



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

November 26, 2012

**RE: HARDY ROAD LANDFILL  
GROUND WATER MONITORING  
NOTICE OF CONTINUED VIOLATION**

**CERTIFIED MAIL 7011 04780 0002 3496 1245**

Stephen A. Dubetz, P.E., P.S.  
Manager, Engineering Services Division  
City of Akron Department of Public Service  
Bureau of Public Works  
1436 Triplett Blvd.  
Akron, Ohio 44306

Dear Mr. Dubetz:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the following ground water documents regarding Hardy Road Landfill, also known as Akron Regional Landfill:

- *Ground Water Quality Assessment Plan for MW-21, Response to Comments Dated June 1, 2012.* The plan is dated June 21, 2012 and was received on June 22, 2012. (Submitted to address Violation 1 of Ohio EPA's letter dated June 1, 2012.)
- *Ground Water Quality Assessment Plan for MW-21, Response to Comments Dated June 1, 2012 Supplemental Data.* The supplement is dated August 22, 2012 and was received on August 24, 2012. (Submitted as supplemental information and data to the above plan.)

The above documents were drafted by Eagon and Associates on behalf of Hardy Road Landfill and contain response to comments generated by Ohio EPA during the review of the *April 2012 Ground Water Quality Assessment Plan*. Ohio EPA comments were contained within a letter to city of Akron, dated June 1, 2012.

Hardy Road is currently conducting a Detection Monitoring Program and Assessment Monitoring Program in accordance with the 2003 Revision of Ohio Administrative Code (OAC) Rule 3745-27-10. The Detection Monitoring System consists of ground water monitoring wells: MW-19, MW-20, MW-22, MW-23, MW-24R, and MW-7S. Due to the verified detection of vinyl chloride in ground water monitoring well MW-21 during the Second 2011 Ground Water Monitoring Event and elevated sodium and chloride

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concentrations in ground water monitoring wells MW-20, and MW-23 during the First 2012 Ground Water Monitoring Event, Hardy Road Landfill is also conducting assessment monitoring at MW-20, MW-21, MW-23 and MW-7S (upgradient) with proposed extent wells MW-3D, MW-10, and two additional downgradient extent wells.

Review results:

### **More Information Needed to Determine Compliance**

This section will address the issue regarding Violation 1 of the June 21, 2012 correspondence. Akron Hardy Road Landfill submittals pertaining to Violation 1 are:

#### Submittal #1

June 22, 2012, *Ground Water Quality Assessment Plan for MW-21 Response to Comments Dated June 1, 2012*, dated June 21, 2012.

and

#### Submittal #2

August 24, 2012, *Ground Water Quality Assessment Plan for MW-21 Response to Comments Dated June 1, 2012 Supplemental Data*, dated August 22, 2012.

### **Original Ohio EPA Comment June 1, 2012** **Violation 1**

Hardy Road Landfill is in violation of OAC Rule 3745-27-10(E)(4)(a) requiring the *GWQAP* to include a detailed description of the hydrogeologic conditions at the landfill.

The *GWQAP* does not contain a detailed description of the silt zone below the uppermost aquifer system (UAS). The *GWQAP* states, "As presented in previous reports, the silt zone below the UAS acts as an aquitard and separates the UAS from the bedrock; therefore, due to the horizontally extensive silt zone below the UAS, a vertical well is not planned at this time."

Hardy Road Landfill's justification for not installing a vertical extent well adjacent to MW-21 is based on the silt zone below the UAS being an aquitard. Ohio EPA will review the need for a vertical extent well upon receipt of the detailed hydrogeologic information on the silt zone below the UAS.

To return to compliance with this rule, the *GWQAP* must be revised to include a detailed description of the silt zone under the UAS. This description must contain the reasons why the lower silt is an aquitard.

### **Akron Hardy Road Landfill June 22, 2012 Response**

On June 22, 2012, Akron Hardy Road Landfill submitted a document entitled *Ground Water Quality Assessment Plan for MW-21 Response to Comments Dated June 1, 2012*, dated June 21, 2012.

The June 22, 2012 submittal states:

Ohio EPA has stated the *Ground Water Quality Assessment Plan (GWQAP)* is in violation of OAC Rule 3745-27-10(E)(4)(a) because it does not contain a detailed description of the silt zone that comprises the lower boundary of the Uppermost Aquifer System (UAS). Since a description of the silt zone (including cross sections) is provided in the *GWQAP* along with general references to previous Hardy Road Landfill reports that have previously described the silt zone, it is unclear what violation has occurred. The comment is a request for additional information to be included in the *GWQAP*.

Information regarding the silt zone that is contained on the hydrogeologic cross sections can be repeated in text form in a revised *GWQAP*, although that seems somewhat redundant. Hydrogeologic cross sections A-A' through G-G' from the *Ground Water Detection Monitoring Plan (GWDMP)* has contained these cross sections with the silt zone depicted since at least 2003. The *GWQAP* also contains these same hydrogeologic cross sections. Observation of the cross sections shows that 15 wells or borings extend to the top, into or through the lower silt zone and have depths ranging from 39 feet to 363 feet. For each well or boring location depicted on the cross sections, the detailed soil description is shown along with available permeability test results. As depicted, the lower silt alone consists primarily of lower permeability materials including clayey silt, sandy silt, clay and silt, silty clay, and sandy clay as compared to the sand layer that comprises the UAS. Since an aquitard is a geologic unit with a lower permeability than an adjacent unit that restricts the flow of ground water from one water-bearing zone (e.g. aquifer) to another, the silt zone is characterized as an aquitard. Therefore, ground water flow within the UAS sand is predominantly horizontal. Further, the silt zone combined with the underlying and even lower permeability Ohio Shale bedrock effectively restricts flow from the UAS to lower water-bearing units.

### **Ohio EPA, DDAGW Response (Verbal)**

In an effort to resolve this outstanding issue, Ohio EPA, DDAGW verbally requested Akron Hardy Road Landfill submit a table summarizing previously acquired information and data collected during the hydrogeologic investigations of the subsurface at the facility. Ohio EPA indicated that if the table of information and data submitted adequately characterized the 'Lower Silt,' Akron Hardy Road Landfill would then be requested to include this table into the *GWQAP* and the issue resolved.

### **Akron Hardy Road Landfill August 24, 2012 Response**

On August 24, 2012, Akron Hardy Road Landfill submitted a document entitled, *Ground Water Quality Assessment Plan for MW-21 Response to Comments Dated June 1, 2012 Supplemental Data*, and was dated August 24, 2012. This submittal contained a table entitled, *Unconsolidated Soil Properties, Hardy Road Landfill* and is contained within *Attachment I*.

The August 24, 2012 submittal, in part, states:

A response letter dated June 21, 2012 (Haaf to Dysle) was submitted to address the one violation. As part of Ohio EPA's review of the June 21<sup>st</sup> letter, a verbal request was made for additional information in the form of a table that summarizes properties of the unconsolidated materials and reference citations for the source of those data. Enclosed is a table that summarizes soil properties and relevant references for data collected from borings and wells at Hardy Road Landfill. The properties associated with the unconsolidated soils shown on the enclosed table are consistent with the expected hydraulic conductivities based on the geology underlying the site as described in *The Ground Water Resources Map for Summit County* (Schmidt 1994), *The Ground Water Resources of Summit County, Ohio Bulletin 27* (Smith and White, 1953), and the *Report of Investigation No. 123, Glacial Geology of Summit County, Ohio* (White 1984).

### **Ohio EPA Response**

Ohio EPA has reviewed the table entitled *Unconsolidated Soil Properties Hardy Road Landfill* contained within *Attachment I*. Upon review, Ohio EPA has determined that the information and data contained within the table is insufficient to adequately characterize the hydraulic properties of the Lower Silt as an aquitard. Specifically, the table identifies three or four locations where the Lower Silt was measured for hydraulic conductivity: PW-1, TB-107D, TB-104, and TB-108. Of these four locations, only TB-104 was tested exclusively within the Lower Silt. At the time of measurement, the hydraulic conductivity within the measured section of the TB-104 was determined to be  $2.98 \times 10^{-4}$  cm/sec, which does not adequately characterize an aquitard. Specifically, the identified hydraulic conductivity of the range of the UAS ranges from  $1.0 \times 10^{-4}$  cm/sec to  $5.0 \times 10^{-8}$  cm/sec.

### **More Information Needed to Determine Compliance**

Akron Hardy Road Landfill should submit to the Ohio EPA additional information and data. The additional information and data should adequately demonstrate the hydraulic properties of the Lower Silt such that a conclusion may be made as to the ability of the Lower Silt to act as a likely migration pathway of adversely impacted ground water away from the limits of waste placement.

If Akron Hardy Road Landfill cannot make an adequate demonstration as described above, Akron Hardy Road Landfill should revise the *GWQAP* to indicate the proposed number, location, and installation methodology of vertical extent wells.

### **CONCLUSION**

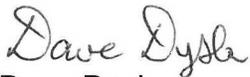
Akron Hardy Road Landfill should submit to the Ohio EPA additional information and data. The additional information and data should adequately demonstrate the hydraulic properties of the Lower Silt such that a conclusion may be made as to the ability of the Lower Silt to act as a likely migration pathway of adversely impacted ground water away from the limits of waste placement.

If Akron Hardy Road Landfill cannot make an adequate demonstration as described above, Akron Hardy Road Landfill should revise the *GWQAP* to indicate the proposed number, location, and installation methodology of vertical extent wells.

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If you have any technical questions regarding this review, please contact Jeffery Rizzo, Ohio EPA, Division of Drinking and Ground WaterS, Northeast District Office, at (330) 963-1115. Please submit all correspondence to Dave Dysle, Ohio EPA, Division of Materials and Waste Management, Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087.

Sincerely,



Dave Dysle  
Environmental Specialist  
Division of Materials and Waste Management

DD/cl

Attachment: Unconsolidated Soil Properties chart

cc: Jeffrey Rizzo, DDAGW, NEDO  
Julie Brown, Summit County Public Health  
Tim Haaf, Waste Management, Inc., Closed Sites Management Group  
Jim Forney, Waste Management, Inc.  
Al Razem, Eagon & Associates  
File: [Sowers/LAND/Hardy Road/GRO/77]  
DMWM #s 4445 and 4445(b)

TO: DAVE DYSLE  
 ATTACHMENT TO AKRON HARDY ROAD LANDFILL  
 IOM 81465, 81669  
 OCTOBER 23, 2012

UNCONSOLIDATED SOIL PROPERTIES  
 HARDY ROAD LANDFILL

Well/Boring	Boring Depth (ft) (From Ground)	Well Depth (ft) (From Ground)	Tested Material	USCS Classification (Encountered by Sand Pack or Tested Interval)	Depth to Top of Lower Silt Zone (ft) <sup>1</sup>	Thickness of Lower Silt <sup>1</sup> (ft)	Hydraulic Conductivity (cm/sec)	Test Interval (ft) (From Ground)	Testing Method	Comments
PW-1	267	247	Upper Silt/Sand/Lower Silt	Varied	239	60	$1.0 \times 10^{-3}$		Pump Test <sup>2</sup>	
TB-105	39.2	34	Upper Silt	ML	Not Present	Not Present	$1.52 \times 10^{-4}$		Slug <sup>3</sup>	Boring into shale.
TB-200	127		Upper Silt	CL	210	135	$5.0 \times 10^{-8}$	25' - 27'	Lab Test <sup>4</sup>	
			Upper Silt	CL/ML			$1.7 \times 10^{-4}$	70' - 72'	Lab Test <sup>4</sup>	
			Upper Silt	ML			$2.0 \times 10^{-7}$	113' - 115'	Lab Test <sup>4</sup>	
			Upper Silt	SP			$6.0 \times 10^{-5}$	127' - 128.5'	Lab Test <sup>4</sup>	
TB-201	120		Upper Silt	CL	178	145	$2.0 \times 10^{-7}$	21' - 23.5'	Lab Test <sup>4</sup>	Top of lower silt from nearby TB-114.
			Upper Silt	ML			$4.0 \times 10^{-5}$	62' - 64'	Lab Test <sup>4</sup>	
			Upper Silt	CL			$2.0 \times 10^{-7}$	90' - 92'	Lab Test <sup>4</sup>	
			Upper Silt	-			$6.0 \times 10^{-4}$	120' - 122.5'	Lab Test <sup>4</sup>	
TB-202	92		Upper Silt	ML	190	65	$9.0 \times 10^{-3}$	40' - 42'	Lab Test <sup>4</sup>	
			Sand	SP			$7.0 \times 10^{-4}$	94' - 96'	Lab Test <sup>4</sup>	
TB-203	142		Upper Silt	CL	153	225	$1.0 \times 10^{-4}$	15' - 17'	Lab Test <sup>4</sup>	
			Upper Silt	SP			$8.0 \times 10^{-4}$	60' - 62'	Lab Test <sup>4</sup>	
			Upper Silt	CL			$7.0 \times 10^{-7}$	108' - 110'	Lab Test <sup>4</sup>	
			Upper Silt	CL/SP			$2.0 \times 10^{-4}$	130' - 132'	Lab Test <sup>4</sup>	
TB-101	71	69	Sand	SW, GW	138	>210	$1.06 \times 10^{-3}$		Slug <sup>3</sup>	
TB-102	43	42.5	Sand	SP	60	228	$1.58 \times 10^{-3}$		Slug <sup>3</sup>	
TB-109	200	153	Sand	ML, SP	210	60	$1.47 \times 10^{-2}$		Slug <sup>3</sup>	
TB-110	170	169	Sand	SP	230	150	$4.8 \times 10^{-3}$		Slug <sup>3</sup>	
TB-107D	166.4	135	Sand/Lower Silt	ML, SM/SC, ML	126	76	$3.8 \times 10^{-4}$		Slug <sup>3</sup>	Testing interval across sand and lower silt.
TB-104	45	30	Lower Silt	SM, ML	18	180	$2.98 \times 10^{-4}$		Slug <sup>3</sup>	Top of sand pack possibly in contact w/sand zone. Very close to river. Shallow well.
TB-108	181	176.5	Lower Silt/Sand	ML, SP, CL	189 / 134	25 / 70	$4.7 \times 10^{-4}$		Slug <sup>3</sup>	Sand lens across screen likely to be from sand zone. 2 components of lower silt zone. 30' thickness below sand finger.
MW-19	68.0	68.0	Sand	SP/SM	85	>210				
MW-20	74.5	74.5	Sand	SM, ML	75	>220				
MW-21	75.0	75.0	Sand	SM/SP	80	>225				
MW-22	100.2	100.2	Sand	SM/SP	105	>220				Lower silt information from PZ-3 (nearby abandoned well).
MW-23	83.0	82.2	Lower Silt	ML	42	>265				
MW-24R	70.0	69.6	Lower Silt	ML	15	>285				
MW-1D	170.0	170.0	Lower Silt		0	>250				
TB-114	333		Lower Silt	CL	178	150				Boring into shale. Log does not note any saturated area, only moist.
PZ-1	145	75.8	Sand	SM	88	240				
TB-116	363		Lower Silt	CL, SC	155	202				Boring into shale. Log does not note any saturated /wet areas, only moist.
PZ-3	152.7	98	Sand	SM/ML	105	>220				

<sup>1</sup> From hydrogeologic cross sections in Ground-Water Assessment Plan (4/12).

<sup>2</sup> Egon conducted and analyzed test 5/01; submitted "Well Yield Analysis of PW-1, Akron Regional Landfill" to LBG 6/01; Appendix H of PTI (6/01).

<sup>3</sup> Crouse conducted and analyzed test 2/99; Appendix F of PTI (6/01).

<sup>4</sup> Geochemical Testing Services conducted laboratory analysis 3/01 for CEC, Appendix E of PTI (6/01).