

Permit No.	Scan Date	DIN
3612-INDUS-2008	March 4, 2014	20678

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RECEIVED
February 28, 2014
Solid Waste Section
Asheville Regional Office

February 28, 2014

Mr. Larry Frost
North Carolina Department of Environment and Natural Resources
Division of Waste Management, Solid Waste Section
2090 U.S. Highway 70
Swannanoa, NC 28778

Subject: Allen Steam Station
Retired Ash Basin (RAB) Ash Landfill (Permit No. 3612)
Corrective Action Response Plan

Dear Mr. Frost:

Duke Energy is in receipt of the NCDENR "Facility Compliance Inspection Report" summarizing inspections performed at the Allen RAB Ash Landfill on December 27, 2013 and January 13, 2014. Within the body of the inspection report, the State requests that

"Under consult from a licensed North Carolina professional engineer (P.E.) please develop a written plan addressing any design, operational, and/or maintenance changes necessary to control future storm water runoff at the landfill. The plan should include, but not limited to, stabilization of the landfill slopes and non-active areas; prevention of excessive on-site and off-site erosion, and the containment of ash within the landfill footprint."

As directed, the attached plan has been prepared under consult from a licensed North Carolina professional engineer and is being submitted within 30 days of receipt of the inspection report for your review and approval. Duke Energy is committed to environmental compliance and stewardship, and we take seriously the responsibility to operate all facilities safely and protective of the environment. We believe that our proposed plan addresses appropriate steps that will help ensure safe and environmentally protective operation and maintenance of the Allen RAB Ash Landfill. If you would like to discuss further the proposed corrective action plan or to visit the Allen RAB Ash Landfill, please let Duke Energy know.

If there are any questions regarding this report, please contact me at (704) 382-4761.

Sincerely,

Sean DeNeale, Engineer II
Environmental Services

Electronic cc: Mr. Don Scruggs – Allen Steam Station
Mr. Ed Sullivan – Duke Energy Corporation
Mrs. Kim Hutchinson – Duke Energy Corporation
Mr. Tim Russell – Duke Energy Corporation

Mr. Jeff Newell – Duke Energy Corporation
Mr. Jason Reeves – S&ME, Inc.
Mr. Kyle Baucom – S&ME, Inc.
Mr. Norman Divers – Charah



February 28, 2014

Duke Energy
P.O. Box 1006, Mail Code: EC13K
Charlotte, North Carolina 28201-1006

Attention: Mr. Sean DeNeale
Sean.DeNeale@duke-energy.com
Engineer II – Waste Programs

Reference: Corrective Action Response – Site Erosion and Sedimentation Control Measures

Retired Ash Basin (RAB) – Ash Landfill (Solid Waste Permit No. 36-12)
Duke Energy - Allen Steam Station, Belmont, NC
S&ME Project No. 1356-10-009C, Task 4
North Carolina P.E. Firm License No. F-0176

Dear Mr. DeNeale:

As requested by Duke Energy, S&ME, Inc. (S&ME) prepared this letter and related information in response to the January 29, 2014 North Carolina Department of Environment and Natural Resources (NCDENR) “Facility Compliance Inspection Report”. We prepared this letter as requested by Mr. Sean DeNeale of Duke Energy.

The January 29, 2014 NCDENR “Facility Compliance Inspection Report” stated that the following corrective action must be made:

“Corrective action: Under consult from a licensed North Carolina professional engineer (P.E.) please develop a written plan addressing any design, operational, and/or maintenance changes necessary to control future storm water runoff at the landfill. The plan should include, but not limited to, stabilization of the landfill slopes and non-active areas; prevention of excessive on-site and off-site erosion, and the containment of ash within the landfill footprint. With 30-days of your receipt of this report, submit the proposed plan for review and approval.”

The subsequent sections of this letter explain the background of the project in further detail.

BACKGROUND

The Allen RAB Ash Landfill is being constructed over a retired ash basin at Duke Energy's Allen Steam Station. Phase 1 construction consists of the construction of Cells 1 and 2. The Cell 1 liner system was constructed, and a "Permit to Operate" (PTO) for Cell 1 (Solid Waste Permit No. 36-12) was issued by NCDENR Solid Waste Section on December 9, 2009.

Between July 2011 and October 2013, Cell 2A was the active face of the landfill, while Cell 1 was generally inactive. Cell 1 was left with the sump area and haul ramp exposed to aid in leachate and storm water management. The Cell 1 top deck consisted of fly ash covered with a dust suppressant in accordance with the Dust Control Plan in the Operations Plan.

Due to the future waste projections, an operating decision was made by Duke to temporarily close Cell 1. The fill progression plan and associated erosion and sediment control (E&SC) measures associated with the Cell 1 temporary closure were outlined on the "Fill Progression – Interim Closure Plans" prepared by Franklin S. Craig, P.E. Consulting Engineer dated October 11, 2013. The Cell 1 temporary closure was performed by the landfill operator, Charah, generally between November 2013 and January 2014.

The temporary closure of Cell 1 consisted of filling the sump area and haul ramp with waste material, crowning the top deck with waste material, and applying 12 inches of interim soil cover over the top deck and side slopes. Storm water from the top deck area is conveyed to channels adjacent to perimeter diversion berms located along the downstream edge of the top deck area. A series of rock checks are located along the length of these channels to slow storm water flows as they are conveyed to the four corners of Cell 1. Storm water from the top deck area is conveyed by the storm water channels to three (3) 18-inch diameter corrugated HDPE down drains each located at the northwest corner, southwest corner, and southeast corners of Cell 1. Riprap lined energy dissipaters are located at the outlet of the down drains which discharge into the ditches along the landfill perimeter.

The storm water flows in the northeast corner of Cell 1 are conveyed to a riprap lined channel located along the southern edge of the haul road.

As mentioned previously, the Cell 1 temporary closure was performed between November 2013 and January 2014. During this construction period, there were several significant rainfall events, which resulted in erosion through the temporary soil cover and into the underlying ash waste. These events occurred on December 23, 2013 and January 11, 2014, and they were reported to NCDENR within 24 hours of the potential ash release beyond the landfill waste boundary. Bill Wagner, Environmental Senior Specialist with NCDENR, performed site visits on December 27, 2013 and January 13, 2014 to observe the site conditions. His observations are described in detail in the January 29, 2014 NCDENR "Facility Compliance Inspection Report". The report stated

that there was no evidence of ash being transported beyond the landfill perimeter ditches and into the downstream sediment basin.

In addition, NCDENR, Duke, Charah, and S&ME representatives met on January 16, 2014 to discuss the recent events and perform site observations. As a result of the Cell 1 erosion and ash releases beyond the landfill waste boundary, NCDENR requested that a corrective action plan be prepared to reduce on-site and off-site erosion and the containment of ash within the landfill waste boundary.

RESPONSE PLAN

As requested in the NCDENR “Facility Compliance Inspection Report”, a written plan must be developed and submitted to NCDENR to address design, operational, and maintenance changes to provide stabilization, erosion control, and ash containment. As previously mentioned, there were several significant rainfall events during the bare soil construction conditions, which resulted in erosion through the temporary soil cover cap and into the underlying ash waste. Since these events occurred, the eroded areas were repaired, erosion and sediment control (E&SC) measures were restored and repaired, additional improvements were implemented, and Cell 1 was re-seeded and mulched with hydromulch. Cell 1 was re-seeded with a blend of temporary and permanent seed mix.

Until a good stand of permanent vegetation is established, which should ultimately reduce the risk of erosion, downstream sedimentation, and future ash release events, a stringent maintenance program will be implemented to observe and repair E&SC measures. In addition, E&SC measures, storm water conveyance measures, and operational changes will be implemented to reduce the potential for on-site and off-site sedimentation of the RAB landfill. These measures include proposed measures for the Cell 1 top deck and side slope stabilization and storm water conveyance, as well as the proposed operational changes. It should be noted that several proposed measures have already been implemented at the time of this letter submittal, while others will be implemented within 30 days (weather dependent) of the approval of this proposed plan. These measures are described in more detail in following sections of this letter.

CELL 1 INTERIM CLOSURE PROJECT – PROPOSED CORRECTIVE ACTIONS:

1. Inspections and Maintenance

- a. Daily contractor self-implemented inspections of Cell 1 until a minimum of 70% vegetation is established
- b. Weekly inspections (standard NCDENR requirement)
- c. Inspections after any rainfall event (NCDENR requirement is within 24 hours of a 0.5-inch rainfall or greater)
- d. Perform sediment removal, repairs, or reseeded upon any inspection deficiencies
- e. Increase mowing frequencies of Cell 1 for improved inspections (at least semi-annually)

- f. Increase Duke in-house E&SC inspections of Cell 1 until a minimum of 70% vegetation is established (at least monthly)
- g. Implement third-party landfill inspections (at least annually)

2. Top Deck

- a. Verify existing top deck grades are graded appropriately to the four corners of Cell 1
- b. Repair and maintain erosion rilling identified per the Operations Plan and by the on-going maintenance program
- c. Track top deck perpendicular to grades to provide surface roughening
- d. Re-seed (including both temporary and permanent seed mix) and provide temporary stabilization as determined by on-going maintenance program
 - i. If vegetation is not established with re-seeding, consider other methods to stabilize the top deck surface and prevent erosion, including the possible installation of additional soil cover thickness, erosion control matting, or scrim-reinforced polyethylene cover
- e. Install erosion control matting along top deck channels adjacent to diversion berms

3. Side Slopes

- a. Repair and maintain erosion rilling identified per the Operations Plan and by the on-going maintenance program
- b. Track side slopes perpendicular to slope to provide surface roughening
- c. Re-seed (including both temporary and permanent seed mix) and provide temporary stabilization as determined by on-going maintenance program
 - i. If vegetation is not established with re-seeding, consider other methods to stabilize the side slope surface and prevent erosion, including the possible installation of additional soil cover thickness, erosion control matting, or scrim-reinforced polyethylene cover

4. Downdrains

- a. Evaluate existing downdrains for up to the 100-year design storm for storm water conveyance from the top deck
- b. Install soil cover around exposed downdrains along the slopes
- c. Re-compact soils around existing downdrain inlets and ensure a minimum of 18 inches of soil cover over the top of downdrain inlets
- d. Add riprap and woven fabric protection at down drain inlets
- e. If the on-going maintenance program shows that additional protection is needed at the downdrain inlets, then additional inlet armoring options may consist of grouted riprap or a grout/concrete mud mat around the culvert inlets.
- f. If on-going maintenance program demonstrates the need, provide aggregate ring filter as pipe inlet protection

5. Future Planning

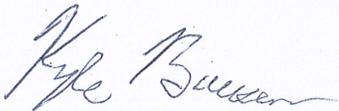
- a. Landfill operator will continue to work with owner and engineer to develop detailed work plan for transitioning projects describing all phases of the work, major project milestones, schedule, staffing, equipment, storm water management, contingencies, etc.
- b. NCDENR will continue to be informed of additional planned projects or major work when appropriate, including waste placement activity in Cell 1
- c. Owner and operator will continue to take extra precautions by planning in advance for transitional projects and/or extreme weather events, having the appropriate equipment, backup equipment, and material necessary for forecasted conditions

CLOSING

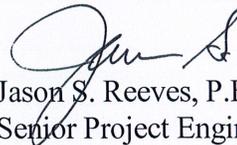
We appreciate the opportunity to continue to provide engineering services for the Allen RAB Ash Landfill. It is our opinion that the proposed maintenance program, additional E&SC measures, storm water conveyance measures, and operational changes address the concerns outlined by NCDENR for the site. Please contact us if you have any questions or need additional information.

Respectfully submitted,

S&ME, Inc.



Kyle Baucom, P.E.
Project Engineer



Jason S. Reeves, P.E.
Senior Project Engineer
N.C. Registration No. 24486



Cc: Sean DeNeale, Duke Energy
Jeff Newell, Duke Energy
Tim Russell, Duke Energy
Don Scruggs, Duke Energy
Norman Divers, Charah