



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

Solid Waste Section

March 16, 2010

Mr. Larry Garriss, Solid Waste Director
Halifax County Department of Public Utilities
P.O. Box 70
Halifax, North Carolina 27839

Re: Additional Comments on Permit Application of Halifax County Construction and Demolition
Debris Landfill (C&DLF), Area 1 Continued Operations (the Permit Application)
Halifax County, North Carolina
Permit No. 42-04, Document ID No. (Doc ID) 9907

Dear Mr. Garriss:

On February 5, 2010, Solid Waste Section of the Division of Waste Management (DWM) received the written responses to the DWM's comment dated October 2, 2009. Richardson Smith Gardner and Associates (RSG), on behalf of Halifax County, prepared and submitted the responses (DIN 9562) which have been incorporated to the revised Permit Application. The Solid Waste Section has preformed a review of the above-referenced documentations and requests for additional information below:

Attachment A – Facility and Engineering Plan

1. (Section 3.0 Landfill Capacity) On October 3, 2002 G.N. Richardson & Associated on behalf of the Halifax County submitted a permit extension request letter and attached figures. The Drawing S2 & S3 shown the C&DLF incremental fill sequences No. 1 through No.7 and indicated that the fill operations would be terminated at the elevation contours up to 346 feet above mean sea level (AMSL). The Solid Waste Section approved this permit extension request on December 30, 2002. The Facility Plan of this 2008 Permit Application proposes that the final fill operations will be terminated at the elevation contours up to 358 feet AMSL which results in the C&DLF containing the total gross capacity of 131,267 cubic yards. Could you please describe the volume of the approved total gross capacity of the C&DLF in October 3, 2002 permit application to demonstrate if the variance of total gross capacity results in a "substantial amendment" in accordance with NCGS 130A-294(b1)(1)?
2. (Section 5.1 Final Cover System) Since the geosynthetic material will function as a moisture barrier, will the proposed 18-inch thick vegetative support layer provide a sufficient soil depth supporting health growth of vegetation during the lengthy draught experienced in recent years in the State of North Carolina? Please clarify.
3. (Appendix A – 1.0 Landfill Volume Study) The data of net waste capacity for remaining Area 1 presented in Sheet 3 of 9 (33,886 cy/23,720 ton) is inconsistent with that in Sheet 7 of 9 (34,975 cy/24,483 tons). The remaining service life for Area 1 is not consistent, either. Please clarify and make necessary corrections.

Attachment B – Technical Specifications

4. Please provide specification for constructing 12-inch-thick intermediate soil cover.
5. (Section 02258, Vegetative Soil Layer(VSL)) Please address the following concerns:
 - i. The alternative soil cover system proposes to construct a 24-inch thick VSL on the 4 (horizontal) to 1 (vertical) side slopes. To facilitate the vegetation growth, it is general practice for no compaction on the top 6-inch top soil layer. Should there be a minimum compaction requirement for the bottom 18-inch soil layer to prevent subsidence, local slope failure, and soil erosion? Please clarify.
 - ii. (Paragraph B.2) The earthen material used in the VSL is specified in this paragraph having the maximum grain size less than 3 inches. Would the selected grain size of earthen material be based on the criteria concluded from the filter design (see Comment 5) and the recommendations for geomembrane protection from geosynthetic manufacturers? Please clarify.
6. (Section 02712, Drainage Composite) Please address the following concerns:
 - i. Please provide a filter design calculation to ensure that the selected geotextile with AOS equivalent to U.S sieve # 70⁺ (in Table 1) can properly function as filter material preventing the DGC from clogging by fines in the overlying VSL.
 - ii. Please provide design calculations to demonstrate that the specified DGC has a sufficient transmissivity, consideration of the long-term performance, which is able to safely convey the surface water in the designed storm event to the drainage system.
 - iii. (Table 1, Note 2) Would the laboratory measured transmissivity be determined under a simulated condition for 100-hour duration, rather than 24-hour? Please clarify.
 - iv. (Table 1, Note 3) Would the GCL be saturated prior to conducting the laboratory testing on interface shear strength between geocomposite and GCL? Please clarify.
 - v. (Paragraph D.3 - Installation, on page 02712-4) Please provide specifications to protect the in-placed geomembrane or GCL during the course of deploying DGC from vehicle, equipment, tool, and unexpected long-duration exposure.
 - vi. (Paragraph D.6 – Cover Placement, on page 02712-6) Provide the specification of (a) the maximum ground pressure of the equipment and buffer material thickness above DGC, if equipment is allowed to directly operate on top of DGC to placing VSL material; and (b) the maximum duration that in-placed DGC can be exposed without placing any permanent cover material and the actions to be taken if this specified duration is passed.
7. (Section 02776, Geosynthetic Clay Liner) Please address the following concerns:
 - i. Specify the GCL Installer's qualification as described in Section 7.2 of the CQA Plan.
 - ii. (Paragraph C.1.e – Installation Procedures and Drawings, on page 02776-4) Would the Contractor be required to submit CQA Engineer a conceptual plan for placement of the GCL panels over the area of installation for a review and approval? Please clarify.
 - iii. (Paragraphs B, on page 02776-3) The Paragraphs B shall specify the material properties of the granular sodium bentonite applied between all overlapped seams described in the Paragraph D.3.g. and repairmen in the Paragraph D.3.i.
 - iv. (Paragraph D.3.a, on page 02776-5) Because the GCL will directly contact the subgrade – 12-inch-thick intermediate soil cover, this sub-paragraph needs to specify the maximum soil grain size in the finished subgrade to prevent void fraction and/or puncture damage on GCL from the certain sizes of rock or gravel or other material.
 - v. (Paragraph D.3.a, on page 02776-5) Please specify the subgrade certification requirement prior to placing GCL layer according to Rule .1624(b)(90(C)(i).

- vi. (Paragraph D.3.i, on page 02776-6) What method or practice is there to ensure the patched area will not be removed or displaced while placing the cover material? Should dry granular sodium bentonite be applied around the damage area prior to placing the patch? Please clarify.
 - vii. (Table1) Please specify the confine pressure (consideration of low normal loading condition for the cover system) and hydration condition which are simulating the field condition for the hydraulic conductivity on the GCL according to Rule 1624(b)(9)(A)(ii).
8. (Section 02778, LLDPE Geomembrane(LLDPE-GM)) Please address the following concerns:
- i. (Paragraph D.3, on page 02778-7) Because the LLDPE-GM will directly contact the subgrade – 12-inch-thick intermediate soil cover, this sub-paragraph specify the maximum size of grain (rock, gravel, other material) is ½ inches. Please provide a calculation to demonstrate this maximum grain size will not create puncture damage on the 30-mil LLDPE-GM.
 - ii. (Paragraph D.5, on page 02778-9) What provisions are there to avoid “fish-mouths” or wrinkles while seaming and to fix or correct the problem? Please clarify.
 - iii. (Paragraph D.6, on page 02778-10) Will the anchor trenches be constructed for installing the LLDPE-GM? There is no trench layout or trench detail showing on the Drawings (Sheet No. 5/Drawing No. S4 and Sheet No. 6/Drawing No. D1) indicate. Please clarify.

Attachment C– CQA Plan

9. (Section 5.0 Geomembrane CQA) Are the specified air pressure test requirements for 30-mil LLDPE in Table 5.2 consistent with the specifications in ASTM D 5820 which states the pressure ranges from 25 psi to 30 psi? Please clarify.
10. (Section 5.4.6.3 Geomembrane CQA Laboratory Destructive Testing) Please specify the LLDPE-GM samples for laboratory testing will only be conducted after the samples from the same batch collected for field destructive seam testing have passed the shear strength criteria stated in Table 3 of Section 02778 in Attachment B.

Attachment D – Operations Manual

11. Please address the requirement stated in the Rule .0542(j)(8).
12. (Section 1.4 Signage) Please add the requirement stated in the Rule .0542(j)(6) to this section. The 18 February 2010 Facility Compliance Audit Report indicated the C&DLF does not in compliance with the rule requirement.
13. (Section 2.5) Please address the requirement stated in the Rule .0542(g)(3). The 18 February 2010 Facility Compliance Audit Report indicated the C&DLF does not in compliance with the rule requirement.
14. (Section 2.5.5.1) The Rule .0542(f)(1) requires the working face to be cover when the waste exceeds one-half acres, and this period cover requirement stated in this section is incorrect. Please make necessary correction.
15. (Section 3.4) Please identify the gas probes (total number of probes and identification numbers) that will be sampled quarterly. There are nine (9) landfill gas probes (GM-1, GM-2, GM-2B, GM-2R, GM-3, GM-4, GM-4R, GM-5, and GM-5B) shown on Drawing No. FIG. 1. Will these ten probes be sampled quarterly?

Attachment F – Closure and Post-Closure Plan

16. (Table 3.1) The cost for CQA is incorrect. However, after consulting the closure cost estimates for other landfill facilities in the State of North Carolina, the reviewer thinks the unit cost for CQA of \$6,000 will be a reasonable cost. Please increase the unit cost from 5,000 to \$6,000.

Figures

6. (Drawing No. S4/Sheet No. 5) Please double check the drawing detail references and correct the typographic errors shown below:

- i Down pipe detail is shown on 1/EC1 (Sheet No. 7), not on 2/EC1.
- ii Filter berm detail is shown on 3/EC1 (Sheet No. 7), not on 2/EC3.

Please submit the written responses to the comments. If the responses will be incorporated into the Permit Application, please submit a hard copy and an electronic copy of the revised portions of the Permit Application. The Solid Waste Section appreciates your efforts and cooperation in this matter. If you have any questions, please contact me at (919) 508- 8507.

Sincerely,



Ming-Tai Chao, P.E.
Environmental Engineer II
Permitting Branch, Solid Waste Section

cc:

Pieter K. Scheer, P.E., RSG
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