



State of Ohio Environmental Protection Agency

Northwest District Office

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Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director

Re: Seneca County
Sunny Farms Landfill
Ground Water

May 23, 2007

Mr. Michael Holmes
Regus Industries, LLC
2730 Transit Road
West Seneca, New York 14224

Dear Mr. Holmes:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Statistical Analysis of Groundwater Quality Data - November 2006 Semiannual Detection Monitoring Event for Sunny Farms Landfill. The report was dated January 2007 and received by Ohio EPA on January 26, 2007.

The Sunny Farms Landfill is located in Loudon Township, Seneca County, Ohio. Seven wells are in assessment monitoring. Sixteen wells are in detection monitoring. Based on Ohio EPA's evaluation, the facility is presently operating under the correct ground water monitoring phases, the well system is adequate for the detection monitoring and the owner/operator should continue to monitor under the current program. Ohio EPA reviewed the report dated January 2007 (received January 26, 2007) in order to determine compliance with OAC Rule 3745-27-10.

The report is signed by a qualified ground water scientist, but the signature is not notarized.

COMMENTS

VIOLATIONS

1. Ohio Administrative Code (OAC) Rules 3745-27-10(C)(5)(b). The owner/operator is in violation of OAC Rule 3745-27-10(C)(5)(b), requiring **Background ground water quality at a sanitary landfill facility may be based on sampling of wells that are not hydraulically upgradient where either of the following occur:**
 - (b) **Sampling of other wells will provide an indication of background ground water quality that is as representative or more representative than that provided by upgradient wells.**

- A. According to the report, page 11, paragraph 1, **"The background database used for interwell statistics was constructed using historical groundwater quality data from upgradient/sidegradient monitoring wells MP-9A, MP-10A, MP-11A, MP-12A, MP-13A, MP-14A, MP-15A, MP-16A, and MP-18A.**

Wells MP10A, MP13A, and MP15A are not upgradient of the landfill cells according to the potentiometric surface maps submitted with the semiannual data submittals. In telephone conversations on December 13, 2006 and December 26, 2006, Brent Smith with Burgess and Niple was informed that the data for wells MP10A, MP13A and MP15A (15A after the July 1, 2005 sampling event) were sidegradient to the waste and the data collected from these wells should not be used in the background data set for statistical analyses. The data from these wells was collected after waste was placed in cells sidegradient to the wells.

- B. According to comment 1 in the Ohio EPA letter dated March 12, 2007 **The owner/operator has adequately addressed the violation of Ohio Administrative Code (OAC) Rule 3745-27-10(C)(7)(e) as described below. As a result of the updating of the background data set , compliance with OAC Rule 3745-27-10(C)(4), (B)(3), and (C)(7)(f) cannot be determined. Note that this comment is being made by Ohio EPA prior to completing a thorough review of the reports received concerning the November 2006 sampling event.** The comment contained a discussion of the wells contained in the SZS monitoring system.

The comment further stated **In updating the background data set the owner/operator has added six (6) wells to the upgradient portion of the monitoring system for the significant zone of saturation (SZS); this makes a total of nine (9) wells. The data from the six wells has been added to the background data set.**

Three of the wells MP10A, 13A and 15A are currently sidegradient or downgradient; therefore, the data for these three wells cannot be used in the background data set.

The Ohio EPA has conducted further investigation of the monitoring system for the SZS . The owner/operator has indicated, for the first time with the November 2006 sampling event, that there are nine upgradient wells in the monitoring system for the SZS (MP9A, 10A, 11A, 12A, 13A, 14A, 15A, 16A, and 18A). According to data submitted to the Ohio EPA the only upgradient wells for the SZS, currently, are MP11A , and 14A.

According to OAC Rule 3745-27-10(C)(4): **The owner or operator shall establish background ground water quality, unless the exception in paragraph (C)(5) of this rule applies, by analyzing ground water samples collected from hydraulically upgradient wells(s) for each of the monitoring parameters or constituents required in the ground water monitoring program.**

On June 20, 2002 Ohio EPA sent a letter to the owner/operator of the San Lan Landfill (Sunny Farms Landfill). The letter contained the Ohio EPA revision of the ground water quality assessment plan required by the Consent Order, VI. Injunctive Relief, number 16 filed on October 23, 2001. The monitoring system for the SZS was based on the construction of the phases of the landfill. At that time the upgradient wells for phase 1 - MP9A, 11A, 13A, 15A, and 18A; for phase 2 - MP9A, 11A and 15A; phases 3-7 - MP11A. The plan was revised so that only ground water quality data from wells that meet the requirement of OAC Rule 3745-27-10(C)(4) are added to the background data set for statistical analysis. Prior to the consent order, it was determined by the owner/operator (see comment 2 below) that well MP12A was not screened in the same zone as the other SZS wells and background needed to be established again. Starting with the June 2002 sampling event, the owner/operator began collecting background data for wells MP9A, 11A and 15A. According to the September 2005 data report (June 2005 sampling event), **"...MP-9A was utilized as a downgradient monitoring well for the first time during the June 2005 sampling event."** At this point in time until the November 2006 sampling event wells MP11A and 15A were the upgradient wells according to the data reports submitted by the owner/operator. The Ohio EPA addressed the issue of well MP9A in two letters dated February 16, 2006 (comment 9 on page 6) and August 18, 2006 (comment 9 on page 16) *"According to the report, page 11, section 5.2.2, lines 5-8, ...Construction of Phase 3 of the waste disposal cell was completed in August 2005; therefore, monitoring well MP-9A will be monitored as a downgradient well per the existing revised GDMP (B&N, June 2005). As long as this well remains in detection monitoring, this well will continue to be used for background interwell statistics. Well MP-9A is no longer an upgradient well. Data collected from well MP-9A cannot be added to an upgradient data pool for the calculation of interwell statistical analyses."* As stated above in this comment, the owner/operator has indicated, for the first time with the November 2006 sampling event, that there are nine upgradient wells in the monitoring system for the SZS (MP9A, 10A, 11A, 12A, 13A, 14A, 15A, 16A, and 18A).

The background data set was updated in the Semiannual Determination of Rate, Extent, and Concentration - November 2006 Groundwater Quality Assessment Monitoring Event dated January 2007 to include data collected from sidegradient wells MP10A, 13A, and 18A. Wells MP10A and MP13A have never been considered to be upgradient wells. The data set also contains data for wells MP9A and 15A which were collected after these wells became sidegradient.

MP9A became sidegradient in April 2005. MP15A became sidegradient in August 2005. As discussed below in portion C of this comment below well MP16A cannot be used as an upgradient well for SZS. It is not monitoring the same SZS as the other A series wells (screened in only clay like well MP12A).

Table 1 below contains the status of the wells at a particular phase of construction. Table 2 contains the time periods that the data is usable as upgradient/background for statistical analyses.

Table 1

	MP9A	MP10A	MP11A	MP13A	MP14A	MP15A	MP16A	MP18A
Phase								
1	UG		UG	UG	n/a	UG	n/a	UG
2	UG	n/a	UG	SG	n/a	UG	n/a	DG/SG
3	DG (3C)	n/a	UG	SG	n/a	SG (3D)	n/a	DG
4	DG	DG/SG	UG	SG	UG	SG	UG	DG
5	DG	DG/SG	UG	DG	UG	DG	UG	DG
6	DG	DG/SG	UG	DG	UG	DG	UG	DG
7	DG	DG/SG	UG	DG	UG	DG	SG	DG

*only samples were collected on November 14, 2006

Based on the above discussion and Table 1, the usable data for the background data set should be as follows:

Table 2

	MP9A	MP10A*	MP11A	MP13A	MP14A	MP15A	MP16A [‡]	MP18A
Starting Date	1/16/02	none	9/23/92# (01/15/02)	none	11/14/06	01/16/02	none	3/2/99 [^] (06/25/01)
Ending Date	11/16/04	none	as long as it is in detection monitoring	none	as long as it is in detection monitoring	07/01/05	none	1/16/02

*only samples were collected on November 14, 2006 # 9/23/92 for indicator parameters and 01/15/02 for other parameter [^]3/2/99 for indicator parameters, 6/25/01 for other parameters [‡]well MP16A is not screened in the SZS; therefore data from the well is not representative of the ground water quality in the SZS see comments 8 and 9 below

- C. Well MP16A is not monitoring a SZS. The boring log for well MP16A shows that from 0 to 33.13 feet the only material observed was clay. The screen and sand pack was installed from 24 to about 33. feet in clay. There are no descriptions on this log as to moisture content. The screens for the other SZS wells, except MP12A, were installed in silty clay to sand. Well MP16A is not screened in the SZS being monitored by all the A wells except well MP12A.

In order to return to compliance with OAC Rules 3745-27-10(C)(5)(b), the owner/operator needs to: (A) remove the data for wells MP10A, MP13A, and MP15A from the background data set for any statistical analyses and conduct the statistical analyses again. Tables 1, 6, 7, 9, and 11 will need to be corrected. Statistical analysis is not required in assessment monitoring; therefore, the owner/operator can also return to compliance by comparing the downgradient assessment well data to the revised upgradient data. (B) The owner/operator needs to update the background data set by removing, from the background data set, any data collected for a well when it became a sidegradient/ downgradient well and data from any well never considered to be an upgradient well (MP10A, 13A, 16A) [see Table 1, above for status of the wells at a particular phase of construction, and Table 2 for the time periods that the wells were/are considered upgradient]; and (C) the owner/operator should (1) not use MP16A as an upgradient monitoring well, (2) remove the data for well MP16A from the background database for interwell statistical analyses, (3) conduct the statistical analyses without the data from MP16A in the background database, and (4) well MP16A should be properly plugged and abandoned.

2. OAC Rule 3745-27-10(C)(4), and (B)(1)(a). The owner/operator is in violation of OAC Rule 3745-27-10(C)(4) requiring **The owner or operator shall establish background ground water quality, unless the exception in paragraph (C)(5) of this rule applies, by analyzing ground water samples collected from hydraulically upgradient wells(s) for each of the monitoring parameters or constituents required in the ground water monitoring program.**

and OAC Rule (B)(1)(a) requiring, **The ground water monitoring system, for detection monitoring, assessment monitoring, or corrective measures, shall consist of a sufficient number of wells, installed at appropriate locations and depths, to yield ground water samples from both the uppermost aquifer system and any significant zones of saturation that exist above the uppermost aquifer system that do the following: (a) Represent the quality of the background ground water that has not been affected by past or present operations at the sanitary landfill facility.**

Well MP12A was the original upgradient well for the SZS. It was removed from the system based on a letter dated August 2, 2001 from Mark Ruoff of the Mark James Corporation and the letter dated August 16, 2001 from Mike Leone of Burgess and Niple both consultants for the previous owner/operator. The owner/operator has placed it back into the SZS monitoring system as an upgradient well based on the same reasons it was removed, in the first place. The Ohio EPA has reviewed the boring logs, and the

ground water quality data for MP12A and the other SZS wells. There are four reasons for not including well MP12A in the SZS monitoring system:

- A. Well MP12A is not monitoring a SZS. The boring log for well MP12A shows that from 0 to 29.9 feet the only material observed was clay. The screen and sand pack was installed from 18 to 29.32 feet in dry clay. The screens for the other SZS wells were installed in silty clay to sand; except for well MP16A which monitors a clay zone [see comment 1. C. below].
- B. The ground water quality data is drastically different from the other current and proposed upgradient monitoring wells in the SZS. The data for arsenic, barium, beryllium, chromium, cobalt, lead, manganese, nickel, potassium, silver, vanadium, and zinc are significantly higher in well MP12A than any other SZS well. In fact, the only detections of beryllium and silver were in well MP12A. The inclusion of the data for well MP12A in the background data set creates a data set with spatial variability. According to the letter dated August 2, 2001 from Mark Ruoff, **The continued progress of the groundwater quality assessment plan has been impacted by the fact that the groundwater samples collected from well MP-12A may not represent the water quality of the uppermost significant aquifer.**
- C. According to the letter dated August 2, 2001 from Mark Ruoff, **A review of the geologic and well completion logs, however, allows the conclusion to be made that well MP-12A is not acceptable as a background well. The geologic log shows that the A-Series sand/sandy clay unit is not present at well MP-12A. Furthermore, the well was completed with the bottom of the PVC well casing in direct contact with the upper part of the dolomite bedrock. It is apparent that the well probably does not monitor the exact same significant saturated unit as the other wells at the facility. According to a letter dated August 16, 2001 from the owner/operator, Based on the boring log ... MP-12A is screened at the unconsolidated deposits/ bedrock surface [according to the boring log the base of the screen/sand pack is 0.58 feet above the interface]. The unconsolidated deposits at MP-12A consist entirely of clay. The low groundwater yield experienced at MP-12A during each sampling event confirms that the screened interval is within fine-grained silt and clay at this location [the log for this well only shows clay for the first 29.9 feet this distinctly different from all of the other SZS wells, the geologist on site described it as clay not silty clay, etc.]. Other monitoring wells at the San-Lan Landfill are screened across a thin silt and sand layer just above bedrock [1 well base of screen/sand pack on bedrock, 20 wells base of screen/sand pack 0.44 to 8 feet above bedrock, MP12A 0.68 feet above bedrock]. Groundwater quality at MP-12A has been noticeably different than the other Zone A monitoring wells. Clay particles promote cation exchange, which can often alter the chemistry of groundwater. This may be the reason for the different geochemistry observed at MP-12A.**

In order to meet the requirements of ...10(B)(1)(a), a more representative background database must be established so that groundwater quality downgradient of the facility, specifically at assessment monitoring wells MP-2AR and MP-7AR, can be properly evaluated.

- D. Ohio EPA used linear regression analysis to evaluate the effects of sample turbidity on total metal, calcium, chloride, potassium, sulfate, sodium and ammonia nitrogen analytical results for well MP12A, and MP11A. As seen in Table 1 below, the background data for well MP12A for nine metals, potassium and calcium are influenced by turbidity (i.e., total metals, potassium and calcium concentrations are artificially elevated and the variation of these parameter concentrations is artificially increased). The regression analyses for upgradient well MP11A show no affects from turbidity on the total metal, calcium, chloride, potassium, sulfate, sodium and ammonia nitrogen concentrations.

In telephone conversations on December 13, 2006 and December 26, 2006, Brent Smith with Burgess and Niple was informed that the data collected for well MP12A should not be used in the background data set for statistical analyses. The results from the samples collected from well MP12A are not representative of the quality of the background ground water that has not been affected by past or present operations at the sanitary landfill facility. In order to return to compliance with OAC Rule 3745-27-10(C)(4), and (B)(1)(a), the owner/operator needs to remove MP12A data from background and conduct the statistical analyses again, MP12A cannot be used as an upgradient monitoring location in any future sampling events, and the well should be properly plugged and abandoned.

3. OAC Rule 3745-27-10(C)(1)(a): The owner/operator is in violation of OAC Rule 3745-27-10(C)(1)(a) requiring, **A written sampling and analysis plan, which documents the sampling and analysis procedures that shall be utilized in the ground water monitoring program. The owner or operator is required to use the procedures documented within the sampling and analysis plan.**

According to the Groundwater Detection Monitoring Plan (GWDAP) revised November 2006, page 19, section 3.10.2, "Minimum / no purge sampling will be conducted for monitoring wells that yield an insufficient volume for low-flow purge techniques (less than 100 ml/min)."

According to the Groundwater Well Development Record Form for well MP13A attached to the letter dated January 19, 2007 from Burgess and Niple, the well was pumped at 100 ml/min for 20 minutes and the water level rose from 20.75 feet btoc to 20.70 feet btoc and then dropped to 20.73 feet btoc. This indicates that the well can yield at least 100 ml/min. The owner/operator is in violation for not following the GWDMP. In order to prevent this violation in future sampling events, the owner/operator should follow the procedures contained in the GWDMP.

4. OAC Rule 3745-27-10(B)(3)(e). The owner/operator is in violation of OAC Rule 3745-27-10(B)(3)(e). According to OAC Rule 3745-27-10(B)(3)(e), **The monitoring wells, piezometers, and other measurement, sampling, and analytical devices shall be operated and maintained to perform to design specifications throughout the life of the monitoring program.**

The Groundwater Monitoring Well Record Form for well MP13A has a note in the comment section stating "PVC Riser seems to have sunk into ground, bentonite along edges of well casing higher than riser! Cement Pad loose!" This well has not been maintained to perform to design specifications.

In order to regain compliance with OAC Rule 3745-27-10(B)(3)(e), the owner/operator needs to repair or replace well MP13A before the next sampling event.

5. OAC Rule 3745-27-10(E)(6). The owner/operator is in violation of OAC Rule 3745-27-10(E)(6) [1994 rules OAC Rule 3745-27-10(E)(5)].

According to OAC Rule 3745-27-10(E)(6), **A determination of rate, extent, and concentration. The owner or operator shall implement the "ground water quality assessment plan" which satisfies the requirements of paragraphs (E)(3), (E)(4), and (E)(5) of this rule and**

According to OAC Rule 3745-27-10(E)(5)(a)(ii), **Within seventy-five days of commencing the sampling required in paragraph (E)(5)(a)(i) of this rule, sample all monitoring wells screened within the same geologic units at the facility as the affected well, not sampled under paragraph (E)(5)(a)(i) of this rule. These samples shall be analyzed for those waste-derived constituents found to be above background levels in the affected monitoring wells sampled under paragraph (E)(5)(a)(i) of this rule.**

According to the Groundwater Monitoring Data dated June 2002, page 1 and 2, "The Ohio EPA approved the Groundwater Quality Assessment Plan ... on June 20, 2002.... According to the implementation schedule the following events were to have occurred, or are to occur in the near future:

-4. *Within 75 days of commencing the sampling required under Item 1, sample the remaining detection monitoring wells for those leachate or leachate-derived constituents found to be above background levels in the affected wells.*

The sampling event, initiated on July 31, 2002, included the sampling of all the assessment and detection monitoring wells for the parameters detected above background in the assessment wells.

In summary, the schedule contained in Section 7.0 of the GWQAP has been implemented as required. Items 1, 2, 4, and 5 have been completed as required."

Displayed on Table 4 for the sampling event initiated on July 31, 2002 found in the *Statistical Analysis of Groundwater Quality Data - November 2006 Semiannual Detection Monitoring Event dated January 2007* are three parameters (chloride, iron and manganese) above the calculated tolerance limits for well MP1AR and eight parameters (arsenic, chloride, chromium, COD, iron, lead, manganese and sodium) for well MP4A. The calculated tolerance limits are found in Table 4 of the report dated November 20, 2002 from the owner/operator's consultants the Mark James Corporation and Burgess & Niple.

Due to the fact that wells MP1AR and MP4A were sampled according to OAC Rule (E)(5)(a)(ii) and there were parameters above background/statistical limits, wells MP1AR and MP4A should have been added to the assessment monitoring program and used to determine **rate, extent, and concentration** according to OAC Rule 3745-27-10(E)(6). The owner/operator did not add wells MP1AR and MP4A to the assessment monitoring program.

The owner/operator is in violation of OAC Rule 3745-27-10(E)(6) for not being capable of determining **rate, extent, and concentration** by not adding wells MP1AR and MP4A to the assessment monitoring program. In order to come into compliance OAC Rule 3745-27-10(E)(6) for this citation, the owner/operator should add wells MP1AR and MP4A to the assessment monitoring program, and submit a ground water quality assessment plan(s) according to OAC Rule 3745-27-10(E) for wells MP1AR and MP4A.

Additional Information

The Ohio EPA conducted Sen Slope Analyses of the chloride data for well MP1AR using the Sanitas Statistical Software. It was determined by multiple analyses that there was a significant upward trend at a 95% confidence limit for the data set for each analyses until the analysis that was conducted using only the first six (6) data (August 13, 1991 to April 5, 1994). There was not a significant trend for the first six data.

The Ohio EPA conducted intra well Shewart Cusum Control Chart Analyses of the chloride data for MP1AR using the Sanitas Statistical Software. The first eight data values were used as background (August 13, 1991 to March 13, 1995). Three analyses were conducted starting with one compliance value (April 6, 1995) then adding one additional value for two more analyses (October 5, 1995 and June 27, 1996). A statistically significant trend was detected for the October 5, 1995 event and again for the June 27, 1996 event.

Non parametric tolerance limit statistical analyses were calculated for chloride, ammonia, potassium, sodium, arsenic, chloride, barium, cadmium, chromium, cobalt, copper, nickel, iron, lead, magnesium, manganese, alkalinity, sulfate and sodium for wells MP1AR and MP4A using the November 2006 sampling data. The statistical limits were exceeded for chloride, arsenic, barium, cadmium, chromium, lead and iron for well MP1AR. The statistical limits were exceeded for chloride, arsenic, and sodium for well MP4A.

6. OAC Rule 3745-27-10(C)(7)(a): The owner/operator is in violation of OAC Rule 3745-27-10(C)(7)(a) requiring **"The statistical method used to evaluate ground water monitoring data shall be appropriate for the distribution of chemical parameters or waste-derived constituents."**

According to the Statistical Analysis of Groundwater Quality Data - November 2006 Semiannual Detection Monitoring Event dated January 2007, parametric interwell prediction limits were used as the statistical method for two wells, MP9B and MP10B for the following parameters: ammonia, chloride, potassium, sodium, arsenic, barium and zinc. According to the tables of Interwell Prediction Limit Calculations for parametric prediction limits in Appendix I of the report, K of 5 is used in that it is the number of samples that are going to be compared. Since there are only two wells that are being compared to the limit, K should be 2.

In order to regain compliance with OAC Rule 3745-27-10(C)(7)(a), the owner/operator should calculate parametric interwell prediction limits using a K of 2 and conduct the statistical analyses for ammonia, chloride, potassium, sodium, arsenic, barium and zinc in wells MP9B and MP10B and submit the results to Ohio EPA. If interwell prediction limits are used in the future for any parameters the K will have to be adjusted for the number of samples that will be compared to the limit with K having a maximum of 5.

7. OAC Rule 3745-27-10(C)(1): The owner/operator is in violation of OAC Rule 3745-27-10(C)(1) requiring **"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."**

According to a letter dated April 13, 1999 from Jay Clayton of the Mark James Corporation to the Ohio EPA, page 1, paragraph 5, "In summary, the wells were not damaged as of the 4/6/95 sampling event.... Therefore, the wells were damaged sometime between August 8, 1995 and September 28, 1995."

According to an April 30, 1999 letter from Jay Clayton of the Mark James Corporation to the Ohio EPA, response to comment 1, "Regarding the issue of abandonment of wells MP1A, 2A, 7A, and 8A, ... The reason the wells were abandoned was that it was suspected that surface water was entering the wells via their damaged casings and contaminating the ground water. Sampling and analyses performed on the replacement wells confirms that the ground water quality was degraded because of the damaged wells."

The owner/operator is in violation for using data collected from the six sampling events from October 4, 1995 to June 24, 1998 in the background data sets for wells MP1A-AR, and 8A-AR. In order to regain compliance with OAC Rule 3745-27-10(C)(1) the owner/operator should remove all the data collected for all parameters from the six sampling events from October 4, 1995 to June 24, 1998 in the background data sets for

wells MP1A-AR, and 8A-AR, conduct the statistical analyses for these wells again, and submit the results of the statistical analyses to the Ohio EPA.

8. OAC OAC Rule 3745-27-10(C)(1). The owner/operator is in violation of OAC Rule 3745-27-10(C)(1) requiring . See comment 7 for the rule citation.

According to an April 30, 1999 letter from Jay Clayton of the Mark James Corporation to the Ohio EPA, response to comment 1, "Regarding the issue of abandonment of wells MP1A, 2A, 7A, and 8A, ... Sampling and analyses performed on the replacement wells confirms that the ground water quality was degraded because of the damaged wells."

The Ohio EPA removed the data for the six sampling events from October 4, 1995 to June 24, 1998 then conducted Mann-Whitney analyses to compare the data from the original and replacement wells. For well MP1AR a) there was insufficient data to conduct an analysis for potassium, so the October 4, 1994 sample result should be removed from the background data set and b) there was statistically significant difference between the original and replacement well concentration for chloride, so the original well value should be removed from the background data set. For well 8AR, a) there was insufficient data to conduct an analysis for potassium, so the October 4, 1994 sample result should be removed from the background data set and b) there were statistically significant differences between the original and replacement well concentrations for ammonia and sodium, so the original well data should be removed from the background data set.

In order to regain compliance with OAC Rule 3745-27-10(C)(1) the owner/operator should remove the data for wells MP1A and 8A that are described above, conduct the statistical analyses again, and submit the results to the Ohio EPA.

MORE INFORMATION NEEDED TO DETERMINE COMPLIANCE

9. OAC OAC Rule 3745-27-10(B)(3). Compliance with OAC 3745-27-10(B)(3) can not be determined at this time. See comment 2 for the rule citation.

According to the Potentiometric Surface of the Glacial Till Unit Measured November 13, 2006, the water level for well MP3A is higher than what is expected for the ground water flow regime at the landfill in the SZS.

In a letter dated February 16, 2000, comment 2, the Ohio EPA stated "There appears to be radial flow from the landfill...". The owner/operator never responded to this comment.

According to an Ohio EPA letter dated October 27, 2000, **According to the October 5, 2000 letter, page 3, paragraph 2, "All available data points were used in mapping; however, data from well MP-3A appears to be questionable. The 12/99 and 6/00 glacial till maps show a difference in ground water elevations of 6 to 8 feet between MP-3A and MP-4A, 400 feet to the south. ...It is possible the water levels in MP-3A are being influenced by water levels in an adjacent ditch. It is our**

opinion that the data obtained from MP-3A is not representative of the true potentiometric surface of the glacial till, and should be removed from the data set."

The owner/operator should investigate and determine the reason(s) for the anomalously high ground water levels in well MP3A. If it is determined that representative samples cannot be obtained from the well it should be properly plugged and abandoned, and replaced.

The owner/operator never responded to this comment. Well MP3A continues to have questionable water levels; the water levels are higher than the other 4 monitoring wells on the east side of the facility in an upgradient direction from well MP3A.

The water level data from well MP3A has been questionable for a considerable length of time. There are strong indications that there is radial flow out from at least some portions of the landfill. The high water levels at well MP3A could also be explained by effects from a connection with a drainage ditch. In order to maintain compliance with OAC Rule 3745-27-10(B)(3), the owner/operator should determine the cause of the higher water levels. If the well is connected, for example, by way of fractures in the unconsolidated deposits to the ditch, the owner/operator should properly plug and abandon the well, and install a new properly constructed well on the east side of phase 1 of the landfill. If the landfill is exhibiting radial flow, the owner/operator should revise the potentiometric surface maps of the "Glacial Till Unit", and add additional wells if necessary.

STATEMENTS

10. According to the monitoring well logs in appendix C of the Groundwater Detection Monitoring Plan (GWDMP), Wells MP3A, 4A, 9A, 10A, 11A, 12A, 13A, 14A, 15A, 16A, and 18A consist of four inch schedule 40 casings and screens installed in six inch boreholes. PVC casing schedule 40 pipe has an outside diameter of 4.5 inches. With an outside diameter of 4.5 inches there is less than 1 inch of space around the casings for the placement of the sand pack. According to the Ohio EPA Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring, Chapter 7, page 7-12, "The distance between the casing and the borehole wall should be at least 2-4 inches to allow for the proper placement of the filter pack and annular seal. Therefore, the filter pack thickness should be 2 to 4 inches."
11. According to a letter dated April 13, 1999 from Jay Clayton of the Mark James Corporation to the Ohio EPA, page 1, paragraph 5, "In summary, the wells were not damaged as of the 4/6/95 sampling event... Therefore, the wells were damage sometime between August 8, 1995 and September 28, 1995."

According to an April 30, 1999 letter from Jay Clayton of the Mark James Corporation to the Ohio EPA, response to comment 1, "Regarding the issue of abandonment of wells - MP1A, 2A, 7A, and 8A, ... The reason the wells were abandoned was that it was suspected that surface water was entering the wells via their damaged casings and

Mr. Michael Holmes
May 23, 2007
Page 13

contaminating the ground water. Sampling and analyses performed on the replacement wells confirms that the ground water quality was degraded because of the damaged wells."

If wells MP2AR and MP7AR ever return to detection monitoring the owner/operator should not use data collected from the six sampling events from October 4, 1995 to June 24, 1998 in the background data sets for wells MP2A-AR, and 7A-AR.

If you have any questions please contact Jack Leow at the Ohio EPA, Northwest District Office, Division of Drinking and Ground Waters, 347 N. Dunbridge Rd., Bowling Green, Ohio 43402. Submit all reports/data to MaryAnn Miller, Ohio EPA, Northwest District Office, Division of Solid and Infectious Waste Management, 347 N. Dunbridge Rd., Bowling Green, Ohio 43402.

Sincerely,



Mary Ann Miller, R.S.
Environmental Specialist
Division of Solid & Infectious Waste Management

/cs

pc: John Walker, Sunny Farms Landfill, LLC
Brendon Pantano, Sunny Farms Landfill, LLC
Nicki Rumschlag, Seneca County Health Department
Michael E. Leone, Burgess & Niple, Inc.
Carl Mussenden, DSIWM, CO
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~~NWDO File: Seneca County, Sunny Farms Landfill, Groundwater~~

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