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Solid Waste Section
Asheville Regional Office

MEMORANDUM

TO: Meeting Attendees

FROM: Kyle Baucom, Ken Daly

DATE: December 21, 2009

SUBJECT: **December 15, 2009 Discussion Item Summary**
Cell 1 Pre-Operations Meeting
Plant Allen Retired Ash Basin (RAB) Ash Landfill
Belmont, North Carolina
S&ME Project No. 1356-06-825 Phase 09

PRINCIPAL ATTENDEES

Duke Energy: Aaron Horne; Ted Manes; Tony Mathis; Jeff Newell; Don Scruggs; Andy Tinsley; Chris Ussery; James Wallace

NCDENR: Larry Frost; Ed Mussler

SEFA: Joe Thames; Daniel Woody

S&ME, Inc.: Kyle Baucom; Ken Daly

This discussion item summary is intended to provide a general summary of the subject meeting and to document decisions and action items. This discussion item summary is based on the notes and memory of the authors. This is not intended to be a rigorous and complete record of the meeting.

DISCUSSION ITEM SUMMARY:

1. **Introduction:** The meeting began at approximately 10:20 A.M., and parties introduced themselves and their involvement in the project. Duke Energy is the owner of the landfill. NCDENR is the permitting branch. SEFA is the operator of the landfill. S&ME is the design engineer.
2. **NCDENR Items:** Larry Frost began the meeting by addressing items that NCDENR wanted to cover prior to additional discussions concerning operations.
 - 2.1 He explained that a minimum 3 feet of soil cover (over the geosynthetics) should

- be placed at the entrance of the haul road into the landfill.
- 2.2 He explained that any sacrificial geomembrane over the leachate collection system laterals or sump area should be cut and peeled back or removed prior to operations. This needs to be documented and the documentation placed in the operating record.
 - 2.3 He explained that the proper signage should be in place with the permit number and acceptable waste for the landfill. Duke Energy personnel confirmed that two signs are in-place at the facility.
 - 2.4 He explained that spare parts and spare equipment for leachate management system (i.e. pumps) should be kept on-site, or be readily accessible, in case of equipment malfunction.
 - 2.5 He explained that leachate level alarms should be both audible and visual alarms.
 - 2.6 He explained that a maximum of 1 foot of liquid leachate head can be stored on the liner. In the event that this maximum is exceeded, C.T. Gerstell with the NCDENR Field Operations branch must be contacted within 24 hours. He noted that after business hours, the State Emergency Operations Center should be contacted (the phone number is in the Operations Plan Appendix I).
 - 2.7 He explained that an annual cleaning of leachate piping must be performed. He requested to be notified at the time of the first cleaning. He also explained that this should be documented and recorded in the operating record.
 - 2.8 He explained that the Permit to Operate was modified to correct references to the document identification numbers (Permit to Operate, Attachment 1). He noted that the up to date Permit to Operate may be obtained from the NCDENR website.
 - 2.9 Larry Frost noted a correction that needed to be made in the Operations Plan Section 3.3.1. The Operations Plan, section 3.3.1, last sentence references the “LCS sump controls...” and the reference should be to “LDS sump controls...”

3. Project Overview and Background

- 3.1 A meeting agenda (attached) and copies of the Operations Plan were distributed to the group. Ken Daly continued by explaining that Duke Energy, SEFA, and S&ME worked from the current meeting agenda during an earlier internal pre-operations meeting and had reviewed and discussed the agenda items and Operations Plan. For the sake of making effective use of participant’s limited time today, he proposed reviewing the major elements of the Operations Plan on the agenda.
- 3.2 In response to NCDENR considerations explained by Larry Frost, Ted Manes explained that the alarms are currently visual alarms only. Larry Frost explained that the audible alarm can be a localized audible alarm, loud enough to be noticed by someone driving by the control panel area. Ted Manes explained that the Cell 2 control panel installation is scheduled around February, and proposed to retrofit Cell 1 control panels to include an audible alarm and alarm test buttons at that time. Larry Frost explained that this would be acceptable.
- 3.3 The next item of discussion was the inspection/cleaning of leachate piping.

Larry Frost explained that the leachate piping should be flushed out with some type of high pressure water jet. He explained that any blockages in the piping should be observed with a camera to identify the source of blockage. Ed Mussler explained that NCDENR's reason for the cleanout and inspection requirement was due to problems at other North Carolina solid waste facilities. Ed Mussler noted that a request to reduce requirement for annual cleanout may be requested and would be considered and would be based on the demonstrated performance of the system from results of cleanout events.

- 3.4 Ted Manes noted that the Cell 2 leachate collection pumps are currently on site, though not installed, and can serve as backup equipment for Cell 1. He noted that Duke Energy will talk to the pump manufacturer and seek recommendations for backup equipment and pumps.
- 3.5 Regarding the 1-foot maximum allowable leachate head on the liner system, Ted Manes explained that the sump liquid levels are set to start running pumps at a 18-inch liquid level. Larry Frost responded that this was acceptable in the sump areas and that the 1-foot requirement was for the overall cell.
- 3.6 Ted Manes explained that someone, who is SWANA trained and certified would always be on-site while the landfill is operating.

4. General Facility Operations – Operations Plan (OP) Section 1

4.1 Dust Control

- 4.1.1 Ken Daly explained that dust control is a critical operations concern. Several methods discussed to reduce dust include: using water trucks, paved roads, and the automated wheel rinse.
- 4.1.2 Chris Ussery explained that during waste placement in the landfill, operational cover would be used to aid in dust control. He explained that this would be operational soil cover for now. However, he explained that Duke Energy intends to use an alternative operational cover.
- 4.1.3 Larry Frost explained that this alternative operational cover would need to be demonstrated to the Field Operations section of the NCDENR Solid Waste Section, and they would issue an authorization letter for use of the alternative operational cover during operations.

4.2 Training: Ken Daly explained that the operator's personnel should be trained for the required tasks. In particular, it is required that one certified operator be on site at all times the landfill is in operations. A certified operator is someone who has completed the SWANA certification training as endorsed by NCDENR.

4.3 Record Keeping: Ken Daly explained the "operating record" as described in the Operations Plan Section 1.9, and the records that should be maintained on-site. Chris Ussery explained that the operating record would be kept on-site at the SEFA trailer.

4.4 Erosion and Sediment Control (E&SC)

- 4.4.1 Ken Daly explained that E&SC inspections of the sediment basin to the south of the landfill should occur weekly.
- 4.4.2 Ted Manes explained that Earnhardt Grading (EGI) was performing

E&SC inspections during Cell 2 construction. However, he explained that the operator would begin E&SC inspections following Cell 2 construction.

- 4.4.3 Ted Manes asked about how the borrow area applied to E&SC maintenance during operations. Ken Daly explained that it is his understanding that the construction activities are currently under a general permit for construction activities and that the landfill and borrow area would be included within the plant's existing NPDES permit once construction was completed.
- 4.4.4 Larry Frost noted that in the event of a leachate release during operations (i.e. a contact water release or leachate breakout) that NCDENR needs to be notified within 24 hours.
- 4.4.5 Ken Daly explained that there was a section added to the Operations Plan that per the NCDENR Dam Safety group's comments that addressed surface erosion monitoring on slopes and embankments. He explained that this surface erosion monitoring applies to slopes that have interim or final soil cover and have been seeded and vegetated.

5. Waste Handling and Landfill Sequencing – OP Section 2

- 5.1 Landfill Capacity: Ken Daly explained the projected landfill capacity and lifetime are based on assumed ash generation rates. Parties discussed that due to the decrease in ash generation rates and the increased in-place waste density observed during landfill subgrade construction, the actual landfill capacity and lifetime should be greater than originally projected.
- 5.2 Waste Acceptance: Ken Daly explained that the accepted waste streams are primarily comprised of approximately 95% fly ash and the remaining 5% shall be comprised of bottom ash, boiler slag, mill rejects, and flue gas desulfurization (FGD) residue. Andy Tinsley and Don Scruggs noted that Duke Energy is considering requesting disposal of other on-site materials. Larry Frost explained that organic materials were not acceptable and that other additional waste streams would be considered with a permit modification request.
- 5.3 Landfill Sequencing: Ken Daly explained the waste disposal sequence will consist of a 10-foot operational lift in subcell 1A, followed by a 10-foot operational lift in subcell 1B, followed by incremental 10-foot lifts over Cell 1 until proposed grades are reached.
- 5.4 Waste Placement
 - 5.4.1 Ken Daly explained that a 10-foot operational lift consists of 12-inch thick compacted lifts with waste compacted at 95% of its Standard Proctor maximum dry density and within + or – 5% of its optimum moisture content.
 - 5.4.2 Ken Daly explained that waste should be placed in a high to low direction while maintaining drainage pathways for contact water runoff.
 - 5.4.3 Ken Daly also explained that in the event that the assumed loading rate of 500,000 tons per year is exceeded, then the Division shall be notified and the influence on slope stability must be considered. He explained that this

- was added to the Operations Plan based on Dam Safety comments.
- 5.4.4 After discussing Dam Safety’s involvement and comments prior to issuance of the Permit to Operate, Ken Daly explained that field density and moisture content testing will take place at one test per lift per 20,000 square feet and laboratory standard Proctor testing will take place at one test per 15,000 cubic yards. He explained the these testing frequencies are outlined in Appendix II of the Operations Plan
 - 5.4.5 Kyle Baucom presented to the group a Cell 1 drawing with a defined letter-number grid system. Ken Daly explained that a proposed operations idea is to use the prepared grid to organize and track field testing. With the grid spaced at 104 feet by 104 feet, each grid represents an area of approximately 20,000 square feet and a field density test would be performed in each grid per each lift lift.
 - 5.4.6 Ken Daly explained additional language in the Operations Plan pertaining to waste placement, monitoring, and testing of waste streams other than ash, which states that, “...should the quantity of combustion residuals other than fly ash exceed 25,000 tons per year and is placed in an area larger than one (1) acre and is placed in a thickness exceeding 12 inches, then the waste fill compaction shall be monitored and tested...”
- 5.5 Soil Cover Placement
- 5.5.1 Ken Daly explained that per the Operations Plan Section 2.5, 6 inches of operational cover should be applied weekly and when the active area reaches 2 acres.
 - 5.5.2 He explained that per the Operations Plan Section 2.5, 12 inches of interim cover must be placed on final slopes and areas where waste placement will be inactive for 12 months.

6. Environmental Management – OP Section 3

- 6.1 Leachate Collection System (LCS)
- 6.1.1 Ken Daly explained that leachate must be sampled and analyzed semiannually in accordance with the Operations Plan Section 3.2.
 - 6.1.2 He also explained the LCS pump operations levels. A level of 1.5 feet activates the low flow pump to begin pumping. If the level is reduced to 0.5 feet, then the pump will shut off. If the level rises to 2.0 feet, then the high flow pump is activated. Both pumps continue to pump leachate until the level is reduced to 0.5 feet. If the level continues to rise and reaches 2.5 feet, then a high level alarm is activated.
- 6.2 Leak Detection System (LDS)
- 6.2.1 Ken Daly explained that pump throughput should be recorded monthly until waste height of 40 feet and recorded quarterly after a waste height of 40 feet. The LDS pump throughput needs to be converted to a gallons per acre per day rate.
 - 6.2.2 He explained that based on the pump throughput, the leakage rate must be calculated in gallons per acre per day (gpad) for each subcell to compare

the initial response leakage rate of 300 gpad and the action leakage rate of 500 gpad.

6.2.3 Ed Mussler explained that liner systems are often damaged during the start of operations due to shear stresses resulting from vehicles stopping too quickly and turning sharply. He advised the group to be aware of this during landfill operations.

6.3 Landfill Gas Management

6.3.1 Ken Daly explained that due to NCDENR's request, gas management should be performed by monitoring on an annual basis and recording results as outlined in the Operations Plan Section 3.4.

7. **Emergency Action Plan (EAP):** Ken Daly explained that the EAP was added to the Operations Plan as a response to Dam Safety comments. He explained indicators of slope stability failures and the steps that need to be taken in the event of a slope stability failure.
8. **Site Tour:** Following the meeting, attendees toured the landfill area. Attendees visited the Cell 1 control panel and sump area, the Cell 2 control panel area, the active ash basin, and the Cell 1 landfill operations access entrance.

The meeting adjourned at approximately 12:30 P.M.

Attachments:

Pre-Operations Meeting Agenda (Draft) dated 12/15/09

MEMORANDUM

TO: Meeting Attendees
FROM: Ken Daly, Kyle Baucom, S&ME, Inc.
DATE: December 15, 2009
SUBJECT: Pre-Operations Meeting Agenda
Allen Steam Station – Retired Ash Basin (RAB) Ash Landfill
S&ME Project No. 1356-06-825

- 1.0 Level I Safety Assessment and Sign-in
- 2.0 Introduction and Designation of Responsible Personnel
- 3.0 Agenda Review with NCDENR Personnel
 - 3.1 Project Overview and Background
 - 3.2 Operations Plan: Section-by-section
- 4.0 Project Overview and Background
 - 4.1 Regulatory Process
 - 4.1.1 Site Suitability
 - 4.1.2 Permit to Construct Application → NCDENR Permit to Construct
 - 4.1.3 Construction Certification Report → NCDENR Permit to Operate
 - 4.1.4 Operations
 - 4.2 Design Details
 - 4.2.1 Double liner system
 - 4.2.2 Liner System Overview (Top down...)
 - 2-foot protective cover layer
 - Geocomposite drainage layer (leachate collection system – LCS)
 - Primary HDPE geomembrane liner
 - Geocomposite drainage layer (leak detection system – LDS)
 - Secondary HDPE geomembrane liner
 - Geosynthetic clay liner (GCL)
 - 18-inch soil liner – permeability no greater than 1.0×10^{-5} cm/sec
 - 4.2.3 Settlement and slope stability
 - 4.2.4 Leak detection system

- 4.2.5 Stormwater management and rain cover
- 4.3 Operations Plan
 - 4.3.1 Guidance document for operations
 - 4.3.2 Permit to Operate – other operations conditions/requirements
- 5.0 General Facility Operations - Operations Plan (OP) Section 1
 - 5.1 Dust control (1.6)
 - 5.2 Training (1.8)
 - 5.3 Record keeping (1.9)
 - 5.4 Erosion and Sediment Control (E&SC) (1.10)
- 6.0 Waste Handling and Landfill Sequencing – OP Section 2
 - 6.1 Waste Acceptance (2.2)
 - 6.1.1 Fly ash (approximately 95% or more)
 - 6.1.2 Bottom ash
 - 6.1.3 Boiler slag
 - 6.1.4 Mill rejects
 - 6.1.5 Flue gas desulfurization (FGD) residue
 - 6.2 Landfill Sequencing (2.3 and 2.4)
 - 6.2.1 Subcell 1A – 10-foot lift
 - 6.2.2 Subcell 1B – 10-foot lift
 - 6.2.3 Entire Cell 1 – 10-foot lift
 - 6.3 Waste Placement (2.5)
 - 6.3.1 Within limit of waste
 - 6.3.2 Disposal location
 - 6.3.3 Operational lift = 10-ft thick
 - 6.3.4 Compacted lifts = 12-inch thick
 - 6.3.5 95% Standard Proctor maximum dry density
 - 6.3.6 + or – 5% of optimum moisture content
 - 6.3.7 In-place density and moisture content testing – one test per 20,000 square feet
 - 6.3.8 Laboratory testing – one Standard Proctor test per 15,000 cubic yards
 - 6.3.9 Maximum 2-acre area of active face
 - 6.3.10 FGD placement methods: 6-inch lifts, not within 25-ft of slope, blend with other lift
 - 6.3.11 CCB's over 25,000 tons/year AND area > 1 acre AND thickness > 12 inches, then monitor compaction
 - 6.3.12 Operational cover = 6-inches soil, weekly or when active area reaches 2-acre area
 - 6.3.13 Interim cover = 12-inches soil, place when at final grades and/or 12-month inactive areas
 - 6.3.14 Maintain final slopes
- 7.0 Environmental Management - OP Section 3

- 7.1 Storm water collection and conveyance (3.1)
 - 7.1.1 Non-contact runoff
 - 7.1.2 Directed via ditches and piping to existing sediment basin
- 7.2 Leachate collection and conveyance
 - 7.2.1 Contact runoff
 - 7.2.2 Must be self contained within landfill
 - 7.2.3 Directed via infiltration to sump area
 - 7.2.4 Methods are up to the operator
- 7.3 Leachate collection system (LCS) (3.2)
 - 7.3.1 Anatomy of... (Construction Drawings C6, C11, D1, D3, D4)
 - 7.3.2 Activation and documentation (by Engineer!)
 - 7.3.3 Equipment maintenance
 - 7.3.4 Pump leachate levels
 - 7.3.5 Pump readout records/documentation
 - 7.3.6 Leachate sampling (semi-annually)
 - 7.3.7 Contingency plan
- 7.4 Leak detection system (LDS) (3.3)
 - 7.4.1 Separate subcell systems
 - 7.4.2 Equipment maintenance
 - 7.4.3 Pump leachate levels
 - 7.4.4 Pump readout records/documentation (3.3.2)
 - 7.4.5 Initial Response Leakage Rate and Action Leakage Rate
- 7.5 Response Action Plan (3.3.3)
 - 7.5.1 Initial response leakage rate (IRLR) gallons/acre/day (gpad)
 - 7.5.2 Action leakage rate (ALR) = 500 gpad
 - 7.5.3 Review equipment
 - 7.5.4 Review operations area
 - 7.5.5 Written notification to Division within 14 days
 - 7.5.6 Written assessment to Division within 30 days
 - 7.5.7 Leachate sampling
 - 7.5.8 ALR exceedance only → establish whether or not to close cell; evaluate preventative measures
 - 7.5.9 ALR exceedance only → written notification of sampling results and any implemented preventative measures taken
- 7.6 Landfill Gas Management (3.4)
 - 7.6.1 Annual monitoring
 - 7.6.2 Record keeping
 - 7.6.3 Contingency plan
 - Corrective measures
 - Addressed in final closure and post-closure