



**PLAN FOR IDENTIFICATION
OF NEW DISCHARGES
FOR
ASHEVILLE STEAM ELECTRIC PLANT
200 CP&L DRIVE
ARDEN, NORTH CAROLINA 28704
NPDES PERMIT #NC0000396**

PREPARED FOR

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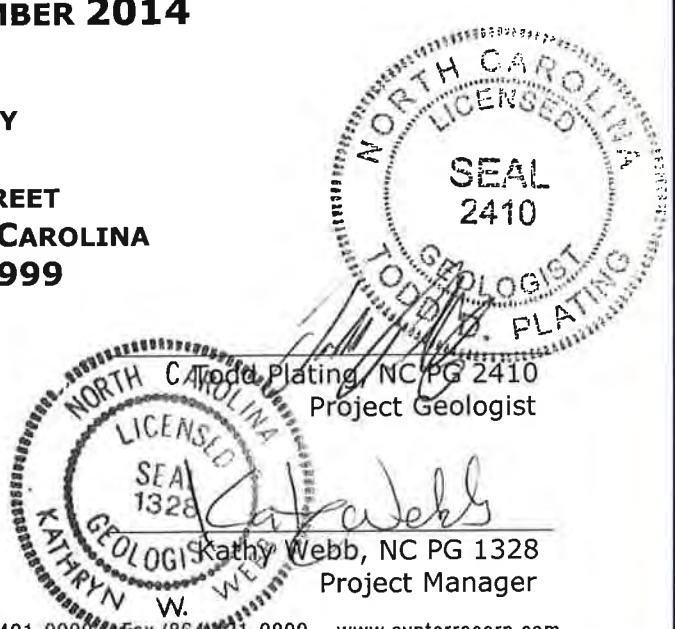


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1.0 INTRODUCTION

The purpose of this document is to address the requirements of North Carolina General Statute (GS)130A-309.210 (d) *Identification and assessment of discharges; correction of unpermitted discharges*, as modified by North Carolina Senate Bill 729, for the Asheville Steam Electric Plant ash basin operated under National Pollution Discharge Elimination System (NPDES) Permit NC0000396.

The following requirements are contained in General statute 130A-309.210:

- d) *Identification of New Discharges. – No later than October 1, 2014, the owner of a coal combustion residuals surface impoundment shall submit a proposed Plan for the Identification of New Discharges to the Department for its review and approval as provided in this subsection.*
 - (1) *The proposed Plan for the Identification of New Discharges shall include, at a minimum, all of the following:*
 - a. *A procedure for routine inspection of the coal combustion residuals surface impoundment to identify indicators of potential new discharges, including toe drain outfalls, seeps, and weeps.*
 - b. *A procedure for determining whether a new discharge is actually present.*
 - c. *A procedure for notifying the Department when a new discharge is confirmed.*
 - d. *Any other information related to the identification of new discharges required by the Department.*
 - (2) *The Department shall approve the Plan for the Identification of New Discharges if it determines that the Plan complies with the requirements of this subsection and will be sufficient to protect public health, safety, and welfare; the environment; and natural resources.*
 - (3) *No later than 30 days from the approval of the Plan for the Identification of New Discharges, the owner shall begin implementation of the Plan in accordance with the Plan.*

The North Carolina Senate Bill 729 establishes the submittal date of this Plan for Identification of New Discharges no later than October 1, 2014.

This bill also modified GS 130A to establish the following submittals that are related to this Plan. GS130A-309.210(a) was modified to require:

(2) *No later than December 31, 2014, the owner of a coal combustion residuals surface impoundment shall submit a topographic map that identifies the location of all (i) outfalls from engineered channels designed or improved for the purpose of collecting water from the toe of the impoundment and (ii) seeps and weeps discharging from the impoundment that are not captured by engineered channels designed or improved for the purpose of collecting water from the toe of the impoundment to the Department. The topographic map shall comply with all of the following:*

- a. *Be at a scale as required by the Department.*
- b. *Specify the latitude and longitude of each toe drain outfall, seep, and weep.*
- c. *Specify whether the discharge from each toe drain outfall, seep, and weep is continuous or intermittent.*
- d. *Provide an average flow measurement of the discharge from each toe drain outfall, seep, and weep including a description of the method used to measure average flow.*
- e. *Specify whether the discharge from each toe drain outfall, seep, and weep identified reaches the surface waters of the State. If the discharge from a toe drain outfall, seep, or weep reaches the surface waters of the State, the map shall specify the latitude and longitude of where the discharge reaches the surface waters of the State.*
- f. *Include any other information related to the topographic map required by the Department.*

The inspection procedures presented in this plan, developed to satisfy the requirements of GS130A-309.210(d), will be used as the basis for developing the topographic map required by GS130A-309.210(a)(2).

2.0 SITE DESCRIPTION

2.1 Plant Description

Duke Energy Progress, Inc. (Duke Energy) owns and operates the Asheville Plant which began commercial operation in the 1960s, with additions in the 1990s and around 2000, and consists of two coal-fired units that primarily use bituminous coal. Additionally, the Plant also has two combustion turbines. Ash generated from coal combustion has been stored on-site in the ash basins and is also used as beneficial fill at the nearby Asheville Airport. The on-site ash basins are encircled within the waste boundary and 500-foot compliance boundary shown on **Figure 1**.

Lake Julian was built for cooling water by damming the flow of Powell Creek on the north side of the plant. A large portion of Lake Julian borders the east side of the plant site. Surface water from the French Broad River is also pumped into Lake Julian as a supplemental water supply. The water from the French Broad River enters a stilling area of the lake on the north side of the plant. Heated water is discharged back into Lake Julian to the east of the plant. The French Broad River borders the west side of the property and flows south to north. Powell Creek also flows south to north prior to formation of Lake Julian. Powell Creek flows east to west from the Lake Julian Dam to the French Broad River.

2.2 Ash Basin Description

The plant and ash basins are located on the east side of I-26 and the French Broad River. The current configuration of the ash basins is shown on **Figure 2**. The ash management area consists of:

- The original 1964 ash basin, built during plant construction and expanded in the 1970s, is now overlain with wastewater treatment wetlands. The treatment wetlands basins are lined.
- The 1964 ash basin was replaced with a second ash basin, built in approximately 1982, located to the south of the 1964 ash basin.
- The 1982 ash basin is being dewatered and excavated. The ash is being transported to the Asheville Airport for structural fill. New ash is being generated daily and is being dewatered in concrete lined basins located on a portion of the 1964 ash basin.

The ash basin system is an integral part of the plant's wastewater treatment system which receives inflows from ash transport water, coal pile runoff, storm water runoff, and various low volume wastes. The treated wastewater is permitted to discharge to

the French Broad River via permitted Outfall 001. The 500 foot compliance boundary circles the ash management area (**Figure 2**).

The discharge from the ash basins are permitted by the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Resources (DWR) under the National Pollution Discharge Elimination System (NPDES) Permit NC0000396.

3.0 SITE GEOLOGY AND HYDROGEOLOGY

3.1 Site Geologic/Soil Framework

The Asheville Plant is located in the Piedmont Mountain region of North Carolina as described by LeGrand (2004). The geology across the site varies from mica gneiss and garnet mica schist in the upland areas (east of I-26) to alluvium along the French Broad River floodplain (west of I-26).

In general, the regional geology consists of overburden, also referred to as regolith, and metamorphic bedrock. In stream valleys, fluvial deposits, also referred to as alluvium, overlie the bedrock. The metamorphic rock, primarily schist and gneiss, tends to be exposed on the ground surface along topographic ridges, road cuts, and in stream or river valleys. Where the metamorphic bedrock has been weathered into unconsolidated material, silt, sand and clay are found overlying the bedrock. The two layers, regolith/saprolite or alluvium, and consolidated bedrock form the basic framework of the groundwater system. The transition zone between the regolith and consolidated bedrock can be a significant hydrogeologic feature in the system.

The regolith tends to be composed of a shallow soil zone where the relict structure of the original bedrock material is no longer present. The soil zone transitions downward into saprolite, which is still unconsolidated material, but has the visual texture of the parent bedrock. Saprolite is generally composed of silt, sand, and clay with a porosity ranging from 35 to 55 percent, making it a storage reservoir for groundwater with good natural attenuation characteristics. Where the thickness of saprolite is thin, or it is not present, the saturated zone may be entirely in fractured bedrock. The consolidated nature of the bedrock limits the presence and transport of groundwater to fractures interconnected with the ground surface or the overlying regolith. In areas where the saprolite to competent bedrock is gradual, the slightly weathered rock referred to as the 'transition zone' can be a significant zone of groundwater transport.

3.2 Site Hydrogeologic Framework

The geology at the depth of the water table (the screened interval for most of the site compliance boundary wells) varies across the site from being within the regolith (within the saprolite), the transition zone between saprolite and competent bedrock, within the upper bedrock, or within floodplain alluvial deposits.

The topography of the water table (the depth to the saturated aquifer) tends to mirror the ground surface topography. Topographic ridges and stream valleys, or topographic lows between ridges create groundwater divides. The groundwater flow will follow the

surface topography until the water table intersects the ground surface in a spring, seep or stream.

As discussed by LeGrand (2004), the French Broad River and its tributaries are groundwater discharge zones for the saprolite and bedrock aquifer at the site. The French Broad River creates a hydrogeologic boundary to the west of the plant site. The Powell Creek drainage feature creates a hydrogeologic boundary to the north side of the site. The unnamed tributary located along the southern property line creates a hydrogeologic boundary to the south of the site. Lake Julian is located upgradient of the ash management area and it, along with the Powell Creek drainage basin, form the eastern hydraulic boundary of the site.

As further discussed by LeGrand (2004), groundwater moves continuously toward streams where it discharges in small springs or seeps in draws or topographic depressions. The path of groundwater is restricted by topography. Groundwater rarely passes beneath a perennial stream to another groundwater flow system. Thus the concept of local slope aquifer systems, or compartments, applies to the regional geologic setting of the site. The high crests of the water table (recharge zones) represent natural groundwater divides as do the low lying stream discharge zones. These localized hydrogeologic flow system compartments tend to keep potential contaminant migration within the flow compartment from which it originates. It is possible, although unusual, that isolated bedrock fractures that receive recharge from one slope aquifer compartment could extend beneath a boundary stream and intercept a fracture serving a well in a neighboring slope aquifer compartment. This can occur when a pumping well pulls the groundwater beyond its natural discharge zone.

4.0 IDENTIFICATION OF NEW DISCHARGES

4.1 Purpose of Inspection

The purpose of the inspection is to identify new discharges and indicators of potential new discharges, including toe drain outfalls, seeps, and weeps associated with the coal combustion residuals surface impoundment (ash basins).

4.2 Seepage

Seepage is considered to be the movement of wastewater from the ash basin through the ash basin embankment, the embankment foundation, the embankment abutments, or through residual material in areas adjacent to the ash basin. A seep is defined in this document as an expression of seepage at the ground surface. A weep is understood to have the same meaning as a seep.

Indicators of seepage include areas where water is observed on the ground surface and/or where vegetation suggests the presence of seepage. Seepage can emerge anywhere on the downstream face, beyond the toe, or on the downstream abutments at elevations below normal pool. Seepage may vary in appearance from a "soft," wet area to a flowing "spring." Seepage may show up first as only an area where the vegetation is lusher and darker green than surrounding vegetation. Cattails, reeds, mosses, and other marsh vegetation often become established in a seepage area (NCDENR, 1985). However, in many instances, indicators of seeps do not necessarily indicate the presence of seeps.

4.3 Area To Be Inspected for New Discharges

The areas to be inspected are the areas of the site where water contained in or percolating through the ash basins might infiltrate into the underlying residual material and be expressed as seepage. The extent of the areas to be inspected was determined based on the generalized LeGrand conceptual model and the concept of the slope-aquifer system and the site topography. In this generalization, flow of water from the ash basins would be expected to be located within the slope-aquifer compartment and to be below the dam elevations. The areas to be inspected are shown on **Figure 2**.

4.4 Inspection Procedure

The inspection procedure for identification of new discharges and indicators of potential new discharges associated with the Asheville ash basin system is provided in Appendix A. In addition to the specific requirements for the inspection, Appendix A also provides the general requirements, the frequency of inspections, documentation requirements, and provides a decision flow chart for determining if the potential new discharge is associated with an ash basin.

5.0 REFERENCES

LeGrand, Harry E., Sr., 2004. "A Master Conceptual Model for Hydrogeological Site Characterization in the Piedmont and Mountain Region of North Carolina: A Guidance Manual". North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section.

NCDENR, "Dam Operation, Maintenance, and Inspection Manual", 1985 (Revised 2007).

FIGURES

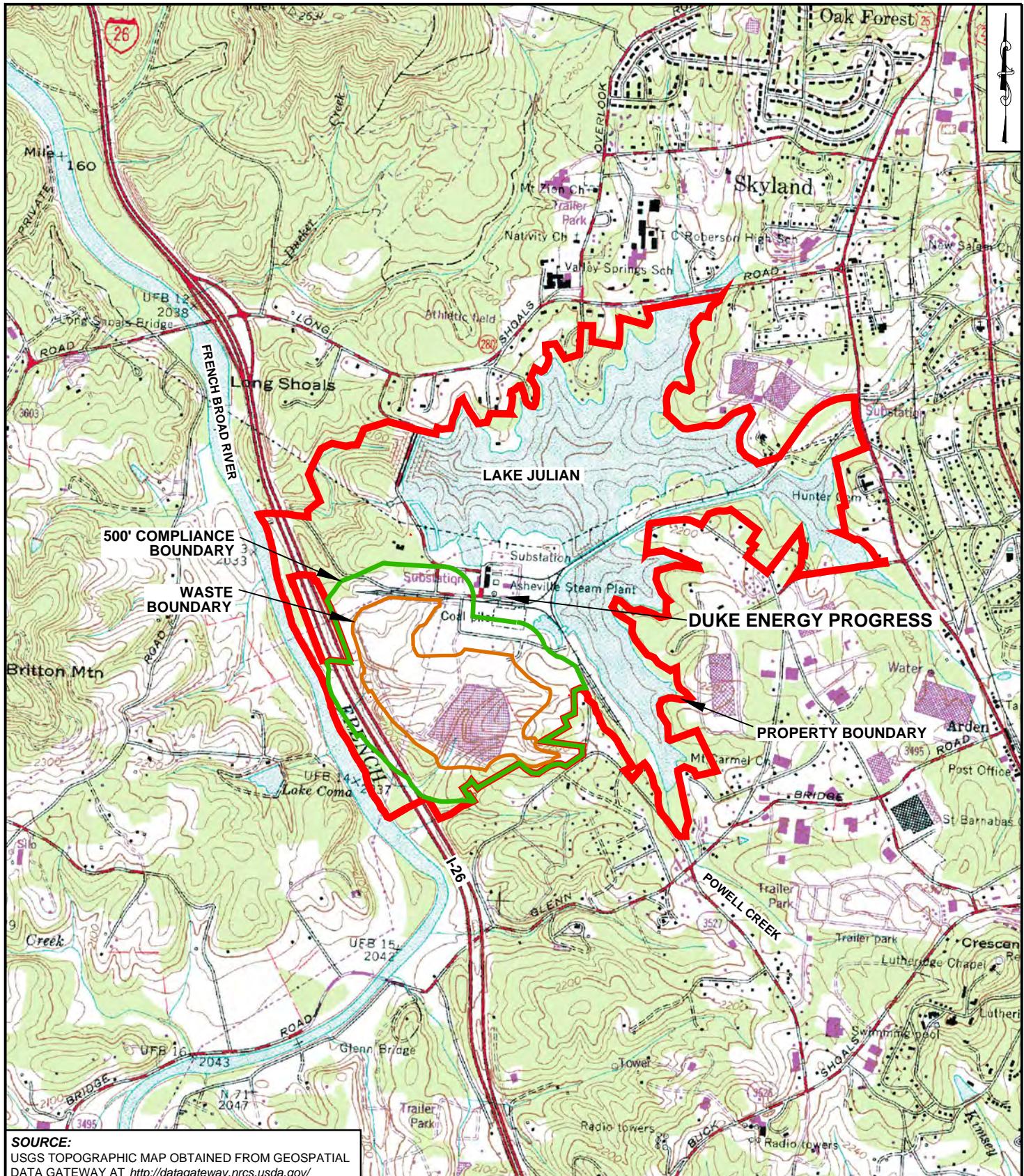


FIGURE 1
SITE LOCATION MAP
DUKE ENERGY PROGRESS
ASHEVILLE STEAM ELECTRIC PLANT
200 CP&L DRIVE
ARDEN, NORTH CAROLINA
SKYLAND NC QUADRANGLE





APPENDIX A

**Inspection for Identification of New
Discharges**

1. Purpose of Inspection

The purpose of the inspection is to identify new discharges and indicators of potential new discharges, including toe drain outfalls, seeps, and weeps that arise after the initial submittal of maps required by North Carolina General Statute 130A-309.210(a)(2)(ii). Seepage is considered to be the movement of wastewater from the ash basin through the ash basin embankment, the embankment foundation, the embankment abutments, or through residual material in areas adjacent to the ash basin. Therefore, a seep is defined in this document as an expression or occurrence of potential wastewater at the ground surface. A weep is understood to have the same meaning as a seep. If new discharges or indicators of potential new discharges are identified, the decision flow chart (see Figure A-1) will be used to determine if the potential new discharge is from the ash basin and if notification to the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Resources (DWR) is required.

2. General Inspection Requirements

- 2.1. Inspections are to be performed on areas that are below the ash basin full pond elevation and within the area shown on **Figure A-2**. The scope of the inspections includes identification of seeps from residual ground and outfalls from engineered channels.
- 2.2. If required, a larger scale figure showing the locations of outfalls from engineered channels will be developed. If a separate figure showing outfalls from engineered channels is not developed, **Figure A-2** will be revised to show these features.
- 2.3. Inspections of areas on or adjacent to the ash basin embankments should be performed within two months after mowing, if possible.
- 2.4. Inspections should not be performed if the following precipitation amounts have occurred in the respective time period preceding the planned inspection:
 - 2.4.1. Precipitation of 0.1 inches or greater within 72 hours, or
 - 2.4.2. Precipitation of 0.5 inches or greater within 96 hours.
- 2.5. Record most recent ash basin water surface elevation.
- 2.6. Review previous inspections for new discharges prior to performing inspection.
- 2.7. Review the most recent previous dam inspections.

- 2.8. Conduct an interview with the Site Environmental Coordinator prior to performing inspection to inquire about possible changes to site conditions, such as pond elevations, operations, additions or removal of wastewater discharges to the ash basin, changes to site surface water drainage, etc.

3. Frequency of Inspections

Inspections will be performed on a semi-annual basis during the first quarter of the year (January to March representative of seasonal high precipitation and while vegetation is dormant) and during the third quarter (July to September representative of seasonal low precipitation and vegetative growth).

4. Qualifications

The inspections shall be performed under the direction of a qualified Professional Engineer or Professional Geologist.

5. Documentation of Inspection

The inspection shall be documented by the individual performing the inspection. The report should contain observations and descriptions of the seeps observed, changes in observations compared to previous inspections, estimates of flows quantities, and photographs of seeps and outfalls of engineered channels designed or improved for collecting water from the impoundment. Photographs are to be numbered and captioned.

6. Initial Inspection

An initial inspection should be performed to identify features and document baseline conditions including location, extent (i.e., dimensions of affected area), and flow. Seep locations should be recorded using a Global Positioning System (GPS) device. Photographs should be taken from vantage points that can be replicated during subsequent semi-annual inspections.

7. Inspection For New Seeps at Outfalls From Engineered Outfalls

Inspect the outfalls from engineered channels designed and/or improved (such as through the placement of rip-rap) associated with the ash basin dikes to identify new seeps or indicators of new seeps.

- 7.1. Inspect all outfalls from engineered channels designed and/or improved (such as through the placement of rip-rap).

- 7.2. Document the condition of the outfall of the engineered channel with photographs.

Photographs are to be taken from a similar direction and scale as the original photographs taken during the initial inspection.

- 7.3. Observe outfall for seepage and for indicators of seeps.

- 7.4. Compare current seepage location, extent, and flow to seepage photographs and descriptions from previous inspections.

- 7.5. Record flow rate if measureable.

8. Inspection For New Seeps Not Captured by Engineered Channels

Inspect areas below the ash basin full pond elevation and within the boundary of the area to be inspected as shown on **Figure A-2** to identify new seeps or indicators of new seeps. Inspect topographic drainage features that potentially could contain new seeps that potentially discharge from the ash basin. Requirements for documentation of the inspection are found in Section 5.

8.1. Previously Identified Seeps

- a) Inspect previously identified seep locations. Document the condition of the seeps with a photograph. Photographs are to be taken from similar direction and at a similar scale as the original photograph documenting the seep. Describe the approximate dimensions and flow conditions of the seep.
- b) If measureable, record flow.
- c) Observe seep to determine if changes to location, extent, of flow are present. Document changes to location, extent, and/or flow amount or pattern.

8.2. New Seep or Indicators of Seep

- a) Mark the location of new seep or indicators of seep using a GPS device.
- b) Document the condition of the seeps or indicators of seeps with a photograph.
- c) Describe the approximate dimensions and flow conditions of the seep.
- d) Map the location of new seep or indicator of seep using GPS coordinate points collected during the site visit.

- e) If seep or indicator of seep was not caused by changes in surface water drainage and if the location is below the ash basin pond elevation, utilize the decision flow chart to determine if the seep represents a discharge from the ash basin and if notification to DWR is required.

9. Update Maps Identifying Seeps

If new seeps are identified during the inspection, **Figure A-2** shall be updated to show the location of the new seeps.

10. Decision Flow Chart

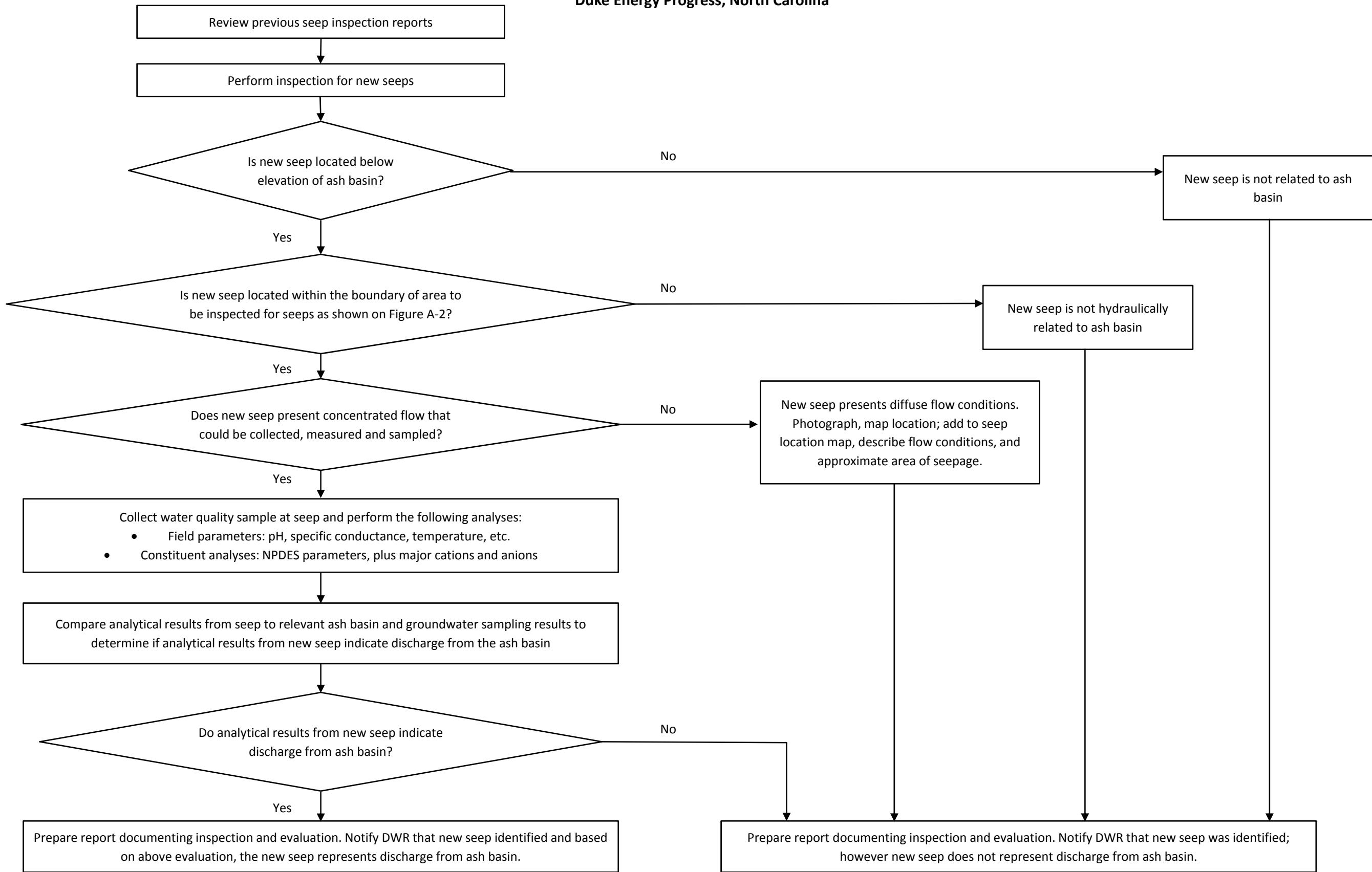
The decision flow chart developed to determine whether a new seep discharges from the ash basin is found in **Figure A-1**.

11. Procedure for Notifying NCDENR DWR If New Discharge Is Confirmed

If it is determined that a newly identified seep is present, Duke Energy will notify the DWR regional office by mail within 14 days after the determination.

Figure A-1 Decision Flow Chart for Determining If New Seep Represents Discharge From the Ash Basin Locations

Duke Energy Progress, North Carolina



Notes:

1. If no new seeps are identified, inspection will be documented however no notification to NCDENR DWR is required.
2. If new seeps are identified that do not represent discharge from the ash basin during the same inspection that identifies new seeps that do represent a discharge from the ash basin, a single report will be submitted to NCDENR DWR.

