



North Carolina Department of Environment and Natural Resources

Dexler R. Mathews, Director

Division of Waste Management

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

May 23, 2007

Joan A. Smyth, P.G.
G. N. Richardson & Associates, Inc.
Engineering and Geological Services
14 North Boylan Avenue
Raleigh, NC 27603

RE: Application for Permit to Construct, Expansion
Davidson County Phase 2, Area 1 MSW Landfill
Additional Information Request
Permit No. 29-06

Dear Ms. Smyth

The above referenced Permit to Construct Application (Design Engineering) and the Design Hydrogeologic Report for the proposed Phase 2, Area 1 Municipal Solid Waste (MSW) landfill in Davidson County, submitted by G. N. Richardson & Associates, Inc. on behalf of Davidson County is being reviewed by the Solid Waste Section (SWS) for hydrogeologic concerns. There are several items in the Hydrogeologic Report that require clarification and/or revision before the hydrogeologic review can be completed. Please respond to the following questions and comments:

*Design Hydrogeologic Report
Section 3.2, pages 3-4 - Site Investigation Methodology
Figure 5 – Boring-Well Location Map*

Section 3.2, pages 3-4 state in-part the following: "The approximately 15 acre Phase 2 Area 1 area was recently investigated with the installation of 14 borings, each advanced to depths between 26 and 69.5 feet below grade. These borings were installed by GNRA with Engineering Tectonics during February 2002. Site Suitability permitting included the installation 19 borings in Phase 2 which included four (4) borings in Area1. During previous site permitting conducted in 1989 12 borings were installed in and around the proposed Phase 2 area by Westinghouse. Previously installed borings are labeled TW-borings. The boring logs and information from these previous investigations are included in this report with data from the most recent investigations to gain a complete understanding of the area. Figure 5 show the boring locations."

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone 919-508-8400 \ FAX 919-733-4810 \ Internet <http://wastenotnc.org>

An Equal Opportunity / Affirmative Action Employer – Printed on Dual Purpose Recycled Paper

According to Figure 5 (Boring-Well Location Map) there appear to be ten (10) piezometers within the footprint area of the proposed phase Area 1. Two (2) borings appear to be located on or close to the footprint boundary (TB-12, TB-15). Please provide documentation that meets the requirement of **Rule 15A NCAC 13B .1623(a)(6) and SWS policy** [i.e. a minimum of one boring/piezometer (that intersect the groundwater table), per acre within the footprint area]. For this "Area 1": a minimum of 15 are required within the footprint area. The area outside the footprint area (compliance area) seems to have ample boring/piezometer number density. As stated above, the additional boring and piezometer data need to intersect the groundwater table. Either, provide additional historical data and locations that meet the boring/piezometer density and groundwater intersection requirements (15 within the footprint) or possibly install additional new groundwater-bearing boring(s) /piezometer(s)/ geoprobe(s). Please revise Figures (i.e. Figure 5, etc.) and Tables to reflect any modifications.

Design Hydrogeologic Report

Appendix B - Geotechnical Laboratory Data

Table 5 - Summary of Hydrogeologic Properties

Table 7 - Gradients and Ground Water Velocities

Table 5 and Table 7 (under the note sections) state in-part: "Effective Porosity from Textural Classification Triangle and grain size analysis or estimated from rock core RQD" and "Effective Porosity from Textural Classification Triangle", respectively.

During the review of the Report, I could not locate textural classification triangles depicting effective porosity points based on laboratory soil tests analysis performed. Please provide textural classification triangles (i.e. A.I. Johnson) depicting calculated effective porosity points and also estimated porosity values used for more consolidated PWR and rock lithology.

Design Hydrogeologic Report

Figure 5 – Boring-Well Location Map

Figure 6 – Geologic Cross Section A-A'

Figure 7 – Geologic Cross-Section B-B'

Figure 8 - Geologic Cross-Section C-C'

The Geologic Cross Section Figures (Figures 6, 7, 8) need to be modified (extended) to show actual lithology and hydrogeology by including existing piezometers located at or beyond the area of compliance; in similar fashion to nested piezometers, PZ-7, PZ-7D depicted on Cross Section C-C' and nested piezometers PZ-12, PZ-12D depicted on Cross Section A-A'. Also, depict the groundwater flow directions on the Cross Sections [Reference: **Rule 15A NCAC 13B .1623(b)(2)(G)(H)(I).**]

Modify Figure 6, Geologic Cross Section A-A' by extending the cross section to possibly existing nested piezometers, PZ-42, PZ 42D.

Modify Figure 7, Geologic Cross Section B-B' by extending the cross section in both directions, to possibly existing piezometer, PZ-34 and existing nested piezometers, PZ-42S, PZ-42D.

Modify Figure 8, Geologic Cross Section C-C' by extending the cross section to possibly existing piezometer, PZ-6 or PZ-40.

Design Hydrogeologic Report

Section 3.5.6 – Potentiometric Surface and Ground Water Gradients

Appendix D – Water Quality Monitoring Plan

Section 1.3 New Monitoring Well Location Criteria

Figure 1A – Proposed Monitor Well Locations

Section 3.5.6, page 13 of the Design Hydrogeologic Report states in-part: “Our evaluation indicates that even during times of low water, ground water continues to flow in the unconsolidated sediments below the site, and does not revert to only fracture flow.”

Figure 1A depicts the location of proposed groundwater monitor wells, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8 along fracture and diabase dike locations. The narrative of Section 1.3, page 2 of the Water Quality Monitoring Plan states in-part: “Proposed monitoring wells MW-2 through MW-5 will be located downgradient of the landfill unit between Area 1 and the ground water discharge location of Rich Fork Creek. Proposed monitoring wells MW-6 through MW-8 will be located south of Area 1. Based upon site hydrogeology and ground water discharge, these locations should be sufficient to monitor ground water quality at the site.”

Based on the data submitted, the composite high and low groundwater surface is mostly above bedrock. It is presumed that most of the proposed groundwater monitor wells will be screened to bracket high and low groundwater levels. In addition, some deep nested groundwater monitor paired wells need to be installed at some of the fracture / diabase dike intersections, next to some of the proposed shallow monitor wells (i.e. MW-3, MW-4, MW-6) in order to effectively monitor any possible higher density constituents. Please revise the narrative and drawing(s) of the report to state the proposed screen depths of the wells and depict revised groundwater monitoring locations on the map(s). Also, a groundwater monitoring well may need to be installed between the proposed northwest footprint and the proposed northwest sediment basin. There appears to be a preferential flow path between existing piezometer PZ-33 and existing piezometer PZ-5D that flows north-northwest.

