



## North Carolina Department of Environment and Natural Resources

Dexter Matthews, Director

Division of Waste Management

Beverly Eaves Perdue, Governor  
Dee Freeman, Secretary

May 12, 2011

Sent Via Email – majones@hendersoncountync.org

Mr. Marcus Jones  
Henderson County  
Director of Engineering  
802 Stoney Mountain Road  
Hendersonville, NC 28791

Re: *Anomalous Detections of Volatile Organic Compounds*  
Henderson County Closed Stand Alone C&D Landfill, Permit Number 45-01

Dear Mr. Jones:

The Solid Waste Section has completed a review of the *Anomalous Detections of Volatile Organic Compounds* report dated September 28, 2010 (Doc ID 13662) and submitted on behalf of Henderson County by Golder Associates NC, Inc. for the stand alone closed Henderson County C&D Landfill. The alternate source demonstration was prepared pursuant to 15A NCAC 13B .0544(b)(1)(I) which states that the owner or operator may demonstrate that a source other than the C&D Landfill unit or a natural variation in ground-water quality has caused contamination or an error in sampling or analysis of data has resulted in false reporting of contamination.

Per the *Anomalous Detections of Volatile Organic Compounds* report and during the March 2010 water quality monitoring event, volatile organic compounds were detected within the downgradient groundwater monitoring wells MW-11, MW-12, and MW-13. The following volatile organic compounds were detected: Acetone, 1,4-Dichlorobenzene, 1,1-Dichloroethane, cis-1,2-Dichloroethene, Methylene Chloride, Tetrachloroethene (PCE), Trichloroethene (TCE), Trichlorofluoromethane, and Total Xylenes. PCE exceeded the Groundwater Standard in groundwater monitoring well MW-11 at 3.4 ug/L, and in groundwater monitoring well MW-12 at 1.6 ug/L.

The groundwater monitoring wells for the stand alone C&D Landfill were installed in June 2001, and during the initial water quality sampling event for these groundwater monitoring wells in 2001, no volatile organic compound detections or exceedances were present. However, volatile organic compound detections and exceedances have historically been documented within groundwater monitoring wells MW-11, MW-12, and MW-13 since April 2003.

Within the *Anomalous Detections of Volatile Organic Compounds* report, dissolved methane, headspace readings, cation/anion analyses, scatter plots, piper plots, stiff diagrams, geochemical signatures, Henry's Law calculations, and mixing models were used to evaluate if landfill leachate from the stand alone C&D Landfill was a source of the volatile organic compounds. Based on the analyses, evaluations, and conclusions that landfill gas is the most likely source for the detected volatile organic compounds within the facility's groundwater, Henderson County is requesting that the Solid Waste Section approve this

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alternate source demonstration for past and future statistically significant detections of the constituents of concern and remain in the Detection Monitoring Program. Also, pending approval of the *Anomalous Detections of Volatile Organic Compounds* report, Henderson County will evaluate potential landfill gas remediation strategies to address groundwater impacts and submit a landfill gas remediation plan for Solid Waste Section approval.

As a result, since volatile organic compounds have exceeded the Groundwater Standards since 2003 within the downgradient groundwater monitoring wells for the stand alone C&D Landfill, and based upon the County's conclusion that landfill gas derived from the stand alone C&D Landfill is the most likely source for the volatile organic compounds within the facility's groundwater, the County's request to remain in the Detection Monitoring Program is not approved at this time. Please initiate Assessment Monitoring pursuant to 15A NAC 13B .0545 for the stand alone C&D Landfill.

Henderson County is required to conduct the following pursuant to 15A NCAC 13B .0545(a)(1), (2), and (3):

- (1) Install at least one additional groundwater monitoring well or methane gas monitoring well at the facility boundary or the compliance boundary, as defined in 15A NCAC 02L .0100, in the direction of contaminant migration. The new sampling point must be installed at the facility boundary or compliance boundary at the location most likely to show impact based on the known geology and hydrogeology;
- (2) Notify all persons who own land or reside on land that directly overlies any part of the plume of contamination if contaminants have migrated off-site or are thought to have migrated off site;
- (3) Within 30 days of triggering an assessment monitoring program, the owner and operator must submit an assessment monitoring work plan for Division review. The Division shall date and stamp the assessment monitoring program "approved" if the conditions in Paragraph (b) of this Rule are met. The owner and operator must place the approved program in the operation record, and notify all appropriate local government officials.

Henderson County is also required to conduct the following pursuant to 15A NCAC 13B .0545(b)(1), (2), and (7):

The assessment monitoring work plan must be in accordance with the following:

- (1) Install additional monitoring wells to characterize the nature and extent of the release;
- (2) Analyze for additional parameters, which may include constituents on the Appendix II of 40 CFR Part 258 as directed by the Division. For any constituent detected in the downgradient wells as the result of analyzing of additional parameters, a minimum of four independent samples from each well (background and downgradient) must be collected and analyzed to establish background for the new constituents; and
- (7) After obtaining the results from the initial and subsequent sampling events, the owner or operator must submit an assessment monitoring report to the Division which must be certified by a Licensed Geologist.

Based upon the results of the *Anomalous Detections of Volatile Organic Compounds* report, landfill gas migration was shown to be a transport mechanism, and the alternate source demonstration investigation can be used to design controls for the landfill gas migration to minimize the potential for headspace gas to water volatile organic compound transfer effects. In order to better understand the migration of landfill gas at the stand alone C&D Landfill, the implementation of a routine landfill gas monitoring program will be required in accordance with 15A NCAC 13B .0544(d)(2). Please submit a landfill gas plan for the installation and monitoring of landfill gas monitoring wells for the stand alone C&D Landfill. Prior to the submittal of the landfill gas plan, please also review the *Landfill Gas Monitoring Guidance Document* dated November 2010 available at <http://portal.ncdenr.org/web/wm/sw/envmonitoring>.

With the installation and monitoring of the new landfill gas monitoring wells for the stand alone C&D

Landfill in conjunction with the information collected within the *Anomalous Detections of Volatile Organic Compounds* report, an effective landfill gas remediation plan with a contingency plan should also be submitted as stated within the *Anomalous Detections of Volatile Organic Compounds* report. *Within 120 days of receipt of this letter*, please submit a landfill gas remediation plan with a contingency plan.

In addition, based upon a review of the files for Permit Number 45-01, please initiate annual sampling for Appendix I of 40 CFR Part 258 constituents for groundwater monitoring well MW-9. In a letter dated December 18, 2009, the Solid Waste Section approved the County's request to discontinue sampling MW-9 due to its location to the MSW Landfill and approved MW-9 to be removed from the compliance monitoring network for the MSW Landfill. The TVA Landfill will now be monitored for groundwater on an annual basis independently from the other waste disposal units. The following documents regarding the TVA Landfill and MW-9 include:

1. A letter dated July 26, 1994 from Mr. Bobby Lutfy, Hydrogeologist with the Solid Waste Section to Mr. Gary Corn with Henderson County stated that an additional well is also needed to monitor the TVA disposal area;
2. A letter dated July 3, 1996 from Mr. Bobby Lutfy, Hydrogeologist with the Solid Waste Section to Mr. Gary Tweed with Henderson County stated that groundwater monitoring well MW-9 was part of the County's Transition Plan to be used to monitor the older inactive landfill area [TVA Landfill], and is not subject to the .1600 rules monitoring requirements;
3. The April 2000 Water Quality Monitoring Plan for the stand alone C&D Landfill stated that sampling results from existing MW-9 and proposed MW-10 should allow for separate monitoring of the existing inactive TVA waste cell and the proposed new C&D Landfill. Piezometers P-7 and P-11 indicate that there is no hydraulic or contaminant cross-flow from the existing waste cell to the proposed new C&D Landfill; and
4. The April 3, 2001 Revised Water Quality Monitoring Plan for the stand alone C&D Landfill stated that sampling results from existing MW-9 and proposed MW-12 (P-3) should allow for separate monitoring of the existing inactive TVA waste cell and the proposed new C&D Landfill. Analytical results from samples collected from P-3 and P-11 indicate that there is no hydraulic or contaminant cross-flow from the existing waste cell to the proposed new C&D Landfill. No volatile organic compounds were detected in either sample.

Finally, on April 7, 2011, Ms. Elizabeth Werner with the Solid Waste Section approved the raising or lowering of the top of casings of groundwater monitoring wells MW-9, 11, 12, and 13 due to the construction of a convenience center (Doc ID 13543). Please be advised that the new top of casing elevations will be surveyed for these groundwater monitoring wells. If you have any questions or concerns regarding this letter, please contact me at 919-508-8500 or [jaclynne.drummond@ncdenr.gov](mailto:jaclynne.drummond@ncdenr.gov). Thank you in advance for your anticipated cooperation with this matter.

Sincerely,



Jaclynne Drummond  
Compliance Hydrogeologist  
Solid Waste Section

cc via email: Natalie Berry, Henderson County Assistant Engineer  
Mark Poindexter, Field Operations Supervisor  
Deb Aja, Western District Supervisor  
Andrea Keller, Environmental Senior Specialist  
Larry Frost, Permitting Engineer  
Elizabeth Werner, Permitting Hydrogeologist