



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

May 24, 2005

Mr. Rick Payne
Cabarrus County, Engineering
PO Box 707
Concord, NC 28026

RE: Application for Permit to Construct, Expansion
Cabarrus County C&D Landfill,
Design Hydrogeologic Study –
Permit No. 13-02

The above referenced Application for Permit to Construct for the expansion of the C&D landfill in Cabarrus County, submitted by CDM on behalf of Cabarrus County, is being reviewed by the Solid Waste Section (SWS) for hydrogeologic concerns. There are several items in the Water Quality Monitoring Plan and the Design Hydrogeologic Report that requires clarification and/or revision before the hydrogeologic review can be completed. Please have your consultants respond to the following questions and comments:

Section 2 Plan and Permit Requirements
Section 2.1.9.6 Buffer Requirements
Page 11
Sheets (Drawings)

This section states in part: *"There exists a minimum buffer of fifty feet between the edge of the disposal area for C&D debris and all property lines, in accordance with 15A NCAC 13B .0503(2)(f)(i)."*

SWS Response:

For new C&D landfill sites, it has been the SWS policy that there is a 200 foot buffer instead of a 50 foot buffer between the waste boundary and the property boundary. Most of the drawings (Sheets) depict the western edge of the waste boundary approximately 170-175 feet from the property boundary. This section of the waste boundary needs to be shifted in order the 200-foot buffer requirement is met and the drawings revised accordingly.

Section 14 *Water Quality Monitoring Plan*
Section 14.3.1 *Monitoring Well Locations*
Pages 4-5
Sheet No. 14-1 *Water Quality Monitoring Plan*

This section mentions that the proposed location of ground-water monitoring well, CD-2 is located down-gradient from the proposed sediment pond.

SWS Response:

The proposed location of this well (CD-2) may need to be relocated further to the southwest near the preferential flow path. For compliance monitoring purposes, the proposed ground-water monitoring wells CD-3, CD-4, and CD-1 need to be relocated further away from the waste boundary, at least to the Review Boundary (approximately 125 feet from the waste boundary).

Section 14 *Water Quality Monitoring Plan*
Section 14.3.2 *Monitoring Well Installation and Construction*
Page 5

SWS Response:

A statement or mention of the submittal of well construction completion records at the time of the proposed well construction/completion could not be located in the Report. Per **Rule 15A NCAC 13B .0601(e)**, upon well completion, a well construction record for each well shall be filed with the Division.

Section 14 *Water Quality Monitoring Plan*
Section 14.4 *Surface Water Quality Monitoring Plan*
Page 7
Sheet No. 14-1 *Water Quality Monitoring Plan*

This section states in part: *"The existing and proposed sampling locations are shown on Sheet 14-1"*.

SWS Response:

The locations of the surface water sampling locations could not be located on this drawing (Sheet No. 14-1)

Appendix D Design Hydrogeologic Report
Section 3.2.1 Saprolite
Page 3
Appendix A Boring Logs
Figures 3-3, 3-4, 3-5 Geologic Cross-Sections

This section states in part: *"These soils are typically finer near the surface where weathering is more advanced, and become more dense and coarser in texture as weathering decreases with depth. Near the surface, they are generally comprised of fine sandy silt or silty clay. Silty sands and clay are present at some locations. Most on-site saprolitic soils grade to a silty sand with depth."*

SWS Response:

According to most of the boring logs submitted, there appears to be two distinct lithologic, hydrogeologic subunits within the saprolite unit, based on finer grained soils near the land surface (i.e. USCS - ML, CL) and coarser grained soils at deeper depths (i.e. USCS - SP, SM). The SWS section usually refers to upper, finer grained soils (CL, CH, ML, MH, etc.) as "Residuum" and coarser grained soils (SC, SM., SP, SW, etc.) as "Saprolite".

The cross-sections (Figures 3-3, 3-4, 3-5) and text need to be revised to show residuum and saprolite units.

See further comments under SWS response to Section 3.2.4 Geotechnical Testing Results, below.

Appendix D Design Hydrogeologic Report
Section 3.2.4 Geotechnical Testing Results
Page 4
Table 3-2
Appendix B Grain Size Analysis

This section states in part: *"Two undisturbed samples from the new expansion area were collected and were sent to a laboratory for analysis of USCS, Atterberg Limits, porosity, and hydraulic conductivity. The samples arrived at the lab damaged and calculation of porosity and vertical hydraulic conductivity were not feasible. In order to supplement the data, historical geotechnical results from previous investigations in the area are also provided".* Also, Table 3-2 shows undisturbed samples were collected from Boring No's. B-14, B-16, MW-A, and MW-X.

SWS Response:

Where are the locations of MW-A and MW-X in relation to the proposed site?

As indicated on Table 3-2, the undisturbed samples were retrieved from PWR and the upper zone of the saprolite unit that consists of finer grained material (USCS Classification - CL, MH). According to the grain size analysis and data depicted on Table 3-2, not all of the lithologic units (residuum, saprolite, PWR, and bedrock) appear to be adequately characterized for total porosity, effective porosity, and hydraulic conductivity within the footprint and compliance area of the site.

Please characterize each lithologic unit (residuum, saprolite, PWR, and bedrock) for total porosity, effective porosity, and hydraulic conductivity by providing data from undisturbed samples (shelby tube) and in-situ testing (slug tests). Effective porosity values can be obtained from A.I. Johnson's "Textural Classification Triangle for Unconsolidated Materials", based on grain size analysis obtained from shelby tube samples. Secondary porosity values for bedrock can be obtained from Driscoll, 1986.

*Appendix D Design Hydrogeologic Report
Section 3.3.3 Temporal Trends – Seasonal High Water Table
Pages 10-13
Tables 2-1, 3-1, 3-3, 3-3b, 3-2
Sheet No's. 3-4, C-2, C-5*

Page 13 of this section, states in part: "In the vicinity of the P-4, B-10, and B-8 nested pair, land surface was designated as the seasonal high water table".

SWS Response:

Corresponding Table 3-3, "Water Level Measurements": The ground-water level measurements for the June 2003 sampling event for piezometers B-8D and B-8S appear to be above land surface and above the "Estimated Seasonal High Elevation" when compared to land surface elevation data stated in Table 2-1.

Please clarify.

Also, Table 3-1 needs to be modified, since most of the Ground Surface Elevation readings are actually the Top of PVC Elevations as depicted in Table 2-1.

Note: Check all tables and drawings of the Study to make sure that all elevations (i.e. T.O.C., Ground Surface Elevation, Top of Bedrock Elevations, Top of PWR Elevations, Ground-water Elevations, etc.) are correct and revise accordingly.

Page 13 of this section also states in part: "A seasonal high groundwater table map with proposed landfill basegrades is provided on Sheet 3-4."

SWS Response:

Sheet No. 3-4 is titled "Estimated Long-Term Seasonal High Potentiometric Contour Map". The legend of the map refers to "Estimated Seasonal High Groundwater Elevation". The Cross Section (Sheet No. C-5) depicts "Long-Term Seasonal High Potentiometric Surface". The Grading Plan (Sheet No. C-2) depicts in the legend, "Estimated Long-Term Seasonal High Potentiometric Contour". Page 13 and Table 3-3 of the Study refers to "Estimated Seasonal High Water Table", etc.

Please change the title of Sheet No. 3-4 to read, Estimated Seasonal High Potentiometric Contour Map and change notations on Sheet No. C-2 and C-5 to reflect Estimated Seasonal High Potentiometric Contour /Surface in order to coincide with the text on page 13 and Table 3-3.

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Please note the comments and questions raised above and have your Geologic Consultant provide additional information and revisions as needed. If you, your Geologic Consultant, or your Engineering Consultant have any questions, or wish to schedule a meeting to discuss the items referenced in this letter, please call me at 919-508-8524.

Sincerely,



Brian Wootton
Hydrogeologist
Solid Waste Section

cc:	Jim Barber	Solid Waste Section
	John Murray	Solid Waste Section
	Teresa Bradford	Solid Waste Section
	Tim Grant	CDM
	Thomas Yanoschak	CDM
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