



**Environmental
Protection Agency**

Ted Strickland, Governor
Lee Fisher, Lt. Governor
Chris Korlaski, Director

Re: St. Marys Landfill, Auglaize County
Groundwater

December 22, 2010

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

Dear Mr. Hitchcock:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed "Statistical Report of Groundwater Quality for the Detection Monitoring Program and Notification of Constituents Detected in Assessment Monitoring Wells at the St. Marys Landfill (AUG006.100.0004.DOC)". The report was submitted by Hull & Associates on behalf of the owner/operator of the closed St. Marys Landfill (facility). The report is dated September 27, 2010m and documents the July 13 and 14, 2010, sampling event.

The facility is currently operating under the detection monitoring plan as required by OAC Rule 3745-27-10(D) for the uppermost aquifer system, and under the assessment monitoring plan as required by OAC Rule 3745-27-10(E) for the stated significant zone of saturation. A revised corrective measures plan has been submitted to Ohio EPA for the stated significant zone of saturation, but has been found to be inadequate. Based upon Ohio EPA's evaluation, the well systems are not adequate for the significant zones of saturation. The owner or operator should move toward implementation of an effective corrective measure. The following are Ohio EPA comments relating to the current submittal.

COMMENTS

VIOLATIONS

1. **The owner/operator continues to be in violation of OAC Rule 3745-27-10(C)(1) and (C)(1)(a) which require that the ground water monitoring program 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; and that the owner or operator use the procedures documented within the sampling and analysis plan. The owner/operator needs to sample wells that purge dry as soon as enough water is available. Other wells should be sampled immediately after purging to ensure that representative samples are collected.**

The sampling and analysis plan, revised April 2009, states on page 22, "If a sample cannot be obtained after the initial purging, multiple trips to the well with less than 24 hours between trips will be made in accordance with the Ohio EPA Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring (February 1995)." This manual indicates that for wells that purge dry the samples should be collected as soon as sufficient water is available. This is because extended recovery times after purging allow the ground water to equilibrate with atmospheric conditions thereby changing ground water chemistry.

A review of the field data sheets in the submittal indicates that wells: MW-1 (dry) MW-2 (not dry), MW-3 (dry), MW-4 (not dry), MW-5 (not dry), MW-6 (dry), MW-7 (not dry), MW-8 (dry), MW-9 (not dry), AW-1 (not dry), AW-2 (not dry), AW-3 (dry), AW-4 (dry), BW-1 (dry), BW-2 (not dry), BW-3 (not dry), BW-4 (not dry), BW-5 (dry), and BW-6 (not dry), whether purged dry or not, were purged on July 13, 2010, but not sampled until July 14, 2010. Some of these wells recharge quickly enough to collect samples immediately after purging. Other wells recharge quickly enough to collect samples in much less than 24 hours. Only 8 of these 19 wells (MW-1, MW-3, MW-6, MW-8, AW-3, AW-4, BW-1, and BW-5) were purged dry. (MW-1, MW-8, and BW-1 which purged dry this event, were not purged dry in the July 2010 event.) The ability for some of the wells to be sampled on the same day has been established during previous sampling events.

In addition, some of the wells which should have been sampled shortly after purging display changes in field parameters between the end of purging on July 13, 2010, and sampling on July 14, 2010. Following is a table indicating the change in field parameter values from purging on July 13, 2010, to sampling on July 14, 2010, for wells which were not bailed dry and displayed a significant change in ground water chemistry between purging and sampling. (It should be noted that the typical wait time between purging and sampling is over 22 hours.) This change in field parameter values may be due to stagnation of the water in the well between purging and sampling. The values which appear to show a significant change are in **bold**. These differences in values exceed the 10% value specified by the City in SOP No. F3007 included in their sampling and analysis plan. The values marked with an asterisk are those which exceed the current Ohio EPA standards (pH ± 0.2 S.U., conductance $\pm 3\%$, temperature $\pm 0.5^\circ\text{C}$).

WELL	07/13/10 pH	07/14/10 pH	07/13/10 Temp.	07/14/10 Temp.	07/13/10 Cond.	07/14/10 Cond.
MW-2	6.87*	7.39*	11.7*	14.3*	1176*	1310*
MW-4	6.63*	6.97*	13.5*	14.8*	1800	1810
MW-5	7.18*	7.59*	12.3*	14.6*	1500	1470
MW-7	7.06	7.20	12.5*	14.8*	1620*	1640*
MW-9	7.22*	7.60*	15.5*	19.8*	1010*	980*
AW-1	7.09	7.28	10.8*	15.0*	1460*	1410*
AW-2	7.14	7.30	11.3*	14.2*	1520	1540
BW-2	7.09*	7.53*	12.7*	14.3	1140	1130
BW-3	7.16*	7.50*	13.1*	15.6*	1270	1260
BW-4	6.85*	7.33*	13.7*	14.6*	1630	1630
BW-6	7.06	7.24	12.5*	14.2*	1760	1740

2. **The City of St. Marys continues to be in violation of OAC Rule 3745-27-10(C)(3)(b) which requires that the ground water flow direction be determined for all significant zones of saturation monitored. Maps for all significant zones of saturation need to be provided.**

Based on cross sections provided by the owner/operator in April 2009, there are two, and perhaps three separate significant zones of saturation. (AW-3 and AW-4 are screened in a separate zone from the other SZS wells based on the most recent cross sections.) The owner/operator submitted one map for the "Significant Saturated Units", indicating flow direction; however, since there are two (2) or three (3) significant zones of saturation, there should be a map for each of these zones.

3. **The City of St. Marys continues to be in violation of OAC Rule 3745-27-10(B)(1)(b) which requires that the ground water monitoring system consist of a sufficient number of wells in significant zones of saturation that represent the quality of the ground water downgradient of the limits of solid waste placement. Additional wells need to be added to the monitoring system for each of the significant zones of saturation.**

Based on cross sections provided by the owner/operator in April 2009, there are two (or three) separate significant zones of saturation. As of yet, and based on the cross sections, the two thicker zones (typically occurring at about 825' and 835') are not properly monitored and additional wells are needed in each of these zones as documented by Ohio EPA in a letter to the owner/operator dated September 27, 2004. In addition, the need for additional wells and the potential locations of these wells was discussed with the owner/operator in a meeting held in the City of St. Marys on September 16, 2004. Based on the recent cross sections and maps there are at least six (6) more monitoring wells that are needed at the site in the two thicker zones.

4. **The City of St. Marys continues to be in violation of: OAC Rule 3745-27-10(D)(7)(c)(ii), which requires the owner/operator, who has not obtained approval to remain in detection monitoring under this rule, to comply with the provisions of OAC Rule 3745-27-10 (D)(7)(c)(ii) within two hundred and ten days from initial sampling; 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), to implement a ground water quality assessment plan capable of determining the concentration, rate and extent 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 April 27, 2009, Ohio EPA received the statistical report of ground water quality for the February 11, 2009, sampling event. On page 5 of this report the owner/operator indicates, "This report serves as formal notification to Ohio EPA that the chloride values reported for detection monitoring wells BW-5 and BW-6 during the February 2009 sampling event demonstrate statistically significant increases over their statistical backgrounds." The two hundred and ten day period from initial sampling ended September 10, 2009. No demonstration for chloride at wells BW-5 or BW-6 has been provided to Ohio EPA and no approval has been granted. These wells

have, by rule, been in the assessment program since September 10, 2009. Also, the owner/operator has not provided nor implemented a ground water quality assessment plan.

MORE INFORMATION NEEDED TO DETERMINE COMPLIANCE

5. **Compliance with OAC Rule 3745-27-10(C)(1), requiring that procedures be used that ensure that consistent and representative samples are collected and representative results are produced, cannot be determined at this time. The City of St. Marys needs to indicate how the collection of excessively turbid samples provides results which are representative of the ground water of the site and ensure that low turbidity samples are collected from the site's wells. They should also document why the field and laboratory turbidities significantly differ for some of the wells listed in the table. Results from samples collected with excessive turbidities should not be used in background. In addition, the owner/operator needs to describe any changes in purging, sampling or analytical procedures which might affect the turbidity of these samples.**

A review of the laboratory turbidity, field turbidity, and total suspended solids (TSS) data for the well samples included in the submittal indicates that several wells continue to demonstrate excessive turbidity/TSS values. Following is a list of the wells which display significantly excessive values (bold) as observed from the results for the July 2010 sampling event. There appears to be a marked difference between some of the field and laboratory turbidity and TSS readings. If the procedures are consistent the readings should be nearly consistent.

Ground water velocities would typically not be sufficient to mobilize additional fine material to cause increased turbidity unless some outside stress was applied. Wells MW-3 and MW-4, for example, were purged and sampled with a bailer. Care must be taken to purge and sample with a bailer in order to not produce increased turbidity. It might be helpful to use a constant flow pump at a very slow rate to obtain low turbidity samples. The use of slow rate constant flow pumps has been successful in reducing turbidity at other sites; however, the rate must be slow enough to ensure representative samples.

There may be serious problems with either the purging and sampling methods or the wells themselves. Many of the wells display extreme field turbidity readings even though the wells have been allow to set for over 22 hours. It is important that low turbidity, representative samples are collected and analyzed.

WELL	LATEST FIELD TURBIDITY (NTU)	LATEST LAB TURBIDITY (NTU)	LOWEST HISTORICAL REPORTED TURBIDITY (NTU)	SAMPLE DATE OF LOWEST	LATEST TSS (MG/L)
MW-1	161	40	25	04/02/96	26
MW-2	111	9.8	9.8	07/14/10	<5
MW-3	1000	220	50	06/24/97	194
MW-4	501	160	54	07/28/09	194

WELL	LATEST FIELD TURBIDITY (NTU)	LATEST LAB TURBIDITY (NTU)	LOWEST HISTORICAL REPORTED TURBIDITY (NTU)	SAMPLE DATE OF LOWEST	LATEST TSS (MG/L)
MW-5	234	48	23	06/25/97	54
AW-1	162	26	10.2	01/18/06	12.5
AW-2	203	35	7.4	09/19/96	47
AW-3	150	38	28.8	07/28/05	28.5
AW-4	ND	70	13.4	06/15/00	112
BW-2	181	17	14	06/20/01	26.5
BW-3	140	38	4	07/02/98	17
BW-5	180	15	7.34	06/19/03	17
MW-7	533	160	18.5	07/29/09	48
MW-8	569	130	15.1	07/31/07	158

6. **Compliance with OAC Rule 3745-27-10(B)(3)(e), which requires that monitoring wells be operated and maintained to perform to design specifications cannot be determined at this time. The City of St. Marys needs to describe any changes in well conditions which occurred at the site and if any of the wells were damaged.**

During the July 2010 sampling event, the wells noted in comment 5 above displayed excessive turbidity or TSS values. OAC Rule 3745-27-10(B)(3)(e) requires that the wells be maintained to perform to design specifications and OAC Rule 3745-27-10(C)(1) requires that procedures be used which will result in data which is representative of the ground water of the site. This excessive turbidity may be the result of sampling procedures or may be due to damage to the wells. Since the site's wells have been installed and sampled for some time and the conditions in most of the wells have stabilized at lower turbidity values, it would not be expected that turbidity values would rise due to natural conditions.

To further the understanding of the high turbidity values in some of the wells Ohio EPA analyzed the TSS readings at well MW-3 for trends. The earliest data, typically collected between 1994 and 1997, display a decreasing trend. This is common with new wells which, in effect, are developed over time. The data collected from January 1997 to the present show an increasing trend. This increasing trend is troublesome in that it might be due to damage to the well (In April 1998, for example the TSS was 30 mg/L, but the current value is 194 mg/L.). This well, and perhaps others, need to be refurbished.

7. **Compliance with OAC Rule 3745-27-10(C)(1) cannot be determined at this time. For rule citation see comment number 1 above. The City needs to clarify when the field parameter results were determined both in the field and in the laboratory.**

A review of the field data sheets indicates that the field parameters were determined in the field on July 14, 2010, subsequent to purging on July 13, 2010. The laboratory report indicates, for example, that "Turbidity – Client Supplied" was analyzed on July 16, 2010, at 10:03. The laboratory report also indicates that specific conductance, pH, and temperature were also analyzed on July 16, 2010, at 10:03. The laboratory-derived turbidity, however, was analyzed on July 14, 2010, at 21:16 which is prior to when the laboratory report indicates the field parameters were analyzed.

8. **Compliance with OAC Rule 3745-27-10(C)(1) cannot be determined at this time. For rule citation see comment number 1 above. The high RPD values for the TDS, TSS, nitrate/nitrite, benzene, chloroethane, and vinyl chloride duplicate sets at well MW-2 are excessive and do not meet the requirements of this rule for providing representative results. The City needs to ensure that these results are qualified and are not used in background. Also, the owner/operator should review the data relative to field or laboratory errors.**

A review of the TDS, TSS, nitrate/nitrite, benzene, chloroethane, and vinyl chloride data for well MW-2 indicates that a duplicate sample set was collected on July 14, 2010. The relative percent differences (RPD) for these parameters are listed below. These RPD results appear to be excessive; and the data should not be used without qualification.

Parameter	Value	Value	RPD
TDS	607 mg/L	799 mg/L	27.31
TSS	11.5 mg/L	<5 mg/L	78.79
Nitrate/nitrite	0.0278 mg/L	0.136 mg/L	132.11
Benzene	1.64 µg/L	2.99 µg/L	58.32
Chloroethane	12.8 µg/L	23.4 µg/L	58.56
Vinyl chloride	3.7 µg/L	6.62 µg/L	56.59

9. **Compliance with OAC Rule 3745-27-10(C)(1) cannot be determined at this time. For rule citation see comment number 1 above. The City needs to carefully review and explain all laboratory procedures relative to the detection of a significant number of parameters in the laboratory blank, relative percent difference exceedances in the laboratory duplicate QC data, recovery exceedances in the matrix spike/matrix spike duplicate QC data, and other QC data. In addition the owner/operator needs to explain how the presence and detections of these parameters impacts the analyses in the field samples. The owner/operator also needs to list all necessary changes to procedures to ensure that representative results are provided. The case narrative needs to be provided.**

A review of the QA/QC portion of the TestAmerica analytical report indicates a significant number of detections in laboratory blanks. Laboratory blanks are typically prepared with analyte-free water and should result in no detections. The review also indicates a significant number of exceedances in relative percent differences in laboratory duplicates, LCS/LCS duplicates, matrix spike and matrix spike duplicates, and "other" data. No case narrative describing and correcting these problems could be found in the report.

10. **Compliance with OAC Rule 3745-27-10(C)(1) cannot be determined at this time. For rule citation see comment number 1 above. The City needs to clearly and completely explain the procedures that changed relative to sampling which resulted in wells MW-1 and BW-1 being purged dry. Also, potential damage to the wells should be explained which would result in the wells being purged dry.**

In the current submittal the field data sheets for wells MW-1 and BW-1 indicate that these wells were purged dry. Both wells were purged using a Monsoon pump being operated at 0.5 gallons per minute on July 13, 2010. Prior to purging MW-1 displayed a stated water column of 17.39 feet; and BW-1 displayed a stated water column of 31.11.

In February 2010 these wells were also purged and sampled. At that time neither well was purged dry. In February, well MW-1 was purged with a Keck pump operated at 0.5 gallons per minute; and well BW-1 was purged using a Keck pump operated at twice the rate at 1.0 gallons/per minute. At that time well MW-1 displayed a stated water column of 15.89 feet; and well BW-1 displayed a stated water column of 29.58 feet. In February 2010, there was a shorter water column and, therefore, less hydraulic head than in July 2010.

It would be expected that with a greater water column in both wells in July compared to February, the response (i.e., not purged dry) would be the same for both events, since in July there was even more water in the wells. In addition, well BW-1 was purged at half the rate in July compared to February and it was purged dry in July, but not February. It appears that something significant changed either in the purging process or there was damage to the wells causing the change in productivity. This needs to be explained.

11. **Compliance with OAC Rule 3745-27-10(C)(1)(a), which requires the procedures in the plan be utilized, cannot be determined at this time. The City needs to explain how duplicate sampling at well MW-2 was performed randomly.**

Section 5.1 of the sampling and analysis plan states in part, "For quality assurance/quality control purposes, a minimum of one duplicate sample will be collected from a randomly selected monitoring well during each sampling event." The current duplicate sample set was collected from well MW-2. Since there were 15 wells sampled in the current event, the likelihood of producing a duplicate set at MW-2 is 1 in 15. Over time, with a statistical population this likelihood should be consistent and a duplicate would be collected from MW-2, on average, every 15 events.

A review of the historical data since 2002 for well MW-2 indicates that a duplicate sample set was collected at this well in: June 2002, June 2003, January 2005, January 2006, January 2008, July 2008, July 2009, February 2010, and July 2010. This pattern certainly does not appear to be random.

12. **Compliance with OAC Rule 3745-27-10(C)(1) cannot be determined at this time. For rule citation see comment number 1 above. The City needs to explain how the data used for zinc background at well BW-1 are all representative of ground water quality. It appears that at least one of the values is an outlier.**

A review of the statistical report pages in Appendix C indicates that 20 background values were used for zinc in the BW-1 non-parametric prediction limit analysis. The data set consists of two detections and 18 non-detects. Using Dixon's outlier analysis procedure is inappropriate since a divide-by-zero error will result. The use of the Ohio EPA method indicates that the value 0.56 mg/L is an outlier and needs to be removed until such time that it can be shown to be representative of ground water of the site.

RECOMMENDATIONS

13. It is recommended that recharge rates of wells that purge dry be recorded and monitored in order for the field personnel to know when sufficient water is available and when it is appropriate to sample the well. It had been previously observed that enough water is available for sampling, in wells which bailed dry, within about 3 hours of purging.

STATEMENTS

14. **Compliance data should not be removed merely because it is a calculated outlier. Compliance data may be removed if the data is the result of errors in field or laboratory procedures.**

Near the top of page 4 of the report for the February 2010 sampling event, the owner/operator stated, "Additionally, the results of outlier tests completed for chloride in monitoring wells BW-5 and BW-6 indicate that the June 2003 chloride value reported for monitoring well BW-5 and the February 2007 chloride value reported for monitoring well BW-6 are statistical outliers and are not representative of other chloride values reported for these respective monitoring wells." The removed values are not in the background data set, but are in the compliance data set. Compliance data should not be removed especially in control charts since the removal of such data can have an effect on the statistical analyses. Conversely, if the data was the result of field or laboratory error it is not representative of ground water of the site and may be removed following proper demonstration (e.g., a demonstration consistent with OAC Rule 3745-92-7910 (E)(9)(b)).

15. **Several parameters display exceedances in MW-2, MW-3, and MW-4.** On page 5 of the submittal the owner/operator notes that, "For assessment monitoring wells, statistical significances were calculated for chloride in monitoring well MW-2; chloride, potassium, and sodium in monitoring well MW-3; chloride and sodium in monitoring well MW-4; and chloride in monitoring well MW-5." The owner/operator also notes that volatile organic compounds (VOCs) were observed above their respective practical quantitation limits in MW-2, MW-3, and MW-4.

A review of the data also indicates that arsenic concentrations were significantly above values recorded at upgradient well MW-1. Well MW-1 reported a concentration of 11.4 µg/L while MW-2 reported a concentration of 16.1 µg/L; MW-3 reported a concentration of 44.5 µg/L, and MW-4 reported a concentration of 104 µg/L. Although statistical analyses were not performed for metals on these wells, other metals appear to display significant increases above background. Also, wells AW-2 and AW-3 display chloride levels above upgradient background, and well AW-4 displays a sodium level above upgradient background. It should be noted that MW-7 reported an arsenic level greater than the current MW-1 level. Also, chloride exceeds upgradient background at MW-7 and MW-8; and ammonia and potassium exceed background levels in MW-8.

16. **A letter dated June 13, 2008, (5-7702) sent by Ohio EPA to the City of Saint 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; and a letter dated July 14, 2010, (5-9362) contained 25 comments. No responses have been received from the City. It is important that the owner/operator respond to the agency requests for information and violations.**

17. **In previous Ohio EPA reviews of owner/operator reports of ground water quality, the agency indicated that the City of Saint Marys continued to be in violation relative to several rules and information requested by Ohio EPA of the owner/operator had not yet been received. This information is again requested. These comments include, but are not limited to:**
 - A violation of OAC Rule 3745-27-10(B)(3)(d) relative to the documentation of redevelopment activities conducted in the summer of 2005,
 - A violation of OAC Rule 3745-27-10(C)(1)(a) relative to providing field data sheets for the March 29, 2007 re-sampling event,
 - A violation of OAC Rule 3745-27-10(C)(7)(e) relative to the inclusion of metals values associated with excessive TSS values and reanalysis for statistically significant increases above background for the February and March 2007 sampling events, and
 - A violation of OAC Rule 3745-27-10(C)(1) relative to errors in the potentiometric surface map for the significant zones of saturation produced for the February and March 2007 sampling events.

18. **Wells MW-2, MW-3, MW-4, and MW-5 are affected and in the assessment program. In the second paragraph on page 1 of the submittal the City states, "As part of the detection monitoring program and in accordance with the facility's Revised Detection Monitoring Sampling and Analysis Plan (DMSAP, last revised April 2009), monitoring wells MW-1 through MW-6 are used to evaluate groundwater quality in the significant saturated units, and monitoring wells BW-1 through BW-6 are used to evaluate groundwater quality in the uppermost aquifer. In accordance with the facility's Groundwater Quality Assessment Plan (GWQAP), last revised April 2009), monitoring wells MW-1 through MW-5 and AW-1 through AW-4 are used to evaluate groundwater quality in the significant saturated units as part of the assessment monitoring program." While well MW-1 is used as a background well and is considered a detection well, wells MW-2 through MW-5 are affected based on OAC Rule 3745-27-10(D) and are in the assessment program based on OAC Rule 3745-27-10(E). If these wells are returned to the detection monitoring program by OAC Rule 3745-27-10(E)(9), they will then be considered to be in the detection program.**

19. **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 dataset. Note that this data was not used in the evaluation and has been excluded from the facility's dataset."

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.

20. **A review of the historical data for the wells at the site indicates that some of the wells display an apparent increasing trend for non-statistical parameters and perhaps a few statistical parameters. This information is shown on the following table. Investigation of these potential trends would be appropriate.**

WELL	PARAMETERS	APPARENT INCREASING TREND?
MW-6	nitrate/nitrite, conductance	yes
MW-1	Conductance	yes
AW-1	Conductance	yes
AW-3	nitrate/nitrite, conductance, chloride, sodium	yes
AW-4	Conductance	yes
BW-1	Conductance	yes
BW-2	nitrate/nitrite	yes
BW-3	nitrate/nitrite, conductance	yes
BW-4	nitrate/nitrite, conductance	yes
BW-6	nitrate/nitrite, conductance	yes

21. **A review of "Figure 1 Potentiometric Surface Map for the Significant Saturated Units" indicates the values at several pairs of wells, which are located relatively close to each other, cause unusual changes in ground water gradient in their immediate area. In the immediate area of wells MW-4 and AW-3 the data causes the contours to constrict indicating an anomalous increase in gradient. In the immediate area of AW-4 and MW-7, the data indicates a local change in gradient from east to west at these wells. This information suggests that the two wells are completed in separate zones. It appears from the ground water data and the boring log/cross section data, that AW-4 is completed in a different zone than either MW-7 (deeper zone typically observed at about 825') or MW-4 (shallower zone typically observed at about 835').**
22. **In the first paragraph in the "Statistical Analysis" section on page 3 the owner/operator references the U.S. EPA 1989 and 1992 statistical guidance documents relative to the statistical methodologies and techniques used in this report. The 2009 U.S. EPA Unified Guidance is now available and should take precedence over the other two documents.**
23. **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. Well AW-4 is completed in an intermediate zone.**

24. **The presence of volatile organic compounds (VOC) in upgradient well MW-1 may be an indication of serious concerns.** Data relating to VOCs in upgradient SZS well MW-1 indicate the presence of trans-1,2-dichloroethene at 2.66 µg/L suggest possible cross contamination of the sample, the presence of an upgradient source or potential radial flow out of the landfill. Well MW-1 is located immediately up gradient of the facility and within about 20 feet of the limits of solid waste based on site maps. There are no currently-defined sources of this VOC in the area of this well except the landfill.
25. **While the presence of an increase in 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 first paragraph on page 4 the owner/operator states, "A statistical significance was identified for chloride in upgradient monitoring well BW-1 during this sampling event. This statistical significance is the result of natural variation in groundwater quality that occurs over time and does not require notification to Ohio EPA as it was calculated for an upgradient well."

It is Ohio EPA's expectation that progress will be made during 2011 towards correcting the above issues. If progress towards correcting these issues does not meet Ohio EPA's expectation then additional enforcement action may be taken.

If you have any questions please feel free to contact Randy Skrzyniecki at the Ohio EPA Northwest District Office (419-373-3149). Any written correspondence should be sent to the attention of Brent Goetz, Division of Solid and Infectious Waste Management, Ohio EPA Northwest District Office, 347 Dunbridge Road, Bowling Green, Ohio 43402.

Sincerely,



Brent M. Goetz, R.S.
Environmental Specialist
Division of Solid and Infectious Waste Management

/cs

pc: Auglaize County Commissioners
Bill Petruzzi, Hull & Associates, Inc.
~~DSWIM=NWDO File: Auglaize County, St. Marys Landfill, Groundwater~~

ec: Mike Reiser, DSIWM, NWDO
Jack Leow, DDAGW, NWDO
Randy Skrzyniecki, DDAGW, NWDO

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