

STATE OF NORTH CAROLINA
COUNTY OF ROCKINGHAM

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL QUALITY

IN THE MATTER OF
DUKE ENERGY CAROLINAS, LLC

File No. DV-2016-0017

FOR VIOLATIONS OF
NPDES PERMIT NC0003468,
N.C.G.S. 143-215.1(a)(1), and
15A NCAC 2B .0211

FINDINGS AND DECISIONS
AND ASSESSMENT OF
CIVIL PENALTIES

Acting pursuant to delegation provided by the Secretary of the Department of Environmental Quality, I, S. Jay Zimmerman, Director of the Division of Water Resources (DWR) make the following:

I. FINDINGS OF FACT

- A. Duke Energy Carolinas, LLC (Duke) is a limited liability company organized and existing in the State of North Carolina.
- B. Duke owns and operates energy production facilities and treatment facilities for wastewater generated by energy production activities at the Dan River Steam Station, located off of South Edgewood Road, south of the City of Eden, in Rockingham County, North Carolina.
- C. Duke was originally issued NPDES permit NC0003468 on August 30, 1976 for the discharge of treated wastewater from the Dan River Steam Station to the Dan River, class C waters of the state in the Roanoke River Basin. Since that time, the NPDES permit has been renewed several times, most recently on January 31, 2013 (with an effective date of March 1, 2013). In the most recent permit, the facility is named as the "Dan River Combined Cycle Station," as a result of Duke's retirement of the coal combustion energy production facility at the site, and its replacement with a facility using natural gas. Existing wastewater treatment units remained in operation following the transition in the means of energy production.
- D. NPDES permit NC0003468 contains specific requirements for the conveyance, treatment and discharge of wastewater to surface waters. Discharge of wastewater generated from various operations within the Dan River Steam Station is permitted at outfalls designated 001 (once-through cooling water, cooling tower blowdown, intake screen backwash, plant collection sumps and domestic wastewater), 001A (wastes from filtered water plant, including wash down water and laboratory wastes), 002 (ash basin discharge including low volume wastes, boiler cleaning wastewater, ash disposal, stormwater, boiler blowdown and metal washing) and 002A (yard sump overflow consisting of stormwater runoff, miscellaneous sumps and coal yard runoff), to the Dan River.

- E. The Dan River Steam Station began operating in 1949 as a coal combustion plant. Such plants commonly employ a waste management system whereby the residual solids from the coal combustion process are mixed with water, and the resulting slurry is deposited in an impoundment designed for the purpose of storage and treatment of such wastewater (commonly known as a “coal ash pond” or “coal ash basin”). Solids separate from slurry and deposit at the bottom of the basin. The less contaminated supernatant remains at the surface of the basin, where it can be discharged under the terms and conditions of relevant laws and/or permits. From the beginning of its operation until 1956, the Dan River Steam Station generated a coal ash slurry that was deposited on the land surface at the site, where the solids separated from the water, with the water eventually flowing to the Dan River. Beginning in 1956, the Dan River Steam Station modified its wastewater treatment processes to use an ash pond waste disposal system.
- F. The Dan River Steam Station’s first coal ash basin was constructed in 1956 and is commonly referred to as the “Primary Ash Basin.” During 1968 and 1969, the Primary Ash Basin was expanded. During 1976 and 1977, the expanded Primary Ash Basin was divided to form a second ash basin (the “Secondary Ash Basin”) that would receive flow from the Primary Ash Basin, providing wastewater with additional treatment prior to discharge. The resultant basins had surface areas of 27 acres (Primary) and 12 acres (Secondary).
- G. Stormwater pipes with diameters of 48 inches and 36 inches existed beneath the Primary Ash Basin with the purpose of conveying stormwater from different areas of the Dan River Steam Station property to the Dan River. The 36 inch pipe was made of reinforced concrete and ran for a length of approximately 600 feet. The 48 inch pipe was originally installed in 1954, and was made of galvanized, corrugated metal pipe. When it was first installed, its entire length was outside the boundary of the Primary Ash Basin and did not extend all the way to the Dan River. When the Primary Ash Basin was expanded in 1968 – 1969, the expanded basin covered the 48 inch pipe and the location of its outfall. The length of the pipe was extended to the Dan River at that time using reinforced concrete pipe at its outfall end.

- H. From 1976 until 2010, safety inspections of the coal ash basins were required to be performed every five years pursuant to directives of the North Carolina Utilities Commission. Duke hired consultants to perform the inspections and prepare reports containing observations, conclusions and recommendations. In reports generated by their consultants in 1981 and 1986, it was recommended that Duke perform quantitative monitoring of the inflow and outflow of both the 48 inch and 36 inch stormwater pipes [in addition to qualitative (visual) monitoring] in order to determine if wastewater was leaking into the pipes from the coal ash basins. In those reports, inspection of the interiors of the pipes was recommended if any leaks were suspected, in order to determine if they were indicative any threat to the structural integrity of the pipes. The 1986 inspection report stated the desire to see such monitoring performed on the 48 inch stormwater pipe was because "part of this culvert is constructed of corrugated metal pipe which would be expected to have less longevity of satisfactory service than the reinforced concrete pipe."
- I. The sixth independent consultant's report, submitted to Duke in February 2007 and based upon the results of a November 2006 inspection conducted by staff of MACTEC Engineering and Consulting, Inc. referenced that Duke engineers had formerly performed annual safety inspections of the coal ash basins, but since 2001 that program of routine inspections has not been maintained. It additionally stated that routine monthly site inspections performed by Dan River Steam Station personnel had been conducted during "most months of 2001, 2002, 2004, 2005 and 2006," but that "Monthly inspections were not performed in 2003."
- J. The sixth independent consultant's report contained the following recommendation:
- The outflow of the drainage pipes extending under the primary ash basins to the river should be monitored for turbidity of the discharge, which would be indicative of soil entrance into the pipes through leaks under the basin. The appearance of turbidity would make it advisable to perform a TV camera inspection of the pipe to help determine if the leak or leaks are a threat.
- K. No documentation exists of Duke performing quantitative flow monitoring or video inspection of either the 48 inch or the 36 inch stormwater pipes running beneath the Primary Ash Basin as a means to evaluate those pipes for wastewater intrusion.

- L. In an independent engineering report regarding the Dan River Steam Station's coal combustion waste (CCW) impoundments prepared by Paul C. Rizzo Associates, Inc. in September 2009 for the U.S. Environmental Protection Agency (EPA) as part of EPA's nationwide effort to determine the structural status of coal ash basins in the aftermath of the coal ash spill at the Tennessee Valley Authority's Kingston Plant in December 2008, the Primary and Secondary Ash Basins were characterized as being "significant hazard potential structures," because their failure was "not likely to result in loss of life, but may cause significant economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns." The report continued by stating "The predominate risk of failure for the Primary and Secondary Ponds is environmental damage."
- M. Duke has received no authority to discharge wastewater generated from activities at the Dan River Steam Station to waters of the state apart from that granted by NPDES permit NC0003468.
- N. Part II, Section B. 2. of NPDES Permit NC0003468 states: "The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit with a reasonable likelihood of adversely affecting human health or the environment [40 CFR 122.41(d)]."
- O. Part II, Section C. 2. of NPDES Permit NC0003468 states, in part: "The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit."
- P. North Carolina General Statute 143-215.1(a)(1) states that no person shall make any outlet to the waters of the state without first receiving a permit for the activity.
- Q. 15A NCAC 2B .0211(1) states that best usage for Class C waters are "aquatic life propagation and maintenance of biological integrity (including fishing, and fish), wildlife, secondary recreation, agriculture and any other usage except for primary recreation or as a source of water supply for drinking, culinary or food processing purposes."
- R. 15A NCAC 2B .0211(2) states that Class C waters "will be suitable for aquatic life propagation and maintenance of biological integrity (including fishing, and fish), wildlife, secondary recreation, agriculture; sources of water pollution which preclude any of these uses on either a short-term or a long-term basis will be considered violating a water quality standard."

- S. On February 2, 2014, a portion of a corrugated metal section of a 48 inch stormwater pipe running underneath the Dan River Steam Station's Primary Ash Pond ruptured. This event led to the discharge of approximately 27 million gallons of coal ash wastewater and between 30,000 and 39,000 tons of coal ash into the Dan River. The discharge created turbid conditions in the Dan River and led to the deposition of coal ash downstream as far as the Kerr Lake Reservoir (as far as 70 miles downstream). Discharge of wastewater from the 48 inch pipe continued until the outlet of the pipe was permanently sealed on February 8, 2014.
- T. Engineering estimates of corrugated metal pipe place its maximum effective lifespan at around fifty (50) years due to its susceptibility to corrosion. This effective lifespan is lessened if the pipe is placed in a potentially corrosive environment. At the time of the rupture of the 48 inch stormwater pipe running beneath the Primary Ash Basin, the corrugated metal pipe portion was sixty (60) years old.
- U. On February 6, 2014, Duke conducted a video inspection of a 36 inch, reinforced concrete, stormwater pipe running underneath the Dan River Steam Station's Primary Ash Pond. The examination revealed the infiltration of wastewater from the ash pond occurring to varying degrees at various points throughout its length, with the wastewater ultimately conveyed to the Dan River. Discharge from the 36 inch pipe continued until the pipe was permanently sealed on February 21, 2014. Analyses of the water being discharged to the Dan River via the 36 inch stormwater pipe conducted on February 14 and February 17, 2014 indicated the flow contained characteristics of coal ash wastewater, including arsenic concentrations of 140 µg/L and 180 µg/L on those respective dates.
- V. In the *Joint Factual Statement* agreed to between the United States of America and Duke Energy Business Services, LLC, Duke Energy Carolinas, LLC and Duke Energy Progress, Inc., and filed in the United States District Court for the Eastern District of North Carolina on May 14, 2015, Duke affirmed that the following violations of the NPDES permit occurred:
- Failure to properly operate and maintain the treatment works covered by NPDES permit NC0003468 (§§ 1 & 80).
 - Failure to take all reasonable steps to minimize or prevent any discharge of coal ash that would adversely affect the environment (§§ 1 & 80).

Additionally, in the *Joint Factual Statement*, Duke affirmed that the following non-permitted violations occurred:

- Discharge of wastewater from the 48 inch stormwater pipe without first obtaining a NPDES permit for the activity from February 2, 2014 until February 8, 2014 (§§ 41 - 42 & 81 - 89).

- Discharge of wastewater from the 36 inch stormwater pipe without first obtaining a NPDES permit for the activity from at least January 1, 2012 until February 21, 2014 (§§ 41 - 42 & 90 - 93).
 - Release of between 30,000 and 37,000 tons of coal ash from the Primary Ash Basin to the Dan River, with its deposition occurring over 62 miles of the river downstream of the release, resulting in the removal of best usage of Class C waters (§§ 1, 81, 87, 88 & 96).
- W. Duke Energy Carolinas, LLC has not been assessed civil penalties for violations of NPDES permits or water quality statutes and regulations during the five years preceding this assessment.
- X. The cost to the State of the enforcement procedures in this matter totaled \$207,005.41.

Based upon the above Findings of Fact, I make the following:

II. CONCLUSIONS OF LAW

- A. Duke Energy Carolinas, LLC is a “person” within the meaning of G.S. 143-215.6A pursuant to G.S. 143-212 (4).
- B. NPDES Permit NC0003468 is required by G.S. 143-215.1.
- C. The Dan River constitutes waters of the State within the meaning of G.S. 143-212(6) and G.S. 143-215.1(a)(1).
- D. Coal ash and coal ash wastewater described in the Findings of Fact above are “waste” pursuant to G.S. 143-213(18)(b).
- E. The discharge of coal ash and/or coal ash wastewater from the 48 and/or 36 inch stormwater pipes preceding, during and following the February 2, 2014 event at the Dan River Steam Station constituted activities that had a reasonable likelihood of adversely affecting human health or the environment.
- F. Having been made aware on numerous occasions of the potential for the introduction of coal ash wastewater to the stormwater pipes running beneath the Dan River Steam Station’s Primary Ash Pond, the jeopardy such an activity posed to the structural integrity of the ash pond, and the severe consequences that could occur should the integrity of the ash pond be compromised, Duke failed to take all reasonable steps to minimize or prevent any discharge or sludge disposal from the Dan River Steam Station treatment works with a reasonable likelihood of adversely affecting human health or the environment from at least January 1, 2012, in violation of Part II, Section B. 2. of NPDES Permit NC0003468.

- G. Duke failed to properly operate and maintain the Dan River Steam Station wastewater treatment works since at least January 1, 2012, in violation of Part II, Section C. 2. of NPDES permit NC0003468, by allowing conditions to exist that led to inflow of coal ash wastewater into the 48 inch and the 36 inch stormwater pipes running underneath the Primary Ash Pond, ultimately resulting in the structural failure of the 48 inch pipe and the release of coal ash and coal ash wastewater from the ash pond into the Dan River.
- H. The discharge of coal ash and coal ash wastewater from the Dan River Steam Station Primary Ash Pond to the Dan River via inflow into the ruptured section of the 48 inch stormwater pipe running beneath the Primary Ash Pond constituted making an outlet to waters of the state.
- I. Duke violated G.S. 143-215.1(a)(1) from February 2, 2014 until February 8, 2014, by making an outlet to waters of the waters of the state without first obtaining a permit for its discharge of coal ash and coal ash wastewater via the 48 inch stormwater pipe.
- J. The discharge of coal ash wastewater from the Dan River Steam Station Primary Ash Pond to the Dan River via inflow into the 36 inch reinforced concrete stormwater pipe running beneath the Primary Ash Pond constituted making an outlet to waters of the state.
- K. Duke violated G.S. 143-215.1(a)(1) since at least January 1, 2012 until February 21, 2014, by making an outlet to waters of the waters of the state without first obtaining a permit for its discharge of coal ash wastewater via the 36 inch stormwater pipe.
- L. Duke may be assessed civil penalties in this matter pursuant to G.S. 143-215.6A(a)(2) and G.S. 143-215.6A(b1), which provide that a civil penalty of not more than ten thousand dollars (\$10,000.00) per violation may be assessed against a person who is required but fails to apply for or to secure a permit required by G.S. 143-215.1, or who violates or fails to act in accordance with the terms, conditions or requirements of a permit issued pursuant to G.S. 143-215.1.
- M. 15A NCAC 2B .0211(1) and 15A NCAC 2B .0211(2), are water quality standards established pursuant to G.S. 143-214.1.
- N. Duke violated 15A NCAC 2B .0211(1) on 171 occasions from February 2, 2014 through July 22, 2014, by allowing the discharge of coal ash and coal ash wastewater from the Dan River Steam Station's Primary Ash Pond to the Dan River, such that natural aquatic habitat was covered by deposition of thousands of tons of coal ash on the stream bed, and citizens of North Carolina were advised to avoid consumption of fish from and recreational contact with the Dan River, thereby removing best usage of Class C waters.

- O. Duke may be assessed civil penalties in this matter pursuant to G.S. 143-215.6A(a)(1) and G.S. 143-215.6A(b1), which provide that a civil penalty of not more than ten thousand dollars (\$10,000.00) per violation may be assessed against a person who violates any classification, standard, limitation, or management practice established pursuant to G.S. 143-214.1, 143-214.2 or 143-215.
- P. The State's enforcement costs in this matter may be assessed against Duke pursuant to G.S. 143-215.3(a)(9).
- Q. S. Jay Zimmerman, pursuant to delegation provided by the Secretary of the Department of Environmental Quality, has the authority to assess civil penalties in this matter.

Based upon the above Findings of Fact and Conclusions of Law, I make the following:

III. DECISION

Accordingly, Duke Energy Carolinas, LLC is hereby assessed a civil penalty of:

- \$ 763,000.00 For 763 of 763 violations of Part II, Section B. 2. of NPDES permit NC0003468 by failing to take all reasonable steps to minimize or prevent any discharge or sludge disposal from the Dan River Steam Station treatment works with a reasonable likelihood of adversely affecting human health or the environment from at least January 1, 2012 until February 1, 2014.
- \$ 953,000.00 For 782 of 782 violations of Part II, Section C. 2. of NPDES permit NC0003468 by failing to properly operate and maintain the Dan River Steam Station treatment works from at least January 1, 2012 until February 21, 2014.
- \$ 70,000.00 For 7 of 7 violations of G.S. 143-215.1(a)(1) by making an outlet to waters of the State via the 48 inch stormwater pipe from February 2, 2014 through February 8, 2014, without having first secured a permit for the activity.
- \$ 3,128,000.00 For 782 of 782 violations of G.S. 143-215.1(a)(1) by making an outlet to waters of the State via the 36 inch stormwater pipe from January 1, 2012 through February 21, 2014, without having first secured a permit for the activity.

\$ 1,710,000.00 For 171 of 171 violations of 15A NCAC 2B .0211(1), the water quality standard for best usage of Class C waters, by removing best usage from the Dan River from February 2, 2014 through July 22, 2014.

\$ 4,624,000.00 TOTAL CIVIL PENALTY

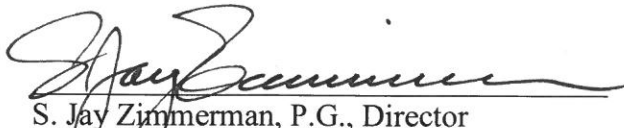
\$ 207,005.41 Enforcement Costs

\$ 4,831,005.41 TOTAL AMOUNT DUE

As required by G.S. 143-215.6A(c), in determining the amount of penalty, I considered the factors set out in G.S. 143B-282.1(b), which are:

- (1) The degree and extent of harm to the natural resources of the State, to the public health, or to private property resulting from the violations;
- (2) The duration and gravity of the violations;
- (3) The effect on ground or surface water quantity or quality or on air quality;
- (4) The cost of rectifying the damage;
- (5) The amount of money saved by noncompliance;
- (6) Whether the violations were committed willfully or intentionally;
- (7) The prior record of the violator in complying or failing to comply with programs over which the Environmental Management Commission has regulatory authority; and
- (8) The cost to the State of the enforcement procedures

7/8/2016
Date


S. Jay Zimmerman, P.G., Director
Division of Water Resources