OhioEPA
State of Ohio Environmental Protection Agency

Northwest District Office

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

Re: GMPT Landfill, Defiance County
Ground Water

February 14, 2008

Mr. Chuck Renn
Environmental Engineering
General Motors Powertrain
P. O. Box 70
Defiance, Ohio 43512-0070

Dear Mr. Renn:

On January 8, 2008, the Ohio Environmental Protection Agency (Ohio EPA), Division of Solid and Infectious Waste Management (DSIWM), Northwest District Office (NWDO) received a document titled *"October 2007 Semi-annual Statistical Evaluation of Ground Water Monitoring Data,"* dated January 2008, for the General Motors Powertrain Landfill (facility) in Defiance County. The report was reviewed to determine compliance with Ohio Administrative Code (OAC) Rule 3745-30-08.

COMMENTS

Owner/Operator's Response to Previously Cited Violations

1. **The July 24, 2007 letter from Ohio EPA cited the owner/operator in violation of OAC Rule 3745-30-08(C)(5), which requires that *"...The statistical method specified shall ensure protection of human health and safety and the environment..."*. The owner/operator continues to be in violation of this rule. In responding to this violation, the owner/operator needs to evaluate the spatial variability of the ground water quality data and its implications for statistical analysis of the ground water quality data. Further, in responding to this violation, the owner/operator needs to consider the requirements of OAC Rule 3745-30-08(C)(6)(d), which requires that, if a tolerance interval is used, the levels of confidence and the percentage of the population contained in the interval shall be protective of human health and safety and the environment.**

As stated in the July 24, 2007 letter from Ohio EPA, *"...Ohio EPA is questioning the use of elevated iron data from MW-10DR in the statistical background database. These elevated iron data from MW-10DR have significantly increased the tolerance limit (trigger level) for iron in the downgradient wells. For example, the tolerance limit for iron (for all downgradient wells) has increased from 5,400 µg/L in October 2003, to 18,000 µg/L in April 2007. This means that iron concentrations at the downgradient monitoring wells, which generally range from less than 100 µg/L to approximately 1,800 µg/L could increase on the order of 10- to 100-fold without causing a statistical trigger...."*

For the October 2007 report, the parametric tolerance limit for iron (for all downgradient wells) decreased from the previous 18,000 µg/L to 16,000 µg/L. However, this tolerance limit is still well in excess of concentrations being observed at the downgradient wells.

This tolerance limit is so high (compared to downgradient concentrations) because of the significant spatial variability of the upgradient ground water quality data, most prominently between MW-10DR and the remaining three upgradient wells. This significant spatial variation between the upgradient wells combined with the pooling of the upgradient data into one dataset has essentially invalidated the inter-well comparisons for iron.

Therefore, potential releases from the landfill, impacting the ground water quality for iron, could easily be overlooked, since they would be masked by the current statistical method. This conflicts with the fundamental purpose of the ground water monitoring program (to detect and assess potential releases from the landfill) and as such does not ensure the protection of human health and safety and the environment. Therefore, the owner/operator is in violation of OAC Rule 3745-30-08(C)(5).

More Information Needed to Determine Compliance

2. **Compliance with OAC Rule 3745-30-08(C)(6)(d), regarding the use of tolerance intervals, cannot be determined at this time. To allow for an evaluation of compliance with OAC Rule 3745-30-08(C)(6)(d), the owner/operator needs to demonstrate the levels of confidence and the percentage of the population contained in the tolerance intervals being performed.**

OAC Rule 3745-30-08(C)(6)(d) requires that *"If a tolerance interval...is used to evaluate ground water monitoring data, then the levels of confidence and the percentage of the population contained in any tolerance....interval shall be protective of human health and safety and the environment. These statistical parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern."*

Given the issues with the statistical analysis of iron detailed in Comment No. 1 above, Ohio EPA is currently unable to determine compliance with OAC Rule 3745-30-08(C)(6)(d) as it applies to the statistical analysis of iron data. Further, with general concerns over spatial variability of the ground water quality data, Ohio EPA is currently unable to determine compliance with OAC Rule 3745-30-08(C)(6)(d) as it applies to the statistical analysis of sulfate and TDS.

3. **Compliance with OAC Rule 3745-30-08(C)(6)(e), regarding the use of practical quantitation limits (PQLs), cannot be determined at this time. Specifically, Ohio EPA is questioning the PQL used for TDS analysis. To allow for an evaluation of compliance with the requirements of OAC Rule 3745-30-08(C)(6)(e), the owner operator needs to either lower the laboratory PQL for TDS to a level which is deemed as commonly achievable or demonstrate how the current PQL for TDS represents the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions.**

   OAC Rule 3745-30-08(C)(6)(e) requires that *"...Any practical quantitation limit (PQL) used in the statistical method shall be the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility."*

   For the October 2007 annual sampling event, TDS was reported with a PQL above the level which is commonly achievable by analytical laboratories doing business in Ohio.

4. **Compliance with OAC Rules 3745-30-08(C)(1) and (C)(1)(c), regarding field analysis of the ground water, cannot be determined at this time. To assure compliance with OAC Rules 3745-30-08(C)(1) in the future, the owner/operator needs to either revise the SAP to document the field parameter stabilization criteria noted below, followed by field implementation, or demonstrate to Ohio EPA how the current field parameter stabilization criteria in the SAP meet the requirements of OAC Rule 3745-30-08(C)(1).**

OAC Rule 3745-30-08(C)(1) requires that *"the ground water monitoring program shall include consistent sampling and analysis procedures...that are designed to ensure monitoring results that provide an accurate representation of ground water quality..."*

Further, OAC Rule 3745-30-08(C)(1)(C) requires that the Sampling & Analysis Plan (SAP) include a detailed description of the procedures and techniques to be used for the performance of *"field analysis"*.

The SAP states *"Purging will be considered complete, and stabilization reached, when three of the four following conditions have been reached for three consecutive readings:*

- *Temperature: three consecutive readings within ±0.5 °C*
- *pH: three consecutive readings within ±0.2 Standards Units (SU)*
- *Specific conductance: three consecutive readings within ±5 percent*
- *Turbidity: three consecutive readings within ±10 percent, or two consecutive readings below 10 NTU".*

Based on review of current technical literature, Ohio EPA agrees with the stated parameter fluctuation for stabilization of temperature and that parameter fluctuation be monitored for stabilization over three consecutive measurements. However, Ohio EPA also believes that the stabilization of purge water within ±0.1 SU for pH and within ±3 percent for specific conductance are essential in evaluating when purging can be terminated.

This issue was brought to the owner/operator's attention in the July 24, 2007 letter from Ohio EPA which noted that more information was needed to determine compliance with these rules.

In response to that comment in the July 24, 2007 letter from Ohio EPA, an August 22, 2007 letter from the owner/operator stated *"GMPT Defiance is willing to modify the Sampling and Analysis Plan (SAP) to include this sampling technique, however, after a meeting that includes Ohio EPA's legal staff since the SAP covers the ground water monitoring sampling techniques at the North Perimeter Area as well."*

In response, the November 30, 2007 letter from Ohio EPA stated *"It is true that the most recent version of the SAP (August 2003) is used for both the Residual Waste Landfill (RWL) and the North Perimeter Area (NPA). However, to date the August 2003 SAP has not been approved for the NPA. Therefore, such a revision to the SAP would not require an alteration to an approval as it regards the NPA.*

"Therefore, as GMPT Defiance is willing to modify the SAP to conform to the field parameter stabilization criteria noted above and to assure compliance with OAC Rules 3745-30-08(C)(1) in the future, GMPT Defiance needs to proceed with revising the SAP to document the field parameter stabilization criteria noted above, followed by field implementation."

Recommendations

5. **Ohio EPA recommends that the SAP be revised to remove specific references to the PQL values for ground water sample analysis.**

Table 2 of the SAP lists the ground water quality analysis parameters, the associated methods of analysis, and the respective PQLs. However, Table 2 also notes *"The PQLs may change over time as instrumentation and methods are updated. PQLs may also vary slightly during sampling events due to minor differences in sample volumes."* This periodic fluctuation in PQL values is understandable. For the October 2007 event, a large majority of the constituents analyzed were analyzed with PQLs that were different from those listed in the SAP.

Considering this, and the fact that the PQL values are not required to be documented in the SAP, Ohio EPA recommends that the SAP be revised to remove specific references to the PQL values for ground water sample analysis.

Statements

6. **The concentrations of ammonia and barium at MW-15D continue to be generally elevated. The owner/operator needs to closely monitor these constituent concentrations at MW-15D in future sampling events.**

During the October 2007 annual sampling event, the concentration of ammonia at MW-15D was 6.3 mg/L. This concentration of ammonia is higher than observed at other on-site wells. Further, concentrations of this magnitude are not typically attributable to natural conditions, but are typically associated with ground water contamination. Such elevated ammonia concentrations have been noted at MW-15D since 2001.

Further, the concentration of barium was 1.0 mg/L. This concentration of barium is considerably higher than observed at other on-site wells.

Ammonia and barium are not statistical indicator parameters for the facility. However, ground water beneath a landfill facility can still become impacted without a statistically significant change in the indicator parameters. (For the facility, there are four indicator parameters: dissolved iron, dissolved lead, sulfate and total dissolved solids). Considering this, the owner/operator should closely monitor the ammonia and barium concentrations at MW-15D in future sampling events.

7. **The owner/operator recently installed MW-11DR in the proximity of upgradient well MW-11D due to concerns regarding water level fluctuations and increases in concentrations of several constituents at MW-11D. The owner/operator has not yet indicated its intentions for the future use of MW-11DR. Pending the development and sampling of MW-11DR, the owner/operator needs to notify Ohio EPA of its intentions for this well and revise the SAP as necessary. Additionally, the boring log for MW-11DR needs to be submitted to Ohio EPA.**

As previously stated in the January 25, 2006, August 25, 2006, January 23, 2007 and July 24, 2007 letters from Ohio EPA, *"The concentrations of sodium, sulfate and total dissolved solids (TDS) at upgradient well MW-11D have increased significantly in recent events. For sodium, the concentrations ranged between 146 mg/L and 160 mg/L, but jumped to 270 mg/L for the October 2005 sampling event. For sulfate, historical concentrations were usually less than 500 mg/L. However, the sulfate concentrations have been increasing and reached 1,800 mg/L for the October 2005 sampling event. For TDS, historical concentrations were usually less than 1,000 mg/L. However, the TDS concentrations have been increasing and reached 2,840 mg/L for the October 2005 sampling event.*

Of these constituents, sulfate and TDS are statistical parameters. Although elevated, these recent concentrations of sulfate and TDS now approximate concentrations observed typically at upgradient well MW-10DR. Considering this, the elevated sulfate and TDS concentrations at MW-11D have not affected (have not increased) the statistical tolerance limits for sulfate or TDS. The owner/operator should closely monitor the sodium, sulfate and TDS concentrations at MW-11D in future sampling events."

For the October 2007 annual sampling event, the sodium concentration at MW-11D was at 260 mg/L (below the peak concentration of 270 mg/L observed in October 2005). The sulfate concentration was 1900 mg/L (below the peak concentration of 2000 mg/L in April 2007) and TDS increased to the highest concentrations ever recorded for MW-11D (3600 mg/L).

Because of these changes occurring at MW-11D, the owner/operator recently installed a potential replacement well (MW-11DR) in the proximity of MW-11D. The submittal states *"The purpose of installing MW-11DR is to obtain groundwater quality data from a well in the close proximity to MW-11D for comparison to data collected from MW-11D."*

If you have any questions, please feel free to contact Ken Brock at the Ohio EPA Northwest District Office at 419-373-3143. Any written correspondence should be sent to the attention of Kimberly Burnham, Division of Solid and Infectious Waste Management, Ohio EPA Northwest District Office, 347 N. Dunbridge Road, Bowling Green, Ohio 43402.

Sincerely,

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