REDACTED

INFORMATION SHEET

PRESIDING: Chair Mitchell, Presiding; Commissioners Brown-Bland, Gray, Clodfelter, Duffley, Hughes, McKissick
PLACE: Held Via Videoconference
DATE: Friday, September 11, 2020
TIME: 8:30 a.m. – 12:56 p.m.
DOCKET NOS.: E-7, Sub 1214; E-7, Sub 1213; E-7, Sub 1187
COMPANY: Duke Energy Carolinas, LLC; Duke Energy Progress, LLC
DESCRIPTION: E-7, Sub 1213, In the Matter of Petition of Duke Energy Carolinas, LLC, for Approval of Prepaid Advantage Program; E-7, Sub 1214, In the Matter of Application of Duke Energy Carolinas, LLC, for Adjustment of Rates and Charges Applicable to Electric Utility Service in North Carolina; E-7, Sub 1187, In the Matter of Application of Duke Energy Carolinas, LLC, for an Accounting Order to Defer Incremental Storm Damage Expenses Incurred as a Result of Hurricane Florence and Michael and Winter Storm Diego

VOLUME NUMBER: 20

APPEARANCES
(See attached.)

WITNESSES
(See attached.)

EXHIBITS
(See attached.)

COPIES ORDERED: Downey, Culpepper, Holt, Cummings, Edmondson, Grantmyre, Dodge, Jost, Little, Luhr, Force, Townsend, Robinson, Kells, Mehta, Lee, Cress, Ross, Ledford, Smith, Schauer, Heslin, Su, Crystal and Beverly
CONFIDENTIAL TRANSCRIPTS and EXHIBITS ORDERED: Robinson, Heslin, Somers, Kells, Jagannathan, Mehta, Lee, Cress, Ross, Jenkins, Beverly, Ledford, Smith, Crystal, Su, Force, Townsend, Downey, Culpepper, Cummings, Dodge, Edmondson, Grantmyre, Holt, Jost, Little, and Luhr

REPORTED BY: Joann Bunze
TRANSCRIBED BY: Joann Bunze
DATE FILED: September 23, 2020

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PLACE: Held via Videoconference REDACTED

DATE: Friday, September 11, 2020

TIME: 8:30 A.M. - 12:56 P.M.

DOCKET NO.: E-7, Sub 1214

E-7, Sub 1213

E-7, Sub 1187

BEFORE: Chair Charlotte A. Mitchell, Presiding

Commissioner ToNola D. Brown-Bland

Commissioner Lyons Gray

Commissioner Daniel G. Clodfelter

Commissioner Kimberly W. Duffley

Commissioner Jeffrey A. Hughes

Commissioner Floyd B. McKissick, Jr.

IN THE MATTER OF:

DOCKET NO. E-7, SUB 1214

Application of Duke Energy Carolinas, LLC,

for Adjustment of Rates and Charges Applicable to

Electric Utility Service in North Carolina

DOCKET NO. E-7, SUB 1213

Petition of Duke Energy Carolinas, LLC,

for Approval of Prepaid Advantage Program

DOCKET NO. E-7, SUB 1187

Application of Duke Energy Carolinas, LLC,

for an Accounting Order to Defer Incremental Storm

Damage Expenses Incurred as a Result of Hurricanes

Florence and Michael and Winter Storm Diego

VOLUME 20

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14 FOR THE USING AND CONSUMING PUBLIC AND ON BEHALF OF
15 THE STATE AND ITS CITIZENS IN THIS MATTER THAT AFFECTS
16 THE PUBLIC INTEREST:
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18 Teresa Townsend, Esq., Special Deputy Attorney General
19 North Carolina Department of Justice
20 Post Office Box 629
21 Raleigh, North Carolina 27603
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1 T A B L E O F C O N T E N T S

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City of Eden

Department of Public Utilities – Wastewater Treatment

October 23, 2018

Michael Lanning
GM II – Regulated Stations
864 S. Edgewood Rd.
Eden, N.C. 27288

Subject: Dan River Steam Station-IUP #1013-Revision
Approval of increase in daily flow.

Dear Mr. Lanning,

On October 15, 2018, Duke Energy Carolinas LLC (Duke Energy) requested approval of an increase in the daily flow of 0.5 MGD to 0.6 MGD.

After review of the Effluent limits and monitoring requirements and past Effluent data that Duke Energy has submitted, the City of Eden grants approval for this increase in flow effective this date. However, we had to decrease the limits for Molybdenum and Arsenic in order to stay consistent with the poundage that is being contributed. These changes will be revised in the current permit. Thank you for your patience.

Should you have any questions, please contact me at 336-627-1009 ext.103 or email cpowell@edennc.us.

Sincerely,

Chris Powell

Chris Powell
Pretreatment Supervisor

Cc: Brad Corcoran, City Manager
Terry Shelton, Public Utilities Director
Melinda Ward, Wastewater Plant Superintendent
Dana Newcomb, ORC

P. O. Box 70 • Eden, NC 27289-0070 • (336) 627-1009 • Fax (336) 627-9968

City of Eden

Department of Public Utilities – Wastewater Treatment

Permit No. 1013
Leachate from Landfill & Ash Basin

To Discharge Wastewater under the Industrial Pretreatment Program

In compliance with the provisions of North Carolina General Statute 143-215.1, any applicable federal categorical pretreatment regulations, all other lawful standards, and regulations promulgated and adopted by the North Carolina Environmental Management Commission and the City of Eden Sewer Use Ordinance, Chapter 16-150. The following Industry, hereafter referred to by name or as the permittee:

Industry name, permittee: Duke Energy, Dan River Combined Cycle Station
Facility Located at Street Address: 864 South Edgewood Road
City State, Zip: Eden, North Carolina 27288

Is hereby authorized to discharge wastewater from the facility located at the above listed address into the sanitary sewer collection system and the wastewater treatment facility of the Control Authority and/or Municipality listed below:

IUP Control Authority and/or Municipality WWTP name: City of Eden's Mebane Bridge WWTP
NPDES Number: NC0025071
WWTP Address: 204 Mebane Bridge Road
City, State, Zip: Eden, NC 27288

In accordance with effluent limitations, monitoring requirements, and all other conditions set forth in Parts I, II, and III of this Industrial User Pretreatment Permit (IUP).

Effective date, this permit and the authorization to discharge shall become effective at midnight on this date: October 23, 2018
Expiration date, this permit and the authorization to discharge shall expire at midnight on this date: February 28, 2019

Signed this the 23rd day of October 2018.

Melinda S. Ward
Wastewater Superintendent
By Authority of the City Council of the City of Eden

PART I

Specific Conditions

IUP, PART I, OUTLINE:

A.) IUP Basic Information
B.) IUP Modification History
C.) Authorization Statement
D.) Description of Discharges
E.) Schematic and Monitoring Locations
F.) Effluent Limits & Monitoring Requirements
G.) Definitions and Limit Page(s) notes

A. IUP Basic Information:

Receiving Control Authority & WWTP name: City of Eden WWTP	POTW NPDES #: NC0025071
IUP Name: Duke Energy, Dan River Combined Cycle Station	IUP Number: 1013
IUP Effective date: October 23, 2018	Pipe Numbers, list all regulated pipes: 001
IUP Expiration date: February 28, 2019	IUP 40 CFR #: 423.16

B. IUP History:

Effective Date	Renewal or Modification	Description of changes over previous IUP.
5/22/2016	Permit issued	None
1/25/2017	Expiration Date Changed	February 28, 2018
7/12/2017	Permit Modification	Molybdenum limit changed from 0.1 mg/L to 1.0 mg/L
2/7/2018	Permit Modification	Granted approval of an Ultra Filtration System for the removal of arsenic effective immediately. Added additional information about bag filter
3/1/18	Permit Renewal	Removed some parameters, changed limits from daily max to monthly average, and increased daily flow.
4/25/18	Permit Modification	Granted Approval of a second Ultra Filtration System.
10/23/18	Permit Modification	Increased daily flow from 0.5 MGD to 0.6 MGD, decreased limits for Arsenic and Molybdenum. Updated flow diagram.

C.) Authorization Statement:

1.) The Permittee is hereby authorized to discharge wastewater in accordance with the effluent limitations, monitoring requirements, and all other conditions set forth in this Industrial User Pretreatment Permit (IUP) into the sewer collection system and wastewater treatment facility of the City of Eden.

2.) The Permittee is hereby authorized to continue operation of and discharge wastewater from the following treatment or pretreatment facilities. These facilities must correspond to the treatment units listed on both the application and inspection forms.

IU Treatment Units	
List all Treatment Units:	Descriptions:
- Ultra Filtration System (2)	-Pretreatment system designed for the removal of Arsenic from the water generated from the dewatering wells in the primary basin.
-Bag Filter	-Filters out sediment.

3.) The Permittee is hereby authorized to, if required by the City of Eden and after receiving Authorization to Construct (A to C) from the City of Eden, construct and operate additional pretreatment units as needed to meet final effluent limitations.

D.) Description of IUP Discharge:

1. Describe the discharge(s) from all regulated pipes.

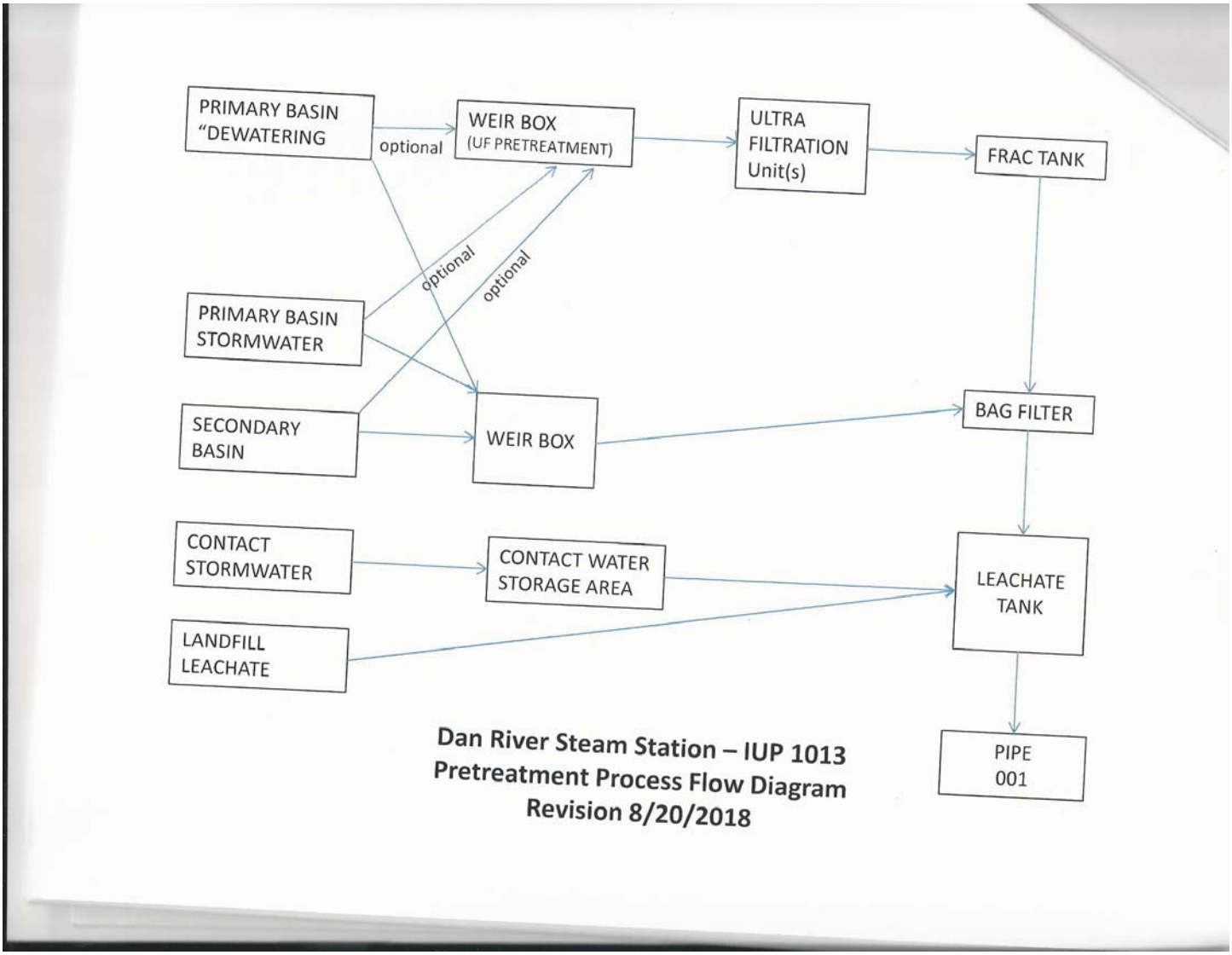
Pipe # 001, Description of Discharge: Discharge is from the existing ash basin, the contact storm water from the northeast side of the property, which includes the area around the ash stacks and powerhouse, as well as leachate from the new landfill for the existing coal ash.

E.) Schematic and Monitoring Locations:

The facility schematic and description of monitoring location given below must show enough detail such that someone unfamiliar with the facility could readily find and identify the monitoring location and connection to the sewer. Include and identify all regulated pipes.

PIPE DESCRIPTION

Discharge of wastewater generated by all industrial processes from all sources at the facility. The drawing shows the location of Discharge Pipe 001.



IUP, Part 1 Section F:
Effluent Limits and Monitoring Requirements
Categorical 423.16 – Combustion Residual Leachate from Landfills, Pretreatment Standards Existing Source (PSES)

The Permittee may discharge from Pipe 001 effective immediately and lasting until the expiration of this permit for all existing sources. This discharge shall be limited and monitored as specified below.

		Concentration Limits			Monitoring Frequency			
		Daily Max	Monthly Average	Units	By Industry	By POTW	Sample Collection Method (C or G)	Required Laboratory Detection Level
1	Flow	0.6		MGD	Daily	1/6 months	Meter	
2	BOD	Monitor		mg/L	Monthly	1/6 months	Composite	2 mg/L
3	TSS	Monitor		mg/L	Monthly	1/6 months	Composite	2 mg/L
4	pH	6-11		SU	Weekly	1/6 months	Grab	
5	Temperature	40		C	Monthly	1/6 months	Grab	
OTHER PARAMETERS: Please List Alphabetically								
6	Arsenic		0.2	mg/L	1/Monthly	1/6 months	Composite	0.01 mg/L
7	Antimony		0.10	mg/L	1/Monthly	1/6 months	Composite	0.001 mg/L
8	Cadmium		Monitor	mg/L	1/Monthly	1/6 months	Composite	0.001 mg/L
9	Chromium		Monitor	mg/L	1/Monthly	1/6 months	Composite	0.005 mg/L
10	Lead		Monitor	mg/L	1/Monthly	1/6 months	Composite	0.005 mg/L
11	Mercury *		Monitor	ng/L	1/Monthly	1/6 months	Grab	2.5 ng/L
12	Molybdenum		0.5	mg/L	1/Monthly	1/6 months	Composite	0.005 mg/L
13	Nickel		Monitor	mg/L	1/Monthly	1/6 months	Composite	0.005 mg/L
14	Selenium		Monitor	mg/L	1/Monthly	1/6 months	Composite	0.01mg/L
15	Zinc		Monitor	mg/L	1/Monthly	1/6 months	Composite	0.01 mg/L

*** Low Level Mercury Analytical Method: EPA 1631E**
**** No PCBs are allowed in discharge at any time.**

G.) Definitions and Limit Pages notes:

In addition to the definitions in the City of Eden's Sewer Use Ordinance, the following definitions and requirements apply:

1. Composite Sample:
   Unless defined differently below, a composite sample for the monitoring requirements of this IUP, is defined as the automatic or manual collection of one grab sample of constant volume, not less than 100 ml, collected every hour during the entire discharge period on the sampling day. Sampling day shall be a typical production, and discharge day.
2. Daily Monitoring Frequency
   Daily Monitoring Frequency as specified in this IUP shall mean each day of discharge.
3. Grab Sample
   Grab sample for the monitoring requirements of this IUP is defined as a single "dip and take" sample collected at a representative point in the discharge stream.
4. Instantaneous measurement
   An Instantaneous measurement for the monitoring requirements of this IUP is defined as a single reading, observation, or measurement.

PART II

General Conditions

Outline of PART II,

1. **Representative Sampling**

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to, and approval by, the permit issuing authority.

2. **Reporting**

a.) Monitoring results obtained by the permittee shall be reported on forms specified by the City of Eden, postmarked no later than the twentieth day of the month following the month in which the samples were taken. If no discharge occurs during a reporting period (herein defined as each calendar month) in which a sampling event was to have occurred, a form with the phrase "no discharge" shall be submitted. Copies of these and all other reports required herein shall be submitted to the Municipality and shall be sent to the following address:

City of Eden
Melinda S. Ward, Wastewater Superintendent
P. O. Box 70
Eden, NC 27289

b.) If the sampling performed by the permittee indicates a violation, the permittee shall notify the Control Authority and/or Municipality within 24 hours of becoming aware of the violation. The permittee shall also repeat the sampling and analysis and submit the results of the repeat analysis to the Control Authority and/or Municipality within 30 days after becoming aware of the violation.

c.) If no self-monitoring is required by this IUP, and the sampling performed by the City of Eden indicates a violation, the City shall notify the permittee within 24 hours of becoming aware of the violation, and the permittee shall sample for the applicable parameter and submit the results of this analysis within 30 days after the POTW became aware of the violation.

3. **Test Procedures**

Test procedures for the analysis of pollutants shall be performed in accordance with the techniques prescribed in 40 CFR part 136 and amendments thereto unless specified otherwise in the monitoring conditions of this permit.

4. **Additional Monitoring by Permittee**

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be submitted to the City of Eden. The City may require more frequent monitoring or the monitoring of other pollutants not required in this permit by written notification.

5. **Duty to Comply**

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the City of Eden's Sewer Use Ordinance and is grounds for possible enforcement action.

6. **Duty to Mitigate - Prevention of Adverse Impact**

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health, the POTW, the waters receiving the POTW's discharge, or the environment.

7. **Facilities Operation, Bypass**

The permittee shall at all times maintain in good working order and operate as efficiently as possible, all control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Bypass of treatment facilities is prohibited except when approved in advance by the City of Eden. Bypass approval shall be given only when such bypass is in compliance with 40 CFR 403.17.

8. **Removed Substances**

Solids, sludge's, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutants from such materials from entering the sewer system. The permittee is responsible for assuring its compliance with any requirements regarding the generation, treatment, storage, and/or disposal of "Hazardous waste" as defined under the Federal Resource Conservation and Recovery Act.

9. **Upset Conditions**

An "upset" means an exceptional incident in which there is an unintentional and temporary noncompliance with the effluent limitations of this permit because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed or inadequate treatment facilities, lack of preventative maintenance, or careless or improper operations.

An upset may constitute an affirmative defense for action brought for the noncompliance. The permittee has the burden of proof to provide evidence and demonstrate that none of the factors specifically listed above were responsible for the noncompliance.

10. **Right of Entry**

The permittee shall allow the staff of the State of North Carolina Department of Environment and Natural Resources, Division of Water Resources, the Regional Administrator of the Environmental Protection Agency, the City of Eden, and/or their authorized representatives, upon the presentation of credentials:

1. To enter upon the permittee's premises where a real or potential discharge is located or in which records are required to be kept under the terms and conditions of this permit; and

2. At reasonable times to have access to and copy records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

11. **Availability of Records and Reports**

The permittee shall retain records of all monitoring information, including all calibration and maintenance records as well as copies of reports and information used to complete the application for this permit for at least five (5) years. All records that pertain to matters that are subject to any type of enforcement action shall be retained and preserved by the permittee until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

Except for data determined to be confidential under the Sewer Use Ordinance, all reports prepared in accordance with terms of this permit shall be available for public inspection at the City of Eden. As required by the Sewer Use Ordinance, effluent data shall not be considered confidential.

12. **Duty to Provide Information**

The permittee shall furnish to the Wastewater Superintendent or their designee, within a reasonable time, any information which the Superintendent, their designee, or the Division of Water Quality may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish, upon request, copies of records required to be kept by this permit.

13. **Signatory Requirements**

All reports or information submitted pursuant to the requirements of this permit must be signed and certified by the Authorized Representative as defined under the Sewer Use Ordinance. If the designation of an Authorized Representative is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, or overall responsibility for environmental matters for the company, a new authorization satisfying the requirements of this section must be submitted to the Wastewater Superintendent prior to or together with any reports to be signed by an authorized representative.

14. **Toxic Pollutants**

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Federal Clean Water Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit may be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

15. **Civil and Criminal Liability**

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

16. **Federal and/or State Laws**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Federal and/or State law or regulation.

17. **Penalties**

The Sewer Use Ordinance of the City of Eden provides that any person who violates a permit condition is subject to a civil penalty not to exceed $25,000 dollars per day of such violation.

Under state law, (NCGS 143-215.6B), under certain circumstances it is a crime to violate terms, conditions, or requirements of pretreatment permits. It is a crime to knowingly make any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance. These crimes are enforced at the prosecutorial discretion of the local District Attorney.

18. **Need to Halt or Reduce not a Defense**

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of the permit.

19. **Transferability**

This permit shall not be reassigned or transferred or sold to a new owner, new user, different premises, or a new or changed operation without approval of the City.

20. **Property Rights**

This permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

21. **Severability**

The provisions of this permit are severable and, if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

22. **Permit Modification, Revocation, Termination**

This permit may be modified, revoked and reissued or terminated with cause in accordance to the requirements of the City of Eden's Sewer Use Ordinance and North Carolina General Statute or implementing regulations.

23. **Re-Application for Permit Renewal**

The permittee is responsible for filing an application for reissuance of this permit at least 180 days prior to its expiration date.

24. **Dilution Prohibition**

The permittee shall not increase the use of potable or process water or in any other way attempt to dilute the discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in this permit.

25. **Reports of Changed Conditions**

The permittee shall give notice to the City of Eden of any planned significant changes to the permittee's operations or system which might alter the nature, quality, or volume of its wastewater at least 180 days before the change. The permittee shall not begin the changes until receiving written approval from the City. Also see Part II, 30 below for additional reporting requirements for spill/slug issues.

Significant changes may include but are not limited to

(a) increases or decreases to production;
(b) increases in discharge of previously reported pollutants;
(c) discharge of pollutants not previously reported to the City; or
(d) New or changed chemicals.

26. **Construction**
No construction of pretreatment facilities or additions thereto shall be begun until Final Plans and Specifications have been submitted to the City of Eden and written approval and an Authorization to Construct (A to C) have been issued.

27. **Reopener**
The permit shall be modified or, alternatively, revoked and reissued to comply with any applicable effluent standard or limitation for the control of any pollutant shown to contribute to toxicity of the WWTP effluent or any pollutant that is otherwise limited by the POTW discharge permit. The permit as modified or reissued under this paragraph may also contain any other requirements of State or Federal pretreatment regulations then applicable.

28. **Categorical Reopener**
This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 302(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

1.) Contains different conditions or is otherwise more stringent than any effluent limitation in this permit; or
2.) Controls any pollutant not limited in this permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

29. **General Prohibitive Standards**
The permittee shall comply with the general prohibitive discharge standards in 40 CFR 403.5 (a) and (b) of the Federal pretreatment regulations.

30. **Potential Problems**
The permittee shall provide protection from accidental and slug discharges of prohibited materials and other substances regulated by this permit. The permittee shall also notify the POTW immediately of any changes at its facility affecting the potential for spills and other accidental discharge, discharge of a non-routine, episodic nature, a non-customary batch discharge, or a slug load as defined in the Sewer Use Ordinance.

Additionally, the permittee shall notify by telephone the City of Eden immediately of all discharges that could cause problems to the POTW including any slug loadings as defined in the Sewer Use Ordinance. If the permittee experiences such a discharge, they shall inform the City immediately upon the first awareness of the commencement of the discharge. Notification shall include location of the discharge, type of waste, concentration and volume if known and corrective actions taken by the permittee. A written follow-up report thereof shall be filed by the permittee within five (5) days, unless waived by the City.

PART III
Special Conditions

1. **Slug/Spill Control Measures**
Submit Slug/Spill Control Plan in accordance with SUO [Section 16-133]; Implement Upon POTW Approval. The permittee shall provide updates to the City as required by Part II, 30, of this IUP. Modifications to the measures shall be approved by the City prior to installation/implementation. If a measure fails, the City shall be notified within 24 hours.

2. **Sludge Management Plan**

Ninety days prior to the initial disposal of sludge generated by any pretreatment facility, the permittee shall submit a sludge management plan to the Control Authority.

3. **Flow Measurement Requirements**

The permittee shall maintain appropriate discharge flow measurement devices and methods consistent with approved scientific practices to ensure the accuracy and reliability of measurements of the volume of monitored discharges. Devices installed shall be a continuous recording flow meter capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes. The devices shall be installed, calibrated, and maintained to ensure accuracy. At the time of issuance of the permit, this method consists of ultrasound discharge flow meter for Pipe 001. The meter shall be calibrated every year and documentation submitted to the City within 15 days. Modifications to the flow metering equipment shall be approved by the City prior to installation. If a required flow measurement device fails, the City shall be notified within 24 hours.

4. **Certified Laboratory Analysis**

Pollutant analysis shall be performed by a North Carolina Division of Water Resources Certified Laboratory that is certified in the analysis of the pollutant in wastewater.

5. **Certified Operator**

Pursuant to Chapter 90A-44 of North Carolina General Statutes, and upon classification of the facility by the Certification Commission, the permittee shall employ a certified wastewater pretreatment plant operator in responsible charge (ORC) of the wastewater treatment facilities. Such operator must hold a certification of the type and grade equivalent to, or greater than the classification assigned to the wastewater treatment facilities by the Certification Commission. The permittee must also employ a certified backup operator of the appropriate type and grade to comply with the conditions of Title 15A, Chapter 8A .0202. The ORC of the facility must visit the wastewater facility as required; must properly manage and document daily operation and maintenance of the facility; and must comply with all other conditions of Title 15A, Chapter 8A .0202. The permittee shall submit a letter designating the operator in responsible charge to the Certification Commission or their designee within thirty days after facility classification.

6. **Operation and Maintenance of Pretreatment Facilities**

The permittee shall establish an operation and maintenance program for all pretreatment facilities sufficient to satisfy at a minimum the manufacturers' instructions and recommendations for all equipment. The City reserves the right to establish stricter operation and maintenance schedules of equipment if it deems necessary for the proper operations of the equipment. The permittee shall maintain a copy of the manufacturer's instructions at the facility permitted herein and shall maintain records of operation and maintenance events taken place sufficient to show compliance with such instructions.

7. **Payment of User Charges**

The permittee shall pay all user charges for City sewer services promptly upon receipt of regular bills as required in the City of Eden Code of Ordinance.

8. **Code of Ordinance**

The permittee shall comply with all sections of Chapter 16 of the City's Code of Ordinance unless otherwise specified in this permit.

IUP Synopsis

A. IUP Basic Information

Receiving POTW name: Mebane Bridge WWTP	POTW NPDES#: NC0025071
IUP name: Duke Power, Dan River Combined Cycle Station	IUP Number: 1013
IUP Effective date: October 23, 2018	Pipe Numbers, list all regulated pipes: 001
IUP expiration date: February 28, 2019	IUP 40 CFR#: 423.16

B. IUP Survey & Application form

Attached is a completed copy of the Industrial User Wastewater Survey & Application Form.

C. IU Inspection form

Attached is a copy of an Industrial User Inspection Form to be completed by the City within the next 12 months.

D. RATIONALE FOR LIMITATIONS:

As listed on the IUP Limits Pages, PART I, Section F of the IUP.

Review of IU Monitoring Data, with no Over Allocation situation:
The following pollutants were assigned numerical limits in this IUP based on a review of monitoring data for the permittee of stored wastewater to determine what ranges of concentrations could be discharged. To account for sample variability a factor was applied to the monitoring data to determine the permit limit. No parameters were above the 5% MAHL. Permit limits assigned by the City of Eden do not result in an Over Allocation situation for any pollutants.

Arsenic Antimony Molybdenum

Water Resources
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

S. JAY ZIMMERMAN
Director

May 5, 2016

Ms. Melinda Ward
Wastewater Superintendent
City of Eden
191 Mebane Bridge Road
Eden, NC 27288-5346

Subject: Pretreatment Review of Industrial User Pretreatment Permit Program: City of Eden
NPDES Permit No: NC0025071
Rockingham County

Dear Ms. Ward:

The Pretreatment, Emergency Response, and Collection Systems (PERCS) Unit of the Division of Water Resources has reviewed the draft copy of Industrial User Pretreatment Permit (IUP) submitted by the City of Eden for the following Significant Industrial User (SIU). The draft IUP was initially received by the Division on March 14, 2016, followed by several revisions received on May 4, 2016.

IUP #	SIU
1013	Duke Energy, Dan River Combined Cycle Station

The review indicates that the IUP is adequate and the minimum requirements of 15A NCAC 2H .0905 and .0916 and 40 CFR 403.8(f)(1)(iii) are met. Please forward the signed copy of issued IUP, along with copy of transmittal letter to the industry and updated allocation table.

Federal and State pretreatment regulations require the local delegated pretreatment program to effectively control and document the discharge of wastewater from Significant/Categorical Industrial Users to the POTW. It is the POTW's responsibility to ensure that these objectives are consistently met.

Thank you for your continued cooperation with the Pretreatment Program. If you have any questions or comments, please contact Monti Hassan at (919) 807-6314 [email: Monti.Hassan@ncdenr.gov] or Deborah Gore, Unit Supervisor at (919) 807-6383 [email: Deborah.Gore@ncdenr.gov].

Sincerely,

Monti Hassan
Division of Water Resources

MH/eden.iup.new.022
CC: Monti Hassan, PERCS Unit
George Smith, Winston-Salem Regional Office
Central Files

CITY of EDEN, North Carolina

Permit No. 1013
Leachate from Landfill & Ash Basin

To Discharge Wastewater
Under the Industrial Pretreatment Program

In compliance with the provisions of North Carolina General Statute 143-215.1, any applicable federal categorical pretreatment regulations, all other lawful standards, and regulations promulgated and adopted by the North Carolina Environmental Management Commission and the City of Eden Sewer Use Ordinance, Chapter 16-150. The following Industry, hereafter referred to by name or as the permittee:

Industry name, permittee: Duke Energy, Dan River Combined Cycle Station
Facility Located at Street Address: 864 South Edgewood Road
City State, Zip: Eden, North Carolina 27288

is hereby authorized to discharge wastewater from the facility located at the above listed address into the sanitary sewer collection system and the wastewater treatment facility of the Control Authority and/or Municipality listed below:

IUP Control Authority and/or Municipality WWTP name: City of Eden's Mebane Bridge WWTP
NPDES Number: NC0025071
WWTP Address: 204 Mebane Bridge Road
City, State, Zip: Eden, NC 27288

in accordance with effluent limitations, monitoring requirements, and all other conditions set forth in Parts I, II, and III of this Industrial User Pretreatment Permit (IUP).

Effective date, this permit and the authorization to discharge shall become effective at midnight on this date: May 22, 2016
Expiration date, this permit and the authorization to discharge shall expire at midnight on this date: August 31, 2017

Signed this the 20th day of May 2016.

Melinda S. Ward
Melinda S. Ward
Wastewater Superintendent
By Authority of the City Council
of the City of Eden

PART I

Specific Conditions

IUP, PART I, OUTLINE:

A.) IUP Basic Information
B.) IUP Modification History
C.) Authorization Statement
D.) Description of Discharges
E.) Schematic and Monitoring Locations
F.) Effluent Limits & Monitoring Requirements
G.) Definitions and Limit Page(s) notes

A. IUP Basic Information:

Receiving Control Authority & WWTP name: City of Eden WWTP	POTW NPDES #: NC0025071
IUP Name: Duke Energy, Dan River Combined Cycle Station	IUP Number: 1013
IUP Effective date: May 22, 2016	Pipe Numbers, list all regulated pipes: 001
IUP Expiration date: August 31, 2017	IUP 40 CFR #: 423.16

B. IUP History:

Effective Date	Renewal or Modification	Description of changes over previous IUP.
5/22/2016	Permit issued	None

C.) Authorization Statement:

1.) The Permittee is hereby authorized to discharge wastewater in accordance with the effluent limitations, monitoring requirements, and all other conditions set forth in this Industrial User Pretreatment Permit (IUP) into the sewer collection system and wastewater treatment facility of the City of Eden.

2.) The Permittee is hereby authorized to continue operation of and discharge wastewater from the following treatment or pretreatment facilities. These facilities must correspond to the treatment units listed on both the application and inspection forms.

IU Treatment Units	
List all Treatment Units:	Descriptions:
None	

3.) The Permittee is hereby authorized to, if required by the City of Eden and after receiving Authorization to Construct (A to C) from the City of Eden, construct and operate additional pretreatment units as needed to meet final effluent limitations.

D.) Description of IUP Discharge:

1. Describe the discharge(s) from all regulated pipes.

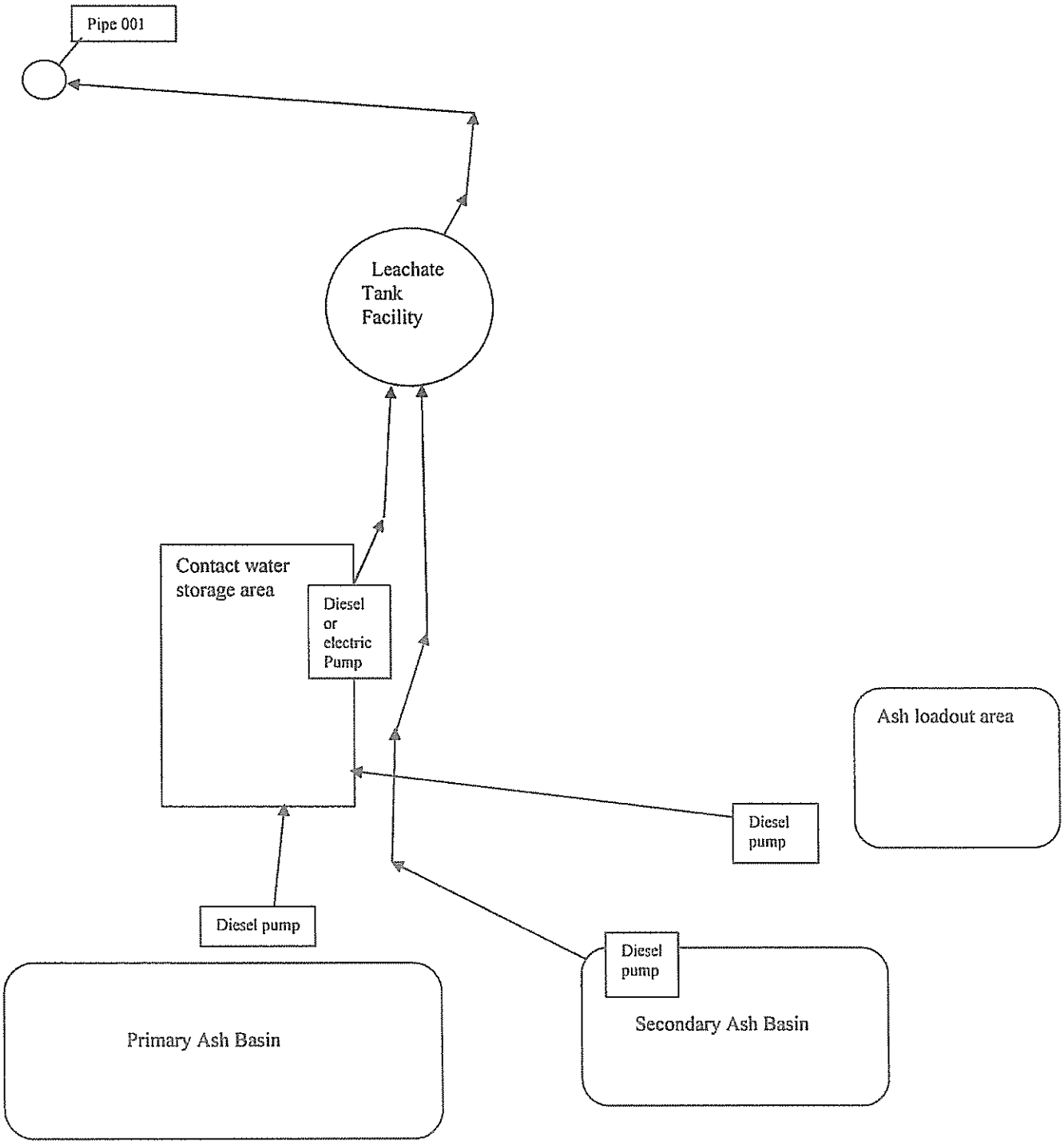
Pipe # 001, Description of Discharge:
Discharge is from the existing ash basin, the contact storm water from the northeast side of the property, which includes the area around the ash stacks and powerhouse, as well as leachate from the new landfill for the existing coal ash.

E.) Schematic and Monitoring Locations:

The facility schematic and description of monitoring location given below must show enough detail such that someone unfamiliar with the facility could readily find and identify the monitoring location and connection to the sewer. Include and identify all regulated pipes.

PIPE DESCRIPTION

Discharge of wastewater generated by all industrial processes from all sources at the facility. The drawing shows the location of Discharge Pipe 001.



IUP, Part 1 Section F:
Effluent Limits and Monitoring Requirements
Categorical 423.16 – Combustion Residual Leachate from Landfills, Pretreatment Standards Existing Source (PSES)

The Permittee may discharge from Pipe 001 effective immediately and lasting until the expiration of this permit for all existing sources. This discharge shall be limited and monitored as specified below.

		Concentration Limits			Monitoring Frequency			
		Daily Max	Monthly Average	Units	By Industry	By POTW	Sample Collection Method (C or G)	Required Laboratory Detection Level
1	Flow	0.3		MGD	Daily	1/6 months	Meter	
2	BOD	Monitor		mg/L	Monthly	1/6 months	Composite	2 mg/L
3	TSS	Monitor		mg/L	Monthly	1/6 months	Composite	2 mg/L
4	pH	6-11		SU	Weekly	1/6 months	Grab	
5	Temperature	40		C	Monthly	1/6 months	Grab	
OTHER PARAMETERS: Please List Alphabetically								
6	Ammonia	Monitor		mg/L	*1/Monthly	1/6 months	Composite	0.1 mg/L
7	Arsenic	0.30		mg/L	*1/Monthly	1/6 months	Composite	0.01 mg/L
8	Antimony	0.10		mg/L	*1/Monthly	1/6 months	Composite	0.001 mg/L
9	Cadmium	0.10		mg/L	*1/Monthly	1/6 months	Composite	0.001 mg/L
10	Chromium	1.34		mg/L	*1/Monthly	1/6 months	Composite	0.005 mg/L
11	Copper	1.36		mg/L	*1/Monthly	1/6 months	Composite	0.005 mg/L
12	Cyanide	0.24		mg/L	*1/Monthly	1/6 months	Grab	0.008 mg/L
13	Lead	0.21		mg/L	*1/Monthly	1/6 months	Composite	0.005 mg/L
14	Mercury**	117		ng/L	*1/Monthly	1/6 months	Grab	2.5 ng/L
15	Molybdenum	0.10		mg/L	*1/Monthly	1/6 months	Composite	0.005 mg/L
16	Nickel	0.18		mg/L	*1/Monthly	1/6 months	Composite	0.005 mg/L
17	Selenium	0.37		mg/L	*1/Monthly	1/6 months	Composite	0.01 mg/L
18	Silver	0.43		mg/L	*1/Monthly	1/6 months	Composite	0.005 mg/L
19	Sulfide	92.5		mg/L	*1/Monthly	1/6 months	Grab	0.10 mg/L
20	Zinc	2.61		mg/L	*1/Monthly	1/6 months	Composite	0.01 mg/L
21	PCB ***	Monitor		µg/L	1/5 years			0.5 µg/L
22	624/625	Monitor		mg/L	1/5 years			

*** The first sampling event of the sample requirement is to take place in the first week of discharge.**
**** Low Level Mercury Analytical Method: EPA 1631E**
***** No PCBs are allowed in discharge at any time.**

G.) Definitions and Limit Pages notes:

In addition to the definitions in the City of Eden's Sewer Use Ordinance, the following definitions and requirements apply:

1. Composite Sample:
   Unless defined differently below, a composite sample for the monitoring requirements of this IUP, is defined as the automatic or manual collection of one grab sample of constant volume, not less than 100 ml, collected every hour during the entire discharge period on the sampling day. Sampling day shall be a typical production, and discharge day.

2. Daily Monitoring Frequency
   Daily Monitoring Frequency as specified in this IUP shall mean each day of discharge.

3. Grab Sample
   Grab sample for the monitoring requirements of this IUP is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

4. Instantaneous measurement
   An Instantaneous measurement for the monitoring requirements of this IUP is defined as a single reading, observation, or measurement.

PART II

General Conditions

Outline of PART II,

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to, and approval by, the permit issuing authority.

2. Reporting

a.) Monitoring results obtained by the permittee shall be reported on forms specified by the City of Eden, postmarked no later than the twentieth day of the month following the month in which the samples were taken. If no discharge occurs during a reporting period (herein defined as each calendar month) in which a sampling event was to have occurred, a form with the phrase "no discharge" shall be submitted. Copies of these and all other reports required herein shall be submitted to the Municipality and shall be sent to the following address:

City of Eden
Melinda S. Ward, Wastewater Superintendent
P. O. Box 70
Eden, NC 27289

b.) If the sampling performed by the permittee indicates a violation, the permittee shall notify the Control Authority and/or Municipality within 24 hours of becoming aware of the violation. The permittee shall also repeat the sampling and analysis and submit the results of the repeat analysis to the Control Authority and/or Municipality within 30 days after becoming aware of the violation.

c.) If no self-monitoring is required by this IUP, and the sampling performed by the City of Eden indicates a violation, the City shall notify the permittee within 24 hours of becoming aware of the violation, and the permittee shall sample for the applicable parameter and submit the results of this analysis within 30 days after the POTW became aware of the violation.

3. **Test Procedures**
Test procedures for the analysis of pollutants shall be performed in accordance with the techniques prescribed in 40 CFR part 136 and amendments thereto unless specified otherwise in the monitoring conditions of this permit.

4. **Additional Monitoring by Permittee**
If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be submitted to the City of Eden. The City may require more frequent monitoring or the monitoring of other pollutants not required in this permit by written notification.

5. **Duty to Comply**
The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the City of Eden's Sewer Use Ordinance and is grounds for possible enforcement action.

6. **Duty to Mitigate - Prevention of Adverse Impact**
The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health, the POTW, the waters receiving the POTW's discharge, or the environment.

7. **Facilities Operation, Bypass**
The permittee shall at all times maintain in good working order and operate as efficiently as possible, all control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Bypass of treatment facilities is prohibited except when approved in advance by the City of Eden. Bypass approval shall be given only when such bypass is in compliance with 40 CFR 403.17.

8. **Removed Substances**
Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutants from such materials from entering the sewer system. The permittee is responsible for assuring its compliance with any requirements regarding the generation, treatment, storage, and/or disposal of "Hazardous waste" as defined under the Federal Resource Conservation and Recovery Act.

9. **Upset Conditions**
An "upset" means an exceptional incident in which there is an unintentional and temporary noncompliance with the effluent limitations of this permit because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed or inadequate treatment facilities, lack of preventative maintenance, or careless or improper operations.

An upset may constitute an affirmative defense for action brought for the noncompliance. The permittee has the burden of proof to provide evidence and demonstrate that none of the factors specifically listed above were responsible for the noncompliance.

10. **Right of Entry**
The permittee shall allow the staff of the State of North Carolina Department of Environment and Natural Resources, Division of Water Resources, the Regional Administrator of the Environmental Protection Agency, the City of Eden, and/or their authorized representatives, upon the presentation of credentials:

1. To enter upon the permittee's premises where a real or potential discharge is located or in which records are required to be kept under the terms and conditions of this permit; and

2. At reasonable times to have access to and copy records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

11. **Availability of Records and Reports**

The permittee shall retain records of all monitoring information, including all calibration and maintenance records as well as copies of reports and information used to complete the application for this permit for at least five (5) years. All records that pertain to matters that are subject to any type of enforcement action shall be retained and preserved by the permittee until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

Except for data determined to be confidential under the Sewer Use Ordinance, all reports prepared in accordance with terms of this permit shall be available for public inspection at the City of Eden. As required by the Sewer Use Ordinance, effluent data shall not be considered confidential.

12. **Duty to Provide Information**

The permittee shall furnish to the Wastewater Superintendent or their designee, within a reasonable time, any information which the Superintendent, their designee, or the Division of Water Quality may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish, upon request, copies of records required to be kept by this permit.

13. **Signatory Requirements**

All reports or information submitted pursuant to the requirements of this permit must be signed and certified by the Authorized Representative as defined under the Sewer Use Ordinance. If the designation of an Authorized Representative is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, or overall responsibility for environmental matters for the company, a new authorization satisfying the requirements of this section must be submitted to the Wastewater Superintendent prior to or together with any reports to be signed by an authorized representative.

14. **Toxic Pollutants**

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Federal Clean Water Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit may be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

15. **Civil and Criminal Liability**

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

16. **Federal and/or State Laws**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Federal and/or State law or regulation.

17. **Penalties**

The Sewer Use Ordinance of the City of Eden provides that any person who violates a permit condition is subject to a civil penalty not to exceed $25,000 dollars per day of such violation.

Under state law, (NCGS 143-215.6B), under certain circumstances it is a crime to violate terms, conditions, or requirements of pretreatment permits. It is a crime to knowingly make any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance. These crimes are enforced at the prosecutorial discretion of the local District Attorney.

18. **Need to Halt or Reduce not a Defense**
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of the permit.

19. **Transferability**
This permit shall not be reassigned or transferred or sold to a new owner, new user, different premises, or a new or changed operation without approval of the City.

20. **Property Rights**
This permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

21. **Severability**
The provisions of this permit are severable and, if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

22. **Permit Modification, Revocation, Termination**
This permit may be modified, revoked and reissued or terminated with cause in accordance to the requirements of the City of Eden's Sewer Use Ordinance and North Carolina General Statute or implementing regulations.

23. **Re-Application for Permit Renewal**
The permittee is responsible for filing an application for reissuance of this permit at least 180 days prior to its expiration date.

24. **Dilution Prohibition**
The permittee shall not increase the use of potable or process water or in any other way attempt to dilute the discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in this permit.

25. **Reports of Changed Conditions**
The permittee shall give notice to the City of Eden of any planned significant changes to the permittee's operations or system which might alter the nature, quality, or volume of its wastewater at least 180 days before the change. The permittee shall not begin the changes until receiving written approval from the City. Also see Part II, 30 below for additional reporting requirements for spill/slug issues.

Significant changes may include but are not limited to

(a) increases or decreases to production;
(b) increases in discharge of previously reported pollutants;
(c) discharge of pollutants not previously reported to the City; or
(d) new or changed chemicals.

26. **Construction**
No construction of pretreatment facilities or additions thereto shall be begun until Final Plans and Specifications have been submitted to the City of Eden and written approval and an Authorization to Construct (A to C) have been issued.

27. **Reopener**
The permit shall be modified or, alternatively, revoked and reissued to comply with any applicable effluent standard or limitation for the control of any pollutant shown to contribute to toxicity of the WWTP effluent or any pollutant that is otherwise limited by the POTW discharge permit. The permit as modified or reissued under this paragraph may also contain any other requirements of State or Federal pretreatment regulations then applicable.

28. **Categorical Reopener**
This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 302(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

1.) contains different conditions or is otherwise more stringent than any effluent limitation in this permit; or
2.) controls any pollutant not limited in this permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

29. **General Prohibitive Standards**
The permittee shall comply with the general prohibitive discharge standards in 40 CFR 403.5 (a) and (b) of the Federal pretreatment regulations.

30. **Potential Problems**
The permittee shall provide protection from accidental and slug discharges of prohibited materials and other substances regulated by this permit. The permittee shall also notify the POTW immediately of any changes at its facility affecting the potential for spills and other accidental discharge, discharge of a non-routine, episodic nature, a non-customary batch discharge, or a slug load as defined in the Sewer Use Ordinance.

Additionally, the permittee shall notify by telephone the City of Eden immediately of all discharges that could cause problems to the POTW including any slug loadings as defined in the Sewer Use Ordinance. If the permittee experiences such a discharge, they shall inform the City immediately upon the first awareness of the commencement of the discharge. Notification shall include location of the discharge, type of waste, concentration and volume if known and corrective actions taken by the permittee. A written follow-up report thereof shall be filed by the permittee within five (5) days, unless waived by the City.

PART III
Special Conditions

1. **Slug/Spill Control Measures**
Submit Slug/Spill Control Plan in accordance with SUO [Section 16-133]; Implement Upon POTW Approval.

The permittee shall provide updates to the City as required by Part II, 30, of this IUP. Modifications to the measures shall be approved by the City prior to installation/implementation. If a measure fails, the City shall be notified within 24 hours.

2. **Sludge Management Plan**
Ninety days prior to the initial disposal of sludge generated by any pretreatment facility, the permittee shall submit a sludge management plan to the Control Authority.

3. **Flow Measurement Requirements**
The permittee shall maintain appropriate discharge flow measurement devices and methods consistent with approved scientific practices to ensure the accuracy and reliability of measurements of the volume of monitored discharges. Devices installed shall be a continuous recording flow meter capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes. The devices shall be installed, calibrated, and maintained to ensure accuracy. At the time of issuance of the permit, this method consists of ultrasound discharge flow meter for Pipe 001. The meter shall be calibrated every year and documentation submitted to the City within 15 days. Modifications to the flow metering equipment shall be approved by the City prior to installation. If a required flow measurement device fails, the City shall be notified within 24 hours.

4. **Certified Laboratory Analysis**
Pollutant analysis shall be performed by a North Carolina Division of Water Resources Certified Laboratory that is certified in the analysis of the pollutant in wastewater.

5. **Certified Operator**
Pursuant to Chapter 90A-44 of North Carolina General Statutes, and upon classification of the facility by the Certification Commission, the permittee shall employ a certified wastewater pretreatment plant operator in responsible charge (ORC) of the wastewater treatment facilities. Such operator must hold a certification of the type and grade equivalent to, or greater than the classification assigned to the wastewater treatment facilities by the Certification Commission. The permittee must also employ a certified backup operator of the appropriate type and grade to comply with the conditions of Title 15A, Chapter 8A .0202. The ORC of the facility must visit the wastewater facility as required; must properly manage and document daily operation and maintenance of the facility; and must comply with all other conditions of Title 15A, Chapter 8A .0202. The permittee shall submit a letter designating the operator in responsible charge to the Certification Commission or their designee within thirty days after facility classification.

6. **Operation and Maintenance of Pretreatment Facilities**

The permittee shall establish an operation and maintenance program for all pretreatment facilities sufficient to satisfy at a minimum the manufacturers' instructions and recommendations for all equipment. The City reserves the right to establish stricter operation and maintenance schedules of equipment if it deems necessary for the proper operations of the equipment. The permittee shall maintain a copy of the manufacturer's instructions at

the facility permitted herein and shall maintain records of operation and maintenance events taken place sufficient to show compliance with such instructions.

7. **Payment of User Charges**

The permittee shall pay all user charges for City sewer services promptly upon receipt of regular bills as required in the City of Eden Code of Ordinance.

8. **Code of Ordinance**

The permittee shall comply with all sections of Chapter 16 of the City's Code of Ordinance unless otherwise specified in this permit.

IUP Synopsis

A. IUP Basic Information

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IUP name: Duke Power, Dan River Combined Cycle Station	IUP Number: 1013
IUP Effective date: May 22, 2016	Pipe Numbers, list all regulated pipes: 001
IUP expiration date: August 31, 2017	IUP 40 CFR#: 423.16

B. IUP Survey & Application form

Attached is a completed copy of the Industrial User Wastewater Survey & Application Form.

C. IU Inspection form

Attached is a copy of an Industrial User Inspection Form to be completed by the City within the next 12 months.

D. RATIONALE FOR LIMITATIONS:

As listed on the IUP Limits Pages, PART I, Section F of the IUP.

Review of IU Monitoring Data, with no Over Allocation situation:
The following pollutants were assigned numerical limits in this IUP based on a review of monitoring data for the permittee of stored wastewater to determine what ranges of concentrations could be discharged. To account for sample variability a factor was applied to the monitoring data to determine the permit limit. No parameters were above the 5% MAHL. Permit limits assigned by the City of Eden do not result in an Over Allocation situation for any pollutants.

Arsenic
Antimony
Cadmium
Chromium
Copper
Cyanide
Lead
Mercury
Molybdenum
Nickel
Selenium
Silver
Sulfide
Zinc

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

December 20, 2018

Mr. Paul Draovitch, Senior Vice President
Environmental, Health and Safety
Duke Energy Carolinas, LLC
Mail Code EC13K
P.O. Box 1006
Charlotte, North Carolina 28201-1006

RECEIVED
JAN 02 2019
BY: P. Draovitch
C. Hall

Subject: Final NPDES Permit Modification
Permit NC0003468
Dan River Combined Cycle Station
Rockingham County
Grade I PCWPCS

Dear Mr. Draovitch:

Division personnel have reviewed and approved your application for a major modification of the subject permit. Accordingly, we are forwarding the attached NPDES permit modification. This permit modification 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).

No major changes were made to the draft major modification sent to you on October 30, 2018.

The final major modification maintains the following significant changes identified in the letter sent on October 30, 2018:

1. Monitoring and limits for BOD and Fecal Coliforms have been eliminated due to the removal of the domestic wastewater from Outfall 001.
2. The Special Conditions for Ash Pond Working Capacity and Ash Pond Closure have been removed since all the ash will be excavated by August 1, 2019.
3. The Outfall 002A is permanently plugged and has been removed from the permit.
4. The Special Condition Groundwater Monitoring Well has been replaced with the Special Condition Compliance Boundary to be consistent with other Duke Permits.

If any parts, measurement frequencies or sampling requirements contained in this permit 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 Resources or any other Federal, State, or Local governmental regulations.

If you have any questions concerning this permit, please contact Sergei Chernikov at (919) 707-3606 or via email at sergei.chernikov@ncdenr.gov.

Sincerely,

for Linda Culpepper, Director
Division of Water Resources, NCDEQ

Hardcopy: NPDES Files
Central Files
E-copy: DWR/Winston Salem Regional Office/Water Quality
DWR/Aquatic Toxicology Branch/Susan Meadows
EPA Region IV

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES

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,

Duke Energy Carolinas, LLC

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

Dan River Combined Cycle Station
864 South Edgewood Road
Eden, NC
Rockingham County

to receiving waters designated as the Dan River in the Roanoke River Basin

in accordance with effluent limitations, monitoring requirements, and other applicable conditions set forth in Parts I, II, and III hereof.

This major modification shall become effective February 1, 2019.

This major modification and authorization to discharge shall expire at midnight on November 30, 2021.

Signed this day December 20, 2018.

for Linda Culpepper, Director
Division of Water Resources
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.

Duke Energy Carolinas, LLC
is hereby authorized to:

1. Continue to discharge the following:
   - Outfall 001: once-through cooling water and cooling tower blowdown from the combined cycle unit, intake screen backwash, and plant collection sumps (low volume wastes);
   - Internal Outfall 001A (discharges to Outfall 001): wastes from the filtered water plant including miscellaneous wash down water and laboratory wastes (low volume waste sources);
   - Outfall 002: an ash basin discharge consisting of low volume wastes, boiler cleaning wastewater, ash disposal, stormwater, boiler blowdown, and metal washing wastewater;
   - Seep Outfalls 102, 103, 104 (Outfall 104 also contains stormwater): 3 potentially contaminated groundwater seeps; and

2. Discharge from said treatment works at the location specified on the attached map into the Dan River (Outfall 001, Outfall 002, and Seep Outfall 104) and Railroad Branch (Seep Outfall 102 and Seep Outfall 103), both receiving streams are classified C waters in the Roanoke River Basin.

Part I

A. (1.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 001) [15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the permittee is authorized to discharge once-through cooling water, intake screen backwash, cooling tower blowdown, plant collections sumps, and treated domestic wastewater from **Outfall 001**. Such discharges shall be limited and monitored[5] by the permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location[1]
Flow, MGD			Daily	Pump Logs	Upstream or Effluent
Temperature,	35.0 °C		Daily	Grab	Effluent
Temperature,		32.0 °C [2]	Daily	Grab	Downstream
Temperature, °C [3]			Daily	Grab	Upstream, Effluent
Total Iron, mg/L			Quarterly	Grab	Effluent
Total Suspended Solids	30.0 mg/L	100.0 mg/L	2/Month	Grab	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	2/Month	Grab	Effluent
pH	6.0 ≤ pH ≤ 9.0		2/Month	Grab	Effluent
Total Residual Chlorine [4]		28.0 µg/L	2/Month	Grab	Effluent
Total Mercury[6]	47.0 ng/L		Quarterly	Grab	Effluent

Notes:

1. Sample locations: Upstream – at intake; Downstream – downstream approximately two (2) miles near the NCSR 700 bridge crossing; Effluent - at point downstream of combined wastewaters from the combined cycle turbine unit.
2. In no case should the ambient temperature exceed 32°C as a result of Dan River Steam Station operations. The ambient temperature shall be defined as the daily average downstream water temperature. When the effluent temperature is recorded below 32°C as a daily average, then monitoring and reporting of the downstream water temperature is not required. In cases where the permittee experiences equipment problems and is unable to obtain daily temperatures from the existing temperature monitoring system, temperature monitoring must be reestablished within five working days.
3. The daily average temperature of the effluent shall be such as not to exceed 10°C if the daily average intake temperature is below 2.5°C, and shall not exceed two times the intake temperature (°C) plus 5 if the daily average intake temperature ranges from 2.5°C to 12.8°C. This limitation is in effect only when a single control unit is operating.
4. Total Residual Chlorine compliance is required only if chlorine or chlorine derivative is added to the cooling water. The Division shall consider all effluent TRC values reported below 50 µg/L to be in compliance with the permit. However, the permittee shall continue to record and submit all values reported by a North Carolina certified laboratory (including field certified), even if these values fall below 50 µg/L.
5. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (18.).
6. The facility shall use EPA method 1631E. Annual average limit.

The mixing zone is defined as the area extending from the power plant intake to the NCSR 700 bridge crossing (downstream approximately two miles).

Based upon studies conducted by the permittee and submitted to the Division, it has been determined pursuant to Section 316(a) of the Clean Water Act that the thermal component of the discharge assures the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in the receiving water.

All domestic wastewater produced at the power plant is to be fully treated through the onsite wastewater treatment system prior to being discharged.

The permittee shall obtain authorization from the Division of Water Resources prior to using any biocide in the cooling water; see condition A. (12.).

There shall be no discharge of floating solids or foam visible in other than trace amounts.

A. (2.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 001A) [15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the permittee is authorized to discharge wastewater from the filtered water plant including wash down water and laboratory wastes (low volume waste sources) through **Internal Outfall 001A**. Such discharges shall be limited and monitored[2] by the permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Average	Measurement Frequency	Sample Type	Sample Location[1]
Total Suspended Solids	30.0 mg/L	100.0 mg/L	2/Month	Grab	Effluent
Oil & Grease	15.0 mg/L	20.0 mg/L	2/Month	Grab	Effluent
pH	6.0 ≤ pH ≤ 9.0		2/Month	Grab	Effluent

Notes:
1. Effluent sample location shall be at point downstream of the oil separator and prior to mixing with outfall 001.
2. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (18.).

Should no flow occur during a given month, the words "no flow" should be clearly written on the front of the DMR. All samples shall be a representative discharge.

There shall be no discharge of floating solids or foam visible in other than trace amounts.

A. (3.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 002-normal operations/decanting) [15A NCAC 02B .0400 et seq., 02B .0500 et seq.]
During the period beginning on the effective date of this permit and lasting until expiration, the permittee is authorized to discharge effluent from **Outfall 002 (decanting the free water above the settled ash layer that does not involve mechanical disturbance of the ash)** consisting of low volume wastes, boiler cleaning wastewater, ash disposal, stormwater, boiler blowdown, and metal washing wastewater. Such discharges shall be limited and monitored[5] by the permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location[1]
Flow, MGD			Daily	Pump Logs or estimate	Effluent
pH[8]	6.0 ≤ pH ≤ 9.0		Monthly	Grab	Effluent
Total Suspended Solids[6]	29.0 mg/L	96.0 mg/L	Monthly	Grab	Effluent
Oil and Grease	14.0 mg/L	19.0 mg/L	Monthly	Grab	Effluent
Total Kjeldahl Nitrogen (TKN), mg/L			Annually	Grab	Effluent
Total Nitrogen (TN), mg/L TN = (NO_2 + NO_3) + TKN			Annually	Calculated	Effluent
Total Phosphorus, mg/L			Annually	Grab	Effluent
Chronic Toxicity[2]			Monthly	Grab	Effluent
Turbidity[3], NTU			Monthly	Grab	Effluent
Sulfate, mg/L			Monthly	Grab	Effluent
Total Hardness, mg/L			Monthly	Grab	Effluent
Total Arsenic, µg/L			Weekly	Grab	Effluent
Total Chromium, µg/L			Weekly	Grab	Effluent
Total Lead, µg/L			Weekly	Grab	Effluent
Total Copper, µg/L			Weekly	Grab	Effluent
Total Cadmium, µg/L			Weekly	Grab	Effluent
Total Zinc, µg/L			Weekly	Grab	Effluent
Total Dissolved Solids, mg/L			Weekly	Grab	Effluent
Total Mercury[4]	47.0 ng/L		Weekly	Grab	Effluent
Total Iron[7]	1.0 mg/L	1.0 mg/L	Weekly	Grab	Effluent
Total Selenium, µg/L			Weekly	Grab	Effluent
Nitrate/nitrite as N			Monthly	Grab	Effluent

Notes:
1. Effluent sampling shall be conducted at the discharge from the ash settling pond prior to mixing with any other waste stream.
2. Chronic Toxicity (*Ceriodaphnia dubia*) at 1.1%; See Special Condition A. (10.).
3. The discharge from this facility shall not cause turbidity in the receiving stream to exceed 50 NTU. If the instream turbidity exceeds 50 NTU due to natural background conditions, the discharge cannot cause turbidity to increase in the receiving stream. Therefore, if the effluent measurement exceeds 50 NTU, the Permittee shall sample upstream and downstream turbidity in the receiving waterbody, within 24 hours, to demonstrate the existing turbidity level in the receiving waterbody was not increased. All data shall be reported on the DMRs. (See 15A NCAC 2B .0211 (21)).
4. The facility shall use EPA method 1631E. Annual average limit.

5. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (18.).
6. The facility shall continuously monitor TSS concentration when the decanting process commences and the pump shall be shutoff automatically when the one half of the Daily Maximum limit (15 minutes average) is exceeded. Pumping will be allowed to continue if interruption might result in a dam failure or damage. The continuous TSS monitoring only required when the pumps are employed.
7. Monitoring for total iron and its discharge limits apply only if wastewater from a boiler chemical cleaning is generated and discharged to the ash basin.
8. The facility shall continuously monitor pH when the decanting process commences and the decanting pump shall be shutoff automatically when 15 minutes running average pH falls below 6.1 standard units or rises above 8.9 standard units. Pumping will be allowed to continue if interruption might result in a dam failure or damage.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

The facility is allowed to drawdown the wastewater in the ash pond to no less than three feet above the ash.

The level of water in the ash pond should not be lowered more than 1 ft/week, unless approved by the DEQ Dam Safety Program. The facility shall use a floating pump station with free water skimmed from the basin surface using an adjustable weir.

The limits and conditions in Section A. (4.) of the permit apply when water in the ash settling basin is lowered below the three feet trigger mark.

The facility shall treat the wastewater discharged from the ash pond/ponds by the physical-chemical treatment facilities. The facility shall submit plans for the proposed treatment technologies to the Complex NPDES permitting unit and the Winston-Salem Regional Office 2 weeks prior to the commencement of the treated discharge.

The facility shall notify the Complex NPDES Permitting Unit and the Winston-Salem Regional Office 1 week prior to the commencement of the treated discharge.

A. (4.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 002-dewatering) [15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the commencement date of the dewatering operation and lasting until expiration, the Permittee is authorized to discharge effluent from **Outfall 002 (dewatering-removing the interstitial water)** consisting of low volume wastes, boiler cleaning wastewater, ash disposal, stormwater, boiler blowdown, and metal washing wastewater. Such discharges shall be limited and monitored[5] by the permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location[1]
Flow		1.5 MGD	Weekly	Pump Logs or estimate	Effluent
pH[8]	6.0 ≤ pH ≤ 9.0		Weekly	Grab	Effluent
Total Suspended Solids[6]	29.0 mg/L	96.0 mg/L	Weekly	Grab	Effluent
Oil and Grease	14.0 mg/L	19.0 mg/L	Weekly	Grab	Effluent
Total Kjeldahl Nitrogen (TKN), mg/L			Weekly	Grab	Effluent
Total Nitrogen (TN), mg/L TN = (NO_2 + NO_3) + TKN			Weekly	Calculated	Effluent
Total Phosphorus, mg/L			Weekly	Grab	Effluent
Chronic Toxicity[2]			Monthly	Grab	Effluent
Turbidity[3], NTU			Weekly	Grab	Effluent
Sulfate, mg/L			Weekly	Grab	Effluent
Total Hardness, mg/L			Weekly	Grab	Effluent
Total Arsenic, µg/L			Weekly	Grab	Effluent
Total Chromium, µg/L			Weekly	Grab	Effluent
Total Lead, µg/L			Weekly	Grab	Effluent
Total Copper, µg/L			Weekly	Grab	Effluent
Total Cadmium, µg/L			Weekly	Grab	Effluent
Total Zinc, µg/L			Weekly	Grab	Effluent
Total Dissolved Solids, mg/L			Weekly	Grab	Effluent
Total Mercury[4]	47.0 ng/L		Weekly	Grab	Effluent
Total Iron[7]	1.0 mg/L	1.0 mg/L	Weekly	Grab	Effluent
Total Selenium, µg/L			Weekly	Grab	Effluent
Nitrate/nitrite as N			Weekly	Grab	Effluent

Notes:

1. Effluent sampling shall be conducted at the discharge from the ash settling pond prior to mixing with any other waste stream.
2. Chronic Toxicity (*Ceriodaphnia dubia*) at 1.1%; See Special Condition A. (10.).
3. The discharge from this facility shall not cause turbidity in the receiving stream to exceed 50 NTU. If the instream turbidity exceeds 50 NTU due to natural background conditions, the discharge cannot cause turbidity to increase in the receiving stream. Therefore, if the effluent measurement exceeds 50 NTU, the Permittee shall sample upstream and downstream turbidity in the receiving waterbody, within 24 hours, to demonstrate the existing turbidity level in the receiving waterbody was not increased. All data shall be reported on the DMRs. (See 15A NCAC 2B .0211 (21)).
4. The facility shall use EPA method 1631E. Annual average limit.
5. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (18.).

6. The facility shall continuously monitor TSS concentration when the dewatering process commences and the dewatering pump shall be shutoff automatically when the one half of the Daily Maximum limit (15 minutes average) is exceeded. Pumping will be allowed to continue if interruption might result in a dam failure or damage. The continuous TSS monitoring only required when the pumps are employed.
7. Monitoring for total iron and its discharge limits apply only if wastewater from a boiler chemical cleaning is generated and discharged to the ash basin.
8. The facility shall continuously monitor pH when the dewatering process commences and the dewatering pump shall be shutoff automatically when 15 minutes running average pH falls below 6.1 standard units or rises above 8.9 standard units. Pumping will be allowed to continue if interruption might result in a dam failure or damage.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

The level of water in the ash pond should not be lowered more than 1 ft/week, unless approved by the DEQ Dam Safety Program.

The facility shall treat the wastewater discharged from the ash pond/ponds by the physical-chemical treatment facilities. The facility shall submit plans for the proposed treatment technologies to the Complex NPDES permitting unit and the Winston-Salem Regional Office 2 weeks prior to the commencement of the treated discharge.

The facility shall notify the Complex NPDES Permitting Unit and the Winston-Salem Regional Office 1 week prior to the commencement of the treated discharge.

A. (5.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 102) [15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from outfall 102 – Seep Discharge. Such discharges shall be limited and monitored[1] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency[2]	Sample Type	Sample Location
Flow, MGD			Monthly/Quarterly	Estimate	Effluent
pH[3]			Monthly/Quarterly	Grab	Effluent
TSS	30.0 mg/L	100.0 mg/L	Monthly/Quarterly	Grab	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	Monthly/Quarterly	Grab	Effluent
Fluoride, mg/L			Monthly/Quarterly	Grab	Effluent
Total Mercury[4], ng/L			Monthly/Quarterly	Grab	Effluent
Total Barium, mg/L			Monthly/Quarterly	Grab	Effluent
Total Iron, mg/L			Monthly/Quarterly	Grab	Effluent
Total Manganese, µg/L			Monthly/Quarterly	Grab	Effluent
Total Zinc, µg/L			Monthly/Quarterly	Grab	Effluent
Total Arsenic	150.0 µg/L	340.0 µg/L	Monthly/Quarterly	Grab	Effluent
Total Aluminum			Monthly/Quarterly	Grab	Effluent
Total Cadmium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Chromium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Copper, µg/L			Monthly/Quarterly	Grab	Effluent
Total Lead	2.94 µg/L	75.5 µg/L	Monthly/Quarterly	Grab	Effluent
Total Nickel, µg/L			Monthly/Quarterly	Grab	Effluent
Total Selenium, µg/L			Monthly/Quarterly	Grab	Effluent
Nitrate/nitrite as N, mg/L			Monthly/Quarterly	Grab	Effluent
Sulfates, mg/L			Monthly/Quarterly	Grab	Effluent
Chlorides, mg/L			Monthly/Quarterly	Grab	Effluent
TDS, mg/L			Monthly/Quarterly	Grab	Effluent
Total Hardness, mg/L			Monthly/Quarterly	Grab	Effluent
Temperature, ^{0}C			Monthly/Quarterly	Grab	Effluent
Conductivity, µmho/cm			Monthly/Quarterly	Grab	Effluent

Notes:

1. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (18.).
2. The facility shall conduct monthly sampling from the effective date of the permit. After one year from the effective date of the permit the monitoring will be reduced to quarterly
3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.
4. The facility shall use EPA method 1631E.

If the facility is unable to obtain a seep sample due to the dry or low flow conditions preventing the facility from obtaining a representative sample, then "no flow" should be reported on the DMR. This requirement is established in the Section D of the Standard Conditions and 40 CFR 122.41 (j).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. (6.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 103) [15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from outfall 103 – Seep Discharge. Such discharges shall be limited and monitored[1] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency[2]	Sample Type	Sample Location
Flow, MGD			Monthly/Quarterly	Estimate	Effluent
pH[3]			Monthly/Quarterly	Grab	Effluent
TSS	30.0 mg/L	100.0 mg/L	Monthly/Quarterly	Grab	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	Monthly/Quarterly	Grab	Effluent
Fluoride, mg/L			Monthly/Quarterly	Grab	Effluent
Total Mercury[4], ng/L			Monthly/Quarterly	Grab	Effluent
Total Barium, mg/L			Monthly/Quarterly	Grab	Effluent
Total Iron, mg/L			Monthly/Quarterly	Grab	Effluent
Total Manganese, µg/L			Monthly/Quarterly	Grab	Effluent
Total Zinc, µg/L			Monthly/Quarterly	Grab	Effluent
Total Arsenic	150.0 µg/L	340.0 µg/L	Monthly/Quarterly	Grab	Effluent
Total Aluminum			Monthly/Quarterly	Grab	Effluent
Total Cadmium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Chromium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Copper, µg/L			Monthly/Quarterly	Grab	Effluent
Total Lead	2.94 µg/L	75.5 µg/L	Monthly/Quarterly	Grab	Effluent
Total Nickel, µg/L			Monthly/Quarterly	Grab	Effluent
Total Selenium, µg/L			Monthly/Quarterly	Grab	Effluent
Nitrate/nitrite as N, mg/L			Monthly/Quarterly	Grab	Effluent
Sulfates, mg/L			Monthly/Quarterly	Grab	Effluent
Chlorides, mg/L			Monthly/Quarterly	Grab	Effluent
TDS, mg/L			Monthly/Quarterly	Grab	Effluent
Total Hardness, mg/L			Monthly/Quarterly	Grab	Effluent
Temperature, °C			Monthly/Quarterly	Grab	Effluent
Conductivity, µmho/cm			Monthly/Quarterly	Grab	Effluent

Notes:

1. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (18.).
2. The facility shall conduct monthly sampling from the effective date of the permit. After one year from the effective date of the permit the monitoring will be reduced to quarterly
3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.
4. The facility shall use EPA method 1631E.

If the facility is unable to obtain a seep sample due to the dry or low flow conditions preventing the facility from obtaining a representative sample, then "no flow" should be reported on the DMR. This requirement is established in the Section D of the Standard Conditions and 40 CFR 122.41 (j).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. (7.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 104) [15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from outfall 104 – Seep Discharge and stormwater discharge. Such discharges shall be limited and monitored[1] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency[2]	Sample Type	Sample Location
Flow, MGD			Monthly/Quarterly	Estimate	Effluent
pH[3]			Monthly/Quarterly	Grab	Effluent
TSS	30.0 mg/L	100.0 mg/L	Monthly/Quarterly	Grab	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	Monthly/Quarterly	Grab	Effluent
Fluoride, mg/L			Monthly/Quarterly	Grab	Effluent
Total Mercury[4], ng/L			Monthly/Quarterly	Grab	Effluent
Total Barium, mg/L			Monthly/Quarterly	Grab	Effluent
Total Iron, mg/L			Monthly/Quarterly	Grab	Effluent
Total Manganese, µg/L			Monthly/Quarterly	Grab	Effluent
Total Zinc, µg/L			Monthly/Quarterly	Grab	Effluent
Total Arsenic, µg/L			Monthly/Quarterly	Grab	Effluent
Total Cadmium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Chromium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Copper, µg/L			Monthly/Quarterly	Grab	Effluent
Total Lead, µg/L			Monthly/Quarterly	Grab	Effluent
Total Nickel, µg/L			Monthly/Quarterly	Grab	Effluent
Total Selenium, µg/L			Monthly/Quarterly	Grab	Effluent
Nitrate/nitrite as N, mg/L			Monthly/Quarterly	Grab	Effluent
Sulfates, mg/L			Monthly/Quarterly	Grab	Effluent
Chlorides, mg/L			Monthly/Quarterly	Grab	Effluent
TDS, mg/L			Monthly/Quarterly	Grab	Effluent
Total Hardness, mg/L			Monthly/Quarterly	Grab	Effluent
Temperature, ^{0}C			Monthly/Quarterly	Grab	Effluent
Conductivity, µmho/cm			Monthly/Quarterly	Grab	Effluent

Notes:

1. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (18.).
2. The facility shall conduct monthly sampling from the effective date of the permit. After one year from the effective date of the permit the monitoring will be reduced to quarterly
3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.
4. The facility shall use EPA method 1631E.

If the facility is unable to obtain a seep sample due to the dry or low flow conditions preventing the facility from obtaining a representative sample, then "no flow" should be reported on the DMR. This requirement is established in the Section D of the Standard Conditions and 40 CFR 122.41 (j).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. (8.) TOXICITY RE-OPENER CONDITION

[15A NCAC 02B .0200 et seq.]

This permit shall be modified, or revoked and reissued, to incorporate additional toxicity limitations and monitoring requirements in the event that toxicity testing or other studies conducted on the effluent or receiving stream indicate that detrimental effects may be expected in the receiving stream as a result of this discharge.

A. (9.) SPECIAL CONDITIONS

[NCGS 143-215.3 (a) (2) and NCGS 143-215.66]

The following special conditions are applicable to all outfalls regulated by this permit:

a) There shall be no discharge of polychlorinated biphenyl compounds such as those once commonly used for transformer fluid.
b) Nothing contained in this permit shall be construed as a waiver by the permittee of any right to a hearing it may have pursuant to State or Federal laws or regulations.
c) Discharge of any waste resulting from the combustion of toxic or hazardous waste to any waste stream which ultimately discharges to waters of the United States is prohibited, unless specifically authorized in this permit.
d) The permittee shall report all visible discharges of floating materials (such as an oil slick) to the Director when submitting DMRs.
e) "Upset," means an exceptional incident in which there is an unintentional and temporary non-compliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent cause by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or improper operations.
f) All flows shall be reported on monthly DMRs. Should no flow occur during a given month, the words "no flow" should be clearly written on the front of the DMR.
g) EPA methods 200.7 or 200.8 (or the most current versions) shall be used for analyses of all metals except for total mercury.
h) All effluent samples for all external outfalls shall be taken at the most accessible location after the final treatment but prior to discharge to waters of the U.S. (40 CFR 122.41(j)).
i) The term *low volume waste sources* means wastewater from all sources except those for which specific limitations are otherwise established in this part (40 CFR 423.11 (b)).
j) The term *chemical metal cleaning waste* means any wastewater resulting from cleaning any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning (40 CFR 423.11 (c)).
k) The term *metal cleaning waste* means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning (40 CFR 423.11 (d)).
l) For all outfalls where the flow measurement is to be "estimated" the estimate can be done by using calibrated V-notch weir, stop-watch and graduated cylinder, or other method approved by the Division.
m) The concentration of asbestos in any wastewater shall not exceed 7 million fibers per liter.

A. (10.) CHRONIC TOXICITY LIMIT (Monthly, Outfall 002)

[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

The effluent discharge shall at no time exhibit observable inhibition of reproduction or significant mortality to ***Ceriodaphnia dubia*** at an effluent concentration of 1.1 %.

The permit holder shall perform at a minimum, <u>*monthly*</u> monitoring using test procedures outlined in the "North Carolina *Ceriodaphnia* Chronic Effluent Bioassay Procedure," Revised December 2010, or

subsequent versions or "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure" (Revised- December 2010) or subsequent versions. Effluent sampling for this testing must be obtained during representative effluent discharge and shall be performed at the NPDES permitted final effluent discharge below all treatment processes.

If the test procedure performed as the first test of any month results in a failure or ChV below the permit limit, then multiple-concentration testing shall be performed at a minimum, in each of the two following months as described in "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure" (Revised-December 2010) or subsequent versions.

All toxicity testing results required as part of this permit condition will be entered on the Effluent Discharge Monitoring Form (MR-1) for the months in which tests were performed, using the parameter code **TGP3B** for the pass/fail results and **THP3B** for the Chronic Value. Additionally, DWR Form AT-3 (original) is to be sent to the following address:

Attention: North Carolina Division of Water Resources
Water Sciences Section/Aquatic Toxicology Branch
1621 Mail Service Center
Raleigh, North Carolina 27699-1621

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

Test data shall be complete, accurate, include all supporting chemical/physical measurements and all concentration/response data, and be certified by laboratory supervisor and ORC or approved designate signature. 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 Water Sciences Section at the address cited above.

Should the permittee fail to monitor during a month in which toxicity monitoring is required, monitoring will be required during the following month. Assessment of toxicity compliance is based on the toxicity testing month.

Should any test data from this monitoring requirement or tests performed by the North Carolina Division of Water Resources 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, minimum control organism reproduction, 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. (11.) BIOCIDE CONDITION

[NCGS 143-215.1]

The permittee shall not use any biocides except those approved in conjunction with the permit application. The permittee shall notify the Director in writing not later than ninety (90) days prior to instituting use of any additional biocide used in cooling systems which may be toxic to aquatic life other than those previously reported to the Division of Water Resources. Such notification shall include completion of Biocide Worksheet Form 101 and a map locating the discharge point and

receiving stream. Completion of Biocide Worksheet Form 101 is not necessary for those outfalls containing toxicity testing. Division approval is not necessary for the introduction of new biocides into outfalls currently tested for whole effluent toxicity.

A. (12.) CLEAN WATER ACT SECTION 316(a) THERMAL VARIANCE

[40 CFR 125, Subpart H]

The thermal variance granted under Section 316(a) terminates on expiration of this NPDES permit. Should the permittee wish a continuation of its 316(a) thermal variance beyond the term of this permit, reapplication for such continuation shall be submitted in accordance with 40 CFR Part 125, Subpart H and Section 122.21(1) (6) not later than 180 days prior to permit expiration. Reapplication shall include a basis for continuation such as a) plant operating conditions and load factors are unchanged and are expected to remain so for the term of the reissued permit; b) there are no changes to plant discharges or other discharges in the plant site area which could interact with the thermal discharges; and c) there are no changes to the biotic community of the receiving water body which would impact the previous variance determination.

The next 316(a) studies shall be performed in accordance with the Division of Water Resources approved plan. The temperature analysis and the balanced and indigenous study plan shall conform to the specifications outlined in 40 CFR 125 Subpart H and the EPA's Draft 316(a) Guidance Manual, dated 1977. EPA shall be provided an opportunity to review the plan prior to the commencement of the study.

Copies of all the study plans, study results, and any other applicable materials should be submitted to:

1) Electronic Version Only (pdf and CD)
   Division of Water Resources
   WQ Permitting Section - NPDES
   1617 Mail Service Center
   Raleigh, NC 27699-1617
2) Electronic Version (pdf and CD) and Hard Copy
   Division of Water Resources
   Water Sciences Section
   1621 Mail Service Center
   Raleigh, NC 27699-1621

A. (13.) CLEAN WATER ACT SECTION 316(B)

[40 CFR 125.95]

The permittee shall comply with the Cooling Water Intake Structure Rule per 40 CFR 125.95. The permittee shall submit all the materials required by the Rule with the next renewal application.

A. (14.) STRUCTURAL INTEGRITY INSPECTIONS OF ASH POND DAM

[15A NCAC 02K.0208]

The facility shall meet the dam design and dam safety requirements per 15A NCAC 2K.

A. (15.) INSTREAM MONITORING

[15A NCAC 02B.0500 ET SEQ.]

The facility shall conduct semiannual instream monitoring (4000 ft. upstream and 10,000 ft. downstream of the Outfall 002 and in the Railroad Branch 50 ft. upstream of the first seep and 50 ft.

downstream of the last seep) for dissolved arsenic, dissolved selenium, dissolved mercury (method 1631E), dissolved chromium, dissolved lead, dissolved cadmium, dissolved copper, total hardness, and dissolved zinc. The monitoring results shall be submitted with the NPDES permit renewal application and reported on the DMRs.

A. (16.) APPLICABLE STATE LAW (STATE ENFORCEABLE ONLY)

[NCGS 143-215.1(b)]

This facility shall meet the requirements of Senate Bill 729 (Coal Ash Management Act). This permit may be reopened to include new requirements imposed by Senate Bill 729.

A. (17.) DOMESTIC WASTEWATER TREATMENT PLANT

[NCGS 143-215.1(b)]

The domestic wastewater treatment facility shall be properly operated and maintained at all times. Its effluent must meet secondary limits for domestic wastewater, and not cause contravention of any water quality standards.

A. (18.) ELECTRONIC REPORTING OF DISCHARGE MONITORING REPORTS

[G.S. 143-215.1(b)]

Federal regulations require electronic submittal of all discharge monitoring reports (DMRs) and program reports. The final NPDES Electronic Reporting Rule was adopted and became effective on December 21, 2015.

NOTE: This special condition supplements or supersedes the following sections within Part II of this permit (*Standard Conditions for NPDES Permits*):

- Section B. (11.) Signatory Requirements
- Section D. (2.) Reporting
- Section D. (6.) Records Retention
- Section E. (5.) Monitoring Reports

1. **Reporting Requirements [Supersedes Section D. (2.) and Section E. (5.) (a)]**

   The permittee shall report discharge monitoring data electronically using the NC DWR's Electronic Discharge Monitoring Report (eDMR) internet application.

   Monitoring results obtained during the previous month(s) shall be summarized for each month and submitted electronically using eDMR. The eDMR system allows permitted facilities to enter monitoring data and submit DMRs electronically using the internet. Until such time that the state's eDMR application is compliant with EPA's Cross-Media Electronic Reporting Regulation (CROMERR), permittees will be required to submit all discharge monitoring data to the state electronically using eDMR and will be required to complete the eDMR submission by printing, signing, and submitting one signed original and a copy of the computer printed eDMR to the following address:

   NC DENR / Division of Water Resources / Water Quality Permitting Section

ATTENTION: Central Files
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

If a permittee is unable to use the eDMR system due to a demonstrated hardship or due to the facility being physically located in an area where less than 10 percent of the households have broadband access, then a temporary waiver from the NPDES electronic reporting requirements may be granted and discharge monitoring data may be submitted on paper DMR forms (MR 1, 1.1, 2, 3) or alternative forms approved by the Director. Duplicate signed copies shall be submitted to the mailing address above. See "How to Request a Waiver from Electronic Reporting" section below.

Regardless of the submission method, the first DMR is due on the last day of the month following the issuance of the permit or in the case of a new facility, on the last day of the month following the commencement of discharge.

Starting on **December 21, 2020**, the permittee must electronically report the following compliance monitoring data and reports, when applicable:

- Sewer Overflow/Bypass Event Reports;
- Pretreatment Program Annual Reports; and
- Clean Water Act (CWA) Section 316(b) Annual Reports.

The permittee may seek an electronic reporting waiver from the Division (see "How to Request a Waiver from Electronic Reporting" section below).

2. Electronic Submissions

In accordance with 40 CFR 122.41(l)(9), the permittee must identify the initial recipient at the time of each electronic submission. The permittee should use the EPA's website resources to identify the initial recipient for the electronic submission.

Initial recipient of electronic NPDES information from NPDES-regulated facilities means the entity (EPA or the state authorized by EPA to implement the NPDES program) that is the designated entity for receiving electronic NPDES data [see 40 CFR 127.2(b)].

EPA plans to establish a website that will also link to the appropriate electronic reporting tool for each type of electronic submission and for each state. Instructions on how to access and use the appropriate electronic reporting tool will be available as well. Information on EPA's NPDES Electronic Reporting Rule is found at: http://www2.epa.gov/compliance/final-national-pollutant-discharge-elimination-system-npdes-electronic-reporting-rule.

Electronic submissions must start by the dates listed in the "Reporting Requirements" section above.

3. How to Request a Waiver from Electronic Reporting

The permittee may seek a temporary electronic reporting waiver from the Division. To obtain an electronic reporting waiver, a permittee must first submit an electronic reporting waiver request to the Division. Requests for temporary electronic reporting waivers must be submitted in writing to the Division for written approval at least sixty (60) days prior to the date the facility would be required under this permit to begin submitting monitoring data and reports. The duration of a temporary waiver shall not exceed 5 years and shall thereupon expire. At such time, monitoring data and reports shall be submitted electronically to the Division unless the permittee re-applies for and is granted a new temporary electronic reporting waiver by the Division. Approved electronic reporting waivers are not transferrable. Only permittees with an approved reporting waiver request may submit monitoring data and reports on paper to the Division for the period that the approved reporting waiver request is effective.

Information on eDMR and the application for a temporary electronic reporting waiver are found on the following web page:

http://deq.nc.gov/about/divisions/water-resources/edmr

4. **Signatory Requirements [Supplements Section B. (11.) (b) and Supersedes Section B. (11.) (d)]**

All eDMRs submitted to the permit issuing authority shall be signed by a person described in Part II, Section B. (11.)(a) or by a duly authorized representative of that person as described in Part II, Section B. (11.)(b). A person, and not a position, must be delegated signatory authority for eDMR reporting purposes.

For eDMR submissions, the person signing and submitting the DMR must obtain an eDMR user account and login credentials to access the eDMR system. For more information on North Carolina's eDMR system, registering for eDMR and obtaining an eDMR user account, please visit the following web page:

http://deq.nc.gov/about/divisions/water-resources/edmr

Certification. Any person submitting an electronic DMR using the state's eDMR system shall make the following certification [40 CFR 122.22]. NO OTHER STATEMENTS OF CERTIFICATION WILL BE ACCEPTED:

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

5. **Records Retention [Supplements Section D. (6.)]**
The permittee shall retain records of all Discharge Monitoring Reports, including eDMR submissions. These records or copies shall be maintained for a period of at least 3 years from the date of the report. This period may be extended by request of the Director at any time [40 CFR 122.41].

A. (19.) DISCHARGE FROM SEEPAGE

[NCGS 143-215.1(b)]

Existing Discharges from Seepage

The facility identified 4 unpermitted seeps (all non-engineered) from the ash settling basin. Seep 1, seep 2, and seep 3 discharge to Railroad Branch. Seep 4 discharges to Dan River. The locations of the seeps are identified below and are depicted on the map attached to the permit.

Table 1. Discharge Coordinates and Assigned Outfall Numbers

Discharge ID	Latitude	Longitude	Outfall number
S-1	36.493	-79.711	Not assigned
S-2	36.493	-79.711	102
S-3	36.493	-79.711	103
S-4	36.486	-79.719	104

The outfall for these discharges is through an effluent channel meeting the requirements in 15A NCAC 2B .0228. Within 180 days of the effective date of this permit, the permittee shall demonstrate, through in-stream sampling meeting the requirements of condition A. (19.), that the water quality standards in the receiving stream are not contravened.

Discharges from Seepage Identified After Permit Issuance

The facility shall comply with the "Plan for Identification of New Discharges" as contained in Attachment 2. For any discharge identified pursuant to this Plan, the facility shall, within 90 days of the seep discovery, determine if the discharge seep meets the state water quality standards established in 15A NCAC 2B .0200 and submit the results of this determination to the Division. If the standards are not contravened, the facility shall conduct monitoring for the parameters specified in A. (8.).

If any of the water quality standards are exceeded, the facility shall be considered in violation until one of the options below is fully implemented:

1) Submit a complete application for 404 Permit (within 30 days after determining that a water quality standards is exceeded) to pump the seep discharge to one of the existing outfalls, install a pipe to discharge the seep to the Dan River/Railroad Branch, or install an *in-situ* treatment system. After the 404 Permit is obtained, the facility shall complete the installation of the pump, pipe, or treatment system within 180 days from the date of the 404 permit receipt and begin pumping/discharging or treatment.
2) Demonstrate through modeling that the decanting and dewatering of the ash basin will result in the elimination of the seep. The modeling results shall be submitted to the Division within 120 days from the date of the seep discovery. Within 180 days from the completion of the dewatering the facility shall confirm that the seep flow ceased. If the seep flow continues, the facility shall choose one of the other options in this Special Condition.
3) Demonstrate that the seep is discharging through the designated "Effluent Channel" and the water quality standards in the receiving stream are not contravened. This demonstration should be submitted to the Division no later than 180 days from the date of the seep discovery. The "Effluent Channel" designation should be established by the DEQ Regional Office personnel prior to the issuance of the permit. This permit shall be reopened for cause to include the "Effluent Channel" in a revised permit.

All effluent limits, including water quality-based effluent limits, remain applicable notwithstanding any action by the Permittee to address the violation through one of the identified options, so that any discharge in exceedance of an applicable effluent limit is a violation of the Permit as long as the seep remains flowing.

New Identified Seeps
If new seeps are identified, the facility shall follow the procedures outlined above. The deadlines for new seeps shall be calculated from the date of the seep discovery. The new identified seep is not permitted until the permit is modified and the new seep included in the permit and the new outfall established for the seep.

A. (20.) FISH TISSUE MONITORING NEAR ASH POND DISCHARGE (Outfall 002)

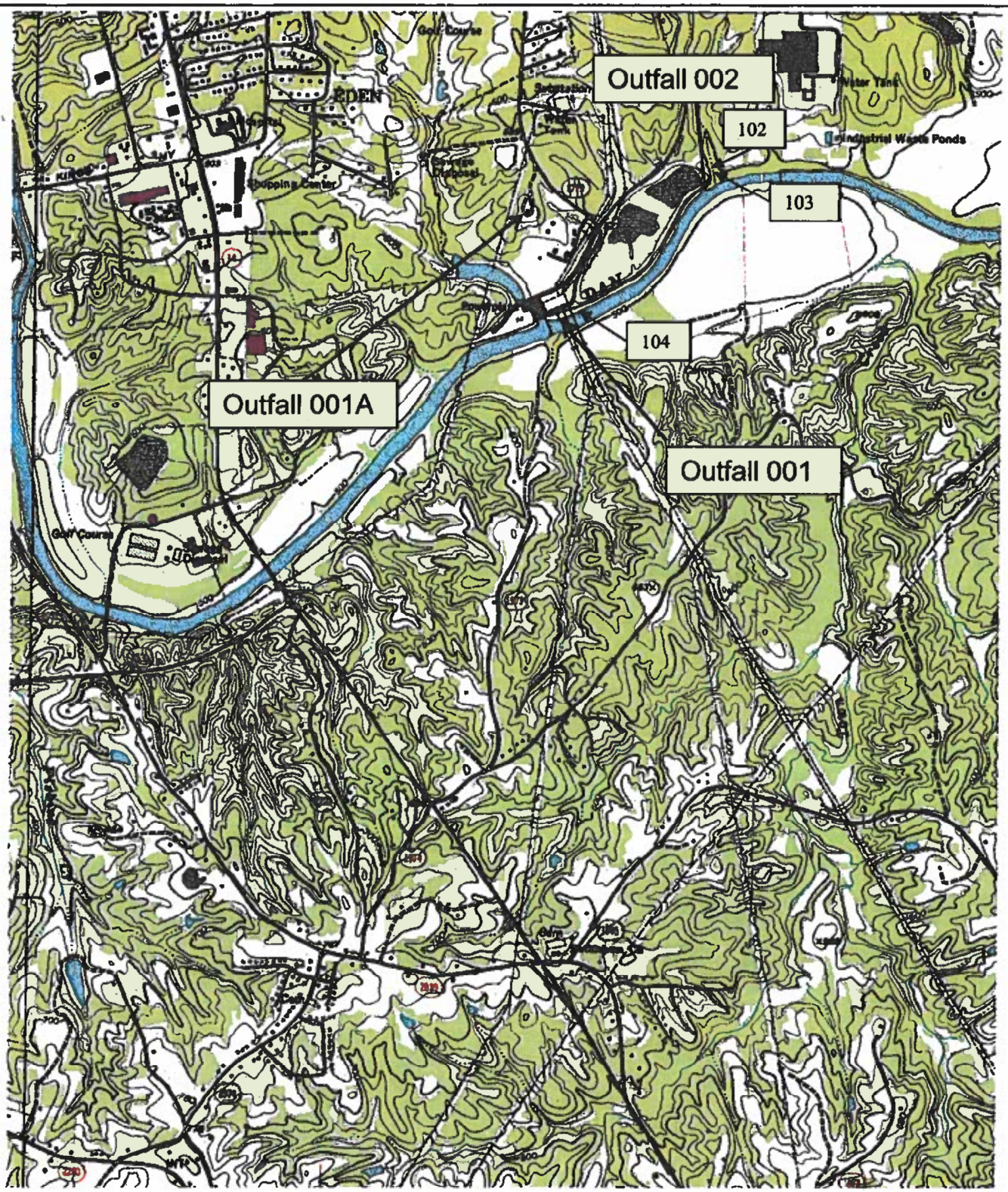
[NCGS 143-215.3 (a) (2)]

The facility shall conduct fish tissue monitoring annually during the permit term and submit the results with the NPDES permit renewal application. The objective of the monitoring is to evaluate potential uptake of pollutants by fish tissue near the Ash Pond discharge. The parameters analyzed in fish tissue shall be arsenic, selenium, and mercury. The monitoring shall be conducted in accordance with the Sampling Plan approved by the Division. Upon approval, the plan becomes an enforceable part of the permit.

A. (21.) COMPLIANCE BOUNDARY

[15A NCAC 02L.0107]

The compliance boundary for the disposal system shall be specified in accordance with 15A NCAC 02L .0107(a) or (b) dependent upon the date permitted. An exceedance of groundwater standards at or beyond the compliance boundary is subject to remediation action according to 15A NCAC 02L .0106(c), (d), or (e) as well as enforcement actions in accordance with North Carolina General Statute 143-215.6A through 143-215.6C. The compliance boundary map for this facility is incorporated herein and attached hereto as Attachment A.

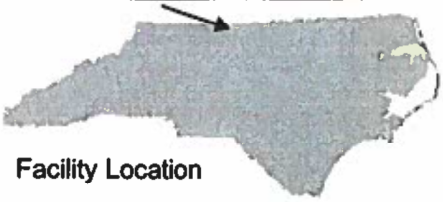


USGS Quad: B20NW Southeast Eden, NC

	Outfall 001	Outfall 002
Latitude:	36° 29' 7.9" N	36° 29' 30.1" N
Longitude:	79° 43' 13.9" W	79° 42' 39.6" W

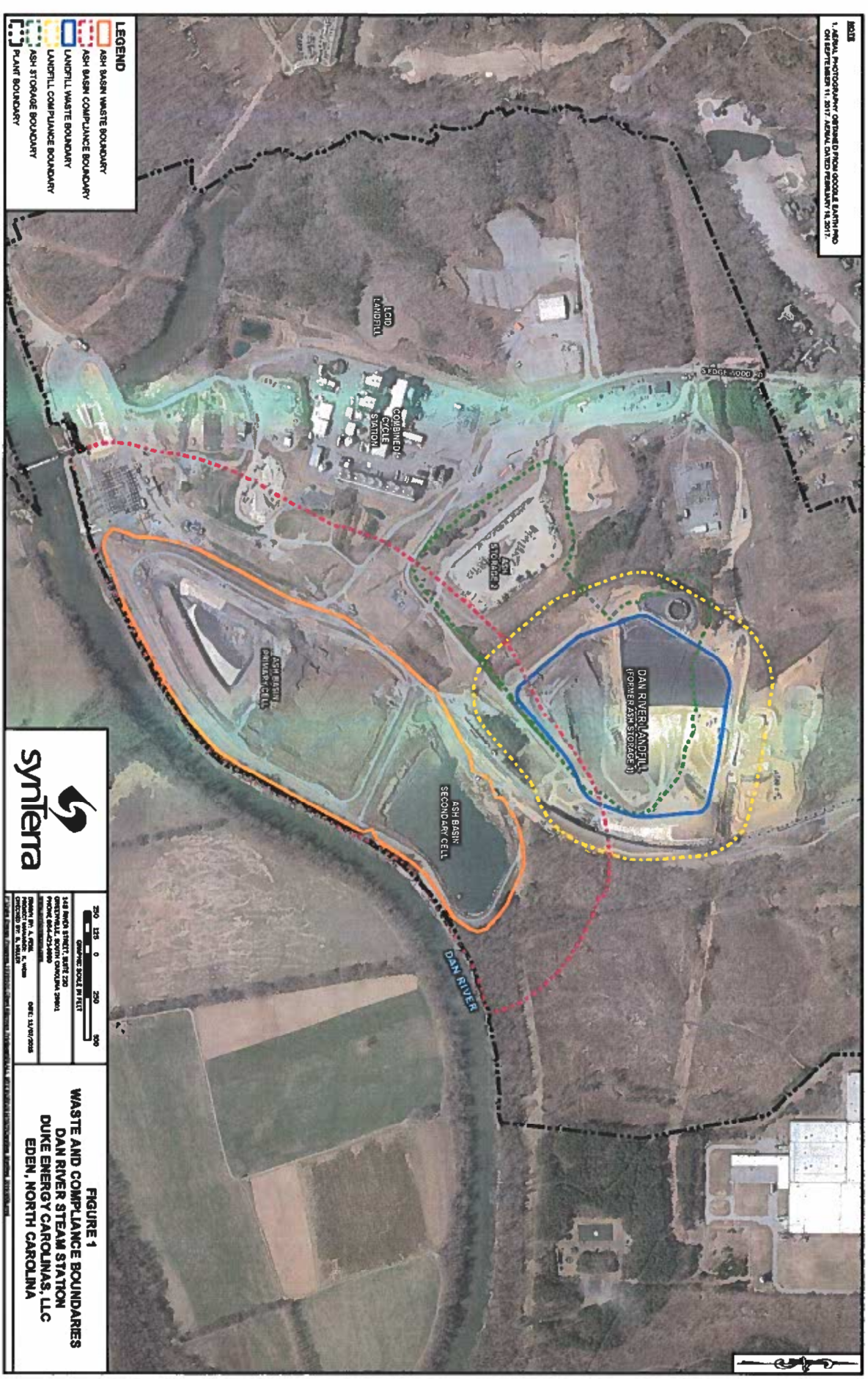
Subbasin: 03-02-03 **HUC: 03010103**

Stream Class: C
Receiving Stream: Dan River



Duke Energy Carolinas - Dan River Station
NPDES Permit No. NC0003468 Rockingham County

Attachment A



Lucas and Maness Exhibit 1

North Carolina Public Staff
Data Request No. 158
DEC Docket No. E-7, Sub 1214
Item No. 158-1
Page 1 of 1

Request:

1. Please provide the details of each DEC depreciation or decommissioning study going back to 2000 with respect to whether any costs for coal ash impoundment or other coal ash disposal site/facility closures or retirements/removals were included in net salvage, either explicitly or implicitly, for decommissioning of DEC's coal plants.

Response:

Copies of the four depreciation studies and one decommissioning study conducted by or for DEC from 2000 forward are provided herewith. Each of the earliest three depreciation studies, which were dated as of December 31, 2003 (E-7, Sub 783), December 31, 2008 (E-7, Sub 909), and December 31, 2011 (E-7, Sub 1026) respectively, reflect a calculated net salvage percentage for the equipment and facilities subject to the study, which would include coal ash basins as part of the plant facilities, although not in any specific dollar amount. None of those net salvage percentages include or account for anticipated costs of coal ash removal or remediation, or retirement/decommissioning of coal ash impoundments or storage facilities. The most recent depreciation study prepared for DEC, dated as of December 31, 2016_ (E-7, Sub 1146), also does not include such costs, nor does the Burns & MacDonnell decommissioning study, dated as of April 19, 2017, upon which it was based, inasmuch as DEC had by the time of those studies established asset retirement obligations in connection with anticipated coal ash basin closure costs. The relevant asset retirement obligation accounting ("ARO") rules expressly exclude cost of removal as part of depreciation expense, and instead include such costs in the ARO. See 18 C.F.R. §101, Definitions 10 ("[c]ost of removal does not include the cost of removal activities associated with asset retirement obligations that are capitalized as part of the tangible long-lived assets that give rise to the obligation.").

Request:

2. If such costs were included in the depreciation or decommissioning studies, please provide workpapers or other analyses showing the annual amounts and final decommissioning costs included, by coal ash basin and other ash disposal site and by FERC account, if possible.

Response:

See response to DR 158-1.

Request:

3. If such costs were not included in the depreciation or decommissioning studies, please explain why not.

Response:

Prior to approximately the mid-2010s, and particularly in connection with the promulgation of the US Environmental Protection Agency's final rule on coal combustion residuals ("CCR Rule"), it was not standard industry practice to include anticipated costs of coal ash impoundment closure in net salvage portion of depreciation expense for several reasons. In the early part of the period specified in DR 1 above, it was not common to have decommissioning studies performed that included coal burning facilities because the prevailing presumption by electric companies at that time was that such facilities would continue to provide power in same function well into the future. Moreover, ash basins would continue serving their function of holding CCRs, and would in that connection continue to be managed and permitted. Without a definite plan to decommission these plants, or the specific manner at which the facility will be decommissioned, it was not appropriate to include decommissioning costs related to coal ash basin closures in the calculation of depreciation rates. Further, as a general matter, pre-CCR Rule coal ash basin closures ordinarily were planned and carried out in conjunction with the relevant environmental authorities. While DEC began assessing the requirements for and anticipated costs of coal ash basin closure in the years immediately prior to the promulgation of the CCR Rule and enactment of North Carolina's Coal Ash Management Act (CAMA), as evidenced, for example, by AGO Fountain Direct Cross Ex. 6 and AGO Late Filed Ex. 1(L) in Docket E-7, Sub 1146, there was no clarity from federal or North Carolina environmental authorities as to how closure would be accomplished, rendering any cost estimations speculative. Further, following the enactment of CAMA and promulgation of the CCR Rule, which were the triggering events for the establishment of coal ash basin closure AROs, the applicable accounting rules shifted to ARO accounting rather than recovery of net salvage costs through depreciation expense. See also response to DR 158-1.

Request:

4. Please provide all records, including reports, memos, and email messages, that indicate whether or not DEC and/or its consultants ever discussed impoundment or other coal ash site/facility closure/retirement/removal costs being included in net salvage. Please include any mention of how and whether such costs should be included in net salvage, including any discussions prior, during, or after the rate case in Docket No. E-7, Sub 1146.

Response:

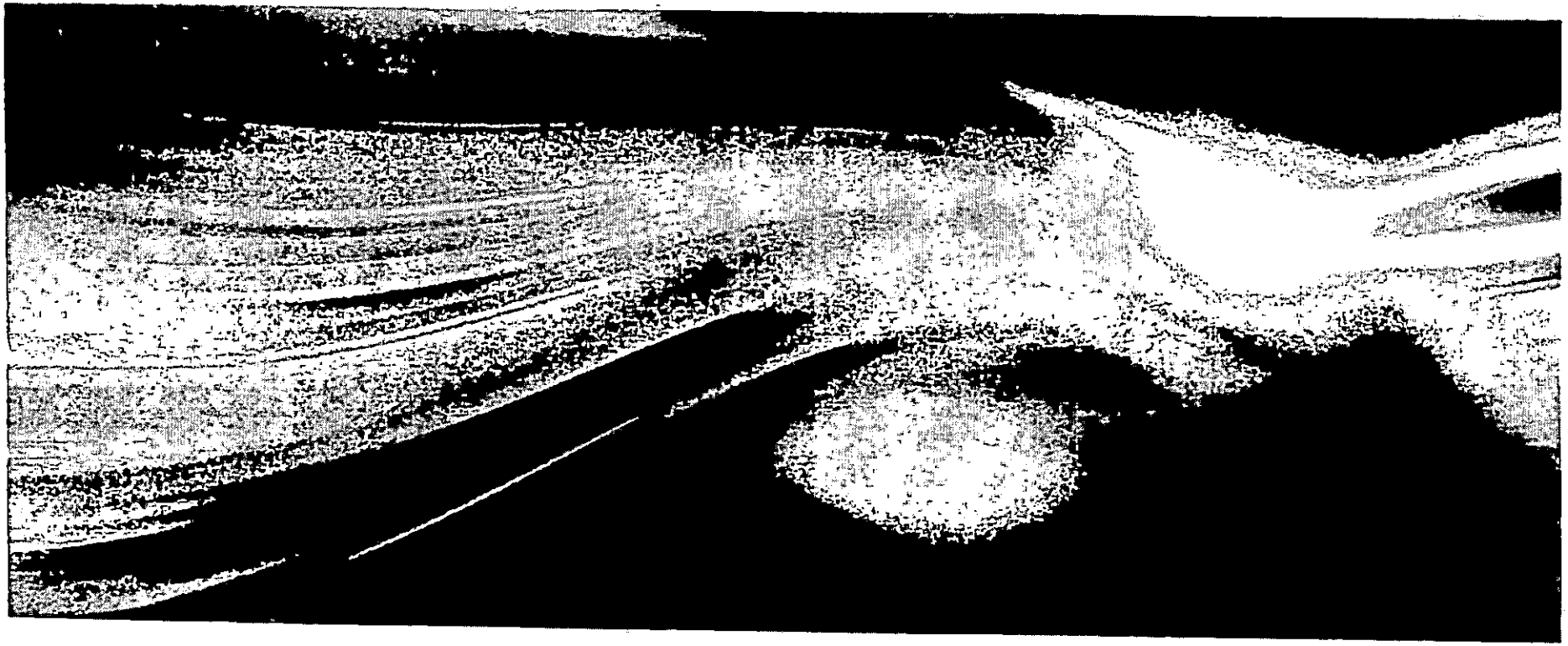
See the attached files "Attachment DEC PS 158-4.pdf" and "Attachment DEC PS 158-4 B.pdf."

Attachment DEC PS 158-4.pdf

Attachment DEC PS 158-4 B.pdf

I/A

Duke Energy.



Decommissioning Evaluation for DEC Coal/CT's Fleet

October 18, 2011

Duke Energy.

Goal and Approach

Standard of Decommission to Build Estimate

- Estimate assumes 'greenfield' designation for all areas excluding ash basins.
  - These areas will be returned to natural state, suitable to be sold, built upon etc
- Ash basin estimates are designed to 'brownfield' and will require monitoring.
  - Not suitable for all types of structures to built upon moving forward

Methodology to Build Estimate

- Use previous decommissioning study for station input data
- Incorporate new additions to stations (WFGD, SCR's etc)
- Update unit costs with input from vendors
- Work with EHS to outline current governing rules for decommission

Duke Energy.

Environmental Health and Safety Governing Rules

- Will explore permitting onsite landfill to allow asbestos disposal and masonry coated with lead paint
  - Will use masonry for backfill in basement and other areas to reduce backfill expense
- Ground water monitoring will be needed after decommission
  - $500k/station one time charge included in estimate (provides 30 yr of monitoring)
- Building demo will only go 2 feet below grade. Brick/concrete will be used as backfill into basement where acceptable.
- New Coal Combustion Residuals (CCR) Rule not expected until 2012 but decommission estimate includes a synthetic cap for ash landfills.
- Coal yard will be removed to a depth of 5ft; remaining hole will require backfill (preferably onsite materials); Dirt removed likely disposal to on site landfill
- Ash basin dikes will be breached or modified to provide for permanent drainage.

Duke Energy.

Executive Summary-Results

Station	MW	Unit Costs	Non Ash Disposal Site Costs	Ash Disposal	Proj Mgmt/ Eng/Contingency	Sub Total	Scrap	Net
Allen	1127	$ 25,271,075	$ 3,567,827	$ 182,978,518	$ 5,253,382	$ 217,070,802	$ 23,087,675	$ 193,983,127
Belews Creek	2220	$ 35,544,607	$ 5,454,139	$ 218,832,840	$ 7,322,004	$ 267,153,590	$ 34,046,135	$ 233,107,454
Cliffside	1560	$ 25,543,369	$ 3,533,059	$ 114,665,289	$ 5,591,284	$ 149,333,002	$ 22,766,694	$ 126,566,308
Marshall	2078	$ 29,925,845	$ 4,958,308	$ 339,609,721	$ 6,352,613	$ 380,846,487	$ 27,400,295	$ 353,446,192
Buck	434	$ 15,449,008	$ 2,128,744	$ 90,854,780	$ 3,398,460	$ 111,830,992	$ 16,397,225	$ 95,433,767
Dan River	281	$ 9,813,361	$ 2,128,744	$ 30,219,790	$ 4,700,487	$ 46,862,381	$ 10,555,355	$ 36,307,027
Lee	370	$ 10,961,912	$ 2,624,598	$ 48,634,872	$ 6,331,252	$ 68,552,634	$ 13,473,217	$ 55,079,417
Riverbend	454	$ 15,937,527	$ 3,015,313	$ 68,398,154	$ 8,870,145	$ 96,221,139	$ 19,216,517	$ 77,004,621
Buck CC/All CT's	3747	$ 10,492,730			$ 2,356,293	$ 12,849,023	$ 29,633,140	$ (16,784,116)
Totals:		$ 178,939,434	$ 27,410,731	$1,094,193,964	$ 50,175,921	$ 1,350,720,050	$ 196,576,253	$ 1,154,143,796

Note: Dan River CC not included because of expected completion date

Ash closed onsite

Duke Energy.

Executive Summary-Takeaways

- Ash disposal represents 80% of projected costs, 95% of the net costs
- Current scrap prices are a significant contributor to net; scrap value increased at a rate greater than removal costs including fuel

Factors Impacting Trends in Estimate

- Steel removal costs reductions
- Reduction in project management costs
- Improvements in asbestos removal
- Spike in scrap costs

- Changes in ash disposal requirements
- Fuel increases
- Possible landfill restrictions could require more shipping costs
- Backfill prices increases

Decommission Assumptions

Concrete Removal:	$35/cubic yard
Steel Removal:	$0.08/lb ($160/ton)
Steel Scrap Value:	$326/ton ($0.163/lb)
Copper Scrap Value:	$2.84/lb
Mark up from 1996 Estimates:	20%
Engineering costs:	5%
Contingency:	10%
Project Management:	6%

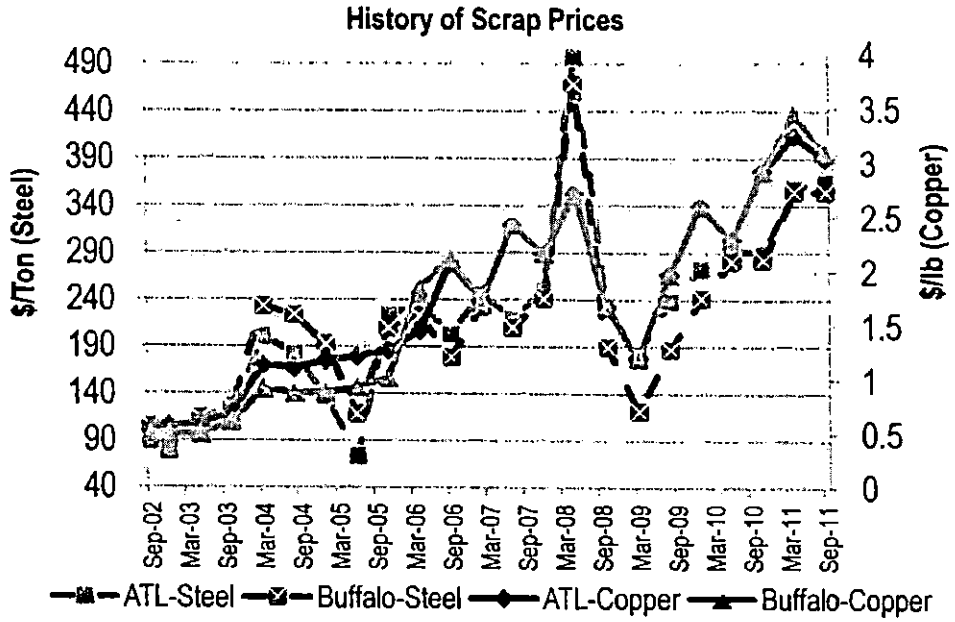
Duke Energy.

Impact of Scrap Market

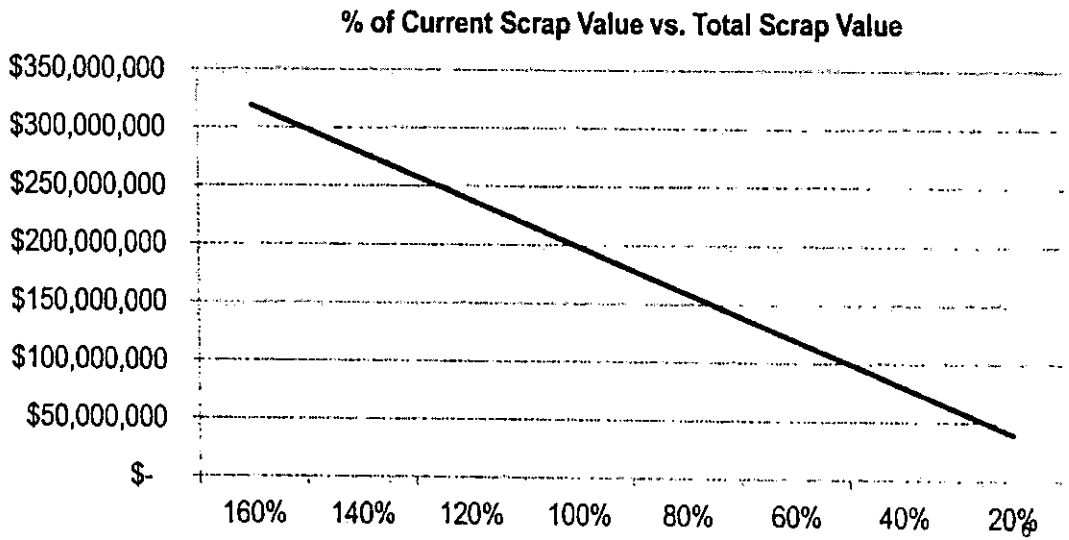
Scrap values used in 1994 evaluation:
- Copper: $0.47/lb
- Carbon Steel: $30/ton ($0.015/lb)

Current scrap prices:
- Copper: $3.05/lb
- Carbon Steel: $350/ton ($0.175/lb)

(93% of values used in estimate)



Input components
- Carbon Steel: 321,000 tons
- Copper: 15,600 tons



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Ash Basin Details

- Assumes classification of ash as Subtitle "D"-Non Hazardous Waste
- Costs could be substantially greater if designated as Subtitle "C"- Hazardous Waste
- Rule not expected to be finalized until 2012 at earliest
- Strategy for estimate developed by SME's which will move dry ash to ash basin for closure to synthetic cap

on-site closure | take ash away for disposal

Station	Class "D" Estimates[3]	Class "C" Estimates[1]
Belews Creek	$219M	$2.52B
Allen	$183M	$1.22B
Buck	$91M	$618M
Cliffside	$115M	$1.1B
Dan River	$35M	$309M[2]
Lee	$49M	$415M
Marshall	$340M	$4.9B
Riverbend	$69M	$309M[2]

[1]High level estimates from May 2010
[2]Approximation based on acreage of existing ash basin and estimates of other stations
[3]Aligns with most current estimates in 2011 9x3 forecast

Butler, Melissa O.

From: John Spanos <jspanos@gfnet.com>
Sent: Thursday, July 25, 2013 2:15 PM
To: Reilly, Dan; Wooten, Amanda E; Halstead, Paul L.
Subject: RE: DE Carolinas COR Reserve

My only comment would be related to the reference to T&D assets. There are no true final termination costs for T&D as these are mass accounts.

From: Reilly, Dan [mailto:Dan.Reilly@duke-energy.com]
Sent: Thursday, July 25, 2013 12:54 PM
To: Wooten, Amanda E; Halstead, Paul L; John Spanos
Subject: RE: DE Carolinas COR Reserve

John,

As a follow up to our meeting I put together the following notes to summarize our discussion. Please let me know if you think I misstated anything:

Duke Energy Carolinas

- Duke Energy Carolinas COR accrual for Steam, Hydro and Other Production is based on interim net salvage rates.
- Interim net salvage rate are the rates for the portion of the plant that will be retired prior to the end of the plants life (i.e. the plant being shut down) and is based on analysis of historical cost of removal and salvage data.
- The interim net salvage rate is applied to the entire plant balance (i.e. both the portion of the plant that will be retired on a interim basis and portion that will be retired at the end of the plants life) and therefore you have a COR accrual for 100% of the plant based on interim net salvage rate.
- While the interim net salvage methodology is creating some reserve for the portion of the plant that will be retired at the end of the plants life, the interim salvage rates are lower than rates needed to decommission the plant, whether that is brownfield, greenfield or keeping the site safe and secure.
- Transmission and Distribution's COR rates follow a similar methodology, however final termination costs for T&D are not expected to be as significant as for generation plant.

Other Factors

- Duke Energy Carolinas has always applied this "interim" COR accrual methodology.
- The methodology has was widely used in the utility industry until about 10 years ago.
- Since then most utilities have tried to build the cost of decommissioning their assets into their COR rates.
- DEI and DEK have rates to decommission their plants to a brownfield state built into their COR accruals rates

Thanks again for your time on the call this morning, it was very informative.

Regards,
Dan
-----Original Appointment-----
From: Wooten, Amanda E
Sent: Wednesday, July 24, 2013 3:37 PM
To: Wooten, Amanda E; Reilly, Dan; Halstead, Paul L; John Spanos
Subject: DE Carolinas COR Reserve
When: Thursday, July 25, 2013 9:00 AM-9:30 AM (GMT-05:00) Eastern Time (US & Canada).
Where: CR-CLT-Duke Energy Center-DEC-4201(8)

HI John,

I hope you're doing well. In preparation for our SC rate case, we wanted to have a brief call with you to get a better understanding of what our COR reserve is intended to cover. We understand that we are currently collecting for interim retirements through depreciation accruals, but has that always been the case? Essentially, what are the assumptions behind the COR factors in the depreciation study – brownfield, greenfield, what happens when the site is no longer operating, etc? Hopefully this time will work for you, but if not, please let me know a time that will.

Dial In: 866-385-2663
Conferee Code: 312539

Thanks,
Amanda

Request:

5. Please describe in detail and quantify any effect the issuance of SFAS No. 143 had on the determination of depreciation rates or depreciation expense previously related to cost of removal or net salvage, including the effect(s) of Paragraphs B21 and B22 of the Statement. For example:
a. Were depreciation rates changed at the effective date of SFAS No. 143 to reflect the preclusion described in B21 and B22? If so, how were they changed? If not, why not?
b. Were depreciation rates changed at the effective date of the next depreciation rate study following the effective date of SFAS No. 143 to reflect the preclusion described in B21 and B22? If so, how were they changed? If not, why not?
c. If depreciation rates were not changed, what was the increase in accumulated depreciation formerly credited toward cost of removal or net salvage subsequently credited toward instead? Please explain your answer.

Response:

a. Upon DEC's adoption of SFAS 143 in 2003, there were no changes to depreciation rates or depreciation expense previously related to cost of removal or net salvage associated with decommissioning of ash impoundments to reflect the preclusion described in Paragraphs B21 and B22 of the Statement. As noted in the response to DR 158-1, the net salvage percentages included in depreciation rates at that time did not include or account for anticipated costs of coal ash removal or remediation, or retirement/decommissioning of coal ash impoundments or storage facilities. Furthermore, the scope of SFAS 143 was limited to "legal obligations associated with the retirement of a tangible long-lived asset." Since there were no legal obligations associated with the retirement of DEC's ash ponds in 2003, the adoption of SFAS 143 had no effect on the accounting related to DEC's ash ponds at that time.

b. Following the 2003 effective date of SFAS 143, the next DEC depreciation study was dated as of December 31, 2008. For the same reasons noted in the response to DR 158-5a above, there were no changes to depreciation rates at that time to reflect the preclusion described in Paragraphs B21 and B22 of SFAS 143.

c. As noted in the response to DR 158-1 above, the net salvage percentages included in depreciation rates did not include or account for anticipated costs of coal ash removal or remediation, or retirement/decommissioning of coal ash impoundments or storage facilities, and therefore no such amounts had formerly been credited toward cost of removal.

Public Staff
Lucas/Maness Exhibit 2

Docket No. E-7, Sub 1214

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Public Staff
Lucas/Maness Exhibit 3

Docket No. E-7, Sub 1214

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Public Staff
Lucas/Maness Exhibit 4

Docket No. E-7, Sub 1214

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Public Staff
Lucas/Maness Exhibit 5

Docket No. E-7, Sub 1214

CONFIDENTIAL

I/A

Duke Energy Carolinas
Table 1: Summary of Depreciation Rates and Annual Accrual Amounts
As of December 31, 2018

		Current Approved		DEC Proposed			Public Staff Proposed			
Functional Category	12/31/18 Investment	Accrual Rate	Accrual Amount	Accrual Rate	Accrual Amount	Difference from Current	Accrual Rate	Accrual Amount	Difference from Current	Difference from Company
A	B	C	D	E	F	G	H	I	J	K
Steam Production Plant	8,352,937,230	3.41%	284,823,199	4.40%	367,923,551	83,100,352	3.90%	326,020,669	41,197,470	(41,902,882)
Nuclear Production Plant	8,518,494,363	3.39%	288,434,455	3.60%	306,886,916	18,452,461	3.60%	306,886,916	18,452,461	0
Hydraulic Production Plant	2,134,189,181	1.87%	39,880,402	2.00%	42,784,187	2,903,785	1.99%	42,377,657	2,497,255	(406,530)
Other Production Plant	3,153,387,534	3.09%	97,440,447	3.21%	101,212,036	3,771,589	3.12%	98,537,143	1,096,696	(2,674,893)
Transmission Plant	3,871,037,930	2.05%	79,291,459	2.23%	86,253,267	6,961,808	2.23%	86,253,267	6,961,808	0
Distribution Plant	12,022,021,973	2.27%	273,273,414	2.28%	273,848,655	575,241	2.24%	269,624,535	(3,648,879)	(4,224,120)
General Plant	1,150,068,086	5.45%	62,704,125	5.27%	60,633,994	(2,070,131)	5.27%	60,633,994	(2,070,131)	0
Land Rights	199,557,774	1.09%	2,174,938	0.98%	1,960,710	(214,228)	0.98%	1,960,710	(214,228)	0
General Plant Reserve Amortization	0		(10,159,236)		(13,907,418)	(3,748,182)		(13,907,418)	(3,748,182)	0
Total Depreciable Plant	**39,401,694,071**	**2.84%**	**1,117,863,203**	**3.12%**	**1,227,595,898**	**109,732,695**	**2.99%**	**1,178,387,474**	**60,524,271**	**(49,208,424)**

Duke Energy Carolinas
Table 2: Summary of Depreciation Rates and Annual Accrual Amounts
As of December 31, 2018

		Current Approved		DEC Proposed			Public Staff Proposed			
Plant	12/31/18 Investment	Accrual Rate	Accrual Amount	Accrual Rate	Accrual Amount	Difference from Current	Accrual Rate	Accrual Amount	Difference from Current	Difference from Company
A	B	C	D	E	F	G	H	I	J	K
Steam Production										
Marshall	1,744,647,645	3.43%	59,908,159	4.36%	76,118,155	16,209,996	4.36%	76,130,114	16,221,955	11,959
Belews Creek	2,207,034,270	3.10%	68,523,054	3.83%	84,451,345	15,928,291	3.77%	83,162,358	14,639,304	(1,288,987)
Cliffside 5 (J.E. Rogers)	746,187,435	3.71%	27,654,099	5.79%	43,188,228	15,534,129	3.28%	24,490,424	(3,163,675)	(18,697,804)
Cliffside 6 (J.E. Rogers)	2,103,465,498	3.05%	64,234,080	3.18%	66,914,430	2,680,350	3.19%	66,995,842	2,761,762	81,412
Cliffside 5 and 6 Common (J.E. Rogers)	162,575,435	3.10%	5,044,522	3.95%	6,417,469	1,372,947	3.92%	6,378,074	1,333,552	(39,395)
Lee	113,085,133	3.61%	4,085,107	5.42%	6,125,915	2,040,808	5.33%	6,030,704	1,945,597	(95,211)
Allen	1,236,713,184	4.39%	54,234,632	6.73%	83,249,392	29,014,760	4.96%	61,374,536	7,139,904	(21,874,856)
Shared Department Plant	39,228,631	2.90%	1,139,546	3.72%	1,458,617	319,071	3.72%	1,458,617	319,071	0
Total Steam Production	**8,352,937,230**	**3.41%**	**284,823,199**	**4.40%**	**367,923,551**	**83,100,352**	**3.90%**	**326,020,669**	**41,197,470**	**(41,902,882)**
Nuclear Production Plant										
Oconee	4,343,945,956	4.13%	179,290,171	4.37%	189,619,337	10,329,166	4.37%	189,619,337	10,329,166	0
McGuire	3,325,093,560	2.65%	88,249,233	2.85%	94,828,750	6,579,517	2.85%	94,828,750	6,579,517	0
Catawba	848,008,545	2.46%	20,842,116	2.64%	22,393,810	1,551,694	2.64%	22,393,810	1,551,694	0
Shared Department Plant	1,446,303	3.66%	52,935	3.11%	45,019	(7,916)	3.11%	45,019	(7,916)	0
Total Nuclear Production	**8,518,494,363**	**3.39%**	**288,434,455**	**3.60%**	**306,886,916**	**18,452,461**	**3.60%**	**306,886,916**	**18,452,461**	**0**
Hydro Production Plant										
Cowans Ford	113,753,783	1.91%	2,170,025	2.23%	2,531,690	361,665	2.22%	2,528,313	358,288	(3,377)
Bad Creek	1,020,255,320	1.51%	15,410,183	1.58%	16,082,113	671,930	1.58%	16,082,613	672,430	500
Jocassee	170,054,080	1.76%	2,995,117	2.04%	3,473,084	477,967	2.01%	3,412,181	417,064	(60,903)
Keowee	125,826,474	2.51%	3,164,472	2.66%	3,347,765	183,293	2.67%	3,354,964	190,492	7,199
Fishing Creek	47,207,176	2.04%	963,149	2.14%	1,008,877	45,728	2.11%	994,078	30,929	(14,799)
Cedar Creek	32,337,981	2.18%	704,138	2.27%	733,853	29,715	2.21%	713,613	9,475	(20,240)
Bridgewater	206,176,256	2.22%	4,572,111	2.22%	4,586,349	14,238	2.19%	4,523,428	(48,683)	(62,921)
Gaston Shoals	20,522,083	3.84%	787,487	4.08%	836,926	49,439	3.96%	811,940	24,453	(24,986)
Lookout Shoals	21,326,840	2.08%	443,235	2.20%	468,616	25,381	2.14%	455,585	12,350	(13,031)
Mountain Island	28,382,786	2.19%	620,809	2.33%	660,283	39,474	2.26%	642,243	21,434	(18,040)
99 Islands	24,859,025	3.20%	794,601	3.36%	835,434	40,833	3.24%	804,286	9,685	(31,148)
Oxford	57,684,356	1.98%	1,143,651	2.29%	1,319,517	175,866	2.26%	1,303,181	159,530	(16,336)

Duke Energy Carolinas
Table 2: Summary of Depreciation Rates and Annual Accrual Amounts
As of December 31, 2018

		Current Approved		DEC Proposed			Public Staff Proposed			
Plant	12/31/18 Investment	Accrual Rate	Accrual Amount	Accrual Rate	Accrual Amount	Difference from Current	Accrual Rate	Accrual Amount	Difference from Current	Difference from Company
A	B	C	D	E	F	G	H	I	J	K
Rhodhiss	30,659,083	2.26%	693,412	2.35%	719,583	26,171	2.32%	710,121	16,709	(9,462)
Tuxedo	10,579,047	2.60%	275,466	2.68%	283,578	8,112	2.59%	273,947	(1,519)	(9,631)
Wateree	53,457,780	1.92%	1,024,978	2.11%	1,125,552	100,574	2.07%	1,108,379	83,401	(17,173)
Wylie	50,172,184	1.91%	957,270	2.15%	1,079,024	121,754	2.12%	1,062,184	104,914	(16,840)
Great Falls	9,793,238	2.72%	266,741	3.06%	300,103	33,362	2.81%	274,728	7,987	(25,375)
Dearborn	20,214,613	2.20%	445,290	2.35%	475,967	30,677	2.29%	463,261	17,971	(12,706)
NPL Bear Creek	11,514,733	1.52%	174,590	3.68%	423,788	249,198	3.64%	418,742	244,152	(5,046)
NPL Bryson	6,309,659	4.75%	299,870	4.79%	302,180	2,310	4.70%	296,274	(3,596)	(5,906)
NPL Cedar Cliff	7,377,131	3.27%	241,388	3.39%	249,752	8,364	3.30%	243,248	1,860	(6,504)
NPL Franklin	7,973,528	4.33%	345,106	4.41%	351,960	6,854	4.37%	348,253	3,147	(3,707)
NPL Mission	8,069,916	4.36%	351,829	4.49%	362,216	10,387	4.35%	350,886	(943)	(11,330)
NPL Nantahala	23,186,143	1.66%	384,209	2.24%	519,722	135,513	2.24%	520,386	136,177	664
NPL Queens Creek	1,301,400	5.10%	66,382	5.29%	68,827	2,445	4.76%	61,900	(4,482)	(6,927)
NPL Tennessee Creek	7,906,198	2.25%	177,643	2.35%	186,045	8,402	2.26%	178,477	834	(7,568)
NPL Thorpe	12,445,273	2.02%	251,442	2.29%	285,122	33,680	2.25%	279,470	28,028	(5,652)
NPL Tuckasegee	3,612,580	3.44%	124,443	3.72%	134,493	10,050	3.58%	129,208	4,765	(5,285)
Shared Department Plant	1,230,516	2.55%	31,365	2.58%	31,768	403	2.58%	31,768	403	0
Total Hydro Production	**2,134,189,181**	**1.87%**	**39,880,402**	**2.00%**	**42,784,187**	**2,903,785**	**1.99%**	**42,377,657**	**2,497,255**	**(406,530)**
Other Production Plant										
Lincoln	405,310,216	2.37%	9,585,901	2.61%	10,592,580	1,006,679	2.48%	10,033,048	447,147	(559,532)
Dan River CC	656,942,874	3.26%	21,395,315	3.25%	21,365,439	(29,876)	3.19%	20,954,859	(440,456)	(410,580)
Lee	61,631,468	2.77%	1,709,399	2.95%	1,817,943	108,544	2.83%	1,744,288	34,889	(73,655)
Mill Creek	250,891,938	2.53%	6,339,190	2.68%	6,713,283	374,093	2.58%	6,471,696	132,506	(241,587)
Rockingham	303,406,446	2.93%	8,891,077	3.11%	9,423,818	532,741	3.00%	9,105,038	213,961	(318,780)
Buck CC	671,907,790	3.09%	20,776,850	3.08%	20,702,962	(73,888)	3.02%	20,284,440	(492,410)	(418,522)
Lee CC	594,705,587	3.01%	17,901,642	3.26%	19,373,017	1,471,375	3.18%	18,889,947	988,305	(483,070)
Equitable Diesel Generators	17,732,022	6.23%	1,104,705	7.13%	1,263,586	158,881	6.95%	1,232,376	127,671	(31,210)
Shared Department Plant	79,121	3.15%	2,492	2.98%	2,354	(138)	2.98%	2,354	(138)	0
Total Other Production	**2,962,607,463**	**2.96%**	**87,706,571**	**3.08%**	**91,254,982**	**3,548,411**	**2.99%**	**88,718,045**	**1,011,474**	**(2,536,937)**

Duke Energy Carolinas
Table 2: Summary of Depreciation Rates and Annual Accrual Amounts
As of December 31, 2018

		Current Approved		DEC Proposed			Public Staff Proposed			
Plant	12/31/18 Investment	Accrual Rate	Accrual Amount	Accrual Rate	Accrual Amount	Difference from Current	Accrual Rate	Accrual Amount	Difference from Current	Difference from Company
A	B	C	D	E	F	G	H	I	J	K
Solar										
General	29,305,784	5.42%	1,587,556	5.78%	1,692,676	105,120	5.78%	1,692,676	105,120	0
Mocksville	31,773,280	4.98%	1,583,450	5.14%	1,633,157	49,707	5.08%	1,614,946	31,496	(18,211)
Monroe	116,568,189	5.06%	5,898,350	5.13%	5,983,186	84,836	5.04%	5,869,538	(28,812)	(113,648)
Woodleaf	13,132,818	5.06%	664,520	4.98%	653,612	(10,908)	4.93%	647,474	(17,046)	(6,138)
Total Solar	**190,780,071**	**5.10%**	**9,733,876**	**5.22%**	**9,962,631**	**228,755**	**5.15%**	**9,824,635**	**90,759**	**(137,996)**

Duke Energy Carolinas
Table 3: Summary of Depreciation Rates and Annual Accrual Amounts
As of December 31, 2018

			Current Approved		DEC Proposed			Public Staff Proposed			
Account	Description	12/31/18 Investment	Accrual Rate	Accrual Amount	Accrual Rate	Accrual Amount	Difference from Current	Accrual Rate	Accrual Amount	Difference from Current	Difference from Company
	A	B	C	D	E	F	G	H	I	J	K
	Steam Production Plant										
311.00	Structures and Improvements										
	Marshall	177,753,235	3.14%	5,581,452	5.54%	9,855,840	4,274,388	5.53%	9,829,754	4,248,302	(26,086)
	Belews Creek	350,179,474	3.07%	10,750,510	3.89%	13,615,052	2,864,542	3.84%	13,446,892	2,696,382	(168,160)
	Lee	34,317,919	3.19%	1,094,742	7.10%	2,435,020	1,340,278	7.02%	2,409,118	1,314,376	(25,902)
	Cliffside 5 (J.E. Rogers)	62,362,310	3.53%	2,201,390	5.76%	3,595,031	1,393,641	3.22%	2,008,066	(193,324)	(1,586,965)
	Cliffside 6 (J.E. Rogers)	156,228,546	2.95%	4,608,742	3.08%	4,815,136	206,394	3.08%	4,811,839	203,097	(3,297)
	Cliffside 5 and 6 Common (J.E. Rogers)	90,585,364	3.11%	2,817,205	3.48%	3,147,951	330,746	3.44%	3,116,137	298,932	(31,814)
	Allen	152,962,346	4.73%	7,235,119	11.65%	17,822,672	10,587,553	8.52%	13,032,392	5,797,273	(4,790,280)
	Shared Department Plant	28,964,788	2.76%	799,428	3.79%	1,097,083	297,655	3.79%	1,097,083	297,655	0
	Total Structures and Improvements	*1,053,353,981*	*3.33%*	*35,088,588*	*5.35%*	*56,383,785*	*21,295,197*	*4.72%*	*49,751,281*	*14,662,693*	*(6,632,504)*
311.01	Structures and Improvements - Capital Lease										
	Cliffside 5 and 6 Common (J.E. Rogers)	51,965,134	3.11%	1,616,116	5.04%	2,620,531	1,004,415	5.04%	2,620,531	1,004,415	0
	Total Structures and Improvements - Capital Lease	*51,965,134*	*3.11%*	*1,616,116*	*5.04%*	*2,620,531*	*1,004,415*	*5.04%*	*2,620,531*	*1,004,415*	*0*
312.00	Boiler Plant Equipment										
	Marshall	1,223,859,776	3.28%	40,142,601	4.01%	49,050,706	8,908,105	4.01%	49,076,777	8,934,176	26,071
	Belews Creek	1,519,843,407	2.95%	44,835,380	3.68%	55,938,868	11,103,488	3.62%	55,018,331	10,182,951	(920,537)
	Lee	46,799,187	3.76%	1,759,649	4.66%	2,181,759	422,110	4.58%	2,143,403	383,754	(38,356)
	Cliffside 5 (J.E. Rogers)	587,455,504	3.65%	21,442,126	5.62%	33,024,570	11,582,444	3.19%	18,739,831	(2,702,295)	(14,284,739)
	Cliffside 6 (J.E. Rogers)	1,277,388,376	2.99%	38,193,912	3.13%	40,029,348	1,835,436	3.14%	40,109,995	1,916,083	80,647
	Cliffside 5 and 6 Common (J.E. Rogers)	13,321,805	2.89%	385,000	3.09%	411,937	26,937	3.05%	406,315	21,315	(5,622)
	Allen	861,043,480	3.71%	31,944,713	4.92%	42,365,801	10,421,088	3.66%	31,514,191	(430,522)	(10,851,610)
	Shared Department Plant	1,215,220	3.25%	39,495	3.38%	41,031	1,536	3.38%	41,031	1,536	0
	Total Boiler Plant Equipment	*5,530,926,754*	*3.23%*	*178,742,876*	*4.03%*	*223,044,020*	*44,301,144*	*3.56%*	*197,049,874*	*18,306,998*	*(25,994,146)*
314.00	Turbogenerator Units										
	Marshall	233,926,272	4.30%	10,058,830	5.43%	12,700,737	2,641,907	5.43%	12,702,197	2,643,367	1,460
	Belews Creek	239,196,294	3.95%	9,448,254	4.61%	11,018,677	1,570,423	4.55%	10,883,431	1,435,177	(135,246)
	Lee	8,932,738	3.38%	301,927	5.14%	459,312	157,385	5.02%	448,423	146,496	(10,889)
	Cliffside 5 (J.E. Rogers)	60,191,252	4.29%	2,582,205	7.44%	4,479,143	1,896,938	4.24%	2,552,109	(30,096)	(1,927,034)
	Cliffside 6 (J.E. Rogers)	268,873,564	3.25%	8,738,391	3.35%	9,005,389	266,998	3.35%	9,007,264	268,873	1,875
	Allen	144,305,497	7.67%	11,068,232	12.06%	17,402,128	6,333,896	8.77%	12,655,592	1,587,360	(4,746,536)
	Shared Department Plant	535,483	3.20%	17,135	3.30%	17,661	526	3.30%	17,661	526	0
	Total Turbogenerator Units	*955,961,099*	*4.42%*	*42,214,974*	*5.76%*	*55,083,047*	*12,868,073*	*5.05%*	*48,266,678*	*6,051,704*	*(6,816,369)*

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	A	B	C	D	E	F	G	H	I	J	K
315.00	Accessory Electric Equipment										
	Marshall	75,898,724	3.44%	2,610,916	3.79%	2,875,276	264,360	3.80%	2,884,152	273,236	8,876
	Belews Creek	69,152,297	3.35%	2,316,602	3.67%	2,535,409	218,807	3.60%	2,489,483	172,881	(45,926)
	Lee	16,727,998	3.52%	588,826	4.01%	671,186	82,360	3.92%	655,738	66,912	(15,448)
	Cliffside 5 (J.E. Rogers)	23,486,538	3.45%	810,286	4.68%	1,098,786	288,500	2.68%	629,439	(180,847)	(469,347)
	Cliffside 6 (J.E. Rogers)	153,517,154	3.11%	4,774,384	3.16%	4,850,606	76,222	3.16%	4,851,142	76,758	536
	Cliffside 5 and 6 Common (J.E. Rogers)	134,927	3.11%	4,196	3.41%	4,595	399	3.37%	4,547	351	(48)
	Allen	56,953,056	4.42%	2,517,325	6.03%	3,436,300	918,975	4.46%	2,540,106	22,781	(896,194)
	Total Accessory Electric Equipment	*395,870,694*	*3.44%*	*13,622,535*	*3.91%*	*15,472,158*	*1,849,623*	*3.55%*	*14,054,606*	*432,071*	*(1,417,552)*
316.00	Miscellaneous Power Plant Equipment										
	Marshall	33,209,639	4.56%	1,514,360	4.93%	1,635,596	121,236	4.93%	1,637,235	122,875	1,639
	Belews Creek	28,662,799	4.09%	1,172,308	4.69%	1,343,339	171,031	4.62%	1,324,221	151,913	(19,118)
	Lee	6,307,291	5.39%	339,963	6.00%	378,638	38,675	5.93%	374,022	34,059	(4,616)
	Cliffside 5 (J.E. Rogers)	12,691,831	4.87%	618,092	7.81%	990,698	372,606	4.42%	560,979	(57,113)	(429,719)
	Cliffside 6 (J.E. Rogers)	247,457,858	3.20%	7,918,651	3.32%	8,213,951	295,300	3.32%	8,215,601	296,950	1,650
	Cliffside 5 and 6 Common (J.E. Rogers)	6,568,205	3.38%	222,005	3.54%	232,455	10,450	3.51%	230,544	8,539	(1,911)
	Allen	21,448,804	6.85%	1,469,243	10.36%	2,222,491	753,248	7.61%	1,632,254	163,011	(590,237)
	Shared Department Plant	8,513,140	3.33%	283,488	3.56%	302,842	19,354	3.56%	302,842	19,354	0
	Total Miscellaneous Power Plant Equipment	*364,859,567*	*3.71%*	*13,538,110*	*4.20%*	*15,320,010*	*1,781,900*	*3.91%*	*14,277,699*	*739,589*	*(1,042,311)*
	Total Steam Production Plant	**8,352,937,230**	**3.41%**	**284,823,199**	**4.40%**	**367,923,551**	**83,100,352**	**3.90%**	**326,020,669**	**41,197,470**	**(41,902,882)**
	Nuclear Production Plant										
321.00	Structures and Improvements										
	Oconee	962,552,204	4.01%	38,598,343	4.19%	40,290,834	1,692,491	4.19%	40,290,834	1,692,491	0
	McGuire	688,865,400	2.47%	17,014,975	2.55%	17,590,981	576,006	2.55%	17,590,981	576,006	0
	Catawba	244,337,032	2.40%	5,864,089	2.49%	6,084,205	220,116	2.49%	6,084,205	220,116	0
	Total Structures and Improvements	*1,895,754,636*	*3.24%*	*61,477,407*	*3.37%*	*63,966,020*	*2,488,613*	*3.37%*	*63,966,020*	*2,488,613*	*0*
322.00	Reactor Plant Equipment										
	Oconee	1,936,377,070	4.08%	79,004,184	4.33%	83,818,041	4,813,857	4.33%	83,818,041	4,813,857	0
	McGuire	1,541,431,173	2.49%	38,381,636	2.74%	42,260,970	3,879,334	2.74%	42,260,970	3,879,334	0
	Catawba	366,655,392	2.40%	8,799,729	2.60%	9,515,997	716,268	2.60%	9,515,997	716,268	0
	Total Reactor Plant Equipment	*3,844,463,636*	*3.28%*	*126,185,549*	*3.53%*	*135,595,008*	*9,409,459*	*3.53%*	*135,595,008*	*9,409,459*	*0*
323.00	Turbogenerator Units										

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	Oconee	323,043,817	3.81%	12,307,969	4.03%	13,007,263	699,294	4.03%	13,007,263	699,294	0
	McGuire	558,023,213	3.27%	18,247,359	3.37%	18,807,118	559,759	3.37%	18,807,118	559,759	0
	Catawba	96,835,608	2.55%	2,469,308	2.78%	2,692,698	223,390	2.78%	2,692,698	223,390	0
	Total Turbogenerator Units	*977,902,638*	*3.38%*	*33,024,636*	*3.53%*	*34,507,079*	*1,482,443*	*3.53%*	*34,507,079*	*1,482,443*	*0*
324.00	Accessory Electric Equipment										
	Oconee	882,699,098	4.64%	40,957,238	4.90%	43,285,982	2,328,744	4.90%	43,285,982	2,328,744	0
	McGuire	255,846,958	2.70%	6,907,868	3.11%	7,958,448	1,050,580	3.11%	7,958,448	1,050,580	0
	Catawba	90,651,299	2.66%	2,411,325	3.01%	2,732,517	321,192	3.01%	2,732,517	321,192	0
	Total Accessory Electric Equipment	*1,229,197,356*	*4.09%*	*50,276,431*	*4.39%*	*53,976,947*	*3,700,516*	*4.39%*	*53,976,947*	*3,700,516*	*0*
325.00	Miscellaneous Power Plant Equipment										
	Oconee	239,273,766	3.52%	8,422,437	3.85%	9,217,217	794,780	3.85%	9,217,217	794,780	0
	McGuire	280,926,816	2.74%	7,697,395	2.92%	8,211,233	513,838	2.92%	8,211,233	513,838	0
	Catawba	49,529,213	2.62%	1,297,665	2.76%	1,368,393	70,728	2.76%	1,368,393	70,728	0
	Shared Department Plant	1,446,303	3.66%	52,935	3.11%	45,019	(7,916)	3.11%	45,019	(7,916)	0
	Total Miscellaneous Power Plant Equipment	*571,176,098*	*3.06%*	*17,470,432*	*3.30%*	*18,841,862*	*1,371,430*	*3.30%*	*18,841,862*	*1,371,430*	*0*
	Total Nuclear Production Plant	**8,518,494,363**	**3.39%**	**288,434,455**	**3.60%**	**306,886,916**	**18,452,461**	**3.60%**	**306,886,916**	**18,452,461**	**0**
	Hydarulic Production Plant										
331.00	Structures and Improvements										
	Cowans Ford	16,442,484	1.77%	291,032	1.85%	303,767	12,735	1.85%	304,186	13,154	419
	Bad Creek	228,124,721	1.55%	3,535,933	1.61%	3,683,512	147,579	1.62%	3,695,620	159,687	12,108
	Jocassee	28,418,569	1.62%	460,381	2.21%	626,982	166,601	2.17%	616,683	156,302	(10,299)
	Keowee	13,536,904	2.72%	368,204	3.16%	428,071	59,867	3.17%	429,120	60,916	1,049
	Fishing Creek	4,376,021	2.16%	94,522	2.21%	96,591	2,069	2.18%	95,397	875	(1,194)
	Cedar Creek	3,989,687	2.16%	86,177	2.30%	91,628	5,451	2.24%	89,369	3,192	(2,259)
	Bridgewater	65,238,752	2.34%	1,526,587	2.36%	1,538,980	12,393	2.33%	1,520,063	(6,524)	(18,917)
	Gaston Shoals	1,666,255	3.92%	65,317	4.69%	78,119	12,802	4.58%	76,314	10,997	(1,805)
	Lookout Shoals	2,520,600	2.07%	52,176	2.16%	54,430	2,254	2.10%	52,933	757	(1,497)
	Mountain Island	3,374,178	2.37%	79,968	2.71%	91,559	11,591	2.66%	89,753	9,785	(1,806)
	99 Islands	1,507,510	2.75%	41,457	4.42%	66,569	25,112	4.30%	64,823	23,366	(1,746)
	Oxford	4,113,826	1.93%	79,397	1.96%	80,590	1,193	1.93%	79,397	(0)	(1,193)
	Rhodhiss	4,003,189	2.10%	84,067	2.17%	86,747	2,680	2.13%	85,268	1,201	(1,479)
	Tuxedo	1,023,476	3.95%	40,427	4.16%	42,587	2,160	4.08%	41,758	1,331	(829)
	Wateree	9,060,996	2.00%	181,220	2.07%	187,820	6,600	2.04%	184,844	3,624	(2,976)

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	A	B	C	D	E	F	G	H	I	J	K
	Wylie	6,639,141	2.03%	134,775	2.09%	138,786	4,011	2.06%	136,766	1,991	(2,020)
	Great Falls	471,321	1.85%	8,719	2.40%	11,316	2,597	2.16%	10,181	1,462	(1,135)
	Dearborn	2,137,143	2.00%	42,743	2.10%	44,924	2,181	2.04%	43,598	855	(1,326)
	NPL Bear Creek	1,003,826	4.72%	47,381	4.10%	41,185	(6,196)	4.06%	40,755	(6,626)	(430)
	NPL Bryson	18,925	0.90%	170	1.19%	225	55	1.07%	202	32	(23)
	NPL Cedar Cliff	1,549,512	4.36%	67,559	4.51%	69,922	2,363	4.42%	68,488	929	(1,434)
	NPL Franklin	942,130	4.36%	41,077	4.46%	41,989	912	4.42%	41,642	565	(347)
	NPL Mission	326,066	4.06%	13,238	4.19%	13,663	425	4.06%	13,238	0	(425)
	NPL Nantahala	2,173,944	3.26%	70,871	3.55%	77,107	6,236	3.54%	76,958	6,087	(149)
	NPL Queens Creek	112,213	8.03%	9,011	8.30%	9,309	298	7.80%	8,753	(258)	(556)
	NPL Tennessee Creek	355,878	2.84%	10,107	3.28%	11,677	1,570	3.19%	11,353	1,246	(324)
	NPL Thorpe	3,070,673	3.43%	105,324	3.58%	109,906	4,582	3.54%	108,702	3,378	(1,204)
	NPL Tuckasegee	2,374,067	4.57%	108,495	4.65%	110,279	1,784	4.50%	106,833	(1,662)	(3,446)
	Shared Department Plant	27,831	3.24%	902	3.41%	949	47	3.41%	949	47	0
	Total Structures and Improvements	*408,599,840*	*1.87%*	*7,647,237*	*1.99%*	*8,139,189*	*491,952*	*1.98%*	*8,093,946*	*446,709*	*(45,243)*
332.00	Reservoirs, Dams, and Waterways										
	Cowans Ford	36,637,451	1.54%	564,217	1.82%	666,876	102,659	1.82%	666,802	102,585	(74)
	Bad Creek	455,304,760	1.33%	6,055,553	1.34%	6,114,618	59,065	1.34%	6,101,084	45,531	(13,534)
	Jocassee	52,373,977	0.84%	439,941	1.04%	543,604	103,663	1.00%	523,740	83,799	(19,864)
	Keowee	17,440,014	0.84%	146,496	0.88%	152,815	6,319	0.88%	153,472	6,976	657
	Fishing Creek	15,283,129	1.81%	276,625	1.83%	279,944	3,319	1.80%	275,096	(1,529)	(4,848)
	Cedar Creek	12,029,057	2.11%	253,813	2.19%	263,545	9,732	2.13%	256,219	2,406	(7,326)
	Bridgewater	105,399,463	2.05%	2,160,689	2.04%	2,151,270	(9,419)	2.01%	2,118,529	(42,160)	(32,741)
	Gaston Shoals	6,356,557	2.44%	155,100	2.69%	171,060	15,960	2.57%	163,364	8,264	(7,696)
	Lookout Shoals	5,618,091	1.44%	80,901	1.55%	87,322	6,421	1.50%	84,271	3,370	(3,051)
	Mountain Island	5,531,690	1.09%	60,295	1.17%	64,681	4,386	1.11%	61,402	1,107	(3,279)
	99 Islands	11,666,336	2.70%	314,991	2.68%	312,929	(2,062)	2.56%	298,658	(16,333)	(14,271)
	Oxford	30,626,357	1.78%	545,149	2.20%	674,961	129,812	2.18%	667,655	122,506	(7,306)
	Rhodhiss	7,546,537	1.64%	123,763	1.68%	127,019	3,256	1.65%	124,518	755	(2,501)
	Tuxedo	6,431,758	1.86%	119,631	1.90%	122,244	2,613	1.81%	116,415	(3,216)	(5,829)
	Wateree	14,861,723	1.46%	216,981	1.61%	239,430	22,449	1.58%	234,815	17,834	(4,615)
	Wylie	21,518,089	1.67%	359,352	2.11%	454,470	95,118	2.08%	447,576	88,224	(6,894)
	Great Falls	2,869,197	1.74%	49,924	1.83%	52,428	2,504	1.60%	45,907	(4,017)	(6,521)
	Dearborn	1,506,206	1.51%	22,744	1.59%	23,920	1,176	1.53%	23,045	301	(875)
	NPL Bear Creek	3,719,273	0.61%	22,688	2.05%	76,398	53,710	2.01%	74,757	52,069	(1,641)
	NPL Bryson	2,838,508	4.67%	132,558	4.66%	132,198	(360)	4.56%	129,436	(3,122)	(2,762)
	NPL Cedar Cliff	2,112,155	1.12%	23,656	1.18%	24,934	1,278	1.09%	23,022	(634)	(1,912)

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	NPL Franklin	5,460,622	4.44%	242,452	4.51%	246,171	3,719	4.46%	243,544	1,092	(2,627)
	NPL Mission	1,811,702	2.96%	53,626	3.00%	54,275	649	2.86%	51,815	(1,811)	(2,460)
	NPL Nantahala	13,526,218	0.73%	98,741	1.54%	207,945	109,204	1.54%	208,304	109,563	359
	NPL Queens Creek	763,264	4.69%	35,797	4.65%	35,504	(293)	4.13%	31,523	(4,274)	(3,981)
	NPL Tennessee Creek	4,890,494	1.37%	67,000	1.43%	69,736	2,736	1.33%	65,044	(1,956)	(4,692)
	NPL Thorpe	4,897,153	0.03%	1,469	0.13%	6,422	4,953	0.08%	3,918	2,449	(2,504)
	NPL Tuckasegee	637,985	0.25%	1,595	0.35%	2,234	639	0.20%	1,276	(319)	(958)
	Shared Department Plant	324,568	2.17%	7,043	2.25%	7,308	265	2.25%	7,308	265	0
	Total Reservoirs, Dams, and Waterways	*849,982,333*	*1.49%*	*12,632,790*	*1.57%*	*13,366,261*	*733,471*	*1.55%*	*13,202,513*	*569,723*	*(163,748)*
333.00	Water Wheels, Turbines, and Generators										
	Cowans Ford	49,672,299	2.11%	1,048,086	2.58%	1,280,469	232,383	2.57%	1,276,578	228,492	(3,891)
	Bad Creek	238,780,281	1.66%	3,963,753	1.82%	4,344,051	380,298	1.82%	4,345,801	382,048	1,750
	Jocassee	71,154,555	2.38%	1,693,478	2.53%	1,803,138	109,660	2.50%	1,778,864	85,386	(24,274)
	Keowee	72,561,595	2.89%	2,097,030	2.96%	2,149,824	52,794	2.97%	2,155,079	58,049	5,255
	Fishing Creek	22,386,920	2.10%	470,125	2.24%	502,060	31,935	2.21%	494,751	24,626	(7,309)
	Cedar Creek	12,254,188	2.14%	262,240	2.23%	272,968	10,728	2.16%	264,690	2,450	(8,278)
	Bridgewater	20,780,064	2.44%	507,034	2.47%	514,146	7,112	2.44%	507,034	(0)	(7,112)
	Gaston Shoals	10,102,537	4.81%	485,932	4.93%	497,619	11,687	4.80%	484,922	(1,010)	(12,697)
	Lookout Shoals	10,624,869	2.33%	247,559	2.44%	259,677	12,118	2.38%	252,872	5,313	(6,805)
	Mountain Island	16,270,738	2.43%	395,379	2.55%	414,277	18,898	2.48%	403,514	8,135	(10,763)
	99 Islands	10,666,437	3.73%	397,858	3.84%	409,679	11,821	3.71%	395,725	(2,133)	(13,954)
	Oxford	18,546,865	2.28%	422,869	2.48%	459,157	36,288	2.44%	452,544	29,675	(6,613)
	Rhodhiss	16,360,555	2.57%	420,466	2.67%	436,568	16,102	2.64%	431,919	11,453	(4,649)
	Tuxedo	1,996,061	3.74%	74,653	3.86%	77,014	2,361	3.76%	75,052	399	(1,962)
	Wateree	23,654,144	2.07%	489,641	2.29%	542,327	52,686	2.26%	534,584	44,943	(7,743)
	Wylie	17,445,697	2.02%	352,403	2.12%	369,410	17,007	2.08%	362,871	10,468	(6,539)
	Great Falls	5,339,350	3.14%	167,656	3.51%	187,448	19,792	3.24%	172,995	5,339	(14,453)
	Dearborn	11,865,475	2.26%	268,160	2.42%	287,379	19,219	2.36%	280,025	11,865	(7,354)
	NPL Bear Creek	6,450,844	1.46%	94,182	4.58%	295,664	201,482	4.54%	292,868	198,686	(2,796)
	NPL Bryson	3,331,409	4.86%	161,906	4.93%	164,256	2,350	4.84%	161,240	(666)	(3,016)
	NPL Cedar Cliff	3,352,939	4.17%	139,818	4.26%	142,954	3,136	4.18%	140,153	335	(2,801)
	NPL Franklin	1,340,571	3.94%	52,818	4.08%	54,632	1,814	4.03%	54,025	1,207	(607)
	NPL Mission	5,814,650	4.82%	280,266	4.97%	289,113	8,847	4.83%	280,848	582	(8,265)
	NPL Nantahala	3,866,009	2.68%	103,609	2.78%	107,499	3,890	2.79%	107,862	4,253	363
	NPL Queens Creek	38,141	1.03%	393	1.69%	644	251	1.06%	404	11	(240)
	NPL Tennessee Creek	2,167,433	3.96%	85,830	4.06%	88,079	2,249	3.97%	86,047	217	(2,032)
	NPL Thorpe	819,570	2.56%	20,981	2.72%	22,301	1,320	2.68%	21,964	983	(337)

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	A	B	C	D	E	F	G	H	I	J	K
	NPL Tuckasegee	250,437	1.14%	2,855	3.47%	8,685	5,830	3.32%	8,314	5,459	(371)
	Shared Department Plant	837	3.59%	30	3.59%	30	0	3.59%	30	0	0
	Total Water Wheels, Turbines, and Generators	*657,895,468*	*2.24%*	*14,707,010*	*2.43%*	*15,981,068*	*1,274,058*	*2.41%*	*15,823,574*	*1,116,564*	*(157,494)*
334.00	Accessory Electric Equipment										
	Cowans Ford	7,019,818	2.43%	170,582	2.62%	183,897	13,315	2.62%	183,919	13,337	22
	Bad Creek	51,305,557	1.91%	979,936	2.05%	1,049,938	70,002	2.05%	1,051,764	71,828	1,826
	Jocassee	13,791,024	2.13%	293,749	2.77%	382,344	88,595	2.74%	377,874	84,125	(4,470)
	Keowee	21,431,167	2.49%	533,636	2.79%	597,688	64,052	2.79%	597,930	64,294	242
	Fishing Creek	4,825,713	2.34%	112,922	2.51%	121,004	8,082	2.48%	119,678	6,756	(1,326)
	Cedar Creek	3,549,165	2.46%	87,309	2.55%	90,433	3,124	2.49%	88,374	1,065	(2,059)
	Bridgewater	7,383,450	2.52%	186,063	2.57%	189,621	3,558	2.54%	187,540	1,477	(2,081)
	Gaston Shoals	2,109,581	3.22%	67,929	3.60%	75,856	7,927	3.48%	73,413	5,484	(2,443)
	Lookout Shoals	2,113,118	2.40%	50,715	2.58%	54,420	3,705	2.51%	53,039	2,324	(1,381)
	Mountain Island	2,678,560	2.63%	70,446	2.78%	74,452	4,006	2.71%	72,589	2,143	(1,863)
	99 Islands	640,203	4.00%	25,608	4.68%	29,977	4,369	4.57%	29,257	3,649	(720)
	Oxford	3,769,798	2.14%	80,674	2.35%	88,504	7,830	2.32%	87,459	6,785	(1,045)
	Rhodhiss	2,251,110	2.32%	52,226	2.49%	56,071	3,845	2.46%	55,377	3,151	(694)
	Tuxedo	907,396	3.69%	33,483	3.74%	33,923	440	3.65%	33,120	(363)	(803)
	Wateree	5,385,950	2.31%	124,415	2.64%	142,234	17,819	2.61%	140,573	16,158	(1,661)
	Wylie	3,929,751	2.39%	93,921	2.50%	98,229	4,308	2.47%	97,065	3,144	(1,164)
	Great Falls	853,483	3.42%	29,189	4.23%	36,092	6,903	3.92%	33,457	4,268	(2,635)
	Dearborn	3,821,458	2.47%	94,390	2.66%	101,578	7,188	2.59%	98,976	4,586	(2,602)
	NPL Bear Creek	122,275	2.89%	3,534	2.78%	3,402	(132)	2.73%	3,338	(196)	(64)
	NPL Bryson	14,608	3.13%	457	3.51%	513	56	3.42%	500	43	(13)
	NPL Cedar Cliff	108,549	3.04%	3,300	3.37%	3,657	357	3.27%	3,550	250	(107)
	NPL Franklin	119,785	3.69%	4,420	3.94%	4,720	300	3.88%	4,648	228	(72)
	NPL Mission	50,985	3.06%	1,560	3.48%	1,772	212	3.32%	1,693	133	(79)
	NPL Nantahala	2,140,284	2.99%	63,994	3.51%	75,162	11,168	3.52%	75,338	11,344	176
	NPL Queens Creek	183,285	5.02%	9,201	5.94%	10,888	1,687	5.38%	9,861	660	(1,027)
	NPL Tennessee Creek	194,806	2.86%	5,571	3.19%	6,209	638	3.09%	6,020	449	(189)
	NPL Thorpe	2,132,647	2.93%	62,487	3.43%	73,138	10,651	3.39%	72,297	9,810	(841)
	NPL Tuckasegee	243,404	3.10%	7,546	3.44%	8,370	824	3.29%	8,008	462	(362)
	Total Accessory Electric Equipment	*143,076,932*	*2.27%*	*3,249,263*	*2.51%*	*3,594,092*	*344,829*	*2.49%*	*3,566,655*	*317,392*	*(27,437)*
335.00	Miscellaneous Power Plant Equipment										
	Cowans Ford	1,741,315	2.56%	44,578	2.64%	45,902	1,324	2.64%	45,971	1,393	69
	Bad Creek	28,870,301	2.09%	603,389	2.13%	616,113	12,724	2.13%	614,937	11,548	(1,176)

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	A	B	C	D	E	F	G	H	I	J	K
	Jocassee	3,900,448	2.63%	102,582	2.87%	111,824	9,242	2.82%	109,993	7,411	(1,831)
	Keowee	856,794	2.23%	19,106	2.26%	19,367	261	2.26%	19,364	258	(3)
	Fishing Creek	335,392	2.67%	8,955	2.77%	9,278	323	2.73%	9,156	201	(122)
	Cedar Creek	515,883	2.83%	14,599	2.96%	15,279	680	2.90%	14,961	362	(318)
	Bridgewater	7,374,528	2.60%	191,738	2.61%	192,332	594	2.58%	190,263	(1,475)	(2,069)
	Gaston Shoals	287,153	4.60%	13,209	4.97%	14,272	1,063	4.85%	13,927	718	(345)
	Lookout Shoals	450,161	2.64%	11,884	2.84%	12,767	883	2.77%	12,469	585	(298)
	Mountain Island	527,620	2.79%	14,721	2.90%	15,314	593	2.84%	14,984	263	(330)
	99 Islands	378,539	3.88%	14,687	4.30%	16,280	1,593	4.18%	15,823	1,136	(457)
	Oxford	627,510	2.48%	15,562	2.60%	16,305	743	2.57%	16,127	565	(178)
	Rhodhiss	497,691	2.59%	12,890	2.65%	13,178	288	2.62%	13,040	150	(138)
	Tuxedo	220,355	3.30%	7,272	3.54%	7,810	538	3.45%	7,602	330	(208)
	Wateree	494,968	2.57%	12,721	2.78%	13,741	1,020	2.74%	13,562	841	(179)
	Wylie	639,506	2.63%	16,819	2.83%	18,129	1,310	2.80%	17,906	1,087	(223)
	Great Falls	259,887	4.33%	11,253	4.93%	12,819	1,566	4.69%	12,189	936	(630)
	Dearborn	250,695	2.56%	6,418	2.75%	6,905	487	2.68%	6,719	301	(186)
	NPL Bear Creek	165,739	3.80%	6,298	4.02%	6,662	364	3.97%	6,580	282	(82)
	NPL Bryson	106,209	4.50%	4,779	4.70%	4,988	209	4.61%	4,896	117	(92)
	NPL Cedar Cliff	124,238	3.59%	4,460	4.51%	5,597	1,137	4.41%	5,479	1,019	(118)
	NPL Franklin	110,420	3.93%	4,339	4.03%	4,448	109	3.98%	4,395	56	(53)
	NPL Mission	66,513	4.72%	3,139	5.10%	3,393	254	4.95%	3,292	153	(101)
	NPL Nantahala	1,239,717	3.51%	43,514	3.91%	48,432	4,918	3.90%	48,349	4,835	(83)
	NPL Queens Creek	201,667	5.93%	11,959	6.18%	12,457	498	5.63%	11,354	(605)	(1,103)
	NPL Tennessee Creek	224,997	3.77%	8,482	4.28%	9,619	1,137	4.17%	9,382	900	(237)
	NPL Thorpe	1,479,207	4.10%	60,647	4.92%	72,779	12,132	4.87%	72,037	11,390	(742)
	NPL Tuckasegee	98,009	3.96%	3,881	4.94%	4,843	962	4.81%	4,714	833	(129)
	Shared Department Plant	792,882	2.95%	23,390	2.96%	23,481	91	2.96%	23,481	91	0
	Total Miscellaneous Power Plant Equipment	*52,838,344*	*2.46%*	*1,297,271*	*2.56%*	*1,354,314*	*57,043*	*2.54%*	*1,342,952*	*45,681*	*(11,362)*
336.00	Roads, Railroads, and Bridges										
	Cowans Ford	2,240,416	2.30%	51,530	2.27%	50,779	(751)	2.27%	50,857	(673)	78
	Bad Creek	17,869,699	1.52%	271,619	1.53%	273,881	2,262	1.53%	273,406	1,787	(475)
	Jocassee	415,508	1.20%	4,986	1.25%	5,192	206	1.21%	5,028	42	(164)
	Dearborn	633,636	1.71%	10,835	1.78%	11,261	426	1.72%	10,899	64	(362)
	NPL Bear Creek	52,776	0.96%	507	0.90%	477	(30)	0.84%	443	(64)	(34)
	NPL Cedar Cliff	129,738	2.00%	2,595	2.07%	2,688	93	1.97%	2,556	(39)	(132)
	NPL Nantahala	239,971	1.45%	3,480	1.49%	3,577	97	1.49%	3,576	96	(1)
	NPL Queens Creek	2,830	0.74%	21	0.88%	25	4	0.19%	5	(16)	(20)

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	A	B	C	D	E	F	G	H	I	J	K
	NPL Tennessee Creek	72,590	0.90%	653	1.00%	725	72	0.87%	632	(21)	(93)
	NPL Thorpe	46,024	1.16%	534	1.25%	576	42	1.20%	552	18	(24)
	NPL Tuckasegee	8,678	0.82%	71	0.94%	82	11	0.72%	62	(9)	(20)
	Shared Department Plant	84,399	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Total Roads, Railroads, and Bridges	*21,796,265*	*1.59%*	*346,831*	*1.60%*	*349,263*	*2,432*	*1.60%*	*348,016*	*1,185*	*(1,247)*
	Total Hydarulic Production Plant	**2,134,189,181**	**1.87%**	**39,880,402**	**2.00%**	**42,784,187**	**2,903,785**	**1.99%**	**42,377,657**	**2,497,255**	**(406,530)**
	Other Production Plant										
341.00	Structures and Improvements										
	Lincoln	28,616,966	3.11%	889,988	3.32%	950,643	60,655	3.19%	912,881	22,893	(37,762)
	Dan River CC	145,096,631	2.79%	4,048,196	2.87%	4,167,976	119,780	2.81%	4,077,215	29,019	(90,761)
	Lee	493,308	3.06%	15,095	3.62%	17,881	2,786	3.52%	17,364	2,269	(517)
	Mill Creek	29,782,579	2.83%	842,847	2.97%	883,635	40,788	2.88%	857,738	14,891	(25,897)
	Rockingham	3,365,506	3.90%	131,255	4.19%	141,177	9,922	4.10%	137,986	6,731	(3,191)
	Buck CC	147,848,826	2.80%	4,139,767	2.90%	4,291,904	152,137	2.84%	4,198,907	59,140	(92,997)
	Lee CC	12,554,329	2.75%	345,244	2.84%	356,441	11,197	2.75%	345,244	0	(11,197)
	Total Structures and Improvements	*367,758,145*	*2.83%*	*10,412,392*	*2.94%*	*10,809,657*	*397,265*	*2.87%*	*10,547,336*	*134,944*	*(262,321)*
341.66	Structures and Improvements - Solar										
	Mocksville	101,358	4.98%	5,048	4.90%	4,962	(86)	4.86%	4,926	(122)	(36)
	Woodleaf	154,629	5.06%	7,824	4.54%	7,016	(808)	4.49%	6,943	(881)	(73)
	Total Structures and Improvements - Solar	*255,987*	*5.03%*	*12,872*	*4.68%*	*11,978*	*(894)*	*4.64%*	*11,869*	*(1,003)*	*(109)*
342.00	Fuel Holders, Producers, and Accessories										
	Lincoln	12,584,656	1.44%	181,219	1.60%	201,367	20,148	1.47%	184,994	3,775	(16,373)
	Dan River CC	20,414,344	2.65%	540,980	2.69%	549,502	8,522	2.63%	536,897	(4,083)	(12,605)
	Mill Creek	15,066,355	2.12%	319,407	2.25%	338,691	19,284	2.16%	325,433	6,026	(13,258)
	Rockingham	55,564	3.11%	1,728	3.51%	1,952	224	3.42%	1,900	172	(52)
	Buck CC	30,592,902	2.63%	804,593	2.67%	817,004	12,411	2.60%	795,415	(9,178)	(21,589)
	Lee CC	21,061,946	2.79%	587,628	2.88%	607,305	19,677	2.80%	589,734	2,106	(17,571)
	Total Fuel Holders, Producers, and Accessories	*99,775,768*	*2.44%*	*2,435,555*	*2.52%*	*2,515,821*	*80,266*	*2.44%*	*2,434,375*	*(1,180)*	*(81,446)*
342.02	Fuel Holders, Producers, and Accessories - Capital Lease										
	Dan River CC (Pipeline)	7,908,780	2.51%	198,510	3.61%	285,580	87,070	3.61%	285,580	87,070	0
	Dan River CC (Pipeline Heaters)	1,879,537	2.51%	47,176	5.23%	98,240	51,064	5.23%	98,240	51,064	0
	Buck CC	31,886,250	2.46%	784,402	5.90%	1,880,361	1,095,959	5.90%	1,880,361	1,095,959	0

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	Lee CC	41,450,841	2.71%	1,123,318	5.32%	2,204,568	1,081,250	5.32%	2,204,568	1,081,250	0
	Total Fuel Holders, Producers, and Accessories - Ca	*83,125,408*	*2.59%*	*2,153,406*	*5.38%*	*4,468,749*	*2,315,343*	*5.38%*	*4,468,749*	*2,315,343*	*0*
343.00	Prime Movers										
	Lincoln	254,277,560	2.23%	5,670,390	2.56%	6,518,306	847,916	2.42%	6,153,517	483,127	(364,789)
	Dan River CC	151,071,822	2.87%	4,335,761	2.93%	4,419,666	83,905	2.86%	4,320,654	(15,107)	(99,012)
	Lee	59,449,299	2.75%	1,634,856	2.92%	1,735,749	100,893	2.80%	1,664,580	29,724	(71,169)
	Mill Creek	184,168,769	2.46%	4,530,552	2.64%	4,859,803	329,251	2.54%	4,677,887	147,335	(181,916)
	Rockingham	78,932,481	3.74%	2,952,075	4.01%	3,165,494	213,419	3.91%	3,086,260	134,185	(79,234)
	Buck CC	136,707,128	2.87%	3,923,495	2.92%	3,994,305	70,810	2.85%	3,896,153	(27,342)	(98,152)
	Lee CC	401,856,604	3.03%	12,176,255	3.11%	12,480,195	303,940	3.02%	12,136,069	(40,186)	(344,126)
	Total Prime Movers	*1,266,463,663*	*2.78%*	*35,223,384*	*2.94%*	*37,173,518*	*1,950,134*	*2.84%*	*35,935,121*	*711,737*	*(1,238,397)*
343.10	Prime Movers - Rotable Parts										
	Dan River CC	36,034,350	10.39%	3,743,969	9.13%	3,289,649	(454,320)	9.13%	3,289,649	(454,320)	0
	Buck CC	33,675,526	8.23%	2,771,496	3.78%	1,274,361	(1,497,135)	3.78%	1,274,361	(1,497,135)	0
	Total Prime Movers - Rotable Parts	*69,709,876*	*9.35%*	*6,515,465*	*6.55%*	*4,564,010*	*(1,951,455)*	*6.55%*	*4,564,010*	*(1,951,455)*	*0*
344.00	Generators										
	Lincoln	78,931,769	2.53%	1,996,974	2.77%	2,182,699	185,725	2.64%	2,083,799	86,825	(98,900)
	Dan River CC	238,322,730	2.81%	6,696,869	2.87%	6,838,721	141,852	2.80%	6,673,036	(23,833)	(165,685)
	Mill Creek	1,328,564	3.52%	46,765	3.98%	52,840	6,075	3.89%	51,681	4,916	(1,159)
	Equitable Diesel Generators	17,732,022	6.23%	1,104,705	7.13%	1,263,586	158,881	6.95%	1,232,376	127,671	(31,210)
	Rockingham	217,352,905	2.61%	5,672,911	2.75%	5,970,642	297,731	2.64%	5,738,117	65,206	(232,525)
	Buck CC	231,708,718	2.80%	6,487,844	2.87%	6,645,643	157,799	2.80%	6,487,844	0	(157,799)
	Lee CC	47,069,175	2.85%	1,341,471	2.96%	1,390,971	49,500	2.87%	1,350,885	9,414	(40,086)
	Total Generators	*832,445,882*	*2.80%*	*23,347,539*	*2.92%*	*24,345,102*	*997,563*	*2.84%*	*23,617,738*	*270,199*	*(727,364)*
344.66	Generators - Solar										
	General	28,316,889	5.40%	1,529,112	5.81%	1,646,019	116,907	5.81%	1,646,019	116,907	0
	Mocksville	29,390,361	4.98%	1,463,640	5.16%	1,515,704	52,064	5.10%	1,498,908	35,268	(16,796)
	Monroe	112,338,379	5.06%	5,684,322	5.14%	5,771,404	87,082	5.04%	5,661,854	(22,468)	(109,550)
	Woodleaf	11,967,613	5.06%	605,561	4.99%	596,812	(8,749)	4.94%	591,200	(14,361)	(5,612)
	Total Generators - Solar	*182,013,241*	*5.10%*	*9,282,635*	*5.24%*	*9,529,939*	*247,304*	*5.16%*	*9,397,982*	*115,347*	*(131,957)*
345.00	Accessory Electric Equipment										
	Lincoln	26,598,378	2.61%	694,218	2.07%	549,288	(144,930)	1.93%	513,349	(180,869)	(35,939)
	Dan River CC	47,241,929	3.21%	1,516,466	3.03%	1,430,080	(86,386)	2.95%	1,393,637	(122,829)	(36,443)

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			Current Approved		DEC Proposed			Public Staff Proposed			
Account	Description	12/31/18 Investment	Accrual Rate	Accrual Amount	Accrual Rate	Accrual Amount	Difference from Current	Accrual Rate	Accrual Amount	Difference from Current	Difference from Company
	A	B	C	D	E	F	G	H	I	J	K
	Lee	723,831	3.68%	26,637	3.92%	28,373	1,736	3.80%	27,506	869	(867)
	Mill Creek	16,890,166	2.89%	488,126	2.68%	451,830	(36,296)	2.58%	435,766	(52,360)	(16,064)
	Rockingham	2,169,822	3.49%	75,727	3.76%	81,616	5,889	3.66%	79,415	3,688	(2,201)
	Buck CC	48,082,448	3.17%	1,524,214	2.98%	1,434,261	(89,953)	2.90%	1,394,391	(129,823)	(39,870)
	Lee CC	63,605,677	3.33%	2,118,069	3.32%	2,111,329	(6,740)	3.22%	2,048,103	(69,966)	(63,226)
	Total Accessory Electric Equipment	*205,312,252*	*3.14%*	*6,443,457*	*2.96%*	*6,086,777*	*(356,680)*	*2.87%*	*5,892,167*	*(551,290)*	*(194,610)*
345.66	Accessory Electric Equipment - Solar										
	General	988,895	5.91%	58,444	4.72%	46,657	(11,787)	4.72%	46,657	(11,787)	0
	Mocksville	2,281,560	5.03%	114,762	4.93%	112,491	(2,271)	4.87%	111,112	(3,650)	(1,379)
	Monroe	4,229,811	5.06%	214,028	5.01%	211,782	(2,246)	4.91%	207,684	(6,344)	(4,098)
	Woodleaf	893,771	5.06%	45,225	4.95%	44,207	(1,018)	4.90%	43,795	(1,430)	(412)
	Total Accessory Electric Equipment - Solar	*8,394,037*	*5.15%*	*432,459*	*4.95%*	*415,137*	*(17,322)*	*4.88%*	*409,247*	*(23,212)*	*(5,890)*
346.00	Miscellaneous Power Plant Equipment										
	Lincoln	4,300,888	3.56%	153,112	4.42%	190,277	37,165	4.29%	184,508	31,396	(5,769)
	Dan River CC	8,972,751	2.98%	267,388	3.19%	286,025	18,637	3.12%	279,950	12,562	(6,075)
	Lee	965,030	3.40%	32,811	3.72%	35,940	3,129	3.61%	34,838	2,027	(1,102)
	Mill Creek	3,655,505	3.05%	111,493	3.46%	126,484	14,991	3.37%	123,191	11,698	(3,293)
	Rockingham	1,530,169	3.75%	57,381	4.11%	62,937	5,556	4.01%	61,360	3,979	(1,577)
	Buck CC	11,405,993	2.99%	341,039	3.20%	365,123	24,084	3.13%	357,008	15,969	(8,115)
	Lee CC	7,107,014	2.95%	209,657	3.13%	222,208	12,551	3.03%	215,343	5,686	(6,865)
	Shared Department Plant	79,121	3.15%	2,492	2.98%	2,354	(138)	2.98%	2,354	(138)	0
	Total Miscellaneous Power Plant Equipment	*38,016,470*	*3.09%*	*1,175,373*	*3.40%*	*1,291,348*	*115,975*	*3.31%*	*1,258,550*	*83,177*	*(32,798)*
346.66	Miscellaneous Power Plant Equipment - Solar										
	Woodleaf	116,806	5.06%	5,910	4.77%	5,577	(333)	4.74%	5,537	(373)	(40)
	Total Miscellaneous Power Plant Equipment - Solar	*116,806*	*5.06%*	*5,910*	*4.77%*	*5,577*	*(333)*	*4.74%*	*5,537*	*(373)*	*(40)*
	Total Other Production Plant	**3,153,387,534**	**3.09%**	**97,440,447**	**3.21%**	**101,212,036**	**3,777,499**	**3.12%**	**98,537,143**	**1,102,606**	**(2,674,893)**
	Total Production Plant	**22,159,008,308**	**3.21%**	**710,578,503**	**3.70%**	**818,812,267**	**108,233,764**	**3.49%**	**773,827,922**	**63,249,419**	**(44,984,345)**
	Transmission Plant										
352.00	Structures and Improvements	108,489,173	1.95%	2,115,539	2.00%	2,170,087	54,548	2.00%	2,170,087	54,548	0
353.00	Station Equipment	1,849,287,081	2.12%	39,204,886	2.35%	43,512,066	4,307,180	2.35%	43,512,066	4,307,180	0
354.00	Towers and Fixtures	587,791,762	1.69%	9,933,681	1.71%	10,058,236	124,555	1.71%	10,058,236	124,555	0

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	A	B	C	D	E	F	G	H	I	J	K
355.00	Poles and Fixtures	558,831,171	2.28%	12,741,351	2.69%	15,024,969	2,283,618	2.69%	15,024,969	2,283,618	0
356.00	Overhead Conductors and Devices	760,660,329	2.00%	15,213,207	2.02%	15,381,796	168,589	2.02%	15,381,796	168,589	0
357.00	Underground Conduit	124,174	1.12%	1,391	1.09%	1,356	(35)	1.09%	1,356	(35)	0
358.00	Underground Conductors and Devices	5,812,002	1.39%	80,787	1.79%	104,142	23,355	1.79%	104,142	23,355	0
359.00	Roads and Trails	42,238	1.46%	617	1.46%	615	(2)	1.46%	615	(2)	0
	Total Transmission Plant	**3,871,037,930**	**2.05%**	**79,291,459**	**2.23%**	**86,253,267**	**6,961,808**	**2.23%**	**86,253,267**	**6,961,808**	**0**
	Distribution Plant										
361.00	Structures and Improvements	112,827,983	1.94%	2,188,863	1.96%	2,214,720	25,857	1.96%	2,214,720	25,857	0
362.00	Station Equipment	1,376,647,877	2.59%	35,655,180	2.34%	32,261,405	(3,393,775)	2.34%	32,261,405	(3,393,775)	0
364.00	Poles, Towers, and Fixtures	1,633,135,516	1.98%	32,336,083	2.12%	34,614,100	2,278,017	2.12%	34,614,100	2,278,017	0
365.00	Overhead Conductors and Devices	2,263,640,318	1.94%	43,914,622	1.97%	44,559,335	644,713	1.97%	44,559,335	644,713	0
366.00	Underground Conduit	203,949,850	1.57%	3,202,013	1.37%	2,791,873	(410,140)	1.25%	2,549,373	(652,640)	(242,500)
367.00	Underground Conductors and Devices	2,040,861,816	2.00%	40,817,236	1.96%	40,019,115	(798,121)	1.96%	40,019,115	(798,121)	0
368.00	Line Transformers	1,518,704,424	1.77%	26,881,068	2.06%	31,289,615	4,408,547	2.06%	31,289,615	4,408,547	0
369.00	Services	1,107,500,564	1.32%	14,619,007	1.39%	15,374,051	755,044	1.39%	15,374,051	755,044	0
370.00	Metering Equipment	100,494,301	5.30%	5,326,198	2.60%	2,615,173	(2,711,025)	2.60%	2,615,173	(2,711,025)	0
370.01	Meters	68,544,544		10,553,102		10,601,895	48,793		10,601,895	48,793	0
370.02	Meters - Utility of the Future	438,309,267	7.19%	31,514,436	6.88%	30,148,683	(1,365,753)	5.97%	26,167,063	(5,347,373)	(3,981,620)
371.00	Installations on Customers' Premises	914,011,910	2.16%	19,742,657	2.33%	21,338,273	1,595,616	2.33%	21,338,273	1,595,616	0
373.00	Street Lighting and Signal Systems	243,393,601	2.68%	6,522,949	2.47%	6,020,417	(502,532)	2.47%	6,020,417	(502,532)	0
	Total Distribution Plant	**12,022,021,973**	**2.27%**	**273,273,414**	**2.28%**	**273,848,655**	**575,241**	**2.24%**	**269,624,535**	**(3,648,879)**	**(4,224,120)**
	General Plant										
390.00	Structures and Improvements	675,049,911	3.22%	21,736,607	3.06%	20,657,294	(1,079,313)	3.06%	20,657,294	(1,079,313)	0
391.00	Office Furniture and Equipment	48,878,029	6.67%	3,260,165	6.67%	3,258,543	(1,622)	6.67%	3,258,543	(1,622)	0
391.10	Office Furniture and Equipment - EDP	113,710,528	12.50%	14,213,816	12.50%	14,217,928	4,112	12.50%	14,217,928	4,112	0
392.00	Transportation Equipment										
	Passenger Cars and Station Wagon	94,915	0.00%	0	3.66%	3,477	3,477	3.66%	3,477	3,477	0
	Light Trucks	2,419,475	7.50%	181,461	6.21%	150,280	(31,181)	6.21%	150,280	(31,181)	0
	Medium Trucks	438,551	0.00%	0	7.31%	32,054	32,054	7.31%	32,054	32,054	0
	Heavy Trucks	1,304,835	9.92%	129,440	0.00%	0	(129,440)	0.00%	0	(129,440)	0
	Heavy Trucks / Power Equipped	2,801,236	0.00%	0	0.00%	0	0	0.00%	0	0	0

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	A	B	C	D	E	F	G	H	I	J	K
	Tractors - Gasoline and Diesel	65,897	10.39%	6,847	0.00%	0	(6,847)	0.00%	0	(6,847)	0
	Trailers	5,511,869	5.23%	288,271	1.90%	104,821	(183,450)	1.90%	104,821	(183,450)	0
	Total Transportation Equipment	*12,636,777*	*4.80%*	*606,019*	*2.30%*	*290,632*	*(315,387)*	*2.30%*	*290,632*	*(315,387)*	*0*
393.00	Stores Equipment	14,298,929	5.00%	714,946	5.00%	714,946	0	5.00%	714,946	0	0
394.00	Tools, Shop, and Garage Equipment	104,793,596	5.00%	5,239,680	5.00%	5,240,529	849	5.00%	5,240,529	849	0
395.00	Laboratory Equipment	5,877,459	6.67%	392,027	6.67%	391,830	(197)	6.67%	391,830	(197)	0
396.00	Power Operated Equipment										
	Mobile Cranes	509,129	3.14%	15,987	3.91%	19,910	3,923	3.91%	19,910	3,923	0
	Miscellaneous Non-Highway Equipment	1,020,976	4.74%	48,394	0.00%	0	(48,394)	0.00%	0	(48,394)	0
	Miscellaneous Equipment	9,797,880	6.54%	640,781	0.00%	0	(640,781)	0.00%	0	(640,781)	0
	Total Power Operated Equipment	*11,327,986*	*6.22%*	*705,162*	*0.18%*	*19,910*	*(685,252)*	*0.18%*	*19,910*	*(685,252)*	*0*
397.00	Communication Equipment	153,219,179	10.00%	15,321,918	10.00%	15,328,598	6,680	10.00%	15,328,598	6,680	0
398.00	Miscellaneous Equipment	10,275,692	5.00%	513,785	5.00%	513,784	(1)	5.00%	513,784	(1)	0
	Total General Plant	**1,150,068,086**	**5.45%**	**62,704,125**	**5.27%**	**60,633,994**	**(2,070,131)**	**5.27%**	**60,633,994**	**(2,070,131)**	**0**
	Depreciable Land Rights										
310.00	Rights of Way										
	Marshall	452,636	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Belews Creek	1,543,811	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Lee	3,106	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Allen	4,303	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Total Account 310	*2,003,856*	*0.00%*	*0*	*0.00%*	*0*	*0*	*0.00%*	*0*	*0*	*0*
320.00	Rights of Way										
	Oconee	425,003	1.55%	6,588	1.54%	6,546	(42)	1.54%	6,546	(42)	0
	McGuire	74,882	1.65%	1,236	1.64%	1,227	(9)	1.64%	1,227	(9)	0
	Catawba	456,657	1.85%	8,448	1.84%	8,399	(49)	1.84%	8,399	(49)	0
	Total Account 320	*956,542*	*1.70%*	*16,272*	*1.69%*	*16,172*	*(100)*	*1.69%*	*16,172*	*(100)*	*0*
330.00	Rights of Way										
	Cowans Ford	6,881,547	0.66%	45,418	0.66%	45,372	(46)	0.66%	45,372	(46)	0
	Bad Creek	723,692	1.23%	8,901	1.22%	8,840	(61)	1.22%	8,840	(61)	0
	Jocassee	436,179	0.86%	3,751	0.84%	3,685	(66)	0.84%	3,685	(66)	0

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	A	B	C	D	E	F	G	H	I	J	K
	Keowee	12,071,075	0.72%	86,912	0.71%	86,162	(750)	0.71%	86,162	(750)	0
	Fishing Creek	35,796	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Bridgewater	393,705	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Gaston Shoals	16,648	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Lookout Shoals	7,426	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Mountain Island	323,913	0.00%	0	0.00%	0	0	0.00%	0	0	0
	99 Islands	17,102	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Oxford	695,790	0.06%	417	0.08%	548	131	0.08%	548	131	0
	Rhodhiss	199,929	0.00%	0	0.01%	17	17	0.01%	17	17	0
	Tuxedo	245,404	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Wateree	204,111	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Wylie	1,189,441	0.00%	0	0.00%	0	0	0.00%	0	0	0
	NPL Bear Creek	435	0.00%	0	0.00%	0	0	0.00%	0	0	0
	NPL Franklin	12,423	0.00%	0	0.00%	0	0	0.00%	0	0	0
	NPL Nantahala	80,304	0.00%	0	0.00%	0	0	0.00%	0	0	0
	NPL Queens Creek	5,782	0.00%	0	0.00%	0	0	0.00%	0	0	0
	NPL Tennessee Creek	711	0.00%	0	0.00%	0	0	0.00%	0	0	0
	NPL Thorpe	47,127	0.00%	0	0.00%	0	0	0.00%	0	0	0
	NPL Tuckasegee	1,518	0.00%	0	0.00%	0	0	0.00%	0	0	0
	Total Account 330	*23,590,058*	*0.62%*	*145,399*	*0.61%*	*144,624*	*(775)*	*0.61%*	*144,624*	*(775)*	*0*
340.00	Rights of Way										
	Dan River CC	7,693	4.45%	342	4.98%	383	41	4.98%	383	41	0
	Total Account 340	*7,693*	*4.45%*	*342*	*4.98%*	*383*	*41*	*4.98%*	*383*	*41*	*0*
350.00	Rights of Way	163,057,492	1.15%	1,875,161	1.03%	1,673,327	(201,834)	1.03%	1,673,327	(201,834)	0
360.00	Rights of Way	8,830,280	1.37%	120,975	1.25%	110,290	(10,685)	1.25%	110,290	(10,685)	0
360.20	Land Rights	561,560	1.51%	8,480	1.36%	7,656	(824)	1.36%	7,656	(824)	0
389.00	Rights of Way	550,127	1.51%	8,307	1.50%	8,256	(51)	1.50%	8,256	(51)	0
389.20	Land Rights	165	1.21%	2	1.21%	2	0	1.21%	2	0	0
	Total Depreciable Land Rights	**199,557,774**	**1.09%**	**2,174,938**	**0.98%**	**1,960,710**	**(214,228)**	**0.98%**	**1,960,710**	**(214,228)**	**0**
	Reserve Adjustment for Amortization										
391.00	Office Furniture and Equipment			(485,779)		(1,091,336)	(605,557)		(1,091,336)	(605,557)	0
391.10	Office Furniture and Equipment - EDP			(7,162,540)		(6,686,253)	476,287		(6,686,253)	476,287	0
393.00	Stores Equipment			(167,822)		(510,479)	(342,657)		(510,479)	(342,657)	0

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	A	B	C	D	E	F	G	H	I	J	K
394.00	Tools, Shop, and Garage Equipment			791,555		182,044	(609,511)		182,044	(609,511)	0
395.00	Laboratory Equipment			60,273		(196,882)	(257,155)		(196,882)	(257,155)	0
397.00	Communication Equipment			(3,375,963)		(5,756,654)	(2,380,691)		(5,756,654)	(2,380,691)	0
398.00	Miscellaneous Equipment			181,040		152,142	(28,898)		152,142	(28,898)	0
	Total Reserve Adjustment for Amortization			**(10,159,236)**	**0.00%**	**(13,907,418)**	**(3,748,182)**	**0.00%**	**(13,907,418)**	**(3,748,182)**	**0**
	Total Depreciable Plant	**39,401,694,071**	**2.84%**	**1,117,863,203**	**3.12%**	**1,227,601,475**	**109,738,272**	**2.99%**	**1,178,393,010**	**60,529,807**	**(49,208,465)**

Duke Energy Carolinas
Table 4: Calculation of Depreciation Rates
As of December 31, 2018

Account	Description	12/31/18 Investment	12/31/18 Book Reserve	Percent Reserve	Future Net Salvage Percent	Net Plant to be Recovered	Remaining Life	Total Annual Rate	Total Annual Accrual
	A	B	C	D=C/B	E	F	G	H	I
	Steam Production Plant								
311.00	Structures and Improvements								
	Marshall	177,753,235	35,349,371	19 89%	-5%	151,291,526	15.4	5.53%	9,824,125
	Belews Creek	350,179,474	127,788,409	36.49%	-6%	243,401,833	18.1	3.84%	13,447,615
	Lee	34,317,919	10,301,899	30 02%	-10%	27,447,812	11.4	7.02%	2,407,703
	Cliffside 5 (J.E. Rogers)	62,362,310	38,109,929	61.11%	-4%	26,746,874	13 3	3.22%	2,011,043
	Cliffside 6 (J.E. Rogers)	156,228,546	27,594,694	17.66%	-6%	138,007,565	28.7	3.08%	4,808,626
	Cliffside 5 and 6 Common (J.E. Rogers)	90,585,364	4,099,902	4 53%	-4%	90,108,876	28 9	3.44%	3,117,954
	Allen	152,962,346	61,362,435	40.12%	-4%	97,718,405	7 5	8.52%	13,029,121
	Shared Department Plant	28,964,788	3,149,285	10 87%	-20%	31,608,460	28 8	3.79%	1,097,516
	Total Structures and Improvements	*1,053,353,981*	*307,755,924*	*29.22%*		*806,331,350*	*16.2*	*4.72%*	*49,743,703*
311.01	Structures and Improvements - Capital Lease								
	Cliffside 5 and 6 Common (J.E. Rogers)	51,965,134	0	0 00%	0%	51,965,134	19 8	5.05%	2,624,502
	Total Structures and Improvements - Capital Lease	*51,965,134*	*0*	*0.00%*		*51,965,134*	*19.8*	*5.05%*	*2,624,502*
312.00	Boiler Plant Equipment								
	Marshall	1,223,859,776	559,384,340	45.71%	-5%	725,668,425	14 8	4.01%	49,031,650
	Belews Creek	1,519,843,407	654,801,341	43 08%	-6%	956,232,670	17.4	3.62%	54,955,901
	Lee	46,799,187	27,702,555	59.19%	-10%	23,776,551	11.1	4.58%	2,142,032
	Cliffside 5 (J.E. Rogers)	587,455,504	367,281,979	62 52%	-4%	243,671,745	13 0	3.19%	18,743,980
	Cliffside 6 (J.E. Rogers)	1,277,388,376	280,431,103	21 95%	-6%	1,073,600,576	26 8	3.14%	40,059,723
	Cliffside 5 and 6 Common (J.E. Rogers)	13,321,805	2,953,230	22.17%	-4%	10,901,447	26 8	3.05%	406,770
	Allen	861,043,480	665,456,695	77 28%	-4%	230,028,524	7 3	3.66%	31,510,757
	Shared Department Plant	1,215,220	298,589	24 57%	-15%	1,098,914	26 8	3.37%	41,004
	Total Boiler Plant Equipment	*5,530,926,754*	*2,558,309,832*	*46.25%*		*3,264,978,851*	*16.6*	*3.56%*	*196,891,817*
314.00	Turbogenerator Units								
	Marshall	233,926,272	58,769,958	25.12%	-5%	186,852,627	14.7	5.43%	12,711,063
	Belews Creek	239,196,294	64,184,171	26 83%	-6%	189,363,900	17.4	4.55%	10,882,983
	Lee	8,932,738	5,879,460	65 82%	-10%	3,946,552	8 8	5.02%	448,472
	Cliffside 5 (J.E. Rogers)	60,191,252	30,179,321	50.14%	-4%	32,419,581	12.7	4.24%	2,552,723
	Cliffside 6 (J.E. Rogers)	268,873,564	40,544,973	15 08%	-6%	244,461,004	27.1	3.35%	9,020,701
	Allen	144,305,497	56,447,141	39.12%	-4%	93,630,576	7.4	8.77%	12,652,781
	Shared Department Plant	535,483	84,029	15.69%	-5%	478,229	27.1	3.30%	17,647
	Total Turbogenerator Units	*955,961,099*	*256,089,053*	*26.79%*		*751,152,469*	*15.6*	*5.05%*	*48,286,369*
315.00	Accessory Electric Equipment								
	Marshall	75,898,724	37,588,881	49 53%	-5%	42,104,779	14.6	3.80%	2,883,889
	Belews Creek	69,152,297	29,950,525	43 31%	-6%	43,350,910	17.4	3.60%	2,491,432
	Lee	16,727,998	11,257,714	67 30%	-10%	7,143,084	10 9	3.92%	655,329
	Cliffside 5 (J.E. Rogers)	23,486,538	16,436,607	69 98%	-4%	7,989,392	12.7	2.68%	629,086
	Cliffside 6 (J.E. Rogers)	153,517,154	27,975,060	18 22%	-6%	134,753,124	27 8	3.16%	4,847,235
	Cliffside 5 and 6 Common (J.E. Rogers)	134,927	11,747	8.71%	-4%	128,577	28 3	3.37%	4,543
	Allen	56,953,056	40,679,451	71.43%	-4%	18,551,728	7 3	4.46%	2,541,333
	Total Accessory Electric Equipment	*395,870,694*	*163,899,985*	*41.40%*		*254,021,593*	*18.1*	*3.55%*	*14,052,846*
316.00	Miscellaneous Power Plant Equipment								
	Marshall	33,209,639	10,782,210	32.47%	-5%	24,087,911	14.7	4.93%	1,638,633
	Belews Creek	28,662,799	7,074,278	24.68%	-6%	23,308,289	17.6	4.62%	1,324,335
	Lee	6,307,291	2,825,235	44.79%	-10%	4,112,785	11 0	5.93%	373,890
	Cliffside 5 (J.E. Rogers)	12,691,831	5,906,840	46 54%	-4%	7,292,664	13 0	4.42%	560,974
	Cliffside 6 (J.E. Rogers)	247,457,858	39,846,436	16.10%	-6%	222,458,893	27.1	3.32%	8,208,815
	Cliffside 5 and 6 Common (J.E. Rogers)	6,568,205	451,533	6 87%	-4%	6,379,400	27.7	3.51%	230,303
	Allen	21,448,804	10,230,609	47.70%	-4%	12,076,148	7.4	7.61%	1,631,912
	Shared Department Plant	8,513,140	545,526	6.41%	-5%	8,393,271	27.7	3.56%	303,006
	Total Miscellaneous Power Plant Equipment	*364,859,567*	*77,662,667*	*21.29%*		*308,109,361*	*21.6*	*3.91%*	*14,271,868*
	Total Steam Production Plant	**8,352,937,230**	**3,363,717,461**	**40.27%**		**5,436,558,759**	**16.7**	**3.90%**	**325,871,105**
	Nuclear Production Plant								
321.00	Structures and Improvements								

Duke Energy Carolinas
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As of December 31, 2018

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	A	B	C	D=C/B	E	F	G	H	I
	Oconee	962,552,204	363,677,135	37.78%	-1%	608,500,591	15.1	4.19%	40,298,052
	McGuire	688,865,400	347,935,764	50 51%	-3%	361,595,598	20.6	2.55%	17,553,184
	Catawba	244,337,032	123,558,372	50 57%	-3%	128,108,771	21.1	2.48%	6,071,506
	Total Structures and Improvements	*1,895,754,636*	*835,171,271*	*44.05%*		*1,098,204,960*	*17.2*	*3.37%*	*63,922,742*
322.00	Reactor Plant Equipment								
	Oconee	1,936,377,070	712,563,446	36 80%	-1%	1,243,177,395	14 8	4.34%	83,998,473
	McGuire	1,541,431,173	764,011,403	49 57%	-3%	823,662,706	19 5	2.74%	42,239,113
	Catawba	366,655,392	193,073,267	52.66%	-3%	184,581,787	19.4	2.59%	9,514,525
	Total Reactor Plant Equipment	*3,844,463,636*	*1,669,648,116*	*43.43%*		*2,251,421,888*	*16.6*	*3.53%*	*135,752,111*
323.00	Turbogenerator Units								
	Oconee	323,043,817	139,593,883	43 21%	-1%	186,680,372	14.4	4.01%	12,963,915
	McGuire	558,023,213	178,531,985	31 99%	-3%	396,231,925	21.1	3.37%	18,778,764
	Catawba	96,835,608	49,529,540	51.15%	-3%	50,211,136	18.6	2.79%	2,699,523
	Total Turbogenerator Units	*977,902,638*	*367,655,408*	*37.60%*		*633,123,433*	*18.4*	*3.52%*	*34,442,202*
324.00	Accessory Electric Equipment								
	Oconee	882,699,098	234,018,394	26 51%	-1%	657,507,695	15 2	4.90%	43,257,085
	McGuire	255,846,958	98,800,588	38.62%	-3%	164,721,779	20.7	3.11%	7,957,574
	Catawba	90,651,299	35,170,598	38 80%	-3%	58,200,240	21 3	3.01%	2,732,406
	Total Accessory Electric Equipment	*1,229,197,356*	*367,989,580*	*29.94%*		*880,429,714*	*16.3*	*4.39%*	*53,947,065*
325.00	Miscellaneous Power Plant Equipment								
	Oconee	239,273,766	103,623,611	43 31%	-1%	138,042,893	15 0	3.85%	9,202,860
	McGuire	280,926,816	110,356,559	39 28%	-3%	178,998,061	21 8	2.92%	8,210,920
	Catawba	49,529,213	20,607,709	41.61%	-3%	30,407,381	22 2	2.77%	1,369,702
	Shared Department Plant	1,446,303	415,007	28.69%	-2%	1,060,222	23.6	3.11%	44,925
	Total Miscellaneous Power Plant Equipment	*571,176,098*	*235,002,886*	*41.14%*		*348,508,556*	*18.5*	*3.30%*	*18,828,406*
	Total Nuclear Production Plant	**8,518,494,363**	**3,475,467,261**	**40.80%**		**5,211,688,551**	**17.0**	**3.60%**	**306,892,527**
	Hydarulic Production Plant								
331.00	Structures and Improvements								
	Cowans Ford	16,442,484	8,532,993	51 90%	-11%	9,718,165	32 0	1.85%	303,693
	Bad Creek	228,124,721	115,385,174	50 58%	-6%	126,427,030	34 3	1.62%	3,685,919
	Jocassee	28,418,569	13,643,912	48 01%	-4%	15,911,399	25 8	2.17%	616,721
	Keowee	13,536,904	2,594,906	19.17%	-5%	11,618,844	27.1	3.17%	428,740
	Fishing Creek	4,376,021	1,805,495	41 26%	-16%	3,270,690	34 3	2.18%	95,355
	Cedar Creek	3,989,687	1,508,531	37 81%	-15%	3,079,609	34 5	2.24%	89,264
	Bridgewater	65,238,752	13,080,924	20 05%	-3%	54,114,990	35.6	2.33%	1,520,084
	Gaston Shoals	1,666,255	588,944	35 35%	-15%	1,327,249	17.4	4.58%	76,279
	Lookout Shoals	2,520,600	1,265,854	50 22%	-21%	1,784,072	33.7	2.10%	52,940
	Mountain Island	3,374,178	967,129	28.66%	-22%	3,149,369	35.1	2.66%	89,726
	99 Islands	1,507,510	636,989	42 25%	-17%	1,126,797	17.4	4.30%	64,758
	Oxford	4,113,826	1,703,598	41.41%	-7%	2,698,196	34 0	1.93%	79,359
	Rhodhiss	4,003,189	1,712,393	42.78%	-16%	2,931,306	34 3	2.13%	85,461
	Tuxedo	1,023,476	266,923	26 08%	-17%	930,544	22 3	4.08%	41,728
	Wateree	9,060,996	4,204,233	46.40%	-15%	6,215,913	33.6	2.04%	184,997
	Wylie	6,639,141	2,924,173	44 04%	-14%	4,644,447	33 9	2.06%	137,004
	Great Falls	471,321	597,970	126 87%	-100%	344,672	33 8	2.16%	10,197
	Dearborn	2,137,143	1,175,159	54 99%	-23%	1,453,527	33 3	2.04%	43,649
	NPL Bear Creek	1,003,826	194,639	19 39%	-10%	909,570	22 3	4.06%	40,788
	NPL Bryson	18,925	20,707	109.42%	-27%	3,328	16 5	1.07%	202
	NPL Cedar Cliff	1,549,512	357,676	23 08%	-22%	1,532,729	22.4	4.42%	68,425
	NPL Franklin	942,130	208,180	22.10%	-21%	931,797	22.4	4.42%	41,598
	NPL Mission	326,066	134,386	41 21%	-31%	292,761	22.1	4.06%	13,247
	NPL Nantahala	2,173,944	635,075	29 21%	-11%	1,778,003	23.1	3.54%	76,970
	NPL Queens Creek	112,213	75,712	67.47%	-72%	117,295	13.4	7.80%	8,753
	NPL Tennessee Creek	355,878	172,255	48.40%	-18%	247,681	21 8	3.19%	11,362
	NPL Thorpe	3,070,673	1,204,062	39 21%	-17%	2,388,625	22 0	3.54%	108,574
	NPL Tuckasegee	2,374,067	690,737	29.10%	-30%	2,395,550	22.4	4.50%	106,944
	Shared Department Plant	27,831	12,757	45 84%	-25%	22,031	23 2	3.41%	950

Duke Energy Carolinas
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As of December 31, 2018

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	A	B	C	D=C/B	E	F	G	H	I
	Total Structures and Improvements	*408,599,840*	*176,301,486*	*43.15%*		*261,366,190*	*32.3*	*1.98%*	*8,083,688*
332.00	Reservoirs, Dams, and Waterways								
	Cowans Ford	36,637,451	17,066,913	46 58%	-11%	23,600,658	35.4	1.82%	666,685
	Bad Creek	455,304,760	250,081,266	54 93%	-6%	232,541,780	38 0	1.34%	6,119,521
	Jocassee	52,373,977	40,748,919	77 80%	-4%	13,720,017	26 2	1.00%	523,665
	Keowee	17,440,014	14,364,755	82 37%	-5%	3,947,260	25 8	0.88%	152,995
	Fishing Creek	15,283,129	7,826,968	51 21%	-16%	9,901,462	35 9	1.80%	275,807
	Cedar Creek	12,029,057	4,545,168	37.78%	-15%	9,288,248	36 2	2.13%	256,581
	Bridgewater	105,399,463	31,623,078	30 00%	-3%	76,938,368	36 3	2.01%	2,119,514
	Gaston Shoals	6,356,557	4,447,623	69 97%	-15%	2,862,418	17 5	2.57%	163,567
	Lookout Shoals	5,618,091	3,780,588	67 29%	-21%	3,017,302	35 8	1.50%	84,282
	Mountain Island	5,531,690	4,591,161	83 00%	-22%	2,157,501	35.1	1.11%	61,467
	99 Islands	11,666,336	8,415,279	72.13%	-17%	5,234,334	17 5	2.56%	299,105
	Oxford	30,626,357	8,643,511	28 22%	-7%	24,126,691	36 2	2.18%	666,483
	Rhodhiss	7,546,537	4,286,243	56 80%	-16%	4,467,740	35 8	1.65%	124,797
	Tuxedo	6,431,758	4,928,998	76.64%	-17%	2,596,159	22 3	1.81%	116,420
	Wateree	14,861,723	8,674,766	58 37%	-15%	8,416,215	35 8	1.58%	235,090
	Wylie	21,518,089	8,348,089	38 80%	-14%	16,182,532	36.1	2.08%	448,270
	Great Falls	2,869,197	4,119,978	143 59%	-100%	1,618,416	35 2	1.60%	45,978
	Dearborn	1,506,206	1,032,092	68 52%	-23%	820,541	35.6	1.53%	23,049
	NPL Bear Creek	3,719,273	2,429,263	65 32%	-10%	1,661,937	22 2	2.01%	74,862
	NPL Bryson	2,838,508	689,452	24 29%	-27%	2,915,453	22 5	4.56%	129,576
	NPL Cedar Cliff	2,112,155	2,072,209	98.11%	-22%	504,620	21 9	1.09%	23,042
	NPL Franklin	5,460,622	1,125,734	20.62%	-21%	5,481,619	22 5	4.46%	243,627
	NPL Mission	1,811,702	1,210,836	66 83%	-31%	1,162,494	22.4	2.86%	51,897
	NPL Nantahala	13,526,218	10,196,693	75 38%	-11%	4,817,410	23 2	1.54%	207,647
	NPL Queens Creek	763,264	886,994	116 21%	-72%	425,820	13 5	4.13%	31,542
	NPL Tennessee Creek	4,890,494	4,334,673	88.63%	-18%	1,436,110	22 0	1.33%	65,278
	NPL Thorpe	4,897,153	5,657,657	115 53%	-17%	72,012	18 8	0.08%	3,830
	NPL Tuckasegee	637,985	804,614	126.12%	-30%	24,767	19.7	0.20%	1,257
	Shared Department Plant	324,568	235,061	72.42%	-25%	170,649	23.4	2.25%	7,293
	Total Reservoirs, Dams, and Waterways	*849,982,333*	*457,168,581*	*53.79%*		*460,110,529*	*34.8*	*1.56%*	*13,223,126*
333.00	Water Wheels, Turbines, and Generators								
	Cowans Ford	49,672,299	12,932,614	26 04%	-11%	42,203,637	33 0	2.57%	1,278,898
	Bad Creek	238,780,281	116,106,407	48.62%	-6%	137,000,691	31 5	1.82%	4,349,228
	Jocassee	71,154,555	29,014,013	40.78%	-4%	44,986,724	25 3	2.50%	1,778,131
	Keowee	72,561,595	20,035,069	27.61%	-5%	56,154,605	26.1	2.97%	2,151,517
	Fishing Creek	22,386,920	10,527,622	47 03%	-16%	15,441,205	31 2	2.21%	494,910
	Cedar Creek	12,254,188	5,831,655	47 59%	-15%	8,260,661	31 2	2.16%	264,765
	Bridgewater	20,780,064	4,299,837	20.69%	-3%	17,103,629	33.7	2.44%	507,526
	Gaston Shoals	10,102,537	3,273,687	32.40%	-15%	8,344,230	17 2	4.80%	485,130
	Lookout Shoals	10,624,869	4,862,370	45.76%	-21%	7,993,722	31.6	2.38%	252,966
	Mountain Island	16,270,738	6,850,619	42.10%	-22%	12,999,681	32 2	2.48%	403,717
	99 Islands	10,666,437	5,746,242	53 87%	-17%	6,733,489	17 0	3.71%	396,088
	Oxford	18,546,865	4,800,001	25 88%	-7%	15,045,145	33 2	2.44%	453,167
	Rhodhiss	16,360,555	4,650,378	28.42%	-16%	14,327,866	33 2	2.64%	431,562
	Tuxedo	1,996,061	706,661	35.40%	-17%	1,628,731	21.7	3.76%	75,057
	Wateree	23,654,144	10,301,438	43 55%	-15%	16,900,827	31.6	2.26%	534,836
	Wylie	17,445,697	8,725,082	50 01%	-14%	11,163,013	30.7	2.08%	363,616
	Great Falls	5,339,350	5,430,989	101.72%	-100%	5,247,711	30 3	3.24%	173,192
	Dearborn	11,865,475	5,833,844	49.17%	-23%	8,760,690	31 3	2.36%	279,894
	NPL Bear Creek	6,450,844	622,205	9.65%	-10%	6,473,723	22.1	4.54%	292,929
	NPL Bryson	3,331,409	680,704	20.43%	-27%	3,550,186	22 0	4.84%	161,372
	NPL Cedar Cliff	3,352,939	1,038,472	30 97%	-22%	3,052,114	21 8	4.18%	140,005
	NPL Franklin	1,340,571	445,526	33 23%	-21%	1,176,565	21 8	4.03%	53,971
	NPL Mission	5,814,650	1,436,750	24.71%	-31%	6,180,441	22 0	4.83%	280,929
	NPL Nantahala	3,866,009	1,942,497	50 25%	-11%	2,348,773	21 8	2.79%	107,742
	NPL Queens Creek	38,141	61,123	160 26%	-72%	4,480	11.1	1.06%	404
	NPL Tennessee Creek	2,167,433	688,102	31.75%	-18%	1,869,469	21.7	3.97%	86,151
	NPL Thorpe	819,570	515,562	62 91%	-17%	443,334	20 2	2.68%	21,947
	NPL Tuckasegee	250,437	153,517	61 30%	-30%	172,051	20.7	3.32%	8,312
	Shared Department Plant	837	364	43 51%	-25%	682	22.7	3.59%	30

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	A	B	C	D=C/B	E	F	G	H	I
	Total Water Wheels, Turbines, and Generators	*657,895,468*	*267,513,350*	*40.66%*		*455,568,074*	*28.8*	*2.41%*	*15,827,992*
334.00	Accessory Electric Equipment								
	Cowans Ford	7,019,818	1,871,614	26.66%	-11%	5,920,384	32 2	2.62%	183,863
	Bad Creek	51,305,557	21,431,384	41.77%	-6%	32,952,507	31.4	2.05%	1,049,443
	Jocassee	13,791,024	4,984,283	36.14%	-4%	9,358,382	24 8	2.74%	377,354
	Keowee	21,431,167	7,330,043	34 20%	-5%	15,172,683	25.4	2.79%	597,350
	Fishing Creek	4,825,713	1,869,049	38.73%	-16%	3,728,778	31 2	2.48%	119,512
	Cedar Creek	3,549,165	1,283,430	36.16%	-15%	2,798,110	31.7	2.49%	88,268
	Bridgewater	7,383,450	1,293,507	17 52%	-3%	6,311,446	33.7	2.54%	187,283
	Gaston Shoals	2,109,581	1,216,280	57.66%	-15%	1,209,738	16 5	3.48%	73,317
	Lookout Shoals	2,113,118	946,254	44.78%	-21%	1,610,619	30.4	2.51%	52,981
	Mountain Island	2,678,560	971,243	36 26%	-22%	2,296,600	31.6	2.71%	72,677
	99 Islands	640,203	263,472	41.15%	-17%	485,565	16.6	4.57%	29,251
	Oxford	3,769,798	1,284,563	34 08%	-7%	2,749,120	31 5	2.32%	87,274
	Rhodhiss	2,251,110	899,228	39 95%	-16%	1,712,060	30 9	2.46%	55,406
	Tuxedo	907,396	359,550	39.62%	-17%	702,104	21 2	3.65%	33,118
	Wateree	5,385,950	1,666,888	30 95%	-15%	4,526,954	32 2	2.61%	140,589
	Wylie	3,929,751	1,466,076	37 31%	-14%	3,013,840	31.1	2.47%	96,908
	Great Falls	853,483	846,773	99 21%	-100%	860,193	25.7	3.92%	33,471
	Dearborn	3,821,458	1,610,384	42.14%	-23%	3,090,010	31 2	2.59%	99,039
	NPL Bear Creek	122,275	68,995	56.43%	-10%	65,507	19.6	2.73%	3,342
	NPL Bryson	14,608	8,867	60.70%	-27%	9,685	19.4	3.42%	499
	NPL Cedar Cliff	108,549	60,735	55 95%	-22%	71,695	20 2	3.27%	3,549
	NPL Franklin	119,785	46,290	38.64%	-21%	98,650	21 2	3.88%	4,653
	NPL Mission	50,985	33,281	65 28%	-31%	33,509	19 8	3.32%	1,692
	NPL Nantahala	2,140,284	696,235	32 53%	-11%	1,679,480	22 3	3.52%	75,313
	NPL Queens Creek	183,285	187,948	102 54%	-72%	127,303	12 9	5.38%	9,868
	NPL Tennessee Creek	194,806	108,452	55.67%	-18%	121,419	20 2	3.09%	6,011
	NPL Thorpe	2,132,647	984,390	46.16%	-17%	1,510,807	20 9	3.39%	72,287
	NPL Tuckasegee	243,404	152,379	62.60%	-30%	164,046	20 5	3.29%	8,002
	Total Accessory Electric Equipment	*143,076,932*	*53,941,593*	*37.70%*		*102,381,197*	*28.7*	*2.49%*	*3,562,323*
335.00	Miscellaneous Power Plant Equipment								
	Cowans Ford	1,741,315	490,757	28.18%	-11%	1,442,103	31.4	2.64%	45,927
	Bad Creek	28,870,301	11,988,137	41 52%	-6%	18,614,382	30 2	2.13%	616,370
	Jocassee	3,900,448	1,402,176	35 95%	-4%	2,654,290	24.1	2.82%	110,136
	Keowee	856,794	475,327	55.48%	-5%	424,306	21 9	2.26%	19,375
	Fishing Creek	335,392	100,284	29 90%	-16%	288,770	31 5	2.73%	9,167
	Cedar Creek	515,883	107,134	20.77%	-15%	486,132	32 5	2.90%	14,958
	Bridgewater	7,374,528	1,342,055	18 20%	-3%	6,253,709	32 9	2.58%	190,082
	Gaston Shoals	287,153	94,773	33 00%	-15%	235,453	16 9	4.85%	13,932
	Lookout Shoals	450,161	158,124	35.13%	-21%	386,571	31 0	2.77%	12,470
	Mountain Island	527,620	176,533	33.46%	-22%	467,163	31 2	2.84%	14,973
	99 Islands	378,539	178,514	47.16%	-17%	264,377	16.7	4.18%	15,831
	Oxford	627,510	158,895	25 32%	-7%	512,541	31 8	2.57%	16,118
	Rhodhiss	497,691	176,438	35.45%	-16%	400,884	30 8	2.62%	13,016
	Tuxedo	220,355	99,710	45 25%	-17%	158,106	20 8	3.45%	7,601
	Wateree	494,968	137,837	27 85%	-15%	431,376	31 8	2.74%	13,565
	Wylie	639,506	153,262	23 97%	-14%	575,775	32.1	2.80%	17,937
	Great Falls	259,887	134,989	51 94%	-100%	384,785	31.6	4.69%	12,177
	Dearborn	250,695	105,775	42.19%	-23%	202,580	30.1	2.68%	6,730
	NPL Bear Creek	165,739	40,913	24.69%	-10%	141,400	21 5	3.97%	6,577
	NPL Bryson	106,209	29,666	27 93%	-27%	105,219	21 5	4.61%	4,894
	NPL Cedar Cliff	124,238	33,852	27 25%	-22%	117,718	21 5	4.41%	5,475
	NPL Franklin	110,420	40,071	36 29%	-21%	93,537	21 3	3.98%	4,391
	NPL Mission	66,513	15,984	24 03%	-31%	71,147	21.6	4.95%	3,294
	NPL Nantahala	1,239,717	293,528	23.68%	-11%	1,082,557	22.4	3.90%	48,328
	NPL Queens Creek	201,667	199,174	98.76%	-72%	147,693	13 0	5.63%	11,361
	NPL Tennessee Creek	224,997	63,585	28 26%	-18%	201,911	21 5	4.17%	9,391
	NPL Thorpe	1,479,207	166,468	11 25%	-17%	1,564,204	21.7	4.87%	72,083
	NPL Tuckasegee	98,009	26,138	26.67%	-30%	101,274	21 5	4.81%	4,710
	Shared Department Plant	792,882	323,709	40 83%	-5%	508,817	21.7	2.96%	23,448
	Total Miscellaneous Power Plant Equipment	*52,838,344*	*18,713,808*	*35.42%*		*38,318,782*	*28.5*	*2.54%*	*1,344,319*

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	A	B	C	D=C/B	E	F	G	H	I
336.00	Roads, Railroads, and Bridges								
	Cowans Ford	2,240,416	717,465	32 02%	-11%	1,769,396	34 8	2.27%	50,845
	Bad Creek	17,869,699	8,956,170	50.12%	-6%	9,985,711	36 5	1.53%	273,581
	Jocassee	415,508	312,928	75 31%	-4%	119,200	23 8	1.21%	5,008
	Dearborn	633,636	414,116	65 36%	-23%	365,256	33.6	1.72%	10,871
	NPL Bear Creek	52,776	51,359	97 32%	-10%	6,695	15.1	0.84%	443
	NPL Cedar Cliff	129,738	103,471	79.75%	-22%	54,809	21.4	1.97%	2,561
	NPL Nantahala	239,971	191,178	79.67%	-11%	75,190	21 0	1.49%	3,580
	NPL Queens Creek	2,830	4,813	170 07%	-72%	55	10.1	0.19%	5
	NPL Tennessee Creek	72,590	75,847	104.49%	-18%	9,809	15 5	0.87%	633
	NPL Thorpe	46,024	43,210	93 89%	-17%	10,638	19 3	1.20%	551
	NPL Tuckasegee	8,678	10,450	120.42%	-30%	831	13 3	0.72%	63
	Shared Department Plant	84,399	84,399	100 00%	0%	0	0 0	0.00%	0
	Total Roads, Railroads, and Bridges	*21,796,265*	*10,965,406*	*50.31%*		*12,397,591*	*35.6*	*1.60%*	*348,142*
	Total Hydarulic Production Plant	**2,134,189,181**	**984,604,224**	**46.13%**		**1,330,142,363**	**31.4**	**1.99%**	**42,389,589**
	Other Production Plant								
341.00	Structures and Improvements								
	Lincoln	28,616,966	15,424,949	53 90%	-3%	14,050,526	15.4	3.19%	912,372
	Dan River CC	145,096,631	22,321,187	15 38%	-3%	127,128,343	31 2	2.81%	4,074,626
	Lee	493,308	27,239	5 52%	-3%	480,868	27.7	3.52%	17,360
	Mill Creek	29,782,579	11,265,883	37 83%	-3%	19,410,173	22.6	2.88%	858,857
	Rockingham	3,365,506	490,223	14 57%	-1%	2,908,938	21.1	4.10%	137,864
	Buck CC	147,848,826	24,228,245	16 39%	-3%	128,056,046	30 5	2.84%	4,198,559
	Lee CC	12,554,329	155,693	1 24%	-4%	12,900,809	37 3	2.75%	345,866
	Total Structures and Improvements	*367,758,145*	*73,913,419*	*20.10%*		*304,935,703*	*28.9*	*2.87%*	*10,545,505*
341.66	Structures and Improvements - Solar								
	Mocksville	101,358	2,653	2.62%	-10%	108,841	22.1	4.86%	4,925
	Woodleaf	154,629	1,287	0 83%	-9%	167,258	24.1	4.49%	6,940
	Total Structures and Improvements - Solar	*255,987*	*3,940*	*1.54%*		*276,099*	*23.3*	*4.64%*	*11,865*
342.00	Fuel Holders, Producers, and Accessories								
	Lincoln	12,584,656	10,159,076	80.73%	-3%	2,803,120	15 2	1.47%	184,416
	Dan River CC	20,414,344	4,499,405	22 04%	-3%	16,527,369	30 8	2.63%	536,603
	Mill Creek	15,066,355	8,252,384	54.77%	-3%	7,265,962	22 3	2.16%	325,828
	Rockingham	55,564	16,781	30 20%	-1%	39,339	20.7	3.42%	1,900
	Buck CC	30,592,902	7,693,624	25.15%	-3%	23,817,065	29 9	2.60%	796,557
	Lee CC	21,061,946	381,790	1 81%	-4%	21,522,634	36 5	2.80%	589,661
	Total Fuel Holders, Producers, and Accessories	*99,775,768*	*31,003,060*	*31.07%*		*71,975,489*	*29.6*	*2.44%*	*2,434,966*
342.02	Fuel Holders, Producers, and Accessories - Capital Lease								
	Dan River CC (Pipeline)	7,908,780	1,340,432	16 95%	0%	6,568,348	23 0	3.61%	285,580
	Dan River CC (Pipeline Heaters)	1,879,537	37,546	2 00%	0%	1,841,991	18.7	5.24%	98,502
	Buck CC	31,886,250	9,472,345	29.71%	0%	22,413,905	11 9	5.91%	1,883,521
	Lee CC	41,450,841	842,699	2 03%	0%	40,608,142	18.4	5.32%	2,206,964
	Total Fuel Holders, Producers, and Accessories - Ca	*83,125,408*	*11,693,022*	*14.07%*		*71,432,386*	*16.0*	*5.38%*	*4,474,568*
343.00	Prime Movers								
	Lincoln	254,277,560	170,145,382	66 91%	-3%	91,760,504	14 9	2.42%	6,158,423
	Dan River CC	151,071,822	31,661,093	20 96%	-3%	123,942,884	28.7	2.86%	4,318,567
	Lee	59,449,299	20,098,671	33 81%	-3%	41,134,107	24.7	2.80%	1,665,348
	Mill Creek	184,168,769	90,540,679	49.16%	-3%	99,153,153	21 2	2.54%	4,677,036
	Rockingham	78,932,481	18,065,526	22 89%	-1%	61,656,279	20 0	3.91%	3,082,814
	Buck CC	136,707,128	31,866,980	23 31%	-3%	108,941,362	28 0	2.85%	3,890,763
	Lee CC	401,856,604	6,660,547	1.66%	-4%	411,270,321	33 9	3.02%	12,131,868
	Total Prime Movers	*1,266,463,663*	*369,038,878*	*29.14%*		*937,858,611*	*26.1*	*2.84%*	*35,924,819*
343.10	Prime Movers - Rotable Parts								
	Dan River CC	36,034,350	16,521,654	45 85%	40%	5,098,956	1.6	8.84%	3,186,848
	Buck CC	33,675,526	18,930,954	56 22%	40%	1,274,361	1 0	3.78%	1,274,361

Duke Energy Carolinas
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As of December 31, 2018

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	A	B	C	D=C/B	E	F	G	H	I
	Total Prime Movers - Rotable Parts	*69,709,876*	*35,452,608*	*50.86%*		*6,373,318*	*1.4*	*6.40%*	*4,461,209*
344.00	Generators								
	Lincoln	78,931,769	49,880,974	63 20%	-3%	31,418,748	15.1	2.64%	2,080,712
	Dan River CC	238,322,730	43,827,501	18 39%	-3%	201,644,911	30 2	2.80%	6,676,984
	Mill Creek	1,328,564	164,226	12 36%	-3%	1,204,195	23 3	3.89%	51,682
	Equitable Diesel Generators	17,732,022	6,804,831	38 38%	-3%	11,459,152	9 3	6.95%	1,232,167
	Rockingham	217,352,905	107,547,490	49.48%	-1%	111,978,944	19 5	2.64%	5,742,510
	Buck CC	231,708,718	48,685,475	21 01%	-3%	189,974,504	29 3	2.80%	6,483,771
	Lee CC	47,069,175	692,447	1.47%	-4%	48,259,495	35.7	2.87%	1,351,807
	Total Generators	*832,445,882*	*257,602,944*	*30.95%*		*595,939,948*	*25.2*	*2.84%*	*23,619,633*
344.66	Generators - Solar								
	General	28,316,889	8,672,183	30.63%	0%	19,644,706	11 9	5.83%	1,650,816
	Mocksville	29,390,361	2,794,245	9 51%	-10%	29,535,152	19.7	5.10%	1,499,246
	Monroe	112,338,379	6,466,358	5.76%	-10%	117,105,858	20.7	5.04%	5,657,288
	Woodleaf	11,967,613	225,491	1 88%	-9%	12,819,207	21.7	4.94%	590,747
	Total Generators - Solar	*182,013,241*	*18,158,277*	*9.98%*		*179,104,924*	*19.1*	*5.16%*	*9,398,097*
345.00	Accessory Electric Equipment								
	Lincoln	26,598,378	20,172,175	75 84%	-3%	7,224,155	14.1	1.93%	512,351
	Dan River CC	47,241,929	11,887,695	25.16%	-3%	36,771,492	26.4	2.95%	1,392,860
	Lee	723,831	66,793	9 23%	-3%	678,753	24.7	3.80%	27,480
	Mill Creek	16,890,166	8,766,041	51 90%	-3%	8,630,830	19 8	2.58%	435,901
	Rockingham	2,169,822	681,524	31.41%	-1%	1,509,996	19 0	3.66%	79,473
	Buck CC	48,082,448	13,815,768	28.73%	-3%	35,709,153	25.6	2.90%	1,394,889
	Lee CC	63,605,677	1,424,527	2 24%	-4%	64,725,378	31.6	3.22%	2,048,271
	Total Accessory Electric Equipment	*205,312,252*	*56,814,523*	*27.67%*		*155,249,756*	*26.4*	*2.87%*	*5,891,225*
345.66	Accessory Electric Equipment - Solar								
	General	988,895	359,626	36 37%	0%	629,269	13 5	4.71%	46,613
	Mocksville	2,281,560	318,714	13 97%	-10%	2,191,002	19.7	4.87%	111,218
	Monroe	4,229,811	357,735	8.46%	-10%	4,295,057	20.7	4.91%	207,491
	Woodleaf	893,771	24,743	2.77%	-9%	949,467	21.7	4.90%	43,754
	Total Accessory Electric Equipment - Solar	*8,394,037*	*1,060,818*	*12.64%*		*8,064,795*	*19.7*	*4.87%*	*409,076*
346.00	Miscellaneous Power Plant Equipment								
	Lincoln	4,300,888	1,664,305	38.70%	-3%	2,765,609	15 0	4.29%	184,374
	Dan River CC	8,972,751	1,257,137	14 01%	-3%	7,984,796	28 5	3.12%	280,168
	Lee	965,030	80,601	8 35%	-3%	913,379	26 2	3.61%	34,862
	Mill Creek	3,655,505	1,216,822	33 29%	-3%	2,548,348	20.7	3.37%	123,109
	Rockingham	1,530,169	311,168	20 34%	-1%	1,234,302	20.1	4.01%	61,408
	Buck CC	11,405,993	1,899,422	16.65%	-3%	9,848,751	27.6	3.13%	356,839
	Lee CC	7,107,014	102,754	1.45%	-4%	7,288,540	33 8	3.03%	215,637
	Shared Department Plant	79,121	7,291	9 21%	-5%	75,786	32 2	2.97%	2,354
	Total Miscellaneous Power Plant Equipment	*38,016,470*	*6,539,500*	*17.20%*		*32,659,513*	*25.9*	*3.31%*	*1,258,750*
346.66	Miscellaneous Power Plant Equipment - Solar								
	Woodleaf	116,806	0	0 00%	-9%	127,318	23 0	4.74%	5,536
	Total Miscellaneous Power Plant Equipment - Solar	*116,806*	*0*	*0.00%*		*127,318*	*23.0*	*4.74%*	*5,536*
	Total Other Production Plant	**3,153,387,534**	**861,280,989**	**27.31%**		**2,363,997,861**	**24.0**	**3.12%**	**98,435,248**
	Total Production Plant	**22,159,008,308**	**8,685,069,935**	**39.19%**		**14,342,387,535**	**18.5**	**3.49%**	**773,588,469**
	Transmission Plant								
352.00	Structures and Improvements	108,489,173	19,855,502	18 30%	-10%	99,482,588	45 8	2.00%	2,172,109
353.00	Station Equipment	1,849,287,081	575,987,478	31.15%	-20%	1,643,157,019	37 8	2.35%	43,469,762
354.00	Towers and Fixtures	587,791,762	306,917,069	52 22%	-50%	574,770,575	57.1	1.71%	10,066,035
355.00	Poles and Fixtures	558,831,171	107,009,737	19.15%	-30%	619,470,785	41 2	2.69%	15,035,699
356.00	Overhead Conductors and Devices	760,660,329	349,213,187	45 91%	-40%	715,711,273	46 5	2.02%	15,391,640
357.00	Underground Conduit	124,174	86,325	69 52%	0%	37,849	27 9	1.09%	1,357
358.00	Underground Conductors and Devices	5,812,002	1,841,268	31.68%	0%	3,970,734	38.1	1.79%	104,219

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359.00	Roads and Trails	42,238	18,089	42 83%	0%	24,149	39 3	1.45%	614
	Total Transmission Plant	**3,871,037,930**	**1,360,928,655**	**35.16%**		**3,656,624,972**	**42.4**	**2.23%**	**86,241,435**
	Distribution Plant								
361.00	Structures and Improvements	112,827,983	19,186,633	17 01%	-10%	104,924,149	47.4	1.96%	2,213,590
362.00	Station Equipment	1,376,647,877	515,805,874	37.47%	-20%	1,136,171,578	35 2	2.34%	32,277,602
364.00	Poles, Towers, and Fixtures	1,633,135,516	831,677,002	50 93%	-30%	1,291,399,169	37 3	2.12%	34,621,962
365.00	Overhead Conductors and Devices	2,263,640,318	847,176,924	37.43%	-25%	1,982,373,474	44 5	1.97%	44,547,719
366.00	Underground Conduit	203,949,850	118,056,749	57 89%	-10%	106,288,086	41.7	1.25%	2,548,875
367.00	Underground Conductors and Devices	2,040,861,816	810,636,007	39.72%	-20%	1,638,398,172	40 9	1.96%	40,058,635
368.00	Line Transformers	1,518,704,424	631,089,942	41 55%	-10%	1,039,484,925	33 2	2.06%	31,309,787
369.00	Services	1,107,500,564	605,596,107	54.68%	-15%	668,029,542	43 5	1.39%	15,357,001
370.00	Metering Equipment	100,494,301	75,940,296	75 57%	0%	24,554,005	9.4	2.60%	2,612,128
370.01	Meters	68,544,544	(86,031,083)	-125 51%	0%	154,575,628	14.6	15.45%	10,587,372
370.02	Meters - Utility of the Future	438,309,267	38,262,364	8.73%	0%	400,046,903	15 3	5.97%	26,146,856
371.00	Installations on Customers' Premises	914,011,910	269,597,098	29 50%	-5%	690,115,408	32 3	2.34%	21,365,802
373.00	Street Lighting and Signal Systems	243,393,601	97,823,010	40.19%	-10%	169,909,951	28 2	2.48%	6,025,176
	Total Distribution Plant	**12,022,021,973**	**4,774,816,923**	**39.72%**		**9,406,270,989**	**34.9**	**2.24%**	**269,672,503**
	General Plant								
390.00	Structures and Improvements	675,049,911	152,884,893	22.65%	-10%	589,670,009	28 5	3.06%	20,690,176
391.00	Office Furniture and Equipment	48,878,029	16,046,750	32 83%	0%	32,831,279	10.1	6.65%	3,250,622
391.10	Office Furniture and Equipment - EDP	113,710,528	43,215,000	38 00%	0%	70,495,528	5 0	12.40%	14,099,106
392.00	Transportation Equipment								
	Passenger Cars and Station Wagon	94,915	73,220	77.14%	10%	12,203	3 5	3.67%	3,487
	Light Trucks	2,419,475	1,475,465	60 98%	10%	702,063	4.7	6.17%	149,375
	Medium Trucks	438,551	184,742	42.13%	10%	209,953	6 5	7.37%	32,301
	Heavy Trucks	1,304,835	1,174,352	90 00%	10%	(1)	0 0	0.00%	0
	Heavy Trucks / Power Equipped	2,801,236	2,521,112	90 00%	10%	0	0 0	0.00%	0
	Tractors - Gasoline and Diesel	65,897	59,307	90 00%	10%	0	0 0	0.00%	0
	Trailers	5,511,869	3,398,681	61.66%	10%	1,562,001	14 9	1.90%	104,832
	Total Transportation Equipment	*12,636,777*	*8,886,879*	*70.33%*		*2,486,221*	*8.6*	*2.29%*	*289,995*
393.00	Stores Equipment	14,298,929	2,387,260	16.70%	0%	11,911,669	16.7	4.99%	713,274
394.00	Tools, Shop, and Garage Equipment	104,793,596	35,105,300	33 50%	0%	69,688,296	13 3	5.00%	5,239,721
395.00	Laboratory Equipment	5,877,459	3,345,440	56 92%	0%	2,532,019	6 5	6.63%	389,541
396.00	Power Operated Equipment								
	Mobile Cranes	509,129	89,886	17.65%	10%	368,330	18 5	3.91%	19,910
	Miscellaneous Non-Highway Equipment	1,020,976	918,878	90 00%	10%	0	0 0	0.00%	0
	Miscellaneous Equipment	9,797,880	9,117,180	93 05%	10%	(299,088)	0 0	0.00%	0
	Total Power Operated Equipment	*11,327,986*	*10,125,944*	*89.39%*		*69,243*	*3.5*	*0.18%*	*19,910*
397.00	Communication Equipment	153,219,179	76,419,455	49 88%	0%	76,799,724	5 0	10.02%	15,359,945
398.00	Miscellaneous Equipment	10,275,692	1,808,690	17.60%	0%	8,467,002	16 5	4.99%	513,152
	Total General Plant	**1,150,068,086**	**350,225,611**	**30.45%**		**864,950,990**	**14.3**	**5.27%**	**60,565,440**
	Depreciable Land Rights								
310.00	Rights of Way								
	Marshall	452,636	452,636	100 00%	0%	0	0 0	0.00%	0
	Belews Creek	1,543,811	1,547,854	100 26%	0%	(4,043)	0 0	0.00%	0
	Lee	3,106	3,106	100 00%	0%	0	0 0	0.00%	0
	Allen	4,303	4,303	100 00%	0%	0	0 0	0.00%	0
	Total Account 310	*2,003,856*	*2,007,899*	*100.20%*		*(4,043)*	*0.0*	*0.00%*	*0*
320.00	Rights of Way								
	Oconee	425,003	325,108	76 50%	0%	99,895	15 3	1.54%	6,529

Duke Energy Carolinas
Table 4: Calculation of Depreciation Rates
As of December 31, 2018

Account	Description	12/31/18 Investment	12/31/18 Book Reserve	Percent Reserve	Future Net Salvage Percent	Net Plant to be Recovered	Remaining Life	Total Annual Rate	Total Annual Accrual
	A	B	C	D=C/B	E	F	G	H	I
	McGuire	74,882	45,610	60 91%	0%	29,272	23 9	1.64%	1,225
	Catawba	456,657	248,863	54 50%	0%	207,794	24.7	1.84%	8,413
	Total Account 320	*956,542*	*619,581*	*64.77%*		*336,961*	*20.8*	*1.69%*	*16,167*
330.00	Rights of Way								
	Cowans Ford	6,881,547	5,329,789	77.45%	0%	1,551,758	34 2	0.66%	45,373
	Bad Creek	723,692	379,185	52.40%	0%	344,507	39 0	1.22%	8,834
	Jocassee	436,179	336,713	77 20%	0%	99,466	27 0	0.84%	3,684
	Keowee	12,071,075	9,761,915	80 87%	0%	2,309,160	26 8	0.71%	86,163
	Fishing Creek	35,796	35,796	100 00%	0%	0	0 0	0.00%	0
	Bridgewater	393,705	393,705	100 00%	0%	0	0 0	0.00%	0
	Gaston Shoals	16,648	16,648	100 00%	0%	0	0 0	0.00%	0
	Lookout Shoals	7,426	7,426	100 00%	0%	0	0 0	0.00%	0
	Mountain Island	323,913	323,913	100 00%	0%	0	0 0	0.00%	0
	99 Islands	17,102	17,102	100 00%	0%	0	0 0	0.00%	0
	Oxford	695,790	682,133	98 04%	0%	13,657	24 9	0.08%	548
	Rhodhiss	199,929	199,525	99 80%	0%	404	23 8	0.01%	17
	Tuxedo	245,404	245,404	100 00%	0%	0	0 0	0.00%	0
	Wateree	204,111	204,111	100 00%	0%	0	0 0	0.00%	0
	Wylie	1,189,441	1,189,441	100 00%	0%	0	0 0	0.00%	0
	NPL Bear Creek	435	429	98.62%	0%	6	0 0	0.00%	0
	NPL Franklin	12,423	12,423	100 00%	0%	0	0 0	0.00%	0
	NPL Nantahala	80,304	80,304	100 00%	0%	0	0 0	0.00%	0
	NPL Queens Creek	5,782	5,782	100 00%	0%	0	0 0	0.00%	0
	NPL Tennessee Creek	711	711	100 00%	0%	0	0 0	0.00%	0
	NPL Thorpe	47,127	47,127	100 00%	0%	0	0 0	0.00%	0
	NPL Tuckasegee	1,518	1,518	100 00%	0%	0	0 0	0.00%	0
	Total Account 330	*23,590,058*	*19,271,100*	*81.69%*		*4,318,958*	*29.9*	*0.61%*	*144,619*
340.00	Rights of Way								
	Dan River CC	7,693	4,126	53.63%	0%	3,567	9 3	4.99%	384
	Total Account 340	*7,693*	*4,126*	*53.63%*		*3,567*	*9.3*	*4.99%*	*384*
350.00	Rights of Way	163,057,492	77,455,417	47 50%	0%	85,602,075	51 2	1.03%	1,671,916
360.00	Rights of Way	8,830,280	1,619,402	18 34%	0%	7,210,878	65.4	1.25%	110,258
360.20	Land Rights	561,560	272,504	48 53%	0%	289,056	37 8	1.36%	7,647
389.00	Rights of Way	550,127	230,404	41 88%	0%	319,723	38.7	1.50%	8,262
389.20	Land Rights	165	76	46 06%	0%	89	44 5	1.21%	2
	Total Depreciable Land Rights	**199,557,774**	**101,480,509**	**50.85%**		**98,077,265**	**50.1**	**0.98%**	**1,959,253**

Duke Energy Carolinas
Table 5: Current and Proposed Parameters
As of December 31, 2018

		Current				Company Proposed					Public Staff Proposed				
Account	Description	AYFR	Proj Life	Iowa Curve Shape	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Steam Production Plant														
311.00	Structures and Improvements														
	Marshall	06-2034	100	S1	-5%	06-2034	100	S0.5	15.4	-5%	06-2034	100	S0 5	15.4	-5%
	Belews Creek	06-2037	100	S1	-7%	06-2037	100	S0.5	18.1	-7%	06-2037	100	S0 5	18.1	-6%
	Lee	06-2030	100	S1	-11%	06-2030	100	S0.5	11.4	-11%	06-2030	100	S0 5	11.4	-10%
	Cliffside 5 (J.E. Rogers)	06-2032	100	S1	-5%	06-2026	100	S0.5	7.4	-4%	06-2032	100	S0 5	13.3	-4%
	Cliffside 6 (J.E. Rogers)	06-2048	100	S1	-6%	06-2048	100	S0.5	28.7	-6%	06-2048	100	S0 5	28.7	-6%
	Cliffside 5 and 6 Common (J.E. Rogers)	06-2048	100	S1	-5%	06-2048	100	S0.5	28.9	-5%	06-2048	100	S0 5	28.9	-4%
	Allen	06-2026	100	S1	-5%	06-2024	100	S0.5	5.5	-4%	06-2026	100	S0 5	7.5	-4%
	Shared Department Plant	06-2048	100	S1	-20%	06-2048	100	S0.5	28.8	-20%	06-2048	100	S0 5	28.8	-20%
	Total Structures and Improvements														
311.01	Structures and Improvements - Capital Lease														
	Cliffside 5 and 6 Common (J.E. Rogers)					10-2038	100	S0.5	19.8	0%	10-2038	100	S0 5	19.8	0%
	Total Structures and Improvements - Capital Lease														
312.00	Boiler Plant Equipment														
	Marshall	06-2034	50	R2	-5%	06-2034	47	R2	14.8	-5%	06-2034	47	R2	14.8	-5%
	Belews Creek	06-2037	50	R2	-7%	06-2037	47	R2	17.4	-7%	06-2037	47	R2	17.4	-6%
	Lee	06-2030	50	R2	-11%	06-2030	47	R2	11.1	-11%	06-2030	47	R2	11.1	-10%
	Cliffside 5 (J.E. Rogers)	06-2032	50	R2	-5%	06-2026	47	R2	7.4	-4%	06-2032	47	R2	13.0	-4%
	Cliffside 6 (J.E. Rogers)	06-2048	50	R2	-6%	06-2048	47	R2	26.8	-6%	06-2048	47	R2	26.8	-6%
	Cliffside 5 and 6 Common (J.E. Rogers)	06-2048	50	R2	-5%	06-2048	47	R2	26.8	-5%	06-2048	47	R2	26.8	-4%
	Allen	06-2026	50	R2	-5%	06-2024	47	R2	5.4	-4%	06-2026	47	R2	7.3	-4%
	Shared Department Plant	06-2048	50	R2	-15%	06-2048	47	R2	26.8	-15%	06-2048	47	R2	26.8	-15%
	Total Boiler Plant Equipment														
314.00	Turbogenerator Units														
	Marshall	06-2034	55	R1.5	-5%	06-2034	50	R2	14.7	-5%	06-2034	50	R2	14.7	-5%
	Belews Creek	06-2037	55	R1.5	-7%	06-2037	50	R2	17.4	-7%	06-2037	50	R2	17.4	-6%
	Lee	06-2030	55	R1.5	-11%	06-2030	50	R2	8.8	-11%	06-2030	50	R2	8.8	-10%
	Cliffside 5 (J.E. Rogers)	06-2032	55	R1.5	-5%	06-2026	50	R2	7.2	-4%	06-2032	50	R2	12.7	-4%
	Cliffside 6 (J.E. Rogers)	06-2048	55	R1.5	-6%	06-2048	50	R2	27.1	-6%	06-2048	50	R2	27.1	-6%
	Allen	06-2026	55	R1.5	-5%	06-2024	50	R2	5.4	-4%	06-2026	50	R2	7.4	-4%
	Shared Department Plant	06-2048	55	R1.5	-5%	06-2048	50	R2	27.1	-5%	06-2048	50	R2	27.1	-5%
	Total Turbogenerator Units														
315.00	Accessory Electric Equipment														
	Marshall	06-2034	55	R1.5	-5%	06-2034	60	S1	14.6	-5%	06-2034	60	S1	14.6	-5%
	Belews Creek	06-2037	55	R1.5	-7%	06-2037	60	S1	17.4	-7%	06-2037	60	S1	17.4	-6%
	Lee	06-2030	55	R1.5	-11%	06-2030	60	S1	10.9	-11%	06-2030	60	S1	10.9	-10%
	Cliffside 5 (J.E. Rogers)	06-2032	55	R1.5	-5%	06-2026	60	S1	7.3	-4%	06-2032	60	S1	12.7	-4%
	Cliffside 6 (J.E. Rogers)	06-2048	55	R1.5	-6%	06-2048	60	S1	27.8	-6%	06-2048	60	S1	27.8	-6%
	Cliffside 5 and 6 Common (J.E. Rogers)					06-2048	60	S1	28.3	-5%	06-2048	60	S1	28.3	-4%
	Allen	06-2026	55	R1.5	-5%	06-2024	60	S1	5.4	-4%	06-2026	60	S1	7.3	-4%
	Total Accessory Electric Equipment														
316.00	Miscellaneous Power Plant Equipment														
	Marshall	06-2034	50	R2.5	-5%	06-2034	45	R2.5	14.7	-5%	06-2034	45	R2.5	14.7	-5%
	Belews Creek	06-2037	50	R2.5	-7%	06-2037	45	R2.5	17.6	-7%	06-2037	45	R2.5	17.6	-6%
	Lee	06-2030	50	R2.5	-11%	06-2030	45	R2.5	11.0	-11%	06-2030	45	R2.5	11.0	-10%
	Cliffside 5 (J.E. Rogers)	06-2032	50	R2.5	-5%	06-2026	45	R2.5	7.4	-4%	06-2032	45	R2.5	13.0	-4%
	Cliffside 6 (J.E. Rogers)	06-2048	50	R2.5	-6%	06-2048	45	R2.5	27.1	-6%	06-2048	45	R2.5	27.1	-6%
	Cliffside 5 and 6 Common (J.E. Rogers)	06-2048	50	R2.5	-5%	06-2048	45	R2.5	27.7	-5%	06-2048	45	R2.5	27.7	-4%
	Allen	06-2026	50	R2.5	-5%	06-2024	45	R2.5	5.4	-4%	06-2026	45	R2.5	7.4	-4%
	Shared Department Plant	06-2048	50	R2.5	-5%	06-2048	45	R2.5	27.7	-5%	06-2048	45	R2.5	27.7	-5%
	Total Miscellaneous Power Plant Equipment														
	Total Steam Production Plant														
	Nuclear Production Plant														
321.00	Structures and Improvements														

Duke Energy Carolinas
Table 5: Current and Proposed Parameters
As of December 31, 2018

		Current				Company Proposed					Public Staff Proposed				
Account	Description	AYFR	Proj Life	Iowa Curve Shape	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Oconee	07-2034	55	S1 5	-1%	07-2034	55	S1.5	15.1	-1%	07-2034	55	S1 5	15.1	-1%
	McGuire	03-2043	55	S1 5	-4%	03-2043	55	S1.5	20.6	-3%	03-2043	55	S1 5	20.6	-3%
	Catawba	12-2043	55	S1 5	-4%	12-2043	55	S1.5	21.1	-3%	12-2043	55	S1 5	21.1	-3%
	Total Structures and Improvements														
322.00	Reactor Plant Equipment														
	Oconee	07-2034	50	R2	-1%	07-2034	45	R2	14.8	-1%	07-2034	45	R2	14.8	-1%
	McGuire	03-2043	50	R2	-4%	03-2043	45	R2	19.5	-3%	03-2043	45	R2	19.5	-3%
	Catawba	12-2043	50	R2	-4%	12-2043	45	R2	19.4	-3%	12-2043	45	R2	19.4	-3%
	Total Reactor Plant Equipment														
323.00	Turbogenerator Units														
	Oconee	07-2034	50	R1.5	-1%	07-2034	45	R2	14.4	-1%	07-2034	45	R2	14.4	-1%
	McGuire	03-2043	50	R1.5	-4%	03-2043	45	R2	21.1	-3%	03-2043	45	R2	21.1	-3%
	Catawba	12-2043	50	R1.5	-4%	12-2043	45	R2	18.6	-3%	12-2043	45	R2	18.6	-3%
	Total Turbogenerator Units														
324.00	Accessory Electric Equipment														
	Oconee	07-2034	50	R2.5	-1%	07-2034	50	R2.5	15.2	-1%	07-2034	50	R2.5	15.2	-1%
	McGuire	03-2043	50	R2.5	-4%	03-2043	50	R2.5	20.7	-3%	03-2043	50	R2.5	20.7	-3%
	Catawba	12-2043	50	R2.5	-4%	12-2043	50	R2.5	21.3	-3%	12-2043	50	R2.5	21.3	-3%
	Total Accessory Electric Equipment														
325.00	Miscellaneous Power Plant Equipment														
	Oconee	07-2034	50	R2.5	-1%	07-2034	50	R2.5	15.0	-1%	07-2034	50	R2.5	15.0	-1%
	McGuire	03-2043	50	R2.5	-4%	03-2043	50	R2.5	21.8	-3%	03-2043	50	R2.5	21.8	-3%
	Catawba	12-2043	50	R2.5	-4%	12-2043	50	R2.5	22.2	-3%	12-2043	50	R2.5	22.2	-3%
	Shared Department Plant	12-2043	50	R2.5	-2%	12-2043	50	R2.5	23.6	-2%	12-2043	50	R2.5	23.6	-2%
	Total Miscellaneous Power Plant Equipment														
	Total Nuclear Production Plant														
	Hydarulic Production Plant														
331.00	Structures and Improvements														
	Cowans Ford	06-2055	75	S2	-13%	06-2055	75	S2	32.0	-11%	06-2055	75	S2	32.0	-11%
	Bad Creek	06-2058	75	S2	-6%	06-2058	75	S2	34.3	-6%	06-2058	75	S2	34.3	-6%
	Jocassee	06-2046	75	S2	-4%	06-2046	75	S2	25.8	-5%	06-2046	75	S2	25.8	-4%
	Keowee	06-2046	75	S2	-5%	06-2046	75	S2	27.1	-5%	06-2046	75	S2	27.1	-5%
	Fishing Creek	06-2055	75	S2	-16%	06-2055	75	S2	34.3	-17%	06-2055	75	S2	34.3	-16%
	Cedar Creek	06-2055	75	S2	-18%	06-2055	75	S2	34.5	-17%	06-2055	75	S2	34.5	-15%
	Bridgewater	06-2055	75	S2	-4%	06-2055	75	S2	35.6	-4%	06-2055	75	S2	35.6	-3%
	Gaston Shoals	06-2036	75	S2	-15%	06-2036	75	S2	17.4	-17%	06-2036	75	S2	17.4	-15%
	Lookout Shoals	06-2055	75	S2	-22%	06-2055	75	S2	33.7	-23%	06-2055	75	S2	33.7	-21%
	Mountain Island	06-2055	75	S2	-23%	06-2055	75	S2	35.1	-24%	06-2055	75	S2	35.1	-22%
	99 Islands	06-2036	75	S2	-18%	06-2036	75	S2	17.4	-19%	06-2036	75	S2	17.4	-17%
	Oxford	06-2055	75	S2	-10%	06-2055	75	S2	34.0	-8%	06-2055	75	S2	34.0	-7%
	Rhodhiss	06-2055	75	S2	-15%	06-2055	75	S2	34.3	-17%	06-2055	75	S2	34.3	-16%
	Tuxedo	06-2041	75	S2	-17%	06-2041	75	S2	22.3	-19%	06-2041	75	S2	22.3	-17%
	Wateree	06-2055	75	S2	-16%	06-2055	75	S2	33.6	-16%	06-2055	75	S2	33.6	-15%
	Wylie	06-2055	75	S2	-16%	06-2055	75	S2	33.9	-15%	06-2055	75	S2	33.9	-14%
	Great Falls	06-2055	75	S2	-97%	06-2055	75	S2	33.8	-108%	06-2055	75	S2	33.8	-100%
	Dearborn	06-2055	75	S2	-22%	06-2055	75	S2	33.3	-25%	06-2055	75	S2	33.3	-23%
	NPL Bear Creek	06-2041	75	S2	-29%	06-2041	75	S2	22.3	-11%	06-2041	75	S2	22.3	-10%
	NPL Bryson	06-2041	75	S2	-27%	06-2041	75	S2	16.5	-29%	06-2041	75	S2	16.5	-27%
	NPL Cedar Cliff	06-2041	75	S2	-22%	06-2041	75	S2	22.4	-24%	06-2041	75	S2	22.4	-22%
	NPL Franklin	06-2041	75	S2	-20%	06-2041	75	S2	22.4	-22%	06-2041	75	S2	22.4	-21%
	NPL Mission	06-2041	75	S2	-31%	06-2041	75	S2	22.1	-34%	06-2041	75	S2	22.1	-31%
	NPL Nantahala	06-2042	75	S2	-13%	06-2042	75	S2	23.1	-11%	06-2042	75	S2	23.1	-11%
	NPL Queens Creek	06-2032	75	S2	-73%	06-2032	75	S2	13.4	-79%	06-2032	75	S2	13.4	-72%
	NPL Tennessee Creek	06-2041	75	S2	-18%	06-2041	75	S2	21.8	-20%	06-2041	75	S2	21.8	-18%
	NPL Thorpe	06-2041	75	S2	-19%	06-2041	75	S2	22.0	-18%	06-2041	75	S2	22.0	-17%
	NPL Tuckasegee	06-2041	75	S2	-31%	06-2041	75	S2	22.4	-33%	06-2041	75	S2	22.4	-30%
	Shared Department Plant	06-2042	75	S2	-20%	06-2042	75	S2	23.2	-25%	06-2042	75	S2	23.2	-25%

Duke Energy Carolinas
Table 5: Current and Proposed Parameters
As of December 31, 2018

		Current				Company Proposed					Public Staff Proposed				
Account	Description	AYFR	Proj Life	Iowa Curve Shape	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Total Structures and Improvements														
332.00	Reservoirs, Dams, and Waterways														
	Cowans Ford	06-2055	100	S2 5	-13%	06-2055	100	S2.5	35.4	-11%	06-2055	100	S2 5	35.4	-11%
	Bad Creek	06-2058	100	S2 5	-6%	06-2058	100	S2.5	38.0	-6%	06-2058	100	S2 5	38.0	-6%
	Jocassee	06-2046	100	S2 5	-4%	06-2046	100	S2.5	26.2	-5%	06-2046	100	S2 5	26.2	-4%
	Keowee	06-2046	100	S2 5	-5%	06-2046	100	S2.5	25.8	-5%	06-2046	100	S2 5	25.8	-5%
	Fishing Creek	06-2055	100	S2 5	-16%	06-2055	100	S2.5	35.9	-17%	06-2055	100	S2 5	35.9	-16%
	Cedar Creek	06-2055	100	S2 5	-18%	06-2055	100	S2.5	36.2	-17%	06-2055	100	S2 5	36.2	-15%
	Bridgewater	06-2055	100	S2 5	-4%	06-2055	100	S2.5	36.3	-4%	06-2055	100	S2 5	36.3	-3%
	Gaston Shoals	06-2036	100	S2 5	-15%	06-2036	100	S2.5	17.5	-17%	06-2036	100	S2 5	17.5	-15%
	Lookout Shoals	06-2055	100	S2 5	-22%	06-2055	100	S2.5	35.8	-23%	06-2055	100	S2 5	35.8	-21%
	Mountain Island	06-2055	100	S2 5	-23%	06-2055	100	S2.5	35.1	-24%	06-2055	100	S2 5	35.1	-22%
	99 Islands	06-2036	100	S2 5	-18%	06-2036	100	S2.5	17.5	-19%	06-2036	100	S2 5	17.5	-17%
	Oxford	06-2055	100	S2 5	-10%	06-2055	100	S2.5	36.2	-8%	06-2055	100	S2 5	36.2	-7%
	Rhodhiss	06-2055	100	S2 5	-15%	06-2055	100	S2.5	35.8	-17%	06-2055	100	S2 5	35.8	-16%
	Tuxedo	06-2041	100	S2 5	-17%	06-2041	100	S2.5	22.3	-19%	06-2041	100	S2 5	22.3	-17%
	Wateree	06-2055	100	S2 5	-16%	06-2055	100	S2.5	35.8	-16%	06-2055	100	S2 5	35.8	-15%
	Wylie	06-2055	100	S2 5	-16%	06-2055	100	S2.5	36.1	-15%	06-2055	100	S2 5	36.1	-14%
	Great Falls	06-2055	100	S2 5	-97%	06-2055	100	S2.5	35.2	-108%	06-2055	100	S2 5	35.2	-100%
	Dearborn	06-2055	100	S2 5	-22%	06-2055	100	S2.5	35.6	-25%	06-2055	100	S2 5	35.6	-23%
	NPL Bear Creek	06-2041	100	S2 5	-29%	06-2041	100	S2.5	22.2	-11%	06-2041	100	S2 5	22.2	-10%
	NPL Bryson	06-2041	100	S2 5	-27%	06-2041	100	S2.5	22.5	-29%	06-2041	100	S2 5	22.5	-27%
	NPL Cedar Cliff	06-2041	100	S2 5	-22%	06-2041	100	S2.5	21.9	-24%	06-2041	100	S2 5	21.9	-22%
	NPL Franklin	06-2041	100	S2 5	-20%	06-2041	100	S2.5	22.5	-22%	06-2041	100	S2 5	22.5	-21%
	NPL Mission	06-2041	100	S2 5	-31%	06-2041	100	S2.5	22.4	-34%	06-2041	100	S2 5	22.4	-31%
	NPL Nantahala	06-2042	100	S2 5	-13%	06-2042	100	S2.5	23.2	-11%	06-2042	100	S2 5	23.2	-11%
	NPL Queens Creek	06-2032	100	S2 5	-73%	06-2032	100	S2.5	13.5	-79%	06-2032	100	S2 5	13.5	-72%
	NPL Tennessee Creek	06-2041	100	S2 5	-18%	06-2041	100	S2.5	22.0	-20%	06-2041	100	S2 5	22.0	-18%
	NPL Thorpe	06-2041	100	S2 5	-19%	06-2041	100	S2.5	18.8	-18%	06-2041	100	S2 5	18.8	-17%
	NPL Tuckasegee	06-2041	100	S2 5	-31%	06-2041	100	S2.5	19.7	-33%	06-2041	100	S2 5	19.7	-30%
	Shared Department Plant	06-2042	100	S2 5	-20%	06-2042	100	S2.5	23.4	-25%	06-2042	100	S2 5	23.4	-25%
	Total Reservoirs, Dams, and Waterways														
333.00	Water Wheels, Turbines, and Generators														
	Cowans Ford	06-2055	70	S1	-13%	06-2055	65	S1	33.0	-11%	06-2055	65	S1	33.0	-11%
	Bad Creek	06-2058	70	S1	-6%	06-2058	65	S1	31.5	-6%	06-2058	65	S1	31.5	-6%
	Jocassee	06-2046	70	S1	-4%	06-2046	65	S1	25.3	-5%	06-2046	65	S1	25.3	-4%
	Keowee	06-2046	70	S1	-5%	06-2046	65	S1	26.1	-5%	06-2046	65	S1	26.1	-5%
	Fishing Creek	06-2055	70	S1	-16%	06-2055	65	S1	31.2	-17%	06-2055	65	S1	31.2	-16%
	Cedar Creek	06-2055	70	S1	-18%	06-2055	65	S1	31.2	-17%	06-2055	65	S1	31.2	-15%
	Bridgewater	06-2055	70	S1	-4%	06-2055	65	S1	33.7	-4%	06-2055	65	S1	33.7	-3%
	Gaston Shoals	06-2036	70	S1	-15%	06-2036	65	S1	17.2	-17%	06-2036	65	S1	17.2	-15%
	Lookout Shoals	06-2055	70	S1	-22%	06-2055	65	S1	31.6	-23%	06-2055	65	S1	31.6	-21%
	Mountain Island	06-2055	70	S1	-23%	06-2055	65	S1	32.2	-24%	06-2055	65	S1	32.2	-22%
	99 Islands	06-2036	70	S1	-18%	06-2036	65	S1	17.0	-19%	06-2036	65	S1	17.0	-17%
	Oxford	06-2055	70	S1	-10%	06-2055	65	S1	33.2	-8%	06-2055	65	S1	33.2	-7%
	Rhodhiss	06-2055	70	S1	-15%	06-2055	65	S1	33.2	-17%	06-2055	65	S1	33.2	-16%
	Tuxedo	06-2041	70	S1	-17%	06-2041	65	S1	21.7	-19%	06-2041	65	S1	21.7	-17%
	Wateree	06-2055	70	S1	-16%	06-2055	65	S1	31.6	-16%	06-2055	65	S1	31.6	-15%
	Wylie	06-2055	70	S1	-16%	06-2055	65	S1	30.7	-15%	06-2055	65	S1	30.7	-14%
	Great Falls	06-2055	70	S1	-97%	06-2055	65	S1	30.3	-108%	06-2055	65	S1	30.3	-100%
	Dearborn	06-2055	70	S1	-22%	06-2055	65	S1	31.3	-25%	06-2055	65	S1	31.3	-23%
	NPL Bear Creek	06-2041	70	S1	-29%	06-2041	65	S1	22.1	-11%	06-2041	65	S1	22.1	-10%
	NPL Bryson	06-2041	70	S1	-27%	06-2041	65	S1	22.0	-29%	06-2041	65	S1	22.0	-27%
	NPL Cedar Cliff	06-2041	70	S1	-22%	06-2041	65	S1	21.8	-24%	06-2041	65	S1	21.8	-22%
	NPL Franklin	06-2041	70	S1	-20%	06-2041	65	S1	21.8	-22%	06-2041	65	S1	21.8	-21%
	NPL Mission	06-2041	70	S1	-31%	06-2041	65	S1	22.0	-34%	06-2041	65	S1	22.0	-31%
	NPL Nantahala	06-2042	70	S1	-13%	06-2042	65	S1	21.8	-11%	06-2042	65	S1	21.8	-11%
	NPL Queens Creek	06-2032	70	S1	-73%	06-2032	65	S1	11.1	-79%	06-2032	65	S1	11.1	-72%
	NPL Tennessee Creek	06-2041	70	S1	-18%	06-2041	65	S1	21.7	-20%	06-2041	65	S1	21.7	-18%
	NPL Thorpe	06-2041	70	S1	-19%	06-2041	65	S1	20.2	-18%	06-2041	65	S1	20.2	-17%
	NPL Tuckasegee	06-2041	70	S1	-31%	06-2041	65	S1	20.7	-33%	06-2041	65	S1	20.7	-30%
	Shared Department Plant	06-2042	70	S1	-25%	06-2042	65	S1	22.7	-25%	06-2042	65	S1	22.7	-25%

Duke Energy Carolinas
Table 5: Current and Proposed Parameters
As of December 31, 2018

		Current				Company Proposed					Public Staff Proposed				
Account	Description	AYFR	Proj Life	Iowa Curve Shape	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Total Water Wheels, Turbines, and Generators														
334.00	Accessory Electric Equipment														
	Cowans Ford	06-2055	65	S1	-13%	06-2055	65	S1	32.2	-11%	06-2055	65	S1	32.2	-11%
	Bad Creek	06-2058	65	S1	-6%	06-2058	65	S1	31.4	-6%	06-2058	65	S1	31.4	-6%
	Jocassee	06-2046	65	S1	-4%	06-2046	65	S1	24.8	-5%	06-2046	65	S1	24.8	-4%
	Keowee	06-2046	65	S1	-5%	06-2046	65	S1	25.4	-5%	06-2046	65	S1	25.4	-5%
	Fishing Creek	06-2055	65	S1	-16%	06-2055	65	S1	31.2	-17%	06-2055	65	S1	31.2	-16%
	Cedar Creek	06-2055	65	S1	-18%	06-2055	65	S1	31.7	-17%	06-2055	65	S1	31.7	-15%
	Bridgewater	06-2055	65	S1	-4%	06-2055	65	S1	33.7	-4%	06-2055	65	S1	33.7	-3%
	Gaston Shoals	06-2036	65	S1	-15%	06-2036	65	S1	16.5	-17%	06-2036	65	S1	16.5	-15%
	Lookout Shoals	06-2055	65	S1	-22%	06-2055	65	S1	30.4	-23%	06-2055	65	S1	30.4	-21%
	Mountain Island	06-2055	65	S1	-23%	06-2055	65	S1	31.6	-24%	06-2055	65	S1	31.6	-22%
	99 Islands	06-2036	65	S1	-18%	06-2036	65	S1	16.6	-19%	06-2036	65	S1	16.6	-17%
	Oxford	06-2055	65	S1	-10%	06-2055	65	S1	31.5	-8%	06-2055	65	S1	31.5	-7%
	Rhodhiss	06-2055	65	S1	-15%	06-2055	65	S1	30.9	-17%	06-2055	65	S1	30.9	-16%
	Tuxedo	06-2041	65	S1	-17%	06-2041	65	S1	21.2	-19%	06-2041	65	S1	21.2	-17%
	Wateree	06-2055	65	S1	-16%	06-2055	65	S1	32.2	-16%	06-2055	65	S1	32.2	-15%
	Wylie	06-2055	65	S1	-16%	06-2055	65	S1	31.1	-15%	06-2055	65	S1	31.1	-14%
	Great Falls	06-2055	65	S1	-97%	06-2055	65	S1	25.7	-108%	06-2055	65	S1	25.7	-100%
	Dearborn	06-2055	65	S1	-22%	06-2055	65	S1	31.2	-25%	06-2055	65	S1	31.2	-23%
	NPL Bear Creek	06-2041	65	S1	-29%	06-2041	65	S1	19.6	-11%	06-2041	65	S1	19.6	-10%
	NPL Bryson	06-2041	65	S1	-27%	06-2041	65	S1	19.4	-29%	06-2041	65	S1	19.4	-27%
	NPL Cedar Cliff	06-2041	65	S1	-22%	06-2041	65	S1	20.2	-24%	06-2041	65	S1	20.2	-22%
	NPL Franklin	06-2041	65	S1	-20%	06-2041	65	S1	21.2	-22%	06-2041	65	S1	21.2	-21%
	NPL Mission	06-2041	65	S1	-31%	06-2041	65	S1	19.8	-34%	06-2041	65	S1	19.8	-31%
	NPL Nantahala	06-2042	65	S1	-13%	06-2042	65	S1	22.3	-11%	06-2042	65	S1	22.3	-11%
	NPL Queens Creek	06-2032	65	S1	-73%	06-2032	65	S1	12.9	-79%	06-2032	65	S1	12.9	-72%
	NPL Tennessee Creek	06-2041	65	S1	-18%	06-2041	65	S1	20.2	-20%	06-2041	65	S1	20.2	-18%
	NPL Thorpe	06-2041	65	S1	-19%	06-2041	65	S1	20.9	-18%	06-2041	65	S1	20.9	-17%
	NPL Tuckasegee	06-2041	65	S1	-31%	06-2041	65	S1	20.5	-33%	06-2041	65	S1	20.5	-30%
	Total Accessory Electric Equipment														
335.00	Miscellaneous Power Plant Equipment														
	Cowans Ford	06-2055	55	R2	-13%	06-2055	55	R2	31.4	-11%	06-2055	55	R2	31.4	-11%
	Bad Creek	06-2058	55	R2	-6%	06-2058	55	R2	30.2	-6%	06-2058	55	R2	30.2	-6%
	Jocassee	06-2046	55	R2	-4%	06-2046	55	R2	24.1	-5%	06-2046	55	R2	24.1	-4%
	Keowee	06-2046	55	R2	-5%	06-2046	55	R2	21.9	-5%	06-2046	55	R2	21.9	-5%
	Fishing Creek	06-2055	55	R2	-16%	06-2055	55	R2	31.5	-17%	06-2055	55	R2	31.5	-16%
	Cedar Creek	06-2055	55	R2	-18%	06-2055	55	R2	32.5	-17%	06-2055	55	R2	32.5	-15%
	Bridgewater	06-2055	55	R2	-4%	06-2055	55	R2	32.9	-4%	06-2055	55	R2	32.9	-3%
	Gaston Shoals	06-2036	55	R2	-15%	06-2036	55	R2	16.9	-17%	06-2036	55	R2	16.9	-15%
	Lookout Shoals	06-2055	55	R2	-22%	06-2055	55	R2	31.0	-23%	06-2055	55	R2	31.0	-21%
	Mountain Island	06-2055	55	R2	-23%	06-2055	55	R2	31.2	-24%	06-2055	55	R2	31.2	-22%
	99 Islands	06-2036	55	R2	-18%	06-2036	55	R2	16.7	-19%	06-2036	55	R2	16.7	-17%
	Oxford	06-2055	55	R2	-10%	06-2055	55	R2	31.8	-8%	06-2055	55	R2	31.8	-7%
	Rhodhiss	06-2055	55	R2	-15%	06-2055	55	R2	30.8	-17%	06-2055	55	R2	30.8	-16%
	Tuxedo	06-2041	55	R2	-17%	06-2041	55	R2	20.8	-19%	06-2041	55	R2	20.8	-17%
	Wateree	06-2055	55	R2	-16%	06-2055	55	R2	31.8	-16%	06-2055	55	R2	31.8	-15%
	Wylie	06-2055	55	R2	-16%	06-2055	55	R2	32.1	-15%	06-2055	55	R2	32.1	-14%
	Great Falls	06-2055	55	R2	-97%	06-2055	55	R2	31.6	-108%	06-2055	55	R2	31.6	-100%
	Dearborn	06-2055	55	R2	-22%	06-2055	55	R2	30.1	-25%	06-2055	55	R2	30.1	-23%
	NPL Bear Creek	06-2041	55	R2	-29%	06-2041	55	R2	21.5	-11%	06-2041	55	R2	21.5	-10%
	NPL Bryson	06-2041	55	R2	-27%	06-2041	55	R2	21.5	-29%	06-2041	55	R2	21.5	-27%
	NPL Cedar Cliff	06-2041	55	R2	-22%	06-2041	55	R2	21.5	-24%	06-2041	55	R2	21.5	-22%
	NPL Franklin	06-2041	55	R2	-20%	06-2041	55	R2	21.3	-22%	06-2041	55	R2	21.3	-21%
	NPL Mission	06-2041	55	R2	-31%	06-2041	55	R2	21.6	-34%	06-2041	55	R2	21.6	-31%
	NPL Nantahala	06-2042	55	R2	-13%	06-2042	55	R2	22.4	-11%	06-2042	55	R2	22.4	-11%
	NPL Queens Creek	06-2032	55	R2	-73%	06-2032	55	R2	13.0	-79%	06-2032	55	R2	13.0	-72%
	NPL Tennessee Creek	06-2041	55	R2	-18%	06-2041	55	R2	21.5	-20%	06-2041	55	R2	21.5	-18%
	NPL Thorpe	06-2041	55	R2	-19%	06-2041	55	R2	21.7	-18%	06-2041	55	R2	21.7	-17%
	NPL Tuckasegee	06-2041	55	R2	-31%	06-2041	55	R2	21.5	-33%	06-2041	55	R2	21.5	-30%
	Shared Department Plant	06-2042	55	R2	-5%	06-2042	55	R2	21.7	-5%	06-2042	55	R2	21.7	-5%
	Total Miscellaneous Power Plant Equipment														

Duke Energy Carolinas
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As of December 31, 2018

		Current				Company Proposed					Public Staff Proposed				
Account	Description	AYFR	Proj Life	Iowa Curve Shape	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
336.00	Roads, Railroads, and Bridges														
	Cowans Ford	06-2055	75	R4	-13%	06-2055	75	R4	34.8	-11%	06-2055	75	R4	34.8	-11%
	Bad Creek	06-2058	75	R4	-6%	06-2058	75	R4	36.5	-6%	06-2058	75	R4	36.5	-6%
	Jocassee	06-2046	75	R4	-4%	06-2046	75	R4	23.8	-5%	06-2046	75	R4	23.8	-4%
	Dearborn	06-2055	75	R4	-22%	06-2055	75	R4	33.6	-25%	06-2055	75	R4	33.6	-23%
	NPL Bear Creek	06-2041	75	R4	-29%	06-2041	75	R4	15.1	-11%	06-2041	75	R4	15.1	-10%
	NPL Cedar Cliff	06-2041	75	R4	-22%	06-2041	75	R4	21.4	-24%	06-2041	75	R4	21.4	-22%
	NPL Nantahala	06-2042	75	R4	-13%	06-2042	75	R4	21.0	-11%	06-2042	75	R4	21.0	-11%
	NPL Queens Creek	06-2032	75	R4	-73%	06-2032	75	R4	10.1	-79%	06-2032	75	R4	10.1	-72%
	NPL Tennessee Creek	06-2041	75	R4	-18%	06-2041	75	R4	15.5	-20%	06-2041	75	R4	15.5	-18%
	NPL Thorpe	06-2041	75	R4	-19%	06-2041	75	R4	19.3	-18%	06-2041	75	R4	19.3	-17%
	NPL Tuckasegee	06-2041	75	R4	-31%	06-2041	75	R4	13.3	-33%	06-2041	75	R4	13.3	-30%
	Shared Department Plant	06-2042	75	R4	0%	06-2042	75	R4	0.0	0%	06-2042	75	R4	0.0	0%
	Total Roads, Railroads, and Bridges														
	Total Hydarulic Production Plant														
	Other Production Plant														
341.00	Structures and Improvements														
	Lincoln	06-2035	50	S2	-2%	06-2035	50	R3	15.4	-5%	06-2035	50	R3	15.4	-3%
	Dan River CC	06-2052	50	S2	-3%	06-2052	50	R3	31.2	-5%	06-2052	50	R3	31.2	-3%
	Lee	06-2047	50	S2	-3%	06-2047	50	R3	27.7	-6%	06-2047	50	R3	27.7	-3%
	Mill Creek	06-2043	50	S2	-2%	06-2043	50	R3	22.6	-5%	06-2043	50	R3	22.6	-3%
	Rockingham	06-2040	50	S2	-1%	06-2040	50	R3	21.1	-3%	06-2040	50	R3	21.1	-1%
	Buck CC	06-2051	50	S2	-3%	06-2051	50	R3	30.5	-5%	06-2051	50	R3	30.5	-3%
	Lee CC					06-2058	50	R3	37.3	-7%	06-2058	50	R3	37.3	-4%
	Total Structures and Improvements														
341.66	Structures and Improvements - Solar														
	Mocksville					06-2041	40	S2.5	22.1	-11%	06-2041	40	S2 5	22.1	-10%
	Woodleaf					06-2043	40	S2.5	24.1	-10%	06-2043	40	S2 5	24.1	-9%
	Total Structures and Improvements - Solar														
342.00	Fuel Holders, Producers, and Accessories														
	Lincoln	06-2035	50	R2.5	-2%	06-2035	50	R2.5	15.2	-5%	06-2035	50	R2.5	15.2	-3%
	Dan River CC	06-2052	50	R2.5	-3%	06-2052	50	R2.5	30.8	-5%	06-2052	50	R2.5	30.8	-3%
	Mill Creek	06-2043	50	R2.5	-2%	06-2043	50	R2.5	22.3	-5%	06-2043	50	R2.5	22.3	-3%
	Rockingham	06-2040	50	R2.5	-1%	06-2040	50	R2.5	20.7	-3%	06-2040	50	R2.5	20.7	-1%
	Buck CC	06-2051	50	R2.5	-3%	06-2051	50	R2.5	29.9	-5%	06-2051	50	R2.5	29.9	-3%
	Lee CC					06-2058	50	R2.5	36.5	-7%	06-2058	50	R2.5	36.5	-4%
	Total Fuel Holders, Producers, and Accessories														
342.02	Fuel Holders, Producers, and Accessories - Capital Lease														
	Dan River CC (Pipeline)	06-2052	50	R2.5	0%	12-2041	SQUARE		23.0	0%	12-2041	SQUARE		23.0	0%
	Dan River CC (Pipeline Heaters)					09-2037	SQUARE		18.7	0%	09-2037	SQUARE		18.7	0%
	Buck CC	06-2051	50	R2.5	0%	11-2030	SQUARE		11.9	0%	11-2030	SQUARE		11.9	0%
	Lee CC					05-2037	SQUARE		18.4	0%	05-2037	SQUARE		18.4	0%
	Total Fuel Holders, Producers, and Accessories - Capital Lease														
343.00	Prime Movers														
	Lincoln	06-2035	40	R2	-2%	06-2035	45	R1.5	14.9	-5%	06-2035	45	R1.5	14.9	-3%
	Dan River CC	06-2052	40	R2	-3%	06-2052	45	R1.5	28.7	-5%	06-2052	45	R1.5	28.7	-3%
	Lee	06-2047	40	R2	-3%	06-2047	45	R1.5	24.7	-6%	06-2047	45	R1.5	24.7	-3%
	Mill Creek	06-2043	40	R2	-2%	06-2043	45	R1.5	21.2	-5%	06-2043	45	R1.5	21.2	-3%
	Rockingham	06-2040	40	R2	-1%	06-2040	45	R1.5	20.0	-3%	06-2040	45	R1.5	20.0	-1%
	Buck CC	06-2051	40	R2	-3%	06-2051	45	R1.5	28.0	-5%	06-2051	45	R1.5	28.0	-3%
	Lee CC					06-2058	45	R1.5	33.9	-7%	06-2058	45	R1.5	33.9	-4%
	Total Prime Movers														
343.10	Prime Movers - Rotable Parts														
	Dan River CC	06-2052	5	R5	40%	06-2052	5	R5	1.6	40%	06-2052	5	R5	1.6	40%
	Buck CC	06-2051	5	R5	40%	06-2051	5	R5	1.0	40%	06-2051	5	R5	1.0	40%

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		Current				Company Proposed					Public Staff Proposed				
Account	Description	AYFR	Proj Life	Iowa Curve Shape	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage	AYFR	Proj Life	Iowa Curve Shape	Avg Rem Life	Future Net Salvage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Total Prime Movers - Rotable Parts														
344.00	Generators														
	Lincoln	06-2035	50	R2	-2%	06-2035	50	R2	15.1	-5%	06-2035	50	R2	15.1	-3%
	Dan River CC	06-2052	50	R2	-3%	06-2052	50	R2	30.2	-5%	06-2052	50	R2	30.2	-3%
	Mill Creek	06-2043	50	R2	-2%	06-2043	50	R2	23.3	-5%	06-2043	50	R2	23.3	-3%
	Equitable Diesel Generators	06-2028	50	R2	-5%	06-2028	50	R2	9.3	-5%	06-2028	50	R2	9.3	-3%
	Rockingham	06-2040	50	R2	-1%	06-2040	50	R2	19.5	-3%	06-2040	50	R2	19.5	-1%
	Buck CC	06-2051	50	R2	-3%	06-2051	50	R2	29.3	-5%	06-2051	50	R2	29.3	-3%
	Lee CC					06-2058	50	R2	35.7	-7%	06-2058	50	R2	35.7	-4%
	Total Generators														
344.66	Generators - Solar														
	General		20	S2 5	0%		20	S2.5	11.9	0%		20	S2 5	11.9	0%
	Mocksville	06-2041	25	S2 5	-10%	06-2041	25	S2.5	19.7	-11%	06-2041	25	S2 5	19.7	-10%
	Monroe					06-2042	25	S2.5	20.7	-12%	06-2042	25	S2 5	20.7	-10%
	Woodleaf					06-2043	25	S2.5	21.7	-10%	06-2043	25	S2 5	21.7	-9%
	Total Generators - Solar														
345.00	Accessory Electric Equipment														
	Lincoln	06-2035	35	S0 5	-2%	06-2035	40	S0	14.1	-5%	06-2035	40	S0	14.1	-3%
	Dan River CC	06-2052	35	S0 5	-3%	06-2052	40	S0	26.4	-5%	06-2052	40	S0	26.4	-3%
	Lee	06-2047	35	S0 5	-3%	06-2047	40	S0	24.7	-6%	06-2047	40	S0	24.7	-3%
	Mill Creek	06-2043	35	S0 5	-2%	06-2043	40	S0	19.8	-5%	06-2043	40	S0	19.8	-3%
	Rockingham	06-2040	35	S0 5	-1%	06-2040	40	S0	19.0	-3%	06-2040	40	S0	19.0	-1%
	Buck CC	06-2051	35	S0 5	-3%	06-2051	40	S0	25.6	-5%	06-2051	40	S0	25.6	-3%
	Lee CC					06-2058	40	S0	31.6	-7%	06-2058	40	S0	31.6	-4%
	Total Accessory Electric Equipment														
345.66	Accessory Electric Equipment - Solar														
	General		20	S2 5	0%		20	S2.5	13.5	0%		20	S2 5	13.5	0%
	Mocksville	06-2041	25	S2 5	-10%	06-2041	25	S2.5	19.7	-11%	06-2041	25	S2 5	19.7	-10%
	Monroe					06-2042	25	S2.5	20.7	-12%	06-2042	25	S2 5	20.7	-10%
	Woodleaf					06-2043	25	S2.5	21.7	-10%	06-2043	25	S2 5	21.7	-9%
	Total Accessory Electric Equipment - Solar														
346.00	Miscellaneous Power Plant Equipment														
	Lincoln	06-2035	40	S2	-2%	06-2035	40	S1.5	15.0	-5%	06-2035	40	S1 5	15.0	-3%
	Dan River CC	06-2052	40	S2	-3%	06-2052	40	S1.5	28.5	-5%	06-2052	40	S1 5	28.5	-3%
	Lee	06-2047	40	S2	-3%	06-2047	40	S1.5	26.2	-6%	06-2047	40	S1 5	26.2	-3%
	Mill Creek	06-2043	40	S2	-2%	06-2043	40	S1.5	20.7	-5%	06-2043	40	S1 5	20.7	-3%
	Rockingham	06-2040	40	S2	-1%	06-2040	40	S1.5	20.1	-3%	06-2040	40	S1 5	20.1	-1%
	Buck CC	06-2051	40	S2	-3%	06-2051	40	S1.5	27.6	-5%	06-2051	40	S1 5	27.6	-3%
	Lee CC					06-2058	40	S1.5	33.8	-7%	06-2058	40	S1 5	33.8	-4%
	Shared Department Plant					06-2058	40	S1.5	32.2	-5%	06-2058	40	S1 5	32.2	-5%
	Total Miscellaneous Power Plant Equipment														
346.66	Miscellaneous Power Plant Equipment - Solar														
	Woodleaf					06-2043	35	R2.5	23.0	-10%	06-2043	35	R2.5	23.0	-9%
	Total Miscellaneous Power Plant Equipment - Solar														
	Total Other Production Plant														
	Total Production Plant														
	Transmission Plant														
352.00	Structures and Improvements		60	R3	-20%		55	R2	45.8	-10%		55	R2	45.8	-10%
353.00	Station Equipment		52	R1.5	-25%		48	R1.5	37.8	-20%		48	R1.5	37.8	-20%
354.00	Towers and Fixtures		70	R2	-40%		75	R2	57.1	-50%		75	R2	57.1	-50%
355.00	Poles and Fixtures		50	R1.5	-25%		48	R1	41.2	-30%		48	R1	41.2	-30%
356.00	Overhead Conductors and Devices		60	R2	-40%		60	R2.5	46.5	-40%		60	R2.5	46.5	-40%
357.00	Underground Conduit		55	S4	0%		55	S4	27.9	0%		55	S4	27.9	0%
358.00	Underground Conductors and Devices		55	S3	0%		50	S4	38.1	0%		50	S4	38.1	0%

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
359.00	Roads and Trails		65	R4	0%		65	R4	39.3	0%		65	R4	39.3	0%
	Total Transmission Plant														
	Distribution Plant														
361.00	Structures and Improvements		60	R2.5	-20%		55	S0.5	47.4	-10%		55	S0 5	47.4	-10%
362.00	Station Equipment		42	R1	-25%		44	R1	35.2	-20%		44	R1	35.2	-20%
364.00	Poles, Towers, and Fixtures		49	R2	-25%		50	R2	37.3	-30%		50	R2	37.3	-30%
365.00	Overhead Conductors and Devices		49	R0.5	-20%		52	R0.5	44.5	-25%		52	R0.5	44.5	-25%
366.00	Underground Conduit		55	R3	-15%		60	R3	41.7	-15%		60	R3	41.7	-10%
367.00	Underground Conductors and Devices		54	R3	-20%		55	R3	40.9	-20%		55	R3	40.9	-20%
368.00	Line Transformers		43	R1.5	0%		45	R1.5	33.2	-10%		45	R1.5	33.2	-10%
369.00	Services		50	R1.5	-10%		52	R1.5	43.5	-15%		52	R1.5	43.5	-15%
370.00	Metering Equipment		20	L0	0%		17	L0	9.4	0%		17	L0	9.4	0%
370.01	Meters	12-2019	20	L0	0%	08-2033	17	L0	14.6	0%	08-2033	17	L0	14.6	0%
370.02	Meters - Utility of the Future		15	S2 5	0%		15	S2.5	13.3	0%		17	S2 5	15.3	0%
371.00	Installations on Customers' Premises		40	R0.5	-5%		40	R1	32.3	-5%		40	R1	32.3	-5%
373.00	Street Lighting and Signal Systems		35	R1	-10%		36	R0.5	28.2	-10%		36	R0.5	28.2	-10%
	Total Distribution Plant														
	General Plant														
390.00	Structures and Improvements		40	R2	-10%		40	S1	28.5	-10%		40	S1	28.5	-10%
391.00	Office Furniture and Equipment		15	SQ	0%		15	SQ	10.1	0%		15	SQ	10.1	0%
391.10	Office Furniture and Equipment - EDP		8	SQ	0%		8	SQ	5.0	0%		8	SQ	5.0	0%
392.00	Transportation Equipment														
	Passenger Cars and Station Wagon		5	S2 5	5%		5	S2.5	3.5	10%		5	S2 5	3.5	10%
	Light Trucks		6	L3	5%		6	L3	4.7	10%		6	L3	4.7	10%
	Medium Trucks		8	L2	5%		8	L2	6.5	10%		8	L2	6.5	10%
	Heavy Trucks		10	L2	5%		10	L2	0.0	10%		10	L2	0.0	10%
	Heavy Trucks / Power Equipped		10	L2	5%		10	L2	0.0	10%		10	L2	0.0	10%
	Tractors - Gasoline and Diesel		13	L3	5%		13	L3	0.0	10%		13	L3	0.0	10%
	Trailers		17	L0.5	5%		16	L0.5	14.9	10%		16	L0.5	14.9	10%
	Total Transportation Equipment														
393.00	Stores Equipment		20	SQ	0%		20	SQ	16.7	0%		20	SQ	16.7	0%
394.00	Tools, Shop, and Garage Equipment		20	SQ	0%		20	SQ	13.3	0%		20	SQ	13.3	0%
395.00	Laboratory Equipment		15	SQ	0%		15	SQ	6.5	0%		15	SQ	6.5	0%
396.00	Power Operated Equipment														
	Mobile Cranes		19	S1 5	0%		19	S1.5	18.5	10%		19	S1 5	18.5	10%
	Miscellaneous Non-Highway Equipment		14	S1 5	0%		13	L2	0.0	10%		13	L2	0.0	10%
	Miscellaneous Equipment		14	S1 5	0%		13	L2	0.0	10%		13	L2	0.0	10%
	Total Power Operated Equipment														
397.00	Communication Equipment		10	SQ	0%		10	SQ	5.0	0%		10	SQ	5.0	0%
398.00	Miscellaneous Equipment		20	SQ	0%		20	SQ	16.5	0%		20	SQ	16.5	0%
	Total General Plant														
	Depreciable Land Rights														
310.00	Rights of Way														
	Marshall	06-2034	100	R4	0%	06-2034	100	R4	0.0	0%	06-2034	100	R4	0.0	0%
	Belews Creek	06-2037	100	R4	0%	06-2037	100	R4	0.0	0%	06-2037	100	R4	0.0	0%
	Lee	06-2030	100	R4	0%	06-2030	100	R4	0.0	0%	06-2030	100	R4	0.0	0%
	Allen	06-2026	100	R4	0%	06-2024	100	R4	0.0	0%	06-2024	100	R4	0.0	0%
	Total Account 310														
320.00	Rights of Way														
	Oconee	07-2034	100	R4	0%	07-2034	100	R4	15.3	0%	07-2034	100	R4	15.3	0%

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	McGuire	03-2043	100	R4	0%	03-2043	100	R4	23.9	0%	03-2043	100	R4	23.9	0%
	Catawba	12-2043	100	R4	0%	12-2043	100	R4	24.7	0%	12-2043	100	R4	24.7	0%
	Total Account 320														
330.00	Rights of Way														
	Cowans Ford	06-2055	110	R4	0%	06-2055	110	R4	34.2	0%	06-2055	110	R4	34.2	0%
	Bad Creek	06-2058	110	R4	0%	06-2058	110	R4	39.0	0%	06-2058	110	R4	39.0	0%
	Jocassee	06-2046	110	R4	0%	06-2046	110	R4	27.0	0%	06-2046	110	R4	27.0	0%
	Keowee	06-2046	110	R4	0%	06-2046	110	R4	26.8	0%	06-2046	110	R4	26.8	0%
	Fishing Creek	06-2055	110	R4	0%	06-2055	110	R4	0.0	0%	06-2055	110	R4	0.0	0%
	Bridgewater	06-2055	110	R4	0%	06-2055	110	R4	0.0	0%	06-2055	110	R4	0.0	0%
	Gaston Shoals	06-2036	110	R4	0%	06-2036	110	R4	0.0	0%	06-2036	110	R4	0.0	0%
	Lookout Shoals	06-2055	110	R4	0%	06-2055	110	R4	0.0	0%	06-2055	110	R4	0.0	0%
	Mountain Island	06-2055	110	R4	0%	06-2055	110	R4	0.0	0%	06-2055	110	R4	0.0	0%
	99 Islands	06-2036	110	R4	0%	06-2036	110	R4	0.0	0%	06-2036	110	R4	0.0	0%
	Oxford	06-2055	110	R4	0%	06-2055	110	R4	24.9	0%	06-2055	110	R4	24.9	0%
	Rhodhiss	06-2055	110	R4	0%	06-2055	110	R4	23.8	0%	06-2055	110	R4	23.8	0%
	Tuxedo	06-2041	110	R4	0%	06-2041	110	R4	0.0	0%	06-2041	110	R4	0.0	0%
	Wateree	06-2055	110	R4	0%	06-2055	110	R4	0.0	0%	06-2055	110	R4	0.0	0%
	Wylie	06-2055	110	R4	0%	06-2055	110	R4	0.0	0%	06-2055	110	R4	0.0	0%
	NPL Bear Creek	06-2041	110	R4	0%	06-2041	110	R4	0.0	0%	06-2041	110	R4	0.0	0%
	NPL Franklin	06-2041	110	R4	0%	06-2041	110	R4	0.0	0%	06-2041	110	R4	0.0	0%
	NPL Nantahala	06-2042	110	R4	0%	06-2042	110	R4	0.0	0%	06-2042	110	R4	0.0	0%
	NPL Queens Creek	06-2032	110	R4	0%	06-2032	110	R4	0.0	0%	06-2032	110	R4	0.0	0%
	NPL Tennessee Creek	06-2041	110	R4	0%	06-2041	110	R4	0.0	0%	06-2041	110	R4	0.0	0%
	NPL Thorpe	06-2041	110	R4	0%	06-2041	110	R4	0.0	0%	06-2041	110	R4	0.0	0%
	NPL Tuckasegee	06-2041	110	R4	0%	06-2041	110	R4	0.0	0%	06-2041	110	R4	0.0	0%
	Total Account 330														
340.00	Rights of Way														
	Dan River CC	06-2052	60	R4	0%	06-2052	60	R4	9.3	0%	06-2052	60	R4	9.3	0%
	Total Account 340														
350.00	Rights of Way		75	R4	0%		80	R4	51.2	0%		80	R4	51.2	0%
360.00	Rights of Way		75	R3	0%		80	R3	65.4	0%		80	R3	65.4	0%
360.20	Land Rights		75	R3	0%		80	R3	37.8	0%		80	R3	37.8	0%
389.00	Rights of Way		60	R3	0%		60	R3	38.7	0%		60	R3	38.7	0%
389.20	Land Rights		60	R3	0%		60	R3	44.5	0%		60	R3	44.5	0%
	Total Depreciable Land Rights														

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Table 6: Calculation of Weighted Net Salvage Percent for Generation Plant
As of December 31, 2018

Location	Total Future Retirements	Terminal Retirements				Interim Retirements				Total Net Salvage	Total Retirements	Estimated Net Salvage
		Retirements ($)	Net Salvage ($)	Percent of Total Retire	Net Salvage (%)	Retirements ($)	Net Salvage ($)	Percent of Total Retire	Net Salvage (%)	($)		(%)
	(1)	(2)	(3)	(4)=(2)/(1)	(5)=(3)/(2)	(6)	(7)=(6)x(9)	(8)=(6)/(1)	(9)	(10)=(3)+(7)	(11)=(2)+(6)	(12)=(10)/(11)
Steam Production												
Marshall	(1,744,647,645)	(1,570,213,838)	57,641,867	90 00%	-4%	(174,433,808)	24,420,733	10.00%	-14%	82,062,600	(1,744,647,645)	-5%
Belews Creek	(2,207,034,270)	(1,929,524,339)	94,718,339	87.43%	-5%	(277,509,932)	38,851,390	12.57%	-14%	133,569,729	(2,207,034,270)	-6%
Cliffside 5 (J.E. Rogers)	(746,187,435)	(715,740,160)	26,768,682	95 92%	-4%	(30,447,274)	4,262,618	4.08%	-14%	31,031,300	(746,187,435)	-4%
Cliffside 6 (J.E. Rogers)	(2,103,465,498)	(1,714,332,249)	64,116,026	81 50%	-4%	(389,133,249)	54,478,655	18.50%	-14%	118,594,681	(2,103,465,498)	-6%
Cliffside 5 and 6 Common (J.E. Rogers)	(110,610,301)	(104,003,200)	3,889,720	94 03%	-4%	(6,607,100)	924,994	5.97%	-14%	4,814,714	(110,610,301)	-4%
Lee	(113,085,133)	(101,083,692)	9,310,085	89 39%	-9%	(12,001,441)	1,680,202	10.61%	-14%	10,990,286	(113,085,133)	-10%
Allen	(1,236,713,184)	(1,197,904,245)	45,940,954	96 86%	-4%	(38,808,939)	5,433,251	3.14%	-14%	51,374,206	(1,236,713,184)	-4%
Total Steam Production	**(8,261,743,465)**	**(7,332,801,723)**	**302,385,672**	**88.76%**	**-4%**	**(928,941,742)**	**130,051,844**	**11.24%**	**-14%**	**432,437,516**	**(8,261,743,465)**	**-5%**
Nuclear Production Plant												
Oconee	(4,343,945,956)	(3,927,604,147)	0	90.42%	0%	(416,341,809)	37,470,763	9.58%	-9%	37,470,763	(4,343,945,956)	-1%
McGuire	(3,325,093,560)	(2,143,426,717)	0	64.46%	0%	(1,181,666,843)	106,350,016	35.54%	-9%	106,350,016	(3,325,093,560)	-3%
Catawba	(848,008,545)	(519,567,165)	0	61 27%	0%	(328,441,380)	29,559,724	38.73%	-9%	29,559,724	(848,008,545)	-3%
Total Nuclear Production	**(8,517,048,061)**	**(6,590,598,029)**	**0**	**77.38%**	**0%**	**(1,926,450,031)**	**173,380,503**	**22.62%**	**-9%**	**173,380,503**	**(8,517,048,061)**	**-2%**
Hydro Production Plant												
Cowans Ford	(113,753,783)	(85,913,580)	6,237,207	75 53%	-7%	(27,840,203)	6,124,845	24.47%	-22%	12,362,052	(113,753,783)	-11%
Bad Creek	(1,020,255,320)	(746,661,723)	1,997,265	73.18%	0%	(273,593,597)	60,190,591	26.82%	-22%	62,187,856	(1,020,255,320)	-6%
Jocassee	(170,054,080)	(138,577,695)	306,245	81.49%	0%	(31,476,385)	6,924,805	18.51%	-22%	7,231,050	(170,054,080)	-4%
Keowee	(125,826,474)	(109,116,348)	2,221,324	86.72%	-2%	(16,710,127)	3,676,228	13.28%	-22%	5,897,552	(125,826,474)	-5%
Fishing Creek	(47,207,176)	(35,872,864)	4,992,909	75 99%	-14%	(11,334,311)	2,493,549	24.01%	-22%	7,486,457	(47,207,176)	-16%
Cedar Creek	(32,337,981)	(25,063,845)	3,358,294	77 51%	-13%	(7,274,136)	1,600,310	22.49%	-22%	4,958,604	(32,337,981)	-15%
Bridgewater	(206,176,256)	(186,507,114)	2,860,575	90.46%	-2%	(19,669,142)	4,327,211	9.54%	-22%	7,187,786	(206,176,256)	-3%
Gaston Shoals	(20,522,083)	(19,039,393)	2,810,227	92.78%	-15%	(1,482,690)	326,192	7.22%	-22%	3,136,419	(20,522,083)	-15%
Lookout Shoals	(21,326,840)	(15,471,872)	3,263,990	72 55%	-21%	(5,854,969)	1,288,093	27.45%	-22%	4,552,083	(21,326,840)	-21%
Mountain Island	(28,382,786)	(20,429,429)	4,555,440	71 98%	-22%	(7,953,357)	1,749,738	28.02%	-22%	6,305,178	(28,382,786)	-22%
99 Islands	(24,859,025)	(23,320,269)	3,940,873	93 81%	-17%	(1,538,756)	338,526	6.19%	-22%	4,279,399	(24,859,025)	-17%
Oxford	(57,684,356)	(49,267,017)	2,368,095	85.41%	-5%	(8,417,339)	1,851,815	14.59%	-22%	4,219,910	(57,684,356)	-7%
Rhodhiss	(30,659,083)	(24,285,075)	3,444,740	79 21%	-14%	(6,374,007)	1,402,282	20.79%	-22%	4,847,022	(30,659,083)	-16%
Tuxedo	(10,579,047)	(9,879,410)	1,677,819	93 39%	-17%	(699,636)	153,920	6.61%	-22%	1,831,739	(10,579,047)	-17%
Wateree	(53,457,780)	(39,728,899)	4,877,648	74 32%	-12%	(13,728,881)	3,020,354	25.68%	-22%	7,898,002	(53,457,780)	-15%
Wylie	(50,172,184)	(38,671,320)	4,495,190	77 08%	-12%	(11,500,864)	2,530,190	22.92%	-22%	7,025,380	(50,172,184)	-14%
Great Falls	(9,793,238)	(6,004,050)	8,956,325	61 31%	-149%	(3,789,188)	833,621	38.69%	-22%	9,789,947	(9,793,238)	-100%
Dearborn	(20,214,613)	(14,160,657)	3,266,609	70 05%	-23%	(6,053,956)	1,331,870	29.95%	-22%	4,598,480	(20,214,613)	-23%
NPL Bear Creek	(11,514,733)	(10,585,822)	993,714	91 93%	-9%	(928,911)	204,360	8.07%	-22%	1,198,074	(11,514,733)	-10%
NPL Bryson	(6,309,659)	(6,055,494)	1,618,493	95 97%	-27%	(254,164)	55,916	4.03%	-22%	1,674,409	(6,309,659)	-27%
NPL Cedar Cliff	(7,377,131)	(6,680,605)	1,434,953	90 56%	-21%	(696,526)	153,236	9.44%	-22%	1,588,188	(7,377,131)	-22%
NPL Franklin	(7,973,528)	(7,806,336)	1,598,100	97 90%	-20%	(167,191)	36,782	2.10%	-22%	1,634,882	(7,973,528)	-21%
NPL Mission	(8,069,916)	(7,628,114)	2,434,229	94 53%	-32%	(441,802)	97,196	5.47%	-22%	2,531,425	(8,069,916)	-31%
NPL Nantahala	(23,186,143)	(18,835,346)	1,493,630	81 24%	-8%	(4,350,797)	957,175	18.76%	-22%	2,450,805	(23,186,143)	-11%
NPL Queens Creek	(1,301,400)	(1,197,093)	917,424	91 99%	-77%	(104,307)	22,948	8.01%	-22%	940,372	(1,301,400)	-72%
NPL Tennessee Creek	(7,906,198)	(6,692,287)	1,182,816	84.65%	-18%	(1,213,910)	267,060	15.35%	-22%	1,449,877	(7,906,198)	-18%
NPL Thorpe	(12,445,273)	(9,493,786)	1,418,267	76 28%	-15%	(2,951,487)	649,327	23.72%	-22%	2,067,594	(12,445,273)	-17%
NPL Tuckasegee	(3,612,580)	(3,228,369)	997,422	89 36%	-31%	(384,211)	84,526	10.64%	-22%	1,081,948	(3,612,580)	-30%

Duke Energy Carolinas
Table 6: Calculation of Weighted Net Salvage Percent for Generation Plant
As of December 31, 2018

Location	Total Future Retirements	Terminal Retirements				Interim Retirements				Total Net Salvage	Total Retirements	Estimated Net Salvage
		Retirements ($)	Net Salvage ($)	Percent of Total Retire	Net Salvage (%)	Retirements ($)	Net Salvage ($)	Percent of Total Retire	Net Salvage (%)	($)		(%)
	(1)	(2)	(3)	(4)=(2)/(1)	(5)=(3)/(2)	(6)	(7)=(6)x(9)	(8)=(6)/(1)	(9)	(10)=(3)+(7)	(11)=(2)+(6)	(12)=(10)/(11)
Total Hydro Production	**(2,132,958,665)**	**(1,666,173,814)**	**79,719,824**	**78.12%**	**-5%**	**(466,784,852)**	**102,692,667**	**21.88%**	**-22%**	**182,412,492**	**(2,132,958,665)**	**-9%**
Other Production Plant												
Lincoln	(405,310,216)	(290,010,583)	9,751,766	71 55%	-3%	(115,299,633)	1,152,996	28.45%	-1%	10,904,762	(405,310,216)	-3%
Dan River CC	(611,120,207)	(408,016,726)	17,609,123	66.77%	-4%	(203,103,481)	2,031,035	33.23%	-1%	19,640,158	(611,120,207)	-3%
Lee	(61,631,468)	(37,057,744)	1,900,606	60.13%	-5%	(24,573,724)	245,737	39.87%	-1%	2,146,343	(61,631,468)	-3%
Mill Creek	(250,891,938)	(152,640,891)	5,592,134	60 84%	-4%	(98,251,047)	982,510	39.16%	-1%	6,574,644	(250,891,938)	-3%
Rockingham	(303,406,446)	(241,367,037)	3,619,261	79 55%	-1%	(62,039,409)	620,394	20.45%	-1%	4,239,655	(303,406,446)	-1%
Buck CC	(606,346,014)	(410,916,459)	16,714,484	67.77%	-4%	(195,429,556)	1,954,296	32.23%	-1%	18,668,780	(606,346,014)	-3%
Lee CC	(553,254,746)	(315,671,573)	19,437,177	57 06%	-6%	(237,583,172)	2,375,832	42.94%	-1%	21,813,009	(553,254,746)	-4%
Total Other Production	**(2,791,961,035)**	**(1,855,681,013)**	**74,624,551**	**66.47%**	**-4%**	**(936,280,022)**	**9,362,800**	**33.53%**	**-1%**	**83,987,351**	**(2,791,961,035)**	**-3%**
Solar												
Mocksville	(31,773,280)	(16,804,441)	3,118,334	52 89%	-19%	(14,968,839)	0	47.11%	0%	3,118,334	(31,773,280)	-10%
Monroe	(116,568,189)	(61,490,037)	12,181,636	52.75%	-20%	(55,078,152)	0	47.25%	0%	12,181,636	(116,568,189)	-10%
Woodleaf	(13,132,818)	(6,992,829)	1,218,164	53 25%	-17%	(6,139,990)	0	46.75%	0%	1,218,164	(13,132,818)	-9%
Total Solar	**(161,474,287)**	**(85,287,307)**	**16,518,133**	**52.82%**	**-19%**	**(76,186,980)**	**0**	**47.18%**	**0%**	**16,518,133**	**(161,474,287)**	**-10%**

Source:
Spanos Exhibit 1
DEC Response to PS DR 1-8

REDACTED

Duke Energy Carolinas
Table 7: Calculation of Terminal Net Salvage Percent
As of December 31, 2018

REDACTED

Plant	[redacted]	Estimated Decommissioning Cost (Year-2016 $)	Current Dollar Year	Escalation Year	Adjusted Escalated Decommissioning Cost (Year-2023 $)
(1)		F	G	H	I=Fx(1+2.5%)^[H-G]
Steam Production					
Marshall		36,958,000	2016	2034	57,641,867
Belews Creek		56,394,000	2016	2037	94,718,339
Cliffside (J.E. Rogers)		43,055,000	2016	2048	94,882,755
Lee		6,589,000	2016	2030	9,310,085
Allen		35,889,000	2016	2026	45,940,954
Total Steam Production		**178,885,000**			**302,493,999**
Nuclear Production Plant					
Oconee		0	2016		0
McGuire		0	2016		0
Catawba		0	2016		0
Total Nuclear Production		**0**			**0**
Hydro Production Plant					
Cowans Ford		2,381,000	2016	2055	6,237,207
Bad Creek		708,000	2016	2058	1,997,265
Jocassee		146,000	2016	2046	306,245
Keowee		1,059,000	2016	2046	2,221,324
Fishing Creek		1,906,000	2016	2055	4,992,909
Cedar Creek		1,282,000	2016	2055	3,358,294
Bridgewater		1,092,000	2016	2055	2,860,575
Gaston Shoals		1,715,000	2016	2036	2,810,227
Lookout Shoals		1,246,000	2016	2055	3,263,990
Mountain Island		1,739,000	2016	2055	4,555,440
99 Islands		2,405,000	2016	2036	3,940,873
Oxford		904,000	2016	2055	2,368,095
Rhodhiss		1,315,000	2016	2055	3,444,740
Tuxedo		905,000	2016	2041	1,677,819
Wateree		1,862,000	2016	2055	4,877,648
Wylie		1,716,000	2016	2055	4,495,190
Great Falls		3,419,000	2016	2055	8,956,325
Dearborn		1,247,000	2016	2055	3,266,609
NPL Bear Creek		536,000	2016	2041	993,714
NPL Bryson		873,000	2016	2041	1,618,493
NPL Cedar Cliff		774,000	2016	2041	1,434,953
NPL Franklin		862,000	2016	2041	1,598,100
NPL Mission		1,313,000	2016	2041	2,434,229
NPL Nantahala		786,000	2016	2042	1,493,630
NPL Queens Creek		618,000	2016	2032	917,424
NPL Tennessee Creek		638,000	2016	2041	1,182,816
NPL Thorpe		765,000	2016	2041	1,418,267
NPL Tuckasegee		538,000	2016	2041	997,422
Total Hydro Production		**34,750,000**			**79,719,824**
Other Production Plant					
Lincoln		6,100,000	2016	2035	9,751,766
Dan River CC		7,239,000	2016	2052	17,609,123
Lee		884,000	2016	2047	1,900,606
Mill Creek		2,871,000	2016	2043	5,592,134
Rockingham		2,001,000	2016	2040	3,619,261
Buck CC		7,043,000	2016	2051	16,714,484
Lee CC		7,239,000	2018	2058	19,437,177
Total Other Production		**33,377,000**			**74,624,551**
Solar					
Mocksville		1,682,000	2016	2041	3,118,334
Monroe		6,570,660	2017	2042	12,181,636
Woodleaf		657,066	2018	2043	1,218,164
Total Solar		**8,909,726**			**16,518,133**

Source:
Spanos Exhibit 1
DEC Response to PS DR 1-8
DEC Response to PS DR 43-19 Confidential Attachment

Duke Energy Carolinas
Table 8: Calculation of Weighted Interim Net Salvage Percent
As of December 31, 2018

Account	Estimated Future Interim Retirement	2018 Original Cost as a Percet of Total	DEC Interim Net Salvage %	DEC Weighted Average of Interim Net Salvage (%)	Staff Interim Net Salvage %	Staff Weighted Average of Interim Net Salvage (%)
(1)	(2)	(3)	(4)	(5)=(3)*(4)	(4)	(5)=(3)*(4)
Steam Production						
311.00	29,863,904.71	3.21%	-20%	-1%	-20%	-1%
312.00	671,298,499.48	72.26%	-15%	-11%	-15%	-11%
314.00	122,806,874.05	13.22%	-5%	-1%	-5%	-1%
315.00	52,917,661.51	5.70%	-10%	-1%	-10%	-1%
316.00	52,054,802.57	5.60%	-5%	0%	-5%	0%
Total Steam Production	**928,941,742.32**			**-14%**		**-14%**
Nuclear Production						
321.00	444,050,814.81	23.05%	-10%	-2%	-10%	-2%
322.00	925,017,581.78	48.02%	-10%	-5%	-10%	-5%
323.00	240,354,197.67	12.48%	-5%	-1%	-5%	-1%
324.00	191,068,030.22	9.92%	-10%	-1%	-10%	-1%
325.00	125,959,406.99	6.54%	-2%	0%	-2%	0%
Total Nuclear Production	**1,926,450,031.47**			**-9%**		**-9%**
Hydro Production						
331.00	108,818,076.77	23.31%	-25%	-6%	-25%	-6%
332.00	99,982,006.61	21.42%	-25%	-5%	-25%	-5%
333.00	181,259,912.05	38.83%	-25%	-10%	-25%	-10%
334.00	48,030,474.78	10.29%	-5%	-1%	-5%	-1%
335.00	23,147,643.56	4.96%	-5%	0%	-5%	0%
336.00	5,546,737.98	1.19%	0%	0%	0%	0%
Total Hydro Production	**466,784,851.75**			**-22%**		**-22%**
Other Production						
341.00	92,418,725.63	9.87%	-10%	-1%	-10%	-1%
342.00	22,429,792.45	2.40%	-5%	0%	0%	0%
343.00	493,587,104.19	52.72%	-5%	-3%	0%	0%
344.00	196,741,192.40	21.01%	-5%	-1%	0%	0%
345.00	115,775,982.39	12.37%	-5%	-1%	0%	0%
346.00	15,327,224.65	1.64%	-5%	0%	0%	0%
Total Other Production	**936,280,021.71**			**-6%**		**-1%**

Source: DEC PS DR 76-1

O'Donnell Proxy Group
DCF Summary

Company	Forecasted Annualized Dividend Yield			Value Line									Average Plowback Growth Rate [4]	CFRA 3 Year Projected EPS CAGR [5]	Schwab LT Growth Rate 3-5 Years EPS (AEE) [6]
				10 Year			5 Year			Forecasted					
	13-Wks [1]	4-Wks [2]	Current [3]	EPS [4]	DPS [4]	BPS [4]	EPS [4]	DPS [4]	BPS [4]	EPS [4]	DPS [4]	BPS [4]			
													Exhibit KWO-2		
American Elec Pwr	3.0%	3.4%	3.4%	3.0%	4.5%	4.0%	4.0%	5.5%	3.0%	5.0%	5.5%	4.5%	3.4%	6.0%	6.2%
ALLETE Inc	3.3%	4.0%	4.0%	2.5%	3.0%	5.0%	4.0%	3.5%	5.0%	5.5%	5.5%	4.5%	2.6%	10.0%	7.0%
Alliant Energy	2.8%	3.1%	3.0%	5.0%	7.0%	4.0%	5.0%	7.0%	5.0%	6.5%	5.5%	7.5%	4.0%	6.0%	5.7%
Ameren Corp	2.5%	2.8%	2.6%	1.0%	-2.0%	-0.5%	6.5%	3.0%	2.5%	6.0%	5.0%	6.0%	4.3%	6.0%	4.9%
CMS Energy Corp	2.6%	2.8%	2.7%	9.5%	15.0%	4.5%	7.0%	7.0%	5.5%	7.5%	7.0%	7.5%	5.2%	8.0%	7.5%
Consol. Edison	3.5%	3.8%	3.8%	2.5%	2.0%	5.0%	2.0%	2.5%	4.0%	3.0%	3.5%	3.5%	2.8%	4.0%	2.4%
Dominion Energy	4.6%	5.1%	4.9%	3.0%	7.5%	4.5%	3.5%	7.5%	6.5%	7.0%	4.5%	6.5%	2.7%	4.0%	4.9%
Duke Energy	4.2%	4.8%	4.6%	2.5%	7.0%	1.0%	0.5%	3.0%	1.5%	6.0%	2.5%	2.5%	1.7%	5.0%	4.1%
Edison International	3.9%	4.9%	4.6%	-3.5%	6.5%	3.0%	-9.0%	11.0%	3.0%	NMF	4.5%	5.5%	5.5%	NMF	3.2%
Entergy Corp	3.2%	3.9%	3.8%	-0.5%	2.5%	1.0%	0.5%	1.5%	-2.5%	3.0%	4.0%	5.0%	4.5%	6.0%	-1.5%
Eversource Energy	2.6%	2.9%	2.7%	8.0%	9.5%	6.5%	7.0%	8.0%	5.0%	5.5%	6.0%	5.0%	3.5%	6.0%	5.7%
Hawaiian Electric	2.9%	3.2%	3.0%	5.0%	-	3.0%	4.0%	-	3.5%	2.5%	3.0%	3.5%	2.8%	5.0%	3.3%
IDACORP Inc	2.7%	3.1%	3.0%	7.0%	6.5%	5.5%	4.0%	10.0%	5.0%	3.5%	7.0%	4.0%	4.1%	3.0%	2.5%
MGE Energy Inc	2.0%	2.2%	2.2%	4.5%	3.5%	5.5%	2.5%	4.0%	5.5%	5.5%	5.5%	5.0%	4.6%	4.8%	-
NextEra Energy	2.2%	2.5%	2.3%	6.0%	9.0%	8.5%	6.0%	10.5%	9.5%	10.0%	10.5%	7.0%	3.9%	8.0%	7.6%
Northwestern Corp	3.4%	3.9%	3.9%	8.5%	5.0%	5.5%	7.0%	7.0%	8.0%	2.0%	4.5%	3.5%	3.0%	4.0%	3.8%
OGE Energy Corp	4.2%	5.5%	5.1%	5.0%	7.0%	7.0%	2.0%	10.0%	5.5%	4.5%	6.0%	3.5%	3.5%	5.0%	2.9%
Otter Tail Corp	3.0%	3.5%	3.2%	5.5%	1.5%	-	9.0%	2.5%	4.5%	5.0%	5.0%	5.0%	3.8%	4.6%	-
Pinnacle West	3.6%	4.2%	4.1%	4.5%	2.5%	2.5%	5.0%	3.0%	4.5%	4.0%	6.0%	3.5%	3.5%	5.0%	4.6%
PNM Resources	2.6%	3.2%	3.1%	7.0%	2.5%	-	6.0%	11.0%	1.0%	7.0%	7.0%	5.0%	4.1%	6.0%	6.3%
Portland General	3.0%	3.5%	3.2%	3.5%	4.5%	2.5%	4.0%	4.5%	3.5%	4.5%	6.5%	3.0%	3.3%	5.0%	4.7%
Public Serv Enterprise Group	3.7%	4.5%	4.4%	1.5%	3.5%	6.5%	1.0%	4.0%	5.0%	6.0%	5.0%	5.0%	4.6%	4.0%	3.5%
Sempra Energy	3.1%	3.9%	3.5%	1.0%	10.0%	5.5%	2.0%	7.5%	4.0%	11.0%	8.0%	7.0%	3.9%	12.0%	-
Southern Co	4.1%	4.7%	4.4%	3.0%	3.5%	4.0%	2.5%	3.5%	3.0%	4.0%	3.0%	4.0%	3.1%	4.0%	2.1%
WEC Energy Group	2.7%	2.9%	2.8%	8.5%	14.5%	8.0%	6.0%	9.5%	10.5%	6.0%	6.5%	3.5%	3.8%	6.0%	6.2%
Xcel Energy	2.7%	3.0%	2.7%	5.5%	4.5%	4.5%	5.0%	6.0%	4.5%	5.5%	6.0%	5.5%	4.1%	6.0%	6.1%
AVERAGE	**3.2%**	**3.7%**	**3.5%**	**4.2%**	**5.6%**	**4.4%**	**3.7%**	**6.1%**	**4.5%**	**5.4%**	**5.5%**	**4.8%**	**3.7%**	**5.7%**	**4.5%**

Notes:
EPS = earnings per share
DPS = dividends per share
BPS = book value per share

Sources:
[1] The Value Line Investment Survey, Summary and Index: 1/17/2020 1/24/2020 1/31/2020 2/7/2020 2/14/2020 2/21/2020 2/28/2020 3/6/2020 3/13/2020 3/20/2020 3/27/2020 4/3/2020 4/10/2020
[2] The Value Line Investment Survey, Summary and Index: 3/20/2020 3/27/2020 4/3/2020 4/10/2020
[3] The Value Line Investment Survey, Summary and Index: 4/10/2020
[4] The Value Line Investment Survey: 1/24/2020 (Electric Utilities West), 2/14/2020 (Electric Utilities East), 3/13/2020 (Electric Utilities Central)
[5] CFRA Stock Report earnings estimates as of 3/13/2020 as provided by Schwab.com
[6] Schwab Equity Report earnings estimates as of 3/13/2020 as provided by Schwab.com

O'Donnell Proxy Group
Plowback Ratios

Company	% Retained to Common Equity				
	2017	2018	2019 / 2019E*	2022E* - 2025E*	Average
American Elec Pwr	3.2%	3.5%	3.4%	3.5%	3.4%
ALLETE Inc	2.4%	2.7%	2.3%	3.0%	2.6%
Alliant Energy	4.0%	4.4%	4.2%	3.5%	4.0%
Ameren Corp	3.4%	4.8%	4.4%	4.5%	4.3%
CMS Energy Corp	5.2%	5.3%	4.9%	5.5%	5.2%
Consol. Edison	3.0%	3.5%	2.0%	2.5%	2.8%
Dominion Energy	1.8%	NMF	NMF	3.5%	2.7%
Duke Energy	1.2%	1.0%	2.0%	2.5%	1.7%
Edison International	6.6%	NMF	5.0%	5.0%	5.5%
Entergy Corp	3.9%	4.9%	5.2%	4.0%	4.5%
Eversource Energy	3.5%	3.4%	3.5%	3.5%	3.5%
Hawaiian Electric	2.1%	3.1%	3.0%	3.0%	2.8%
IDACORP Inc	4.4%	4.4%	4.0%	3.5%	4.1%
MGE Energy Inc	4.2%	4.7%	4.6%	5.0%	4.6%
NextEra Energy	4.4%	3.2%	3.5%	4.5%	3.9%
Northwestern Corp	3.4%	3.2%	3.0%	2.5%	3.0%
OGE Energy Corp	3.5%	3.8%	3.6%	3.0%	3.5%
Otter Tail Corp	3.3%	4.0%	4.0%	4.0%	3.8%
Pinnacle West	4.2%	3.9%	3.0%	3.0%	3.5%
PNM Resources	4.5%	2.9%	5.0%	4.0%	4.1%
Portland General	3.6%	3.5%	3.0%	3.0%	3.3%
Public Serv Enterprise Group	4.1%	3.4%	6.0%	5.0%	4.6%
Sempra Energy	3.3%	4.1%	3.0%	5.0%	3.9%
Southern Co	3.9%	2.6%	2.5%	3.5%	3.1%
WEC Energy Group	3.6%	3.7%	3.8%	4.0%	3.8%
Xcel Energy	3.9%	4.3%	4.0%	4.0%	4.1%
AVERAGE	**3.6%**	**3.7%**	**3.7%**	**3.8%**	**3.7%**

*E = expected
Plowback = Percent retained to common equity
The Value Line Investment Survey: 1/24/2020 (Electric Utilities West), 2/14/2020 (Electric Utilities East), 3/13/2020 (Electric Utilities Central)

O'Donnell Proxy Group
CAPM Results

Comparable Group

	30-Yr.Risk-Free Rate [1]	Average Proxy Group Beta	Equity Risk Premium	Equity Cost Rate	
Treasury - Maximum	3.46%	0.55	4.0%	5.64%	
Treasury - Average	2.63%	0.55	4.0%	4.81%	
Treasury - Minimum	0.99%	0.55	4.0%	3.17%	**LOW**

	30-Yr.Risk-Free Rate [1]	Average Proxy Group Beta	Equity Risk Premium	Equity Cost Rate	
Treasury - Maximum	3.46%	0.55	6.0%	6.74%	**HIGH**
Treasury - Average	2.63%	0.55	6.0%	5.91%	
Treasury - Minimum	0.99%	0.55	6.0%	4.27%	

Source: ***[1]*** *US Treasury Yields: February 23, 2018 through April 10, 2020*
https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield

O'Donnell Proxy Group
Returns on Book Value

Company	% Return on Common Equity			
	2017	2018	2019 / 2019E*	2022E* - 2025E*
American Elec Pwr	9.8%	10.1%	10.3%	10.5%
ALLETE Inc	7.7%	8.1%	7.7%	8.5%
Alliant Energy	6.4%	11.2%	10.7%	10.5%
Ameren Corp	9.4%	10.7%	10.3%	10.0%
CMS Energy Corp	13.7%	13.8%	13.6%	13.5%
Consol. Edison	8.2%	8.5%	7.0%	8.5%
Dominion Energy	13.1%	10.6%	6.5%	13.5%
Duke Energy	7.1%	6.7%	8.0%	8.5%
Edison International	12.7%	NMF	11.5%	11.0%
Entergy Corp	11.7%	12.2%	12.1%	11.0%
Eversource Energy	8.9%	9.0%	9.0%	9.5%
Hawaiian Electric	8.5%	9.3%	9.5%	9.0%
IDACORP Inc	9.4%	9.6%	9.0%	9.5%
MGE Energy Inc	9.8%	10.3%	10.2%	10.5%
NextEra Energy	10.9%	9.4%	10.0%	13.0%
Northwestern Corp	9.0%	8.8%	9.0%	9.0%
OGE Energy Corp	10.0%	10.6%	10.9%	11.0%
Otter Tail Corp	10.6%	11.3%	11.1%	11.5%
Pinnacle West	9.9%	9.8%	9.5%	10.0%
PNM Resources	9.1%	7.9%	10.5%	9.0%
Portland General	8.4%	8.5%	8.5%	9.0%
Public Serv Enterprise Group	10.3%	9.7%	12.5%	11.0%
Sempra Energy	9.2%	10.0%	9.5%	11.5%
Southern Co	13.4%	12.5%	12.0%	13.0%
WEC Energy Group	10.5%	10.8%	11.2%	12.5%
Xcel Energy	10.2%	10.3%	10.5%	10.5%
AVERAGE	**9.9%**	**10.0%**	**10.0%**	**10.6%**

*E = expected

The Value Line Investment Survey: 1/24/2020 (Electric Utilities West), 2/14/2020 (Electric Utilities East), 3/13/2020 (Electric Utilities Central)

Hevert Proxy Group
DCF Summary

Company	Forecasted Annualized Dividend Yield			Value Line									Average Plowback Growth Rate [4]	CFRA 3 Year Projected EPS CAGR [5]	Schwab LT Growth Rate 3-5 Years EPS (AEE) [6]
				10 Year			5 Year			Forecasted					
	13-Wks [1]	4-Wks [2]	Current [3]	EPS [4]	DPS [4]	BPS [4]	EPS [4]	DPS [4]	BPS [4]	EPS [4]	DPS [4]	BPS [4]			
													Exhibit KWO-7		
American Elec Pwr	3.0%	3.4%	3.4%	3.0%	4.5%	4.0%	4.0%	5.5%	3.0%	5.0%	5.5%	4.5%	3.4%	6.0%	6.2%
ALLETE Inc	3.3%	4.0%	4.0%	2.5%	3.0%	5.0%	4.0%	3.5%	5.0%	5.5%	5.5%	4.5%	2.6%	10.0%	7.0%
Alliant Energy	2.8%	3.1%	3.0%	5.0%	7.0%	4.0%	5.0%	7.0%	5.0%	6.5%	5.5%	7.5%	4.0%	6.0%	5.7%
Ameren Corp	2.5%	2.8%	2.6%	1.0%	-2.0%	-0.5%	6.5%	3.0%	2.5%	6.0%	5.0%	6.0%	4.3%	6.0%	4.9%
Avangrid Inc	3.6%	4.0%	4.0%	-	-	-	-	-	-	8.5%	3.6%	1.5%	1.3%	8.0%	6.3%
CMS Energy Corp	2.6%	2.8%	2.7%	9.5%	15.0%	4.5%	7.0%	7.0%	5.5%	7.5%	7.0%	7.5%	5.2%	8.0%	7.5%
DTE Energy Co	3.6%	4.6%	4.2%	8.0%	5.5%	4.5%	7.5%	7.0%	5.0%	5.0%	6.5%	5.5%	4.4%	6.0%	6.0%
Evergy Inc.	3.2%	3.7%	3.5%	-	-	-	-	-	-	NMF	NMF	NMF	1.8%	8.0%	6.5%
Hawaiian Electric	2.9%	3.2%	3.0%	5.0%	-	3.0%	4.0%	-	3.5%	2.5%	3.0%	3.5%	2.8%	5.0%	3.3%
NextEra Energy	2.2%	2.5%	2.3%	6.0%	9.0%	8.5%	6.0%	10.5%	9.5%	10.0%	10.5%	7.0%	3.9%	8.0%	7.6%
Northwestern Corp	3.4%	3.9%	3.9%	8.5%	5.0%	5.5%	7.0%	7.0%	8.0%	2.0%	4.5%	3.5%	3.0%	4.0%	3.8%
OGE Energy Corp	4.2%	5.5%	5.1%	5.0%	7.0%	7.0%	2.0%	10.0%	5.5%	4.5%	6.0%	3.5%	3.5%	5.0%	2.9%
Otter Tail Corp	3.0%	3.5%	3.2%	5.5%	1.5%	-	9.0%	2.5%	4.5%	5.0%	5.0%	5.0%	3.8%	4.6%	-
Pinnacle West	3.6%	4.2%	4.1%	4.5%	2.5%	2.5%	5.0%	3.0%	4.5%	4.0%	6.0%	3.5%	3.5%	5.0%	4.6%
PNM Resources	2.6%	3.2%	3.1%	7.0%	2.5%	-	6.0%	11.0%	1.0%	7.0%	7.0%	5.0%	4.1%	6.0%	6.3%
Portland General	3.0%	3.5%	3.2%	3.5%	4.5%	2.5%	4.0%	4.5%	3.5%	4.5%	6.5%	3.0%	3.3%	5.0%	4.7%
Southern Co	4.1%	4.7%	4.4%	3.0%	3.5%	4.0%	2.5%	3.5%	3.0%	4.0%	3.0%	4.0%	3.1%	4.0%	2.1%
WEC Energy Group	2.7%	2.9%	2.8%	8.5%	14.5%	8.0%	6.0%	9.5%	10.5%	6.0%	6.5%	3.5%	3.8%	6.0%	6.2%
Xcel Energy	2.7%	3.0%	2.7%	5.5%	4.5%	4.5%	5.0%	6.0%	4.5%	5.5%	6.0%	5.5%	4.1%	6.0%	6.1%
AVERAGE	**3.1%**	**3.6%**	**3.4%**	**5.4%**	**5.5%**	**4.5%**	**5.3%**	**6.3%**	**4.9%**	**5.5%**	**5.7%**	**4.7%**	**3.5%**	**6.1%**	**5.4%**

Notes:
EPS = earnings per share
DPS = dividends per share
BPS = book value per share

Sources:
[1] The Value Line Investment Survey, Summary and Index: 1/17/2020 1/24/2020 1/31/2020 2/7/2020 2/14/2020 2/21/2020 2/28/2020 3/6/2020 3/13/2020 3/20/2020 3/27/2020 4/3/2020 4/10/2020
[2] The Value Line Investment Survey, Summary and Index: 3/20/2020 3/27/2020 4/3/2020 4/10/2020
[3] The Value Line Investment Survey, Summary and Index: 4/10/2020
[4] The Value Line Investment Survey: 1/24/2020 (Electric Utilities West), 2/14/2020 (Electric Utilities East), 3/13/2020 (Electric Utilities Central)
[5] CFRA Stock Report earnings estimates as of 3/13/2020 as provided by Schwab.com
[6] Schwab Equity Report earnings estimates as of 3/13/2020 as provided by Schwab.com

Hevert Proxy Group
Plowback Ratios

Company	% Retained to Common Equity				
	2017 [1]	2018 [1]	2019 / 2019E* [1]	2022E* - 2025E* [1]	Average
American Elec Pwr	3.2%	3.5%	3.4%	3.5%	3.4%
ALLETE Inc	2.4%	2.7%	2.3%	3.0%	2.6%
Alliant Energy	4.0%	4.4%	4.2%	3.5%	4.0%
Ameren Corp	3.4%	4.8%	4.4%	4.5%	4.3%
Avangrid Inc	NMF	0.4%	1.5%	2.0%	1.3%
CMS Energy Corp	5.2%	5.3%	4.9%	5.5%	5.2%
DTE Energy Co	4.6%	4.9%	4.1%	4.0%	4.4%
Evergy Inc.	-	0.6%	2.4%	2.5%	1.8%
Hawaiian Electric	2.1%	3.1%	3.0%	3.0%	2.8%
NextEra Energy	4.4%	3.2%	3.5%	4.5%	3.9%
Northwestern Corp	3.4%	3.2%	3.0%	2.5%	3.0%
OGE Energy Corp	3.5%	3.8%	3.6%	3.0%	3.5%
Otter Tail Corp	3.3%	4.0%	4.0%	4.0%	3.8%
Pinnacle West	4.2%	3.9%	3.0%	3.0%	3.5%
PNM Resources	4.5%	2.9%	5.0%	4.0%	4.1%
Portland General	3.6%	3.5%	3.0%	3.0%	3.3%
Southern Co	3.9%	2.6%	2.5%	3.5%	3.1%
WEC Energy Group	3.6%	3.7%	3.8%	4.0%	3.8%
Xcel Energy	3.9%	4.3%	4.0%	4.0%	4.1%
AVERAGE	**3.7%**	**3.4%**	**3.5%**	**3.5%**	**3.5%**

*E = expected
Plowback = Percent retained to common equity
The Value Line Investment Survey: 1/24/2020 (Electric Utilities West), 2/14/2020 (Electric Utilities East), 3/13/2020 (Electric Utilities Central)

Hevert Proxy Group
CAPM Results

Comparable Group

	30-Yr.Risk-Free Rate [1]	Average Proxy Group Beta	Equity Risk Premium	Equity Cost Rate	
Treasury - Maximum	3.46%	0.54	4.0%	5.62%	
Treasury - Average	2.71%	0.54	4.0%	4.86%	
Treasury - Minimum	0.99%	0.54	4.0%	3.15%	**LOW**

	30-Yr.Risk-Free Rate [1]	Average Proxy Group Beta	Equity Risk Premium	Equity Cost Rate	
Treasury - Maximum	3.46%	0.54	6.0%	6.69%	**HIGH**
Treasury - Average	2.71%	0.54	6.0%	5.94%	
Treasury - Minimum	0.99%	0.54	6.0%	4.22%	

Source: ***[1]*** *US Treasury Yields: February 23, 2018 through April 7, 2020*
https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield

Hevert Proxy Group
Returns on Book Value

Company	% Return on Common Equity			
	2017	2018	2019 / 2019E* [1]	2022E* - 2025E* [1]
American Electric Power Co Inc	9.8%	10.1%	10.3%	10.5%
ALLETE Inc	7.7%	8.1%	7.7%	8.5%
Alliant Energy Corp	6.4%	11.2%	10.7%	10.5%
Ameren Corp	9.4%	10.7%	10.3%	10.0%
Avangrid	3.4%	3.9%	5.0%	6.0%
CMS Energy Corp	13.7%	13.8%	13.6%	13.5%
DTE Energy Co	10.8%	10.9%	10.0%	10.5%
Evergy Corp.	-	5.3%	7.8%	8.5%
Hawaiian Electric Industries Inc	8.5%	9.3%	9.5%	9.0%
NextEra Energy Inc	10.9%	9.4%	10.0%	13.0%
Northwestern Corp	9.0%	8.8%	9.0%	9.0%
OGE Energy Corp	10.0%	10.6%	10.9%	11.0%
Otter Tail Corp	10.6%	11.3%	11.1%	11.5%
Pinnacle West Capital Corp	9.9%	9.8%	9.5%	10.0%
PNM Resources Inc	9.1%	7.9%	10.5%	9.0%
Portland General Electric Co	8.4%	8.5%	8.5%	9.0%
Southern Co (The)	13.4%	12.5%	12.0%	13.0%
WEC Energy Group Inc	10.5%	10.8%	11.2%	12.5%
Xcel Energy Inc	10.2%	10.3%	10.5%	10.5%
AVERAGE	**9.5%**	**9.6%**	**9.9%**	**10.3%**

*E = expected

The Value Line Investment Survey: 1/24/2020 (Electric Utilities West), 2/14/2020 (Electric Utilities East), 3/13/2020 (Electric Utilities Central)

Appendix A

Kevin W. O'Donnell, CFA

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Kevin W. O'Donnell, is the founder of Nova Energy Consultants, Inc. in Cary, NC. Mr. O'Donnell's academic credentials include a B.S. in Civil Engineering - Construction Option from North Carolina State University as well as a MBA in Finance from Florida State University. Mr. O'Donnell is also a Chartered Financial Analyst (CFA).

Mr. O'Donnell has over thirty-four years of experience working in the electric, natural gas, and water/sewer industries. He is very active in municipal power projects and has assisted numerous southeastern U.S. municipalities cut their wholesale cost of power by as much as 67%. On Dec. 12, 1998, ***The Wilson Daily Times*** made the following statement about O'Donnell.

> **Although we were skeptical of O'Donnell's efforts at first, he has shown that he can deliver on promises to cut electrical rates.**

Through 2018, Mr. O'Donnell has completed close to 30 wholesale power projects for municipal and university-owned electric systems throughout North and South Carolina. In May of 1996 Mr. O'Donnell testified before the U.S. House of Representatives, Committee on Commerce, Subcommittee on Energy and Power regarding the restructuring of the electric utility industry.

Mr. O'Donnell has appeared as an expert witness in over 110 regulatory proceedings before the North Carolina Utilities Commission, the South Carolina Public Service Commission, the Virginia Corporation Commission, the Minnesota Public Service Commission, the New Jersey Board of Public Utilities, the Colorado Public Service Commission, Public Service Commission of the District of Columbia, the Maryland Public Service Commission, the Public Utility Commission of Texas, the Indiana Utility Regulatory Commission, the Wisconsin Public Service Commission, the Pennsylvania Public Service Commission, the Oklahoma State Corporation Commission, the California Public Utilities Commission, and the Florida Public Service Commission. His area of expertise has included rate design, cost of service, rate of return, capital structure, creditworthiness issues, fuel adjustments, merger transactions, holding company applications, as well as numerous other accounting, financial, and utility rate-related issues.

Mr. O'Donnell is the author of the following two articles: "Aggregating Municipal Loads: The Future is Today" which was published in the Oct. 1, 1995 edition of *Public Utilities Fortnightly;* and "Worth the Wait, But Still at Risk" which was published in the May 1, 2000 edition of *Public Utilities Fortnightly.* Mr. O'Donnell is also the co-author of "Small Towns, Big Rate Cuts" which was published in the January, 1997 edition of *Energy Buyers Guide.* All of these articles discuss how rural electric systems can use the wholesale power markets to procure wholesale power supplies.

Regulatory Cases of Kevin W. O'Donnell, CFA
Nova Energy Consultants, Inc.

Year	Name of Applicant	State Jusrisdiction	Docket No.	Client/ Employer	Case Issues
1985	Public Service Company of NC	NC	G-5, Sub 200	Public Staff of NCUC	Return on equity, capital structure
1985	Piedmont Natural Gas Company	NC	G-9, Sub 251	Public Staff of NCUC	Return on equity, capital structure
1986	General Telephone of the South	NC	P-19, Sub 207	Public Staff of NCUC	Return on equity, capital structure
1987	Public Service Company of NC	NC	G-5, Sub 207	Public Staff of NCUC	Return on equity, capital structure
1988	Piedmont Natural Gas Company	NC	G-9, Sub 278	Public Staff of NCUC	Return on equity, capital structure
1989	Public Service Company of NC	NC	G-5, Sub 246	Public Staff of NCUC	Return on equity, capital structure
1990	North Carolina Power	NC	E-22, Sub 314	Public Staff of NCUC	Return on equity, capital structure
1991	Duke Energy	NC	E-7, Sub 487	Public Staff of NCUC	Return on equity, capital structure
1992	North Carolina Natural Gas	NC	G-21, Sub 306	Public Staff of NCUC	Natural gas expansion fund
1992	North Carolina Natural Gas	NC	G-21, Sub 307	Public Staff of NCUC	Natural gas expansion fund
1995	Penn & Southern Gas Company	NC	G-3, Sub 186	Public Staff of NCUC	Return on equity, capital structure
1995	North Carolina Natural Gas	NC	G-21, Sub 334	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1995	Carolina Power & Light Company	NC	E-2, Sub 680	Carolina Utility Customers Assoc.	Fuel adjustment proceeding
1995	Duke Power	NC	E-7, Sub 559	Carolina Utility Customers Assoc.	Fuel adjustment proceeding
1996	Piedmont Natural Gas Company	NC	G-9, Sub 378	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1996	Piedmont Natural Gas Company	NC	G-9, Sub 382	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1996	Public Service Company of NC	NC	G-5, Sub 356	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1996	Cardinal Extension Company	NC	G-39, Sub 0	Carolina Utility Customers Assoc.	Capital structure, cost of capital
1997	Public Service Company of NC	NC	G-5, Sub 327	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1998	Public Service Company of NC	NC	G-5, Sub 386	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1998	Public Service Company of NC	NC	G-5, Sub 386	Carolina Utility Customers Assoc.	Natural gas transporation rates
1999	Public Service Company of NC/SCANA Corp	NC	G-5, Sub 400	Carolina Utility Customers Assoc.	Merger case
1999	Public Service Company of NC/SCANA Corp	NC	G-43	Carolina Utility Customers Assoc.	Merger Case
1999	Carolina Power & Light Company	NC	E-2, Sub 753	Carolina Utility Customers Assoc.	Holding company application
1999	Carolina Power & Light Company	NC	G-21, Sub 387	Carolina Utility Customers Assoc.	Holding company application
1999	Carolina Power & Light Company	NC	P-708, Sub 5	Carolina Utility Customers Assoc.	Holding company application
2000	Piedmont Natural Gas Company	NC	G-9, Sub 428	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
2000	NUI Corporation	NC	G-3, Sub 224	Carolina Utility Customers Assoc.	Holding company application
2000	NUI Corporation/Virginia Gas Company	NC	G-3, Sub 232	Carolina Utility Customers Assoc.	Merger application
2001	Duke Power	NC	E-7, Sub 685	Carolina Utility Customers Assoc.	Emission allowances and environmental compliance costs
2001	NUI Corporation	NC	G-3, Sub 235	Carolina Utility Customers Assoc.	Tariff change request.
2001	Carolina Power & Light Company/Progress E	NC	E-2, Sub 778	Carolina Utility Customers Assoc.	Asset transfer case
2001	Duke Power	NC	E-7, Sub 694	Carolina Utility Customers Assoc.	Restructuring application
2002	Piedmont Natural Gas Company	NC	G-9, Sub 461	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
2002	Cardinal Pipeline Company	NC	G-39, Sub 4	Carolina Utility Customers Assoc.	Cost of capital, capital structure
2002	South Carolina Public Service Commission	SC	2002-63-G	South Carolina Energy Users Committee	Rate of return, accounting, rate design, cost of service
2003	Piedmont Natural Gas/North Carolina Natura	NC	G-9, Sub 470	Carolina Utility Customers Assoc.	Merger application
2003	Piedmont Natural Gas/North Carolina Natura	NC	G-9, Sub 430	Carolina Utility Customers Assoc.	Merger application
2003	Piedmont Natural Gas/North Carolina Natura	NC	E-2, Sub 825	Carolina Utility Customers Assoc.	Merger application
2003	Carolina Power & Light Company	NC	E-2, Sub 833	Carolina Utility Customers Assoc.	Fuel case
2004	South Carolina Electric & Gas	SC	2004-178-E	South Carolina Energy Users Committee	Return on equity, capital structure, rate design, cost of service
2005	Carolina Power & Light Company	NC	E-2, Sub 868	Carolina Utility Customers Assoc.	Fuel case
2005	Piedmont Natural Gas Company	NC	G-9, Sub 499	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
2005	South Carolina Electric & Gas	SC	2005-2-E	South Carolina Energy Users Committee	Fuel application
2005	Carolina Power & Light Company	SC	2006-1-E	South Carolina Energy Users Committee	Fuel application
2006	IRP in North Carolina	NC	E-100, Sub 103	Carolina Utility Customers Assoc.	Submitted rebuttal testimony in investigation of IRP in NC.
2006	Piedmont Natural Gas Company	NC	G-9, Sub 519	Carolina Utility Customers Assoc.	Creditworthiness issue
2006	Public Service Company of NC	NC	G-5, Sub 481	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
2006	Duke Power	NC	E-7, 751	Carolina Utility Customers Assoc.	App to share net revenues from certain wholesale pwr trans

Regulatory Cases of Kevin W. O'Donnell, CFA
Nova Energy Consultants, Inc.

Year	Name of Applicant	State Jurisdiction	Docket No.	Client/ Employer	Case Issues
2006	South Carolina Electric & Gas	SC	2006-192-E	South Carolina Energy Users Committee	Fuel application
2007	Duke Power	NC	E-7, Sub 790	Carolina Utility Customers Assoc.	Application to construct generation
2007	South Carolina Electric & Gas	SC	2007-229-E	South Carolina Energy Users Committee	Rate of return, accounting, rate design, cost of service
2008	South Carolina Electric & Gas	SC	2008-196-E	South Carolina Energy Users Committee	Base load review act proceeding
2009	Western Carolina University	NC	E-35, Sub 37	Western Carolina University	Rate of return, accounting, rate design, cost of service
2009	Duke Power	NC	E-7, Sub 909	Carolina Utility Customers Assoc.	Cost of service, rate design, return on equity, capital structure
2009	South Carolina Electric & Gas	SC	2009-261-E	South Carolina Energy Users Committee	DSM/EE rate filing
2009	Duke Power	SC	2009-226-E	South Carolina Energy Users Committee	Return on equity, capital structure, rate design, cost of service
2009	Tampa Electric	FL	080317-EI	Florida Retail Federation	Return on equity, capital structure
2010	Duke Power	SC	2010-3-E	South Carolina Energy Users Committee	Fuel application - assisted in settlement
2010	South Carolina Electric & Gas	SC	2009-489-E	South Carolina Energy Users Committee	Return on equity, capital structure, rate design, cost of service
2010	Virginia Power	VA	PUE-2010-00006	Mead Westvaco	Rate design
2011	Duke Energy	SC	2011-20-E	South Carolina Energy Users Committee	Nuclear construction financing
2011	Northern States Power	MN	E002/GR-10-971	Xcel Large Industrials	Return on equity, capital structure
2011	Virginia Power	VA	PUE-2011-0027	Mead Westvaco	Capital structure, revenue requirement
2011	Duke Energy	NC	E-7, Sub 989	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2011	Duke Energy	SC	2011-271-E	South Carolina Energy Users Committee	Accounting, cost of service, rate design, ROE, capital structure
2011	Dominion Virginia Power	VA	PUE-2011-00073	Mead Westvaco	Rate design
2012	Town of Smithfield/Partners Equity Group	NC	ES-160, Sub 0	Partners Equity Group	Rate design, asset valuation
2012	Florida Power & Light	FL	120015-EI	Florida Office of Public Counsel	Capital structure
2012	South Carolina Electric & Gas	SC	2012-218-E	South Carolina Energy Users Committee	Accounting, cost of service, rate design, ROE, capital structure
2013	Progress Energy Carolinas	NC	E-2, Sub 1023	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2013	Duke Energy Carolinas	NC	E-7, Sub 1026	Carolina Utility Customers Assoc.	Rate design
2013	Jersey Central Power & Light	NJ	BPU ER12111052	Gerdau Ameristeel	Return on equity, capital structure
2013	Duke Energy Carolinas	SC	2013-59-E	South Carolina Energy Users Committee	Accounting, cost of service, rate design, ROE, capital structure
2013	Tampa Electric	FL	130040-EI	Florida Office of Public Counsel	Capital structure and financial integrity
2013	Piedmont Natural Gas	NC	G-9, Sub 631	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2014	Dominion Virginia Power	VA	PUE-2014-00033	Mead Westvaco	Recoverable fuel costs, hedging strategies
2014	Public Service Company of Colorado	CO	14AL-0660E	Colorado Healthcare Electric Coordinating Council	Return on equity, capital structure
2015	WEC Acquisition of Integrys	WI	9400-YO-100	Staff of Wisconsin Public Service Commission	Merger analysis
2015	Dominion Virginia Power	VA	PUE-2015-00027	Federal Executive Agencies	Return on equity
2015	South Carolina Electric & Gas	SC	2015-103-E	South Carolina Energy Users Committee	Return on equity
2015	Western Carolina University	NC	E-35, Sub 45	Western Carolina University	Accounting, cost of service, rate design, ROE, capital structure
2016	Sandpiper Energy	MD	9410	Maryland Office of People's Counsel	Return on equity, capital structure
2016	Washington Gas Light	DC	FC 1137	Washington, DC Office of People's Counsel	Return on equity, capital structure
2016	Florida Power & Light	FL	160021-EI	Florida Office of Public Counsel	Capital Structure
2016	Jersey Central Power & Light	NJ	EM15060733	NJ Division of Rate Counsel	Asset valuation
2016	Rockland Electric Company	NJ	ER16050428	NJ Division of Rate Counsel	Rate design
2016	Dominon NC Power	NC	E-22, Sub 532	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2017	Potomac Electric Power	DC	FC 1139	Healthcare Council of the National Capital Area (HCNCA)	ROE and capital structure
2017	Columbia Gas of Maryland	MD	FC 9447	Maryland Office of People's Counsel	ROE and capital structure
2017	Washington Gas Light	DC	FC 1142	Washington, DC Office of People's Counsel	Merger analysis
2017	Duke Energy Progress	NC	E-2, Sub 1142	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2018	Public Service Electric & Gas	NJ	GR17070776	NJ Division of Rate Counsel	ROE and capital structure
2018	Duke Energy Carolinas	NC	E-7, Sub 1146	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2018	Elkton Gas/SJI	MD	FC 9475	Maryland Office of People's Counsel	Merger analysis
2018	Entergy Texas	TX	PUC 48371	Public Utilities Commission of Texas	ROE
2018	Duke Energy Carolinas	SC	2018-3-E	South Carolina Energy Users Committee	Fuel case

Regulatory Cases of Kevin W. O'Donnell, CFA
Nova Energy Consultants, Inc.

Year	Name of Applicant	State Jusrisdiction	Docket No.	Client/ Employer	Case Issues
2018	Elkton Gas Company	MD	FC 9488	Maryland Office of People's Counsel	Accounting, ROE, capital structure
2018	Baltimore Gas & Electric	MD	FC9484	Maryland Office of People's Counsel	ROE, capital structure
2018	South Carolina Electric & Gas	SC	2017-370-E	South Carolina Energy Users Committee	Creditworthiness issue
2018	Jersey Central Power & Light	NJ	EO18070728	NJ Division of Rate Counsel	ROE and capital structure
2019	Duke Energy Carolinas	SC	2018-319-E	South Carolina Energy Users Committee	Accounting, rate design
2019	Duke Energy Progress	SC	2018-318-E	South Carolina Energy Users Committee	Accounting, rate design
2019	Public Service Electric and Gas	NJ	EO18060629	NJ Division of Rate Counsel	ROE and capital structure
2019	Potomac Electric Power	MD	FC 9602	Maryland Office of People's Counsel	ROE, capital structure
2019	Oklahoma Gas and Electric	OK	PUD 201800140	Sierra Club	Creditworthiness issue
2019	Peoples Natural Gas	PA	R-2018-3006818	Pennsylvania Office of Consumer Advocate	ROE, capital structure
2019	UGI Natural Gas	PA	R-2018-3006814	Pennsylvania Office of Consumer Advocate	ROE, capital structure
2019	Dominion Virginia Power	VA	PUR-2019-00050	Federal Executive Agencies	Return on Equity
2019	Piedmont Natural Gas	NC	G-9, Sub 743	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE
2019	Pacific Gas & Electric, Southern California Edison, San Diego Gas & Electric	CA	A-1904014, et al	Federal Executive Agencies	ROE, capital structure
2019	Duke Energy Indiana	IN	Cause 45253	Federal Executive Agencies	ROE, capital structure

BEVERIDGE & DIAMOND PC

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September 14, 2018

VIA Email

The Honorable Malcolm J. Howard
Senior United States District Judge
United States Courthouse
201 South Evans St., Rm 209
Greenville, NC 27858
NCEDml_Judge-Howard's_Monitor@nced.uscourts.gov

Re: Duke Energy Court Appointed Monitor Bi-Monthly Update

Dear Judge Howard:

I write to update you on my activities over the last few weeks.

Settlement of the City of Eden's Bromide Claim

On September 7, Duke reported to me that it and the City of Eden have reached a settlement of the City's bromide claim. My team is currently reviewing the settlement under the terms of the Bromide Restitution and Remediation Claims Process.

Semi-annual Status Update on Beckjord Facility

As reported in my August 31 report to the Court, on August 31 Duke provided me with its semi-annual report on the status of the Beckjord facility buyer's compliance with the terms of the purchase agreement. My team has reviewed Duke's report and is generally satisfied with Duke's monitoring of the buyer's progress at Beckjord. We continue to evaluate the status of several closure activities and will update you further in a future report if warranted.

Environmental Audits

Last week, Duke publicly posted the 2018 audit reports for the Buck and Marshall facilities to its website, and this week I provided the reports to the Court and other parties as required under the Plea Agreements. The auditors are currently finalizing the Roxboro and Mayo audit reports and

are awaiting Duke's comments on the H.F. Lee and Cape Fear reports.

This week, the auditors audited the East Bend facility in Kentucky. The next audits are scheduled for mid-October at the Gallagher and Gibson facilities in Indiana.

Also, as discussed in my September 12, 2018 email transmitting the final Buck and Marshall reports, I have notified the auditors of the import of the recent Fourth Circuit decision in *Sierra Club v. Virginia Electric & Power Co.*, No. 17-1895 (4th Cir. Sept. 12, 2018). The decision holds that a landfill and coal ash settling ponds at a closed coal-fired power plant are not themselves "point sources" under the Clean Water Act, and thus groundwater contamination emanating from the landfill and coal ash ponds via percolation of water through the structures (not via any discrete conveyance) and ultimately reaching surface waters is not subject to the effluent limitations of the Act, 33 U.S.C. § 1311. As you know, over the course of the audit program, the auditors have identified potential discharges from coal ash basins to surface waters through hydrologically connected groundwater as an open line of inquiry in certain audit reports. Those reports noted that the factual circumstances presented an open line of inquiry in part because the Fourth Circuit had not yet determined whether a surface impoundment constitutes a point source in that scenario and therefore the auditors could not draw a firm conclusion as to facility compliance. My team has provided the auditors with a summary of the holding of the *Sierra Club* case and a revised framework for evaluating this issue in pending and future audit reports.

CAM Site Visits

From September 10 through September 12, several members of my team and I visited Duke Energy's four facilities that have been identified as priority excavation sites under North Carolina's Coal Ash Management Act ("CAMA"): Sutton, Dan River, Riverbend, and Asheville. The Independent Monitor Chris Bell joined us for three of the site visits. We conducted our last visits to these sites in March 2018. As with the March 2018 site visits, we wanted to observe the pace of excavation progress at each site and discuss with the Duke Energy teams the engineering challenges that they have been managing since our last tour. In addition, these visits allowed us to develop a better understanding of the sites' projections for excavation completion, especially Sutton and Dan River, which have faced the most difficulties over the past six months.

For each site visit, Duke prepared a presentation outlining the current status of the excavation efforts, and recent and foreseeable challenges to progress. Duke personnel were consistently responsive and knowledgeable on my team's questions. Following the presentations, we were led on a tour of each site. As with my last visit, at each site, I emphasized the importance of achieving the CAMA excavation deadlines. I describe my observations for each site below.

Sutton: As of September 9, 2018, Duke reports that Sutton is 1,215 tons ahead of its year-to-date schedule, but with a projected completion date of September 30, 2019, 60 days after the August 1, 2019 CAMA deadline. However, Duke tentatively believes that Sutton *may* have 500,000

less tons of CAMA-regulated ash to excavate than originally thought (currently approximately 1.5 million tons left, rather than 2 million) and thus *may* be able to finish by July 2019. This is because their estimates for total ash, which they believe are accurate, were calculated in volume (cubic yards). Due to the practical difficulties in measuring volume during excavation and disposal, they have been measuring their excavation progress by weighing the disposed ash by weight (tons). Therefore, to equate the amount of excavated ash to the total ash to be excavated, Duke has been using a conversion factor of 1.2 tons per cubic yard. However, the ash at Sutton is reportedly less dense and closer to 1.1 tons of ash per cubic yard, creating the possible delta that Duke now reports.

Based on these updated calculations, Duke is hopeful that it will meet the CAMA deadline and, based on what I observed during the site visit, Duke appears to be working diligently to do so. Despite the difficulties of heavy rain over the end of this summer and the discovery of old cypress groves at the bottom of the primary basin, which is obstructing dredging, Duke continues to make good progress. After building a land bridge out to excavate the wettest and deepest end of the 1984 Basin, Duke has finally emptied the basin of water, removed all ash from over 15 acres of the basin, and is now well-positioned to finish clean closure of the basin. In the 1971 Basin, the use of multiple dredges and excavators to address the cypress stumps has been fruitful and Duke will soon be able to focus on continuing to dredge and dewater the remaining ash.

Per Duke personnel, the major obstacles for Sutton are now the need to ensure that remaining work is perfectly executed so that no time is lost to broken equipment or improperly excavated or landfilled material. The other potential obstacle is ensuring that NCDEQ will timely confirm clean closure of the basins once Duke has finished.

Finally, I note that the Sutton facility is currently dealing with the effects of Hurricane Florence – the second hurricane to affect the facility over the term of the plea agreements. While the implications to the work schedule at Sutton from the storm are highly dependent on the intensity and duration of the effects experienced, I believe it is reasonable to expect some schedule delays from the storm. I will update you further about this after Duke has had an opportunity to assess impacts from Hurricane Florence.

Dan River: As of Duke's September 9, 2018 weekly report, Dan River is 362,189 tons behind its schedule, which anticipates completion by January 15, 2019. During the site visit, Duke personnel spoke candidly about the obstacles that led to the delays that have plagued the site's excavation progress. The landfill breach in May, for example, arose out of the landfilling of ash that was not meeting moisture content specifications and thus had to be reworked and allowed to dry further in order to be fully compacted. While that ash was drying, other parts of the landfill were filled, leading to erosion issues from water flow patterns. Combined with a lack of water control measures to withstand a 25-year storm, the improper filling led to a landfill breach during heavy rains. The repair of that breach, as well as remedying of improper sloping and grading and ash compaction, cost the site approximately 4.5 weeks of production.

While these problems originated with the contractor, Duke personnel acknowledged the need for increased oversight and were working to learn from this mistake while sharing successful strategies between other ash sites. The root cause appears to be the ineffectiveness of the contractor's use of well-point dewatering, the use of groundwater pumps connected to chimneys in the ash basins to suck water out, which led to the landfilling of overly moist ash and the cascade of other landfill erosion problems. Now, Duke continues to face weekly deficits as it evaluates how to transition to traditional dewatering – the excavation, stockpiling, and mechanical working of the ash. I have asked to be informed of the site's revised plans as soon as they are available.

Besides these logistical issues, the site has also faced severe rains over this summer, and recent measurements have revealed that original estimates of total ash did not account for approximately 460,000 tons of ash. Given all of the above difficulties, Duke is pushing its scheduled end date from January 15, 2019 to June 1, 2019, with the understanding that it will be pushing its contractor to exceed the schedule to have a larger cushion before the August 1, 2019 CAMA deadline. Duke reports that Dan River has approximately 820,000 tons of CAMA-regulated ash left to excavate.

Riverbend: As of Duke's September 9, 2018 weekly report, Riverbend is 95,467 tons ahead of schedule and, weather permitting, expects to complete ash excavation in late September or October, 2018, well ahead of the CAMA deadline. Only approximately 100,000 tons of the original 4.8 million tons of ash are left to excavate at the site. Much of this ash is currently stockpiled in the ash stack area. Potential challenges to final closure discussed by the project team include water management, dealing with non-ash materials (e.g., boulders and asbestos-containing ash in the cinder pit), validation of final closure, and the removal of the site's equalization ponds. Regarding closure verification, Duke noted that it is working with NCDEQ to establish protocols for verifying proper closure of the CAMA-regulated structures.

Asheville: As of Duke's September 9, 2018 weekly report, Asheville is 73,389 tons ahead of schedule to complete ash excavation by February 2022, over five months ahead of the August 1, 2022 CAMA deadline. The project team reported that the site expects to be 80,000 tons ahead of plan by the end of the year. The most significant potential challenges that Duke anticipates concerns water management as the site excavates wetter ash; availability of landfill space; consistent availability of truck drivers for the hauling contractor, Waste Management; and potential discovery of more on-site ash.

<u>Update on ash discovery at H.F. Lee</u>

During the September 10 visit to the Sutton site, Duke presented more information on its plans for the ash discovery at H.F. Lee from earlier this year, as my team had requested. Duke reported its position that ash discoveries that are not related to coal ash surface impoundments, like at H.F. Lee, are not subject to CAMA but rather to North Carolina's general groundwater regulatory program. Nonetheless, Duke delineates such ash to determine its extent and potential origin, and as

Duke performs groundwater investigation at all of its ash sites, such non-impoundment ash could become subject to excavation requirements if doing so would remedy detected groundwater exceedances. I will continue to monitor NCDEQ's implementation of its groundwater and surface water programs as they relate to Duke's North Carolina sites.

Status of Groundwater Corrective Action for Duke Sites in North Carolina

During the September site visits, Duke also discussed the status of groundwater remediation at its North Carolina sites. For instance, the Sutton and Asheville facilities are subject to accelerated groundwater remediation work (via pump and treat). Meanwhile, six priority sites where Duke expects to close ash impoundments with ash in place must submit closure plans by August 2019, and updated Corrective Action Plans (CAPs) will be submitted for those sites by December 2019. The timeline for updating CAPs at other sites remains undetermined but is subject to negotiations between Duke and NCDEQ. I will continue to monitor this issue closely as more information becomes available.

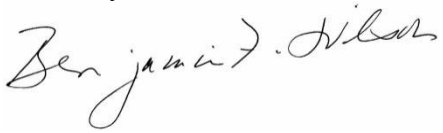
Environmental Concerns and Potential Violations

We continue to receive weekly updates on environmental concerns reported through the hotline and online portal, as well as Duke's "environmental events" reports. To date, we have not identified any reported concerns that rise to the level of a "suspected violation."

*****

As always, please do not hesitate to contact me with any questions or concerns regarding the information in this report or our work in general.

Sincerely,



Benjamin F. Wilson

cc: Jim Wells, Duke Energy
Steve Struble, Duke Energy
Lara Nichols, Duke Energy
Matt Hanchey, Duke Energy
Julie Janson, Duke Energy

Jim Cooney, Womble Carlyle
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Seth Wood, United States Department of Justice
Dwayne Benfield, United States Probation Office
John Wasco, United States Probation Office
Chris Bell, Greenberg Traurig
Stacey Wiggins, Eastern District of North Carolina
Stockton Brown, Eastern District of North Carolina

STATE OF NORTH CAROLINA

COUNTY OF NEW HANOVER

BEFORE THE
DEPARTMENT OF ENVIRONMENTAL
QUALITY

IN THE MATTER OF: REQUEST FOR VARIANCE FROM SESSION LAW 2014-122, SECTIONS 3(B)(4) AND 3(C), COAL ASH MANAGEMENT ACT BY **DUKE ENERGY PROGRESS, LLC**	)	**DECISION GRANTING IN PART VARIANCE WITH CONDITIONS**

On November 16, 2018, pursuant to NCGS § 130A-309.215, Duke Energy Progress, LLC (Duke Energy) submitted an Application for Grant of Variance to Extend the Deadline to Close Sutton Plant CCR Surface Impoundments ("Application") to the North Carolina Department of Environmental Quality ("Department"). The Department received additional information regarding the Application ("Additional Information") from Duke Energy on December 14, 2018. The Application requests that the Department issue a variance to extend the Coal Ash Management Act ("CAMA") closure deadline for the Sutton Plant Coal Combustion Residuals ("CCR") surface impoundments by six months from August 1, 2019 to February 1, 2020.

Based on the Department's analysis of the information submitted, the Department makes the following:

FINDINGS OF FACT

1. The L.V. Sutton Energy Complex (Sutton Plant) is located at 801 Sutton Steam Plant Road, near Wilmington, NC in New Hanover County. The facility is located adjacent to the Cape Fear River and Sutton Lake. The Sutton Plant operated as a three-unit, 575-megawatt coal-fired power plant from 1954 until the coal fired units were retired in 2013 and replaced with a 625-megawatt natural gas fired combined-cycle facility.

2. The Sutton facility has two CCR surface impoundments known as the 1971 Basin and the 1984 Basin. These CCR surface impoundments were operated under NPDES Permit No. NC0001422. The 1971 Basin was operated until 1985 and is unlined. The 1984 Basin was operated until 2013 and was constructed with a 24" thick clay liner. In 2013, the coal-fired units at the Sutton Plant were shut down and coal ash was no longer sluiced to the surface impoundments.

3. By October 2014, Duke Energy had developed the initial excavation plan for the CCR surface impoundments at the Sutton Plant. Duke Energy submitted the plan to the Department in November 2014. To meet the August 2019 deadline, the initial excavation

plans included transporting ash by rail and truck to the Brickhaven Mine facility in Chatham County, NC.

4. As part of the CCR surface impoundments excavation plan, Duke Energy developed the plans for an on-site landfill. Duke Energy submitted the application for the on-site landfill on August 7, 2015. Initial excavation of ash began in November 2015. On April 7, 2016, the Department announced that it would conduct an environmental justice analysis of each Duke Energy coal ash landfill application. The Department submitted its analysis to the EPA Office of Civil Rights, the U.S. Commission on Civil Rights and its North Carolina Advisory Committee for review and approval. Upon completion of this process, the Department issued a permit to construct the Sutton Plant landfill on September 22, 2016. This environmental justice analysis added approximately five months to the landfill construction process.

5. In October 2016, Hurricane Matthew severely impacted the region, delaying both landfill construction and transportation of ash to the Brickhaven Mine.

6. On July 6, 2017, the Department issued the permit to operate the Sutton Plant landfill. The following day Duke Energy began transporting ash to the landfill.

7. In June 2018, dredging operations in the 1971 ash basin were delayed by approximately three weeks due to the unexpected presence of rock and tree stumps in approximately five acres of the basin.

8. In September 2018, Hurricane Florence severely impacted the region causing additional delays in the ability to remove material from the CCR surface impoundments due to extreme flooding as well as damage to the landfill.

9. Throughout this time, Duke Energy evaluated and undertook various measures to accelerate excavation of the CCR surface impoundments, including expediting completion of the onsite landfill and expanding dredging operations.

10. Duke Energy estimates that, as of the end of 2018, it had excavated 4.9 million tons of ash, and that approximately 1.4 million tons of ash remain to be excavated during 2019. From October 2015 until July 2017, Duke Energy excavated an average of 130,000 tons of coal ash per month. Since the landfill became operational in July 2017, Duke Energy has excavated an average of approximately 150,000 tons of coal ash per month.

11. At the end of July 2019, assuming that there are no significant additional delays, Duke Energy forecasts that approximately 350,000 tons of coal ash will require excavation, which means that the excavation would be approximately 94% complete.

12. In terms of Duke Energy's compliance with the provisions of CAMA for the Sutton Plant:

a. Annual inspection by the Department of the Sutton 1971 and 1984 dams occurred on August 29, 2018 and no concerns or issues were reported.

b. Pursuant to NCGS § 130A-309-211(c1), no permanent replacement water connections were required.

c. Pursuant to NCGS § 130A-309-211(a), Duke submitted a comprehensive site assessment for the Sutton Plant on August 4, 2015.

d. Pursuant to NCGS § 130A-309-211(b), Duke submitted a corrective action plan for the Sutton Plant in two parts on November 2, 2015 and February 1, 2016.

13. In accordance with NCGS § 130A-309.215(a2), the Department provided public notice and held a public hearing on January 14, 2019 in Wilmington, NC. Jim Gregson, Deputy Director of the Department's Division of Water Resources, served as the hearing officer. Further details are provided in the enclosed Hearing Officer's Report dated March 25, 2019. The hearing officer provided the following recommendation:

> Based on the review of the public record, written comments, the North Carolina General Statutes and Administrative Code, the Coal Ash Management Act of 2014, and discussions with other Department staff, I recommend to the Assistant Secretary for the Environment that the request for variance be granted and that the closure deadline for the Sutton Plant CCR surface impoundments be extended by the minimum necessary time period that Duke Energy indicates it will take to complete the closure. The extension should not exceed six months.

Based upon the foregoing Findings of Fact, the Department makes the following:

CONCLUSIONS OF LAW

1. The CCR surface impoundments at the Sutton Plant in Wilmington, North Carolina are subject to Session Law 2014-122. Section 3(b) of Session Law 2014-122 deemed the CCR surface impoundments at the Sutton Plant as high priority. Sections 3(b)(4) and 3(c) of Session Law 2014-122 required that the CCR surface impoundments be closed by excavation no later than August 1, 2019.

2. NCGS § 130A-309-215(a) authorizes the Secretary of the Department of Environmental Quality to grant a variance to extend any CAMA deadlines. Secretary Michael Regan has delegated this authority in writing to Sheila Holman, Assistant Secretary for the Environment.

3. Pursuant to NCGS § 130A-309-215(a1), for a variance requested by an impoundment owner, the owner shall submit an application that includes "identification of the site, applicable requirements, and applicable deadlines for which a variance is sought, and the site-specific circumstances that support the need for the variance."

4. Additionally, "[t]he owner of the impoundment shall also provide detailed information that demonstrates (i) the owner has substantially complied with all other requirements and deadlines established by this Part; (ii) the owner has made good faith efforts to comply with the applicable deadline for closure of the impoundment; and (iii) that compliance with the deadline cannot be achieved by application of best available technology found to be economically reasonable at the time and would produce serious hardship without equal or greater benefits to the public." NCGS § 130A-309-215(a1).

5. A variance request shall not be submitted any earlier than one year prior to the applicable deadline.

6. The Department concludes that, in its Application, Duke Energy has identified:
   a. The site for which a variance for the closure deadline is sought as Duke Energy's Sutton Plant (see Application, p. 1);
   b. The applicable requirements in Session Law 2014-122 (see Application, pp. 1-2); and
   c. The applicable deadline for which variance is sought as August 1, 2019 (see Application, p. 2).

7. The Department further concludes that, in its Application and Additional Information, Duke Energy has:
   a. Identified the site-specific information that supports the need for a variance, including the delays caused by two hurricanes, delays caused by the Department's environmental justice review, and Duke Energy's evaluation and implementation of measures to expedite excavation (see Application, pp. 2-9).
   b. Supplied detailed information demonstrating its compliance with the provisions of CAMA, including its submissions of a Comprehensive Site Assessment and a Corrective Action Plan, no issues or concerns were reported with Sutton dams, and no alternative water supplies were required around the Sutton Plan (see Application, pp. 9-10; Additional Information, pp. 3-5).
   c. Supplied detailed information showing it made good faith efforts to comply with the applicable deadline for closure of the CCR surface impoundments, including excavating at an average rate of 150,000 tons per month since commencement of the operation of the onsite landfill, expediting completion of that landfill, expanding dredging operations, adding a third conveyer, simultaneously operating three dredges, and taking various additional measures to meet the August 1, 2019 deadline (see Application, pp. 2-9; Additional Information, pp. 1-3).
   d. Supplied detailed information indicating that compliance with the deadline cannot be achieved by application of best available technology found to be economically reasonable at the time and would produce serious hardship without equal or greater benefits to the public, including information regarding the technology that is currently being deployed to overcome the delays outlined above, additional technology that has been evaluated, and the computation of the average monthly rate of excavation, the amount of coal ash that remains to be excavated, and the

number of months remaining until August 1, 2019 (see Application, pp. 2-9; Additional Information, pp. 1-3).

ORDER

Based on the Findings of Fact and Conclusions of Law as set forth above, IT IS HEREBY ORDERED that the request for the variance is GRANTED IN PART pursuant to NCGS § 130A-309-215(a) with the following conditions:

1. The August 1, 2019 closure date for the CCR surface impoundments at Duke Energy's Sutton Plant is extended four (4) months to December 1, 2019.
2. Beginning April 15, 2019, and by the 15th day of each successive month until closure is completed, Duke Energy shall provide the Department with the amount of ash excavated at the Sutton Plant during the previous month and the cumulative total for ash excavation, the amount of ash placed in the landfill, the rate at which the ash is being removed and disposed, and the estimated volume of the remaining ash to meet the requirements of the closure.
3. This variance is only for the activities associated with the closure and removal of ash from the 1971 and 1984 Basins at the Sutton Plant in Wilmington, North Carolina.

This the 26th day of March, 2019.

DEPARTMENT OF ENVIRONMENTAL QUALITY

Sheila Holman

Sheila Holman
Assistant Secretary for the Environment

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

March 25, 2019

MEMORANDUM

To: Sheila Holman
Assistant Secretary for the Environment

From: Jim Gregson
Deputy Director

Subject: Hearing Officer's Report and Recommendations
Duke Energy Progress, LLC – L.V. Sutton Energy Complex
Variance Request to Extend the Deadline to Close Sutton Plant Coal Combustion Residual (CCR) Surface Impoundments
New Hanover County

On January 14, 2019, I served as the Hearing Officer for the Subject Public Hearing held at Cape Fear Community College, 411 North Front Street, McLeod Building Room S-002, Wilmington, NC 28360. The purpose of the public hearing was to allow the public to comment on Duke Energy's request for variance to extend the Coal Ash Management Act (CAMA) closure deadline for the Sutton Plant CCR impoundments by six months.

No oral comments were presented at the public hearing. I have reviewed all written comments received during the public comment period which ended on February 4, 2019. In preparation of this report I have considered all public comments, Duke Energy's variance application and the public record.

The report has been prepared using the following outline:

I. Site History / Background
II. January 14, 2019, Public Hearing and Comments Summary
III. Recommendations
IV. Attachments

Hearing Officer Report

JANUARY 14, 2019, PUBLIC HEARING – DUKE ENERGY PROGRESS, LLC VARIANCE REQUEST TO EXTEND DEADLINE TO CLOSE SUTTON PLANT CCR SURFACE IMPOUNDMENT LOCATED AT 801 SUTTON STEAM PLANT ROAD NEW HANOVER COUNTY

I. History / Background

The L.V. Sutton Energy Complex (Sutton Plant) is located at 801 Sutton Steam Plant Road, near Wilmington, NC in New Hanover County. The facility is located adjacent to the Cape Fear River and Sutton Lake. The Sutton Plant operated as a three-unit, 575-megawatt coal-fired power plant from 1954 until the coal fired units were retired in 2013 and were replaced with a 625-megawatt natural gas fired combined-cycle facility.

The Sutton facility has two CCR basins known as the 1971 and 1984 Basins. These basins were operated under NPDES Permit No. NC0001422. Fly and bottom ash sluicing was discontinued when the coal fired units were shut down in 2013. The 1971 Basin was operated until 1985 and is unlined. The 1984 Basin was operated from 1984 until 2013 and was constructed with a 24" thick clay liner.

Section 3(b) of the Coal Ash Management Act, Session Law 2014-122 deemed the CCR surface impoundments at the Sutton Plant as high risk. Sections 3(b)(4) and 3(c) of Session Law 2014-122 further required that the surface impoundments be closed by excavation no later than August 1, 2019.

On November 16, 2018, an application was received from Duke Energy for Variance to extend the deadline to close the Sutton Plant CCR surface impoundments. Additional information regarding the application was received from Duke Energy on December 14, 2018. The application requests that the Department issue a variance to extend the CAMA closure deadline for the Sutton Plant CCR Impoundments by six months; from August 1, 2019 to February 1, 2020.

II. January 14, 2019, Public Hearing and Comments Summary

A public hearing was held on January 14, 2019, at 6:00 pm, at Cape Fear Community College, 411 North Front Street, McLeod Building Room S-002, in Wilmington, NC. The purpose of the public hearing was to allow the public to comment on Duke Energy's request for variance to extend the Coal Ash Management Act (CAMA) closure deadline for the Sutton Plant CCR impoundments by six months.

The Department provided notices of public hearing and public comment by:

- providing Duke Energy's request for a variance and the Department's notice of public hearing and public comment to the New Hanover County Health Department (Attachment A);

- providing Duke Energy's request for a variance and the Department's notice of public hearing and public comment to the New Hanover County Public Library (Attachment B);
- posting Duke Energy's request for a variance and the Department's notice of public hearing and public comment to the Department's website, issuing a press release, and posting additional notices to its website on January 14, 2019 and February 4, 2019 (Attachment C);
- emailing notice to all persons on its coal ash email distribution list (Attachment D); and
- publishing notice in the *Wilmington Star News* on December 20, 2018; December 27, 2018; and January 3, 2019 (Attachment E).

Approximately 13 people attended the public hearing including 10 staff members of the Department of Environmental Quality and myself. No individuals signed the attendance sign in sheets at the hearing (Attachment F). The hearing officer provided opening comments and a brief overview of the variance request. No one registered in advance of the hearing to provide oral comments. No one responded when the Hearing Officer asked if anyone that did not register to speak would still like to provide oral comments.

The public hearing transcript is included as Attachment G.

In addition to the public hearing, The Department received seven written comments by email during the public comment period. Two of the emails were duplicates. Email comments are included as Attachment H.

WRITTEN COMMENTS SUMMARY

All email comments expressed general objection to the variance request or provided a general request that the ash be removed. The following is a summary by three major topic areas:

- Clean-up has been prolonged too long.
- What has Duke been doing for the past four years?

  Response – The classification of the Sutton Plant CCR surface impoundments as high risk and the requirements for closure of the impoundments by August 1, 2019, were mandated in Session Law 2014-122 which became effective on September 20, 2014. By October 2014, Duke Energy had developed the initial excavation plan for the surface impoundments at the Sutton Plant. The plan was submitted to the Department of Environmental Quality in November 2014. To meet the August 2019 deadline, the initial excavation plans included transporting ash by rail and truck to the Brickhaven Mine facility in Chatham County. At the same time Duke began developing the plans for an on-site landfill. The application for the on-site landfill was submitted on August 7, 2015. Initial excavation of ash began in November 2015. On April 7, 2016, NC DEQ announced that it would conduct an environmental justice review of each Duke Energy coal ash landfill application and ask the EPA Office of Civil

Rights, the U.S. Commission on Civil Rights and its North Carolina Advisory Committee to review and approve the environmental justice analysis before the permit is issued. The additional review by outside groups with expertise in environmental justice issues is to help ensure Duke Energy's construction of a landfill will not have an adverse disparate impact on a minority or low-income community protected by Title VI of the Civil Rights Act of 1964. Upon completion of this process, the permit to construct the Sutton Plant landfill was issued on September 22, 2016. Hurricane Matthew impacted the region in October 2016, causing additional delays in both landfill construction and transportation of ash to the Brickhaven Mine. In June 2018, dredging operations in the 1971 ash basin were delayed by approximately three weeks due to the unexpected presence of rock and tree stumps in approximately five acres of the basin. The permit to operate the Sutton Plant landfill was issued on July 6, 2017. The following day Duke Energy began transporting ash to the landfill. In September 2018, the area was severely impacted by Hurricane Florence causing additional delays in the ability to remove material from the ash basins due to extreme flooding and damage to the landfill. Duke Energy estimates that approximately 1.4 million tons of ash remain to be excavated during 2019.

- Ash basins should not have been in flood prone areas.

  Response – A review of current FEMA flood maps for the Sutton Plant area indicate the ash basins are in a Flood Zone X (Area of Minimal Flood Hazard). It is recognized that the Sutton Plant property was severely impacted by the historic rainfall events associated with Hurricane Florence.

III. Recommendations

Based on the review of the public record, written comments, the North Carolina General Statutes and Administrative Code, the Coal Ash Management Act of 2014, and discussions with other Department staff, I recommend to the Assistant Secretary for the Environment that the request for variance be granted and that the closure deadline for the Sutton Plant CCR surface impoundments be extended by the minimum necessary time period that Duke Energy indicates it will take to complete the closure. The extension should not to exceed six months.

IV. Attachments

A. Notice to New Hanover Health Department
B. Notice to New Hanover Public Library
C. Notices Posted to the Department's Website
D. Notices Sent to the Department's Coal Ash Email Distribution List
E. Notices Published in the *Wilmington Star News*
F. Public Hearing Attendance Sign-in Sheet
G. Public Hearing Transcript
H. Written Comments Received During Public Comment Period

Attachment A

From: Martin, Sharon L.
To: programsupport@nhcgov.com
Subject: Public Notice of Variance request on Duke Energy Sutton Coal Ash Closure
Date: Friday, December 14, 2018 4:45:00 PM
Attachments: SuttonVariance public notice -12142018.pdf
Sutton Station Application for Grant of Variance to Close Impoundments_20181116.pdf

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Dear program support,

I spoke with James in your environmental health section and he indicated you were the best contact. Attached is a public notice of the Duke Energy request for variance for the closure deadline of the Sutton Coal Ash Facility.

We are required by law to make a copy of this notice and document available in the county health department. Please post as necessary.

Feel free to give me a call if you have any questions of concerns.

Thanks,
Sharon Martin
Public Information Officer

Sharon Martin
Public Information Officer, Division of Air Quality
North Carolina Department of Environmental Quality
919.707.8446 (Office)
919.675.4912 (Mobile)
Sharon.Martin@ncdenr.gov

NOTICE FOR PUBLIC MEETING AND PUBLIC COMMENT PERIOD ON REQUEST FOR VARIANCE TO EXTEND CLOSURE DEADLINE
Duke Energy Sutton Plant

Duke Energy has made a request to the North Carolina Department of Environmental Quality (DEQ) for a variance to extend the Coal Ash Management Act closure deadline by six months for the Sutton Coal Ash facility located at:

801 Sutton Steam Plant Road
Wilmington, NC 28401

This notice serves as a Notice of Public Meeting and Opportunity for Public Comment for this request. The public meeting will be held at the Cape Fear Community College on January 14, 2019 in the Union Station Building.

A copy of the variance request is posted on the DEQ website at deq.nc.gov/Sutton-Variance.

Interested persons are invited to provide comment on the variance request. Written comments may be sent to:

Ellen Lorscheider
1646 Mail Service Center
Raleigh, North Carolina 27699 1646
Phone/Fax: (919)707-8200

The comment period began on December 14, 2018 and ends on February 4, 2019. Written comments may also be submitted during the public comment period via email at the following address:

publiccomments@ncdenr.gov

Please type "Sutton Variance Request" in the subject line.

After weighing all relevant comments received, DEQ will decide whether to grant the request.

George T. Hamrick
Senior Vice President
Coal Combustion Products

400 S. Tryon Street, ST06A
Charlotte, NC 28202

Phone: 980-373-6113
Email: george.hamrick@duke-energy.com

November 16, 2018

VIA UPS OVERNIGHT DELIVERY AND ELECTRONIC MAIL

Mr. Michael S. Regan
Secretary
North Carolina Department of Environmental Quality
217 W Jones St
Raleigh, NC 27603

RE: Application for Grant of Variance to Extend Deadline to Close Sutton Plant CCR Surface Impoundments (N.C.G.S. § 130A-309.215)

Dear Secretary Regan:

North Carolina General Statutes Section 130A-309.215(a) authorizes the Secretary of the North Carolina Department of Environmental Quality ("NCDEQ" or "Department") to "grant a variance to extend any deadline under [the Coal Ash Management Act ("CAMA")] on the Secretary's own motion, or that of an impoundment owner, on the basis that compliance with the deadline cannot be achieved by application of best available technology found to be economically reasonable at the time and would produce serious hardship without equal or greater benefits to the public." Pursuant to N.C.G.S. § 130A-309.215(a1), where a variance is requested by an impoundment owner, the impoundment owner must within one year prior to the applicable deadline, request a variance including, at a minimum, information regarding (A) the site; (B) applicable requirements; (C) applicable deadlines for which a variance is sought; (D) site-specific circumstances supporting the need for the variance; and (E) detailed information demonstrating that "(i) the owner has substantially complied with all other requirements and deadlines established by [CAMA]; (ii) the owner has made good faith efforts to comply with the applicable deadline for closure of the impoundment; and (iii) that compliance with the deadline cannot be achieved by application of best available technology found to be economically reasonable at the time and would produce serious hardship without equal or greater benefits to the public."

Consistent with the requirements of subsection (a1) of N.C.G.S. § 130A-309.215, Duke Energy Progress, LLC ("Duke Energy" or "Company") hereby submits this application for a variance to extend by six months the CAMA closure deadline applicable to the coal combustion residuals ("CCR") surface impoundments at Duke Energy's Sutton Plant ("Sutton") in Wilmington, North Carolina. Section I of this application

addresses elements A, B, and C above; Section II addresses elements D, (E)(ii), and (E)(iii); and Section III addresses element (E)(i). As detailed in Section II below, NCDEQ's grant of the variance is warranted, because despite Duke Energy's application of best available technology found to be economically reasonable, compliance with the applicable CAMA deadline cannot be achieved due to myriad factors, including the impacts of several permitting delays, two major hurricanes, and other unforeseeable challenges and limitations beyond the Company's control.

I. Site; Applicable Requirements and Applicable Deadline

Sections 3.(b)(4) and 3.(c) of CAMA (Sess. L. 2014-122) require that the CCR surface impoundments at Sutton be closed by removal of CCR by no later than August 1, 2019 ("Deadline"). For the reasons discussed in detail below, despite Duke Energy's good faith efforts to apply best available technology found to be economically reasonable, Duke Energy has determined that it may not be able to meet the Deadline without producing serious hardship without equal or greater benefits to the public.

II. Site-specific Circumstances Demonstrating Why Compliance with CAMA's Deadline Cannot be Achieved Despite Duke Energy's Good Faith Efforts and Application of Best Available Technology

Throughout the basin excavation process, Duke Energy has encountered numerous challenges that have cumulatively resulted in the current schedule delay at Sutton and have impacted the Company's ability to close the Sutton CCR surface impoundments by the Deadline. During this period, Duke Energy has consistently exercised best efforts to minimize any delays in meeting the Deadline and has taken important steps to overcome the various challenges and limitations presented in an effort to recover schedule.

Under the standard set out in N.C.G.S. § 130A-309.215, whether application of a given technology would be commercially or economically reasonable requires that the costs of such technology be balanced against its benefits to the public. Following this fundamental principle over the course of the basin closure project, Duke Energy has consistently looked for and evaluated measures to safely and reasonably minimize any delays to the extent possible, considering at all times, the risks and benefits associated with each of the options considered.

In October 2014, the Company developed the initial Sutton Excavation Plan and held the Phase I excavation bidding event for excavation of the first two million tons of CCR for rail transport, which was determined to be the amount of ash that would need

to be transported by rail to meet the Deadline. The contractor Duke Energy selected under this bidding event ("Contractor A") was chosen not only because it had bid the lowest price per ton, but also because it had completeness of technical support, engineering competence, and extensive wet ash basin experience. Due to CAMA's aggressive completion date of August 1, 2019, the complexity of CCR excavation at Sutton, and the expected timeline to construct an on-site landfill, the Brickhaven structural fill in Chatham County, North Carolina was selected as the initial CCR placement site for ash from the Sutton impoundments.

On November 13, 2014, Duke Energy submitted the initial Sutton Excavation Plan to the Department to cover the first 12 to 18 months (Phase I) of ash basin excavation activities. In general, the scope of work included site preparation, initiation of basin dewatering, ash basin preparation, construction of the on-site landfill, and ash removal from the basins. Under the initial Excavation Plan, Duke Energy would begin placing ash in the Brickhaven structural fill—a beneficial use of CCR pursuant to N.C.G.S. § 130A-309.201(1), (11), and (14). Ash would be transported from the site via rail car and also trucked to Brickhaven. Although the quantity trucked was small relative to the quantities transported by rail, this action demonstrated Duke Energy's commitment to commence ash excavation and placement operations as soon as feasible. Rail operations would consist of 85 car unit trains, with rail cars averaging 90 tons per car. The monthly goal was to deliver 14 loaded trains to Brickhaven per month, working seven days per week, or approximately 107,000 tons per month.

While transporting ash to Brickhaven, Duke Energy developed simultaneously an on-site landfill in order to meet the Deadline. Based on an engineering feasibility study commissioned by Duke Energy, it was determined that an on-site landfill would be the least-cost option to dispose of the ash and would have the least environmental impact. Moreover, it was determined to be the most expedient method of ash removal from the basins, consistent with the requirements of CAMA. North Carolina's solid waste rules, which prohibit the commencement of construction activities without having first secured the necessary permits, on-site landfill construction could not begin until issuance of the Permit to Construct.

On August 7, 2015, Duke Energy submitted its application for a Permit to Construct the on-site landfill to dispose of five million tons of coal ash from the Sutton impoundments (Phase II). On September 3, 2015, NCDEQ sent a letter to Duke Energy notifying the Company that the landfill application had been deemed "complete." NCDEQ sent a follow-up letter on October 7, 2015, requesting supplemental information, which Duke Energy provided on December 10, 2015. NCDEQ then initiated a 60-day public comment period, which ran from February 11 to April 15, 2016. The Company reasonably expected that the permit would issue soon after the conclusion

of the comment period because (i) the public meeting was not heavily attended or contentious, (ii) NCDEQ Solid Waste Division staff had been reviewing the application since it was submitted on August 7, 2015, and (iii) it historically took the Department only a few weeks after expiration of the comment period to issue such permits.[1]

Duke Energy completed the updated 2015 Sutton Excavation Plan in November 2015 and revised the milestone dates, which reflected a reasonable expectation that it would secure the Permit to Construct in early 2016, thereby supporting a schedule to complete excavation of the ash by March 2019. Duke Energy was planning to move two million tons of ash via rail and, in parallel, dispose of ash in the on-site landfill from late January 2017 to July 2017. The Company estimated that it could excavate and move between approximately 200,000 to 225,000 tons of ash per month, 93,000 to 118,000 tons of which would be via truck to the landfill and approximately 107,000 tons of which would be via rail to Brickhaven.

However, on April 7, 2016, NCDEQ announced a new policy at a town hall meeting sponsored by the North Carolina Advisory Committee ("Advisory Committee") of the United States Commission on Civil Rights ("USCCR"), followed by a news release announcing a new review and approval process for all CCR landfills. Available at https://deq.nc.gov/press-release/north-carolina-take-extra-steps-protect-minority-communities. NCDEQ declared that it would go "beyond state and federal requirements" by conducting an environmental justice review of each Duke Energy coal ash CCR landfill application, including applications for expansions of existing on-site CCR landfills, and ask EPA's Office of Civil Rights, the USCCR, and the Advisory Committee to review and approve the environmental justice analysis before the permit is issued. NCDEQ reiterated this new policy a week later in a letter to the Advisory Committee. As a result of this new and unexpected process, on September 22, 2016, Duke Energy finally secured the Permit to Construct the Sutton landfill, which was one full year after NCDEQ had deemed the application "complete," and almost five months later than the latest date on which the permit was reasonably expected.

As a result of the permit delay, Duke Energy lost the six plus months of parallel (*i.e.*, on-site and off-site) excavation and placement/disposal for which it had planned. If issuance of the Permit to Construct would not have been delayed, the landfill construction would have been ongoing over this entire period of time, which would have created substantial margin on available space and volume to dispose of ash. The loss of this time and the ability to create margin had a significant negative impact on the ability to complete the project by the Deadline. Compounding this delay, Hurricane Matthew

[1] North Carolina General Statutes Section 130A-309.203 directs NCDEQ to expedite permit reviews for permits necessary to complete basin closure activities under CAMA—60 days after the comment period on the draft permit decision closes.

struck eastern North Carolina on October 8, 2016, further delaying the mobilization of landfill construction, limiting access to the work site, and interrupting rail transport of ash to Brickhaven for 20 days due to railway flooding.

As a result of these unforeseen complications in the landfill permitting process, coupled with historic impacts to the region and Duke Energy's operations from Hurricane Matthew, Duke Energy's excavation schedule was delayed by over six months. However, throughout 2017, Duke Energy continuously evaluated actions and implemented them where the Company determined it was safe and commercially reasonable to do so. Following is a summary of the options the Company evaluated and the economically reasonable measures it undertook to address challenges and limitations and achieve schedule recovery:

- Duke Energy added a third conveyor to increase its margin on rail production. Accelerating the completion of Phase I provided crucial time to transition to Phase II while Duke Energy awaited construction of the on-site landfill to be completed.

- Duke Energy mobilized Contractor B—the contractor performing Phase II of ash excavation—to the site prior to Contractor A completing Phase I to support removal of non-ash material from the 1971 Basin, which accelerated Phase II of basin excavation.

- Due to mild weather and the Company's implementation of parallel activities, construction of Cell 3 of the landfill was completed well in advance of the scheduled September 1, 2017, completion date. As a result of this reduction in the landfill construction schedule, Duke Energy was in a position to start disposing of ash in the landfill upon receipt of the Permit to Operate. NCDEQ issued the permit on July 6, 2017, and the Company promptly started moving ash into the landfill on the following day, representing a 55-day acceleration of the schedule.

- Duke Energy evaluated parallel shipments of ash to Brickhaven and to the on-site landfill but rejected this action primarily based on logistical and contractual constraints. At that time (mid-2017), the Company could only process between approximately 200,000 to 225,000 tons of ash per month irrespective of where it was ultimately placed or disposed of.

- As the project schedule progressed, the landfill continued to be critical path due to the need to get additional cells permitted and operating. Duke Energy took efforts to expedite the landfill construction schedule and was able to complete Cells 5 and 6 a year ahead of schedule, thereby completely removing the landfill

from critical path. In addition, the necessary permits to operate all six cells were secured. Critically, Duke Energy also secured the necessary permits to treat the landfill leachate on-site. This is significant because of the volume of leachate generated by the landfill—as more air space opened up, the volume of precipitation infiltrating into the ash and water draining from the ash itself increased, thus increasing the amount of leachate that needed to be treated.[2] By constructing Phase 2 of the site's wastewater treatment facility, getting the system installed to transfer the landfill leachate to that facility, and securing the necessary discharge permit, Duke Energy was able to simultaneously operate three cells instead of one, thereby allowing it to increase production substantially.

- The Company evaluated the feasibility of applying additional resources in order to increase the production rate, including expanding to night operations. Leveraging its experience, Duke Energy increased its dredging excavation activities up to 20 hours per day, six days a week using two 10-hour shifts or extended shifts.

- A new large dredge was assembled, commissioned, and placed into service in January 2018. Several measures were put into place to continuously improve performance, as follows: (1) A one-week outage was scheduled in late April 2018 to address design and breakdown issues and warranty work on the new dredge; (2) a second smaller dredge was placed into service in mid-April; (3) a third dredge was made available for use as a backup; (4) operating personnel and supervision were staffed up to support increased production; and (5) additional rigor was added to Job Hazard Analysis and Pre-job Briefs, along with increased supervisory oversight. These measures resulted in improved dredge performance. Duke Energy continues to monitor and review performance for additional improvement opportunities.[3]

During Duke Energy's dam decommissioning application discussions with the state, the Company was unexpectedly required by the Department to maintain a 50-foot buffer on the dikes until issuance of a decommissioning permit. The state's decision to limit Duke Energy to a minimum of a 50-foot buffer of ash on the dikes of the 1971 Basin further challenged Duke Energy's ability to meet the Deadline, despite exercising best efforts. The buffer requirement prevented Duke Energy from excavating all of the ash

[2] Trucking and treating leachate is the alternate method of managing leachate, but the extent to which this can be done is dependent on the capacity of local vendors and municipalities. The limit is approximately 40,000 gallons per day, which would allow for only one landfill cell to be open at a time.

[3] Although the operation of three dredges was evaluated, the Company rejected this option due to safety concerns associated with the number of cables, anchors, and pipes that would be introduced.

from the basin dikes until after a dam decommissioning permit could be secured authorizing Duke Energy to remove the dikes. The result was that over 125,000 tons of material remained in the buffer zone of the dikes—material that was originally scheduled to be excavated as Duke Energy cut into the basin. Because Duke Energy was compelled to leave the material in the buffer zone of the dikes, ash was trapped on the dikes, which were surrounded by water. This not only prevented the Company from more efficiently achieving its production goals as planned, but required going back to excavate the material off the dikes from the buffer zone in a less efficient manner, thereby extending schedule.

Although it is not possible to recover the loss of margin occasioned by the delay in securing the necessary permit to decommission the dikes, Duke Energy saved substantial time by plotting the coordinates of the bottom of the 1971 Basin by taking 240 sample borings prior to digging below the groundwater table. Based on those sample borings, the Company determined the lower extent of the ash, thereby allowing it to dredge down directly to those coordinates. Duke Energy then developed as-built drawings certifying that it excavated to those coordinates to establish excavation had been completed. If the Company would not have taken this action, it would have been required to go into the basin on a barge and take 100-foot grid samples, which would have taken significant time. Moreover, if Duke Energy would have found samples that indicated the existence of ash, it would have had to go back to do further excavation. By getting the borings done ahead of time and delineating the GPS coordinates of the contours of the bottom of the basin, the Company saved significant amounts of time.

To further challenge excavation operations, in late June 2018, while continuing to dredge in the 1971 Basin, both dredges encountered trees and stumps (remnants of a Cyprus forest) in three areas estimated to total approximately five acres, which challenged production by requiring an average of 45 non-productive hours per week to clean dredge cutter heads. Neither dredge type could make sufficient progress in those areas due to continuous clogging of the dredge pumps. However, Duke Energy promptly took interim action to redeploy dredge resources to other locations in the basin to maintain production while developing alternatives to effectively remove stumps and debris without compromising production and the dredge schedule. The Company determined to bridge out over two of the three areas to allow for the utilization of mechanical excavation to remove the stumps and CCR material from these areas (approximately 139,000 cubic yards of material). With respect to the third area (approximately 50,000 cubic yards of material), because there was no nearby land access to the area, bridging was rejected as an option. Other options Duke Energy considered included, amphibious excavation, barge excavation, and continued dredging at a reduced rate. To help inform its decision, the Company obtained additional bathymetric and aerial survey data. After evaluating the available options, all of which

would result in schedule delay, Duke Energy determined that dredging through the area would be the most technically feasible option and would result in the least impact on schedule. Although this was the most commercially reasonable option, it, nevertheless, resulted in a schedule loss of three weeks.

In 2018, weather continued to contribute to Duke Energy's inability to meet the Deadline. As in 2017, Sutton experienced above-average levels of precipitation in 2018. Through October 2018, the Wilmington area received historical levels of rainfall. Although average total precipitation in Wilmington in the months of April through September is 35.22 inches, actual rainfall over this six-month period in 2018 was 74.8 inches.[4] Thus, over this six-month period in 2018, Wilmington received 39.58 inches more rainfall than is normally the case. Under the extremely wet conditions presented, ash could not be dried to the level required for transportation and placement in the landfill.

Sutton, which was directly in the Hurricane Florence's path, experienced the full force of the storm's winds and rainfall. By September 11, 2018, precipitation intensity charts showed 25 to 30 inches of predicted rainfall in a concentrated portion of the coastal area just north of Wilmington. Duke Energy took numerous planning and engineering actions before the hurricane to prepare the site and minimize potential storm impacts, including staffing Sutton during the storm, pre-staging equipment, actively reducing water levels in the ponds before the storm arrived, and placing structural materials on-site to respond quickly if repairs were needed.

Rainfall began at Sutton on September 13, with 5.7 inches falling as measured by gauges at the site. On September 14, Sutton received an additional 11.5 inches of rainfall in three hours, between 6:00 a.m. and 9:00 a.m.[5] This rainfall significantly exceeded the 25-year, 24-hour storm event design capacity of the run-on/run-off berm for landfill Cells 4 and 5. On September 16, a second peak rain event occurred between the hours of 12:00 a.m. and 6:00 a.m., with the site receiving an additional 4.2 inches of rainfall. Cumulative rainfall received by 8:00 a.m. on September 16 was approximately 30.1 inches.

On September 17, the site response team's priorities were to ensure the site was stable and prepared to handle another rain event by cleaning out ditches, installing

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[4] In fact, new rainfall records were set in each of the months of May and September 2018. *See* https://w2.weather.gov/climate/index.php?wfo=ilm.

[5] The flooding Cape Fear River triggered the shutdown of the entire plant, including its natural gas-fired operations—and evacuation of plant staff. The storm resulted in 1.8 million Duke Energy customers losing power.

check dams, pumping contact water to the ash basins, restoring power to the site to support wastewater processing equipment operations, and developing a recovery plan to resume ash excavation. On that same day, the construction contractor remobilized and began to manage water in the landfill. The Department performed an inspection on September 28 after repairs had been completed and gave permission for landfill operations and placement of ash in the landfill to resume. Excavation and placement of ash resumed on September 29—only 16 days after the storm began impacting Sutton.

III. Substantial Compliance with all Other CAMA Requirements and Deadlines

In compliance with CAMA, in 2015, Duke Energy embarked on an aggressive plan to close all ash basins across its North Carolina fleet, which is a complex task requiring significant planning, coordination with state regulators, and dedication of resources. In North Carolina, the Company has 31 coal ash basins subject to the requirements of CAMA, which imposes on Duke Energy, among other things, stringent structural stability, closure, post-closure care, groundwater monitoring, and corrective action requirements for CCR surface impoundments, as well as permanent water supply obligations.[6]

In July 2016, the North Carolina legislature amended CAMA to require Duke Energy to rectify any deficiencies identified by, and to comply with the requirements of, any dam safety order issued by the state for CCR surface impoundments. *See* N.C.G.S. § 130A-309-213(d)(1)b. On August 22, 2016, pursuant to N.C.G.S. § 143-215.32, NCDEQ issued Dam Safety Order 16-01 ("DSO") requiring certain repairs to impoundment dams at nine facility's subject to CAMA. Consistent with the requirements of the DSO, Duke Energy promptly undertook the required repairs and sent the Department a letter dated June 1, 2018, notifying it that the Company had fully complied with the requirements of the DSO in accordance with N.C.G.S. §§ 130A-309-213(d)(1)b. and 143-215.32. Specifically, Duke Energy completed all of the repair plans specified by, and timely submitted all of the completion reports to, NCDEQ. The Department conducted as-built inspections for each item and issued Certificates of Final Approval indicating that the required work had been completed as designed. In addition, the annual inspection of each dam has been completed, and the Company has received Notice of Inspection Reports documenting that no deficiencies are present.[7] Finally, on October 10, NCDEQ

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[6] Twenty-six of these basins are also regulated under the federal CCR rule.

[7] The Sutton surface impoundments were not subject to the DSO. Nevertheless, the October 17, 2017, inspection report from the state indicates "the inspections revealed the dams to be well maintained and in good order." Similarly, the most recent annual inspection of the Sutton 1971 and 1984 Basin dams

made official notification to the Environmental Management Commission that Duke Energy had complied with all dam safety requirements, as required by N.C.G.S. § 130A-309-213(d)(1)b.

With respect to the permanent water supply requirements imposed under CAMA, Duke Energy provided each eligible and consenting resident with an alternative drinking water supply (*i.e.*, connection to a public water system or a filtration system) by the deadline set out in N.C.G.S. § 130A-309-211(c1). On October 12, 2018, NCDEQ issued a press release announcing that "permanent replacement water supplies have been provided to all eligible households near Duke Energy coal ash facilities in North Carolina . . . by the deadline of October 15, 2018 set forth in the Coal Ash Management Act." Available at https://deq.nc.gov/news/press-releases/2018/10/12/release-deq-completes-permanent-replacement-water-supplies-coal-ash.

Consistent with the requirements of N.C.G.S. § 130A-309-211, Duke Energy submitted the groundwater assessments to NCDEQ by the applicable CAMA deadline. In addition, the Company has submitted for six sites and continues to prepare for other sites updated comprehensive site assessments. Updated groundwater corrective action plans are also being submitted. These documents will be submitted to NCDEQ in accordance with the schedule provided to Duke Energy by the Department.[8] The Company is also preparing site-specific coal ash impoundment closure plans in accordance with the requirements of N.C.G.S. § 130A-309-214(a)(4). These closure plans will be submitted to the Department no later than the applicable deadline set out in CAMA.

Finally, Duke Energy has substantially complied with all other requirements and deadlines established under CAMA, including its annual inspection, annual reporting, and ash beneficiation requirements.

Conclusion

The latest bathymetric survey data show that Duke Energy has dredged approximately 760,000 cubic yards from the 1971 Basin and that there are approximately 240,000 cubic yards of dredge material remaining. In addition, there are

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occurred on August 29, 2018; no concerns or issues were reported by NCDEQ that would necessitate issuance of a Notice of Deficiency or Notice of Violation.

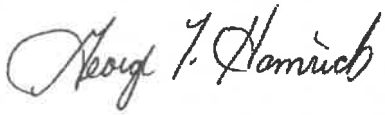
[8] Although not required under CAMA, Duke Energy completed installation of the accelerated remediation system required under Paragraph II.A. of that certain Agreement to Settle and for Release of Claims entered into among NCDEQ and Duke Energy on September 29, 2015.

987,500 cubic yards remaining in the 1984 Basin. By August 1, 2019, Duke Energy estimates it will have excavated and moved for placement or disposal approximately 94 percent of the total ash to be excavated and moved from the Sutton impoundments.

As detailed above, the Company's commitment to the application of best available technology found to be economically reasonable to meet the Deadline has resulted in significant schedule recovery, despite the many challenges and limitations with which Duke Energy was presented throughout the excavation process. Despite these good faith efforts to meet the Deadline, Duke Energy estimates that it requires an additional six months. Accordingly, the Company respectfully requests that the Department grant Duke Energy a variance to extend the Deadline to **February 1, 2020**, to close the Sutton surface impoundments. Although this application requests a six-month variance, Duke Energy is committed to continuing to undertake best efforts to evaluate opportunities and implement commercially reasonable measures to meet the Deadline.

If you have any questions, please do not hesitate to contact Randy Hart at randy.hart@duke-energy.com or (980) 373-5630. We appreciate your time and consideration.

Respectfully submitted,



George T. Hamrick
Senior Vice President, Coal Combustion Products

NCDEQ cc: Sheila C. Holman (sheila.holman@ncdenr.gov)
William F. Lane (bill.lane@ncdenr.gov)

Duke Energy cc: ccprecords@duke-energy.com; Randy Hart

George T. Hamrick
Senior Vice President
Coal Combustion Products

400 S. Tryon Street, ST06A
Charlotte, NC 28202

Phone: 980-373-8113
Email: george.hamrick@duke-energy.com

December 14, 2018

VIA ELECTRONIC MAIL

Ms. Sheila Holman
Assistant Secretary for Environment
North Carolina Department of Environmental Quality
217 W Jones St
Raleigh, NC 27603

RE: Sutton Variance Application: Response to Request for Supplemental Information

Dear Ms. Holman:

Thank you for your letter dated December 12, 2018, requesting supplemental information regarding Duke Energy's Application for Variance to Extend Closure Date for Sutton Plant CCR Surface Impoundments dated November 16, 2018 ("Variance Application"). Specifically, you requested additional information regarding the current and projected process rates for ash excavation, assumptions made in calculating these rates, and technologies evaluated, and why they were ultimately selected or rejected. You also asked Duke Energy to discuss whether the Sutton Plant has met the requirements and deadlines set out in the Coal Ash Management Act, as amended ("CAMA"). This letter responds to the North Carolina Department of Environmental Quality's ("NCDEQ") request for supplemental information. In addition, Duke Energy provides information regarding the status of Duke Energy's compliance with N.C.G.S. § 130A-309.216 regarding the installation of ash beneficiation projects at three Duke Energy sites in North Carolina. Although this information was not requested by NCDEQ or applicable to the Sutton Plant, we thought it might be helpful as you evaluate the Variance Application.

Rates of Excavation, Assumptions, and Technologies Evaluated

Sutton is forecasted to have excavated 4,900,000 tons of ash by the end of 2018. Based on the estimated volume of material in each of the 1971 and 1984 Basins, there will be approximately 1,400,000 tons remaining to be excavated in 2019 to meet final compliance criteria. Over the past three years, the excavation rate for the project has averaged approximately 130,000 tons per month. Since the on-site landfill was put into operation, the excavation rate has averaged approximately 150,000 tons per month. The current excavation plan assumes that Duke Energy will continue to excavate at a rate of 150,000 tons per month. At the end of July 2019, Duke Energy is forecasting to have approximately 350,000 tons remaining to be excavated. Using the original

amount of 6,655,200 tons in the basins, this equates to approximately 94 percent complete. After closure by removal has been completed, post-excavation validation sampling is further required. The sampling is scheduled to take about one month to complete the field and lab work. As detailed in Section II of Duke Energy's November 16 Variance Application, throughout its history, the project has been challenged with regulatory, weather, operational, and other unforeseen challenges, which have significantly impacted the monthly production rate despite Duke Energy's application of best efforts.

Although the excavation rate of 150,000 tons that is currently assumed will not be sufficient to achieve closure by the August 1, 2019 deadline established under CAMA, this number reflects the actions Duke Energy undertook to gain schedule, as set forth in the Variance Application. The technologies/actions Duke Energy considered and either adopted or rejected are summarized in the chart below.

Technologies Evaluated	Status
Send parallel shipments of ash to Brickhaven and on-site landfill after securing delayed permit	*Rejected – Logistical and contractual constraints*
Add third conveyor	Adopted – Allowed Duke Energy to increase its margin on rail production
Early mobilization of Phase II contractor prior to Phase I contractor's completion of work	Adopted – Supported early mobilization and removal of non-ash material from 1971 Basin, thereby accelerating Phase II of basin excavation
Accelerate construction of Cell 3 of on-site landfill	Adopted – Allowed landfill to be filled earlier than scheduled at 150,000 tons per month and eliminated project down time with rail operations being complete
Expedite construction of Cells 5, 6, and 7 of on-site landfill	Adopted – Removed landfill from critical path
Simultaneous operation of multiple landfill cells	Adopted – Substantially increased production
Increase dredging excavation activities up to 20 hours per day, six days per week	Adopted – Substantially increased production
Place additional dredge into service	Adopted – Substantially increased production
Simultaneous operation of three dredges	*Rejected – Safety concerns associated with number of cables, anchors, and pipes*
Plot GPS coordinates of bottom of 1971 Basin	Adopted – Saved significant time by confirming lower extent of ash and avoiding need to go back and do additional excavation and post-excavation sampling time estimates
Redeploy dredge resources to other basin locations while developing alternatives to remove stumps and debris	Adopted – Avoided loss of production and dredge schedule
Take measures in advance of Hurricane Florence reaching landfall to prepare site	Adopted – Minimized potential storm impacts, thus allowing for prompt return to ash excavation and disposal operations

The Sutton site received 5.67 inches of rainfall in November 2018, which impacted eight working days of production, or 64,000 to 80,000 tons of CCR material. Through the first nine days of December 2018, the site has received an additional 3.08 inches of precipitation. In total, as of December 9, a total of 97.67 inches of rain has fallen on the site. This has caused 93 lost working days in 2018, equivalent to 697,500 tons of production.

In addition to delays associated with poor weather, recent dredging production from the 1971 Basin deep ash borrow area has been impaired by the lodging of rocks in the cutter head and dredge pump. A bottom sonar survey identified three rock outcroppings varying from 50 to 250 feet in length. An engineering evaluation will consider this data to determine how Duke Energy should modify the final dredging depths to account for the rock formations/outcroppings. To minimize any schedule delays, the large dredge has been moved to another area in the basin.

These problems demonstrate that despite Duke Energy's continuous application of best efforts, production delays occur because of factors entirely out of Duke Energy's control. They further highlight the fact that estimated excavation rates are influenced by many external factors. Therefore, it would not be prudent to conclude that the project will recover 350,000 tons of shortfall in the first seven months of 2019. In light of the extended variance application process set out in CAMA, which essentially provides a single opportunity to apply for a variance[1], it is critical that the variance request include adequate margin to accommodate additional schedule delays despite Duke Energy's application of best available technology found to be economically reasonable.

Substantial Compliance with Other CAMA Requirements and Deadlines Applicable to the Sutton Plant

- N.C.G.S. § 130A-309-213(d)(1)b. (dam stability) – Although the CCR surface impoundments at the Sutton Plant were not subject to Dam Safety Order 16-01, the October 17, 2017 inspection report from NCDEQ indicates "the inspections revealed the dams to be well maintained and in good order." Similarly, the most recent annual inspection of the Sutton 1971 and 1984 Basin dams occurred on August 29, 2018; no concerns or issues were reported by NCDEQ that would necessitate issuance of a Notice of Deficiency or Notice of Violation.

- N.C.G.S. § 130A-309-211(c1) (provision of permanent water supply) – Although subject to the statutory requirement to establish permanent replacement water supplies for eligible households, it was determined that no connection was needed at the Sutton Plant. NCDEQ sent its concurrence with this determination to Duke Energy on August 10, 2018.

[1] North Carolina General Statutes Section 130A-309.215(a1) provides that Duke Energy may not apply for a variance "earlier than one year prior to the applicable deadline."

- N.C.G.S. § 130A-309-211(a) (comprehensive site assessment) – The comprehensive site assessment for the Sutton Plant was submitted to NCDEQ via cover letter dated August 4, 2015.

- N.C.G.S. § 130A-309-211(b) (corrective action plan) – The corrective action plan was submitted in two parts. Part 1 was dated November 2, 2015, and Part 2 was dated February 1, 2016.[2]

Compliance with N.C.G.S. § 130A-309.216 (ash beneficiation projects)

North Carolina General Statutes Section 130A-309.216 requires Duke Energy to install and operate three large-scale coal ash beneficiation projects to produce reprocessed ash for use in the concrete industry. Duke Energy selected the Buck and H.F. Lee Plants prior to the January 1, 2017 deadline set out in subsection (a) of Section 130A-309.216, and selected the Cape Fear Plant prior to the deadline established under subsection (b) of Section 130A-309.216. Construction of the beneficiation unit at the Buck Plant began in November 2018 and will require 18 to 24 months to complete. Construction of the beneficiation unit at the H.F. Lee Plant is targeted to begin in February 2019, pending receipt of all required permits. Construction is expected to take approximately 18 to 24 months. Finally, construction of the beneficiation unit at Cape Fear is targeted to begin in May 2019, pending receipt of all required permits. Construction is expected to take approximately 18 to 24 months.

Conclusion

As explained in the Variance Application, Duke Energy is committed to continuing to undertake best efforts to evaluate opportunities and implement commercially reasonable measures to meet the August 1, 2019 closure deadline established by CAMA, including taking advantage of good weather days and continuing to move material into the landfill 60 hours or more per week, as weather allows. Nevertheless, Duke Energy respectfully requests that NCDEQ grant it a variance to extend until February 1, 2020, the deadline to close the CCR surface impoundments at the Sutton Plant.

[2] Outside of CAMA, Duke Energy submitted a Sutton comprehensive site assessment supplement dated August 31, 2016, and an updated comprehensive site assessment dated January 30, 2018.

If you have any questions, please do not hesitate to contact Randy Hart at randy.hart@duke-energy.com or (980) 373-5630. We appreciate your time and consideration.

Respectfully submitted,

George T. Hamrick
Senior Vice President, Coal Combustion Products

NCDEQ cc: William F. Lane (bill.lane@ncdenr.gov)
Ed Mussler (ed.mussler@ncdenr.gov)

Duke Energy cc: ccprecords@duke-energy.com; Randy Hart

Attachment B

From: Martin, Sharon L.
To: jrider@nhcgov.com
Subject: Library copy of Public Notice of Duke Energy Request for Variance on Sutton Coal Ash Closure deadline
Date: Friday, December 14, 2018 4:49:00 PM
Attachments: SuttonVariance public notice -12142018.pdf
Sutton Station Application for Grant of Variance to Close Impoundments_20181116.pdf

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Mr. Rider,

Thank you for speaking with me today. Attached are the public notice of the public meeting and comment period as well as the request for variance. Please post as necessary. Thank you so much for your help in this matter, and please let me know if there's ever anything you need.

Thank you,
Sharon Martin
Public Information Officer

Sharon Martin
Public Information Officer, Division of Air Quality
North Carolina Department of Environmental Quality
919.707.8446 (Office)
919.675.4912 (Mobile)
Sharon.Martin@ncdenr.gov

NOTICE FOR PUBLIC MEETING AND PUBLIC COMMENT PERIOD ON REQUEST FOR VARIANCE TO EXTEND CLOSURE DEADLINE
Duke Energy Sutton Plant

Duke Energy has made a request to the North Carolina Department of Environmental Quality (DEQ) for a variance to extend the Coal Ash Management Act closure deadline by six months for the Sutton Coal Ash facility located at:

801 Sutton Steam Plant Road
Wilmington, NC 28401

This notice serves as a Notice of Public Meeting and Opportunity for Public Comment for this request. The public meeting will be held at the Cape Fear Community College on January 14, 2019 in the Union Station Building.

A copy of the variance request is posted on the DEQ website at deq.nc.gov/Sutton-Variance.

Interested persons are invited to provide comment on the variance request. Written comments may be sent to:

Ellen Lorscheider
1646 Mail Service Center
Raleigh, North Carolina 27699 1646
Phone/Fax: (919)707-8200

The comment period began on December 14, 2018 and ends on February 4, 2019. Written comments may also be submitted during the public comment period via email at the following address:

publiccomments@ncdenr.gov

Please type "Sutton Variance Request" in the subject line.

After weighing all relevant comments received, DEQ will decide whether to grant the request.

George T. Hamrick
Senior Vice President
Coal Combustion Products

400 S. Tryon Street, ST06A
Charlotte, NC 28202

Phone: 980-373-8113
Email: george.hamrick@duke-energy.com

November 16, 2018

VIA UPS OVERNIGHT DELIVERY AND ELECTRONIC MAIL

Mr. Michael S. Regan
Secretary
North Carolina Department of Environmental Quality
217 W Jones St
Raleigh, NC 27603

RE: Application for Grant of Variance to Extend Deadline to Close Sutton Plant CCR Surface Impoundments (N.C.G.S. § 130A-309.215)

Dear Secretary Regan:

North Carolina General Statutes Section 130A-309.215(a) authorizes the Secretary of the North Carolina Department of Environmental Quality ("NCDEQ" or "Department") to "grant a variance to extend any deadline under [the Coal Ash Management Act ("CAMA")] on the Secretary's own motion, or that of an impoundment owner, on the basis that compliance with the deadline cannot be achieved by application of best available technology found to be economically reasonable at the time and would produce serious hardship without equal or greater benefits to the public." Pursuant to N.C.G.S. § 130A-309.215(a1), where a variance is requested by an impoundment owner, the impoundment owner must within one year prior to the applicable deadline, request a variance including, at a minimum, information regarding (A) the site; (B) applicable requirements; (C) applicable deadlines for which a variance is sought; (D) site-specific circumstances supporting the need for the variance; and (E) detailed information demonstrating that "(i) the owner has substantially complied with all other requirements and deadlines established by [CAMA]; (ii) the owner has made good faith efforts to comply with the applicable deadline for closure of the impoundment; and (iii) that compliance with the deadline cannot be achieved by application of best available technology found to be economically reasonable at the time and would produce serious hardship without equal or greater benefits to the public."

Consistent with the requirements of subsection (a1) of N.C.G.S. § 130A-309.215, Duke Energy Progress, LLC ("Duke Energy" or "Company") hereby submits this application for a variance to extend by six months the CAMA closure deadline applicable to the coal combustion residuals ("CCR") surface impoundments at Duke Energy's Sutton Plant ("Sutton") in Wilmington, North Carolina. Section I of this application

addresses elements A, B, and C above; Section II addresses elements D, (E)(ii), and (E)(iii); and Section III addresses element (E)(i). As detailed in Section II below, NCDEQ's grant of the variance is warranted, because despite Duke Energy's application of best available technology found to be economically reasonable, compliance with the applicable CAMA deadline cannot be achieved due to myriad factors, including the impacts of several permitting delays, two major hurricanes, and other unforeseeable challenges and limitations beyond the Company's control.

I. Site; Applicable Requirements and Applicable Deadline

Sections 3.(b)(4) and 3.(c) of CAMA (Sess. L. 2014-122) require that the CCR surface impoundments at Sutton be closed by removal of CCR by no later than August 1, 2019 ("Deadline"). For the reasons discussed in detail below, despite Duke Energy's good faith efforts to apply best available technology found to be economically reasonable, Duke Energy has determined that it may not be able to meet the Deadline without producing serious hardship without equal or greater benefits to the public.

II. Site-specific Circumstances Demonstrating Why Compliance with CAMA's Deadline Cannot be Achieved Despite Duke Energy's Good Faith Efforts and Application of Best Available Technology

Throughout the basin excavation process, Duke Energy has encountered numerous challenges that have cumulatively resulted in the current schedule delay at Sutton and have impacted the Company's ability to close the Sutton CCR surface impoundments by the Deadline. During this period, Duke Energy has consistently exercised best efforts to minimize any delays in meeting the Deadline and has taken important steps to overcome the various challenges and limitations presented in an effort to recover schedule.

Under the standard set out in N.C.G.S. § 130A-309.215, whether application of a given technology would be commercially or economically reasonable requires that the costs of such technology be balanced against its benefits to the public. Following this fundamental principle over the course of the basin closure project, Duke Energy has consistently looked for and evaluated measures to safely and reasonably minimize any delays to the extent possible, considering at all times, the risks and benefits associated with each of the options considered.

In October 2014, the Company developed the initial Sutton Excavation Plan and held the Phase I excavation bidding event for excavation of the first two million tons of CCR for rail transport, which was determined to be the amount of ash that would need

to be transported by rail to meet the Deadline. The contractor Duke Energy selected under this bidding event ("Contractor A") was chosen not only because it had bid the lowest price per ton, but also because it had completeness of technical support, engineering competence, and extensive wet ash basin experience. Due to CAMA's aggressive completion date of August 1, 2019, the complexity of CCR excavation at Sutton, and the expected timeline to construct an on-site landfill, the Brickhaven structural fill in Chatham County, North Carolina was selected as the initial CCR placement site for ash from the Sutton impoundments.

On November 13, 2014, Duke Energy submitted the initial Sutton Excavation Plan to the Department to cover the first 12 to 18 months (Phase I) of ash basin excavation activities. In general, the scope of work included site preparation, initiation of basin dewatering, ash basin preparation, construction of the on-site landfill, and ash removal from the basins. Under the initial Excavation Plan, Duke Energy would begin placing ash in the Brickhaven structural fill—a beneficial use of CCR pursuant to N.C.G.S. § 130A-309.201(1), (11), and (14). Ash would be transported from the site via rail car and also trucked to Brickhaven. Although the quantity trucked was small relative to the quantities transported by rail, this action demonstrated Duke Energy's commitment to commence ash excavation and placement operations as soon as feasible. Rail operations would consist of 85 car unit trains, with rail cars averaging 90 tons per car. The monthly goal was to deliver 14 loaded trains to Brickhaven per month, working seven days per week, or approximately 107,000 tons per month.

While transporting ash to Brickhaven, Duke Energy developed simultaneously an on-site landfill in order to meet the Deadline. Based on an engineering feasibility study commissioned by Duke Energy, it was determined that an on-site landfill would be the least-cost option to dispose of the ash and would have the least environmental impact. Moreover, it was determined to be the most expedient method of ash removal from the basins, consistent with the requirements of CAMA. North Carolina's solid waste rules, which prohibit the commencement of construction activities without having first secured the necessary permits, on-site landfill construction could not begin until issuance of the Permit to Construct.

On August 7, 2015, Duke Energy submitted its application for a Permit to Construct the on-site landfill to dispose of five million tons of coal ash from the Sutton impoundments (Phase II). On September 3, 2015, NCDEQ sent a letter to Duke Energy notifying the Company that the landfill application had been deemed "complete." NCDEQ sent a follow-up letter on October 7, 2015, requesting supplemental information, which Duke Energy provided on December 10, 2015. NCDEQ then initiated a 60-day public comment period, which ran from February 11 to April 15, 2016. The Company reasonably expected that the permit would issue soon after the conclusion

of the comment period because (i) the public meeting was not heavily attended or contentious, (ii) NCDEQ Solid Waste Division staff had been reviewing the application since it was submitted on August 7, 2015, and (iii) it historically took the Department only a few weeks after expiration of the comment period to issue such permits.[1]

Duke Energy completed the updated 2015 Sutton Excavation Plan in November 2015 and revised the milestone dates, which reflected a reasonable expectation that it would secure the Permit to Construct in early 2016, thereby supporting a schedule to complete excavation of the ash by March 2019. Duke Energy was planning to move two million tons of ash via rail and, in parallel, dispose of ash in the on-site landfill from late January 2017 to July 2017. The Company estimated that it could excavate and move between approximately 200,000 to 225,000 tons of ash per month, 93,000 to 118,000 tons of which would be via truck to the landfill and approximately 107,000 tons of which would be via rail to Brickhaven.

However, on April 7, 2016, NCDEQ announced a new policy at a town hall meeting sponsored by the North Carolina Advisory Committee ("Advisory Committee") of the United States Commission on Civil Rights ("USCCR"), followed by a news release announcing a new review and approval process for all CCR landfills. Available at https://deq.nc.gov/press-release/north-carolina-take-extra-steps-protect-minority-communities. NCDEQ declared that it would go "beyond state and federal requirements" by conducting an environmental justice review of each Duke Energy coal ash CCR landfill application, including applications for expansions of existing on-site CCR landfills, and ask EPA's Office of Civil Rights, the USCCR, and the Advisory Committee to review and approve the environmental justice analysis before the permit is issued. NCDEQ reiterated this new policy a week later in a letter to the Advisory Committee. As a result of this new and unexpected process, on September 22, 2016, Duke Energy finally secured the Permit to Construct the Sutton landfill, which was one full year after NCDEQ had deemed the application "complete," and almost five months later than the latest date on which the permit was reasonably expected.

As a result of the permit delay, Duke Energy lost the six plus months of parallel (*i.e.*, on-site and off-site) excavation and placement/disposal for which it had planned. If issuance of the Permit to Construct would not have been delayed, the landfill construction would have been ongoing over this entire period of time, which would have created substantial margin on available space and volume to dispose of ash. The loss of this time and the ability to create margin had a significant negative impact on the ability to complete the project by the Deadline. Compounding this delay, Hurricane Matthew

[1] North Carolina General Statutes Section 130A-309.203 directs NCDEQ to expedite permit reviews for permits necessary to complete basin closure activities under CAMA—60 days after the comment period on the draft permit decision closes.

struck eastern North Carolina on October 8, 2016, further delaying the mobilization of landfill construction, limiting access to the work site, and interrupting rail transport of ash to Brickhaven for 20 days due to railway flooding.

As a result of these unforeseen complications in the landfill permitting process, coupled with historic impacts to the region and Duke Energy's operations from Hurricane Matthew, Duke Energy's excavation schedule was delayed by over six months. However, throughout 2017, Duke Energy continuously evaluated actions and implemented them where the Company determined it was safe and commercially reasonable to do so. Following is a summary of the options the Company evaluated and the economically reasonable measures it undertook to address challenges and limitations and achieve schedule recovery:

- Duke Energy added a third conveyor to increase its margin on rail production. Accelerating the completion of Phase I provided crucial time to transition to Phase II while Duke Energy awaited construction of the on-site landfill to be completed.

- Duke Energy mobilized Contractor B—the contractor performing Phase II of ash excavation—to the site prior to Contractor A completing Phase I to support removal of non-ash material from the 1971 Basin, which accelerated Phase II of basin excavation.

- Due to mild weather and the Company's implementation of parallel activities, construction of Cell 3 of the landfill was completed well in advance of the scheduled September 1, 2017, completion date. As a result of this reduction in the landfill construction schedule, Duke Energy was in a position to start disposing of ash in the landfill upon receipt of the Permit to Operate. NCDEQ issued the permit on July 6, 2017, and the Company promptly started moving ash into the landfill on the following day, representing a 55-day acceleration of the schedule.

- Duke Energy evaluated parallel shipments of ash to Brickhaven and to the on-site landfill but rejected this action primarily based on logistical and contractual constraints. At that time (mid-2017), the Company could only process between approximately 200,000 to 225,000 tons of ash per month irrespective of where it was ultimately placed or disposed of.

- As the project schedule progressed, the landfill continued to be critical path due to the need to get additional cells permitted and operating. Duke Energy took efforts to expedite the landfill construction schedule and was able to complete Cells 5 and 6 a year ahead of schedule, thereby completely removing the landfill

from critical path. In addition, the necessary permits to operate all six cells were secured. Critically, Duke Energy also secured the necessary permits to treat the landfill leachate on-site. This is significant because of the volume of leachate generated by the landfill—as more air space opened up, the volume of precipitation infiltrating into the ash and water draining from the ash itself increased, thus increasing the amount of leachate that needed to be treated.[2] By constructing Phase 2 of the site's wastewater treatment facility, getting the system installed to transfer the landfill leachate to that facility, and securing the necessary discharge permit, Duke Energy was able to simultaneously operate three cells instead of one, thereby allowing it to increase production substantially.

- The Company evaluated the feasibility of applying additional resources in order to increase the production rate, including expanding to night operations. Leveraging its experience, Duke Energy increased its dredging excavation activities up to 20 hours per day, six days a week using two 10-hour shifts or extended shifts.

- A new large dredge was assembled, commissioned, and placed into service in January 2018. Several measures were put into place to continuously improve performance, as follows: (1) A one-week outage was scheduled in late April 2018 to address design and breakdown issues and warranty work on the new dredge; (2) a second smaller dredge was placed into service in mid-April; (3) a third dredge was made available for use as a backup; (4) operating personnel and supervision were staffed up to support increased production; and (5) additional rigor was added to Job Hazard Analysis and Pre-job Briefs, along with increased supervisory oversight. These measures resulted in improved dredge performance. Duke Energy continues to monitor and review performance for additional improvement opportunities.[3]

During Duke Energy's dam decommissioning application discussions with the state, the Company was unexpectedly required by the Department to maintain a 50-foot buffer on the dikes until issuance of a decommissioning permit. The state's decision to limit Duke Energy to a minimum of a 50-foot buffer of ash on the dikes of the 1971 Basin further challenged Duke Energy's ability to meet the Deadline, despite exercising best efforts. The buffer requirement prevented Duke Energy from excavating all of the ash

[2] Trucking and treating leachate is the alternate method of managing leachate, but the extent to which this can be done is dependent on the capacity of local vendors and municipalities. The limit is approximately 40,000 gallons per day, which would allow for only one landfill cell to be open at a time.

[3] Although the operation of three dredges was evaluated, the Company rejected this option due to safety concerns associated with the number of cables, anchors, and pipes that would be introduced.

from the basin dikes until after a dam decommissioning permit could be secured authorizing Duke Energy to remove the dikes. The result was that over 125,000 tons of material remained in the buffer zone of the dikes—material that was originally scheduled to be excavated as Duke Energy cut into the basin. Because Duke Energy was compelled to leave the material in the buffer zone of the dikes, ash was trapped on the dikes, which were surrounded by water. This not only prevented the Company from more efficiently achieving its production goals as planned, but required going back to excavate the material off the dikes from the buffer zone in a less efficient manner, thereby extending schedule.

Although it is not possible to recover the loss of margin occasioned by the delay in securing the necessary permit to decommission the dikes, Duke Energy saved substantial time by plotting the coordinates of the bottom of the 1971 Basin by taking 240 sample borings prior to digging below the groundwater table. Based on those sample borings, the Company determined the lower extent of the ash, thereby allowing it to dredge down directly to those coordinates. Duke Energy then developed as-built drawings certifying that it excavated to those coordinates to establish excavation had been completed. If the Company would not have taken this action, it would have been required to go into the basin on a barge and take 100-foot grid samples, which would have taken significant time. Moreover, if Duke Energy would have found samples that indicated the existence of ash, it would have had to go back to do further excavation. By getting the borings done ahead of time and delineating the GPS coordinates of the contours of the bottom of the basin, the Company saved significant amounts of time.

To further challenge excavation operations, in late June 2018, while continuing to dredge in the 1971 Basin, both dredges encountered trees and stumps (remnants of a Cyprus forest) in three areas estimated to total approximately five acres, which challenged production by requiring an average of 45 non-productive hours per week to clean dredge cutter heads. Neither dredge type could make sufficient progress in those areas due to continuous clogging of the dredge pumps. However, Duke Energy promptly took interim action to redeploy dredge resources to other locations in the basin to maintain production while developing alternatives to effectively remove stumps and debris without compromising production and the dredge schedule. The Company determined to bridge out over two of the three areas to allow for the utilization of mechanical excavation to remove the stumps and CCR material from these areas (approximately 139,000 cubic yards of material). With respect to the third area (approximately 50,000 cubic yards of material), because there was no nearby land access to the area, bridging was rejected as an option. Other options Duke Energy considered included, amphibious excavation, barge excavation, and continued dredging at a reduced rate. To help inform its decision, the Company obtained additional bathymetric and aerial survey data. After evaluating the available options, all of which

would result in schedule delay, Duke Energy determined that dredging through the area would be the most technically feasible option and would result in the least impact on schedule. Although this was the most commercially reasonable option, it, nevertheless, resulted in a schedule loss of three weeks.

In 2018, weather continued to contribute to Duke Energy's inability to meet the Deadline. As in 2017, Sutton experienced above-average levels of precipitation in 2018. Through October 2018, the Wilmington area received historical levels of rainfall. Although average total precipitation in Wilmington in the months of April through September is 35.22 inches, actual rainfall over this six-month period in 2018 was 74.8 inches.[4] Thus, over this six-month period in 2018, Wilmington received 39.58 inches more rainfall than is normally the case. Under the extremely wet conditions presented, ash could not be dried to the level required for transportation and placement in the landfill.

Sutton, which was directly in the Hurricane Florence's path, experienced the full force of the storm's winds and rainfall. By September 11, 2018, precipitation intensity charts showed 25 to 30 inches of predicted rainfall in a concentrated portion of the coastal area just north of Wilmington. Duke Energy took numerous planning and engineering actions before the hurricane to prepare the site and minimize potential storm impacts, including staffing Sutton during the storm, pre-staging equipment, actively reducing water levels in the ponds before the storm arrived, and placing structural materials on-site to respond quickly if repairs were needed.

Rainfall began at Sutton on September 13, with 5.7 inches falling as measured by gauges at the site. On September 14, Sutton received an additional 11.5 inches of rainfall in three hours, between 6:00 a.m. and 9:00 a.m.[5] This rainfall significantly exceeded the 25-year, 24-hour storm event design capacity of the run-on/run-off berm for landfill Cells 4 and 5. On September 16, a second peak rain event occurred between the hours of 12:00 a.m. and 6:00 a.m., with the site receiving an additional 4.2 inches of rainfall. Cumulative rainfall received by 8:00 a.m. on September 16 was approximately 30.1 inches.

On September 17, the site response team's priorities were to ensure the site was stable and prepared to handle another rain event by cleaning out ditches, installing

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[4] In fact, new rainfall records were set in each of the months of May and September 2018. *See* https://w2.weather.gov/climate/index.php?wfo=ilm.

[5] The flooding Cape Fear River triggered the shutdown of the entire plant, including its natural gas-fired operations—and evacuation of plant staff. The storm resulted in 1.8 million Duke Energy customers losing power.

check dams, pumping contact water to the ash basins, restoring power to the site to support wastewater processing equipment operations, and developing a recovery plan to resume ash excavation. On that same day, the construction contractor remobilized and began to manage water in the landfill. The Department performed an inspection on September 28 after repairs had been completed and gave permission for landfill operations and placement of ash in the landfill to resume. Excavation and placement of ash resumed on September 29—only 16 days after the storm began impacting Sutton.

III. Substantial Compliance with all Other CAMA Requirements and Deadlines

In compliance with CAMA, in 2015, Duke Energy embarked on an aggressive plan to close all ash basins across its North Carolina fleet, which is a complex task requiring significant planning, coordination with state regulators, and dedication of resources. In North Carolina, the Company has 31 coal ash basins subject to the requirements of CAMA, which imposes on Duke Energy, among other things, stringent structural stability, closure, post-closure care, groundwater monitoring, and corrective action requirements for CCR surface impoundments, as well as permanent water supply obligations.[6]

In July 2016, the North Carolina legislature amended CAMA to require Duke Energy to rectify any deficiencies identified by, and to comply with the requirements of, any dam safety order issued by the state for CCR surface impoundments. *See* N.C.G.S. § 130A-309-213(d)(1)b. On August 22, 2016, pursuant to N.C.G.S. § 143-215.32, NCDEQ issued Dam Safety Order 16-01 ("DSO") requiring certain repairs to impoundment dams at nine facility's subject to CAMA. Consistent with the requirements of the DSO, Duke Energy promptly undertook the required repairs and sent the Department a letter dated June 1, 2018, notifying it that the Company had fully complied with the requirements of the DSO in accordance with N.C.G.S. §§ 130A-309-213(d)(1)b. and 143-215.32. Specifically, Duke Energy completed all of the repair plans specified by, and timely submitted all of the completion reports to, NCDEQ. The Department conducted as-built inspections for each item and issued Certificates of Final Approval indicating that the required work had been completed as designed. In addition, the annual inspection of each dam has been completed, and the Company has received Notice of Inspection Reports documenting that no deficiencies are present.[7] Finally, on October 10, NCDEQ

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[6] Twenty-six of these basins are also regulated under the federal CCR rule.

[7] The Sutton surface impoundments were not subject to the DSO. Nevertheless, the October 17, 2017, inspection report from the state indicates "the inspections revealed the dams to be well maintained and in good order." Similarly, the most recent annual inspection of the Sutton 1971 and 1984 Basin dams

made official notification to the Environmental Management Commission that Duke Energy had complied with all dam safety requirements, as required by N.C.G.S. § 130A-309-213(d)(1)b.

With respect to the permanent water supply requirements imposed under CAMA, Duke Energy provided each eligible and consenting resident with an alternative drinking water supply (*i.e.*, connection to a public water system or a filtration system) by the deadline set out in N.C.G.S. § 130A-309-211(c1). On October 12, 2018, NCDEQ issued a press release announcing that "permanent replacement water supplies have been provided to all eligible households near Duke Energy coal ash facilities in North Carolina . . . by the deadline of October 15, 2018 set forth in the Coal Ash Management Act." Available at https://deq.nc.gov/news/press-releases/2018/10/12/release-deq-completes-permanent-replacement-water-supplies-coal-ash.

Consistent with the requirements of N.C.G.S. § 130A-309-211, Duke Energy submitted the groundwater assessments to NCDEQ by the applicable CAMA deadline. In addition, the Company has submitted for six sites and continues to prepare for other sites updated comprehensive site assessments. Updated groundwater corrective action plans are also being submitted. These documents will be submitted to NCDEQ in accordance with the schedule provided to Duke Energy by the Department.[8] The Company is also preparing site-specific coal ash impoundment closure plans in accordance with the requirements of N.C.G.S. § 130A-309-214(a)(4). These closure plans will be submitted to the Department no later than the applicable deadline set out in CAMA.

Finally, Duke Energy has substantially complied with all other requirements and deadlines established under CAMA, including its annual inspection, annual reporting, and ash beneficiation requirements.

Conclusion

The latest bathymetric survey data show that Duke Energy has dredged approximately 760,000 cubic yards from the 1971 Basin and that there are approximately 240,000 cubic yards of dredge material remaining. In addition, there are

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occurred on August 29, 2018; no concerns or issues were reported by NCDEQ that would necessitate issuance of a Notice of Deficiency or Notice of Violation.

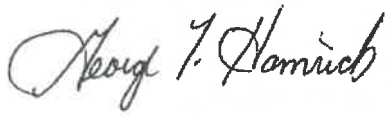
[8] Although not required under CAMA, Duke Energy completed installation of the accelerated remediation system required under Paragraph II.A. of that certain Agreement to Settle and for Release of Claims entered into among NCDEQ and Duke Energy on September 29, 2015.

987,500 cubic yards remaining in the 1984 Basin. By August 1, 2019, Duke Energy estimates it will have excavated and moved for placement or disposal approximately 94 percent of the total ash to be excavated and moved from the Sutton impoundments.

As detailed above, the Company's commitment to the application of best available technology found to be economically reasonable to meet the Deadline has resulted in significant schedule recovery, despite the many challenges and limitations with which Duke Energy was presented throughout the excavation process. Despite these good faith efforts to meet the Deadline, Duke Energy estimates that it requires an additional six months. Accordingly, the Company respectfully requests that the Department grant Duke Energy a variance to extend the Deadline to **February 1, 2020**, to close the Sutton surface impoundments. Although this application requests a six-month variance, Duke Energy is committed to continuing to undertake best efforts to evaluate opportunities and implement commercially reasonable measures to meet the Deadline.

If you have any questions, please do not hesitate to contact Randy Hart at randy.hart@duke-energy.com or (980) 373-5630. We appreciate your time and consideration.

Respectfully submitted,



George T. Hamrick
Senior Vice President, Coal Combustion Products

NCDEQ cc: Sheila C. Holman (sheila.holman@ncdenr.gov)
William F. Lane (bill.lane@ncdenr.gov)

Duke Energy cc: ccprecords@duke-energy.com; Randy Hart

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Charlotte, NC 28202

Phone: 980-373-8113
Email: george.hamrick@duke-energy.com

December 14, 2018

VIA ELECTRONIC MAIL

Ms. Sheila Holman
Assistant Secretary for Environment
North Carolina Department of Environmental Quality
217 W Jones St
Raleigh, NC 27603

RE: Sutton Variance Application: Response to Request for Supplemental Information

Dear Ms. Holman:

Thank you for your letter dated December 12, 2018, requesting supplemental information regarding Duke Energy's Application for Variance to Extend Closure Date for Sutton Plant CCR Surface Impoundments dated November 16, 2018 ("Variance Application"). Specifically, you requested additional information regarding the current and projected process rates for ash excavation, assumptions made in calculating these rates, and technologies evaluated, and why they were ultimately selected or rejected. You also asked Duke Energy to discuss whether the Sutton Plant has met the requirements and deadlines set out in the Coal Ash Management Act, as amended ("CAMA"). This letter responds to the North Carolina Department of Environmental Quality's ("NCDEQ") request for supplemental information. In addition, Duke Energy provides information regarding the status of Duke Energy's compliance with N.C.G.S. § 130A-309.216 regarding the installation of ash beneficiation projects at three Duke Energy sites in North Carolina. Although this information was not requested by NCDEQ or applicable to the Sutton Plant, we thought it might be helpful as you evaluate the Variance Application.

Rates of Excavation, Assumptions, and Technologies Evaluated

Sutton is forecasted to have excavated 4,900,000 tons of ash by the end of 2018. Based on the estimated volume of material in each of the 1971 and 1984 Basins, there will be approximately 1,400,000 tons remaining to be excavated in 2019 to meet final compliance criteria. Over the past three years, the excavation rate for the project has averaged approximately 130,000 tons per month. Since the on-site landfill was put into operation, the excavation rate has averaged approximately 150,000 tons per month. The current excavation plan assumes that Duke Energy will continue to excavate at a rate of 150,000 tons per month. At the end of July 2019, Duke Energy is forecasting to have approximately 350,000 tons remaining to be excavated. Using the original

amount of 6,655,200 tons in the basins, this equates to approximately 94 percent complete. After closure by removal has been completed, post-excavation validation sampling is further required. The sampling is scheduled to take about one month to complete the field and lab work. As detailed in Section II of Duke Energy's November 16 Variance Application, throughout its history, the project has been challenged with regulatory, weather, operational, and other unforeseen challenges, which have significantly impacted the monthly production rate despite Duke Energy's application of best efforts.

Although the excavation rate of 150,000 tons that is currently assumed will not be sufficient to achieve closure by the August 1, 2019 deadline established under CAMA, this number reflects the actions Duke Energy undertook to gain schedule, as set forth in the Variance Application. The technologies/actions Duke Energy considered and either adopted or rejected are summarized in the chart below.

Technologies Evaluated	Status
Send parallel shipments of ash to Brickhaven and on-site landfill after securing delayed permit	*Rejected – Logistical and contractual constraints*
Add third conveyor	Adopted – Allowed Duke Energy to increase its margin on rail production
Early mobilization of Phase II contractor prior to Phase I contractor's completion of work	Adopted – Supported early mobilization and removal of non-ash material from 1971 Basin, thereby accelerating Phase II of basin excavation
Accelerate construction of Cell 3 of on-site landfill	Adopted – Allowed landfill to be filled earlier than scheduled at 150,000 tons per month and eliminated project down time with rail operations being complete
Expedite construction of Cells 5, 6, and 7 of on-site landfill	Adopted – Removed landfill from critical path
Simultaneous operation of multiple landfill cells	Adopted – Substantially increased production
Increase dredging excavation activities up to 20 hours per day, six days per week	Adopted – Substantially increased production
Place additional dredge into service	Adopted – Substantially increased production
Simultaneous operation of three dredges	*Rejected – Safety concerns associated with number of cables, anchors, and pipes*
Plot GPS coordinates of bottom of 1971 Basin	Adopted – Saved significant time by confirming lower extent of ash and avoiding need to go back and do additional excavation and post-excavation sampling time estimates
Redeploy dredge resources to other basin locations while developing alternatives to remove stumps and debris	Adopted – Avoided loss of production and dredge schedule
Take measures in advance of Hurricane Florence reaching landfall to prepare site	Adopted – Minimized potential storm impacts, thus allowing for prompt return to ash excavation and disposal operations

The Sutton site received 5.67 inches of rainfall in November 2018, which impacted eight working days of production, or 64,000 to 80,000 tons of CCR material. Through the first nine days of December 2018, the site has received an additional 3.08 inches of precipitation. In total, as of December 9, a total of 97.67 inches of rain has fallen on the site. This has caused 93 lost working days in 2018, equivalent to 697,500 tons of production.

In addition to delays associated with poor weather, recent dredging production from the 1971 Basin deep ash borrow area has been impaired by the lodging of rocks in the cutter head and dredge pump. A bottom sonar survey identified three rock outcroppings varying from 50 to 250 feet in length. An engineering evaluation will consider this data to determine how Duke Energy should modify the final dredging depths to account for the rock formations/outcroppings. To minimize any schedule delays, the large dredge has been moved to another area in the basin.

These problems demonstrate that despite Duke Energy's continuous application of best efforts, production delays occur because of factors entirely out of Duke Energy's control. They further highlight the fact that estimated excavation rates are influenced by many external factors. Therefore, it would not be prudent to conclude that the project will recover 350,000 tons of shortfall in the first seven months of 2019. In light of the extended variance application process set out in CAMA, which essentially provides a single opportunity to apply for a variance[1], it is critical that the variance request include adequate margin to accommodate additional schedule delays despite Duke Energy's application of best available technology found to be economically reasonable.

<u>Substantial Compliance with Other CAMA Requirements and Deadlines Applicable to the Sutton Plant</u>

- N.C.G.S. § 130A-309-213(d)(1)b. (dam stability) – Although the CCR surface impoundments at the Sutton Plant were not subject to Dam Safety Order 16-01, the October 17, 2017 inspection report from NCDEQ indicates "the inspections revealed the dams to be well maintained and in good order." Similarly, the most recent annual inspection of the Sutton 1971 and 1984 Basin dams occurred on August 29, 2018; no concerns or issues were reported by NCDEQ that would necessitate issuance of a Notice of Deficiency or Notice of Violation.

- N.C.G.S. § 130A-309-211(c1) (provision of permanent water supply) – Although subject to the statutory requirement to establish permanent replacement water supplies for eligible households, it was determined that no connection was needed at the Sutton Plant. NCDEQ sent its concurrence with this determination to Duke Energy on August 10, 2018.

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[1] North Carolina General Statutes Section 130A-309.215(a1) provides that Duke Energy may not apply for a variance "earlier than one year prior to the applicable deadline."

- N.C.G.S. § 130A-309-211(a) (comprehensive site assessment) – The comprehensive site assessment for the Sutton Plant was submitted to NCDEQ via cover letter dated August 4, 2015.

- N.C.G.S. § 130A-309-211(b) (corrective action plan) – The corrective action plan was submitted in two parts. Part 1 was dated November 2, 2015, and Part 2 was dated February 1, 2016.[2]

Compliance with N.C.G.S. § 130A-309.216 (ash beneficiation projects)

North Carolina General Statutes Section 130A-309.216 requires Duke Energy to install and operate three large-scale coal ash beneficiation projects to produce reprocessed ash for use in the concrete industry. Duke Energy selected the Buck and H.F. Lee Plants prior to the January 1, 2017 deadline set out in subsection (a) of Section 130A-309.216, and selected the Cape Fear Plant prior to the deadline established under subsection (b) of Section 130A-309.216. Construction of the beneficiation unit at the Buck Plant began in November 2018 and will require 18 to 24 months to complete. Construction of the beneficiation unit at the H.F. Lee Plant is targeted to begin in February 2019, pending receipt of all required permits. Construction is expected to take approximately 18 to 24 months. Finally, construction of the beneficiation unit at Cape Fear is targeted to begin in May 2019, pending receipt of all required permits. Construction is expected to take approximately 18 to 24 months.

Conclusion

As explained in the Variance Application, Duke Energy is committed to continuing to undertake best efforts to evaluate opportunities and implement commercially reasonable measures to meet the August 1, 2019 closure deadline established by CAMA, including taking advantage of good weather days and continuing to move material into the landfill 60 hours or more per week, as weather allows. Nevertheless, Duke Energy respectfully requests that NCDEQ grant it a variance to extend until February 1, 2020, the deadline to close the CCR surface impoundments at the Sutton Plant.

[2] Outside of CAMA, Duke Energy submitted a Sutton comprehensive site assessment supplement dated August 31, 2016, and an updated comprehensive site assessment dated January 30, 2018.

If you have any questions, please do not hesitate to contact Randy Hart at randy.hart@duke-energy.com or (980) 373-5630. We appreciate your time and consideration.

Respectfully submitted,

George T. Hamrick
Senior Vice President, Coal Combustion Products

NCDEQ cc: William F. Lane (bill.lane@ncdenr.gov)
Ed Mussler (ed.mussler@ncdenr.gov)

Duke Energy cc: ccprecords@duke-energy.com; Randy Hart

Attachment C

Postings to the N.C. Department of Environmental Quality's Website

The North Carolina Department of Environmental Quality (NCDEQ) posted Duke Energy's request for a variance and notice of public meeting and comment on NCDEQ's website on the following dates and at the following website addresses:

- **December 14, 2018 NCDEQ Press Release**: "Comment Period and Public Meeting on Duke Energy Request for Sutton Plant Variance to Extend Closure Deadline" available at https://deq.nc.gov/news/press-releases/2018/12/14/comment-period-and-public-meeting-duke-energy-request-sutton-plant

- **December 14, 2018 NCDEQ Public Notices and Hearings**: "Notice of Comment Period and Public Meeting on Duke Energy Request for Variance to Extend Sutton Closure Deadline" available at https://deq.nc.gov/news/events/notice-comment-period-and-public-meeting-duke-energy-request-variance-extend-sutton

- **January 14, 2019 NCDEQ Public Notices and Hearings**: "Public Meeting on Duke Energy Request for Variance on Sutton Closure Deadline" available at https://deq.nc.gov/news/events/public-meeting-duke-energy-request-variance-sutton-closure-deadline

- **February 4, 2019 NCDEQ Public Notices and Hearings**: "Comment Period Ends on Duke Energy Request for Variance on Sutton Closure Deadline" available at https://deq.nc.gov/news/events/comment-period-ends-duke-energy-request-variance-sutton-closure-deadline

Attachment D

SuttonVariance - 12/14/2018 4:14:03 PM

Comment Period: Duke requests Sutton variance to extend closure deadline

Created by: Sharon Martin

Comment Period: Duke requests Sutton variance to extend closure deadline

Copy of Email

Roy Cooper, Governor

Michael S. Regan, Secretary

Release: IMMEDIATE
Date: December 14, 2018

Contact: Megan Thorpe
Phone: 919-707-8670

Comment Period: Duke requests Sutton Plant variance to extend closure deadline

RALEIGH – The North Carolina Department of Environmental Quality today announced a public comment period for Duke Energy's request for variance to extend the CAMA closure deadline for their Sutton Plant by six months. When the comment period concludes on February 4, 2019, DEQ will consider that input and then make a decision whether to grant Duke's request.

View Duke's request here: deq.nc.gov/Sutton-Variance.

A public meeting on this request will take place at Cape Fear Community College on January 14, 2019. The public and media are invited to attend and comment on Duke's request.

Written comments on the request for variance can be sent to the attention of Ellen Lorscheider, 1646 Mail Service Center, Raleigh, N.C. 27699-1646.

Comments may also be submitted by email to: publiccomments@ncdenr.gov. Please include the term "Sutton Variance Request" in the email's subject line. The deadline for submitting comments is Feb. 4, 2019.

WHAT: Public Meeting on Duke's request for Variance at Sutton Coal Ash facility

WHEN: January 14, 2019, at 6:00 pm

WHERE: Cape Fear Community College
502 N. Front St.,
Wilmington, N.C., 28360

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Website: http://www.ncdenr.gov
Facebook: http://www.facebook.com/ncdeq
Twitter: http://twitter.com/NCDEQ
RSS Feed: http://portal.ncdenr.org/web/opa/news-releases-rss
1601 Mail Service Center, Raleigh, NC 27699-1601

Comment Period: Duke requests Sutton variance to extend closure deadline

Email Details

Subject
Comment Period: Duke requests Sutton variance to extend closure deadline

Sender Name
Megan Thorpe

Sender Email
Megan.Thorpe@ncdenr.gov

Created:
Fri, 14 Dec 2018 16:27:36 Eastern Standard Time

Submitted:
Fri, 14 Dec 2018 16:27:37 Eastern Standard Time

Sent:
Fri, 14 Dec 2018 16:27:37 Eastern Standard Time

Recipient Lists

Contacts:
Asheville Media; DENR Internal; DENR PIOs; Division of Waste Management; Fayetteville Media; Interested Parties; Little Washington; Louise; Major Media; Mooresville; Raleigh Media; Wilmington; Winston-Salem Media

List of Media Contact Recipients

Name	Outlet	Status	Links Clicked
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		Opened	0
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SuttonVariance - 12/14/2018 4:14:03 PM

Comment Period: Duke requests Sutton variance to extend closure deadline

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SuttonVariance - 12/14/2018 4:14:03 PM

Comment Period: Duke requests Sutton variance to extend closure deadline

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Doug Heyl		Opened	0
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Mr. Michael Abernathy	The Times News Burlington, NC	Not Opened	0
Michael Abraczinskas		Not Opened	0
Sarah Adair		Opened	0
Cathy Akroyd		Not Opened	0
Jennifer Allen		Opened	0
Kerri Allen		Opened	0
Greg Andeck		Not Opened	0
David Anderson		Opened	0
AP DESK		Not Opened	0
AP Raleigh		Not Opened	0

Comment Period: Duke requests Sutton variance to extend closure deadline

WSOC TV Assignment Desk		Not Opened	0
Nancy Avery		Not Opened	0
Karl Baker		Not Opened	0
Greg Barnes		Opened	0
Mr. Mark Barrett State,Federal Government & Politics Reporter	Asheville Citizen-Times	Not Opened	0
Todd Benz General Manager	The Courier-Times	Not Opened	0
Shannon Best Media Director	Sampson Independent	Not Opened	0
BladenJournalNewsDesk		Not Opened	0
Ms. Loretta Boniti Senior Political Reporter	Spectrum News Raleigh	Not Opened	0
Lynn Bonner		Not Opened	0
Ms. Lynn Bonner Politics Reporter	The News & Observer	Not Opened	0
Ms. Pat Bradford Publisher & Editor	Wrightsville Beach Magazine	Not Opened	0
Russ Bradley		Not Opened	0
Mr. Cullen Browder Anchor & Reporter	WRAL-TV	Not Opened	0
Jeanne Brown		Not Opened	0
Jared Brumbaugh		Not Opened	0

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Comment Period: Duke requests Sutton variance to extend closure deadline

Cal Bryant Editor	Roanoke-Chowan News-Herald	Not Opened	0
Ron Bryant		Not Opened	0
Tim Buckland		Not Opened	0
Kevin Burk		Not Opened	0
Jenny Callison	Wilmington Journal	Not Opened	0
Scott Calvert		Not Opened	0
John Camp	ABC 11 Eyewitness News Extra - WTVD-TV	Not Opened	0
Christine Carroll Editor	Richmond County Daily Journal	Not Opened	0
Chrysta Carroll		Not Opened	0
Chrysta Carroll	Bladen Journal	Not Opened	0
Gerard Carroll		Opened	0
Charles Carter		Opened	0
Tony Caudle		Not Opened	0
Dan Charles		Not Opened	0
Sterling Cheatham		Not Opened	0
Catherine Clabby		Not Opened	0
Cobey Culton		Not Opened	0

Comment Period: Duke requests Sutton variance to extend closure deadline

Chris Coudriet		Not Opened	0
Michael Cramer		Not Opened	0
Mike Cronin		Not Opened	0
Valerie Crowder		Opened	0
Linda Culpepper		Not Opened	0
Emery Dalesio		Not Opened	0
Amin Davis		Not Opened	0
Candice Davis HR	The Citizen Times	Not Opened	0
Mike Davis		Opened	0
Shannon Deaton		Not Opened	0
John Deem Editor	Statesville Record & Landmark	Not Opened	0
Marion Deerhake		Opened	0
Debra Derr		Opened	0
Donald Dixon		Opened	0
Tyler Dukes		Not Opened	0
Stephanie Ebbs		Opened	0
Beth Eckert		Not Opened	0
Charlotte Edens		Opened	0
Charles Elam		Not Opened	0

SuttonVariance - 12/14/2018 4:14:03 PM

Comment Period: Duke requests Sutton variance to extend closure deadline

Kelsey Ellis		Not Opened	0
Quintin Ellison Editor	Sylva Herald & Ruralite	Not Opened	0
Kimberly Fail		Not Opened	0
Travis Fain		Not Opened	0
Mr. Travis Fain Statehouse Reporter	WRAL-TV	Not Opened	0
Crystal Feldman		Not Opened	0
Jim Fletchner		Not Opened	0
Mr. Steve Garland Advertising Sales Manager	Taylorsville Times	Not Opened	0
Mitch Gillespie		Opened	0
Steve Ginley		Not Opened	0
Gail Goodman		Opened	0
Larry Goodwin		Opened	0
Leslie Griffith		Opened	0
Vaughn Hagerty		Opened	0
Christina Haley		Opened	0
Lindsey Hallock		Opened	0
Ann Hardy		Opened	0
Cris Harrelson		Not Opened	0
Maria Hegsted		Not Opened	0

Comment Period: Duke requests Sutton variance to extend closure deadline

Doug Heyl		Not Opened	0
Mark Hibbs		Opened	0
Sheila Holman		Opened	0
Shana Hoover Advertising/Marketing Director	The Wilson Times	Opened	0
Zachary Horner	The Sanford Herald	Not Opened	0
Kim Horton		Not Opened	0
Sandra Hurley Publisher	Mount Airy News	Not Opened	0
Emilie Ikeda		Not Opened	0
Melody Isaak		Not Opened	0
Rusty Jacobs		Not Opened	0
Mr. Craig Jarvis Business Reporter	The News & Observer	Opened	0
Becky Johnson	The Mountaineer	Not Opened	0
Paul Johnson		Not Opened	0
Chris Jones		Not Opened	0
Mark Jurkowitz Publisher	Outer Banks Sentinel	Not Opened	0
Mr. Dan Kane Investigative Reporter	The News & Observer	Not Opened	0
Steve Keen		Opened	0

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Comment Period: Duke requests Sutton variance to extend closure deadline

Donna King		Not Opened	0
Richard King		Not Opened	0
Jamie Kritzer		Not Opened	0
Ms. Laura LaFleur		Not Opened	0
Ms. Laura LaFleur		Not Opened	0
Laura LaFleur		Not Opened	0
Bill Lane		Opened	1
Coby LaRue Publisher	The Alleghany News	Opened	0
Leigh Lawrence		Opened	0
Teresa Laws General Manager	Ashe Post & Times (West Jefferson, NC)	Opened	0
Dr. Suzanne Lazorick		Opened	0
Kristine Leggett		Not Opened	0
Connie Leinback Editor/ Publisher	Ocracoke Observer	Not Opened	0
Laura Leonard		Opened	0
Laura Leslie	WRAL-TV	Opened	0
Jim Lister		Opened	0
Melissa Long		Not Opened	0
Ellen Lorscheider		Not Opened	0
John Lucey		Opened	0

Comment Period: Duke requests Sutton variance to extend closure deadline

Janet Mack		Not Opened	0
Chris Mackey		Not Opened	0
Angela Marshall		Not Opened	0
Lance Martin Editor	RRSpin (Roanoke Rapids, NC)	Not Opened	0
Sharon Martin		Opened	0
Lynn Matheson		Not Opened	0
Tom Mayor Editor	Mountain Times	Not Opened	0
Jim McCleskey		Opened	0
Mr. Gareth McGrath Local Editor	StarNews	Not Opened	0
Stanley Meiburg		Opened	0
Anderson Miller		Not Opened	0
Eric Millsap Regional Editor	Hickory Daily Record	Not Opened	0
Beau Minnick		Not Opened	0
Jeff Moore		Opened	0
jerome Moore		Opened	0
Molly Moore		Not Opened	0
Jordan Morley		Not Opened	0
James Morrisson		Not Opened	0

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Gary Morrow		Opened	0
Carolyn Moser		Opened	0
Katie Mosher Communications Director		Not Opened	0
Jennifer Mundt		Opened	0
Bridget Munger		Opened	0
Mr. John Murawski Business Reporter	The News & Observer	Not Opened	0
Ed Mussler		Opened	1
John Nichols		Not Opened	0
John Nicholson		Opened	0
Sheila Nicholson		Not Opened	0
Joe Nolan		Not Opened	0
North State Journal		Not Opened	0
Shrikar Nunna		Opened	0
Alaina Oakes		Not Opened	0
Nick Ochsner		Opened	0
Governors Office		Not Opened	0
Elizabeth Ouzts		Opened	0
Elizabeth Ouzts		Not Opened	0
Sarah Ovaska-Few		Not Opened	0

Comment Period: Duke requests Sutton variance to extend closure deadline

Jenni Owen		Not Opened	0
Jodie Owen		Not Opened	0
Tim Owens		Not Opened	0
Charles Petersen		Opened	0
Kendra Pierre-Louis		Opened	0
Michael Pjetraj		Not Opened	0
Mark Plemmons Editor	Independent Tribune	Not Opened	0
Ely Portillo		Opened	0
Adam Powell Editor	The News of Orange County	Opened	0
Kevin Powell General Manager	Tryon Daily Bulletin	Not Opened	0
Tammy Proctor		Opened	0
Candace Prusiewicz		Not Opened	0
Bill Puette		Not Opened	0
Rachael Raney Publisher	The Sanford Herald	Opened	0
Michael Regan		Not Opened	0
Regina		Not Opened	0
William Richardson		Not Opened	0

SuttonVariance - 12/14/2018 4:14:03 PM

Comment Period: Duke requests Sutton variance to extend closure deadline

William Richardson		Not Opened	0
Mr. Deon Roberts Business Reporter	The Charlotte Observer	Not Opened	0
Gary Robertson		Not Opened	0
Fritz Rohde		Not Opened	0
Kirk Ross		Not Opened	0
Krik Ross		Opened	0
Albert Rubin		Not Opened	0
Leslie Rudd		Not Opened	0
Editor Sanford Herald		Not Opened	0
News Desk Sanford Herald		Not Opened	0
Michael Scott		Not Opened	0
Eliza Sease		Not Opened	0
Jamie Shell Editor	Avery Journal-Times	Not Opened	0
Christy Simmons		Opened	1
Butch Smith		Not Opened	0
Erin Smith		Opened	0
Janet Joye Smith		Not Opened	0

Comment Period: Duke requests Sutton variance to extend closure deadline

Patricia Smith		Not Opened	0
Ruth Ravitz Smith		Opened	0
Tricia Smith		Not Opened	0
John D. Solomon		Opened	0
Mike Soraghan		Not Opened	0
Lisa Sorg		Opened	1
Lorea A Stallard		Not Opened	0
Laura Strickler		Not Opened	0
Megan Suggs	Statesville Record & Landmark	Not Opened	0
Kristi Swartz		Not Opened	0
Hiroko Tabuchi	The New York Times	Not Opened	0
Malissa Talbert		Not Opened	0
Lucy Talley Publisher	The Shelby Star	Not Opened	0
Noelle Talley		Not Opened	0
Noelle Talley		Not Opened	0
Noelle Talley	Governor Roy Cooper	Not Opened	0
Jeremy Tarr		Not Opened	0

SuttonVariance - 12/14/2018 4:14:03 PM

Comment Period: Duke requests Sutton variance to extend closure deadline

Phillip Tarte		Opened	0
Jeff Thompson		Opened	0
Joyce Thompson Administration	The Times News Burlington, NC	Not Opened	0
Megan Thorpe		Not Opened	0
William Toler Editor	The Anson Record	Not Opened	0
Mike Trainor		Not Opened	0
WBTV TV	WBTV-TV	Opened	0
WILM TV	WILM-TV	Not Opened	0
WSPA TV	WSPA-TV	Opened	0
WWAY TV	WWAY-TV	Not Opened	0
Therese Vick		Not Opened	0
Curt Vincent General Manager/ Editor	Bladen Journal	Not Opened	0
W. Curt Vincent Editor	The Laurinburg Exchange	Not Opened	0
Toby Vinson		Opened	0
Adam Wagner		Opened	1
Adam Wagner		Not Opened	0
Glen Walker		Not Opened	0
Lisa Wall Editor	The News-Herald (Morganton, NC)	Not Opened	0

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Michael Ware		Not Opened	0
Dan Way		Not Opened	0
Mr. Dan Way Associate Editor	Carolina Journal	Not Opened	0
Sam Weber		Not Opened	0
Mykel Wedig		Opened	0
Sadie Weiner		Not Opened	0
Elizabeth Werner		Opened	1
Rex Whaley		Not Opened	0
Richard Whisnant		Not Opened	0
Nancy Wickle Editor/ Publisher	The Daily Dispatch	Opened	0
Julie Wilsey		Not Opened	0
Bryce Wilson Station Manager	The Goldsboro Daily News	Not Opened	0
Vince Winkel	WHQR-FM	Not Opened	0
Alan Wooten		Opened	0
Sarah Young		Opened	1
Ana Zivanovic-Nenandovic		Not Opened	0

Attachment E

AFFIDAVIT OF PUBLICATION

STATE OF NORTH CAROLINA
COUNTY OF NEW HANOVER

NOTICE FOR PUBLIC MEETING AND PUBLIC COMMENT PERIOD ON REQUEST FOR VARIANCE TO EXTEND CLOSURE DEADLINE

Duke Energy Sutton Plant
Duke Energy has made a request to the North Carolina Department of Environmental Quality (DEQ) for a variance to extend the Coal Ash Management Act closure deadline by six months for the Sutton Coal Ash facility located at 801 Sutton Steam Plant Road, Wilmington, NC 28401.
This notice serves as a Notice of Public Meeting and Opportunity for Public Comment for this request. The public meeting will be held at 6 p.m. Jan. 14, 2019 at Cape Fear Community College, McLeod Building Room S-002, 411 Front Street, Wilmington, N.C.

A copy of the variance request is posted on the DEQ website at deq.nc.gov/Sutton-Variance. Interested persons are invited to provide comment on the variance request. Written comments may be sent to:
Ellen Lorscheider
1646 Mail Service Center
Raleigh, North Carolina 27699 1646
Phone/Fax: (919)707-8200

The comment period began on Dec. 14, 2018 and ends on Feb. 4, 2019. Written comments may also be submitted during the public comment period via email at the following address:
publiccomments@ncdenr.gov.
Please type "Sutton Variance Request" in the subject line. After weighing all relevant comments received, DEQ will decide whether to grant the request.

Before the undersigned, a Notary Public of Said County and State,

Jarimy Springer

Who, being duly sworn or affirmed, according to the law, says that he/she is

Accounting Specialist

of THE STAR-NEWS, a corporation organized and doing business under the Laws of the State of North Carolina, and publishing a newspaper known as STAR-NEWS in the City of Wilmington

NOTICE FOR PUBLIC MEETING AND PUBLIC COMMENT PERIOD ON REQUEST FOR VARIANCE TO EXTEND CLOSURE DEADLINE Duke Energy Sutton Plant Duke Energy has made a request to the North Carolina Department of Environmental Quality DEQ for a variance to extend the Coal

was inserted in the aforesaid newspaper in space, and on dates as follows:

12/20 1x, s12/27 1x, s1/3 1x

And at the time of such publication Star-News was a newspaper meeting all the requirements and qualifications prescribed by Sec. No. 1-597 G.S. of N.C.

Jarimy Springer

Title: **Accounting Specialist**

Sworn or affirmed to, and subscribed before me this 15th day of February, A.D., 2019

In Testimony Whereof, I have hereunto set my hand and affixed my official seal, the day and year aforesaid.

Dawn Bean

Notary Public

DAWN BEAN NOTARY PUBLIC NEW HANOVER COUNTY, NC

My commission expires 4th day of Nov., 2023

Upon reading the aforegoing affidavit with the advertisement thereto annexed it is adjudged by the Court that the said publication was duly and properly made and that the summons has been duly and legally served on the defendant(s).

This _____ day of _____, ____

Clerk of Superior Court

MAIL TO:

Attachment F

ATTENDANCE SHEET - January 14, 2019
SUTTON VARIANCE PUBLIC MEETING

If you do not wish to speak, you may submit written comments to publiccomments@ncdenr.gov by February 4, 2019.

	PRINT NAME	AFFILIATION (Resident, Elected Official, Other)	E-MAIL (if you wish to receive updates)	DO YOU WISH TO SPEAK? (✔)
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Attachment G

HEARING OFFICER'S SPEECH January 14, 2019

I would like to call this public hearing to order.

My name is Jim Gregson. I am the Deputy Director of the Division of Water Resources, Department of Environmental Quality, for the State of North Carolina.

This hearing is being held in accordance with North Carolina General Statute 130A-309.214 in response to an application on the part of Duke Energy for a variance to extend the deadline to close the Sutton Plant CCR Surface Impoundments, in accordance with North Carolina General Statute 130A-309.215.

On November 16, 2018 the North Carolina Department of Environmental Quality received an application from Duke Energy for Variance to Extend the Deadline to Close the Sutton Plan CCR Surface Impoundments. Additional information regarding the application was received from Duke Energy on December 14, 2018.

The application requests that the Department issue a variance to extend the CAMA closure deadline for the Sutton Plant CCR Impoundments by six months; from August 1, 2019 to February 1, 2020.

The Department reviewed the submitted application and in accordance with the law;

- Opened a public comment period that started on December 14, 2018. The public comment period will end on February 4, 2019 at 5:00 PM,
- Announced this public hearing would be held to gather public comment, and
- Provided public notice in the Wilmington area newspapers [Megan, please edit]

In addition to comments gathered here tonight, written comments on the request for variance can be sent to the attention of;

Jim Gregson
1646 Mail Service Center
Raleigh, N.C. 27699-1646.

Comments may also be submitted by email to:

publiccomments@ncdenr.gov

Please include the term "Sutton Variance Request" in the email's subject line. The deadline for submitting comments is Feb. 4, 2019.

As hearing officer, it is my responsibility to listen to your comments and assist in the preparation of a report, which summarizes the information presented tonight and provides recommendations on the request for a variance. To aid in preparing the report, audio of tonight's hearing is being recorded. In addition, I ask that you provide me with a written copy of your comments if possible. Comments should be relevant to the issue of the request for a Variance to Extend the Deadline to Close Sutton Plant CCR Surface Impoundments to be considered in the Department's final decision.

At this time, I will provide an overview of how the hearing will be conducted:

1. I will call on speakers in the order they signed up.
2. Each speaker will be limited to 5 minutes.
3. There will be no cross-examination of speakers or division staff.
4. All public comments will be directed to me as the hearing officer.

5. I ask that everyone respect the right of others to speak without interruption.

At this time, I will give a brief summary of the closure requirements for the coal ash impoundments at Sutton Steam Station. Section 3(b) of the Coal Ash Management Act, Session Law 2014-122 deemed the coal combustion residuals surface impoundments at Sutton Steam Station as high risk. Sections 3(b)(4) and 3(c) of Session Law 2014-122 further required that the surface impoundments be closed by excavation no later than August 1, 2019.

The Coal Ash Management Act allows for a variance in the deadlines imposed under the law. The General Assembly authorized the Secretary of the Department of Environmental Quality to grant a variance on the basis that compliance with the deadline cannot be achieved by application of best available technology found to be economically reasonable at the time and would produce serious hardship without equal or greater benefits to the public. The owner of the impoundment must provide the site-specific circumstances that support the need for the variance. The owner must also provide information showing that the owner has substantially complied with all other requirements and deadlines established by CAMA, that the owner has made good faith efforts to comply with the applicable deadline, and that compliance with the deadline cannot be achieved by application of best available technology found to be economically reasonable at the time and would produce serious hardship without equal or greater benefits to the public. The application by Duke Energy requests an extension of 6 months to complete the closure of the coal combustion residuals surface impoundments at Sutton Steam Station.

The variance request cites a number of issues and circumstances that has resulted in Duke Energy's inability to complete the excavation and closure of the impoundments at Sutton Steam Station. These include delays due to Hurricane Matthew in 2016, permit delays for the on-site landfill, weather delays in 2017, record rain in July of 2018, and Hurricane Florence in September 2018.

After review of this variance request, DEQ's preliminary evaluation is that a 3 to 6 month extension is appropriate, and is here tonight to take comment on the potential granting of the variance.

Now, we will hear from audience members who wish to speak in the order that they registered.

The department may only consider technical and scientific information related to the request for Variance to Extend Deadline to Close Sutton Plant CCR Surface Impoundments when making recommendations the variance. Other issues concerning this facility, or the issue of coal combustion residuals as a whole are beyond the scope of this public hearing.

When your name is called, please come to the podium, state your name and indicate any group you may be representing or affiliated with. To ensure that we hear from all who wish to speak, there will be a 5-minute time limit for providing comments. Staff will keep track of the time and raise a sign to indicate when you have 1-minute remaining and when you have 30 seconds remaining to finish your comments. Please keep your comments concise and limit them to the issue of the variance request for the deadline to complete the excavation of coal combustion residuals from impoundments at the Sutton Steam Station. I appreciate your cooperation in complying with these requests.

(Call out names.)

That concludes tonight's line-up of speakers. Staff will be available for questions or comments after the hearing.

I would like to thank you all for attending tonight's hearing. Your input is greatly appreciated. Remember that you will have until 5:00 pm on Monday, February 4th, 2019 to submit comments on this variance request.

After careful study of all comments received and the requirements of state laws, the department will make a decision on this variance application for the Sutton CCR Impoundments.

This hearing is closed.

Attachment H

Gregson, Jim

From: Louanne Kaye <louannekaye@ymail.com>
Sent: Friday, February 01, 2019 1:47 PM
To: SVC_DENR.publiccomments
Subject: [External] Coal Ash Wilmington area

This clean up has been prolonged for TOO long

Louanne Kaye Wilmington

Gregson, Jim

From: Bruce Santhuff <Bruce@Spaloo.com>
Sent: Saturday, January 26, 2019 12:07 PM
To: SVC_DENR.publiccomments
Subject: [External] Sutton Variance Request

Not sure why Duke would need more than 5 years to clean up the coal ash ponds. What did they do for the last 4 years? It was a mistake that these coal ash basins were located in flood-prone zones and water way areas to begin with! What is the guarantee that they will not ask for another extension or that more coal ash will contaminate our water system before the next hurricane season?

Thank you,
Bruce
Bruce Santhuff

Gregson, Jim

From: Janet Rodrick <jan.rodrick@gmail.com>
Sent: Friday, January 25, 2019 4:00 PM
To: SVC_DENR.publiccomments
Subject: [External] Duke Energy Variance request

Good Morning,

Duke Energy should not be granted any variances that would delay or prevent them from having to clean up coal ash and more right away.
It is a crying shame that they have even tried to make thus request and that it is up for consideration!!!
Where is the consideration for the citizens/taxpayers to our right for clean water, clean air, and to have companies that don't follow the legal rules to be punished!!!???
Please consider the future for all of us that will be living with this disgusting and disgraceful mess that Duke Energy has knowingly created!!
Just because you may not be receiving many letters of complaint does not mean that the citizens are not upset about having their water& air quality be destroyed, Rather they are busy trying to live their lives in hope that our elected officials will ALWAYS do the right thing by its people!
PLEASE DO NIT GRANT SNY MIRE FAVORS TO DUKE ENERGY!
They must be held accountable right away
Thank you for your consideration,
Sincerely
Janet Rodrick

Gregson, Jim

From: angela ohare <ohare4ts@hotmail.com>
Sent: Friday, January 25, 2019 3:26 PM
To: SVC_DENR.publiccomments
Subject: [External] Sutton variance request.

Please see to it that these coal stores get removed and cleaned up before damage is caused to our waterways and environment. Thank you.

Sent from Mail for Windows 10

Gregson, Jim

From: Karen Hamilton <khamilton2188@yahoo.com>
Sent: Friday, January 25, 2019 9:42 AM
To: SVC_DENR.publiccomments
Cc: Karen Hamilton
Subject: [External] Fwd: Duke energy clean up Sutton Variance Request

Sent from my iPad

Begin forwarded message:

From: Karen Hamilton <khamilton2188@yahoo.com>
Date: January 25, 2019 at 9:38:25 AM EST
To: publiccomments@ncdenr.gov
Subject: Duke energy clean up

Duke energy needs to clean up the coal ash in North Carolina. They have had five years to do this and have failed to complete the project. Clean water and a healthy environment for our children and grandchildren are imperative. Duke Energy's money and political power in this state should not excuse them from these detrimental conditions they continue to allow.
I am just a concerned citizen and not affiliated with any group.
Karen Hamilton 2188 Scotts Hill Loop Rd Wilmington, NC 28411
Sent from my iPad

Gregson, Jim

From: Karen Hamilton <khamilton2188@yahoo.com>
Sent: Friday, January 25, 2019 9:38 AM
To: SVC_DENR.publiccomments
Subject: [External] Duke energy clean up

CAUTION: External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to report.spam@nc.gov<mailto:report.spam@nc.gov>

Duke energy needs to clean up the coal ash in North Carolina. They have had five years to do this and have failed to complete the project. Clean water and a healthy environment for our children and grandchildren are imperative. Duke Energy's money and political power in this state should not excuse them from these detrimental conditions they continue to allow.
I am just a concerned citizen and not affiliated with any group.
Karen Hamilton 2188 Scotts Hill Loop Rd Wilmington, NC 28411 Sent from my iPad

Gregson, Jim

From: Sue Skoda <sue.mort1228@yahoo.com>
Sent: Thursday, January 24, 2019 4:01 PM
To: SVC_DENR.publiccomments
Subject: [External] Sutton Variance Request

Hello Ellen Lorscheider,

I read the article "Duke could get coal ash extension" in the Star News on January 16. I had no idea and there was no advertisement regarding the Monday's hearing open to the public.

I am writing to comment that the extension should NOT be granted to February 1 of 2020. The reasons being that Duke had 5 years, under the 2014 Coal Ash Management Act, to close the "high priority" basins at Sutton and did not do so in a planned timely or emergent manner. They are well aware that our state is in the hurricane belt and major storms would impact this clean up at any time and yet, they waited until the storms came.

It's unfortunate that the weather was not cooperative with two hurricanes but, the longer these basins are left, the more contamination of our water, air and overall environment. Yes, another hurricane can impact us again this season and that is why these closures need to happen as soon as possible. This should not be debatable but closures mandated for the safety and welfare of our people and environment.

I strongly encourage the DEQ to examine that this variance request should not be allowed. Who can say that they will not ask for another extension in February 2020 thus again, risking the lives, health and welfare of everyone.

Thank you for the opportunity to express my strong health and community values. I hope that DEQ will do the right thing for the safety of its people and not a corporation.

Sue Skoda, RN, MSN

AFFIDAVIT OF WILLIAM R FEDORKA

STATE OF SOUTH CAROLINA §
§
COUNTY OF LEXINGTON §

On this date personally appeared before me the undersigned authority William R. Fedorka who, having been placed under oath, testified as follows:

1. "My name is William R. Fedorka. I am over 21 years of age. I suffer from no legal disability and I have personal knowledge of all facts stated herein.

2. I am a Vice President of The SEFA Group, Inc., a South Carolina corporation ("SEFA"). I have been employed by SEFA since 2005.

3. SEFA owns and operates a STAR fly ash beneficiation facility located at the Winyah Generating Station operated by Santee Cooper in Georgetown, SC (the "Winyah STAR"). The Winyah STAR was commissioned for operations in April, 2015.

4. As originally designed, the Winyah STAR was intended to generate 250,000 tons per year of beneficiated fly ash under normal operations. As a result of modifications to dryer systems, the current design parameters for normal operations have increased to 275,000 tons per year of beneficiated ash.

5. Based on an assumed average loss on ignition ("LOI") factor of 9% for dried feed ash introduced to the Winyah STAR, the annual feed ash tons to be processed by the Winyah STAR would be approximately 275,000 tons under the original 250,000 ton design specification and approximately 300,000 tons under the revised 275,000 ton design specification.

6. As originally designed, the Winyah STAR specifications assumed that 33% of the ash to be processed in the facility would be supplied directly from operations at the Winyah Generating Station and 67% of the ash to be processed in the facility would be supplied from impoundments located at the Winyah Generating Station or elsewhere in the Santee Cooper system.

7. For 2019, approximately 20% of the ash processed in the Winyah STAR was supplied directly from operations at the Winyah Generating Station, and 80% of the ash processed in the Winyah STAR was supplied from impoundments located at the Winyah Generating Station.

8. The Winyah STAR was constructed at a then-existing facility which used a beneficiation technology different from STAR technology. Significant infrastructure from the previous facility unrelated to the beneficiation technology was retained and reused in the Winyah STAR. Retained infrastructure included a storage dome, a load out silo, truck load outs, a baghouse, ID fan, gas coolers, control room and elements of electrical equipment. The reuse of existing infrastructure lowered the overall cost of construction of the Winyah STAR.

Further affiant sayeth naught."

WILLIAM R. FEDORKA

SUBSCRIBED AND SWORN TO BEFORE ME on the 24 day of April, 2020, to certify which witness my hand and official seal.

Notary Public, State of South Carolina

CONFIDENTIAL
DEC GARRETT/MOORE
CROSS EXAMINATION
EXHIBIT NO. 4

FILED UNDER SEPARATE COVER
AND SEAL

CONFIDENTIAL
DEC GARRETT/MOORE
CROSS EXAMINATION
EXHIBIT NO. 5

FILED UNDER SEPARATE COVER
AND SEAL

Public Staff
Confidential Moore Exhibit 1

Docket No. E-7, Sub 1214

CONFIDENTIAL

Public Staff
Confidential Moore Exhibit 2

Docket No. E-7, Sub 1214

CONFIDENTIAL

Public Staff
Confidential Moore Exhibit 3

Docket No. E-7, Sub 1214

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Public Staff
Confidential Moore Exhibit 4

Docket No. E-7, Sub 1214

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Confidential Moore Exhibit 5

Docket No. E-7, Sub 1214

CONFIDENTIAL

Public Staff
Confidential Moore Exhibit 6

Docket No. E-7, Sub 1214

CONFIDENTIAL

I/A

Public Staff
Moore Exhibit 7

SEFA Building Fly Ash Recycling Plant

Allan Gerlat | Dec 03, 2013

SEFA Group Inc. will build a $40 million facility to recycle high-carbon fly ash in Georgetown, S.C.

The Lexington, S.C.-based SEFA, formerly the Southeastern Fly Ash Co., said in a news release the facility will use all of the fly ash produced at Santee

Cooper's Winyah Generating Station, using a new recycling technology.

The facility also will recycle fly ash previously in ash ponds located at Winyah Station. Coal fly ash from other Santee Cooper electric generating stations also may be transported to the Winyah Station site for processing.

The new facility can recycle up to 400,000 tons of fly ash per year. SEFA will use the fly ash from the Winyah Station as a primary ingredient in its proprietary STAR (Staged Turbulent Air Reactor) process to produce a pure mineral product, free of organic contaminants.

The recycling plant's primary product will be a supplementary cementitious material that is trademarked as STAR RP.

Source URL: https://www.waste360.com/construction/sefa-building-fly-ash-recycling-plant

I/A

SEFA Group to Build Fly Ash Recycling Plant in South Carolina

Fly ash firm is working with large South Carolina power company to take in fly ash from ponds.

SUBSCRIBE

November 22, 2013

CDR Staff

C&D

The SEFA Group, headquartered in Lexington, S.C., has announced plans to build a $40 million facility to recycle high carbon fly ash produced by the power company Santee Cooper at its Winyah generating station in Georgetown, S.C. SEFA also will take in coal fly ash from other Santee Cooper electric generating stations, where the material will be processed into a marketable product.

Santee Copper is South Carolina's state-owned electric and water utility that came into being during the New Deal.

The new facility is expected to recycle up to 400,000 tons of fly ash per year. SEFA will use the material as a primary ingredient for its STAR (staged turbulent air reactor) process to produce a pure mineral product, free of organic contaminants.

SEFA presently has two other STAR plants, one in Columbia, S.C., the other in Newburg, Md. The new facility will be the first to recycle fly ash from settling basins.

Tom Hendrix, CEO of the SEFA Group, says,"We introduced STAR RP to the concrete industry in 2011 when we began operating our Maryland plant. The pure mineral matter produced by our STAR plants provides greater strength and durability in concrete than the fly ashes that were typically used to make concrete over the last several decades."

Santee Cooper says it has recycled fly ash, bottom ash and gypsum since the 1970s. Prior to the recent recession, Santee Cooper was using about 90 percent of the material for beneficial purposes. The utility's ash is used by the cement and concrete block industries.

Santee Cooper notes that it has worked to recycle as much of its ash as possible through the decades. The challenges now are that with EPA (Environmental Protection Agency) regulations spurring the closure of coal-

fired generating stations around the country, there has become greater demand for ash and the development of new technology that increases the viability of pond ash

"As we continue working to close units at Jefferies and Grainger and consider long-term needs for Winyah, Santee Cooper is focused on solutions that are cost effective and beneficial to the environment and the economy," says R M Singletary, executive vice president of corporate services. "This is a triple win. It is cost effective, which means it is responsive to our customers' best interests. It utilizes innovative technology to help an important South Carolina industry be sustainable And it is an EPA approved use of ash "

"This plan also addresses comments by our neighbors, the city of Conway and the South Carolina Department of Health and Environmental Controls about long term placement of the ash, and it does so in a manner that is responsible to customers," Singletary adds. "It's a solution that really does have something favorable for all involved "

The plans will empty Santee Cooper’s ash ponds at the three stations over the next 10 to 15 years. The power company will provide excavation, loading and transportation of the ash to the plants where it will be used

The SEFA Group is diversified throughout many areas of fly ash use for the construction industry.

I/A

A NEW SOLUTION FOR A LONG-STANDING DILEMMA

"The cost of disposing of coal ash just went up. Again."

By Jimmy C. Knowles and Bill Fedorka

While the utility industry has become accustomed to hearing this familiar phrase over the last several decades, previous increases in ash disposal cost are expected to pale in comparison to increases coming after October 14, 2015. On that date, the requirements of the U.S. Environmental Protection Agency's (EPA's) final rule regulating new and existing coal ash landfills and ponds will go into effect. These new requirements are nearly identical—and just as costly—as those for municipal solid waste landfills.

What about the millions of tons of coal ash previously disposed of in unlined ponds? According to the EPA, many of these impoundments will need to be closed and the ash either covered or removed.

Fortunately, the EPA has provided a path to avoid high disposal costs and the long-term risks associated with the new requirements. The solution: "encapsulated beneficial use." This approach is consistent with what the industry has been doing for years: using ash as a performance-enhancing additive in concrete and other composites. Consequently, utilities have an even greater incentive to see that coal ash goes to beneficial uses such as concrete—namely, reducing their disposal costs and improving environmental stewardship.

From the perspective of a commercial customer for coal ash, the decision to use ash has become more difficult. Every year there is less fly ash being produced and the quality of that fly ash is deteriorating. In some markets, fly ash beneficiation has helped improve the quality, thereby increasing the supply. And yet, even markets with access to quality product lacked the year-round availability of fly ash necessary to keep up with the seasonal fluctuations.

Coincidentally, hundreds of millions of tons of previously disposed coal ash were sitting idly in ponds all over the country. The industry was in need of a beneficiation technology that could not only process poor-quality fly ash into a high-quality additive for concrete but also transform previously disposed coal ash, such as pond ash, into a quality product for encapsulated beneficial use.

ENTER STAR

The technology, known as staged turbulent air reactor (STAR), was first commercialized in 2008 and the latest facility came online early 2015 at Santee Cooper's Winyah Generating Station (WGS). The Winyah STAR Plant processes fly ash as it is produced at WGS. More importantly, however, it also processes coal ash that was produced decades ago as it is reclaimed from on-site ash ponds.

For years, The SEFA Group has been a long-term service provider to Santee Cooper—initially for ash marketing and more recently for ash beneficiation and marketing. When Santee Cooper was faced with the task of cleaning out and removing millions of tons of coal ash from several of their ponds, they turned to SEFA for help. In 2013, SEFA first successfully demonstrated commercial-scale beneficiation of pond ash at its McMeekin STAR Plant. The following year, SEFA decommissioned its

currently existing carbon burnout beneficiation plant at WGS and replaced it with the next-generation STAR plant that could interchangeably beneficiate both freshly produced fly ash and previously disposed coal ash reclaimed from ponds.

Santee Cooper required an extremely flexible coal ash beneficiation technology. Each day, the Winyah STAR Plant adjusts to a wide range of coal ash from varied sources. For example, the Winyah STAR Plant routinely operates using only reclaimed coal ash from ponds and yet is able to switch its feed source at a moment's notice to process 100% dry fly ash as the WGS comes online.

The Winyah STAR Plant routinely processes coal ash with residual carbon contents ranging from 5% to over 25%. Because the plant is a stand-alone solution, it does not depend on WGS in any way and operates normally, even when all the WGS units are offline. In fact, even if any or all of the WGS units are decommissioned in the future, the plant could continue operating at full capacity for decades, limited only to processing the on-site pond ash.

Uninterrupted supply and consistent quality translate to increased demand for fly ash. Customers lose confidence in fly ash when they cannot rely on it being available when needed or if the quality of the fly ash causes problems with their production and processes. The Winyah STAR Plant allows Santee Cooper to maximize the annual amount of coal ash used from WGS by providing a continuous supply of quality product to its customer base.

Unless reclaimed pond ash is used at Winyah to augment feed material, the supply of STAR fly ash would never keep up with demand. Like most coal-fired power plants, the recent trend at WGS has been for less coal to be burned, especially during the spring and fall months when customer demand for fly ash is at its highest. Reclaimed coal ash from ponds provides continuous feed material for the Winyah STAR Plant and ensures uninterrupted supply for customers. For power plants, that offers the benefit of elimination or reduction in disposal costs and tangibly demonstrates its long-term commitment to environmental stewardship.

CONSISTENT QUALITY WITH CONTINUOUS PERFORMANCE

The enhanced quality of STAR fly ash is a critical element of its compelling value proposition. Typical by-product fly ash will have varying amounts of unburned carbon, which negatively affects the quality of products made from it, and which subsequently increases both the need and cost of the customers' quality control. Regardless of the carbon content of the source feed, STAR fly ash has little to no carbon remaining and therefore the presence of STAR fly ash does not negatively affect the customers' quality control practices in any way. The quality characteristics of Winyah STAR fly ash remain constant, regardless of whether it is produced from reclaimed pond ash or from fly ash produced by the WGS plant.

Of course, many of the other characteristics of STAR fly ash are changed for the better. For example, STAR processing improves the early strength and ultimate strength gain of any fly ash used in concrete, primarily by increasing the fineness of the fly ash. In the case of pond ash, due to prolonged exposure to water, the ash does not have the strength activity necessary to be marketed as specification-grade fly ash unless it is calcined at the high operating temperatures of a STAR plant.

STAR processing also removes additional contaminants from fly ash including, for example, ammonia, which would otherwise be a nuisance or represent a quality control problem for customers. Consequently, Santee Cooper is supporting research to develop diversified markets for Winyah STAR fly ash as additives in coatings, plastics, rubber, and other products.

LONG-TERM COST IMPLICATIONS

The landfill industry is highly regulated and more stringent environmental regulations have made it more costly to own and operate landfills. Significant amounts of capital are necessary to permit, construct, operate, and monitor sites. New coal combustion residuals (CCR) regulations are intended to mirror nonhazardous municipal solid waste (MSW) landfill rules and standards (RCRA Subtitle D). As a consequence, it has been projected to cost more than $1 million per acre to permit, construct, operate, close, and monitor a landfill in compliance with the new regulations. Permits will require 30 years of environmental monitoring after a landfill closes. It should go without saying that a financial commitment of this magnitude needs to be evaluated and planned well in advance.[1]

In June 2014, the EPA published an economic impact analysis (EIA) for MSW landfills to study the impact of proposed amendments to the Standards of Performance. Figure 1 illustrates one finding from the EIA with respect to MSW landfill cost increases. As discussed previously, the new CCR regulations mirror for the most part those for MSW landfills because both are controlled under RCRA Subtitle D. The EIA presents a model originally published in 2005 to help estimate costs[2] for a hypothetical landfill based on known market conditions and cost data.

EVALUATING THE BENEFITS IN MORE WAYS THAN ONE

A cost analysis comparing two options—1) The "do-nothing," or 100% landfilled options; versus 2) investment in STAR and removing material offsite through sales of thermal beneficiated ash—helps to demonstrate the potential cost difference.

1 The cost to dispose of MSW at a landfill is commonly known as a "tip fee" or "gate fee." In September 2012, the average national spot market price to dispose of one ton of waste in a U.S. landfill was roughly $45, up 3.5% over 2011. This compares to average national tip fees of approximately $32 in 1998 and $8 in 1985. Between 1985 and 1995, the national average tip fee increased by 293%. In the subsequent 10-year period, the national average tip fee increased by 7% per year.

2 Landfill costs fall into the following categories: site development, construction, equipment purchases, operation, closure, and post-closure. Site development includes site surveys, engineering and design studies, and permitting fees. Construction costs encompass building the landfill cells as well as development of permanent on-site structures needed to operate the landfill. Evacuation of the landfill site comprises a notable portion of the construction costs. Installation of a liner can also vary greatly in cost depending on the site's geology. Operating costs are relatively small when compared to the capital costs and include staffing, equipment, leachate treatment, facilities, and general maintenance.

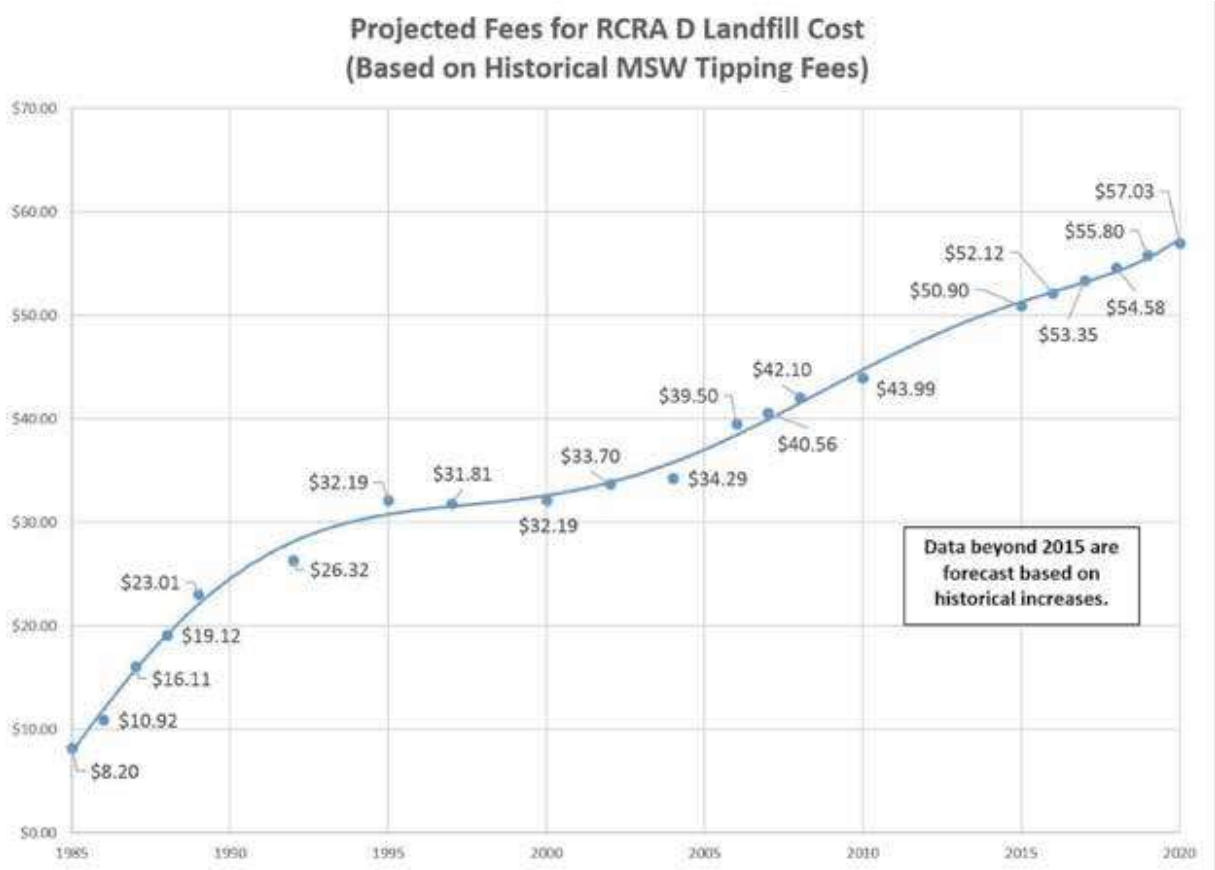

Fig. I

To estimate the net present value (NPV) of a new landfill development project for CCRs, it was assumed that the site development costs, which include all engineering and permitting, would total a fixed $1 million.[3] The calculated operating factors and cost assumptions can be seen in Fig. 2.

For the "do-nothing" option, five 33-acre cells would need to be developed over the 20-year period to handle the 7.9 yd^3 of fly ash disposal. The NPV of all costs was determined to be $84 million dollars assuming a 7% discount rate and inflation of 2.5%. This represents an equivalent, "all-in" disposal cost of $20.82 per ton average over the 20-year period. The cost per acre, in today's dollars, would be approximately $985,000 per acre (see Fig. 3).

If nearly 6.5 million tons of ash were disposed of on site, the utility or landfill owner still has to deal with the 30-year post-closure period and all its associated costs, not to mention the perpetual liability of all that material buried underground.

Even if only 85% of the available fly ash could be beneficiated and taken offsite, only one cell would need to be developed with a life of nearly 40 years. Beneficiation would eliminate the liability and 30-year post-closure costs on 5.5 million tons of fly ash. At the end of the 20-year period, the beneficiation facility would be paid for, with plenty of years of productivity ahead as life extension costs are paid through the operation and management of the facility. Even if the power plant went dark or was mothballed, the STAR could still reclaim material from disposal sites, using it as raw feed.

For the 85% beneficiation option, the NPV of disposal costs would reduce to less than $19 million. Assuming a capital cost for a STAR facility in the $50 million range, the total investment for the beneficiation plus disposal option would be $69 million ($19 million disposal NPV plus $50 million beneficiation investment). This represents a savings of $15 million in today's dollars.

In addition, the beneficiation option would avoid disposal of 6.7 million yd^3 of material, and avoid all post-closure landfill costs, which, according to new regulations, will extend 30 years after closure. The sales of ash from the beneficiation facility would cover all operations and maintenance associated with the beneficiation facility and includes capital for life extension that will allow the plant to operate well past the 20-year period included in the analysis. In addition to the financial advantages, using STAR technology enhances public sentiment because of its broad environmental benefits and the opportunity to be a proactive industry leader.

SUMMING UP

Ultimately, each utility tailors its coal ash management program to its specific circumstances and there will not be a single magic bullet that will solve all of its problems. More likely, each utility will address its unique issues using a combination of several different ash management practices. Even so, it will be increasingly difficult to avoid the skyrocketing cost of ash disposal unless ash can be diverted from disposal to beneficial use. Fortunately, there is now a tool available:

3 An average value of $423,000 (adjusted from $350,000 in 2005 dollars) per acre was used for the landfill construction costs in accordance with the Duffy model. Likewise, the costs for installation of a cap and post-closure care were estimated to be $80,000 and $50,100 per acre, respectively.

SITE DEVELOPMENT OPERATING FACTORS AND COSTS FOR "DO NOTHING" OPTION

Operating Factors
1500MW / 75% Capacity Factor
9600 Btu/kWhr / Bituminous Coal
12,500 Btu/lb. Heat Factor
10% Ash content / 85% Fly Ash
321,667 Fly Ash Tons Per Year
23% Moisture - Conditioned Ash
1 Yd. Conditioned ash = 1 Ton

Operating Cost Assumptions
33 Acres Per Cell
60 Feet Maximum Height of Cell
3:1 Angle of Exterior Slope
$2.00 per ton hauling cost
$3.50 per ton to place/compact
$100,000 per year (misc. cost)

Fig. 2

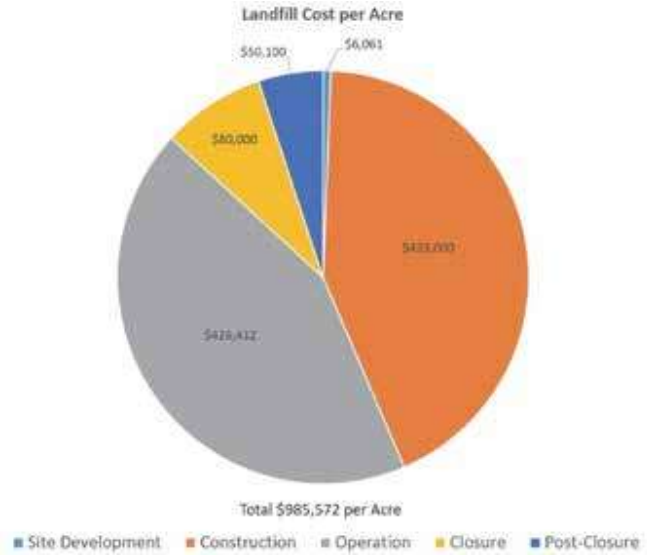

Fig. 3

the staged turbulent air reactor (STAR). STAR has the technical flexibility to continue to transform coal ash from both current operations and existing landfills and ponds into a consistent, high-quality product that can be sold as a value-added product for encapsulated use. This technology prevents coal ash from becoming or continuing to be a liability and expense as a landfill or pond waste product. ❖

Jimmy C. Knowles, Vice President of Market Development and Research, joined The SEFA Group over 30 years ago and has served in a variety of positions with the company.

Bill Fedorka, Director of Engineering for The SEFA Group, is a Design and Project Engineer with over 20 years of experience in feasibility evaluation, process and mechanical design, project management, installation, start-up, and operations/maintenance for an extensive range of mechanical equipment and systems.

I/A

NEWS

How North Carolina law could make it harder to recycle coal ash

Rhiannon Fionn | November 7, 2016

Max / Creative Commons (https://www.flickr.com/photos/iceage366/2686572211)

The use of recycled coal ash in concrete can cut down on more emissions-intensive Portland cement.

Deadlines in North Carolina's coal ash law have some worried that Duke Energy may choose recycling options that could leave prospective concrete customers unsatisfied and much of its coal ash inventory in wet impoundments.

Henry Batten, president of Concrete Supply Co. in Charlotte, says he is committed to buying Duke Energy's recycled coal ash even though he says it will cost him more than purchasing imported Asian ash. However, because of state law, he questions whether Duke Energy can choose to build the type of reprocessing plant that produces ash that, he says, "is 100 percent consumable by us without question; in fact, I would take it all day, every day if I could get it."

Citing geopolitical concerns, he says having a regional source of coal ash that meets international and state specifications for concrete is critical for his company. But his preferred process for beneficiation – optimizing the ash for use in concrete is the most expensive, and Coal Ash Management Act (CAMA) deadlines don't seem to leave room for facilities with long enough lifespans to justify the investment.

Between its North and South Carolina operations, Batten reports that his company "consumes about 2.1 to 2.5 million tons of ash annually," adding, "I'm probably the largest consumer of ash in the Carolinas, and I made a commitment that I would buy that ash because I need a reliable source."

Batten made his comments during a presentation to the Alliance of Carolinians Together (ACT) Against Coal Ash (http://actagainstcoalash.nccoalash.org/) group.

"We feel like the better informed we are, the better we can make decisions, and the better we can advocate for those people who will be most affected," says, Caroline Armijo, a member of ACT, who says she never imaged herself advocating for the concrete industry.

Duke's options

North Carolina law requires Duke Energy to create three beneficiation plants capable of annually producing 300,000 tons of ash "to specifications appropriate for cementitious products" from wet waste impoundments

The law also requires the company to announce siting for two of the three plants by Jan 1, 2017, and a third by July 1, 2017 In October, as part of a lawsuit settlement, Duke identified its Buck plant (https://news.duke-energy.com/releases/duke-energy-to-recycle-coal-ash-at-buck-steam-station-in-salisbury) , in Salisbury, North Carolina, as one of the three sites.

The company could go with one or more of multiple options at the two additional plants, and those options could be provided by different vendors; the technology used at each plant could vary since the technology selected must be site-specific.

The associated costs range from less than $5 million for dry ash handling only to more than $50 million for thermal beneficiation that can process both wet and dry ash. It's the latter that produces the quality of ash Batten wants for his concrete company.

A market study (http://energynews.us/2016/09/14/report-outlines-challenges-to-recycling-north-carolina-coal-ash/) , to be presented to the North Carolina Environmental Management Commission on Nov 9, states, "To our knowledge, the only large scale commercial operation in the U.S. that is currently processing wet ash is the SEFA STAR process."

Another company, PMI Ash Technologies, based in Raleigh, is listed as a thermal beneficiation company for dry ash using its Carbon Burn Out (http://www.pmiash.com/carbonburnout.asp) process, but CEO Lisa Cooper says her company is also qualified to handle wet ash

Both she and Jimmy Knowles, Vice President of Market Development and Research at The SEFA Group, headquartered in Lexington, South Carolina, say that the $50 million price tag represents the high end of the price range for thermal facilities at large coal-fired plants, but that it's not an unreasonable estimate.

"The cited all-in cost above would be for a large plant, probably with a maximum feed rate approaching 500,000 tons per year," says Knowles. "The design for an ash beneficiation plant at any of the Duke Energy sites in N C would probably be similar in size."

Cooper says the price estimate likely includes storage, an important consideration during winter months when there is less construction activity. She says storage costs could be mitigated through agreements with ash marketers.

A site's location could also drive beneficiation costs up. "We have a nice plant in Georgetown, South Carolina," says Knowles, "but between the seismic zone it's in and hurricane issues, there were all kinds of additional costs that were built into it that increased the costs."

Duke Energy could also save by mixing and matching its options, installing the more expensive, but smaller-scale, thermal option along with less expensive dry-ash processors, enabling its ability to upgrade or expand its ash processing in the future in response to market conditions.

The company has only begun the process of requesting information from the companies and declined to comment on vendor-related matters.

Duke could be competitive on coal ash

The market study (http://energynews.us/2016/09/14/report-outlines-challenges-to-recycling-north-carolina-coal-ash/) , produced by Electric Power Research Institute (EPRI), the University of Kentucky Center for Applied Energy Research and Golder Associates, indicates that Duke Energy is well positioned to turn coal ash into a revenue stream with its "competitive advantage" in North Carolina. The study also noted that Duke might be competitive in several other states as well and that annual demand for coal ash is increasing

In fact, demand is so high that Batten says the controversial "cap-in-place" closure method isn't a deterrent Capping an impoundment, however, would add to closure expenses.

"We would hope that every plant that ever gets capped would eventually allow us, or someone like us, to harvest that ash for reuse in concrete because it's better – it's a more sustainable option than leaving it in the impoundments," says Batten.

"We are exploring how cap-in-place designs can be used to allow for potential coal ash recycling," says Duke Energy spokesperson Zenica Chatman, adding that in Florida the company is harvesting previously capped ash to meet market demand there.

North Carolina ratepayers could pay for the beneficiation plants, but they could also benefit from them.

Currently, according to Chatman, "The company does not profit from ash sales in North Carolina. If we have a profit in the net sale of ash byproducts, North Carolina customers get the benefit. If we have a net loss, the company may recover the losses through the fuel clause."

Deadlines not beneficial

According to the study, "Beneficiation will be most attractive at those facilities that will eventually require excavation of the ponded ash, do not have an alternative use (e g clay mine fill), and have a minimum 15 to 20 year period to evaluate, design, construct, and operate a beneficiation facility."

Deadlines were mentioned as an impediment, however, though the 2016 law allows (https://www.documentcloud.org/documents/2922623-H630-CSRI-32-v2-NEW-Coal-Ash-Bill-June-2016.html) the secretary of the Department of Environmental Quality to extend the deadlines.

Currently, the deadline (https://www.documentcloud.org/documents/2922623-H630-CSRI-32-v2-NEW-Coal-Ash-Bill-June-2016.html#document/p27/a305383) for closing intermediate-risk impoundments is August 1, 2028, and the deadline (https://www.documentcloud.org/documents/2922623-H630-CSRI-32-v2-NEW-Coal-Ash-Bill-June-2016.html#document/p27/a305380) for closing impoundments at plants with beneficiation processing is Dec. 31, 2029, both allowing for less time than the study's stated minimum timeframe

The lifespan of a thermal beneficiation plant is estimated to be 30 years.

No one seems to know how the deadlines in CAMA were determined. Duke Energy said to ask the legislators, but each legislator asked either didn't respond or suggested that another legislator be asked

"I can say that closure deadlines are one of the factors that we look at in determining where these units will ultimately be located," said Chatman "Sites with closure deadlines in the 2028-2029 time frame are better candidates for recycling since it allows you time to recycle a substantial amount of material, making the investment more cost competitive with other closure options."

Duke Energy estimates it has 158 million tons of coal ash stored in impoundments and landfills at the company's 14 North Carolina plants, with 124 million tons at its active plants At the rate of 900,000 tons per year, it would take 138 years to beneficiate its current inventory at active plants (assuming no waste ash, and not counting gypsum, which is also recycled from coal ash).

Despite lower ash production as the company's energy mix shifts more toward natural gas, the study predicts Duke Energy will continue to produce more than a million tons of ash annually for the foreseeable future.

Ash that is not beneficiated will be relegated to landfills or left in wet impoundments.

Ash quality matters

Southern bakers know that the wrong flour can ruin their biscuits. The same goes for concrete made with coal ash.

The market study states that thermal beneficiation processing "is a proven and highly flexible technology that can operate on a variety of ash types with a wide range of carbon concentration It produces an ash that is low or even free of

carbon. It also eliminates ammonia from fly ashes impacted by nitrous oxide controls. In addition, the process also produces ash with improved fineness by liberating the very small particles that are trapped in the carbon particles"

Coal ash displaces Portland cement in the concrete mixture, and the ash makes for a more durable product Further, the creation of Portland cement is also a major contributor to greenhouse gas emissions. For those reasons, coal ash is now required to be used for many construction and transportation projects.

"In order to make concrete to meet specifications," Batten says, "we have to have it."

UPDATE:

Following publication, we received additional information from Jennifer McGinnis, Attorney and Principal Legislative Analyst for the N.C. General Assembly, as requested by Rep. Pricey Harrison. In essence, McGinnis said that due to confidentiality agreements she couldn't speak specifically to how the coal ash cleanup deadlines were established in North Carolina law, but that based on public feedback that "I think there was a desire to close the ponds, and eliminate associated risks, as quickly as possible." She also referenced the U.S. Environmental Protection's coal-ash regulation, which became effective in Oct. 2015

CORRECTION:

Henry Batten wishes to correct this quote: Batten reports that his company "consumes about 2.1 to 2.5 million tons of ash annually," writing via email: "The quote was referring to cubic yards of concrete at 2 5 million cyds We consume about 150,000 to 200,000 tons of ash annually."

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Exhibit 1

Docket No. E-7, Sub 1214

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Exhibit 2

Docket No. E-7, Sub 1214

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Public Staff
Garrett Exhibit 3

Riverbend & Sutton Ash to Brickhaven
Calculation of Development Portion of PPP Ref 1.X.12

Plant	PO Number	Revision	Date	PPP Ref. 1.X.12 $/ton	PS DR 127-3 Unloading $/ton	PS DR 127-3 Placement $/ton	Calculated Development $/ton
Riverbend	1104823	0	1/13/2015	$ 11.36	$ 3.28	$ 0.45	$ 7.63
Riverbend	1104823	10	5/3/2016	$ 11.36	$ 3.28	$ 0.45	$ 7.63
Riverbend	1104823	11/12	5/25/2016	$ 12.04	$ 3.28	$ 0.45	$ 8.31
Riverbend	1412247	0	10/22/2015	$ 11.91	$ 3.28	$ 0.45	$ 8.18
Riverbend	1412247	1	1/29/2016	$ 11.91	$ 3.28	$ 0.45	$ 8.18
Riverbend	2278895	0	4/16/2016	$ 16.65	$ 3.28	$ 0.45	$ 12.92
Riverbend	2278895	1	3/2/2017	$ 16.65	$ 3.28	$ 0.45	$ 12.92
Riverbend	5050808	0	3/2/2017	$ 16.65	$ 3.28	$ 0.45	$ 12.92
Sutton	1107196	0	1/13/2015	$ 11.91	$ 2.27	$ 0.31	$ 9.33
Sutton	1107196	16	10/5/2016	$ 12.04	$ 2.27	$ 0.31	$ 9.46

Public Staff
Garrett Exhibit 4

Public Staff Data Request No. 127-3

Item	Riverbend*	Sutton	
PPP Reference 1.X.12 Phase 1 Alpha - Unloading Cost per ton	$3.28	$2.27	
PPP Reference 1.X.12 Phase 1 Alpha - Development Cost per ton	$9.33	$9.33	
PPP Reference 1.X.12 Phase 1 Alpha - Placement Cost per ton	$0.45	$0.31	
Total cost per ton	**$11.36**	**$11.91**	***Actual Unit Rate for the material sent to Brickhaven at RB Ph I - $13.06***

**For Riverbend, the original contract disposal fee was a composite based on 870k tons to Brickhaven & 130k tons to RCC.*

Item	Riverbend
PPP Reference 1.6 Phase 2 - Unloading Cost per ton	3.28
PPP Reference 1.6 Phase 2 - Development Cost per ton	12.92
PPP Reference 1.6 Phase 2 - Placement Cost per ton	0.45
Total cost per ton	**$16.65**

Item	Riverbend	
PPP Reference 1.9 Phase 2 - Rail Transportation - Covers	$0.00	
PPP Reference 1.9 Phase 2 - Rail Transportation - Cover Management	$0.00	
PPP Reference 1.9 Phase 2 - Rail Transportation - On-Site Rail Operations	$0.00	
PPP Reference 1.9 Phase 2 - Rail Transportation - Rail Car Lease	$0.00	
PPP Reference 1.9 Phase 2 - Rail Transportation - Other ***(Only CSX related Cost)***	$12.48	***PO #2278910 Unit Rate***
Total cost per ton	**$12.75**	

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Exhibit 5

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Exhibit 6

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Garrett Exhibit 7

Development Sequence at Brickhaven

Cell	Subcell	CQA Certification Date*
1	1A	10/15/2015
1	1B	2/29/2016
1	1C	4/27/2016
1	1D	5/31/2016
2	2C	9/20/2016
2	2D	9/20/2016
2	2B	12/7/2016
2	2A	3/1/2017
2	2G	6/13/2017
2	2F	6/21/2017
2	2E	9/1/2017
6	6A	12/20/2017
6	6B	12/20/2017
6	6C	1/9/2019

*CQA Certification date is the date NCDEQ approved the construction of each individual Subcell as ready for disposal

Public Staff
Garrett Exhibit 8

I/A	Permit No.	Date	FID
	1910-STRUC-2015	September 10th, 2019	1357866

RECEIVED
September 10th, 2019
Division of Waste Management
Solid Waste Section

September 5, 2019

Mr. Benjamin Jackson, Engineering Project Manager
Permitting Branch, Solid Waste Section
Division of Waste Management, NCDEQ
1646 Mail Service Center
Raleigh NC 27699

Re: Partial Closure Notification

Dear Mr. Jackson,

On behalf of Green Meadow, LLC and Charah, LLC. (Owner), HDR is providing the following partial closure notification for the Brickhaven No. 2 Mine Site Tract "A" Structural Fill (Permit No. 1910). It has been deemed by the Owner that areas will not receive additional coal combustion products, have reached or are below final structural grades, and are ready for closure.

Closure activities beginning in September, 2019 will include placement of the 40 mil LLDPE geomembrane, geocomposite, four feet of cover soil on the side slopes and a minimum of two feet of cover soil on the top deck meeting the approved specifications, and installation of the perimeter and cap drainage systems. The additional cap soils will be added at a later date in order to complete the closure.

The attached drawing identifies the areas previously capped and the areas to be capped under this notification.

When closure is complete HDR will compile a closure certification by a professional engineer stating closure occurred in accordance with the approved Closure/Post-Closure Plan for submittal to NCDEQ. Once closure of the entire structural fill is fully complete the Owner will record the structural fill with the Register of Deeds as required by NCGS 130A-309.219.

If you have any questions, comments, or require additional information, please contact me at 704.338.6843.

Sincerely,
HDR Engineering, Inc. of the Carolinas

Michael D. Plummer, PE
Project Manager

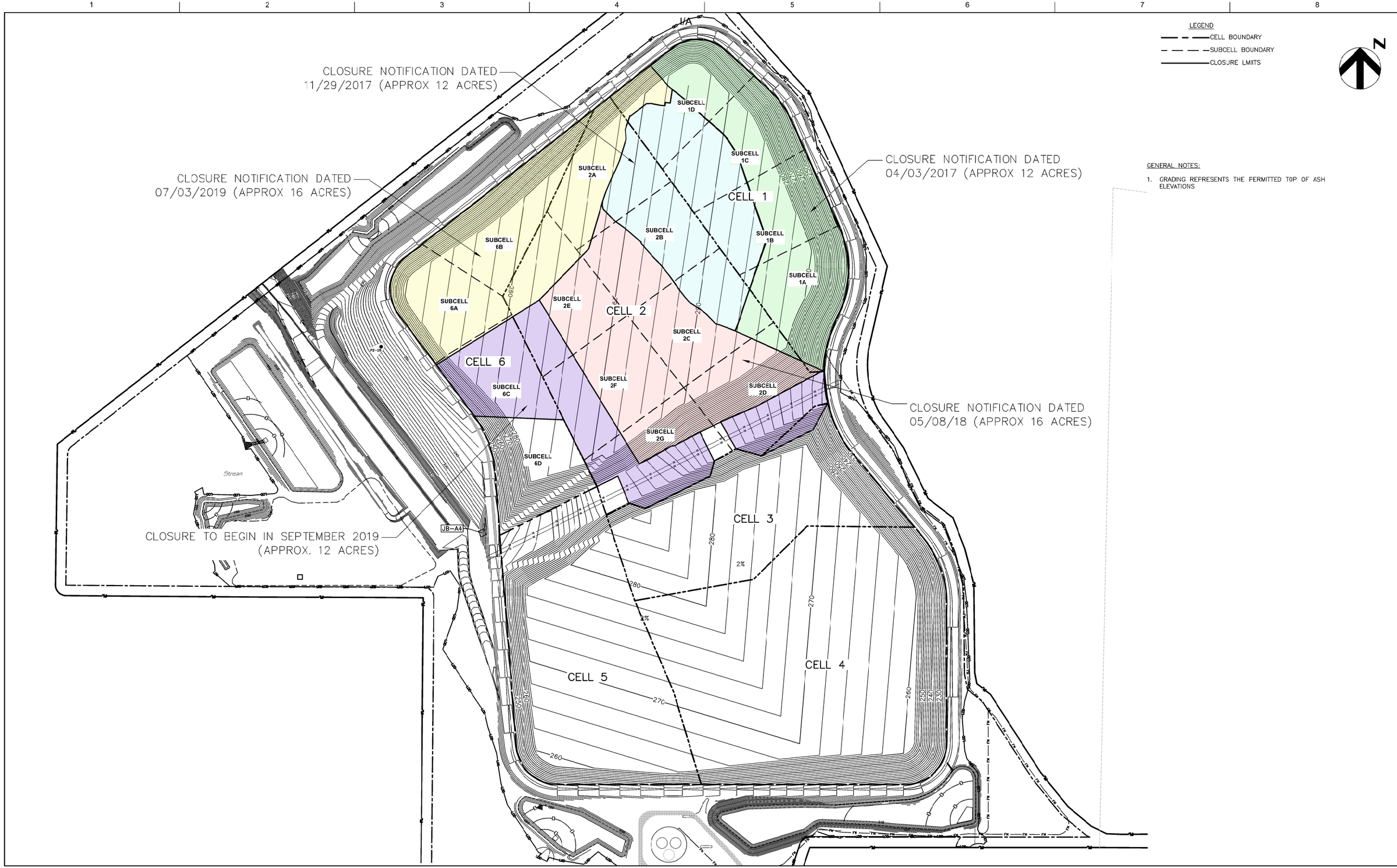
cc: Ed Mussler, NCDEQ (via electronic mail only)
Sherri Stanley, NCDEQ (via electronic mail only)
Tom Flannagan, Charah (via electronic mail only)
Norman Divers, Charah (via electronic mail only)
Greg Grambusch, Charah (via electronic mail only)

Attachments

- Brickhaven Mine – Closure Notification Drawing

hdrinc.com

440 S Church Street, Suite 1000, Charlotte, NC 28202-2075
704.338.6700



GENERAL NOTES:

1. GRADING REPRESENTS THE PERMITTED TOP OF ASH ELEVATIONS

OFFICIAL COPY

Feb 18 2020

C

B

A

HDR Engineering Inc.
of the Carolinas

440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION
1	9/19	APPROX CLOSURE LIMITS

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	
DRAWN BY	Z. PRIESTER
CHECKED BY	
PROJECT NUMBER	10021146

BRICKHAVEN No. 2 MINE TRACT "A" MINE
STRUCTURAL FILL
MONCURE, NC

CLOSURE AREA
CELL 6C, 2G SLOPE, AND
POWER LINE AREAS

0 1" 2"

FILENAME 00C-01.cwg
SCALE 1"=200'

SHEET
00C-01

Public Staff
Garrett Exhibit 9

Independent Development Cost Estimate for Brickhaven Stuctural Fill

Cost Category	Source for Basis Amount	Basis Amount	Adjusted Amount	Comments
Land Acquisition	Chatham County Tax Records	$ 11,873,700	$ 13,654,755	Add 15% for Acquisition Cost
Rail/Infrastructure	Original Amounts in Sutton & Riverbend Purchase Orders	$ 18,000,000	$ 27,000,000	Add 50% Contingency for Brickhaven Site
Mining Bond	Mine Permit	$ 500,000	$ 500,000	No Adjustment
Closure Cost	Financial Assurance Documents	$ 9,520,000	$ 9,520,000	Average $/acre cost in Closure Cost Estimate; 68 Acre area
Post Closure Cost	Financial Assurance Documents	$ 1,038,889	$ 1,038,889	68 acres/144 acres X $2,220,000 Post Closure Cost Amount
Cell Development	Estimate	$ 30,600,000	$ 30,600,000	$450,000/acre; 68 acre area
	Total	$ 71,532,589	$ 82,313,644	

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Exhibit 10

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Exhibit 13

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Garrett Exhibit 14

Station 312631 - Eden
Monthly Precipitation Data for 2018

Month	Rainfall (inches)
January	2.58
February	3.08
March	4.32
April	4.89
May	7.55
June	1.43
July	7.16
August	9.22
September	8.88
October	9.11
November	7.15
December	5.54
TOTAL	70.91

Station 312631 - Eden
Annual Precipitation Data

Year	Rainfall (inches)
1971	51.56
1972	56.07
1973	39.35
1974	45.70
1975	58.86
1976	38.23
1977	37.71
1978	53.36
1979	56.85
1980	37.95
1981	33.49
1982	39.40
1983	47.09
1984	50.66
1985	39.30
1986	33.36
1987	46.06
1988	34.75
1989	56.42
1990	55.38
1991	33.45
1992	46.62
1993	49.10
1994	41.18
1995	48.92
1996	63.30
1997	40.10
1998	42.35
1999	45.65
2009	23.98
2011	45.26
2012	36.22
2013	47.03
2017	45.48
2018	70.91
2019	49.08
AVERAGE	**45.56**

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Exhibit 15

Docket No. E-7, Sub 1214

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Public Staff
Garrett Exhibit 16

526 South Church Street
Charlotte, NC 28682

August 20, 2018

VIA OVERNIGHT MAIL AND EMAIL

Leslie Bradley
SVP, Industrial Division Manager - Infrastructure Group, Parsons
4701 Hedgemore Drive
Charlotte NC 28209

Re: Dan River, Purchase Order 5067043 and Master Contract No. 20588

Dear Ms. Bradley:

Reference is hereby made to that certain Master Contract No. 20588, dated as of March 15, 2017 (the "**Master Contract**"), by and between Duke Energy Business Services LLC, as agent for and on behalf of Duke Energy Carolinas, LLC, Duke Energy Florida, LLC, Duke Energy Indiana, Inc., Duke Energy Kentucky, Inc., Duke Energy Ohio, Inc., and Duke Energy Progress, Inc. (collectively, "**Duke Energy**") and Parsons Environment & Infrastructure Group Inc. ("**Parsons**"). Further reference is hereby made to that certain Purchase Order 5067043, dated March 15, 2017 (the "**Purchase Order**"), issued by Duke Energy to Parsons under the Master Contract, pursuant to which Parsons was engaged to perform certain ash excavation and transportation services at Duke Energy's Dan River facility. Capitalized terms used, but not defined, herein shall have the meaning ascribed to such terms in the Master Contract.

We are writing this letter to notify you that Duke Energy is very concerned with Parsons continued failure to meet the Key Milestones as delineated in the Purchase Order, Exhibit B, 8. Milestones, 8.1 Key Milestones (Key Milestones) and finishing the work per schedule as contracted. The agreed upon dates in the Purchase Order are critical dates for Duke Energy, as regulatory and other requirements we have to meet are dependent upon Parsons completing its Services on time and in accordance with the Key Milestone schedule.

The Master Contract sets forth the terms and conditions that govern the work to be performed under the Purchase Order. Section 2.1 of the Terms and Conditions specifically states that if any Purchase Order specifies Key Milestone Dates, then Parsons "***must*** perform the Services and any required completion of such Services in conformance with such . . . Key Milestone Dates." Furthermore, in an effort to highlight the tremendous importance of these dates, Section 2.1 also states that ***"[t]ime is of the essence*** for all Services to be performed under any Purchase Order". We attempted to make sure this point was clear to Parsons when awarding this work, and even included a paragraph in Exhibit A of the Master Agreement to further drive home this point. This Section states that "[a]ll time limited stated in this agreement are time is of the essence." Based on our numerous discussions at the beginning of the project, the agreement upon the Key Milestone Dates and the repeated insistence that we could not afford any delays in the work, we are disappointed with the progress that has been made to date.

526 South Church Street
Charlotte, NC 28682

In an effort to help remedy Parsons missing further Key Milestones, Duke Energy has been collaboratively working with Parsons to develop a Stockpile Management Plan (*submitted by Parsons to Duke Energy on 8/16/18*) and is collaboratively working with Parsons to develop a Landfill Weather Resistance Plan.

Parsons has not met the Key Milestone for its Services since November, 2017 to present. Duke Energy expects Parsons to meet their contractual schedule obligations by demonstrating significant improvement in Key Milestone(s) as time is of the essence. In no event shall this be considered as a schedule acceleration; rather it an expectation that Parsons meet the original schedule reflected in the Purchase Order. We expect to see immediate improvement on the project to meet the Key Milestone Dates. If Parsons is unable to do so, we will have no choice but to consider all options we have under the Master Contract. We respectfully request a written response from Parsons no later than Friday, August 24, 2018.

If you have any questions or concerns, please do not hesitate to reach out.

Very truly yours,

Mark Teague
Managing Director, Supply Chain
Duke Energy Business Services, LLC

cc: Matt Abirached, Duke Energy
Joe Frondorf, Duke Energy
Bill Hughes, Parsons
Michael Johnson, Parsons
Eric Kinstler, Duke Energy
Dan Mc Rainey, Duke Energy
Mark Patrick, Duke Energy
Alan Thomas, Parsons

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Exhibit 17

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Exhibit 18

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Public Staff
Garrett Exhibit 19

Duke Energy Carolinas
Response to
North Carolina Public Staff Data Request
Data Request No. NCPS 193

Docket No. E-7, Sub 1214

Date of Request: **February 4, 2020**
Date of Response: **February 11, 2020**

[ ] **CONFIDENTIAL**

[X] **NOT CONFIDENTIAL**

Confidential Responses are provided pursuant to Confidentiality Agreement

The attached response to North Carolina Public Staff Data Request No. 193-1, was provided to me by the following individual(s): Trudy H. Morris, Project Manager II, and was provided to North Carolina Public Staff under my supervision.

Camal O. Robinson
Senior Counsel
Duke Energy Carolinas

Request:

1. Regarding the attached white paper titled "CONFIDENTIAL DEC NCPS 112-13 (a) (Contractor Change Narrative)", please provide the following:
a. A narrative explanation of "the increased ash basin quantities…"
i. Please include for each pay item "Excavation/Transportation" and "Unloading/Placement at On Site Landfill" in Sequences 1-4 the quantity that the original bids from Parsons and Trans-Ash were based on, the storage location of the increased quantities prior to excavation, and the total quantity (combined between Parson and Trans-Ash) upon completion.
ii. When and why the ash basin quantities increased.
iii. Supporting work papers with working formulas.
b. A narrative explanation of how adverse weather days are anticipated and addressed in the master contract and/or purchase orders.
i. Please include references to contract and/or purchase order language that is applicable in addition to Paragraph 12, which starts on page B-38 to the Maximo Master Contract Number 20588.
c. A narrative explanation, as it relates to the statement quoted below, that further expands on the site-specific reasons for the increase in cost requested by Parsons and the reasons by the Company agreed to the cost increases.
i. "As has been the case with Parsons to-date, their initial price is low but their final price to perform the work steadily increases as the time and difficulty it takes to perform the work increases."
d. A narrative explanation for why the Company did not anticipate change order claims from Trans-Ash when evaluating the prices for the same scope of work and justifying the recommendation to terminate the contract with Parsons and proceed with Trans-Ash.
e. A narrative explanation of the actions taken by the Company to enforce the performance and financial security contract terms for the agreed upon scope of work with Parsons.
f. Please indicate whether the Company requested a variance from DEQ to the regulatory deadline for the Dan River excavation and closure.
i. If yes, please provide a copy of the request and the response from the regulator.
ii. If no, please explain why.

CONFIDENTIAL DEC NCPS 112-13 (a) (Cor

Response:

1ai: Contract with Parsons was for:

• 1,235,000 cubic yards (CY) in Primary and Secondary Basin (Sequence 1)
• 105,000 CY of ash in and under the Intermediate Dike (Sequence 2)
• 385,000 CY of Ash Stack 2 (Sequence 3)
• 400,000 CY of Dam Decommissioning soil (Sequence 4)

Parsons actually excavated and placed:
• 825,146 CY of Sequence 1 ash in the landfill
• 0 CY of Sequence 2
• 14,950 CY of Sequence 3 ash in the landfill.
• 28,193 CY of Dam Decommissioning (Sequence 4) soil placed in stockpile

Trans-Ash was contracted for:
• 700,000 CY in Primary and Secondary Basin (Sequence 1)
• 105,000 CY of ash in and under the Intermediate Dike (Sequence 2)
• 380,000 CY of Ash Stack 2 (Sequence 3)
• 400,000 CY of Dam Decommissioning soil (Sequence 4)
Trans-Ash actually excavated and placed to-date:
• 695,457 CY of Sequence 1 ash in the landfill
• 66,180 CY of Sequence 2
• 379,785 CY of Sequence 3 ash in the landfill.
• 231,653 CY (as of 12/31/2019) of Dam Decommissioning (Sequence 4) soil placed in stockpile

Sequence 1 & 2 (Basin Ash) actual vs. original estimate
1,586,783 CY vs. 1,340,000 CY = 246,783 CY more than estimated

Sequence 3 (Ash Stack 2) actual vs. original estimate
394,735 vs. 385,000 CY = 9,785 CY more than estimated

1aii: Following additional borings and test digs in September 2018, the CCR inventory of the Primary Basin was increased by 552,000 tons (460,000 CY as placed in the landfill) due to quantifying CCR material under the vertical expansion embankment soil, incorporating revised bottom of ash floor grades, and including estimated soil waste. Upon excavating the area of the Primary Basin in April 2019 where an old creek bed ran through the property prior to construction, it was discovered that what appeared to be ash when saturated was actually organic soil which did not contain CCR and did not

need to be excavated. The northeast corner of the Secondary Basin also required less ash to be excavated than what was estimated in September 2018.

1a.iii: N/A. See calculations provided above.

1b: Maximo Purchase Order 5067043 was issued pursuant to the terms of Maximo Master Contract Number 20588. As defined in Maximo Purchase Order 5067043 Exhibit B item 6 (page 17) "The Excavation rate price per cubic yard should be an inclusive rate for all project operations." As such, weather impacts to productivity are not reimbursable. Exhibit B item 5.2 (page 19) and Exhibit B item 8.1.2 (page 19) specified that the contractor was responsible for maintaining the schedule and providing a plan for recovering schedule in the event their productivity falls behind plan. Paragraph 12 of Maximo Contract 20588 states that "The affected Party must exercise all reasonable efforts to overcome and mitigate the effects of any force majeure event at its own cost…".

1c: From the initial issuance of Purchase Order 5067043 on March 15, 2017 to mid-August 2018, thirteen PO revisions were issued in response to 25 project change requests (PCRs) over a period of 17 months. Two of the PO revisions were caused by dewatering delays related to additional water treatment requirements and one PO revision was due to permitting delays. The balance of these PO revisions were for additional scopes of work not defined in the contract. The referenced statement is a general characterization based on multiple unapproved PCR's submitted by Parsons.

1d As stated in the referenced contractor change whitepaper
• Trans-Ash had demonstrated experience processing saturated material at Sutton and had been predictable in their ability move ash, particularly saturated dredged ash to the landfill despite challenging rain events in 2018
• Trans-Ash had experience working through two winters at Dan River and their lower production forecast in the winter months took this into account
1e: In accordance with the contract, Duke requested recovery plans from Parsons beginning in March 2018. At the beginning of May 2018, the company escalated the production shortfall recovery effort to Parsons' executive leadership. Beginning on May 29, 2018 daily production calls were held with Duke and Parsons senior management. To assist Parsons in developing their recovery plan, the Company allowed Parsons site leadership team to visit the Sutton ash excavation site. Company leadership from the Sutton and Riverbend ash excavation projects came to Dan River and provided means-and-methods details of their operations to Parsons site leadership. The Company collaboratively worked with Parsons to create a Stockpile Management Plan as well as a Landfill Weather Resistance Plan. On August 20, 2018 the Company formally informed

Parsons that immediate improvement must be demonstrated or the Company would be forced to consider all options under the Master Contract (see attached 2018-08-20 Parsons Letter Dan River.pdf) Several face-to-face meetings with Parsons executive leadership were held to understand Parsons recovery plan and the associated costs prior to terminating the contract with Parsons.

1f.i. and 1f.ii: The Company did not request a variance from NCDEQ to the regulatory deadline because the scheduled completion date of May 31, 2019 had sufficient margin for regulatory compliance.

2018-08-20 Parsons Letter Dan River.pdf

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Exhibit 20

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