NCDENR
North Carolina Department of Environment and Natural Resources
Division of Energy, Mineral and Land Resources
Land Quality Section

Tracy E. Davis, PE, CPM
Director

Pat McCrory, Governor
John E. Skvarla, III, Secretary

NOTICE OF INSPECTION

Date: March 11, 2014

Duke Energy Corporation
Attention: Sean DeNeale
526 South Church Street, ECI-013
Charlotte, North Carolina 28202

RE: Riverbend Ash Basin Dam 2 (Secondary)
GASTO-098 – High Hazard Potential
Gaston County

Dear Mr. DeNeale:

The "Dam Safety Law of 1967," as amended, provides for the certification and inspection of dams in the interest of public health, safety, and welfare, in order to reduce the risk of failure of such dams; to prevent injuries to persons, damage to property; and to insure the maintenance of stream flows.

Our records indicate that you are the owner and/or responsible for the referenced dam, which is located off NC HWY 16 in Gaston County and were inspected on February 19, 2014 and March 1, 2014 by personnel of the Land Quality Section. This inspection revealed the conditions outlined below. Please note that references to "right" and "left" in descriptions of the dam structure are referenced while looking in the downstream direction.

1. The overland drainage patterns appear to be creating surface erosion in two rip rap-lined areas on the downstream slope. (Refer to Coordinates 35° 22' 09.70", -80° 57' 36.60" and 35° 22' 09.20, -80° 57' 36.34). It is recommended that you monitor this area periodically, and notify this office of any sudden changes. It is also recommended that you provide measures to arrest the surface erosion in the area. Please be advised that the Division of Energy, Mineral and Land Resources must approve any repair requiring excavation, modification, or major repair work to this dam before the work commences.

2. Standing water and saturated soils were observed at various points along the bench on the downstream slope. It is recommended that plant personnel continue to monitor these areas periodically to confirm wetness on

the benches corresponds with rainfall patterns, and report any changes in the extent of wetness or seepage quantity to this office.

3. Wetness with active seepage flow was observed along the downstream toe of the eastern section of the main embankment and at the low point of the dam toe on the northern section of the embankment. It is recommended that plant personnel continue to monitor these areas periodically, and report any changes in the extent of wetness or seepage quantity to this office.

4. Cracks were observed in the concrete-lined spillway channel immediately downstream of the principal spillway outlet and the concrete outlet headwall. Surface erosion was observed left of the outlet wing wall. The outlet area should be routinely inspected for additional cracking and for signs of undermining of the discharge channel. Existing surface erosion should be repaired.

Additionally, the following general maintenance procedures are recommended:

1. Maintain a ground cover sufficient to restrain accelerated erosion on all earthen portions of the structure.

2. Periodically remove undergrowth, woody vegetation, and trees less than six inches in diameter from the slopes and crest of the dam and establish a good grass cover. All limb debris should be removed as well. This will serve to:

   a. prevent the formation of a root system which might significantly increase seepage through the dam which could ultimately result in failure of the structure;

   b. reduce the possibility of damage to the dam due to the uprooting of trees by wind or other natural causes; and

   c. facilitate ease of inspection and increase the likelihood of early detection of more serious problems connected with the dam.

   Additional information on the problems associated with undesirable vegetation on dams can be found in free publications such as FEMA 534, *Impacts of Plants on Earthen Dams*. This document can be viewed online at http://www.damsafety.org/media/Documents/PDF/fema-534.pdf.

3. Periodically check the operation of all drain valve facilities. This will ensure satisfactory operation of the drains should an emergency situation arise.

4. Periodically monitor the subject dam and appurtenant works with respect to elements affecting its safety. This is in light of the legal duties, obligations, and liabilities arising from the ownership and/or operation of a dam.

During this inspection we also investigated the potential for property damage and loss of life in the event that your dam fails. This investigation determined that failure of your dam could result in significant environmental damage

to Mountain Island Lake and possible interruption of utility service. Therefore, we are listing your dam in the "High Hazard Potential" Note that all hazard classifications are subject to change due to downstream conditions.

Please be advised that the Division of Energy, Mineral and Land Resources must approve any excavation, modification, or major repair work to this dam before the work commences. Also, note that this dam may not be breached, meaning the dam may not be drained by cutting a notch in the dam, without prior engineered breach plans being submitted to and approved by the Division of Energy, Mineral and Land Resources.

The "Dam Operation Maintenance and Inspection Manual" published by this Division provides inspection guidelines and recommended routine dam maintenance activities for the owner as well as emergency procedures in the event of possible dam failure. This document may be viewed online at http://portal.ncdenr.org/web/lr/dams.

Although every reasonable effort is made to determine the safety of each dam, our resources generally limit us to a surficial inspection of the dam and its appurtenant structures. This letter carries no implication regarding the internal stability of the dam. Dams, and especially their spillways and conduits, deteriorate with age. You are therefore advised to keep a close watch on the dam and notify us if you detect any changes, especially cracks, ground movements, or changes in seepage rate or color.

Please notify this office in writing if you wish to assert that you have no ownership or otherwise are not responsible for maintenance or repairs to the subject dam. If you have an emergency situation during non-office hours, you should notify 911 and the State Emergency Operations Center at 1 (800) 858-0368. They will notify the appropriate personnel in this Office of the situation.

Your cooperation and consideration in maintaining a safe dam is appreciated. Should you have any questions concerning our inspection, please contact me at (704) 663-1699.

Sincerely,

Zahid S. Khan

Zahid S. Khan, CPM, CPESC, CPSWQ
Regional Engineer
Land Quality Section

THE/cys

cc: Steven M. McEvoy, PE, State Dam Safety Engineer

DAM SAFETY INSPECTION REPORT

NAME	COUNTY	NO.	INSPECTED BY	DATE
RIVERBEND ASH BASIN DAM 2 (SECONDARY)	GASTON	098	Eplin, Kormanik, Broadway, Schweiber	2/19/2014

OWNER	ADDRESS	PHONE
DUKE ENERGY	See file	

TYPE DAM	TYPE INSPECTION	SITE CONDITIONS
☐ Concrete gravity ☐ Concrete arch ☒ Other ☒ Embankment ☐ Concrete buttress ☐ Stone masonary Ash Basin	☐ Initial ☐ Followup ☐ Other ☒ Periodic	☒ Wet ☐ Dry ☐ Snowcover ☐ Other

HAZARD DESCRIPTION	HAZARD CLASS
See file	☐ Low (A) ☐ Intermediate (B) ☒ High (C)

REMARKS
Donna Burrell, Alex Papp, Larry Baxley, Mike McAlister, Bob Drum, Alex Vogl, Scott Nordgen in attendance.
Heavy rains this morning, 70's Sunny

ACTION
- ☐ None
- ☒ Maintenance
- ☐ Monitoring
- ☐ Minor repair
- ☐ Engineering

RECOMMENDATIONS
- ☒ Inspection letter
- ☐ Deficiency letter
- ☐ RE notice
- ☐ Engineering study
- ☐ Inspection by RE
- ☐ Inspection by DSE
- ☐ Dam safety order
- ☐ Enforcement
- ☒ Periodic reinspection
- ☐ Other reinspection

AREA	PROBLEMS	COMMENTS
UPSTREAM SLOPE / FACE	☒ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Wave erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Sparse rip rap ☐ 11.Displaced rip rap ☐ 12.Cracks ☐ 13.Undermining ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Other	COVER: ☒ Vegetation ☐ Rip rap ☐ Concrete ☐ Asphalt ☐ Other
TOP OF DAM	☒ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Ruts ☐ 6.Livestock damage ☐ 7.Depressions ☐ 8.Unlevel ☐ 9.Misalignment ☐ 10.Has overtopped ☐ 11.Cracks ☐ 12.Spalling ☐ 13.Deteriorated joints ☐ 14.Displaced joints ☐ 15.Exposed reinforcement ☐ 16.Other	COVER: ☒ Vegetation ☐ Gravel ☐ Concrete ☐ Asphalt ☐ Other
DOWNSTREAM SLOPE / FACE	☐ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Wetness ☐ 11.Seepage ☐ 12.Boils ☐ 13.Cracks ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Other	COVER: ☒ Vegetation ☒ Rip rap ☐ Concrete ☐ Other 4) Small suspected mole burrows in D/S slope 2-3" deep mower ruts + slight surface erosion in several areas + toe contact ↓ wetness in toe northern section - in rip rap
TOP CONTACT	☐ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Wetness ☐ 11.Seepage ☐ 12.Boils ☐ 13.Cracks ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Undermining ☐ 20.Other	COVER: ☒ Vegetation ☒ Rip rap ☐ Concrete ☐ Other Several areas of active seepage in traditional locations and along entire toe of slope. Clear flow observed - Heavy rains this morning contributed to wetness observed. 2 depressions in rip rap along toe near D/S toe, left corner main area. coordinates attached monitoring recommended ~ 1ft - seepage not observed in these areas

AREA	PROBLEMS		COMMENTS
ABUTMENT CONTACTS	☒ 1.None	☐ 11.Seepage	COVER: ☒ Vegetation ☐ Rip rap ☐ Concrete ☐ Other
	☐ 2.Trees	☐ 12.Boils	
	☐ 3.High bushes	☐ 13.Cracks	
	☐ 4.Burrows	☐ 14.Holes	
	☐ 5.Erosion	☐ 15.Spalling	
	☐ 6.Livestock damage	☐ 16.Displaced joints	
	☐ 7.Slides	☐ 17.Deteriorated joints	
	☐ 8.Depressions	☐ 18.Exposed reinforcement	
	☐ 9.Bulges	☐ 19.Undermining	
	☐ 10.Wetness	☐ 20.Other	
PRINCIPAL SPILLWAY	☐ 1.None	☐ 11.Joint displacement	TYPE/SIZE: Concrete riser / CMP barrel.
	☐ 2.No trashguard	☐ 12.Undermined	erosion under flume outfall r left side of wingwall, minor cracks in concrete headwall cabove discharge pipe, Continue to monitor
	☐ 3.Obstructed	☐ 13.Voids	
	☐ 4.Plugged	☐ 14.Erosion	
	☐ 5.Rusted	☐ 15.Holes	
	☐ 6.Damaged	☐ 16.Conduit collasped	
	☐ 7.Gates leaking	☐ 17.Spalling	
	☐ 8.Joints leaking	☐ 18.Outlet undercutting	
	☐ 9.Cracks	☐ 19.Misalignment	
	☐ 10.Joint deterioration	☐ 20.Other	transverse cracks above flume, historical
EMERGENCY SPILLWAY	☐ 1.None	☐ 11.Joint displacement	TYPE/SIZE: None
	☐ 2.No ES	☐ 12.Undermining	
	☐ 3.Same as PS	☐ 13.Voids	
	☐ 4.Obstructed	☐ 14.Holes	
	☐ 5.Erosion	☐ 15.Exposed reinforcement	
	☐ 6.Displaced rip rap	☐ 16.Spalling	
	☐ 7.Sparse rip rap	☐ 17.Outlet erosion	
	☐ 8.Joints leaking	☐ 18.Misalignment	
	☐ 9.Cracks	☐ 19.Inadequate capacity	
	☐ 10.Joint deterioration	☐ 20.Other	
DRAINS / OTHER OUTLETS	☐ 1.None		TYPE: None observed
	☐ 2.No bottom drain		
	☐ 3.Bottom drain inoperable		
	☐ 4.Subsurface drain dry		
	☐ 5.Subsurface drain muddy flow		
	☐ 6.Subsurface drain obstructed		
	☐ 7.No animal guard		
	☐ 8.Other		

SKETCHES/COMMENTS

DAM SAFETY INSPECTION REPORT

NAME	COUNTY	NO.	INSPECTED BY	DATE
RIVERBEND ASH BASIN 2 (SECONDARY)	GASTON	098	EPLIN, KORNANIK	3/1/2014
OWNER	**ADDRESS**			**PHONE**
See file				

TYPE DAM: ☐ Concrete gravity ☐ Concrete arch ☐ Other ☒ Embankment ☐ Concrete buttress ☐ Stone masonary — Ash Basin

TYPE INSPECTION: ☐ Initial ☒ Follow-up ☐ Periodic ☐ Other

SITE CONDITIONS: ☐ Dry ☐ Spillway ☒ Wet ☐ Other

HAZARD DESCRIPTION: See file

HAZARD CLASS: ☐ Low (A) ☐ Intermediate (B) ☒ High (C)

REMARKS: Follow-up for outfall characterization
Tim Russell, Donna Burrell + Bob Drum in attendance

ACTION: ☐ None ☐ Maintenance ☐ Monitoring ☐ Minor repair ☐ Engineering

RECOMMENDATIONS: ☐ Inspection letter ☐ Deficiency letter ☐ RE notice ☐ Engineering study ☐ Inspection by RE ☐ Inspection by DSE ☐ Dam safety order ☐ Enforcement ☐ Periodic reinspection ☐ Other reinspection

UPSTREAM SLOPE / FACE

PROBLEMS:
☐ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Wave erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Sparse rip rap ☐ 11.Displaced rip rap ☐ 12.Cracks ☐ 13.Undermining ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Other

COMMENTS:
COVER: ☐ Vegetation ☐ Rip rap ☐ Concrete ☐ Asphalt ☐ Other

DNI

TOP OF DAM

PROBLEMS:
☐ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Ruts ☐ 6.Livestock damage ☐ 7.Depressions ☐ 8.Unlevel ☐ 9.Misalignment ☐ 10.Has overtopped ☐ 11.Cracks ☐ 12.Spalling ☐ 13.Deteriorated joints ☐ 14.Displaced joints ☐ 15.Exposed reinforcement ☐ 16.Other

COMMENTS:
COVER: ☐ Vegetation ☐ Gravel ☐ Concrete ☐ Asphalt ☐ Other

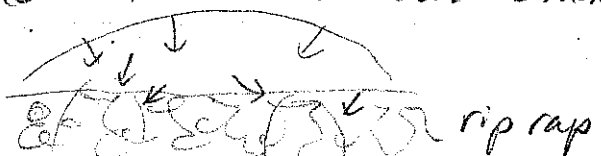
DNI

DOWNSTREAM SLOPE / FACE

PROBLEMS:
☐ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Wetness ☐ 11.Seepage ☐ 12.Boils ☐ 13.Cracks ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Other

COMMENTS:
COVER: ☐ Vegetation ☐ Rip rap ☐ Concrete ☐ Other

2 areas of depression noted in 2/19/2014 inspection. No wetness observed in the area, erosion (surface) observed. Should be monitored



TOE CONTACT

PROBLEMS:
☐ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Wetness ☐ 11.Seepage ☐ 12.Boils ☐ 13.Cracks ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Undermining ☐ 20.Other

COMMENTS:
COVER: ☐ Vegetation ☐ Rip rap ☐ Concrete ☐ Other

DNI

AREA	PROBLEMS	COMMENTS
ABUTMENT CONTACTS	☐ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Wetness ☐ 11.Seepage ☐ 12.Boils ☐ 13.Cracks ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Undermining ☐ 20.Other	COVER: ☐ Vegetation ☐ Rip rap ☐ Concrete ☐ Other DNI
PRINCIPAL SPILLWAY	☐ 1.None ☐ 2.No trashguard ☐ 3.Obstructed ☐ 4.Plugged ☐ 5.Rusted ☐ 6.Damaged ☐ 7.Gates leaking ☐ 8.Joints leaking ☐ 9.Cracks ☐ 10.Joint deterioration ☐ 11.Joint displacement ☐ 12.Undermined ☐ 13.Voids ☐ 14.Erosion ☐ 15.Holes ☐ 16.Conduit collasped ☐ 17.Spalling ☐ 18.Outlet undercutting ☐ 19.Misalignment ☐ 20.Other	TYPE/SIZE: Cast in place concrete riser with 30" CMP barrel DNI
EMERGENCY SPILLWAY	☐ 1.None ☐ 2.No ES ☐ 3.Same as PS ☐ 4.Obstructed ☐ 5.Erosion ☐ 6.Displaced rip rap ☐ 7.Sparse rip rap ☐ 8.Joints leaking ☐ 9.Cracks ☐ 10.Joint deterioration ☐ 11.Joint displacement ☐ 12.Undermining ☐ 13.Voids ☐ 14.Holes ☐ 15.Exposed reinforcement ☐ 16.Spalling ☐ 17.Outlet erosion ☐ 18.Misalignment ☐ 19.Inadequate capacity ☐ 20.Other	TYPE/SIZE: Same as ↗ DNI
DRAINS / OTHER OUTLETS	☐ 1.None ☐ 2.No bottom drain ☐ 3.Bottom drain inoperable ☐ 4.Subsurface drain dry ☐ 5.Subsurface drain muddy flow ☐ 6.Subsurface drain obstructed ☐ 7.No animal guard ☐ 8.Other	TYPE: DNI

SKETCHES/COMMENTS