



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

Re: Closed St. Marys Landfill
Auglaize County
Notice of Violation

August 23, 2013

Mr. Greg Foxhoven
Director of Public Service and Safety
City of St. Marys
101 East Spring Street
St. Marys, Ohio 45885

Dear Mr. Foxhoven:

On June 21, 2013, the Ohio Environmental Protection Agency (Ohio EPA), Division of Materials and Waste Management (DMWM), Northwest District Office (NWDO) received a document titled "Statistical Report of Groundwater Quality for the Detection Monitoring Program, Notification of Statistical Significance and Constituents Detected in Assessment Monitoring Wells at the St. Marys Landfill, and Sampling Results for Investigative Monitoring Wells MW-7 through MW-14; AUG009310030006", dated June 20, 2013, for the St. Marys Landfill (Facility).

This document was submitted by Hull and Associates, Inc., on behalf of the owner/operator. The submittal presents the 2013 first semiannual ground water detection monitoring report as required by Ohio Administrative Code (OAC) Rule 3745-27-10 (D) and the 2013 first semiannual ground water assessment monitoring report as required by OAC Rule 3745-27-10 (E), and other information resulting from the spring 2013 sampling event. Following are Ohio EPA comments related to this submittal.

COMMENTS

Violations

1. **The City of St. Marys continues to be in violation of: OAC Rule 3745-27-10(E)(1) which requires the owner/operator, who has not obtained approval to remain in detection monitoring under OAC Rule 3745-27-10(D)(7)(c)(ii) within two hundred and ten days from initial sampling, to implement a ground water quality assessment plan capable of determining the concentration, rate and extend of migration of waste-derived constituents; and OAC Rule 3745-27-10(E)(3) which requires the owner/operator, who has not obtained approval to remain in detection monitoring under OAC Rule 3745-27-10(D)(7)(c)(ii), to submit to Ohio EPA a ground water quality assessment plan within one hundred and thirty-five days of notifying the agency of a statistically significant increase over background. The owner/operator needs to comply with the requirements of these rules and provide and implement a ground water quality assessment plan.**

On January 19, 2012, Ohio EPA received the statistical report of ground water quality for the November 2, 2011, sampling event. On page 4 of that report in the section titled Notification of Statistical Significance the owner/operator indicates, "This report serves as formal notification to Ohio EPA that statistical significance were (sic) calculated for copper in uppermost aquifer monitoring wells BW-2, BW-3, BW-4 and BW-6, potassium, zinc, and 4-methyl-2-pentanone in uppermost aquifer monitoring well BW-3. The City of St. Marys is planning to complete confirmation resampling activities for these monitoring well/parameter combinations in the near future and will submit to Ohio EPA the results of these activities." No report of this resampling has been received by Ohio EPA. In addition, no demonstrations in accordance with OAC Rule 3745-27-10 (D)(7)(c) or OAC Rule 3745-27-10 (E)(9) for these parameters at these wells have been provided to Ohio EPA and no approval to remain in or return to the detection monitoring program has been granted.

The two hundred and ten day period from initial sampling ended May 30, 2012. The owner/operator is not complying with OAC Rule 3745-27-10 (E). The one hundred thirty five day period from notification ended June 4, 2012. No assessment plan for these wells has been received by Ohio EPA. These wells have, by rule, been in the assessment program since the end of May 2012. The owner/operator needs to comply with the above-stated rules.

2. **The City of St. Marys is in violation of: OAC Rule 3745-27-10(C)(1)(a), which requires the owner/operator to use the procedures documented within the sampling and analysis plan; and OAC Rule 3745-27-10 (C)(7)(a), which requires the owner/operator to either transform data with a non-normal distribution or use a distribution-free theory test. The owner/operator did not transform the background data as required by their plan and did not utilize a distribution-free theory test for the analysis of ammonia nitrogen at well BW-4. The owner/operator needs to properly analyze this data and any other data which is not normally distributed in accordance with these rules and in accordance with their plan.**

A review of the Shewhart-CUSUM control chart for ammonia nitrogen at well BW-4 indicates the "Original Data (Not Transformed)" was utilized in the statistical analyses. Analysis of the 24 background data points by Ohio EPA indicates that the untransformed data is not normally distributed. Plate I, the decision flow chart for statistical analyses, located in the statistical analyses plan for the facility, indicates that if the data is not normally distributed it will be transformed and retested for normality. The methods of transforming the data will be "Log Normal", "Square Root", "Inverse 1/x", "Arc-Sin", or "Other transformations". Since these non-normal data were not transformed prior to statistical analysis, the owner/operator did not meet the requirements of OAC Rule 3745-27-10 (C)(1)(a) or OAC Rule 3745-27-10 (C)(7)(a). The owner/operator needs to perform the statistical analyses again on these data, and any other non-normal data which were used in a statistical analysis method which was not a distribution-free theory test.

Owner/operator's Response to Previously-Cited Violations

3. **Ohio EPA had previously cited OAC Rule 3745-27-10 (C)(3)(b), which requires that the ground water flow direction be determined for all significant zones of saturation (SZS) monitored, and indicated the facility continued to be in violation of this rule. The agency indicted maps for all SZS needed to be provided. In the current submittal the owner/operator included potentiometric surface maps of the uppermost aquifer system (UAS), the shallow SZS, the deep SZS and a map showing the ground water elevations of the isolated SZS. The owner/operator is no longer in violation of OAC Rule 3745-27-10 (C)(3)(b) relative to the submittal of appropriate potentiometric surface maps.**

4. **Ohio EPA had previously cited OAC Rule 3745-27-10 (B)(1)(b), which requires that the ground water monitoring system consist of a sufficient number of wells in SZS that represent the quality of the ground water downgradient of the limits of solid waste placement; and indicated the facility continued to be in violation of this rule. The agency indicted additional wells needed to be added to the monitoring system for each of the significant zones of saturation. Since the beginning of 2013 the owner/operator has added SZS wells MW-10, MW-11, MW-12, MW-13, and MW-14; and they have begun collecting samples at these wells. The owner/operator is no longer in violation of OAC Rule 3745-27-10 (B)(1)(b) relative to the need for more wells in each of the SZS.**

More Information Needed To Determine Compliance

5. **Compliance with OAC Rule 3745-27-10 (C)(1), which requires that procedures be used that ensure that consistent and representative samples are collected and representative results are produced, cannot be determined at this time. To allow for a determination of compliance with this rule the owner/operator needs to carefully review the detection of a significant number of parameters in the field blanks and explain how the presence and detections of these parameters impacts the analyses of the field samples. Further, the owner/operator needs to implement all necessary changes to procedures to ensure that representative results are provided.**

A review of the results portion of the TestAmerica analytical report indicates a significant number of organic and inorganic detections in field blank number 1. These parameters were both "present" (observed between the PQL and the MDL) and quantified detections. The quantified detected values include potassium, with a concentration (13 mg/L) much greater than recorded in affected wells, sodium, alkalinity, total dissolved solids, chlorodibromomethane (1.2 µg/L), chloroform (1.1 µg/L), and dichlorobromomethane (1.6 µg/L). Field blanks are typically prepared with analyte-free water and should result in no detections if field QA/QC procedures are effective. Often data associated with questionable QC data should not be used in the background.

6. **Compliance with OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. For rule citation see comment number 3 above. To ensure compliance with the requirements of this rule, the City of St. Marys needs to ensure that temporary PQL increases are not utilized in the statistical background. In addition, the City of St. Marys needs to implement a procedure that will ensure that these PQL increases, which are said to be due to matrix interference, do not continue. The owner/operator might need to make changes to analytical methods or sampling procedures to ensure that the lowest PQLs are being utilized.**

In the third paragraph in the Data Review section on page 3 the owner/operator states, "As the result of matrix interferences and/or dilutions, PQLs for several parameters were slightly elevated above the prior analytical PQLs for several monitoring well/parameter combinations as indicated on the laboratory analytical report." Some of these PQLs have only increased recently suggesting that matrix interferences have only recently become a problem. The ground water chemistry does not appear to show this. These recent matrix interferences, and the resulting increases in PQL, need to be investigated. It might be necessary to make corrections in the field or laboratory procedures in order to return to the utilization of the lowest PQLs.

7. **Compliance with OAC Rule 3745-27-10 (C)(7)(c), which requires that when a control chart approach is used to evaluate ground water monitoring data the associated parameter values shall be protective of human health and safety and the environment, also the background population size, data distribution and range of concentration values shall be considered, cannot be determined at this time. Compliance data which was removed from the data base needs to be returned to the data set and the statistical limit should be determined again. The new analyses need to be submitted to Ohio EPA prior to the next sampling event. A similar request was made in an agency letter dated February 13, 2013 and no reply was received from the owner/operator.**

A review of the historical values for well BW-4 indicate that compliance value 0.0123 mg/L for ammonia recorded for a sample collected July 14, 2010, was removed from the compliance data set. The reason provided was that it was an outlier. Based on Table B-14, background for ammonia in well BW-4 includes all values for samples collected between September 15, 1994, and June 20, 2001.

All values subsequent to June 20, 2001, are considered compliance values and should be retained in the database and included in the statistical analyses calculations when Shewhart-CUSUM control charts are utilized. These values should not be removed unless there is a specific reason the data are known to be in error. Since all of the compliance values are utilized in the Shewhart-CUSUM control chart procedure, the removal of data will affect the statistical limit determined by the procedure. The removal of data from the compliance data set may result in results which are not representative of the ground water collected from that well.

8. **Compliance with OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. For rule citation see comment number 3 above. The owner/operator needs to clarify the results of the field parameters and the procedures utilized to obtain those field parameters for wells AW-4 and MW-12.**

The field data sheet for well AW-4 indicates the well was purged at 10:09 on April 9, 2013. One volume (1.50 gallons) was purged from the well before it became dry. At that time the field parameters were pH - 6.55 SU, temperature - 11.2 °C, conductivity - 1510 µmohs/cm, and turbidity - 70 NTU.

On the following day at 08:09, the well was sampled. At that time, all of the field parameters including turbidity were exactly the same as recorded at the end of purging approximately 22 hours earlier. These results seem unusual since none of them changed at all over 22 hours. It would be expected that field parameters might change slightly due to changes in conditions. Turbidity would be expected to decrease due to settling of the particulates causing the turbidity.

Well MW-12 was purged at 8:46 on May 21, 2013 and sampled over four (4) hours later at 12:55 and yet the field parameters at purging and at sampling were exactly the same. These anomalies need to be explained. It is possible the field parameters were not recorded for the field samples collected at the time of sampling and the purge values were used instead.

9. **Compliance with OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. For rule citation see comment number 3 above. To allow for a determination of compliance with the requirements of this rule the owner/operator needs to clarify the results of the field parameters and the procedures utilized to obtain those field parameters for wells MW-10, MW-11, MW-12, MW-13 and MW-14.**

The field data sheets for the initial sampling at wells MW-10 through MW-14, completed during the April 10, 2013, sampling event indicate significantly different readings compared to the May 21, 2013 supplemental sampling event. The readings are listed on the table below.

Well MW-	Date 2012	Time 24 hr clock	pH SU	Temp °C	Cond µmohs/cm	DO mg/L	ORP mV	Turb. NTU	Wtr. level feet
10	04/10	1010	6.91	15.0	974	0.15	40	1	5.02
10	05/21	1109	7.17	15.5	1150	0	-20	6	6.13
11	04/10	1302	6.99	16.3	1540	0.26	-13	1	7.74
11	05/21	1216	7.26	16.3	1470	0	-109	4	9.30
12	04/10	1430	6.79	24.2	858	2.11	80	82	9.70
12	05/21	1255	6.43	14.4	1020	-	-	>1000	11.31
13	04/10	1400	6.71	24.4	1260	4.20	67	83	10.94
13	05/21	1305	7.39	17.8	1150	-	-	>1000	11.40

Well MW-	Date 2012	Time 24 hr clock	pH SU	Temp °C	Cond µmohs/cm	DO mg/L	ORP mV	Turb. NTU	Wtr. level feet
14	04/10	1449	6.68	17.4	1860	0	-30	96	11.14
14	05/21	0948	6.71	15.9	2120	0	-101	21	12.19

The readings between the two dates display high variability. For example, while it is expected that the temperature of the shallow ground water might increase between April and May or stay the same it is not expected that it decrease substantially as shown in wells MW-12, MW-13, and MW-14. It is likely that conductivity would change slightly in the same direction (up or down), however, in some wells it increased and in others it decreased. Also, DO, ORP and turbidity changed significantly between April and May. This might be due to changes in purging and sampling procedures. The other changes may be due to the use of different meters or different calibrations. These anomalies need to be analyzed and explained.

10. **Compliance with OAC Rule 3745-27-10 (C)(1), which requires the use of statistical procedures which are designed to ensure monitoring results that provide an accurate representation of ground water quality at the background and downgradient wells; and OAC Rule 3745-27-10 (C)(6), which requires that the statistical method utilized by the facility be protective of human health and the environment, cannot be determined at this time. Several wells display an increasing trend in the background data set. To allow for a determination of compliance with the requirements of this rule, the owner/operator needs to clearly show that the designated background is representative of current background conditions. Alternatively, the owner/operator would need to adjust background to be representative of current background conditions.**

A review of the potassium and sodium background values at upgradient wells MW-1 and BW-1 indicate the presence of an increasing trend in the background data set for potassium at well MW-1 and potassium and sodium at well BW-1. An agency analysis of the data indicates the early data for all four well/parameter combinations prior to about 2005 are members of a different population compared to the data collected from about 2005 to the present. It appears that the early data is no longer representative of background conditions and has resulted in an upward trend in three of these four well/parameter combinations. This might be due to a change in field or laboratory conditions. The owner/operator needs to update the background using only the data from about 2005 to the present or clearly demonstrate that the current background data set is representative of current conditions.

Statements

11. Several parameters display exceedances in MW-2, MW-3, and MW-4.

While statistical analyses are not necessary to be performed on assessment wells, the owner/operator notes several exceedances for chloride, sodium, ammonia, and potassium as well as several volatile organic compounds (VOCs) in the assessment wells. It should be noted that several other parameters appear to display exceedances compared to upgradient well MW-1 including, but not limited to, barium, iron, and manganese in MW-2; arsenic, iron, manganese, and nickel in MW-3; arsenic, barium, iron, manganese, and nickel in MW-4. Also, wells AW-1, AW-2, AW-3, MW-7, and MW-8 display chloride levels significantly above upgradient background, and well AW-4 displays a sodium level above upgradient background values. In addition it appears that some of the newest wells, MW-10 through MW-14 display inorganic concentrations which are greater than upgradient well MW-1. This is especially true for well MW-14.

12. A letter dated June 13, 2008, (5-7702) sent by Ohio EPA to the City of St. Marys provided thirty one comments related to violations, requests for more information and statements. No response has yet been received by Ohio EPA relative to these requests. More recently, a letter dated December 1, 2008, (5-8055) provided 11 comments. Also, a letter dated July 17, 2009, (5-8504) contained 18 comments; a letter dated February 8, 2010, (5-8901) contained 26 comments; a letter dated July 14, 2010, (5-9362) contained 25 comments, a letter dated December 22, 2010, (5-9773) contained 25 comments, a letter dated November 18, 2011, (5-10577) contained 25 comments; a letter dated February 6, 2012, (5-11196) contained 23 comments; a letter dated August 3, 2012, (5-11658) contained 17 comments, and a letter dated February 13, 2013, (5-12065) contained 26 comments.

13. It is important that apparently non-representative data not be removed from the data set, but it should not be used in background.

At the base of the first paragraph in the "Data Review" section on page 2 of the submittal the owner/operator states, "In a letter dated March 18, 2004, from Ben Smith of Ohio EPA to Mike Mackenzie of the City, Ohio EPA states that the low flow data does not appear to be an accurate representation of groundwater quality and requested it be removed from the statistical dataset. Note that this data was not used in the statistical evaluation and has been excluded from the facility's statistical dataset, but this data is still provided on the summary tables provided in Appendix B."

For clarification, Ohio EPA did not say to exclude the data from the dataset, but indicated that it not be used in background. In the March 2004, letter, Ohio EPA stated, "The analytical results determined from low flow samples should not be utilized in the background data set until they can be shown to be representative of the ground water of the site." It is important to retain the data, but not use it in background for several reasons including the situation where, in the future, it can be shown to be representative of the ground water of the site.

14. A review of the historical data for the wells at the site indicates that some of the wells display a possible increasing trend for non-statistical parameters and perhaps a few statistical parameters. This information is shown on the following table.

WELL	PARAMETERS WITH POSSIBLE INCREASING TREND
MW-6	nitrate/nitrite
MW-1	conductance
AW-1	conductance
AW-3	nitrate/nitrite, chloride, sodium
BW-2	nitrate/nitrite
BW-3	nitrate/nitrite
BW-4	nitrate/nitrite
BW-6	nitrate/nitrite

15. Sodium in assessment well AW-4 appears to display an increasing trend over time. The earliest sodium results, collected beginning in December 1995, are in the range of 37 to 54 mg/L. The latest data, collected in the last 6 years, are in the range of 70 to 88 mg/L (87.8 mg/L in November 2011, 75.9 mg/L in April 2012, 71.9 mg/L in September 2012, 81 mg/L in April 2013). Well AW-4 is completed in an intermediate zone.
16. While the presence of an increase in sodium in the sample collected from SZS well MW-1 and chloride in a sample collected from UAS well BW-1 may be indicative of natural variability, it might also be indicative of radial flow from the landfill, errors in sampling or analysis, or damage to the well.

In the fourth paragraph on page 4 the owner/operator states, "A statistical significance was identified for sodium in upgradient monitoring well MW-1 during this sampling event. This statistical significance is the result of either natural variation in groundwater quality that occurs over time, or unfavorable field and/or laboratory conditions at the time of sample collection and/or analysis, and does not require notification to Ohio EPA as it was calculated for an upgradient well." The previous ground water reports for the spring and fall 2011, and spring and fall 2012, events also indicated statistical significance for sodium at well MW-1 and chloride at BW-1.

17. Samples have been collected from well AW-2, located about 200' north northeast of and downgradient of affected well MW-2, since about 1995. No volatile organic compounds have been consistently observed in the well until vinyl chloride was observed during the April 2012, event and now during the September 2012, and April 2013, events. Resampling during both the spring 2012, and fall 2012, events confirmed the presence of vinyl chloride in the ground water samples collected from this well.

18. **Table B-8, which provides the historical analytical results for well AW-2 indicates that the concentration of vinyl chloride determined for the fall 2012, resampling event was 14 µg/L. The laboratory report indicates the value was 1.14 µg/L. The Table B-8 value might be in error.**
19. **Tables B-17, B-18, and B-19 do not contain a row of data in the metals section for silver even though the analytical report indicates this parameter was analyzed and utilized a PQL of 0.010 mg/L. The row label "Sodium, Dissolved" in the metals section could be a typographical error and might need to be "Silver, Total". Correction would be helpful in understanding the results.**
20. **A review of statistical analyses charts indicates a potential change occurring in sodium concentrations following 2004. The charts indicate an increase in sodium concentration beginning with the January 2005, sampling event.**

This increase appears to occur for many of the wells. A general change in concentration across a number of wells is suggestive of a global change in method, perhaps a change in laboratory, laboratory procedures, or equipment. It would be helpful to investigate this change relative to increasing sodium trends and potential future exceedances in sodium. If a general change had occurred, it might be appropriate to move the background window forward.

21. **While it is not necessary to perform statistical analyses on wells in the assessment program, it should be mentioned that based on statistical parameters a number of these wells continue to display exceedances based on a comparison to interwell prediction limits. Also, while not included in the monitoring plan as yet, it appears that two of the three additional wells display exceedances compared to the upgradient well MW-1 using prediction limit analysis. All of these wells are completed in one of the significant zones of saturation. Following is a table of these exceedances:**

WELL	EXCEEDANCE
MW-2	Ammonia, Chloride, Potassium, Sodium, VOC
MW-3	Ammonia, Chloride, Sodium, VOC
MW-4	Chloride, Sodium, VOC
MW-5	Chloride
AW-1	Chloride
AW-2	Ammonia, Chloride, VOC
AW-3	Ammonia, Chloride
AW-4	Sodium
MW-7	Chloride
MW-8	Chloride
MW-10	Chloride, Sodium
MW-12	Potassium
MW-13	Chloride, Potassium
MW-14	Ammonia, Chloride, Potassium, Sodium

22. **The result for field parameter, specific conductance, at well MW-12, is noted to be 85 μ mhos/cm. This value is about an order of magnitude less than what would be expected from unaffected ground water in this area. It appears to be a topographical error. Correction of this error would be helpful in understanding the field results.**
23. **Ohio EPA had previously cited OAC Rule 3745-27-10 (C)(1), which requires that procedures be used that ensure that consistent and representative samples are collected and representative results are produced, and requested additional information relative to high turbidity in three samples. A review of field turbidity values documented for the April 2013, event in the current submittal indicates the values for this parameter have decreased significantly over the past several years. The greatest value is 99 NTU at well MW-7. While this turbidity value is much less than observed in 2010, and 2011, it is still greater than between 2007, and 2009. It should be noted, however, that the current total suspended solids value is similar to the lowest recorded in this well. Ohio EPA commends the owner/operator for their efforts.**

Regarding the May 2013, event, however, wells MW-12 and MW-13 recorded turbidity values of >1000 NTU when they both recorded levels <84 in the April 2013, event. This increase might be due to field procedures. It is suggested the field personnel purge and sample these wells at a slower rate. Also, these wells might need to be redeveloped. The owner/operator is cautioned that parameter values associated with high turbidity might not be representative of the ground water of the site and might not be acceptable for use in background for statistical purposes.

The owner/operator needs to immediately take the necessary measures to return to compliance with Ohio's environmental laws. Within 14 days of receipt of this letter, the owner/operator is requested to provide documentation to this office including the steps taken to abate the violations cited above. Documentation of steps taken to return to compliance includes written correspondence, updated policies, and photographs, as appropriate, and may be submitted via the postal service or electronically to kristin.tillison@epa.state.oh.us.

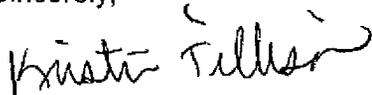
Please be advised that violations cited above will continue until the violations have been properly abated. Failure to comply with Chapter 3734. of the Ohio Revised Code and rules promulgated thereunder may result in a civil penalty of up to \$10,000 per day for each violation. It is imperative that you return to compliance. If circumstances delay the abatement of violations, the City of St. Marys is requested to submit written correspondence of the steps that will be taken by date certain to attain compliance.

If you have any questions contact Randy Skrzyniecki at the Ohio EPA Northwest District Office (419-373-3149).

Mr. Greg Foxhoven
August 23, 2013
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Written correspondence should be sent to the attention of Kristin Tillison, Division of Materials and Waste Management, Ohio EPA Northwest District Office, 347 Dunbridge Road, Bowling Green, Ohio 43402.

Sincerely,



Kristin Tillison, R.S.
Environmental Specialist II
Division of Materials and Waste Management

/llr

pc: Jim Lavrich, Hull & Associates
File Copy: DMWM-SW, Auglaize County, St. Marys Landfill, Groundwater

ec: Randy Skrzyniecki, DDAGW, NWDO
Ken Brock, DDAGW, NWDO
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