release period. The 200 µg/l limitation is an average during the chlorine release period. Simultaneous multi-unit chlorination is permitted.
3. Limitations and monitoring requirements for the 126 Priority Pollutants (per 40 CFR Part 423, Appendix A, exclusive of zinc and chromium) apply only if these substances are added by the permittee for cooling tower maintenance. Compliance with the limitations for the 126 priority pollutants in 40 CFR 423.13 (d)(1) may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136. All primary industries are required to submit a priority pollutant analysis in accordance with 40 CFR Part 122 with their application for permit renewal.

The above listed effluent limitations shall be sampled prior to draining the cooling tower(s), at a location prior to discharge to Mayo Reservoir.

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

A. (2) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS [008]

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 008 (internal outfall, Cooling Tower System)**. Such discharges shall be limited and monitored by the Permittee as specified below:

PARAMETER	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location ¹
Flow			Daily	Pump Logs or similar readings	Effluent
Free Available Chlorine ²	200 µg/L	500 µg/L	Weekly	Grab	Effluent
Time of Chlorine Addition ²		2 hours	Weekly	Logs	
Total Chromium ³	0.2 mg/L	0.2 mg/L	2 / Month	Grab	Effluent
Total Zinc ³	1.0 mg/L	1.0 mg/L	2 / Month	Grab	Effluent
Priority Pollutants ³	No Detectable Amount		Annual	Grab	Effluent
pH	> 6.0 and < 9.0 standard units		Weekly	Grab	Effluent

Notes:

1. Samples taken in compliance with the monitoring requirements listed above shall consist of cooling tower blowdown after mixing with the fly and bottom ash, but prior to discharging into the ash pond.
2. Monitoring is required only if chlorine-based compound is added to the system. Neither free available chlorine nor total residual chlorine may be discharged from any single generating unit for more than two hours per day, unless the Permittee demonstrates to the Division of Water Quality that discharge for more than two hours is required for macroinvertebrate control. The 500 µg/l limitation is an instantaneous maximum and is to be measured during the chlorine release period. The 200 µg/l limitation is an average during the chlorine release period. Simultaneous multi-unit chlorination is permitted.
3. Limitations and monitoring requirements for the 126 Priority Pollutants (per 40 CFR Part 423, Appendix A, exclusive of zinc and chromium) apply only if these substances are added by the permittee for cooling tower maintenance. Compliance with the limitations for the 126 priority pollutants in 40 CFR 423.13 (d)(1) may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136. All primary industries are required to submit a priority pollutant analysis in accordance with 40 CFR Part 122 with their application for permit renewal.

This outfall is not authorized to discharge directly to the Mayo Reservoir.

**A. (3) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS
[002 without FGD wastewater]**

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 002 (Ash Pond Treatment System)**. Such discharges shall be limited and monitored by the Permittee as specified below:

PARAMETER	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location ¹
Flow			Weekly	Pump Logs or similar readings	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	Monthly	Grab	Effluent
Total Suspended Solids	30.0 mg/L	100.0 mg/L	Monthly	Grab	Effluent
Total Selenium ²		3.8 lbs/day	2 / Month	Grab	Effluent
Acute Toxicity ³			Quarterly	Grab	Effluent
Total Arsenic ⁴			Quarterly	Grab	Effluent
Total Copper			Quarterly	Grab	Effluent
Total Iron			Quarterly	Grab	Effluent
pH	≥ 6.0 and ≤ 9.0 standard units		2 / Month	Grab	Effluent

Notes:

1. Samples taken in compliance with the monitoring requirements listed above shall be taken prior to mixing with other waste streams.
2. See A. (8).
3. Acute Toxicity (Fathead Minnow 24hr) No significant mortality at 90%; February, May, August, and November, See A. (7).
4. See A. (13).

After the FGD treatment system is used to treat FGD wastewater, the effluent limits in Conditions A. (4). and A. (5). apply.

There shall be no discharge of floating solids or visible foam in other than trace amounts outside an area five(5) meters from the discharge pipe. No chemical metal cleaning waste may be discharged to the ash pond. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

A. (4) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS [002 with FGD wastewater]

During the period beginning upon commencement of the FGD treatment system to treat FGD wastewater and lasting until expiration, the Permittee is authorized to discharge from **Outfall 002 (Ash Pond Treatment System)**. Such discharges shall be limited and monitored by the Permittee as specified below:

PARAMETER	LIMITS			MONITORING REQUIREMENTS		
	Monthly Average	Weekly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location ¹
Flow				Weekly	Pump Logs or similar readings	Effluent
Oil and Grease	15.0 mg/L		20.0 mg/L	Monthly	Grab	Effluent
Total Suspended Solids	30.0 mg/L		100.0 mg/L	Monthly	Grab	Effluent
Total Selenium			3.8 lbs/day	Weekly	Grab	Effluent
Acute Toxicity ³				Quarterly	Grab	Effluent
Total Mercury ^{2,4}			0.012 µg/L	Weekly	Grab	Effluent
Total Arsenic ⁵				Weekly	Grab	Effluent
Total Beryllium ²		6.5 µg/L		Weekly	Grab	Effluent
Total Cadmium ²		2.0 µg/L		Weekly	Grab	Effluent
Total Chlorides ²		672.0 mg/L	860.0 mg/L	Weekly	Grab	Effluent, MZ ⁶
Total Chromium ²		50.0 µg/L		Weekly	Grab	Effluent
Total Copper				Weekly	Grab	Effluent
Total Fluoride ²		1.8 mg/L		Weekly	Grab	Effluent
Total Lead ²		25.0 µg/L	33.8 µg/L	Weekly	Grab	Effluent
Total Manganese ²		200.0 µg/L		Weekly	Grab	Effluent
Total Nickel				Weekly	Grab	Effluent
Total Silver				Weekly	Grab	Effluent
Total Zinc				Weekly	Grab	Effluent
Total Barium ²		1.0 mg/L		Weekly	Grab	Effluent
Total Thallium ²		0.35 µg/L		Weekly	Grab	Effluent
Total Vanadium ²		24.0 µg/L		Weekly	Grab	Effluent
Total Antimony ²		5.6 µg/L		Weekly	Grab	Effluent
Total Boron ²		750.0 µg/L		Weekly	Grab	Effluent
Total Cobalt ²		65.0 µg/L		Weekly	Grab	Effluent
Total Molybdenum ²		170 µg/L		Weekly	Grab	Effluent
Total Iron				Quarterly	Grab	Effluent
pH	> 6.0 and < 9.0 standard units			2 / Month	Grab	Effluent

Notes:

1. Samples taken in compliance with the monitoring requirements listed above shall be taken prior to mixing with other waste streams.
2. The limit and monitoring frequency becomes applicable 24 months after the commencement of the FGD system. Twice monthly monitoring is required upon initial commencement of the FGD system.
3. Acute Toxicity (Fathead Minnow 24-hr) No significant mortality at 90%; February, May, August, and November [see A. (7)].
4. The mercury limit will take effect one year after commencement of the FGD system to treat FGD wastewater.
5. See A. (13).
6. Instream sampling for chlorides is required at the edge of the mixing zone, 200 meters linear distance from the discharge point. Monitoring shall begin upon commencement of the FGD system and shall last for 5 years.

After the FGD treatment system is used to treat FGD wastewater, the effluent limits in Conditions A. (4) and A. (5) apply.

Progress Energy shall inform this office as well as the Raleigh Regional Office, via phone call and via letter, as to when the FGD treatment system will be used to treat FGD wastewater.

**A. (4) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS
[002 with FGD wastewater] Continued**

There shall be no discharge of floating solids or visible foam in other than trace amounts outside an area five (5) meters from the discharge pipe. No chemical metal cleaning waste may be discharged to the ash pond. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

A. (5) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS [009]

During the period beginning upon commencement of the FGD treatment system to treat FGD wastewater and lasting until expiration, the Permittee is authorized to discharge from **Internal Outfall 009 (treated FGD wet scrubber wastewater)**. Such discharges shall be limited and monitored by the Permittee as specified below:

PARAMETER	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location
Flow			Monthly	Instantaneous	E
Total Suspended Solids			Weekly	Grab	E
Total Mercury			Weekly	Grab	E
Total Selenium			Weekly	Grab	E
Total Arsenic			Weekly	Grab	E
Total Beryllium			Weekly	Grab	E
Total Cadmium			Weekly	Grab	E
Total Chlorides			Weekly	Grab	E
Total Chromium			Weekly	Grab	E
Total Copper			Weekly	Grab	E
Total Fluoride			Weekly	Grab	E
Total Lead			Weekly	Grab	E
Total Manganese			Weekly	Grab	E
Total Nickel			Weekly	Grab	E
Total Silver			Weekly	Grab	E
Total Barium			Weekly	Grab	E
Total Thallium			Weekly	Grab	E
Total Vanadium			Weekly	Grab	E
Total Antimony			Weekly	Grab	E
Total Boron			Weekly	Grab	E
Total Cobalt			Weekly	Grab	E
Total Molybdenum			Weekly	Grab	E
Total Zinc			Weekly	Grab	E

Notes:

1. E - Effluent from the FGD treatment system prior to discharge to the Ash Pond.

A. (6) STORMWATER MONITORING REQUIREMENTS/ Qualitative Monitoring

Qualitative monitoring requires a qualitative inspection of each stormwater outfall, regardless of representative outfall status, for the purpose of evaluating the effectiveness of the Stormwater Pollution Prevention Plan and assessing new sources of stormwater pollution. No analytical tests are required. Qualitative monitoring of stormwater outfalls does not need to be performed during a representative storm event.

Stormwater Discharge Characteristics	Measurement Frequency ¹	Sample Location
Color	Semi-Annual	Stormwater Discharge Outfall
Odor	Semi-Annual	Stormwater Discharge Outfall
Clarity	Semi-Annual	Stormwater Discharge Outfall
Floating Solids	Semi-Annual	Stormwater Discharge Outfall
Suspended Solids	Semi-Annual	Stormwater Discharge Outfall
Foam	Semi-Annual	Stormwater Discharge Outfall
Oil Sheen	Semi-Annual	Stormwater Discharge Outfall
Other obvious indicators of stormwater pollution	Semi-Annual	Stormwater Discharge Outfall

Notes:

1. Measurement Frequency. Qualitative monitoring will be performed twice per year, once in the spring (April - June) and once in the fall (September - November).

**A. (7) ACUTE TOXICITY PASS/FAIL PERMIT LIMIT (Quarterly)
Outfall 002 (Ash Pond)**

The permittee shall conduct acute toxicity tests on a *quarterly* basis using protocols defined in the North Carolina Procedure Document entitled "Pass/Fail Methodology For Determining Acute Toxicity In A Single Effluent Concentration" (Revised-July, 1992 or subsequent versions). The monitoring shall be performed as a Fathead Minnow (*Pimephales promelas*) 24 hour static test. The effluent concentration at which there may be at no time significant acute mortality is 90% (defined as treatment two in the procedure document). Effluent samples for self-monitoring purposes must be obtained during representative effluent discharge below all waste treatment. The tests will be performed during the months of February, May, August and November.

All toxicity testing results required as part of this permit condition will be entered on the Effluent Discharge Monitoring Form (MR-1) for the month in which it was performed, using the parameter code TGE6C. Additionally, DWQ Form AT-2 (original) is to be sent to the following address:

Attention: North Carolina Division of Water Quality
Environmental Sciences Section
1621 Mail Service Center
Raleigh, North Carolina 27699-1621

Completed Aquatic Toxicity Test Forms shall be filed with the Environmental Sciences Branch no later than 30 days after the end of the reporting period for which the report is made.

Test data shall be complete and accurate and include all supporting chemical/physical measurements performed in association with the toxicity tests, as well as all dose/response data. Total residual chlorine of the effluent toxicity sample must be measured and reported if chlorine is employed for disinfection of the waste stream.

Should there be no discharge of flow from the facility during a month in which toxicity monitoring is required, the permittee will complete the information located at the top of the aquatic toxicity (AT) test form indicating the facility name, permit number, pipe number, county, and the month/year of the report with the notation of "No Flow" in the comment area of the form. The report shall be submitted to the Environmental Sciences Branch at the address cited above.

Should any single quarterly monitoring indicate a failure to meet specified limits, then monthly monitoring will begin immediately until such time that a single test is passed. Upon passing, this monthly test requirement will revert to quarterly in the months specified above.

Should the permittee fail to monitor during a month in which toxicity monitoring is required, then monthly monitoring will begin immediately until such time that a single test is passed. Upon passing, this monthly test requirement will revert to quarterly in the months specified above.

Should any test data from either these monitoring requirements or tests performed by the North Carolina Division of Water Quality indicate potential impacts to the receiving stream, this permit may be re-opened and modified to include alternate monitoring requirements or limits.

NOTE: Failure to achieve test conditions as specified in the cited document, such as minimum control organism survival and appropriate environmental controls, shall constitute an invalid test and will require immediate follow-up testing to be completed no later than the last day of the month following the month of the initial monitoring.

A. (8) SELENIUM STUDY

The Permittee shall conduct biological and physical/chemical studies on selenium and its effect in the reservoir. The results shall be submitted each year by May 1 for the prior calendar year. The plan of study shall be submitted to the Director of the Division of Water Quality for approval.

A. (9) CRUTCHFIELD BRANCH

There shall be no direct discharge of wastewater from the ash pond to Crutchfield Branch. There shall be no violation of water quality standards in Crutchfield Branch due to any indirect discharge from the ash pond. The Permittee shall monitor the waters of Crutchfield Branch, 100 yards downstream of the dike, once per year by grab sample for the following: arsenic, copper, and selenium.

A. (10) DOMESTIC WASTEWATER TREATMENT PLANT

The domestic wastewater treatment plant shall be properly operated and maintained to ensure treatment of domestic wastewater to secondary levels.

A. (11) STORMWATER POLLUTION PREVENTION PLAN

The permittee shall develop a Stormwater Pollution Prevention Plan, herein after referred to as the Plan. The Plan shall be considered public information in accordance with Part II, Section E.10. of this permit. The Plan shall include, at a minimum, the following items:

- a. Site Plan: The site plan shall provide a description of the physical facility and the potential pollutant sources which may be expected to contribute to contamination of regulated stormwater discharges. The site plan shall contain the following:
 - (1) A general location map (USGS quadrangle map, or appropriately drafted equivalent map), showing the facility's location in relation to transportation routes and surface waters, and the name of the receiving water(s) to which the stormwater outfall(s) discharges. If the discharge is to a municipal separate storm sewer system, the name of the municipality and the ultimate receiving waters, and accurate latitude and longitude of the point(s) of discharge must be shown.

- (2) A narrative description of storage practices, loading and unloading activities, outdoor process areas, dust or particulate generating or control processes, and waste disposal practices.
- (3) A site map (or series of maps) drawn to scale with the distance legend indicating location of industrial activities (including storage of materials, disposal areas, process areas, and loading and unloading areas), drainage structures, drainage areas for each outfall and activities occurring in the drainage area, building locations and impervious surfaces, the percentage of each drainage area that is impervious. For each outfall, a narrative description of the potential pollutants which could be expected to be present in the regulated stormwater discharge.
- (4) A list of significant spills or leaks of pollutants that have occurred at the facility during the 3 previous years and any corrective actions taken to mitigate spill impacts.
- (5) Certification that the stormwater outfalls have been evaluated for the presence of non-stormwater discharges. The certification statement will be signed in accordance with the requirements found in Part II, Section B.11.

b. **Stormwater Management Plan:** The stormwater management plan shall contain a narrative description of the materials management practices employed which control or minimize the exposure of significant materials to stormwater, including structural and non-structural measures. The stormwater management plan, at a minimum, shall incorporate the following:

- (1) A study addressing the technical and economic feasibility of changing the methods of operations and/or storage practices to eliminate or reduce exposure of materials and processes to stormwater. Wherever practicable the permittee should consider covering storage areas, material handling operations, manufacturing or fueling operations to prevent materials exposure to stormwater. In areas where elimination of exposure is not practicable, the stormwater management plan shall document the feasibility of diverting the stormwater runoff away from areas of potential contamination.
- (2) A schedule to provide secondary containment for bulk storage of liquid materials, storage of Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) water priority chemicals, or storage of hazardous materials to prevent leaks and spills from contaminating stormwater runoff. If the secondary containment devices are connected directly to stormwater conveyance systems, the connection shall be controlled by manually activated valves or other similar devices [which shall be secured with a locking mechanism] and any stormwater that accumulates in the containment area shall be at a minimum visually observed prior to release of the accumulated stormwater. Accumulated stormwater shall be released if found to be uncontaminated. Records documenting the individual making the observation, the description of the accumulated stormwater and the date and time of the release shall be kept for a period of five years.
- (3) A narrative description of Best Management Practices (BMPs) to be considered such as, but not limited to, oil and grease separation, debris control, vegetative filter strips, infiltration and stormwater detention or retention, where necessary. The need for structural BMPs shall be based on the assessment of potential of sources contributing significant quantities of pollutants to stormwater discharges and data collected through monitoring of stormwater discharges.
- (4) Inspection schedules of stormwater conveyances and controls and measures to be taken to limit or prevent erosion associated with the stormwater systems.

c. **Spill Prevention and Response Plan:** The Spill Prevention and Response Plan shall incorporate a risk assessment of potential pollutant sources based on a materials inventory of the facility. Facility personnel (or team) responsible for implementing the plan shall be identified in the plan. A responsible person shall be on-site at all times during facility operations that have the

potential to contaminate stormwater runoff through spills or exposure of materials associated with the facility operations.

- d. **Preventative Maintenance and Good Housekeeping Program:** A preventative maintenance program shall be developed. The program shall document schedules of inspections and maintenance activities of stormwater control systems, plant equipment and systems. Inspection of material handling areas and regular cleaning schedules of these areas shall be incorporated into the program.
- e. Training schedules shall be developed and training provided at a minimum on an annual basis on proper spill response and cleanup procedures and preventative maintenance activities for all personnel involved in any of the facility's operations that have the potential to contaminate stormwater runoff. Facility personnel (or team) responsible for implementing the training shall be identified in the plan.
- f. The Stormwater Pollution Prevention Plan shall identify a specific position(s) responsible for the overall coordination, development, implementation, and revision to the Plan. Responsibilities for all components of the Plan shall be documented and position(s) assignments provided.
- g. **Plan Amendment:** The permittee shall amend the Plan whenever there is a change in design, construction, operation, or maintenance which has a significant effect on the potential for the discharge of pollutants via a point source to surface waters. The Stormwater Pollution Prevention Plan shall be reviewed and updated on an annual basis.

The director may notify the permittee when the Plan does not meet one or more of the minimum requirements of the permit. Within 30 days of such notice, the permittee shall submit a time schedule to the Director for modifying the Plan to meet minimum requirements. The permittee shall provide certification in writing (in accordance with Part III, Standard Conditions, Section B.11.) to the Director that the changes have been made.

- h. **Facility Inspections:** Inspections of the facility and all stormwater systems shall occur at a minimum on a semiannual schedule, once in the fall (September - November) and once during the spring (April - June). The inspection and any subsequent maintenance activities performed shall be documented, recording date and time of inspection, individual(s) making the inspection and a narrative description of the facility's stormwater control systems, plant equipment and systems. Records of these inspections shall be incorporated into the Stormwater Pollution Prevention Plan.

Visual monitoring as required in A(4) Stormwater Monitoring Requirements/Qualitative Monitoring shall be performed in addition to facility inspections.

- i. **Implementation:** Implementation of the Plan shall include documentation of all monitoring, measurements, inspections, maintenance activities and training provided to employees, including the log of the sampling data. Activities taken to implement BMPs associated with the industrial activities, including vehicle maintenance activities, must also be recorded. All required documentation shall be kept on-site for a period of five years and made available to the Director or his authorized representative immediately upon request.

A. (12) STORMWATER MINIMUM MONITORING AND REPORTING REQUIREMENTS

Minimum monitoring and reporting requirements are as follows unless otherwise approved in writing by the Director of the Division of Water Quality:

- a. If a facility has multiple discharge locations with substantially identical stormwater discharges that are required to be sampled, the permittee may petition the Director for representative outfall status. If it is established that the stormwater discharges are substantially identical and the permittee is granted representative outfall status, then sampling requirements may be performed at a reduced number of outfalls.

- b. Visual monitoring for color, odor, solids, foam, outfall staining, visible sheens and dry weather flow shall be performed at all stormwater discharge outfall locations. All visual monitoring shall be documented and records maintained with the Stormwater Pollution Prevention Plan. The initial visual monitoring event shall be performed during the Spring of 2006.
- c. For purposes of the stormwater sampling required in this permit, all samples shall be collected from a discharge resulting from a representative storm event (See definitions in Part II, Section A). Failure to monitor storm events in accordance with the specified frequency shall constitute a violation of this permit. If the stormwater runoff is controlled by a detention pond, the following sampling requirements shall apply:
 - (1) If the detention pond detains the runoff generated by one inch of rainfall for 24 hours, visual observations for color, foam, outfall staining, visible sheens and dry weather flow are required, but analytical sampling shall not be required.
 - (2) If the detention pond discharges only in response to a storm event exceeding a 25-year, 24-hour storm, the pond shall be considered a non-discharging stormwater control system and not subject to NPDES requirements, unless the discharge causes a violation of water quality standards.
- d. Samples analyzed in accordance with the terms of this permit shall be submitted on forms approved by the Director no later than January 31 for the previous year in which sampling was required to be performed.
- e. Analytical results from sampling during the final year of the permit term shall be submitted with the permit renewal application.
- f. This permit regulates stormwater discharges associated with industrial activity. Non-stormwater discharges which shall be allowed in the stormwater conveyance system are:
 - (1) All other discharges that are authorized by an NPDES permit.
 - (2) Foundation drains, air-conditioner condensate without added chemicals, springs, waterline and fire hydrant, water from footing drains, flows from riparian habits and wetlands, fire-fighting training and fire system testing, wash down water without added chemicals.
 - (3) Discharges resulting from fire-fighting.
- g. If the storm event monitored and reported in accordance with this permit coincides with a non-stormwater discharge, the permittee shall separately monitor and report all parameters as required under the non-stormwater portion of this permit and provide this information with the stormwater discharge monitoring report.

No analytical monitoring is required by the permit.

A. (13) FISH TISSUE SAMPLING

Progress Energy shall conduct fish tissue sampling for Arsenic on an annual basis. The fish tissue sampling plan shall be approved by the Division's Environmental Sciences Section prior to commencement of sampling.



Michael F. Easley, Governor
State of North Carolina

William G. Ross, Jr., Secretary
Department of Environment and Natural Resources

Coleen H. Sullins, Director
Division of Water Quality

December 14, 2007

Mr. Larry E. Hatcher, Plant Manager
Progress Energy Carolinas, Inc.
Mayo Electric Generating Plant
10660 Boston Road
Roxboro, NC 27574

Subject: Issuance of NPDES Permit NC0038377
Mayo Steam Plant
Person County

Dear Mr. Hatcher:

Division personnel have reviewed and approved your application for modification of the subject permit. Accordingly, we are forwarding the attached NPDES discharge permit. This permit is issued pursuant to the requirements of North Carolina General Statute 143-215.1 and the Memorandum of Agreement between North Carolina and the U.S. Environmental Protection Agency dated October 15, 2007 (or as subsequently amended).

This final permit contains the following significant changes from the draft you were sent on June 6, 2007:

- Limits and monitoring requirements for antimony, boron, cobalt, and molybdenum have been added based on the unforeseeable potential these parameters may have to cause an exceedance of water quality criteria.
- The minimum flow limit has been removed based on your company's decision to accept additional metals monitoring.
- The beryllium limit has been updated to reflect the current aquatic life standard of 6.5 µg/L.

If any parts, measurement frequencies or sampling requirements contained in this permit modification are unacceptable to you, you have the right to an adjudicatory hearing upon written request within thirty (30) days following receipt of this letter. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings (6714 Mail Service Center, Raleigh, North Carolina 27699-6714). Unless such demand is made, this decision shall be final and binding.

Please note that this permit is not transferable except after notice to the Division. The Division may require modification or revocation and reissuance of the permit. This permit does not affect the legal requirements to obtain other permits which may be required by the Division of Water Quality or permits required by the Division of Land Resources, the Coastal Area Management Act or any other Federal or Local governmental permit that may be required. If you have any questions concerning this permit, please contact Toya Fields at telephone number (919) 733-5083, extension 551.

Sincerely,

Coleen H. Sullins

cc: Central Files
Raleigh Regional Office/Surface Water Protection
NPDES Unit
Aquatic Toxicology Unit
Marshall Hyatt / EPA

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Parameter	Projected Concentration (µg/L) before Treatment	Projected Concentration (µg/L) after 75% Removal	Conc. (µg/L) after Internal Dilution (312:1)	Chronic Water Quality Standards (µg/L)
Antimony	333.0	83.25	0.2668	5.6
Arsenic	193.0	48.25	0.1546	10.0
Barium	2512.0	628.0	2.0128	1000.0
Beryllium	188.0	47.0	0.1506	0.0068
Boron	608.0	**	1.9487	750.0
Cadmium	19.0	4.75	0.0152	2.0
Chloride*	6905.0	**	22.131	230.0
Chromium	95.0	23.75	0.0761	50.0
Cobalt	21.0	5.25	0.0168	65.0
Copper	375.0	93.75	0.3005	7.0
Fluoride	12.0	**	0.0385	1.8
Lead	101.0	25.25	0.0809	25.0
Manganese	2204.0	551.0	1.7660	200.0
Mercury	9.0	2.25	0.0072	0.012
Molybdenum	9413.0	2353.25	7.5425	170.0
Nickel	415.0	103.75	0.3325	25.0
Selenium	1279.0	319.75	1.0248	5.0
Silver	7.6	1.9	0.0061	0.06
Sulfate	2441.0	**	7.8237	250.0
Thallium	2.0	0.5	0.0016	0.35
Vanadium	3155.0	788.75	2.5280	24.0
Zinc	1609.0	402.25	1.2894	50.0

* Chloride concentrations are in mg/L

** System designed to remove metals and nitrogen. Parameters in bold are neither. Assume negligible removal.

Results

Only Beryllium shows a potential to be discharged in amounts that may exceed standards. Therefore monthly monitoring will be added. Monitoring requirements for other parameters will not be added at this time.

Proposed Schedule for Permit Issuance

Draft Permit to Public Notice: May 25, 2005.
Permit Scheduled to Issue: July 18, 2005.

State Contact

If you have any questions on any of the above information or on the attached permit, please contact Dawn Jeffries at (919) 733-5083, extension 595.

NAME: Dawn Jeffries DATE: 5-24-05

Regional Office Comments

NAME: _____ DATE: _____

SUPERVISOR: _____ DATE: _____

NCDENR / DWQ
FACT SHEET FOR NPDES PERMIT MODIFICATION DEVELOPMENT

Carolina Power and Light- (Roxboro)
NPDES No. NC0003425

Facility Information			
(1.) Facility Name:	Roxboro Steam Electric Plant		
(2.) Permitted Flow, MGD:	Outfall 002, no limit	(6.) County:	Person
(3.) Facility Class:	NA	(7.) Regional Office:	RRO
(4.) Facility Status:	Existing	(8.) USGS Topo Quad:	Olive Hill
(5.) Permit Status:	Modification		
Stream Characteristics			
(1.) Receiving Stream:	Hyco Reservoir		
(2.) Subbasin:	03-02-05	(6.) Drainage Area (mi ²):	
(3.) SIC Code:	4911	(7.) Summer 7Q10 (cfs)	Not applicable
(4.) Stream Class:	WS-V, B	(8.) Average Flow (cfs):	Not applicable
(5.) 303(d) Listed:		(9.) IWC (%):	Not applicable

Summary

- This permit was last issued in December 2002 and expires on March 31, 2007. The facility requested a modification to the permit in April 2005 to allow for an additional wastestream, which will be generated by flue gas desulfurization (FGD) units, which are projected to begin operating in 2007. Permittee also requested a minor change in the wording in Condition A.6.
- The permittee proposes to treat the wastewater from the Flue Gas Desulfurization (FGD) by collecting it in a settling pond and then pumping it to a bioreactor. Effluent from the bioreactors will combine with the effluent from the Ash Pond and discharge through internal outfall 002 before ultimately joining the Discharge Canal (outfall 003) and flowing into Hyco Reservoir. The receiving waterbody is classified WS-V B and is listed as impaired in the 2002 303(d) list due to fish advisories for selenium.
- This is the first facility in North Carolina to install bioreactor technology. The permittee has a pilot study in progress at their Conemaugh Station Pennsylvania, and results should be available soon.
- The permittee has provided a list of expected flows and concentrations of parameters in the FGD wastewater before treatment in the bioreactors. The permittee has not provided removal rates for various parameters. However, these systems are designed for removal of metals and nitrogen, and under optimal conditions have reportedly achieved removal rates of 99%. Because DWQ has received no data from the pilot study, a 75% removal rate was assumed in determining projected effluent concentrations. This can be modified if more data is later provided.
- The permittee provided an estimated flow from the FGD process of 1.92 MGD. BIMS data for 2004 indicates that the low flows at outfall 003 (final discharge to the reservoir) were: monthly average - 1107 MGD, weekly average - 600 MGD, and daily max - 592 MGD. Weekly average low flow was used to protect against chronic impacts. Therefore, for estimates of concentrations of pollutants at the final discharge, an internal dilution of 312 was used.
- Outfall 003 already has a toxicity limit. Propose adding monitoring at 003 for parameters not already monitored that show potential to exceed chronic water quality standards assuming a 75% removal rate for metals and a worst-case internal dilution (312:1). Dilution by the receiving water was not taken into account at this time.

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DENR/DWQ
FACT SHEET FOR NPDES PERMIT DEVELOPMENT
 NPDES No. NC0038377, Progress Energy Carolinas, Inc.
 Mayo Steam Electric Generating Plant

Facility Information			
Applicant/Facility Name:	Progress Energy Carolinas/Mayo Steam Electric Generating Plant		
Applicant Address:	10660 Boston Road, Roxboro, NC 27573		
Facility Address:	(same)		
Permitted Flow	Not limited		
Type of Waste:	99.8 % Industrial, 0.2% - domestic		
Facility/Permit Status:	Existing/Major Modification		
County:	Person		
Miscellaneous			
Receiving Stream:	Mayo Reservoir	Regional Office:	RRO
Stream Classification:	WS-V	Quad	A23SW
303(d) Listed?:	No	Permit Writer:	Sergei Chernikov
Subbasin:	030205 (Roanoke)	Date:	April 19, 2006
Drainage Area (mi ²):	Lake		
Summer 7Q10 (cfs)			
30Q2 (cfs):			
Average Flow (cfs):			
IWC (%):	100% (assumed, no modeling info.)		
Primary SIC Code:			

SUMMARY

The Mayo Electric Generating Plant is a coal-fired electric generating plant with one unit rated at a maximum dependable capacity of 745 mw. Water for plant uses is withdrawn from the Mayo Reservoir as required to make up evaporative losses from the cooling tower, boiler water and drinking water needs. This facility is subject to EPA effluent guideline limits per 40 CFR 423- Steam Electric Power Generating Point Source Category. The facility is not subject to the 316(b) Phase II regulations since it is a closed cycle cooling system and has a design flow of less than 50 MGD.

The facility operates the following outfalls:

- Outfall 001 – Cooling tower system. This system is drained for maintenance approximately once a year to the reservoir. The discharge is monitored and reported on the DMRs.
- Outfall 002 – Ash pond treatment system (including low volume waste, ash sluice water, cooling tower blowdown, coal pile runoff, FGD blowdown, etc.) Cooling tower blowdown is usually mixed with bottom and fly ash prior to discharging into the ash pond.
- Outfall 008 (internal) - Cooling tower blowdown is directly discharged to the ash pond. Cooling tower blowdown is usually mixed with ash sluice water prior

to discharge to the ash pond. Cooling tower blowdown is indirectly discharged to Mayo Reservoir via the ash pond treatment system (Outfall 002).

- Outfall 009 (internal) - FGD blowdown.
- Outfalls 004, 005, and 006a, b, c, d, e – stormwater outfalls.

Progress submitted their request for modification of their permit on March 1, 2006. The company is currently operating under the NPDES permit issued December 5, 2005, which will expire March 31, 2007.

The modification request is in response to North Carolina's Clean Air Initiative (Clean Smokestacks Bill), which requires the reduction of SO_x and NO_x from air emissions. As a result of this initiative, the company plans to install Flue Gas Desulfurization (FGD), systems at several plants. The FGD is essentially a scrubber system to remove SO_x by mixing flue gas with a limestone slurry.

The FGD blowdown is predicted to generate a flow of 0.253 MGD, with relatively elevated concentrations of metals and chloride. Progress Energy plans to treat the FGD blowdown via proprietary bioreactor technology. Solids will be removed from the blowdown stream prior to entering a bioreactor which utilizes microorganisms to reduce soluble contaminants to insoluble forms (under anaerobic conditions) that then precipitate from solution. The treated FGD blowdown will then be routed to the Ash Pond. Predicted concentrations from the Ash Pond (Outfall 001) are listed on the attached pages (Tables 1a & 1b).

No other changes in wastewater are anticipated at the plant. The addition of FGD blowdown will only affect the effluent discharge from the ash pond via Outfall 002.

TOXICITY TESTING:

Current Requirement: Acute P/F at 90%, February, May, August, November.
Proposed Requirement: Acute P/F at 90%, February, May, August, November.

The facility has passed all chronic toxicity tests during the previous 4.5 years.

COMPLIANCE SUMMARY: BASED ON THE PREVIOUS 5 YEARS

There are no outstanding and/or chronic compliance problems related to the NPDES permit. A compliance evaluation inspection conducted on 03/31/05 found that facility is in compliance. The only Notice of Violation that was issued during previous 5 years was for TRC (10/13/2003). Letter from Environmental Sciences Branch (05/09/05) concurred with the latest report from Progress that chemical and biological characteristics of Mayo reservoir are similar to prior years.

PROPOSED CHANGES

Limits: As outlined in the attached spreadsheet, based on estimated values of the blowdown concentration and estimated removal efficiency (both provided by Progress Energy), estimated effluent concentrations from the FGD treatment system can be calculated. Maximum predicted effluent concentrations can be determined based on a coefficient of variation of 0.6 and multiplier of 13.2 (as outlined in NC's RPA procedure based on EPA's Technical Support Document, n = 1).

Based on these values, the Division would promulgate limits for: Hg, Be, Cd, Chlorides, Cr, F, Pb, Mn, Ba, Tl, and V.

NPDES PERMIT FACT SHEET

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Progress- Mayo
NPDES No. NC0038377

Misc: An internal outfall 009 was created to monitor the influent to ash pond from FGD treatment system.

PROPOSED SCHEDULE FOR PERMIT ISSUANCE

Draft Permit to Public Notice: 5/24/06 (est.)

Permit Scheduled to Issue: 6/19/06 (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) 733-5038, extension 594.

REGIONAL OFFICE COMMENT:

NAME: _____ DATE: _____

EPA COMMENT:

NAME: _____ DATE: _____

Attachment 1a for Fact Sheet

Progress Energy Carolinas, Inc. (PEC)
 Mayo Electric Generating Plant
 NC0038377

Parameter	Estimated FGD Blowdown Conc. ug/L	Mass Input to ABMet lbs/day ^	Predicted Removal Eff. %	Mass Output from ABMet lbs/day ^	Estimated Effluent conc. mg/L ^^	Estimated Effluent conc. ug/L
Antimony	44.0	0.092841	72.0000	0.025995	0.000413	0.41
Arsenic	39.0	0.082291	0.0000	0.082291	0.001306	10.00
Barium	2519.0	5.315140	0.0000	5.315140	0.084378	84.38
Beryllium	25.0	0.052751	0.0000	0.052751	0.000837	0.84
Boron	79.0	0.166692	0.0000	0.166692	0.002646	2.65
Cadmium	8.0	0.016880	0.0000	0.016880	0.000268	0.27
Chloride	16000000.0	33760.320000	0.0000	33760.320000	535.945982	535945.98
Chromium	121.0	0.255312	0.0000	0.255312	0.004053	4.05
Cobalt	77.0	0.162472	89.1000	0.017709	0.000281	0.28
Copper	72.0	0.151921	92.8000	0.010938	0.000174	0.17
Fluoride	18400.0	38.824368	0.0000	38.824368	0.616338	616.34
Lead	79.0	0.166692	0.0000	0.166692	0.002646	2.65
Manganese	1450.0	3.059529	0.0000	3.059529	0.048570	48.57
Mercury	38.0	0.080181	51.9000	0.038567	0.000612	0.61
Molybdenum	1290.0	2.721926	95.6000	0.119765	0.001901	1.90
Nickel	576.0	1.215372	95.9000	0.049830	0.000791	0.79
Selenium	5480.0	11.562910	85.0000	1.734436	0.027534	25.00
Thallium	8.0	0.016880	81.3000	0.003157	0.000050	0.05
Vanadium	65.0	0.137151	0.0000	0.137151	0.002177	2.18
Zinc	3690.0	7.785974	94.0000	0.467158	0.007416	7.42

^ Mass Input to ABMet is based on FGD est. blowdown of 0.253 MGD and est. concentrations provided by Progress.
 = x mg/L * 0.253 MGD * 8.34

^^ The concentration output is based on the flow from the ash pond (7.3 MGD) + flow from FGD (0.253 MGD) = 7.553 MGD
 mass (lbs/day) / (7.553 * 8.34) = conc. mg/L

Attachment 1b for Fact Sheet

Progress Energy Carolinas, Inc.
 Mayo Electric Generating Plant
 NC0038377

Parameter	Estimated FGD Blowdown Conc. *	(C Waters) WQ standard	EPA Criteria Allowat	Allowable ug/L	Estimated Effluent conc. ug/L ^Λ	Acute Values ug/L	Maximum Predicted conc. for RPA #	Limit or Monitor?
Antimony	44.0		5.6	5.6	0.41		5.41	Monitor
Arsenic	39.0	10		10	10.00		132.00	Monitor
Barium	2519.0	1000		1000	84.38		1113.82	Limit
Beryllium	25.0	0.0068		0.0068	0.84		11.09	Limit
Boron	79.0		750	750	2.65		34.98	Monitor
Cadmium	8.0	2		2	0.27	15	3.56	Limit
Chloride (mg/L)	16000.0	230 mg/L (AL)		230000	535945.98		7074486.94	Limit
Chromium	121.0	50		50	4.05	1022	53.46	Limit
Cobalt	77.0		65	65	0.28		3.70	Monitor
Copper	72.0	7 (AL)		7	0.17		2.24	Monitor
Fluoride	18400.0	1.8 mg/L		1800	616.34		8135.69	Limit
Lead	79.0	25		25	2.65	33.8	34.98	Limit
Manganese	1450.0	200		200	48.57		641.12	Limit
Mercury	38.0	0.012		0.012	0.61		8.05	Limit
Molybdenum	1290.0		170	170	1.90		25.08	Monitor
Nickel	576.0	25		25	0.79	261	10.43	Monitor
Selenium	5480.0	5		5	25.00	56	330.00	Keep Limit
Thallium	8.0		0.35	0.35	0.05		0.66	Limit
Vanadium	65.0	50 (AL)		24	2.18		28.78	Limit
Zinc	3690.0			50	7.42	67	97.94	Monitor (AL)

* Concentrations are in ug/L unless otherwise noted

^Λ The concentration output is based on the flow from the ash pond (7.3 MGD) + flow from FGD (0.253) = 7.553 MGD.

= mass (lbs/day) / (7.553 * 8.34)

= conc. mg/L

Estimated effluent conc. * 13.2

IWC = 100% (assumed, since discharge is into the Lake and no modeling was conducted)

Limit or monitor determined by one data point (the estimated concentration from the ash pond effluent). As defined in EPA TSD for one data point, CV = 0.6 and the multiplier is 13.2