



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

April 5, 2005

Ms. Joan Smyth, L.G.
14 N. Boylan Avenue
Raleigh, North Carolina 27603

RE: Black Bear Disposal, LLC,
a subsidiary of Waste Industries, USA, Inc.
Revised Site Hydrogeologic Report
Camden County, North Carolina

Dear Ms. Smyth,

The March 16, 2005, revisions to the above referenced Revised Site Hydrogeologic Report of February 25, 2005 have been reviewed for hydrogeologic concerns by the Solid Waste Section. There are still some items in the Report that require clarification, revision, or additional information. Please respond to the following questions and comments:

Table of Contents: The pagination referenced in the Table of Contents does not match the pagination in the text of the Report. Also, there is no reference to section 4.7.3 - regarding the Long-term Seasonal High Water Table.

4.1.2.2 There appears to be some text missing in the middle paragraph of this section. Also, the text needs to be updated with the on-site information gathered from boring B-102.

4.2.1 There are two references to the ditches marking the landfill "footprint". These should reference the landfill facility boundary.

4.2.2 The first part of the first sentence in the fourth paragraph of this section (up to the comma) should be deleted.

4.3 The Well Construction Log for the production well THG-1 indicates an 8 foot bentonite seal, not 2 foot.

- 4.4.4. The K-value of 4.1×10^{-6} cm/sec would equal 0.0116 ft/day. The K-value of 1.3×10^{-6} would equal 0.0037 ft/day.
- 4.5 The first paragraph at the top of page 12 should identify the figures in Appendix E that are referenced for each model run.
- 4.7.1 On the last paragraph on page 13, on July 28, 2004, for piezometer B-25, the water table was encountered 14.48 feet below land surface at an elevation of 0.78 MSL.
- 4.7.2 What is the context of the statement at the top of page 15, that "the elevations collected on July 28, 2004, represent the worst case scenario for the landfill area". Is this believed to be the highest readings that could ever occur, and therefore indicative of Long-term Seasonal High Water table conditions. If so, this contradicts other propositions in the Report.
- 4.8.1.1 Has there been any attempt to plot potentiometric data only from deeper piezometers to estimate horizontal flow deeper in the aquifer system? Would this deeper ground-water flow also be to the north?
- 4.8.2 Table 8 references Pump Test data, not Slug Test data. I am not able to match the data presented in the last paragraph of page 16 and the first and fourth paragraphs of page 17 to the data presented in the Tables and Appendices. In the first sentence of the last paragraph on page 16, does this data represent hydraulic conductivity of the "Surficial aquifer" or just the shallow upper portion of the surficial aquifer?
- 4.8.2 The last paragraph of section 4.8.2 (near the top of pg. 18) references an average effective porosity of 35 percent. However, if the two values from the silt/clay units are left out, those values representative of the primary lithologic unit of the upper aquifer would yield a value of about 43 percent. Would this not be a more representative value to be used for the calculations in Table 9?
- 4.8.2 It is still not clear that the representative hydraulic characteristics (hydraulic conductivity, porosity, and effective porosity) have been presented for the various lithologic units (hydrogeologic units) identified, as outlined in section 4.3 of the Report. The information currently presented in section 4.8.2 based on depth is useful, however it does not correspond to the lithologic units identified.

4.13 Reference is made to the "western borrow pit in the western portion of the site". All other references in the Report describe the borrow pits as being located north of the site. In the first paragraph on page 21, what is the "central drainage ditch" and where is it located?

Table 1 The Date of Construction for B-3 and B-7 are inconsistent with the dates on the Boring Logs.

Table 2 My calculations would indicate slightly higher Estimated Effective Porosity values for B-5 and B-18.

Table 3 The TOC Elevations for boring B-103 and B-103d are inconsistent with the elevations on the Boring Logs. It appears that both the Table and the Boring Logs have been changed. Which are the correct TOC Elevations for these two borings?

Table 4 The Average value for Jan. should be 4.22. I am still not able to duplicate the Annual Average value of 50.76 presented in this Table. How was this value determined?

Table 6 The TOC Elevation and Ground Elev. values for B-1s and B-1 appear to be reversed in both of the tables included as part of Table 6. It would be better to carry the Vertical Gradient values out to at least thousandths in order to maintain more accurate significant figures.

Table 9 Boring B-102 is not a piezometer, so how can it be used in this Table? The Maximum Hydraulic Conductivity value, according to Table 8, should be 31.82, rather than 28.37. Refer to previous comments regarding Average Effective Porosity.

Drawings: Sheets 3 and 4: For the first boring location on Cross-section A - A', (GP-32), the ground surface and water table elevations, and the depth of boring, etc. are not consistent with the Boring Logs and Tables. I was not able to locate a Boring Log or Field Notes describing the lithologic profile at this boring location. What is the basis for showing a shallow silty clay layer at this location? Due to the apparent errors for the first boring location reviewed (GP-32), as well as for several other boring locations that I spot checked, I have not attempted a comprehensive review of these two cross-sections. Please check the accuracy for all information shown on the cross-sections on Sheets 3 and 4.

Appendix D Field Logs do not appear to be available for some of the borings. For many of the borings, little or no information was logged. For some borings that were logged, the information does not appear to be complete, especially for the top few feet of the borings. For several of the borings, the Well Construction Records in Appendix B are inconsistent with the Field Logs in Appendix D.

Appendix E Surficial Aquifer Pump Test and Model:

1.12 Reference is made to "this silty aquifer", however the Report describes primarily a sandy aquifer, with soils of the SP classification dominating.

Table 3 Refer to the previous comments for Table 9 in the main body of the Report, which corresponds to this table, Table 3 in Appendix E.

Drawing No. 2: This figure still has some of the errors previously identified for Sheet 1 in the main body of the Report prior to the recent revisions. The Ground Elevation for Boring GP-33 is incorrect. The TOC Elevation for Boring B-103 is inconsistent with the Boring Log. Some of the borings have I and S suffixes.

Figure 5: It is my understanding that this model run is based on the assumption that no outside influences are affecting ground-water flow. Therefore the "Proposed Recharge Trench" should not appear on this figure. This drawing indicates natural ground-water flow generally to the north. Does the ditch along the northern facility boundary have this strong an effect on ground-water flow? What depth of the aquifer was used in this model run? I would expect more of a westerly component of ground-water flow, at least for the deeper part of the aquifer, toward the Dismal Swamp Canal.

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Please respond to these questions and comments, and provide revisions as necessary. If you have any questions regarding items in this letter, please contact me at (919) 733-0692. Beginning on April 11, 2005, our Division phone number will be changed to (919) 508-8400.

Sincerely,



Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Jim Barber Solid Waste Section
Ed Mussler Solid Waste Section
John Crowder SWS - Wilmington
Chuck Boyette SWS - Washington
Jerry Johnson Waste Industries