



State of Ohio Environmental Protection Agency

**Northwest District Office**

347 North Dunbridge Road  
Bowling Green, OH 43402-9398

TELE: (419) 352-8461 FAX: (419) 352-8468  
www.epa.state.oh.us

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

Re: Hancock County Landfill  
Response to Comments  
August 10, 2007 - 7031

December 19, 2007

Hancock County Board of Commissioners  
300 South Main Street  
Findlay, Ohio 45840

Dear Commissioners:

On October 22, 2007, the Ohio Environmental Protection Agency (Ohio EPA), Northwest District Office, received a document titled "Response to Ohio EPA Comments dated August 10, 2007, regarding the Hancock County Sanitary Landfill Groundwater Monitoring Report, Spring 2007", dated October 19, 2007, for the Hancock County Sanitary Landfill (Facility). Ohio EPA reviewed the submittal to determine compliance with Ohio Administrative Code (OAC) Rule 3745-27-10. Below are Ohio EPA's comments regarding this submittal.

**COMMENTS**

**EVALUATION OF THE OWNER/OPERATOR'S RESPONSES TO PREVIOUSLY CITED VIOLATIONS**

1. **The previously cited violation of OAC Rule 3745-27-10 (C)(1)(a) relating to the submittal of additional sampling results for wells SW-9 and SW-10 as required by the assessment plan has been rescinded as detailed below.**

The assessment plan stated that wells SW-9 and SW-10 would be sampled for both Appendix I and Appendix II parameters during the spring 2007 event. Since they were not sampled for these parameters a violation of OAC Rule 3745-27-10 (C)(1)(a) was cited. However, the owner/operator indicated that these wells were intended to be sampled as part of the assessment program for wells SW-4, SW-5, and SW-13. Prior to the spring 2007 sampling event, approval was granted to return wells SW-4, SW-5, and SW-13 to detection monitoring. While the owner/operator did not follow the assessment plan, it is now clear that the portion of the assessment plan associated with wells SW-4, SW-5, and SW-13, and consequently SW-9 and SW-10, was no longer in effect at the time of the sampling event and, therefore, it was not necessary to follow that portion of the plan. The owner/operator has indicated the assessment plan will be modified to remove the requirement to sample SW-9 and SW-10. The owner/operator is encouraged to indicate in a report if a plan is not followed and to also indicate the reason for not following the plan.

2. **In order to avoid violations of OAC Rule 3745-27-10 (B)(1)(b) and OAC Rule 3745-27-10 (C)(8) for future sampling events the owner/operator should consider well SZ-3B to be a downgradient well.**

The owner/operator responded that they believe well SZ-3B is an upgradient well, but will treat this well as a downgradient well "until such time as additional evidence can be collected to support the premise that SZ-3B is an upgradient well". The owner/operator is reminded to ensure that all appropriate sampling and analyses are performed on SZ-3B. (See comment 7)

3. **In order to avoid violations of OAC Rule 3745-27-10 (C)(1) the owner/operator needs to ensure that procedures are utilized which provide representative samples of low turbidity in all future sampling events and that data from samples displaying excessive turbidity readings should not be utilized in background. The wells in question were SW-02, SW-10, SZ-01A, and SZ-03B with turbidity readings of >1,100 NTU and SW-3 with a reading of 550 NTU.**

The owner/operator responded that they disagree that they are in violation of OAC Rule 3745-27-10 (C)(1), that turbid water collected from these wells is representative, and that the results of the turbid samples should be included in background. They also indicate five possible alternatives for sampling which might produce lower turbidity samples. They indicate that they will most likely use a small volume pump to purge and sample in the wells with higher turbidity values. The owner/operator also responded that statistical tests will be performed on the new data to determine if it is consistent with the original/old data. If the new data is consistent with the old data, it will be utilized in the background.

It should be understood that it is the responsibility of the owner/operator to collect and analyze representative samples. This means that the samples should display relatively low turbidity values. As implied in the owner/operator's discussion of purging and sampling by bailer, the turbidity, and consequently the chemistry, of a ground water sample can potentially be controlled by the sampler. If a sampler can control the outcome, even inadvertently, the procedure will not produce representative samples and is not a consistent method since the same amount of turbidity will likely not be able to be produced each event. Inclusion of turbid sample data, which may be representative of a mixture of solids and water, but is not representative of the water of the site, in the background skews the background database and may ultimately mask the presence of a release from the landfill. Data should not be added to the background unless it can be shown that there are no statistical differences between the new data and the historical data, and that all of the new and historical data is representative of the ground water of the site.

As suggested by the owner/operator in listing several methods for potentially obtaining lower turbidity samples and in their discussion of purging and sampling by bailer, it might take some effort to determine the correct procedure or combination of procedures required to produce representative samples at each well. The procedures may include additional well development. If the wells are redeveloped, the withdrawal rate during development should be substantially greater than the purging and sampling rates. The level of turbidity is related to the intergranular flow velocity. Generally increased flow velocity and turbulence will produce more turbidity. During development increased velocities are utilized to remove "fines" which are mobilized at those velocities. During purging and sampling lower flow velocities are used to ensure that the coarser materials that remain are not mobilized. Again, the owner/operator should determine which methods will produce low turbidity samples and utilize them to ensure that proper samples are collected.

4. **The owner/operator has adequately addressed the violation of OAC Rule 3745-27-10 (C)(7)(f) and indicated that the owner/operator needs to correct for spatial variability when conducting statistical analyses of the data.**

The owner/operator responded that Table 3-7 has been revised to show the limits for potassium and ammonia for the SW wells listed by Ohio EPA as being problematic. The owner/operator also indicated that the new limits were calculated using intrawell statistical methods.

5. **The owner/operator has adequately addressed the violation of OAC Rule 3745-27-10 (D)(5)(b)(iii) by providing additional results of statistical analyses.**

The owner/operator responded that statistical limits for ammonia were omitted from Table 3-7 and a new table 3-7 was provided in this submittal along with a revised page 3-10. This new information now displays the statistical analyses for wells SW-4 and SW-14. The data now indicates that there are no statistically significant increases for the Silt Zone (SW) wells.

6. **The owner/operator has adequately addressed the violation of OAC Rule 3745-27-10 (C)(7)(a) by performing statistical analyses on the data for SW-4, SW-5, and SW-13 using an appropriate method.**

The owner/operator responded that an appropriate method has now been used for the data from these wells as shown on revised Tables 3-7 and D4-1. The owner/operator also indicated that the limits determined from the intrawell methods, as shown in the revised tables, are greater than those previously presented.

7. **Ohio EPA cited a violation of OAC Rule 3745-27-10 (D)(5)(b)(iii) and indicated that the owner/operator needs to perform proper statistical analyses on the data for well SZ-3B.**

The owner/operator responded that they believe that well SZ-3B is an upgradient well and the facility is not in violation of OAC Rule 3745-27-10 (D)(5)(b)(iii), however, they will treat SZ-3B as a downgradient well. The owner/operator should understand that, as previously detailed by the agency, data indicate that SZ-3B is a downgradient well. It can be shown that SZ-3B is in a general downgradient position relative to the upgradient wells SZ-1A, SZ-2 and PZ-7; well SZ-3B is downgradient of former well SZ-3A, which was located closer to the landfill; and SZ-3B has been affected by waste-derived constituents. Not performing statistical analyses on a downgradient well in the detection program is a violation of OAC Rule 3745-27-10 (D)(5)(b)(iii).

8. **The owner/operator has adequately addressed the violation of OAC Rule 3745-27-10 (C)(3)(b) by accurately redrawing the map for the SZS and providing the new interpretation to Ohio EPA.**

The owner/operator responded that they disagreed with the violation, "because of the interpretation of the groundwater contours in the northwestern portion of the landfill." The owner/operator should understand that the violation was a result of an error in not utilizing the recorded data and not a result of their interpretation. The owner/operator did, however, indicate that they had redrawn the map. The map was provided in the submittal as requested by Ohio EPA.

9. **The owner/operator will remain in violation of OAC Rule 3745-27-10 (E)(3) until a ground water quality assessment plan for well SZ-3B is submitted to the Ohio EPA.**

Data indicated that well SZ-3B was sampled October 25, 2006 and statistical analyses indicated the analytical results from this sample exceeded limits for potassium, but no demonstration in accordance with OAC Rule 3745-27-10 (D)(7)(c) was forwarded to Ohio EPA. The owner/operator must now comply with OAC Rule 3745-27-10 (E). The owner/operator now indicates that this well is upgradient. Ohio EPA has shown that data indicates the well is downgradient. In their response, the owner/operator indicated that they will provide a ground water assessment plan for well SZ-3B.

#### **RESPONSES TO REQUESTS FOR MORE INFORMATION TO DETERMINE COMPLIANCE**

10. **Compliance with OAC Rule 3745-27-10 (B)(1)(a) and (b) can not be determined at this time. The owner/operator needs to provide a map and contours which contain all of the wells which monitor the stated zone. The map(s) should clearly indicate all of the wells which monitor the zone mapped.**

The owner/operator needed to demonstrate which zone is monitored by well SW-2 and, if necessary, make adjustments to the potentiometric surface map.

Cross sections previously provided by the owner/operator indicated that Silt Zone well SW-2 was monitoring the same zone as the Sand/Silt Zone wells.

The owner/operator responded on page 13 of 30, in part, that they believe that SW-2 is straddling both zones and it may be monitoring both the Sand/Silt Zone and Silt Zone. On page 29 in a response to comment 23 the owner/operator indicates that the potentiometric surface maps had been redrawn with SW-2 as part of the Sand/Silt Zone rather than the Silt Zone. However, the redrawn Sand/Silt Zone map indicates contours which might include SW-2, but the well is not on that map. The Silt Zone map shows SW-2, but the contours do not appear to represent the data. In addition, when discussing the Silt Zone potentiometric surface map interpretation, the owner/operator references a bedrock well MW-3. It is, as yet, unclear, which zone the owner/operator is indicating as being monitored by SW-2. The owner/operator is reminded that if they believe that SW-2, as mapped, monitors the Sand/Silt Zone, the monitoring plan should be changed to reflect this belief.

11. **Compliance with OAC Rule 3745-27-10 (C)(1) can not be determined at this time. The owner/operator should indicate which, if either, set of samples provided the results which are representative of the ground water of the site and not impacted by turbidity. The owner/operator should also indicate which values will be utilized in statistical analysis.**

The owner/operator needed to provide details how the duplicate sample set was collected at well SW-03, when the turbidity readings were collected, and demonstrate which values, or neither set of values, are representative of ground water of the site and not impacted by turbidity. The "duplicate" sample displayed greater concentrations than the "compliance sample".

The owner/operator responded with details on how the duplicate sample set was collected and indicated that in the future the duplicate sets will be collected on a bottle-for-bottle basis rather than a bottle-set-for-bottle-set basis. The owner/operator, however, did not indicate which set of results, if either, are representative of the ground water of the site and not impacted by turbidity.

12. **Compliance with OAC Rule 3745-27-10 (C)(1) can not be determined at that time. The owner/operator needs to provide procedures that will be used to prevent various parameters from entering the blanks.**

The owner/operator responded in part by explaining that the laboratory did not provide the distilled water for the field blanks and that commercially available distilled water was used. The owner/operator did not provide a procedure which will be used to provide proper blanks. The owner/operator merely stated that, "Because these analytes did not appear in any compliance samples at statistically significant concentrations, this should not be considered to be a compliance issue."

The owner/operator needs to provide a procedure which will ensure that proper blanks are utilized. Proper collection of field blanks is part of appropriate QA/QC procedure.

In addition, the owner/operator stated, "The Ohio EPA is correct in stating that the water used to collect field and equipment blanks is supposed to be analyte free, but it should be noted that the quality control program of collecting field blanks is to account for just such occurrences." The owner/operator should understand that the proper collection of blanks using analyte-free water, if blanks are collected, is, in itself, part of the QA/QC program. Analyte free water is used for collection of blanks to determine if proper field and laboratory procedures are utilized. If the blanks display detections for parameters, it is assumed that their presence is due to errors in field or laboratory procedures. Based on the results from the blanks, it is assumed that significant errors are being made by field sampling personnel and laboratory personnel. In addition, if sampling and laboratory errors are being made, the results for all of the samples collected and analyzed are suspect and may not be representative of the ground water of the site. Based on a review of the data provided in the spring 2007 monitoring report, the apparent errors may be due to the "distilled" water purchased by the owner/operator's field personnel. Whether the parameters observed in the blanks are due to field personnel or laboratory errors or due to blank water which was not analyte free, the owner/operator needs to provide a procedure which will ensure proper blank collection and, therefore, promote the collection of representative samples.

**13. The owner/operator has submitted information that has averted a violation of OAC Rule 3745-27-10 (D)(7)(b).**

The owner/operator needed to clearly indicate the presence or absence of statistically significant increases in wells MW-13 and SW-5. The owner/operator responded that the text in Section 3.6 was changed to indicate that well MW-13 is now in the ground water assessment program. Revised Table 3-7 indicates that since the new limit was determined for potassium, there is no statistically significant increase for potassium in well SW-5.

**14. The owner/operator has submitted information that has averted a violation of OAC Rule 3745-27-10 (C)(1).**

The owner/operator needed to provide details of the statistical analyses and comparisons for downgradient wells SW-4 and SW-14. The owner/operator indicated that the limits for ammonia were not included on Table 3-7, but a procedure comparing the results to the limits was utilized. The owner/operator provided a revised Table 3-7. There are no ammonia exceedances for wells SW-4 and SW-14.

15. **It appears that violations of OAC Rule 3745-27-10 (B)(3)(e) will be averted if the owner/operator utilizes new procedures to reduce the amount of silt and clay in the well.**
16. **Ohio EPA indicated that compliance with OAC Rule 3745-27-10 (C)(1) could not be determined at that time. The owner/operator needed to provide explanation why wells which recharge are not sampled when enough water is available. Some wells are purged of one volume and go dry while others are purged of more water, but are not sampled until the next day. Ohio EPA used well SZ-3B as an example.**

The owner/operator responded with details regarding the calculation of the amount of water in 4 inch well and its 12 borehole. The owner/operator also indicated that wells that produce more than one well volume during purging but then bail dry are not recharging at a sustainable rate. The owner/operator also gave an example of SW-03 and indicated it recharges at 3.7 mL/min, and also indicated that the bailed rate at SZ-03B is not excessive.

It should be noted that the example discussed by Ohio EPA was well SZ-3B which was purged of 2.4 well volumes in 21 minutes, but was sampled 18.3 hours later. The details of the calculations provided by the owner/operator were for a 4 inch well in a 12 inch borehole assuming a 25% to 33% effective porosity in the sand pack. It also assumes that the sand pack extended from the screen to the full extent of the borehole. Well SZ-3B is a 2 inch well with a prepack screen installed inside 4.25 inch hollow stem augers. The amount of drained volume water will be different depending on the assumptions. In addition, if it is assumed that the filter pack provides a significant portion of the drained volume, why do some wells, SW-12 for example, produce only one volume before being purged dry? The boring log indicates that 7 feet of sand pack were installed around a 4 inch by 5 foot Johnson VEE-PACK 0.012" slot screen in a boring advanced with 6.25" I.D. augers. Because of potential variability, it is important to provide actual, measured recharge rates collected from the wells to determine a well's rate of recovery. This information has not been provided by the owner/operator. For wells that can be purged dry, recharge information is requested. This information is not only important for determining when to sample, but is also important in determining the sustainable purge rate. The determination of the sustainable purge rate is a starting point to determining a purge rate which will produce low turbidity samples.

In the response the owner/operator also indicated that the purge rate of 0.29 gallons per minute was not excessive at well SZ-03B. Well SZ-03B is purged with a bailer and, based on samples collected in October 2007, is producing 20% to 30% solids by volume. Because significant solids are being produced, the purge rate is excessive for this well. The owner/operator is encouraged to redevelop the well using an appropriate method and is encouraged to purge the well with a pump which can maintain constant low volumes.

17. **Ohio EPA indicated that compliance with OAC Rule 3745-27-10 (B)(3) and OAC Rule 3745-27-10 (C)(1) could not be determined at that time. The owner/operator needed to provide a plan which ensures that low turbidity representative samples are collected from all wells and ensure that low turbidity representative samples are collected.**

The owner/operator responded that the wells, "that are designed to monitor the silt and silt/sand zone produce silty water". The owner/operator also indicated that SZ-3B contains a 0.007-inch slot screen and that silt particles can pass through this screen and collect inside the monitoring well. The owner/operator also indicated, "Because SZ-3B is a Silt Zone well, high turbidity readings caused by silt entering the well are common occurrences. As such, high turbidity groundwater samples are produced and are representative of groundwater quality at the landfill.

A sample collected at Sand/Silt Zone well SZ-3B (Sand/Silt Zone wells are designated "SZ" and Silt Zone wells are designated "SW") indicates between 20% and 30% solids by volume. Of these solids, most appear to consist of very fine sand with some fine sand and possibly some silt, all of which is capable of passing through a 10 slot (0.010") screen. The boring log for this well indicates that a 10 slot rather than a 7 slot screen was installed. If the inner and outer screen, the prepac sand and the outer sand pack are still in place it is unlikely that this very fine to fine sand will naturally pass into the well. It is likely that its introduction into the screen is the result of increased velocities during purging and sampling. It should be noted that representative samples of ground water consists of water and not a mixture of solids and water. The owner/operator needs to development methods which will produce low turbidity samples. Low flow methods may be helpful.

18. **The owner/operator has averted a violation of OAC Rule 3745-27-10 (C)(1) by submitting a corrected field data sheet for MW-15.**
19. **The owner/operator appears to have averted a violation of OAC Rule 3745-27-10 (C)(7)(e) by having the laboratory update the analytical requirements for Hancock County Landfill to reflect the guidance values.**
20. **The owner/operator has averted a violation of OAC Rule 3745-27-10 (C)(1) by submitting a revised laboratory report for well MW-5.**
21. **The owner/operator has averted a violation of OAC Rule 3745-27-10 (C)(1) by indicating how the data are considered valid.**

#### **RESPONSES TO STATEMENTS**

22. **Ohio EPA reminded the owner/operator that ground water monitoring programs are self implementing. The owner/operator had referred to an "approved Groundwater Monitoring Program".**

The owner/operator responded that this will be revised in future submittals.

23. **Ohio EPA noted and discussed contour anomalies in the Silt Zone Potentiometric Surface Map.**

The owner/operator responded that, in general, the changes in contours represent changes in transmissivity. While this is true, the owner/operator should continue to use care in contouring. A widening in the space between contour lines 767' and 769' immediately south of well SW-15 is suggestive of an undocumented increase in transmissivity relative to the area immediately south and north of this area.

24. **Ohio EPA noted potential errors in the Sand/Silt Zone Potentiometric Surface Map.**

The owner/operator responded by referring to responses to earlier comments. The owner/operator also indicated that in adding SW-2 to the Sand/Silt Zone map, the changes in flow direction are slight and that SW-2 and SZ-3B are upgradient wells, but will be treated as downgradient wells.

While the owner/operator contends that SW-2 and SZ-3B are upgradient wells, data and an additional interpretation of the data indicate that these wells are downgradient and should be treated as such.

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 Jeremy Scoles, Division of Solid and Infectious Waste Management, Ohio EPA Northwest District Office, 347 North Dunbridge Road, Bowling Green, Ohio 43402.

Sincerely,



Jeremy Scoles, SIT, CHMM  
Environmental Specialist  
Division of Solid and Infectious Waste Management

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pc: Lindsay Summit, Hancock County Health Department  
Wes Rhiel, P.E., Malcolm Pirnie, Inc

~~File: Hancock County; Hancock County Landfill; Ground Water~~

ec: Abdul Smiley, Jack Leow, Randy Skrzyniecki  
i.d.: 5-7286