Ohio EPA
40 years and moving forward

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

October 10, 2012

RE: WESTLAKE CITY LANDFILL
CUYAHOGA COUNTY
GROUND WATER
NOTICE OF VIOLATION
ADDITIONAL INFORMATION NEEDED

CERTIFIED MAIL 7012 1010 0002 2260 3896

Mr. Don Glauner
Service Director
City of Westlake
27216 Hilliard Boulevard
Westlake, Ohio 44145

Dear Mr. Glauner:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), has reviewed the following report for Westlake Landfill:

- Semi-annual Assessment Activities Report.

The document is dated December 7, 2011. It was received on December 7, 2011, and reviewed for compliance with 3745-27-10(E)(12) and the facility's revised, May 2011 GWQAP. The report was prepared and submitted by Mr. Fraser Hamilton of Earth Consulting, LTD, on behalf of the City of Westlake.

Westlake Landfill closed under the 1990 solid waste landfill regulations, but is currently conducting post-closure ground water detection and ground water quality assessment monitoring in accordance with the 2003 revision to the OAC 3745-27-10 solid and infectious waste regulations. Monitoring wells WW-2, WW-5, WW-9, WW-10, WW-11, WW-12 and WW-13 are currently in the ground water quality assessment program (GWQA) and thus are sampled in accordance with the ground water quality assessment plan (GWQAP). All other downgradient monitoring wells (i.e. WW-1, WW-3R, WW-6R, WW-8) at the facility are currently in the detection monitoring program, and wells WW-4 and WW-7 are used to determine background ground water quality at the facility.

Ohio EPA has reviewed the above referenced document and has noted the following violations:

Violations

1. OAC Rule 3745-27-10(B)(5): The owner or operator shall evaluate, at least annually until the end of the post-closure care period, the ground water surface elevation data obtained in accordance with paragraph (C)(3) of this rule to determine whether the requirements of paragraph (B) of this rule for locating the monitoring wells continue to be satisfied. The results of this evaluation including potentiometric maps for every geologic unit monitored shall be included in a report to be submitted to the appropriate Ohio EPA district office not later than twelve months from the previous report submitted to comply with this paragraph. If the evaluation shows that paragraph (B) of this rule is no longer satisfied, the owner or operator shall immediately revise the number, location, and/or depth of the monitoring wells to bring the ground water monitoring system into compliance with this requirement and place documentation of the revision into the operating record in accordance with paragraph (B)(3)(d) of this rule.

During the year 2011 the owner/operator did not submit a report evaluating if the ground water monitoring system continues to fulfill the requirements of OAC 3745-27-10(B) as described in that rule. A regular, detailed evaluation of the ground water flow regime at the facility and of the adequacy of the current ground water monitoring system to assess potential releases of waste-derived constituents to ground water are essential to an effective GWQA.

Additionally, as described in Violation 2) below, the owner or operator did not consider the ground water elevations from all monitoring wells at the facility in constructing the potentiometric surface maps in the May 2011 and October 2011 sampling events.

Furthermore, in evaluating whether or not the existing ground water monitoring network continues to satisfy the requirements in OAC 3745-27-10(B), it should be noted that OAC 3745-27-10(B)(4) requires that the number, spacing, and depth of ground water monitoring wells in the system be "based on site specific hydrogeologic information including that information listed in paragraphs (C)(3)(a) to (C)(3)(g)" of OAC 3745-27-06 (site investigation rule), which includes such hydrogeologic information as:

- Local geomorphology at the proposed sanitary landfill facility including surface water bodies or topographic features that may influence the ground water flow in the uppermost aquifer system.

- Temporal fluctuations in ground water levels over a period of time to determine the seasonal effects on ground water flow directions.

- Identification and characterization of recharge and discharge areas within the boundaries of the proposed sanitary landfill facility. This shall include any relationships of ground water with seeps, springs, streams, and other surface water features.

Regarding potential surface water body influence on ground water flow regime, the ground water elevation reported at WW-8 for the May 2011 sampling event [639.97 feet above mean sea level (msl)] was at or above the elevation of the bottom of the creek (639-640 feet msl) depicted on Figures 2 and 5 immediately west of WW-8. These data indicate that the creek is intermittently a gaining stream and thus that ground water may have been discharging to the creek at least during the May 2011 sampling event.

Ohio EPA previously requested of the owner or operator's consultant in a February 17, 2011 e-mail and in several telephone discussions that the location of the west and east creeks/ditches at the facility be depicted on potentiometric surface maps and cross sections since they have the potential to influence the ground water flow regime at the facility. The owner or operator's consultant stated in 2011 that elevation measurements of the west creek bottom indicated that the creek bottom was significantly higher than the ground water surface and thus the creek was a losing stream. However, the relatively high May 2011 data seem to contradict this conclusion and to date, the locations of the west creek and east ditch/creek have not been included in any potentiometric surface maps submitted to Ohio EPA, and only the east ditch was depicted in Cross Section 1 of Figure 3 in the December 2011 SAA report.

To return to compliance, the owner or operator must do the following:

- Produce potentiometric surface maps for the May 2011 and October 2011 sampling events using ground water elevations from all monitoring wells at the facility or as many elevations as are available for those events. The potentiometric maps should also include an accurate depiction of the locations of the east and west creeks/ditches relative to monitoring wells and other site features. Additionally, it should be noted that the "Fall 2011" potentiometric surface map (Figure 4) in the December 2011 SAA report did not account for the ground water elevation at WW-8, nor did the report text or Figure 4 justify why it was not included, and thus should be corrected in the re-evaluated Fall 2011 potentiometric map.

- Conduct an evaluation in accordance with OAC 3745-27-10(B)(5) of the ground water flow regime and of the ability of the existing ground water monitoring network's ability to satisfy the requirements of OAC 3745-27-

10(B). A report (or section in a ground water monitoring report) summarizing the results of this evaluation must be submitted to Ohio EPA in accordance with OAC 3745-27-10(B)(5).

2 OAC Rule 3745-27-10(C)(3): states in part... The owner or operator shall at least semiannually and in conjunction with any major sampling event involving more than half the wells in the system... the direction of ground water flow each time ground water elevation measurements are performed...potentiometric maps shall be constructed using the collected ground water elevation measurements and shall be included with the sampling data submittal.

Ground water elevations for several assessment wells were not recorded and/or accounted for in the May 2011 and October 2011 potentiometric surface maps.

The May 2011 detection monitoring report and the December 2011 SAA report indicate that more than half of the uppermost aquifer system monitoring wells were sampled during the May 2011 and October 2011 sampling events. However, the potentiometric surface map submitted with the May 2011 report did not include nor take into consideration ground water elevation data from monitoring wells WW-9, WW-10 and WW-11 from the May 2011 event, and the potentiometric surface map submitted with the December 2011 SAA report did not include nor take into consideration the October 2011 ground water elevation data from monitoring wells WW-9, WW-10, WW-11, WW-12 or WW-13 from the October 2011 event. Furthermore, tables listing ground water elevations for the May 2011 and October 2011 events do not list ground water elevations for WW-9 through WW-13.

To return to compliance, the owner or operator should measure ground water elevations at all ground water monitoring wells at the facility anytime more than half (currently seven or more) of the ground water monitoring wells at the facility are sampled in an event, and construct a potentiometric surface map utilizing all of the ground water elevations obtained from that event.

3. OAC Rule 3745-27-10(E)(12) and -10(E)(12)(b): Semiannual assessment activities report. The owner or operator shall submit to the appropriate Ohio EPA district office and to the approved health department, upon implementation of the ground water quality assessment plan submitted under paragraph (E)(2) of this rule, a report on the activities being conducted at the facility as part of implementation of the ground water quality assessment plan. All monitoring and reporting required by paragraph (E) of this rule shall continue until the director releases the owner/operator from this obligation or the corrective measures plan is approved. Any documents or data previously submitted by the owner/operator during the six month period need not be submitted with the semiannual report. Previously submitted documents or data shall

be referenced within the semiannual report as having been submitted. This report shall be submitted semiannually and contain the following:

(a) A narrative description of all assessment activities that have occurred since the previous report.
(b) All data generated as part of the assessment program since the previous report.

The December 2011 SAA report was missing important data and mischaracterized important data from assessment activities, as follows:

- December 2011 SAA report did not contain copies of field data sheets from ground water sampling events conducted during implementation of the GWQAP nor did it include references to earlier reports that may contain such field data sheets.
- The boring/well completion log for WW-12 failed to accurately depict the construction of WW-12 in that it lists the well depth as "total well depth ±51 ft" (i.e. approximately 51 feet) but the riser is listed as being "±4ft" and the well screen is listed as being "±10 ft," for a total of approximately 14 feet. The length of the riser plus the length of the screen must be approximately the same as the total depth of the well. Therefore, the total depth of the well and/or the length of the screen and/or the length of the riser are listed incorrectly, as may be the caricature of the grout seal and sand pack on the WW-12 log.

To return to compliance, the owner or operator must do the following:

a) Submit copies of all field data sheets from ground water sampling events conducted during implementation of the GWQAP that have not yet been submitted to Ohio EPA, and must either re-submit copies of field data sheets previously submitted to Ohio EPA or reference the report(s) that contain copies of those field data sheets.
b) Correct the boring/well completion log for WW-12 to accurately reflect the installed construction of WW-12 and re-submit a copy of the revised WW-12 log to Ohio EPA.

More Information Needed to Determine Compliance

1) OAC Rules 3745-27-10(E)(1) & -10(E)(4)(e)(i): which require the owner or operator to implement and comply with the GWQAP, including the planned use of statistical data evaluation described in section 3.5 of the GWQAP.

The owner or operator does not appear to have utilized the data evaluation procedures described in the GWQAP, but rather used an alternative data evaluation tool(s) not described in the GWQAP and created the December 2011 SAA report based on utilization of the alternative data evaluation tool(s).

Section 3.5 of the GWQAP, revision 1.1 dated January 26, 2011 states that the data evaluation procedures to be used on ground water quality assessment data in accordance with OAC 3745-27-10(E)(4)(e) "are detailed in Section 4.3.3 if the approved GWMP." Section 4.3.3 of Groundwater Detection Monitoring Program Plan, revision 4.1, dated July 2010 (GWMP) states that "interwell statistical methods will be used in accordance with the requirements of OAC 3745-27-10." More specifically, Appendix F of the GWMP states that interwell prediction limits will be used to compare downgradient well data to upgradient well data. However, no mention of prediction limit results are included in the text of the SAA and no statistical analysis results were included in an appendix or other part of the SAA for extent wells WW-9 through WW-13, nor reference to previous statistical analysis results for WW-5.

The following well/constituent combinations have exceeded the upper prediction for the May 2011 event and previous events and/or exhibited concentrations far exceeding the upper prediction limit during the May 2011 event, and thus indicate the presence of a release of waste-derived constituents at these six monitoring well locations:

WW-2: ammonium, barium, chloride, potassium, sodium

WW-5: chloroethane, ammonium, barium, chloride, potassium

WW-9: chloroethane, ammonium, barium, chloride, potassium

WW-10: benzene, potassium, sodium

WW-11: benzene, chloride, sodium

WW-13: ammonium, barium, chloride, potassium

Since no other data analysis procedures were identified in GWQAP, at a minimum, the seven constituents: benzene, chloroethane, ammonium, barium, chloride, potassium, sodium should have been identified as waste-derived constituents released to ground water at the locations and combinations shown above, and the rate, extent of migration and concentrations of those waste-derived constituents should have been estimated based on the existing monitoring well network, with installation of additional monitoring wells and/or sampling proposed as needed.

Examples of data evaluation procedures utilized in the December 2011 SAA report that are either outside the scope of the GWQAP or at least should have been informed by data evaluation procedures from Section 3.5 of the GWQAP include the following:

- Section 1, page 2 of the SAA concludes that the "historical data set (sic) do not identify a statistically significant increase in concentration at this well location (i.e. WW-5); concentrations of chloroethane have remained consistent for over ten years. The concentrations detected (4 µg/L in the June 2010 sampling episode) are more than one order of magnitude less than the 100 µg/L Maximum Contaminant Level (MCL) established for chloroethane under the Safe Drinking Water Act."

    - Utilizing the upper prediction limit prescribed in Section 3.5 of the GWQAP, the statistical limit for chloroethane is a non-parametric upper prediction limit based on the highest value in background for chloroethane. Since chloroethane is all non-detect in background, any quantified detection (i.e. at or above the PQL) would constitute a statistical exceedance. The historical data set clearly shows that chloroethane has been detected at or above the PQL at WW-5 consistently over the last 10 years of monitoring. Furthermore, comparison of downgradient well concentrations to MCLs or the use of trend testing (i.e. "concentrations of chloroethane have remained consistent for over ten years") are not prescribed in the GWQAP.

- Section 3.2, pages 7-8 of the SAA conclude "the benzene and toluene detections in WW10 and WW11 are attributed to the fact that the wells were sampled shortly after installation in shale. It has been documented that wells newly installed in shale may have sampling results similar to this as the shale contains hydrocarbons that are released to groundwater when the bedrock is newly penetrated. These compounds, by themselves are not considered indicators of impact to groundwater from leachate."

    - Had this evaluation been driven by or at least informed by the statistical procedures outlined in the GWQAP, benzene and toluene would not have been "by themselves," but rather one of several statistically elevated constituents at WW-10 and WW-11 detailed above, and thus may change the interpretation).

It should be noted that OAC 3745-27-10(E)(12) does not require data analysis *results* to be included in the SAA report, rather just a narrative of activities and all *data* obtained from activities competed since the last report. However, the final

assessment report required by OAC 3745-27-10(E)(7) must include data analysis results, and the issues listed above would be actual violations if they occurred in the final assessment report. Therefore, to demonstrate compliance in the future ground water assessment report required by OAC 3745-27-10(E)(7), the owner or operator should do the following prior to completion of the final assessment report:

a) Statistically evaluate the ground water monitoring data from assessment wells WW-2, WW-5, WW-9, WW-10, WW-1 and WW-13 in accordance with the GWQAP to determine which monitoring parameters are above background and are thus potential waste-derived constituents. The owner or operator must also submit copies of the statistical analysis report from any such statistical analysis in accordance with OAC 3745-27-10(12)(b).

b) Revise the GWQAP to describe data evaluation procedures the owner or operator intends to use to supplement or use in lieu of those already described in Section 3.5 of the GWQAP.

Statements

1) WW-13 (and all other assessment wells) must be sampled in accordance with the schedules found in OAC 3745-27-10(E)(5)(b).

Section 5, page 9 of December 2011 SAA report states "no additional monitoring of WW13 seems warranted at this time. The well should be preserved in the event that some future change in conditions suggests that resampling this well is appropriate."

Please note that OAC 3745-27-10(E)(5)(b) requires that any well that is needed or used to meet the provisions of paragraph (E)(6) of this rule (i.e. to determine the rate, extent and concentrations of the release) must continue to be sampled in accordance with the semi-annual and annual schedules prescribed in OAC 3745-27-10(E)(5)(b)(i-ii). WW-13 is certainly needed to make the determination of rate, extent and concentrations of the release(s) at the facility and thus it would be a violation to not continue to sample WW-13 (or other assessment wells) in accordance with OAC 3745-27-10(E)(5)(b)(i-ii).

2) A meeting is needed between the owner of the sanitary sewer, the owner or operator of the facility and Ohio EPA to discuss the potential leachate impact to the sanitary sewer trench fill.

Section 3.2, page 8 of the December 2011 SAA report states that the underground sanitary sewer trench fill running west-to-east along the northern edge of the facility "may be acting as an interceptor for impacted groundwater flowing north from the landfill (Table 3). Additional assessment of groundwater quality along the sewer

trench to the east is needed to fully understand groundwater dynamics in that area." Additionally, Section 5, page 10 of the December 2011 SAA report further states "additional monitoring, including installation of temporary or permanent groundwater monitoring points along the sewer trench should be performed to assess what happens to any groundwater that might be captured in that trench as it migrates northward."

Ohio EPA agrees with these statements, and thinks that to obtain a better understanding of the potential impact to human health, safety and the environment and the duties involved, there should be a meeting involving the owner or operator of the facility, the owner of the sanitary sewer (presumably the City of Westlake), and representatives from the Ohio EPA, Divisions of Materials and Waste Management, Drinking and Ground Waters, and Surface Water, and the Cuyahoga County Health Department.

3) The owner or operator is required by OAC 3745-27-10(E)(12) to submit a semi-annual assessment activities report approximately every six months during implementation of the ground water quality assessment report, and the report need only include a narrative description of assessment activities and copies of all data generated since the previous report.

The next semi-annual assessment activities report is due around June 2012 based on the date of the previous report (December 2011). It should be noted that the rule requires submission of a short narrative description of activities and copies of data pages such as laboratory reports, well installation logs (for any newly installed wells), well sampling field logs and other such data since the previous report, but does *not* require descriptions of any data evaluations (e.g. statistical) to be included in the report. Reporting of data evaluation is only required in the final assessment report required by OAC 3745-27-10(E)(7).

Nothing in this letter shall be construed to authorize any waiver from the requirements of any applicable state or federal laws or regulations. This letter shall not be interpreted to release the City of Westlake from responsibility under Chapters 3704, 3714, 3734, or 6111 of the Ohio Revised Code or under the Federal Clean Water or Comprehensive Environmental Response, Compensation, and Liability Acts for remedying conditions resulting from any release of contaminants to the environment.

Please submit a response within 60 days of receipt of this letter, indicating how the facility has returned to compliance with the OAC Rule 3745-27-10(B)(5), OAC Rule 3745-27-10(C)(3), OAC Rule 3745-27-10(E)(12) and OAC Rule 3745-27-10(E)(12)(b).

If you have any technical questions regarding this review, please contact Steve Churchill of the Division of Drinking and Ground Waters at (614) 728-1225. Please submit all correspondence to Jennifer Carlin, Division of Materials and Waste Management, NEDO, Ohio EPA, 2110 East Aurora Road, Twinsburg, OH 44087.
If you have any questions regarding this letter, please feel free to contact me at (330) 963-1133, or e-mail me at "jennifer.carlin@epa.state.oh.us."

Sincerely,

Jennifer Carlin

Jennifer Carlin
Environmental Specialist
Division of Materials and Waste Management

JC/cl

cc: Mike Sekerak, Cuyahoga County Health Department
Fraser Hamilton, Earth Consulting, LTD
Stephen Churchill, DDAGW, CO
File: [Sowers/LAND/Westlake City LF/GRO/18]
DMWM #4185