Ohio EPA
40 years and moving forward

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

July 31, 2013

Paul Quinn
Service Director
City of Westlake
27216 Hilliard Boulevard
Westlake, Ohio 44145

RE: Westlake City Landfill Cuyahoga County
Post Closure Ground Water Monitoring Report, October 2012 Sampling Episode
Notice of Violation
Additional Information Needed to Determine Compliance

Dear Mr. Quinn:

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

- Post Closure Ground Water Monitoring Report, October 2012 Sampling Episode,

The document is dated February 2013. It was received on February 27, 2013 and reviewed for compliance with Ohio Administrative Code (OAC) 3745-27-10 and the facility's revised 2004 ground water detection monitoring plan (GWDMP). 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, and is currently conducting post-closure ground water detection monitoring and ground water quality assessment monitoring in accordance with OAC Rule 3745-27-10 of the 2003 revised Solid and Infectious Waste Regulations. Monitoring wells WW-2, WW-5, and WW-9 through WW-13 are currently in the ground water quality assessment program and are being sampled in accordance with the ground water quality assessment plan. All other monitoring wells (i.e. WW-1, WW-3R, WW-4, WW-6R, WW-7, WW-8) at the facility are currently in the detection monitoring program.

The sampling report was prepared and submitted to conform to OAC Rule 3745-27-10(C)(10) of the 2003 revised Solid and Infectious Waste regulations. Therefore, the October 2012 report was reviewed for compliance with OAC 3745-27-10 and the facility's revised 2004 ground water detection monitoring plan (GWDMP).

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

Violations

1) OAC Rules 3745-27-10(C)(1): General requirements. The ground water monitoring program shall include consistent sampling and analysis procedures and statistical methods that are protective of human health and the environment and that are designed to ensure monitoring results that provide an accurate representation of ground water quality at the background and downgradient wells installed in accordance with paragraph (B), (D), (E), or (F) of this rule. The following shall be included in the ground water detection monitoring plan, ground water quality assessment monitoring plan, compliance monitoring plan, and corrective measures plan:

   and

   OAC Rules 3745-27-1010(C)(1)(b): The statistical method selected by the owner or operator shall be in accordance with paragraphs (C)(6) and (C)(7) of this rule.

   The statistical limit used for arsenic in the October 2012 report does not comply with the procedures described in the June 2010 statistical analysis plan within the GWDMP and is not representative of background ground water quality at the facility.

   The non-parametric statistical limit for arsenic [0.059 milligrams per liter (mg/L)] listed in the summary table in Appendix D of the October 2012 report is described in the statistical output pages in the June 2012 report as "limit is highest of 33 background values." However, the result of 0.059 mg/L on April 28, 2000 at WW-7 is a statistical outlier and is not representative of background ground water quality and should have been entified as a statistical outlier using the procedures described in the statistical analysis plan or other statistical resource and excluded from the statistical background data base.

   The result of 0.059 mg/L at WW-7 is more than an order of magnitude higher than the next-highest arsenic result in background (estimated result of 0.00237 mg/L at WW-4 in October 2005). This result of 0.059 mg/L is clearly an outlier in the Box and Whiskers plot for arsenic in Appendix D of the June 2012 report and should have been identified as an outlier using the Grubb's test described in the statistical analysis plan or other outlier tests (see Ohio EPA, Division of Materials & Waste Management guidance document #715 "Evaluation of Statistical Outliers and Statistically Significant Trends in Ground Water Quality Data"). Thus the resulting non-parametric prediction limit of 0.059 mg/L for arsenic is not representative of background ground water quality at the facility and should not be used as a statistical limit.

   To return to compliance with these rules, the owner or operator must follow the procedures in the statistical analysis plan, including performing outlier tests on the

arsenic data set and deleting the arsenic result of 0.059 mg/L at WW-7 from the statistical background data set for arsenic, then re-compute the statistical limit for arsenic and submit the results to Ohio EPA.

2) OAC Rule 3745-27-10(C)(8): Determination of a statistically significant increase over background. The owner or operator shall determine whether or not there is a statistically significant increase over background for each parameter or constituent required to be statistically analyzed within the ground water monitoring program. The owner or operator shall make this determination each time he assesses ground water quality. To determine whether a statistically-significant increase or decrease has occurred, the owner or operator shall compare the ground water quality of each parameter or constituent at each downgradient ground water monitoring well to the background value of that parameter or constituent according to the statistical procedures specified in paragraphs (C)(6) and (C)(7) of this rule.

   The owner or operator utilized an improper statistical limit for ammonia and failed to identify an SSI for ammonia at WW-6R during the October 2012 sampling event.

   The statistical limit for ammonia (400 mg/L) shown in the summary table in Appendix D of the October 2012 report does not correspond to any detections or the distribution of ammonia in background at the facility. No detailed statistical output sheets for ammonia were included in the October 2012 report. However, the highest result in the ammonia background listed in the June 2012 report is 5.1 mg/L from March 2003 at WW-7, and the upper prediction limit for ammonia in the June 2012 report is listed as 3.141 mg/L. No anomalously high ammonia detections could have been updated into background between the June 2012 and October 2012 sampling events. Therefore, the statistical limit for ammonia should have been consistent with the June 2012 report limit of 3.141 mg/L and thus the ammonia concentration of 6.5 mg/L detected at WW-6R should have been identified as an SSI for the October 2012 event.

   To return to compliance with this rule, the owner or operator must re-do the statistical analysis for ammonia for the October 2012 event and compare the results to the appropriate statistical limit for ammonia and submit the results, including a written declaration in accordance with OAC 3745-27-10(D)(7)(b) that an SSI occurred for ammonia at WW-6R during the October 2012 event.

3) OAC Rule 3745-27-10(C)(10): Submission of results. All ground water elevation, sample analysis and statistical analysis results generated in accordance with paragraphs (B), (C), (D), (E) and (F) of this rule shall be submitted to Ohio EPA not later than seventy-five days after sampling the well. All ground water data and an accompanying text shall be submitted to Ohio EPA in a form specified by the director or his authorized representative. The data and accompanying text required to be submitted in accordance

with this paragraph shall be placed in the operating record in accordance with rule 3745-27-09 of the Administrative Code.

The October 2012 report documents that the wells were sampled on October 17-18, 2012, leading to submittal deadlines of December 31, 2012 and January 1, 2013. However, the October 2012 report is dated "February 2013" and was received by Ohio EPA on February 27, 2013, one-hundred-thirty-three (133) days after sampling began.

To demonstrate compliance, the owner or operator must submit ground water monitoring data from future sampling events within 75 days of sampling a well.

4) OAC Rule 3745-27-10(D)(7)(b): The owner or operator shall submit a written notification to Ohio EPA of a statistically significant increase over background not later than seventy-five days after withdrawing a sample from the well, that upon analysis demonstrates a statistically significant change. A copy of this notification shall be placed in the operating record in accordance with rule 3745-27-09 of the Administrative Code. The notification must indicate which wells and parameters have shown a statistically significant increase over background levels.

The owner or operator failed to identify and report to Ohio EPA a SSI for benzene in the October 2012 report or other document within seventy-five days of sampling.

Benzene was detected above the practical quantitation limit (PQL) at WW-6R, and the statistical output sheets for benzene in Appendix D of the October 2012 report clearly depict the benzene concentration at WW-6R (18 µg/L) as exceeding the non-parametric prediction limit for benzene (2.5 µg/L). However, the benzene concentration of 18 µg/L at WW-6R was not identified as an SSI along with other listed SSIs in Section 4.0 of the report.

To demonstrate compliance, the owner or operator must submit notification of any SSIs from all future sampling events within 75 days of sampling the well.

5) OAC Rule 3745-27-10(E)(5)(a)(i) Assessment monitoring schedule, frequency, and parameters: Within one hundred thirty-five days of notifying Ohio EPA of a statistically significant change in accordance with paragraph (D)(7) of this rule, the owner or operator shall do the following: Sample the affected well(s) and analyze the samples for all waste-derived constituents, including all constituents listed in appendix I 3745-27-10 24 and appendix II of this rule. Any background wells within the flow path or closest to the affected well and screened within the same geologic unit as the affected well shall be sampled and analyzed for appendix I and II parameters.

SSIs for beryllium, cobalt, lead and potassium occurred at WW-3R in the October 2012 event, but no resampling results or false positive demonstration in accordance OAC

3745-27-10(D)(7)(c) were received by Ohio EPA by the deadlines of April 16, 2013 (D7ci) or May 15, 2013 (D7cii).

Similarly, SSIs for benzene, ammonia, barium, lead and potassium occurred at WW-6R in the October 2012 event, but no resampling results or false positive demonstration in accordance OAC 3745-27-10(D)(7)(c) were received by Ohio EPA by the deadlines of April 17, 2013 (D7ci) or May 16, 2013 (D7cii).

Accordingly, monitoring wells WW-3R and WW-6R are now in the ground water quality assessment program and the ground water quality assessment plan (GWQAP) must be revised to include them.

Furthermore, no Appendix I and II sampling results for WW-3R and WW-6R were received by Ohio EPA by the May 15-16, 2013 deadlines in accordance with OAC 3745-27-10(E)(5)(a)(i). Therefore, the owner or operator is in violation of OAC 3745- 27-10(E)(5)(a)(i).

To return to compliance with this rule, the owner or operator must sample wells WW-3R and WW-6R for Appendix I and II parameters and submit the results to Ohio EPA. Additionally, as stated above the GWQAP and GWDMP must be revised.

Additional Information Needed to Determine Compliance

1) OAC Rule 3745-27-10(C)(1): which requires that the owner or operator utilize consistent sampling and analysis procedures that provide an accurate representation of ground water quality at the background and downgradient wells.

   Several coincident data anomalies and/or missing data from the October 2012 report and GWDMP prevent a determination of whether the samples obtained during the October 2012 sampling event are representative of ground water quality at particular monitoring wells. The data anomalies and/or missing data include the following:

   - Dissolved oxygen (DO) concentrations reported for wells WW-3R, WW-13 and WW-14 are anomalously high compared to those reported for other wells (one to two orders of magnitude). Also, oxidation-reduction potential (ORP) levels reported for WW-3R were highly positive whereas ORP reported for all other wells were negative. Given that these three wells were the final three wells sampled on October 17, 2012 and at the end of the day (i.e. 4pm-6pm), it appears that the water quality meter bulb(s) fell out of calibration later in the afternoon of October 17th. This same issue occurred during the May 2011 sampling event at WW-3R. No record of an afternoon calibration on October 17, 2012 was found in the report.

- The field data sheet for WW-6R stated that "The water level was below the top of sample pump. Could not measure depth to water. Micro purging to evacuate tubing only."

  While water level decline below the top of a dedicated pump can be an unavoidable occurrence at times, as described in the next bullet below it is not clear from the sampling and analysis plan (SAP) [either the July 2010 version or revision 5 from March 2013] or the October 2012 report what the elevation of the pump or pump intake is and if the pump is appropriately placed within the well screen.

- Pump intake elevations cannot be determined. The low-flow and minimum purge/no purge purging and sampling methods utilized at the facility necessitate that the pump intake be within the well screen interval. Furthermore, if water levels within a well are typically low, the pump may need to be lowered to at or near the bottom of the wells screen to facilitate water level measurement and assure sufficient water column height for purging and sampling. However, neither the SAP nor the October 2012 report describe the elevation of the pumps or pump intakes within the monitoring wells at the facility. Similarly, the field data sheets indicate that a peristaltic pump was used to perform low-flow at wells WW-11, WW-13, WW-14 and WW-15 but the elevation of the end of the tubing (pumping intake) was not described, and the field data sheet for WW-12 indicates that a submersible pump was used but the elevation of the pump or pump intake was also not described.

  The July 2010 SAP quotes the Ohio EPA Technical Guidance manual, generally stating that "it is recommended that the pump be set in the center of the well screen interval," but no specific requirement that the pump or pump intake be set in the well screen interval is made in the SAP, nor is the depth of pump or pump intake described. Therefore, Ohio EPA cannot determine where the pumps or pump intakes are placed in any of the monitoring wells at the facility, and thus cannot determine if the low-flow or minimum purge/no purge methods are being implemented correctly.

- The equipment volume for wells WW-3R and WW-6R cannot be determined to verify if the minimum purge/no purge methods are being implemented correctly at those locations. The minimum purge/no purge method is not described in the July 2010 SAP, but is described in Revision 5 from March 2013, stating that "this method only requires that the "dead volume" of water remaining in the dedicated pump and tubing from the previous event (typically about 1 liter) be purged prior to collection of the sample. Field data sheets will include the estimated volumes to be purged for each well with a dedicated pump."

  Nowhere in the SAP or on the field data sheets for WW-3R and WW-6R does it describe the "volumes to be purged" or even the tubing diameter or volume or the pump volume. Therefore, Ohio EPA cannot determine if the volume purged from WW-

3R or WW-6R during the October 2012 sampling event was sufficient for the minimum purge/no purge method.

To demonstrate compliance with this rule, the owner or operator must submit the following:

a) Documentation of the elevation of the pump or pump intake for all monitoring wells at the facility, including that the pump intakes are within the screened interval for each well for the October 2012 sampling event and all subsequent events.

   For dedicated bladder pumps, the owner or operator should describe using a diagram and/or text to specifically describe the elevation of the pump and pump intake, either referenced as depth below the top-of-casing or in feet above mean sea level, and can either be documented in the SAP or on the field data sheets for each sampling event.

   For portable submersible pumps, the SAP or the field data sheets for each sampling event should describe using a diagram and/or text the elevation of the pump and pump intake, either referenced as depth below the top-of-casing or in feet above mean sea level.

   For peristaltic pumps, the SAP or the field data sheets for each sampling event should describe using a diagram and/or text the elevation of the bottom of the tubing where the sample is collected, either referenced as depth below the top-of-casing or in feet above mean sea level.

b) A demonstration that the dissolved oxygen and/or ORP measurements at wells WW-3R, WW-13 and WW-14 during the October 2012 sampling event were either within the normal range for those wells, or a demonstration that the stabilization of the other water quality stabilization parameters plus possibly other evidence sufficiently demonstrates that water quality was stabilized at those well, despite the water quality meter falling out of calibration for DO and/or ORP.

c) Documentation of the "volumes to be purged" at WW-3R and WW-6R during the October 2012 sampling event, including the water-filled volume of the tubing and pumps such that a reviewer can verify that the "dead volume" in the sampling equipment at the beginning of purging has been sufficiently purged prior to obtaining a sample. This data should also be submitted for each future sampling event.

2) OAC Rules 3745-27-10(C)(1) and -10(C)(7)(e): which require that the owner or operator utilize consistent sampling and analysis procedures and statistical methods that are designed to ensure monitoring results that provide an accurate representation of ground

water quality at the background and downgradient wells, including that any practical quantitation limit used be the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

The reporting limits (RLs) used in the laboratory report may not the requirement of these rules. RLs were used for many inorganic parameters in the laboratory report within the October 2012 report, but no definition or description of how these RLs were derived was provided. The state municipal solid waste rules (OAC chapter 3745-27) and federal rules (40 CFR 258.51-258.58) recognize the use of a PQL as the lower quantification limit of a laboratory method within the phrase "the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions." However no definition or description of RL is given in the state or federal rules nor is one provided in the laboratory report for the October 2012 event.

Additionally, OAC 3745-27-10(C)(1) requires that analysis methods be "protective of human health." For parameters with an MCL like antimony, arsenic and thallium, Ohio EPA interprets these rules to require that lower quantitation limits *typically* be below the MCL. The October 2012 report included RLs at or above maximum contaminant levels (MCLs) (e.g. antimony, arsenic, thallium).

Furthermore, for a lower quantitation limit to be "the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions available to the facility," it should be consistent with current laboratory technology. Ohio EPA, Division of Materials and Waste Management guidance document #406 provides a "Target PQL List" of PQLs for parameters found in OAC 3745-27-10, Appendix I that Ohio EPA interprets as fulfilling the requirement of OAC Rule 3745-27-10(C)(7)(e).

The lab narrative stated that "high levels of analyte" were in the samples, necessitating a dilution of samples and thus leading to the high reporting limits. However, it is not clear from the October 2012 report why samples from the October 2012 event required dilution and subsequent higher RLs, but previous sampling events did not.

To demonstrate compliance with these rules, the owner or operator must submit at least one of the following:

a) A revised laboratory report for the October 2012 event that reports the actual lower quantitation limits for all inorganic parameters in accordance with OAC 3745-27-10(C)(7)(e) [i.e. "the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions" and the revised results from analyses using the revised quantitation limits for the October 2012 samples.

b) A letter from the laboratory attesting that the RLs used in the analyses of the October 2012 samples do fit the requirement of OAC 3745-27-10(C)(7)(e) to be "the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions," along with a definition or detailed description of how each of the RLs were derived, including their relation to the method detection limit (MDL) and dilution factor.

Additionally, please note that if the owner or operator's laboratory cannot typically achieve PQLs at or below the Target PQLs in guidance #406 using its currently-applied instruments and/or procedures, to avoid future violations the owner or operator's laboratory may need to utilize different instruments (e.g. "high TDS" instrument versus "low TDS" instrument and/or procedures, or the owner or operator may need to utilize a different laboratory to typically achieve lower PQLs.

3) OAC Rule 3745-27-10(D)(5)(a)(iii): which requires that the owner or operator semiannually perform statistical analysis on sample results from wells screened in the uppermost aquifer system for parameters 1-66 of Appendix I of OAC 3745-27-10.

The October 2012 report did not include detailed statistical output sheets for parameters ammonia, chloride, sodium, arsenic, beryllium, cadmium, chromium, cobalt, copper, nickel, selenium, silver, vanadium and zinc, but rather only a summary sheet of the statistical analyses of these parameters, or rather a mere statement in Section 4.0 and Table 3 regarding the results (beryllium, cobalt, thallium, vanadium). Additionally, statistical analysis results submitted in the October 2012 report included errors in statistical analysis (e.g. ammonia, as described in Violation 2 above).

To demonstrate compliance with this rule, the owner or operator must submit to Ohio EPA detailed output sheets for the missing parameters mentioned above that show the statistical parameters used in each analysis as well as the comparison of sampling results to each statistical limit for the October 2012 event and submit.

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.

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 owner or operator, or others, 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 remedying conditions resulting from any release of contaminants to the environment.

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 #4937