

Feasibility Report Addendum 01 -
Proposed Eastern Expansion
(WDNR License No. 3268)

Vernon County Landfill

Viroqua, Wisconsin

VERSW 167824 | November 19, 2024



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November 19, 2024

RE: Vernon County Landfill
Feasibility Report Addendum 01 -
Proposed Eastern Expansion
(WDNR License No. 3268)
Viroqua, Wisconsin
SEH No. VERSW 167824 4.00

Mr. Mark Peters, Hydrogeologist
Wisconsin Department of Natural Resources
1027 W. St. Paul Ave.
Milwaukee, WI 53233

Dear Mr. Peters:

Short Elliott Hendrickson Inc. (SEH®), on behalf of Vernon County, is submitting this Feasibility Report (FR) Addendum 01 to obtain the Wisconsin Department of Natural Resources' (WDNR) approval for the proposed Eastern Expansion at the Vernon County Landfill (WDNR License No. 3268). Copies of the Feasibility Report Addendum 01 have been issued according to the attached distribution list. Delivery receipts for the Feasibility Report Addendum 01 will be forwarded to the WDNR upon our receipt.

Vernon County is requesting the WDNR review this Feasibility Report Addendum 01 and approve the Feasibility Report so Vernon County can continue to make progress with the landfill permitting process. Should you have any questions or would like to discuss the Feasibility Report Addendum 01 or Feasibility Report further, please contact me at 608.498.4844

Sincerely,

Brian L. Kent, CHMM
Project Manager

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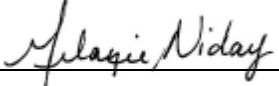
Feasibility Report Addendum 01 - Proposed Eastern Expansion (WDNR License No. 3268)

Vernon County Landfill
Viroqua, Wisconsin

Prepared for:
Vernon County, Wisconsin
Viroqua, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
329 Jay Street, Suite 301
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I, Melanie G. Niday, PG, hereby certify that I am a licensed professional geologist in the State of Wisconsin in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code; that the preparation of this document has not involved any unprofessional conduct as detailed in ch. GHSS 5, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



Melanie G. Niday, PG 672-013 November 19, 2024
Hydrogeologist PG Number Date

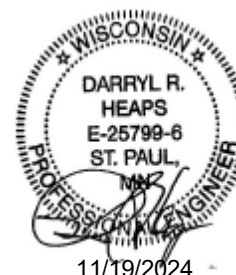


11/19/2024

I, Darryl R. Heaps, PE, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



Darryl R. Heaps, PE, CHMM E-25799 November 19, 2024
Professional Engineer PE Number Date



11/19/2024



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Feasibility Report Addendum 01 - Proposed Eastern Expansion (WDNR License No. 3268)

Vernon County Landfill

Prepared for Vernon County, Wisconsin

1 Background

Vernon County submitted a Feasibility Report (FR) to the Wisconsin Department of Natural Resources (WDNR) dated September 11, 2023, for a proposed expansion of the Vernon County Landfill. The FR included information required to determine the feasibility for the proposed Eastern Expansion of the Vernon County Landfill, WDNR License No. 3268. Following their initial review of the Feasibility Report, the WDNR sent an Incompleteness Determination of the Feasibility Report letter to Vernon County dated December 19, 2023. A virtual meeting occurred between SEH, Vernon County, and the WDNR on January 19, 2024, to discuss the Incompleteness Determination of the Feasibility Report. The WDNR provided additional written comments via email to Vernon County as a follow-up to the virtual meeting on February 1, 2024. A copy of the WDNR's Incompleteness Determination letter and the additional comments provided via email are included in **Appendix A** and **Appendix B**, respectively.

Section 2.0 provides responses to the WDNR Comments within the Incompleteness Determination of the Feasibility Report dated December 19, 2023. **Section 3.0** provides responses to the additional WDNR Comments provided via email on February 1, 2024. **Section 4.0** outlines the 2024 addendum field investigation, **Section 5.0** summarizes recommendations, and **Section 6.0** provides references.

2 Responses to WDNR Comments dated December 19, 2023

The WDNR's Letter of Incompleteness dated December 19, 2023 with the County's responses, is divided into two parts:

- Part A contains a list and explanation of the items needed to complete the FR in accordance with chs. 500, 507, and 512, Wis. Adm. Code and in s.289.24, Wis. Stats;
- Part B is a description of additional information the WDNR needs to make a feasibility determination.

2.1 Part A: Information Needed to Complete Feasibility Report

1. **Site-Specific Geotechnical Information [s. NR 512.09(1)(c) and (d), Wis. Adm. Code]:** *Soil boring B-21 does not extend to at least 25 feet below sub-base grade.*

Response

Because of the extensive fill in the vicinity of boring B-21, the boring did not extend to at least 25 feet below sub-base grade. During the 2024 addendum field investigation, boring B-22, was completed near the original B-21 and was completed at least 25 feet below sub-base grade. As of October 2024, 20 boring locations (10 are required) have been completed within 300-feet of the proposed 4.0-acre horizontal expansion and extend at least 25 feet below the proposed sub-base grade as required within s. NR 512.09(1)(b), Wis. Adm. Code. Borings meeting s. NR 512.09(1)(b), Wis. Adm. Code are provided within **Table 1**.

2. **Site-Specific Geotechnical Information [s. NR 512.09(2)(a), Wis. Adm. Code]:** *The minimal requirement to adequately define the water table surface and horizontal gradients is not met to the east of the proposed expansion area, in part because new groundwater monitoring wells MW-15WT and MW-16WT are dry. The flow toward the merger point of the perched aquifer and regional water table aquifer near the MW-16/MW-16WT groundwater monitoring well point as interpreted in the report needs to be more accurately defined by additional hydrogeological investigation (i.e., data from additional borings and groundwater monitoring wells), as this area would likely be the collection point of a hypothetical discharge from the proposed expansion. Once the assumed merger zone of the perched and regional water tables is confirmed, downgradient regional water table wells will be needed to monitor transport of a hypothetical discharge once it reaches the regional water table as required in s. NR 507.19 (1), Wis. Adm. Code.*

Response

As requested, a 2024 addendum field investigation installed monitoring wells in the southeast portion of the project landfill expansion. Monitoring well MW-18WT was installed within the perched water table and MW-18 and MW-19 were installed within the regional water table. These monitoring wells further refine the perched and regional water tables but overall, the previously interpreted perched and regional water table surfaces are generally representative with the new wells refining flow conditions. The water table surface and horizontal gradients with 2024 addendum field investigation data are described further in **Section 4.3** of this report. Perched and regional water table maps from the 2024 addendum field investigation are also provided within **Figures 1 through 4** of this report. Past monitoring data, the understanding of unsaturated conditions, and the adequacy of the monitoring system is also described further below.

Past Monitoring Data

The perched and the regional groundwater systems directly beneath the expansion footprint have been monitored for the last 30 years indicating both surfaces are predictable, and the horizontal gradients are quantifiable.

Unsaturated Conditions

We agree that the merger or transition zone on the east edge of the proposed expansion footprint corresponds with an eastern edge of the perched system. Further discussion on the hydrogeology of the perched water table systems is provided in **Section 3.0**. The percolation of water in the unsaturated zone occurs through gravity potential via interconnected pores and by moisture potential as a negative pressure due to soil-water interaction. Just like under any geologic conditions, preferred groundwater pathways may occur vertically and horizontally due to lithologic or porosity changes whether the thickness of the unsaturated zone is 10 feet or 100 feet.

A separation between the base of the landfill and groundwater is generally considered a good feature for landfill development; a minimum of 10 feet separation between landfill base grades and the seasonal high-water table is stipulated by NR 504.6, Wis. Adm. Code. The difference here is the depth to groundwater can exceed 100 feet.

Adequacy of Monitoring System

The groundwater conditions described in Section 5.4.2 are conservative assuming the perched system “merges” or transitions to the regional system and the transition zone could represent a “collection point of a hypothetical discharge”. However, in reality there are only two scenarios for groundwater movement beneath the landfill that the existing monitoring system is already designed to monitor:

- **Saturated groundwater flow:** In the presence of saturated conditions, groundwater will move from high hydraulic head to low hydraulic head in the perched system. In the landfill expansion area, current downgradient wells in the perched groundwater system include MW-5A, MW-12, MW-16, MW-17WT, and MW-18WT.
- **Unsaturated groundwater flow:** In unsaturated conditions, the transition zone indicates that infiltrating water will continue its downward vertical percolation until encountering the regional water table because there are no observed seeps or active surface water features at lower elevation in the valley east of the landfill property. For the expansion, downgradient wells in the regional groundwater system include MW-5 and MW-14. Additional wells located downgradient but stratigraphically lower than the regional water table include MW-3, MW-6, and MW-14Z.

To address concerns of the WDNR, a 2024 addendum field investigation was completed during July through October 2024. The results of the 2024 addendum field investigation are presented in **Section 4.0**.

3. ***Subsurface Data Analysis [s. NR 512.10(4), Wis. Adm. Code]:*** *The report appendices do not include raw data for groundwater level measurements. Either field notes/forms or inclusion of measured depth-to water readings on the data tables would satisfy the requirement.*

Response

A table (**Appendix C**) includes all depth-to-water readings for all six rounds of groundwater level monitoring is provided as required within s. NR 512.10(4), Wis. Adm. Code. Depth-to-water readings for the 2024 addendum field investigation are provided within **Appendix J**.

4. **Data Presentation [s. NR 512.11(2)(a), Wis. Adm Code]:** *Inferred or questionable lithostratigraphic boundaries are not marked with a dashed line or question mark.*

Response

Plans Sheets have been revised to include question marks or dashed lines where lithostratigraphic boundaries or groundwater contours are inferred per s. NR 512.11(2)(a), Wis. Adm. Code. Revised **Plan Sheets 4 through 22** are provided. Please note that the lithostratigraphic boundaries on cross-sections were drawn based on combining the results from multiple sources or interpretive methods including soil boring logs, geophysical markers horizons, the bedrock contour map, and historical cross-sections.

5. **Section 1.3.1, Baseline Sampling of New Wells Subsection, Section 4.9, Section 5.4:** *Manganese concentrations in groundwater monitoring well MW-14WT are significantly higher than in other groundwater monitoring wells at the facility, including but not limited to upgradient groundwater monitoring wells and groundwater monitoring wells for which manganese exemptions have been previously granted. Additional discussion on the potential source of the manganese in MW-14WT is needed to evaluate the requested exemption under s. NR 140.28, Wis. Adm. Code.*

Response

Manganese occurs naturally in groundwater and extreme ranges in manganese concentrations are common locally (USGS, 1995). After further evaluation of the manganese concentrations present at MW-14WT, the following may contribute to the observed concentrations.

- Upgradient of the existing and proposed disposal areas, MW-14WT is screened from 1141-1156 feet NAVD within a gray to brown dolostone of the Prairie du Chein aquifer. Representative analyses of water from the St. Peter-Prairie du Chein-Jordan aquifer show a large range in concentrations of manganese (USGS, 1995). The higher concentration of manganese observed may be in part due to the well screened in a slightly different portion of the Prairie du Chein aquifer than other perched water table wells.
- Manganese is also often released from soil or bedrock when the soil or bedrock in contact with groundwater is disturbed (for example during drilling) and, as a result, manganese concentrations typically decrease over time to approach pre-drilling levels. While the manganese concentration within MW-14WT varied during the first six sampling events, there is a slight decreasing trend. Additional sampling is required prior to the Plan of Operations submittal and manganese concentrations at MW-14WT will be re-evaluated further during the Plan of Operations Report.

6. **Section 5, Alternative Geotechnical Investigation Plan and Geophysical Investigation:** *Statements and other information provided in the feasibility report, including the boring logs, indicate that there is a respectable amount of fractured or preferential flow in the dolostone for the perched aquifer and the regional aquifer. Fractured and preferential groundwater flow may be challenging to effectively monitor because it may be difficult or impossible to determine the appropriate locations for groundwater monitoring wells with the capability to detect any*

hypothetical landfill leakage as required in s. NR 507.19 (1), Wis. Adm. Code. In addition, the reported horizontal flow velocities in section 5.4.2.10 of the report indicate a relatively fast groundwater flow regime. A relatively fast flow matrix is consistent with fractured flow behavior and makes it more difficult to effectively monitor groundwater at the landfill. It is not known if additional geotechnical work would provide sufficient additional information regarding the fractured flow matrix. The department is concerned about the ability to effectively monitor groundwater quality at the site. Vernon Co. may propose additional geophysical methods as part of the installation of additional borings and groundwater monitoring wells to define the groundwater flow of the perched aquifer as it converges with the regional aquifer or as part of any other additional work.

Additional geophysical methods to be considered should be applicable to investigation in an open borehole and may include, but are not limited to: electrical methods (e.g., resistivity and similar methods) electromagnetic methods (e.g., electromagnetic induction); additional nuclear methods; physical/imaging methods (e.g., caliper log, acoustic televiewer, optical televiewer, video camera); and fluid column methods (applicable to saturated portions of a borehole). Multiple test methods for each borehole would provide additional lines of evidence to predict groundwater flow. Again, it is not known how feasible any of these additional methods would be and if they would yield sufficient additional information or additional information favorable to the expansion of the landfill.

Response

As presented in Section 5.4.1 of the Feasibility Report, we agree fractures and dissolution cavities are present within the bedrock. However, it is also important to understand how and why the fractures and dissolution cavities were formed, the actual observed groundwater flow pathways, the likelihood of significant karst development, and the limitations of other geophysical methods. Each item is further described below. Note additional discussion on the geology and hydrogeology is provided in Section 3.0.

Origin of Bedrock Fractures and Dissolution Cavities

Dissolution cavities and fractures are present at the site, particularly in the unsaturated zone. As described in Section 5.4.1 of the Feasibility Report, assessment of bedrock coring completed during 2022, and historically at the site, resulted in the following observations and conclusions:

- Dissolution cavities occur primarily as small voids or vugs and do not appear to be interconnected. This is consistent with the published understanding of the Prairie du Chien Group and its hydraulic properties:
 - The uppermost bedrock is in the Oneota Dolomite which regionally has been defined as a confining unit; the overlying Shakopee Formation (not present at our site) is defined regionally as an aquifer (Tipping et al, 2006).
 - The predominant rock type/mineral in the Oneota Dolomite is dolomite (Tipping et al, 2006).
 - Dolomite is significantly less soluble than calcite, especially in the presence of calcite (Drever, 2002).
 - More dissolution of carbonates occurs in open systems with exposure to the atmosphere where CO₂ is readily available; that is why there is less modern dissolution below the perched water table where atmospheric CO₂ would be less available.

- The secondary porosity (fractures/vugs) are considerably lower in the Oneota than the overlying Shakopee (Tipping et al, 2006).
- Shallow bedrock, in general, is often highly fractured and the fractures are likely more interconnected.

Hydraulic Properties and Groundwater Flow

As described in Section 5.4.2, the “relatively fast” average linear flow velocity calculated at the perched water table (ranging from 587 to over 4000 feet per year) is indicative of a porous media with a hydraulic conductivity similar to sand and gravel with some preferred flow paths. However, it is unlikely for perched groundwater to actually leave the landfill property due to the transition zone present in the downgradient direction of the landfill. The conditions of the low permeability unit within the Oneota Dolomite/Sandstone and where it is compromised to allow the perched water table to diminish and transition to the regional water table is described below in **Section 3.0**.

As indicated in Section 5.4.1.3, the average linear flow velocity calculated for the regional water table (248 feet per year), significantly lower than the perched system, is also indicative of a more uniform porous media with a hydraulic conductivity similar to sand. Monitoring of the regional water table over the past 30 years confirms it is consistent and predictable.

Section 5.4.2.6 of the Feasibility Report summarized the horizontal hydraulic conductivity at the Landfill. While some horizontal hydraulic conductivity values were as high as $6.67\text{E-}2$ cm/sec, all in-field hydraulic conductivity testing indicated the formations screened are responding to testing as porous media without turbulent flow. Turbulent flow would be associated with highly interconnected dissolution cavities or fractures and would not be quantifiable during an in-field hydraulic conductivity test.

As stated above, fractured bedrock is common, and it is likely some fractures are interconnected. The in-field hydraulic conductivity testing indicated the wells are responding to testing as porous media, which indicates that although secondary porosity (interconnected fractures) may be present in the geologic units, the primary porosity (intergranular) dominates flow within the bedrock on-site. Therefore, groundwater within the perched water table, regional water table, and within the deeper aquifer (piezometers) on-site is monitorable.

Limitations on Geophysical Methods

There are a few concerns or issues with proposing geophysics within open boreholes at the Landfill.

1. Knowledge gained from geophysics would be on a small scale as only a few additional boreholes is realistic.
2. Open borehole geophysical methods will only work in bedrock if the borehole remains open. During previous investigations, coring has been difficult due to weathering of the saprolite and layered heterogeneity of the dolostone. These characteristics of the bedrock increases the risk of geophysical tools being damaged or caught on uneven surfaces of the borehole wall; these risks are generally not taken due to costs of the equipment and that the borehole will likely not stay open for geophysics to be successfully completed.

Despite the concerns above, additional methods of geophysics were assessed using the Fractured Rock Geophysical Toolbox Method Selection Tool (FRGT Tool). The FRGT Tool was

published in 2015 in a joint effort by the United States Geological Survey, the United States Environmental Protection Agency, and the Environmental Security Technology Certification Program. The FRGT Tool is a spreadsheet-based tool that allows users to input site specific details and goals and then provides an output that summarizes which geophysical methods are feasible and useful for project goals.

The FRGT Tool was used to assess geophysical methods that would be applicable within open boreholes as suggested by the WDNR. The methods that the FRGT Tool output stated might be applicable on-site are listed below.

- Acoustic Televiewer: May be used to assess discrete fractures and lithologic contacts within open boreholes but may not be able to provide results within mud-filled boreholes. Mud was needed to advance borings during the 2022 investigation.
- Caliper: May be used to assess discrete fractures within borehole. Although this may note fractures within boreholes, it does not determine the interconnection of fractures.
- Electromagnetic (EM) Induction: May be used to delineate changes in rock types but is susceptible to interference from metal. Also, conductivity of thin beds cannot be determined.
- Nuclear Magnetic Resonance (NMR): May be used to measure the water content in soils and rock. It may provide the total porosity/water content, pore-size distribution, and/or hydraulic conductivity variations and estimates. However, it could only be completed in a few open hole borings and would limit the effectiveness of this method.
- Flowmeter Logging and Induced Polarization and Normal Resistivity: Requires a water-filled well or borehole so not applicable on-site as a large portion of the boreholes are set at the water table so only small portion of the borehole is saturated.

After review of the geophysical methods suggested by the FRGT Tool, it has been determined that the completion of additional geophysical methods on-site will only provide additional data on a small-scale and will not aid in the large-scale hydraulic properties of the site. Therefore, no additional geophysical methods are proposed at this time.

7. **Section 5.4.1.2:** *Provide the following additional information and clarification regarding the MW-16 groundwater monitoring well nest drilling.*
- The MW-16 boring log provided in Appendix J states that the borehole lost water from 70 feet to termination. Further explain the interpretation provided in the report text that the water loss was due to the head pressure exerted by the confinement of weathered sandy dolostone between two shale layers, and whether the pressure/fluid loss characteristics changed after the lower shale layer was penetrated and the borehole advanced through similar sandy dolostone material. In addition, please indicate if a fractured flow regime and/or other reasons were considered as the cause of the water loss, and why the confining layer was selected as the most probable reason.*
 - Clarify the source of the observation of groundwater at 68.4 feet below ground surface (bgs) on 8/24/2022 (during advancement of MW-16) on the MW-16WT boring log. This information was not provided on the MW-16 boring log.*

Response

Note: Additional information on geologic and hydrogeologic conditions in the vicinity of MW-16 were obtained as part of the 2024 addendum field investigation and presented in Section 4.0.

- a. In reviewing of the field notes, it was determined that water loss began at 60 feet bgs at the MW-16 *boring* and continue to termination (98 feet bgs). Grout was also noted to be lost during the well construction of MW-16 between the depths of 60 and 78 feet bgs. It was also determined when reviewing the field notes, that MW-15WT had water loss from 75 feet bgs to termination (99 feet bgs). The boring logs for MW-15WT and MW-16 have been revised and included within **Appendix D**.

While drilling with fluid, the ability of the borehole to contain drilling fluid indicates there are no significant interconnected fractures or solution cavities associated with karst. As indicated in the report, the loss of drilling fluid occurred into unsaturated weathered sandy dolostone from more than 60 feet of fluid pressure within the borehole. The weathered sandy dolostone encountered on-site appears to have a higher porosity and, as a result, provided a pathway for the drilling fluid to travel. While drilling fluid was lost through termination of the borings, drilling mud pressure returned allowing for borehole advancement without needing to seal off that portion of the borehole; therefore, it was determined that the unsaturated pathway within the weathered sandy dolostone could not be extensive in nature and likely a localized horizontal pathway within the weathered sandy dolostone as would be anticipated.

- b. The observation of groundwater at 68.4 feet bgs, was measured during drilling at MW-16 on 8/24/2022. The boring was drilled to 85 feet bgs on 8/23/2023 and then left open overnight to allow the water level to stabilize to approximately water table conditions in order to determine appropriate depths for MW-16WT and MW-16. As the water level was observed at 68.4 feet bgs the next day, it was determined that MW-16WT be screened between 65 to 75 feet bgs and MW-16 screened between 92 to 97 feet bgs. This measured water level was noted on MW-16WT to explain the reasoning for well placement. A similar note has also been added to MW-16 to clarify this measured water level.

8. *Section 5.4.1: Please clarify the statement that dissolution cavities and fractures are primarily present above groundwater and address or discuss what information indicates the absence of fractures and voids below the water table. Cored borings MW-10, MW-12, and MW-14Z document vugs and fractures, and other boring logs provided in Appendix K document numerous crevices below groundwater in bedrock.*

Response

As described in the response to Comment 6, more dissolution of carbonates occurs in open systems...that is, exposed to the atmosphere where CO₂ is readily available; that is why there are a greater amount of dissolution cavities and fractures above groundwater and less dissolution below the perched water table where CO₂ may be less available. Additionally, the secondary porosity (fractures/vugs) are considerably lower in the Oneota than the overlying Shakopee, and they decrease even more with depth. In addition, Tipping et al (2006) describe an unconformity between the Shakopee and the top of the Oneota Dolomite that would indicate historic weathering and erosion in the upper Oneota Dolomite.

Drilling methods used on-site have varied over time. Traditional coring methods had a history of low recovery and therefore, in 2003, versa sonic was used to core borings MW-1RZ, MW-13P, and MW-14Z in attempts to improve recovery. While the use of sonic generally provided higher recovery within the unconsolidated zone, it had variable success with accurately logging actual

bedrock conditions. The following further outlines the precautions that need to be used when interpreting the sonic boring logs completed on-site.

- As stated within the 2003 Feasibility Report, “Note that the cores obtained from MW-1RZ, MW-13P, and MW-14Z had generally higher fracture frequencies and lower RQD values than those obtained previously from MW-7 and MW-10. This probably reflects the fact that the recent cores were drilled using the versa-sonic method” (Central Wisconsin Engineers, Inc., August 2003).
- No further description is provided on the versa sonic boring logs (e.g. mineralization along fractures, freshness of breakage) for the fracture zones that are noted and therefore, it cannot be determined if they were naturally formed or mechanically formed.

Therefore, the “highly fractured zones” that are noted on the MW-14Z boring log are most likely less competent portions of bedrock (higher percentage of sand or silt) which fractured more readily during drilling. This is also most likely the case for other versa sonic boring logs completed on-site (MW-1RZ and MW-13P). The use of versa sonic provides high recovery and is useful but additional caution needs to be used when interpreting the boring logs.

Other boreholes on-site were further reviewed and assessed in reference to fractures, vugs, or crevices noted below the water table. Notes on these boreholes are provided below.

- Please note that MW-12 was not logged separately; MW-10 was cored, and the same log was used for the shallower nested wells MW-11 and MW-12. The boring log for MW-10 notes “occasional small vugs” and “numerous small vugs” below the water table but does not describe any fractures or crevices below the water table. A majority of RQD’s below the water table are above 70%, indicating competent bedrock.
- MW-7 was cored with methods similar to MW-10 and notes minor vugs at depths below the water table, fractures were observed. RQD percentage ranges from 16% to 90% between the depth to water table (approximately 118 feet bgs) and boring termination. The lowest RQD’s (16 to 23%) are present at depths where sandstone interbeds are noted and therefore, the low RQD’s are noting the change in lithology from a hard dolostone to an interbedded dolostone, which fracturing from drilling is more likely.
- MW-6 was logged from cuttings only and does not note any fractures, vugs, or crevices below the water table.
- MW-5 was logged from cuttings only and does note two “crevices” below the water table. Since this borehole was not cored, the crevices noted are most likely notes from the driller on rods dropping during drilling. Monitoring well MW-5 was set at the depth of one of the crevices noted within the boring log. Slug testing was then completed at MW-5 and a hydraulic conductivity of 2.6E-04 cm/sec was measured. This hydraulic conductivity value suggests that this crevice is not highly interconnected, as the formation responded predicably and not as turbulent flow.

During the 2024 addendum field investigation, Rotosonic drilling methods were utilized to increase recovery and aid in determined depth to water. The 2024 boreholes are reviewed assessed in reference to fractures, vugs, or crevices below.

- **B-22:** Sporadic vugs were noted within the dolostone encountered within B-22. No fractures or crevices were encountered within B-22. A void was thought to occur during drilling as the driller’s note a drop in the drilling rods but once the soil was observed, it was discovered the “void” was a zone of weathered dolostone.

- **MW-16Z:** Sporadic vugs were noted within the dolostone encountered within MW-16Z. No fractures or crevices were encountered within MW-16Z.
- **MW-18:** No vugs, fractures, or crevices were encountered within MW-18.
- **MW-19Z:** No vugs, fractures, or crevices were encountered within MW-18

As stated previously, fractures in bedrock are common and some fractures are likely to be interconnected. The 30 years of monitoring of on-site groundwater elevations confirm that the perched water table and regional water table are consistent. Fractures may be present and may be interconnected but the groundwater at the site is predictable and monitorable. Additional discussion on the geology and on-site coring efforts is provided in **Section 3.0**.

9. **Section 5.4.1.4 Geophysical Horizons:** *Explain the access issues that prevented geophysical investigation at the MW-16/ MW-16WT groundwater monitoring well nest, and whether the access issues are ongoing.*

Response

Geophysics was not able to be completed at the MW-16/MW-16WT location due to steep slopes and muddy conditions at the time geophysics was completed. The MW-16WT/MW-16 well nest was able to be accessed for geophysics during September 2024. Surface water drainage will be updated with the proposed expansion and the access to MW-16/MW-16WT will be improved.

10. **Section 5.4.2.4, Section J-J' and Flow Net:** *Based on the information provided in the feasibility report, the department questions the assumption stated in this section and others that the site represents a homogenous, isotropic system due to soil classifications and hydraulic conductivity values. Other comments pertinent to this section and the other sections referenced in the flow net assumptions discussion are as follows:*

- Hydraulic conductivity values within each of the three dolostone zones identified (perched water table, regional water table, piezometers) vary by two or more orders of magnitude.*
- Variations in lithology within the residuum layer and portions of saprolite and competent bedrock above groundwater, and variations in vertical hydraulic conductivity measurements, do not provide sufficient evidence to support a low likelihood of potential impacts from the landfill to the water table.*
- Based on the limited data, vertical gradients within the upper portion of the regional water table formation vary by approximately one order of magnitude.*
- Bedrock quality data with respect to fracture regimes or voids collected during the geotechnical investigation are limited; however, it is observed in Section 5.4.1.3 that bedrock is highly fractured in general with a likelihood of interconnected fractures. Boring logs are marked with zones consisting of fractures, vugs and voids.*

Depending on the resolution of this comment and the results of any further groundwater investigation at the landfill, the flow net presented in cross section J-J' may need to be modified. The department notes that map view flow nets of both the perched water table and regional water table may enhance understanding of flow from the proposed expansion area to and within groundwater.

Response

The flow net (Plan Sheet 21) provides flow lines for the regional water table in the direction of groundwater flow (south to north) across the proposed expansion area. Based on the geologic

descriptions and hydraulic conductivities of the monitoring wells in reference to the regional water table the assumption of a homogenous, isotropic system can be used. There are some shale interbeds noted within the MW-10 and MW-14Z locations but the interbedding noted is on a small scale that cannot be addressed within a flow net at this scale.

As stated within Section 5.4.2.6 of the Feasibility Report, the hydraulic conductivity values within the regional water table vary by two orders of magnitude ($1.86\text{E-}4$ cm/sec to $6.67\text{E-}2$ cm/sec). A range of two orders of magnitude within the same geologic unit is typical. Unconsolidated soil and bedrock generally have spatial variations that cause differences in hydraulic conductivity that span one or two orders of magnitude. For assumptions needed to create a flow net, a range of two orders of magnitude can still be considered homogeneous and isotropic.

A flow net cannot be accurately constructed for the perched water table due to the lack of a consistent lower boundary condition. The degree of saturation between the perched water table and the regional water table is unmeasurable and therefore, a lower boundary condition cannot be accurately determined, and an accurate flow net cannot be constructed (U. S. EPA, 1986).

11. **Appendix J:** *Explain the differences in the SEH boring logs and the Braun Intertec Logs for the same borings, in particular differences in total borehole depth (B-19 and B-20), differences in depth to bedrock/saprolite (B-18 through B-20, MW-14WT, MW-16, MW-17WT), and differences in bedrock/saprolite lithology (B-20, MW-16, MW-17WT).*

Response

Discrepancies within total depths of boring was discussed with the field staff and borings logs have been revised as applicable (**Appendix D**). SEH boring logs B-18 and B-19 still differ from Brauns boring logs due to differing interpretation of end of boring. At boring B-18 and B-19 a split spoon was attempted but refusal occurred within the first 6 inches and no recovery occurred. Therefore, the SEH boring logs for B-18 and B-19 end at 29.5 feet below ground surface or refusal. Brauns boring logs for B-18 and B-19 have an end of boring depth of 31 feet below ground surface, which would be the bottom of the attempted split spoon if all 18-inches were achieved.

The difference in lithology and depth to saprolite/bedrock descriptions are due to different specialties of the SEH and Braun personnel. The SEH personnel on-site were geologists performing directly under the supervision of a licensed Professional Geologist (PG) and who specialize in geologic descriptions, lithology, and environmental conditions. Braun Intertec provided geotechnical services and did not view conditions in reference to bedrock weathering. Therefore, some differences in lithology and depth to saprolite/bedrock are present between SEH and Braun boring logs. SEH boring logs were used for all geologic interpretation, while all geotechnical information is provided by Braun.

12. **Table 5-4:** *Clarify the “Frozen” designation for the March 2023 water table elevation at MW-17WT. Given that the static water level in this groundwater monitoring well is generally significantly below ground surface, a frozen water surface does not seem likely.*

Response

On March 1, 2023, ice surrounding the inside of the PVC casing on MW-17WT most likely occurred from condensation accumulation at the “frost line” inside of the well, despite the monitoring well plug being tightly sealed. This obstruction made it unfeasible to obtain a water level measurement and/ or groundwater sample.

13. **General Submittal Requirements [s. NR 500.05(6)(g), Wis. Adm. Code]:** *The local survey grid used does not appear to be referenced to state plane coordinates or other datum accepted by the department, and the department did not find discussion or documentation that the coordinate system is based on monuments in the field.*

Response

All existing construction is based on local site coordinates. All proposed construction presented in the Feasibility Study is also based on local site coordinates. A formula for converting coordinates for the proposed expansion to the Wisconsin State Plane coordinate system is presented on a revised **Plan Sheet 2** and survey transformations are provided within **Appendix E**.

14. **Performance Standards [s. NR 504.04(4)(d), Wis. Adm. Code] and General Submittal Requirements [s. NR 512.05, Wis. Adm. Code]:** *The department was unable to locate in Appendix Q the recent nitrate + nitrite data that was referenced in Section 5.4.3.1. These data are necessary to justify how applicable s. NR 140.28, Wis. Adm. Code criteria are met.*

Response

As noted within Section 5.4.3.1.1 of the Feasibility Report, a groundwater exemption of nitrate+nitrite for MW-6 is proposed as there are nine sampling events of nitrate+nitrite and all exceed the PAL. These nine events were completed between 1989 and 1995 so it is unclear why an exemption was never requested for nitrate+nitrite previously at the MW-6 location. No recent nitrate+nitrite data has been collected at the MW-6 location, but this exemption request is made using the historical data provided within Appendix Q. The MW-6 data provided within Appendix Q of the Feasibility Report is provided again within **Appendix F** of this Addendum.

15. **Proposed Physical Changes [s. NR 512.16(2)(b), Wis. Adm. Code]:** *The discharge rates provided are anticipated during active operations and do not compare to existing rates or rates anticipated following closure conditions.*

Response

There should be no significant impacts or changes to aquatic resources including the potential impacts to streams, wetlands, ponds, lakes, and flowages. Primary local surface water flowages include the Seas Branch Creek and an unnamed tributary. The northern portion of the site drains to the north to Seas Branch Creek. Surface water from the southern portion of the site drains to the to an unnamed tributary which then flows northeast to Seas Branch Creek and then east to the west fork of the Kickapoo River. More regionally surface water drainage is to the southeast towards the Kickapoo River.

Relatively minor surface water modeling parameter changes account for pre- and post-development conditions. Less than 10 percent imperviousness is added with gravel for development. Surface water model runoff calculations for pre- and post-development vegetation and soil types representing existing and proposed expansion landfill areas are similar. Existing and proposed vegetation conditions are grassland and soils for each are specified hydrologic soils group D. The difference is that soils on the landfill cover are assumed to be compacted.

There are currently no direct discharge points or impacts to nearby wetlands. The surface water control system proposed for the expansion will not create any impacts to wetlands.

16. **Environmental Review [s. NR 512.16(2)(e), Wis. Adm. Code]:** *Please provide clarification regarding whether the perimeter access road will be designed on the east side of the proposed*

expansion and how that may affect perimeter storm water ditches, toe drains, and other engineering features. Revise the plan set for consistency in depiction of the eastern side of the landfill.

Response

To conserve borrow soils, to minimize site traffic and minimize stormwater runoff, access roads will not be constructed on the eastern side of the final landfill expansion during final closure. Final access will be provided on the landfill's outboard slopes. Access roads will be presented on the Plan of Operation development drawings.

17. ***Existing Environment [s. NR 512.16(3), Wis. Adm. Code]:*** The report does not discuss the dominant animal species found in the area of the expansion.

Response

The following information is added to Section 10.3.2. The proposed expansion area is in an upland prairie that covers the broad ridge between Westby and Viroqua and extends two miles to the west. This prairie-woodland interface provides good habitat for many types of mammals, birds, reptiles, amphibians, and invertebrates.

- Mammals: white tail deer, fox squirrel, coyote, beaver, river otter and others.
- Birds: bald eagle, green herons, cerulean warbler, and many others.
- Reptiles: eastern garter snake, common snapping turtle, eastern painted turtle, and northern water snake.
- Amphibians: American bullfrog, green frog, northern leopard frog, eastern American toad, and spring peeper.
- Invertebrates: insects, arachnids, annelids, and mollusks.

Reference: Kickapoo Valley Reserve (<http://kvr.state.wi.us/Natural-Features/Plants-Animals>)

18. ***Environmental Review [s. 512.16(2)(c), Wis. Adm. Code]:*** The report does not discuss the miles of access roads (or estimated length using other units) to be constructed.

Response

Final access road design will be completed in the Plan of Operation and shown on the development plans. Specific area quantities will be provided.

19. ***Environmental Review [s. 512.16(2)(d), Wis. Adm. Code]:*** The report does not discuss the potential for post-closure gas production, emissions, or discharges.

Response

The potential for emissions and discharges listed in NR 512.16(2)(d) and as addressed in Section 10.2.4 of the Feasibility Report will largely decrease post closure. The potential for operational and construction related emissions such as engine exhaust, dust, and noise will greatly decrease due to the absence of heavy construction equipment and waste hauling vehicle traffic that would otherwise be present during active operations. Similarly, the potential for leachate generation, odors, and impacts to groundwater will be greatly reduced due to the placement of an impervious final cover and the continued operation of the leachate extraction system post closure. Landfill gas (LFG) generation potential will decrease post closure as the landfill achieves organic stability and the waste degrades over time.

The potential for increased storm water runoff post closure will be reduced by the storm water control features implemented in the Expansion design. These will be further presented in the forthcoming Plan of Operation. Generally, storm water runoff could potentially increase as compared to pre-development conditions as storm water will be routed off the final cover as opposed to captured by the waste and into the leachate collection system during active operations. However, the storm water control features for the Expansion will be designed considering post closure conditions and in accordance with applicable standards of NR 504 and NR 151. Additionally, the potential for storm water runoff to pick up contaminants will be greatly reduced post closure due to the restored vegetated surface of the final cover.

20. **Section 6.3 and 8.8.1, Maximum Open Area:** Clarify the maximum open acreage of landfill in these sections of the narrative.

Response

The statements in Section 6.3 and values used in Table 6-3 concerning open and closed areas are correct. The statement concerning landfill areas open and closed to leachate infiltration in Section 8.8.1 shall be corrected in accordance with the following paragraph.

The maximum open acreage of the landfill anticipated is approximately 9.58 acres with 5.00 acres being closed. As shown on Table 6-3, this corresponds to final closure area C-1 (5.0 acres) being closed, and final closure areas C-2 (4.64 acres) and C-3 (4.94 acres) being open, which represents the entire proposed horizontal and vertical expansion area.

21. **Section 8.8.2 Geotextile:** Clarify the minimum thickness of the geotextile used.

Response

Geotextile thicknesses will be specified in conjunction with aggregate gradation design during the Plan of Operation preparation process. All landfill geotextile will be greater than or equal to 12 oz/yd².

22. **Table 8-1:** Include quantities of structural fill needed for support berms and other structure features for the expansion in the soil balance table.

Response

The volume for support berms and other earthwork features are included in the Common "Earthwork" Columns of Table 8-1.

23. **Section 11, Need and Design Capacity:** Resolve the following apparent discrepancies in the needs and site life analysis:

- a. *The starting estimated disposal rate for the landfill provided in Table 11-7 (59,000 cubic yards) is not consistent with the average waste acceptance rate at the landfill presented in Table 11-2 (25,235 cubic yards). Evaluate the service area and needs analysis factors to explain this discrepancy and whether a more representative starting disposal rate would be appropriate.*
- b. *The annual growth rate used in Table 11-5 is 1.56% which is taken from Table 11-2. However, this annual growth rate is significantly higher than the annual population growth rate of 0.22%. While the 1.56% growth rate may be the most conservative calculated from Table 11-2, the actual waste volumes accepted at the landfill fluctuate slightly from year to year. The 1.56% growth rate does not represent a rate that is exponential in*

growth to be compounded annually like the behavior of a population growth rate. Furthermore, the latest trend is a declining waste acceptance rate at the landfill. If the population growth rate is used, the proposed expansion volume would exceed a 15-year site-life. The department is allowed to approve landfills with a maximum 15-year site-life. Please provide any additional explanation available regarding this that may assist the department in its determination of estimated site-life.

Response

The design capacity of the proposed Expansion was based on historic tonnage data collected at the existing facility. Historic, site-specific data, was used to calculate anticipated future waste quantities, factoring in growth in waste generation, over the maximum 15-year life of the Expansion per NR 504.05(3). The projected site life of the Expansion based on historic tonnage data and calculated growth rate was presented in Table 11-5. Using a five-year average of the most recent tonnage data, a starting disposal rate of 25,235 CY (assuming a 1,500 lbs/CY waste density conversion) was utilized for this calculation. A second method (per capita method) for calculating waste quantities and evaluating need of the facility was presented in the FR which utilized the calculated statewide per capita average disposal rate and applying it back to the service area population to estimate waste generation. The second method calculated an annual service area waste disposal, or generation, rate of 59,000 CY which was not used for determining design capacity of the Expansion. The first method is the preferred method as it is based on empirical data collected at the existing facility. The second method is a good gauge for estimating the amount of waste potentially generated within the overall service area and gives an approximation of waste capture and waste potentially leaving the service area.

As discussed in Section 11.3.3, several waste growth rates were calculated utilizing historical tonnage data collected at the facility. The average annual disposal rate from year to year was chosen for calculating future waste growth over the life of the Expansion as it was most conservative. Growth rates ranged from 1.56% to 2.39% of which any these rates within this range are representative of the existing facility's increase in waste disposal over time. Waste growth rates were utilized as opposed to only population growth rate as other factors such as economic development/redevelopment, new industries, weather related disaster/damagers, etc. can lead to increased generation in non-MSW waste types like C&D waste. It is reasonable to infer that MSW generation can be commensurate with population growth, however population growth alone may not be commensurate with other wastes accepted at the facility. Therefore, using population growth rate alone would potentially exclude growth in other non-MSW streams.

Waste received by a solid waste facility can fluctuate from year to year. These fluctuations could be caused by a variety of factors such as new waste diversion efforts, hauler compliance/non-compliance in terms of contractual agreements, increase/decrease in local redevelopment or new development, economy, changes in population, new waste streams, etc. The recent trend experienced during 2020 to 2022 is not expected to be a lasting trend and is likely due to several reasons stated previously. In 2023, the facility received 18,415 tons of waste suggesting the facility may be returning to an increasing trend. Waste tonnage data provided by Vernon County for 2023 is included in **Appendix G**.

24. **Appendix S, Leachate Treatment Agreements [s. NR 512.13(3), Wis. Adm. Code]:** *The leachate treatment agreements provided have expired prior to the submittal of this feasibility report. Provide updated leachate treatment agreements.*

Response

The City of Viroqua Leachate Treatment Agreement provided within Appendix S is the active leachate agreement between the Vernon County Landfill and the City of Viroqua. The agreement states, “this agreement shall remain in effect for the period of time that the County is required to dispose of leachate from the County’s solid waste disposal facility”.

The La Crosse County Leachate Treatment Agreement provided within Appendix S is the active leachate treatment agreement between the Vernon County Landfill and La Crosse County. The agreement states an automatic renewal.

The City of Sparta and the Vernon County Landfill currently have a draft leachate treatment agreement which is provided within **Appendix H**. A final copy will be provided to the WDNR once completed.

25. **Plan Sheet 32, Detail 3-32, Leachate Extraction Building (Phase VII):** Please clarify the thickness of clay liner and rooting zone layer, as these thicknesses are inconsistent with other details provided on the plan sheets and in the narrative.

Response

The detail formerly recognized as Detail 3-32 on Plan Sheet 32 in the Feasibility Report has been revised and is attached as Detail 3-33 on Plan Sheet 33 and depicts a 5 ft. thick clay liner and 2 ft. thick rooting zone.

26. **Appendix R, Sub Appendix B, Sheet 16 Leachate Headwells:** This sheet notes that multiple headwells on the landfill are damaged; please provide a current list of the headwells on site and the status of them as well as provide a history of headwells that are damaged, lost, or abandoned.

Response

Current Existing and Proposed Site Headwells	
Leachate Headwell	Status
LHW-1	Lost (presume buried and damaged)
LHW-2	Obstructed, buried and damaged
LHW-3	Obstructed, buried and damaged
LHW-4	Not constructed
LHW-5	Operational
LHW-6	Operational

A Plan Modification Request was submitted to the WDNR on October 2, 2020, summarizing the status of the headwells and requesting approval to use alternatives. This Plan Modification Request proposed to perform head monitoring at leachate cleanouts CO-3S, CO-7S, CO-3N, and CO-6N and leachate headwells LHW-5 and LHW-6. This Plan Modification Request was approved by the WDNR on February 9, 2021. The Plan Modification Request and the WDNR Approval Letter are included within **Appendix I**.

The following is a summary of the leachate headwells history that was summarized within the October 2, 2020, Plan Modification Request.

- The 2005 plan of operation approval (July 29, 2005) require monthly leachate head well monitoring be conducted at six leachate head wells. The head wells specified included 3

vertical well heads (LHW-1, LHW-2 and LHW-3) that existed at the time of the approval, and three horizontal side slope head wells (LHW-4, LHW-5, and LHW-6). At the time of the 2005 approval, only horizontal LHW-5 was installed.

- Upon investigation, LHW-1 could not be located (presumably abandoned as its location is in the same vicinity as an access road), and LHW-2 and LHW-3 are obstructed approximately 20 feet below the waste surface, which is 10-15 feet above the bottom of the well and top of liner. The vertical wells are very apparently bent and bowed, likely due to waste settlement forces, especially on the side slope. Discussions with site personnel indicate the vertical leachate head wells have been hit several times during mowing and site operations. It is likely each well is damaged in multiple locations, and it is likely that attempts to repair or refurbish the wells would be unsuccessful and costly.
- It also does not appear that horizontal LHW-4 was installed during the 2008 Phase II, Module 3 liner construction. Of the original six leachate head wells in the plan of operation, only LHW-5 and LHW-6 remain in usable condition. Inspection of both leachate head wells did not indicate any damage or issue.

- 27. *Plan Sheets:* Provide a plan sheet with labeled leachate headwells, cleanouts, and leachate lines for the entire site with the proposed expansion.**

Response

Plan Sheet 25, Existing and Phase VII Through IX Leachate Collection System has been added to show labeled headwells, cleanouts, and leachate collection lines for the entire site with the proposed expansion.

- 28. *Plan Sheet 24, Plan Sheet 33, Detail 2-33, Leachate Headwell:* Please provide narrative on the general design of the sweep bend noted on Plan Sheet 24 Note 8 for the leachate collection line cleanouts.**

Response

The existing cleanout riser will be removed and a 6-inch PVC to HDPE stainless steel transition fitting will be connected. A 6-inch SDR 11 HDPE pipe will continue horizontally through a manufacturer recommended minimum 13-foot bend radius to exit the landfill directly to the south at the phase boundary through a vertically oriented 6-inch SDR11 HDPE 22.5 degree long radius bend. The full pipe length will be bedded on a minimum of 4-inch leachate pipe bedding aggregate and covered with a minimum 12-inch pipe bedding aggregate. This design will be depicted on a more detailed drawing in the Plan of Operation.

- 29. *Plan Sheet 23 Horizontal Footprint:* Please discuss the design rationale behind the divot in the waste limits between exiting Phase III Modules 1&2 and proposed Phase VII and the exiting Phase III Modules 3&4 and proposed Phase IX.**

Response

In order to provide a continuous composite base liner system (5-ft of compacted clay and 60-mil HDPE Geomembrane) and to maintain continuous 4:1 maximum final closure slope, the expansion was controlled on a continuous line at the limits of composite liner as shown in Detail 3/34 in the Feasibility Report Drawings. The geometry of the final closure slopes, waste slopes, proposed perimeter berms and existing perimeter berm along the eastern side of the existing MSW landfill, create a horizontal change for the limits of waste as the waste slopes rise up and over the berm elevation along the composite liner splice as shown in Detail 7/30 in the Drawings.

This “divot” is the result of liner design constraints placed at a convergence of slopes to maintain continuous liner limits to ensuring the integrity of the composite liner.

30. Storm Water Controls: *Please discuss the impacts of the expansion to the existing sedimentation basin.*

Response

Expansion of the Vernon County Landfill will have significant impacts on the existing sedimentation basin. The existing basin is located within the footprint of the landfill expansion and therefore is being moved to the east outside of the expansion footprint. The existing basin was sized to manage runoff from the existing landfill footprint. The landfill expansion will increase the amount of runoff draining to the basin. Therefore, the size of the existing basin is inadequate and needs to be enlarged to manage the increased runoff. There are four key criteria that were analyzed to meet the NR 504.09 standards. The criteria are:

1. settling the 0.015 mm particle in the 25-yr, 6-hour storm
2. conveying the 25-yr, 6-hour storm through the primary spillway
3. conveying the 100-yr, 24-hour storm through the emergency spillway
4. dewatering the basin in no less than 3 days.

The table below summarizes the design calculations of the existing and proposed basins in order to meet criteria 1-3 above. Criteria 4 will be met during final design of the sedimentation basin and dewatering structure during the Plan of Operation. The table below shows the proposed basin is designed approximately 2-3 times larger than the existing basin.

	Existing	Proposed
Criteria 1: Surface Area of 25-yr, 6-hr storm (SF)	13,000	25,031
Criteria 2: Storage volume of 25-yr, 6-hr storm (Ac-ft)	1.4	4.15
Criteria 3: Storage volume of 100-yr, 24-hr storm (Ac-ft)	2.0	4.93

Table: comparison of design calculations for existing and proposed sedimentation basins.

2.2 Part B: Additional Information Required for a Feasibility Determination

1. The following apparent typographical errors are noted for the record:

- a. *Plan Sheet 9: Based on the groundwater elevation data presented, the date in the title should be May 2023.*
- b. *Plan Sheet 15. The label of the D' location should be east instead of west.*

Response

A revised **Plan Sheet 9** and **Plan Sheet 15** are provided.

3 Responses to WDNR Comments Dated February 1, 2024

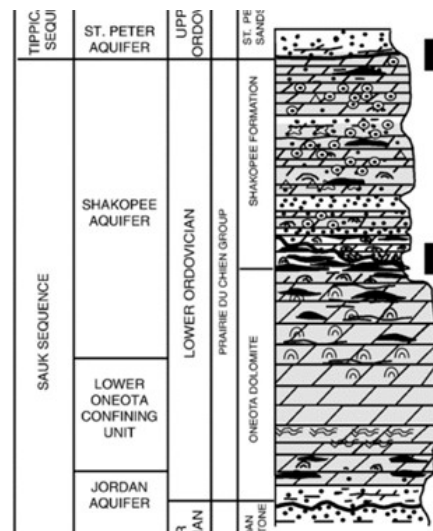
1. **WDNR Comment 1:** Generally, there are a number of gaps in the geologic and hydrogeologic information presented within the feasibility report. Items that remain not well understood include groundwater flow conditions around the southeast corner of the expansion area where SEH has interpreted a merger zone between the perched and regional aquifers. Groundwater flow information presented here appears to be largely interpretive given the number of data points available. For example, you have defined equipotential lines and a complex groundwater flow regime with very few data points (e.g., MW-12, MW-16, and MW-17WT), most of which are seated outside of the southeast area. The grey area shown on Plan Sheets 4 through 7 indicating the merger zone of the perched and regional water tables, appears to have been defined with a single data point (MW-16) from dry wells. The characterization of this area is further confused by what appears to be a contradiction in the information presented in cross section (Plan Sheet 17, cross section F-F') vs. the water table maps 4-7. In cross-section, the merger point is shown at MW-16, but in maps 4-7 the area of the merger shown in gray is a much larger area. It is not well understood how this interpretation was developed given the lack of corresponding geologic and hydrogeologic data.

Response

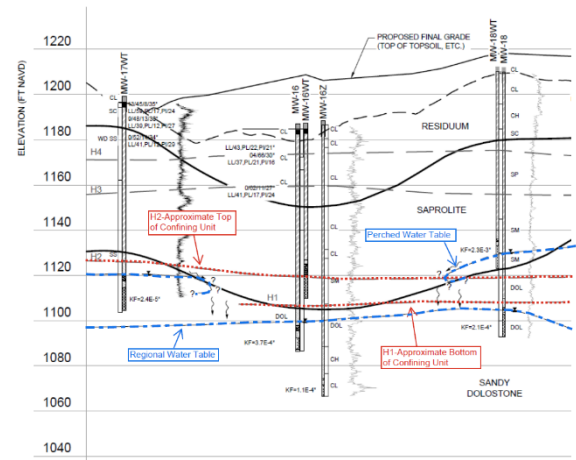
Groundwater conditions at the site conform to anticipated conditions for the geologic units present and applying hydrogeologic principles and concepts. We have based much of our understanding of groundwater conditions on the hydrogeologic studies completed on the Prairie du Chien Group by Tipping, R. G., Runkel, A. C., Alexander, E. C., Jr., Alexander, S. C., and J. A. Green, 2006, Evidence of Hydraulic Heterogeneity And Anisotropy in the Mostly Carbonate Prairie du Chien Group, Southeastern Minnesota (in Sedimentary Geology 184 (2006) 305-330).

Tipping, et al. (2006) establishes the overlying Shakopee Formation of the Prairie du Chien Group as an aquifer and the “intervals of relatively unfractured rock serve as confining units” within the underlying Oneota Dolostone (illustrated in the figure to the left). Fetter (1988) defines a confining layer as “. . . a geologic unit as having little or no intrinsic permeability”.

Tipping et al. (2006) describes the layered heterogeneity of the Prairie du Chien in relationship to depositional environmental and erosional history. Although the Shakopee Formation is not present, regionally the lower portion of Oneota Dolostone (present onsite) consists of rock with low intrinsic permeability that inhibits downward percolation of groundwater. Given the depth to the regional water table occurs 100 to 135 feet below the landfill site, the presence of an intervening lower permeability rock (generally falling below the elevation of 1120 feet defined by the H2 marker horizon identified on gamma logs) provides the optimum conditions needed to develop a perched groundwater system, particularly when underlain by the higher permeability rock found in the basal Oneota Dolostone and underlying Jordan Sandstone.



The continuity of a perched groundwater system depends on favorable hydrogeologic conditions remaining continuous and consistent. However, at the Vernon County Landfill, the lateral extent of the low permeability unit becomes compromised within a valley where much of the bedrock has weathered into saprolite and residuum (MW-16WT/MW-16/MW-16Z) or where lithology changes (MW-19/MW-19Z). This is clearly illustrated in the geologic cross-section G-G' (Plan Sheet 18) and K-K' (Plan Sheet 22) and shown in the figure to the right.



Across the landfill property, the only location in which the elevation of 1120 feet (H2 marker horizon) has been weathered to saprolite is in the southeast. Based on the water level observations in well nests MW-16WT/-16/-16Z and MW-19/-19Z, it is clear that the intrinsic permeability of the confining unit has been compromised through the weathering process or changes in lithology. Fetter (1988) describes a perched aquifer as where “. . . water moves

laterally above the low permeability layer up to the edge then seeps downward toward the main water table . . .” In addition, the perched water table maps included in the Feasibility Study (Plan Sheets 4 and 5) apply principles described by Freeze & Cherry (1979) for the formation of a perched water table (shown to the left) indicating an increase in hydraulic gradient in the transition between the edge of a perched water table and the regional water table (using a river in this example to depict a discharge point).

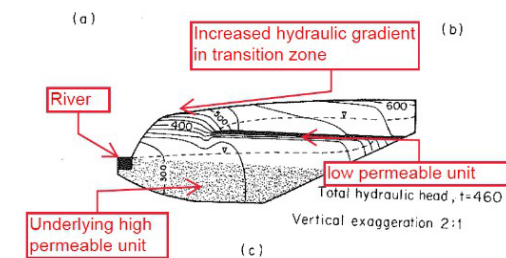
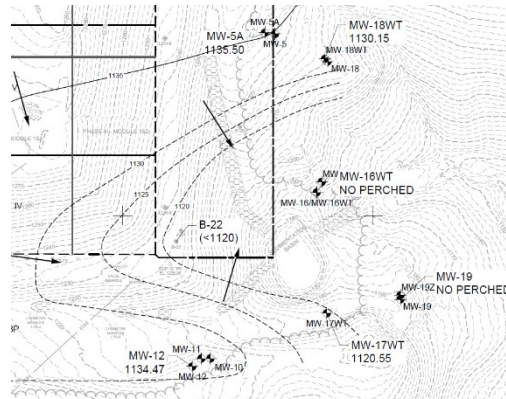


Figure 6.11 Formation of a perched water table (after Freeze, 1971a).



depicting the transition zone has been removed in Plan Sheets 4 through 7. Instead, refer to the intersecting geologic cross- sections in Plan Sheet 18 (G-G') and Plan Sheet 22 (K-K') illustrating the weathered bedrock's role in locally altering perched water table conditions.

This relationship between the perched water table and regional water table has been well documented in research publications and is illustrated well in the following publications:

- Runkel, A. C., Tipping, R. G., Meyer, J. R., Steenberg, J. R., Retzler, A. J., Parker, B. L., Green, J. A., Barry, J. D., & Jones, P. M. (2018). **A multidisciplinary-based conceptual**

model of a fractured sedimentary bedrock aquitard: improved prediction of aquitard integrity. *Hydrogeology Journal*, 26(7), 2133-2159. <https://doi.org/10.1007/s10040-018-1794-2>.

- Nimmo, J. R., Creasey, K. M., Perkins, K., & Mirus, B. B. (2016). **Preferential flow, diffuse flow, and perching in an interbedded fractured-rock unsaturated zone.** *Hydrogeology Journal*, 25, 421-444. <https://doi.org/10.1007/s10040-016-1496-6>.

2. **WDNR Comment 2:** *Additionally, the geological cross-sections show both the perched water table and the regional water table; however, the cross-sections and narrative in section 5.4.2 of the report don't show or attempt to explain what supports the perched aquifer above the regional aquifer, other than touching on vertical gradients that appear to be showing the presence of low permeability formations restricting downward groundwater movement. The cross-sections generally depict the two water levels for each through the same geological formation. It may be that there is currently not sufficient geotechnical information to provide a better explanation for what supports the perched aquifer. However, understanding geological formation that supports the perched aquifer may help to understand where and how it converges with the regional aquifer or the overall flow between the two aquifers.*

Response

Conditions in the lower Oneota Dolostone that developed the perched water table are well documented in previous research and publications as described in the response to Comment 1. In addition, the localized weathered condition of the confining unit that modifies the lateral extent of the perched water table system are also clearly described in the response to Comment 1. Research by others on the Prairie du Chien Group confirms its heterogeneity and anisotropy. Tipping et al. (2006) describes the “. . . Oneota confining unit [as] consisting of thickly bedded dolostone”. Bedded geologic units are commonly indicative of layered heterogeneity, with the perched groundwater at the Vernon County Landfill always observed above the H2 marker horizon defined by gamma logs. The geologic-cross-sections clearly illustrate that the lateral extent of the low permeability unit has become compromised within the valley on-site near MW-16 where much of the bedrock has weathered into saprolite and residuum and near MW-19 where the lithology changes to sandstone. As long as the bedrock is dolostone and has not been weathered below approximately 1120 feet, the perched water table will be present and provides an appropriate upper monitoring system.

In addition, the hydraulic gradient depiction of the transition zone must be gradual as shown on geologic cross-sections and water table contour maps; it would be impossible for the perched groundwater system to persist, likely over thousands of years, if the transition depicted significant flow velocity because the perched system would have drained dry. Routine purging and sample collection over the past 30 years have confirmed the sustainability of this perched groundwater system.

3. **WDNR Comment 3:** *As stated in Comment 2 of the December 19, 2023, letter and as noted in Comment 1 above, additional hydrogeological investigation (data from additional test borings and groundwater monitoring wells) is needed to adequately define the water table surface(s) and flow regime in the area of the merger point between the perched aquifer and regional water table aquifers. Equipotential lines on Plan Sheets 4 and 5 to the north, west, and east of the interpreted merger zone are based largely on data from two dry monitoring wells (MW-15WT and MW-16WT). Therefore, many of the equipotential lines shown are inferred and should be represented with dashed lines or question marks (refer to Comment 4 of the December 19, 2023 letter).*

Additional investigation could allow for additional perched aquifer wells to confirm the interpreted flow regime, or to provide data for an alternate flow scenario. A few potential areas to consider as starting points for additional investigation include, but are not limited to, the following areas.

- a. A test boring and groundwater monitoring well or well nest in the southern portion of the proposed expansion area, in the general area of test boring B-21, could better define flow to the west of the currently interpreted merger zone and could provide geotechnical data in the vicinity of the sump area of the proposed expansion, which is an area where additional pressure on top of a landfill liner would typically be expected. This would also provide an opportunity to obtain geotechnical information at least 25 feet below sub-base grade in this area (refer to Comment 1).*
- b. Completion of a test boring and groundwater monitoring well nest between existing groundwater monitoring well nest MW-5/MW-5A and the currently interpreted merger zone, such as the MW-5R/MW-5AR well nest proposed on Plan Sheet 29, could better define groundwater flow in this area.*
- c. A test boring and groundwater monitoring well or well nest to the southeast of MW-15WT could better define groundwater flow in this area and could provide data that the merger zone area and groundwater flow from a potential release from the expansion area is adequately understood and preclude the need to characterize groundwater flow further on the eastern portion of the merger zone.*

Response

- a. As requested by the WDNR, additional boring B-22 was completed near the previously completed boring B-21 to a depth of at least 25 feet below the proposed sub-base grades.

It should be noted that drilling through the perched water table may compromise the natural barrier properties of the low permeability unit supporting the perched water table. Therefore, B-22 was only drilled to the top of the perched water table so to not compromise the confining layer. Additional drilling was completed, outside the disposal area, to install additional long-term monitoring system wells; these additional wells are used to further define groundwater conditions in support of the groundwater monitoring system.

- b. Concur; the installation replacement wells for MW-5/MW-5A were completed as part of the 2024 addendum field investigation as described in Section 4.0. The wells completed were MW-18WT (perched water table) and MW-18 (regional water table).
- c. Due to the existing topography and direction of groundwater flow in the perched water table, installation of a well or well nest to the southeast of well MW-15WT, while would be ideal, the area is not accessible by drilling equipment and a well installation is not feasible.

Given the direction of groundwater flow in the perched water table, the location of the proposed replacement wells for MW-5/MW-5A provide the best monitoring location and accessible location on the east side of the landfill expansion area. Details on the completed replacement wells (MW-18WT and MW-18) are provide in **Section 4.0**. Because water was observed during the installation of well MW-15WT, the well will be maintained and monitored for water levels to provide additional information for the perched water table contours.

4. ***WDNR Comment 4: The department considered comments made during the January 19, 2024 Teams call that borehole geophysical methods that are not specific to saturated boreholes would only provide data specific to the individual boreholes, and does not concur with this assessment. The use of borehole geophysics could provide fracture and/or potential flow data that has the***

potential for interpretation between boreholes as does inspection of wireline cores. If the landfill feels strongly that borehole geophysics will not be effective, they may consider revisiting wireline coring of the additional test borings and select what they feel is the better option. The landfill could also consider inter-point methods such as dye tracing or surface imaging geophysical investigation techniques to augment the geotechnical investigation data.

Response

As described in Section 2.1, the application of other borehole geophysical methods was evaluating using FRGT Tool, developed by the USGS and EPA and determined too many limitations to add any value. While seismic surficial geophysical methods are better at distinguishing geologic units, electrical resistivity methods may distinguish saturated and unsaturated conditions with proper placement of nodes; at the landfill site, the topographic changes and the presence of the existing landfill limit the usefulness of these methods.

Dye tracing tests are used for tracking and tracing various flows from an injection point to a reception point. For groundwater, a tracer is typically introduced into the aquifer through a naturally occurring recharge feature such as a sinkhole and monitored through reception points such as seeps or surface water features. There are no karst or recharge features on the landfill site and there are no seeps or surface water features. Introducing a dye and flushing it to move through 100 feet of unsaturated conditions is not practical.

Similarly, fracture analysis is generally conducted from aerial photographs, from visible quarry bottoms, and/or through tightly spaced drilling programs where caliper logs, localize dye traces, or visible fractures can be mapped and correlated. The conditions at the landfill are not conducive to fracture analysis techniques.

Therefore, any further investigation of the underlying natural conditions will need to have very clear objectives as presented within the Summary of Hydrogeologic Conditions in the Proposed Expansion Area Table provided below.

Note that because of the unsaturated conditions within the residuum, saprolite, and dolostone below the footprint of the proposed expansion, in the event that leachate does penetrate the 60 mil HDPE liner and the 5-feet of compacted clay it would move through the 77 feet of the unsaturated material through gravity potential and moisture potential; the moisture potential is a negative pressure due to the soil-water interaction and is likely greater than gravity potential under very dry conditions (Fetter, 1988). However, although the high clay content and liquid limit of the residuum results in very high moisture potential, the limited interconnectivity of pore spaces in clay will reduce rates of percolation through the unsaturated material.

The table below summarizing the hydrogeologic conditions in the proposed expansion area, including the information collected during the 2024 Addendum Field Investigation.

Summary of Hydrogeologic Conditions in the Proposed Expansion Area

Hydrostratigraphic Unit	Thickness below Sump (feet)	Geologic Origin	Classification	Proposed Expansion Area Properties	Proposed Expansion Area Coring	Supplemental Data from 2024 Addendum Field Investigation
Unsaturated Residuum	15	Unconsolidated extensively weathered dolostone no original bedrock structure	CL CH CL-ML ML SC SM	Fine-grained (18 samples): 1.7% gravel, 17.7% sand, 37.5% silt, 44.2% clay Coarse-grained (3 samples): 4.2% gravel, 62.9% sand, 32.9% fines Atterberg Limits (18 samples): 53.7 LL, 20.9 PL, 32.7 PI	NA	B-22, MW-16Z, MW-18WT/-18, and MW-19/-19Z : Classifications and soil properties.
Unsaturated Saprolite	30	Poorly consolidated Weathered/fractured dolostone some original bedrock structure	Fractured/ weathered dolostone	NA	poor to high recovery 7 locations	B-22, MW-16Z, MW-18WT/-18, and MW-19/-19Z: Weathering characteristics, Frequency/characteristics of fractures, Frequency/characteristics of vugs.
Unsaturated Oneota Dolostone	37	Oneota Dolostone (competent)	Dolostone	NA	poor to high recovery 7 locations	B-22, MW-16Z, MW-18WT/-18, and MW-19/-19Z: Weathering characteristics, Frequency/characteristics of fractures, Frequency/characteristics of vugs.
Saturated Oneota Dolostone	5	Oneota Dolostone (competent)	Dolostone	Hydraulic Conductivity: 1.2×10^{-3} to 5.9×10^{-4} cm/sec	moderate to high recovery - 6 locations	B-22, MW-16Z, MW-18WT/-18, and MW-19/-19Z: Hydrogeologic Conditions..
Oneota Dolostone Confining Unit	10	Oneota Dolostone (competent)	Dolostone	Hydraulic Conductivity: estimated at less than 1×10^{-5} cm/sec	moderate to high recovery - 5 locations	MW-16Z, MW-18WT/-18, and MW-19/-19Z: Hydrogeologic Conditions..
Unsaturated Oneota Dolostone	12	Oneota Dolostone (competent)	Dolostone	NA	moderate to high recovery - 5 locations	MW-16Z, MW-18WT/-18, and MW-19/-19Z: Weathering characteristics, Frequency/characteristics of fractures, Frequency/characteristics of vugs.
Saturated Oneota Dolostone	70 to 90	Oneota Dolostone (competent)	Dolostone	Hydraulic Conductivity: 1.4×10^{-2} to 2.6×10^{-4} cm/sec	moderate to high recovery - 5 locations	MW-16Z, MW-18WT/-18, and MW-19/-19Z: Hydrogeologic Conditions..

Unsaturated Residuum



B-22, 10-16 ft

Unsaturated Saprolite



MW-14WT, 29.5-31 ft

Saturated Saprolite



MW-18, 80-88 ft

Unsaturated Dolostone



MW-14WT, 51-52 ft

Confining Dolostone



MW-18, 103 ft

4 2024 Addendum Field Investigation

The intent of the addendum field investigation was to supplement and expand the existing site knowledge of the soils, bedrock geology, and groundwater flow system within the area of the proposed expansion.

4.1 Field Investigation

Drilling and monitoring well/piezometer installation for the addendum field investigation was conducted during July and August 2024. Drilling to further identify the bedrock surface elevations, to install new monitoring wells/piezometers, and complete well development was performed by Cascade Environmental (Cascade) under the direction and supervision of a Wisconsin certified SEH Professional Geologist. Geophysics, groundwater sample collection, in-situ hydraulic conductivity testing, and survey was also conducted by SEH geologists and scientists under the direction and supervision of a Wisconsin certified SEH Professional Geologist. Groundwater sample analysis was performed by Eurofins Environmental Testing (Eurofins). The new soil boring, monitoring well, and piezometer locations are shown on Plan Sheet 3, along with existing borings, wells, and piezometers in the proximity of the proposed expansion area which are utilized during the investigation and groundwater monitoring program.

A summary of all field investigation methods and procedures is provided within the 2024 Addendum Field Investigation Procedures Memo included within **Appendix J**.

4.2 Field Investigation Locations

To address the DNR's concerns, additional borings and wells along the eastern edge of the proposed expansion were completed to further define the hydrogeologic conditions as follows:

- B-22: As requested by the WDNR, an additional boring was completed near previously completed boring B-21 and extended at least 25 feet below the proposed sub-base grades. B-22 was completed to the top of the perched water table in order to further define the perched water table surface without installing an additional well within the footprint near the sump, which could potentially compromise the naturally protective unsaturated zone.
- MW-18WT and MW-18: To further investigate the perched water table transition to the regional water table, an additional well nest was installed between MW-15 and MW-16 with the installation of a perched water table well (MW-18WT) and a regional water table well (MW-18).
- MW-16Z: Due to the perched water table transition to the regional water table in the area of the existing MW-16 well nest, a piezometer (MW-16Z) was installed at this location. The piezometer was constructed with a 5-foot screen situated a minimum of 15-feet below the bottom elevation of existing well MW-16.
- MW-19 and MW-19Z: To further investigate the perched water table transition to the regional water table, an additional well nest was also installed between MW-16 and MW-17. No perched water table was found at this location (further discussed below); therefore, a regional water table well (MW-19) and a piezometer (MW-19Z) were installed at this location.

4.3 Subsurface Data Analysis

The following subsections summarize the original geology and hydrogeology as submitted within the Feasibility Report (September 11, 2023), followed with any updates from the 2024 addendum field investigation.

4.3.1 Site Geology

A full description of site geology is provided within **Section 5.4.1** of the Feasibility Report (September 11, 2023). Information regarding site geology was obtained from recent and previous site investigations. A summary of new and previously completed soil borings located within 300 feet of the proposed expansion and extent at least 25 feet below subbase elevation are provided on **Table 1**. Geologic cross-sections of the site are shown on **Plan Sheet 11** through **Plan Sheet 22**.

The uppermost site geologic units have been defined in reference to three primary depositional environments as follows:

- Unconsolidated deposits:
 - Loess: windblow fine-grained sediment.
 - Residuum: formed from bedrock but no longer retains the structural features or details of its bedrock.
- Saprolite: weathered bedrock retaining details or structural features of the bedrock.
- Dolostone Bedrock: uppermost unit is established as the Hager City Member of the Prairie du Chien Group.

4.3.1.1 2024 Addendum Field Investigation Updates

The results of the 2024 Addendum Field Investigation confirm previous site geology, and no updates are required to this section.

4.3.2 Geophysical Horizons

A full description of the geophysical horizons identified on-site is provided within **Section 5.4.1.4** of the Feasibility Report (September 11, 2023). Five marker horizons (H1 to H5) were identified across the site. Identification of the five marker horizons across the site confirms that the bedrock geology across the site is consistent and predictable and provides correlation between historic boring logs and current boring logs as well as correlation from weathered to unweathered bedrock. Based on the gamma logs, the following observations and conclusions have been made:

- Although regionally the bedrock generally dips to the southwest at 10 feet per mile, the marker horizons indicate a relatively horizontal bedrock structure for the limited extent of the site.
- Marker horizon H1 occurs below the perched water table in sandy dolostone with a lower gamma value above a gamma spike.
- Marker horizon H2 occurs below the perched water table near a contact between sandy dolostone and an overlying dolostone with a lower gamma value above a gamma spike.
- Marker horizon H3 generally occurs just above the perched water table in dolostone with a spike below a lower gamma value.

- Marker horizon H4 occurs above H3 and the perched water table in dolostone, but its lower gamma value between two spikes correlates into saprolite within valleys.
- Marker horizon H5 occurs above H4 and the perched water table in dolostone, but its low gamma value above a spike correlate into both saprolite and residuum within valleys.

4.3.2.1 2024 Addendum Field Investigation Updates

The results of the 2024 gamma geophysical analysis align with the previously identified marker horizons (H1 to H5) on-site and confirm the consistency of the bedrock geology across the site. Therefore, no updates are required to this section.

4.3.3 Geologic Cross-sections

Eleven geologic cross-sections (Sections A through K) have been created across the landfill property to evaluate the subsurface conditions across the site and within the proposed expansion area. The cross-section location map is included in Plan Sheet 11, with geologic cross-sections provided on Plan Sheet 12 through Plan Sheet 22. Sections D, Section F, Section G, Section J, and Section K. Revised cross-sections descriptions for the updated cross-sections are provided below. No changes were made to the remaining cross-sections.

4.3.3.1 Geologic Cross-section D-D' (Plan Sheet 15)

Revisions to Geologic Cross-section D-D' (Section D) include the addition of well nest MW-18WT/MW-18 on the east side.

Section D is drawn within the north-central portion of the existing landfill and proposed landfill Expansion area and trends west to east. Section D shows a bedrock high within the west in the area of borings B-6 and B-5. The bedrock surface then decreases to the east between borings B-5 and TB-7. The bedrock surface is then relatively horizontal between boring TB-7 and well nest MW-5/MW-5A. Section D originally showed a bedrock low east of the proposed landfill expansion area, which is confirmed with well nest MW-18WT/MW-18. A minor and discontinuous loess deposit is present in the area of boring TP-11. Section D shows continuous saprolite in the western portion of the cross-section between boring TP-11 and well nest MW-2/MW-2P. Saprolite is also continuous in the area between boring TB-7 through the eastern extent of the cross-section, with thickening east of the proposed expansion area, near well nest MW-18WT/MW-18.

4.3.3.2 Geologic Cross-section F-F' (Plan Sheet 17)

Revisions to Geologic Cross-section F-F' (Section F) include the addition of B-22, which replaces the shallower, previously completed B-21 and the MW-16Z piezometer.

Section F is drawn within the southern portion of the existing landfill and proposed landfill Expansion area and trends from west to east. Section F shows a bedrock high in the west near boring TB-12, with the bedrock surface decreasing to the east. The bedrock surface decreases significantly east of boring B-22. A minor and discontinuous loess deposit and saprolite are present in the area of boring TB-12. Section F shows continuous saprolite in the area between boring TB-6 through the eastern extent of the cross-section with thickening in the east near boring B-22 and well nest MW-16WT/MW-16/MW-16Z.

4.3.3.3 Geologic Cross-section G-G' (Plan Sheet 18)

Revisions to Geologic Cross-section G-G' (Section G) include the addition of well nest MW-19/MW-19Z on the east side.

Section G is drawn south of the existing landfill and proposed landfill Expansion area and trends from west to east. Section G shows an undulating bedrock surface with bedrock highs near well nest MW-1RZ/MW-1PR/MW-1R and near and east of well nest MW-10/MW-11/MW-12.

Section G shows a continuous loess deposit between well nest MW-1RZ/MW-1PR/MW-1R and well MW-13P and another minor loess deposit within the area of well nest MW-10/MW-11/MW-12. Section G shows continuous and thick saprolite across the cross-section with thickening in the east near well nest MW-10/MW-11/MW-12 and well MW-17WT.

4.3.3.4 Geologic Cross-Section J-J' (Plan Sheet 21)

Revisions to Geologic Cross-section J-J' (Section J) include the addition of B-22, which replaces the shallower, previously completed B-21.

Section J is drawn within the central portion of the proposed landfill Expansion area and trends from south to north. Section J shows an undulating bedrock surface with a bedrock high near boring B-22 and another bedrock high in the north between well nest MW-14/MW-14Z and well nest MW-3/MW-4P/MW-6. Minor and discontinuous loess deposits are present within the areas of well nest MW-10/MW-11/MW-12, boring TB-5, and well nest MW-14/MW-14Z. Section J shows continuous saprolite throughout the southern and central portion of the cross-section with thickening in the south near boring B-22 and well nest MW-10/MW-11/MW-12.

4.3.3.5 Geologic Cross-Section K-K' (Plan Sheet 22)

Revisions to Geologic Cross-section K-K' (Section K) include the addition of well nest MW-18WT/MW-18.

Section K is drawn east of the proposed landfill Expansion area and trends from south to north. Section K shows an undulating bedrock surface with a bedrock low in the south within the area of well nest MW-16WT/MW-16 and a bedrock high in the north near MW-14WT. Section K shows continuous saprolite throughout the southern and central portion of the cross-section with thickening in the south near well nest MW-16WT/MW-16, well MW-17WT, and well nest MW-18WT/MW-18. Minor and discontinuous saprolite is present in the north near well MW-14WT.

4.3.4 Site Hydrogeology

A full description of site hydrogeology is provided within **Section 5.4.2** of the Feasibility Report (September 11, 2023). The St. Peter-Prairie du Chien-Jordan aquifer is the only hydrogeologic unit being monitored on-site. It has been determined that a perched water table and regional water table exist on-site. A summary of the wells and their construction that are located within 300 feet of the proposed expansion used for assessing the groundwater conditions is provided in **Table 2**. An updated Groundwater Monitoring Well and Point Information Form is provided within **Appendix K**.

Groundwater elevations measured in the monitoring wells and piezometers across the entire landfill property between 2020 and 2024 are summarized on **Table 3**. Monthly groundwater measurements were recorded between December 2022 and May 2023. The highest measurements during this period generally occurred during the May 2023 monitoring event, and the lowest during the January 2023 event. **Plan Sheet 4** through **Plan Sheet 9** illustrate these high and low events within the Perched Water Table, Regional Water Table, upper potentiometric surface, and lower potentiometric surface.

After installation of the 2024 addendum monitoring wells and piezometers, two rounds of baseline groundwater monitoring events were completed for facility wells prior to this Feasibility Study Addendum 01 submittal. The August 2024 and October 2024 groundwater elevations are illustrated on **Figure 1** through **Figure 6** for the perched water table, regional water table, and upper potentiometric surface. Note, no lower zone piezometers were installed during 2024; therefore, no updated lower potentiometric surface maps were created. The remaining required groundwater monitoring events will be collected prior to the Plan of Operation submittal. Additional groundwater contour maps will be provided at the time of Plan of Operation submittal if needed.

4.3.5 Perched Water Table Contour Maps

The high perched water table contour map generated for the May 2023 monitoring event is included on **Plan Sheet 4**. The low perched water table contour map generated for the January 2023 monitoring event is included on **Plan Sheet 5**. The perched water table surface slopes generally from north to south-southeast across the site. The highest water table elevations are along the northern boundary of the existing landfill and proposed landfill Expansion area. The lowest water table elevations are on the southeastern edge of the proposed landfill expansion area within a bedrock valley.

As discussed above, the perched water table flows to the south-southeast and the head loss decreases dramatically within the southeast edge of the proposed landfill Expansion area near well nest MW-16WT/-16/-16Z. This is due to the increase in weathered bedrock and changing lithology within this area causing the perched water table to diminish and transition to the underlying regional water table. Monitoring well MW-16WT is directly downgradient of the proposed landfill expansion area and although it is dry due to the perched water table not existing within this area, for landfill monitoring purposes its nested monitoring well MW-16 screened within the regional water table system, which would provide water quality data downgradient of the perched water table system and upgradient of the regional water table system.

4.3.5.1 2024 Addendum Field Investigation Updates

The results of the 2024 Addendum Field Investigation confirm previous perched water table conditions. The following items from the 2024 Addendum Field Investigation aided in further refinement of the perched water table within the southeast portion of the proposed expansion area.

- Perched water table well MW-18WT
- No perched water table within the MW-19 location
- Confirmation of no perched water table within the MW-16 location
- Perched water found at approximately 1220 at B-22

Perched water table maps with the 2024 monitoring wells are provided within **Appendix L**. The perched water table surface slopes generally from north to south-southeast across the site, with head loss decreasing dramatically within the southeast corner near well nest MW-16WT/-16/-16Z due to the increase in weathered bedrock and changing lithology within this area causing the perched water table to diminish and transition to the underlying regional water table.

4.3.6 Regional Water Table Contour Maps

The high regional water table contour map generated for the May 2023 monitoring event is included on **Plan Sheet 6**. The low regional water table contour map generated for the January 2023 monitoring event is included on **Plan Sheet 7**. The regional water table surface slopes generally from south to northeast across the site. The highest water table elevations are along the southeastern corner of the proposed landfill expansion near MW-18 and MW-16. The lowest water table elevations are on the northeastern edge of the proposed landfill expansion area.

As discussed above, the overlying perched water table is not present within the southeast edge of the proposed landfill expansion area near MW-16 and MW-19, meaning the regional water table is uppermost saturated surface in this area.

4.3.6.1 2024 Addendum Field Investigation Updates

The results of the 2024 Addendum Field Investigation confirm previous regional water table conditions. The following items from the 2024 Addendum Field Investigation aided in further refinement of the regional water table within the southeast portion of the proposed expansion area.

- Regional water table well MW-18
- Regional water table well MW-19
- Confirmation regional water table at MW-16 location

Regional water table maps with the 2024 monitoring wells are provided within **Appendix L**. The regional water table surface slopes generally from south to northeast across the site, with a northwesterly component of flow in the southeastern corner near MW-16, MW-18, and MW-19 due to the perched water table diminishing in this area and transitioning to the regional water table.

4.3.7 Potentiometric Surface

An upper and lower bedrock potentiometric map was also prepared using the data collected for the May 2023 monitoring event and are included on **Plan Sheet 8** and **Plan Sheet 9**, respectively. The potentiometric groundwater conditions indicate a flow pattern similar to the regional water table conditions with the highest elevations to the south and the lowest elevations to the northeast.

4.3.7.1 2024 Addendum Field Investigation Updates

The results of the 2024 Addendum Field Investigation confirm previous potentiometric surface conditions. The following items from the 2024 Addendum Field Investigation aided in further refinement of the upper potentiometric surface within the southeast portion of the proposed expansion area.

- Upper piezometer MW-16Z
- Upper piezometer MW-19Z

Upper potentiometric surface maps with the 2024 monitoring wells are provided within **Appendix L**. The potentiometric groundwater conditions indicate a flow pattern similar to the regional water table conditions with flow generally from south to north with a northwesterly component of flow in the southeastern corner near MW-16Z and MW-19Z.

4.3.8 Flow Net and Geologic Cross-section J-J'

A flow net of the regional water table is presented on geologic cross-section J-J' (flow net) which trends in the south to north direction throughout the entire proposed landfill expansion area. The location of the flow net cross-section is provided on **Plan Sheet 11** with the flow net included within **Plan Sheet 21**. The purpose of the flow net is to quantifiably illustrate a general flow pattern for the site representing steady groundwater flow. The flow net illustrates equipotential lines ranging across the site from vertical to 80 degrees indicating that groundwater on-site is pre-dominantly horizontal but varies slightly across site with a slight downward gradient.

See **Section 5.4.2.4** of the Feasibility Report (September 11, 2023) for assumptions used within the flow net provided within Cross-section J-J'.

4.3.8.1 2024 Addendum Field Investigation Updates

The results of the 2024 Addendum Field Investigation confirm the previous flow net, and no updates are required to this section.

4.3.9 Horizontal Hydraulic Conductivity

Values of hydraulic conductivity based on the slug tests performed across the landfill property, including the 2024 slug tests are summarized in **Table 4**. Based on the minimum, geometric mean, and maximum values of hydraulic conductivity presented in **Table 4**, the hydrogeologic properties for the dolostone bedrock can be described as follows:

- Dolostone (28 slug tests): The hydraulic conductivity of the dolostone varies widely (2.4E-5 cm/sec to 1.2E-2 cm/sec); therefore, the wells have been grouped into perched water table wells, regional water table wells, and piezometers. Hydraulic conductivity values for each zone are as follows:
 - Perched Water Table Wells: Values vary widely ranging from 2.4E-5 cm/sec to 1.2E-2 cm/sec, which is reflective of more variable hydraulic conditions. The interbedded nature of the shallower dolostone and sandstone bedrock would provide variable hydraulic conditions depending on the material in the screened interval of each well. Although hydraulic conditions are variable, the hydraulic conductivity testing indicates the formations screened are responding to testing as porous media without turbulent flow.
 - Regional Water Table Wells: Values range from 1.9E-4 cm/sec to 6.7E-2 cm/sec with a geometric mean of 1.8E-3 cm/sec, which is reflective of more uniform hydraulic conditions for the uniform bedrock physical properties. The hydraulic conductivity is relatively high but reflective of a uniform porous media.
 - Piezometers: Values range from 2.2E-4 cm/sec to 3.1E-2 cm/sec with a geometric mean of 2.5E-3 cm/sec, which is reflective of more uniform hydraulic conditions for uniform bedrock physical properties. The hydraulic conductivity is relatively high and reflective of a uniform porous media.

The horizontal hydraulic conductivity averages cannot be compared to the vertical hydraulic conductivity values described below, due to all groundwater being located within bedrock and representative undisturbed rock core samples could not be collected within the bedrock.

4.3.9.1 2024 Addendum Field Investigation Updates

The slug test results for the wells installed during 2024 fall within the previously collected hydraulic conductivity values. Therefore, the 2024 Addendum Field Investigation confirms the previous horizontal hydraulic conductivity values, and no updates are required to this section.

4.3.10 Vertical Hydraulic Conductivity

No additional samples were analyzed in the laboratory for coefficient of permeability tests during the 2024 investigation. See **Section 5.4.2.7** of the Feasibility Report (September 11, 2023) for a full description of vertical hydraulic conductivity.

4.3.11 Horizontal Gradients

Horizontal hydraulic gradients for the perched water table and regional water table were calculated across the landfill property using high water table elevation data (May 2023) and the corresponding water table contour map provided on Plan Sheet 4 and Plan Sheet 6, respectively. The horizontal hydraulic gradient measurements were made perpendicular to the direction of groundwater flow.

The horizontal gradient of the perched water table is reflective of a localized system that is more directly tied to precipitation and localized recharge and better mimics local topography. Within the perched water table, the head loss across the landfill property is approximately 30 feet, with the largest head loss in the southeast near MW-16WT and MW-17WT where the perched system diminishes, and transitions to the underlying regional water table. The horizontal gradient for the perched water table is approximately 0.062 to the south-southeast. The hydraulic gradient within the perched water table directly beneath the proposed landfill expansion area is similar at approximately 0.066 toward the south-southeast.

The horizontal gradient of the regional water table is reflective of a regional groundwater system that intercepts and discharges to nearby surface water features north of the landfill. Within the regional water table, the head loss across the landfill property is approximately 30 feet with a horizontal gradient of approximately 0.020 with overall flow to the north-northeast towards and discharging to Seas Branch Creek more than 1,700 feet to the north. The hydraulic gradient within the regional water table across the proposed landfill expansion area is approximately 0.035 toward the north-northeast.

4.3.11.1 2024 Addendum Field Investigation Updates

The 2024 Addendum Field Investigation confirms the previous horizontal hydraulic conductivity values for the perched water table. There are no changes to the horizontal hydraulic conductivity within the perched water table. Wells MW-18 and MW-19 further refined the horizontal hydraulic conductivity within the regional water table and therefore, slightly increased the horizontal hydraulic conductivity within the southeastern portion of the proposed expansion area.

4.3.12 Vertical Gradients

Vertical gradients were calculated for nested wells and all static water elevation data available from 2020 to 2024 and are provided within **Table 5**. Vertical gradients were calculated by subtracting the head in the deeper well from the head in the shallow well and then dividing by the distance between the midpoint of the monitoring well or piezometer screens. Three different group of vertical gradients were calculated and are summarized below:

- Perched Water Table vs Regional Water Table: The average vertical gradients between the perched and regional water table ranges from 0.602 (MW-1P/MW-1) to 1.745 (MW-18WT/MW-18) downward. Vertical gradients greater than a value of one (1) are indicative of perched groundwater conditions formed due to the presence of low permeability formations restricting downward groundwater movement.
- Regional Water Table vs Piezometer: The average vertical gradient between the regional water table and piezometers ranges from 0.013 (MW-1R/MW-1RZ) to 0.246 (MW-14/MW-14Z) downward. With the exception of well nest MW-19/MW-19Z, where the vertical gradient varies from -0.027 upward to 0.052 downward.
- Upper Piezometer vs Lower Piezometer: The average vertical gradient between the upper and lower piezometers ranges from 0.021 (MW-7/MW-8R) to 0.318 (MW-10/MW-11) downward.

4.3.12.1 2024 Addendum Field Investigation Updates

The 2024 Addendum Field Investigation does not provide any significant changes to vertical gradients between the Perched vs Regional Water Tables or the Upper vs Lower Piezometers. The two events of water level measurements from newly installed well nest MW-19 (Regional Water Table Well) and MW-19Z (Upper Zone Piezometer) resulted in a varying direction of vertical gradients between the Regional Water Table and the Piezometer. All other wells screened between the Regional Water Table and Upper Zone Piezometers, some monitored for 30 years, are consistently downward, which is more likely the case for MW-19/MW-19Z as well. Assuming downward gradients between the Regional Water Table and the Upper Zone is conservative for landfill facilities. Therefore, given the limited data and the challenges associated with measuring water levels in deep wells, additional water level data will be collected and presented as part of the Plan of Operations.

4.3.13 Groundwater Flow Velocity

The average linear flow velocity of the groundwater is calculated using the equation $v = Ki/n$, where v = average linear flow velocity, K = hydraulic conductivity, i = hydraulic gradient, and n = effective porosity. See **Section 5.4.2.10** of the Feasibility Report (September 11, 2023) for a full description of Groundwater Flow Velocity. Values for each parameter was established as follows:

- Hydraulic conductivity (K): Since the horizontal hydraulic conductivity of the perched water table is variable, a range of K from $2.43E-5$ cm/sec to $1.18E-2$ cm/sec with a geometric mean of $2.39E-03$ cm/sec were used. The regional water table has a more uniform horizontal hydraulic conductivity value; therefore, the geometric mean of the horizontal hydraulic conductivity values of $1.84E-3$ cm/sec was used.
- Hydraulic gradient (i): The average horizontal gradient for the landfill property within the perched water table is 0.062 south-southeast. The average horizontal gradient for the landfill property within the regional water table is 0.020 north-northeast.
- Effective porosity (n): It was determined that an effective porosity of 20 percent would be used as a conservative value for the perched water table system as the geology varies with sandier to sandstone units present (USGS, 1985 and Seaberg, 2000). For the regional water table system, an effective porosity of 15 percent was used as a conservative value as the geology is more uniform with hard, competent dolostone within this zone (USGS, 1985 and Seaberg, 2000).

Flow velocity can vary locally across the site due to variations in hydraulic conductivity and hydraulic gradients with a downward component of flow. The overall horizontal average linear flow velocity is relatively consistent throughout the year ranging at approximately 767 feet per year toward the south-southeast within the perched water table and is more uniform at approximately 254 feet per year toward the north-northeast within the regional water table.

4.3.13.1 2024 Addendum Field Investigation Updates

Overall, no significant changes within the groundwater flow velocity occurred with the 2024 Addendum Field Investigation data. The groundwater flow velocity average for the perched water table did increase a few hundred feet per year as the new hydraulic conductivity data increased the geometric mean of the perched water table.

4.3.14 Water Quality Assessment

With the 2024 Addendum Field Investigation, the Vernon County Landfill currently has 31 groundwater monitoring wells or piezometers used to assess groundwater conditions at the site. The groundwater monitoring program is conducted in accordance with the WDNR approved plan modification request (WDNR, February 9, 2021). A copy of the revised environmental monitoring plan for the landfill property is located in **Appendix M** of the Feasibility Report (September 11, 2023). Per the approved monitoring plans, the groundwater wells are sampled semiannually in March and September. Sampling and laboratory analysis are typically conducted by personnel from MSA Professional Services Inc., and laboratory analysis is typically conducted by Eurofins Environmental Testing of University Park, Illinois. A revised Environmental Monitoring and Maintenance Plan will be submitted with the Plan of Operation Report to include the monitoring wells and piezometers installed during 2024.

4.3.14.1 2024 Addendum Field Investigation Updates

Two rounds of monthly baseline groundwater analytical data were collected from the five monitoring wells and piezometers installed during 2024 (MW-16Z, MW-18WT, MW-18, MW-19, and MW-19Z). Note, the remaining required monthly baseline groundwater analytical data will be completed prior to and submitted with the Plan of Operation Report. Groundwater samples collected from these wells were analyzed for the baseline and detection monitoring parameters summarized on Table 5 within **Appendix J** in accordance with NR507 Appendix I, Table 1 and Table 3.

The laboratory analytical results of the baseline groundwater quality monitoring results for the proposed Expansion are provided in Attachment H and Attachment I of **Appendix J**. A summary of the analytical results for the background quality samples collected and analyzed in 2024 are provided on Table 6 within **Appendix J**. Note that NR140 Wis. Adm. Code groundwater standards are shown on the table and applicable exceedances to the respective ES and/or PAL values have been made evident by underlining or bolding the associated result. Additional monitoring is ongoing to collect sufficient data to present site-specific PALs (for indicator parameters) and/or ACLs (for applicable inorganic parameters). The analytical results for those monitoring events, along with the applicable site-specific PALs and ACLs will be submitted with the Plan of Operation Report.

The parameters listed below had at least two exceedances of a PAL or one ES exceedance during the initial two baseline monitoring events:

- **Arsenic:** Groundwater from MW-18WT exceeded the ES for arsenic (10 ug/L) during the August 27, 2024, sampling event at 11 ug/L. During the October 2, 2024, sampling event, arsenic was non-detect within MW-18WT. Arsenic within MW-18WT will continue to be assessed during the remainder of the baseline sampling events.
- **Benzene:** Groundwater from MW-19 exceeded the ES for benzene (5 ug/L) during the August 27, 2024, sampling event at 47 ug/L. During the October 2, 2024, sampling event, benzene was detected at 0.38 ug/L within MW-19. MW-19 also had several other VOC detections during the August 27, 2024, sampling event and a few during the October 2, 2024, sampling event. The water quality of MW-19 will continue to be assessed during the remainder of the baseline sampling events.
- **Lead:** Groundwater from MW-18WT exceeded the ES for lead (15 ug/L) during the August 27, 2024, sampling event at 18 ug/L. During the October 2, 2024, sampling event, lead was non-detect within MW-18WT. Lead within MW-18WT will continue to be assessed during the remainder of the baseline sampling events.
- **Manganese:** Manganese from MW-16Z, MW-18WT, MW-19, and MW-19Z had two PAL exceedances (60 ug/L) or at least one ES exceedance (300 ug/L) during the two initial baseline sampling events. Manganese within MW-16Z, MW-18WT, MW-19, and MW-19Z will continue to be assessed during the remainder of the baseline sampling events.

As stated above the remainder of the required baseline sampling events will be collected prior to the submittal of the Plan of Operation Report. All data and results assessments, including applicable site-specific PALs and ACLs, will be submitted with the Plan of Operation Report.

4.4 Environmental Monitoring Program

An environmental monitoring program will be implemented during the operation of the proposed expansion. Monitoring point locations are summarized in **Plan Sheet 29**. A copy of the revised environmental monitoring plan, including the wells installed during 2024, is provided within **Appendix M**.

The existing groundwater monitoring network for WDNR License No. 3268 will be maintained and expanded upon as part of the proposed expansion. Five additional groundwater monitoring wells were installed during 2024 for the proposed expansion, which included one perched water table monitoring well (MW-18WT), two regional water table wells (MW-18 and MW-19), and two piezometers (MW-16Z and MW-19Z). One existing perched water table monitoring well (MW-5A), two existing regional water table monitoring wells (MW-5 and MW-14), and one existing piezometer (MW-14Z) will be abandoned during subsequent construction activities. Replacement wells for well nest MW-5A/-5 was installed during 2024 as well nest MW-18WT/MW-18. Replacement well MW-14R is proposed to be installed once the existing wells are abandoned.

Previously MW-16WT was proposed as a subtitle D well but due to this well continuing to be dry and continuing to indicate no perched water table is present at the MW-16WT location, the revised Environmental Monitoring Program, proposes the use of MW-16 as a subtitle D well. Perched water table well MW-18WT is also proposed as a subtitle D well. The additional baseline sampling parameters required for subtitle D wells will be completed for these wells and data will be present in the Plan of Operation Report.

Below is summary of the monitoring wells and piezometers that are within 300-feet of the proposed expansion and will be used to properly monitoring the proposed expansion area.

- Perched Water Table
 - Upgradient: MW-4P and MW-14WT
 - Downgradient/sidegradient - Horizontal: MW-5A, MW-12, MW-15WT, MW-17WT, and MW-18WT
 - Downgradient – Vertical: MW-16, MW-18, and MW-19
- Regional Water Table
 - Upgradient: MW-16, MW-18, and MW-19
 - Downgradient/sidegradient: MW-5 and MW-14
- Upper Potentiometric Surface
 - Upgradient: MW-11, MW-16Z, and MW-19Z
 - Downgradient: MW-3
- Lower Potentiometric Surface
 - Upgradient: MW-10
 - Downgradient/Sidegradient: MW-6 and MW-14Z

4.5 Conclusions

After review of the data collected from the 2024 Addendum Field Investigation an all previously completed subsurface investigations for the Landfill property the following conclusions continue to be drawn for the subsurface below the proposed landfill expansion area. See Section 5.4.4 of the Feasibility Study (September 11, 2023) for a full description of the Subsurface Data Analysis Conclusions.

- The uppermost site geologic units have been defined in reference to three primary depositional environments as follows: Unconsolidated deposits including loess and residuum; saprolite; and dolostone bedrock.
- Bedrock coring at the site has resulted in the following observations and conclusions:
 - Dissolution cavities and bedrock fractures associated with dolomitic rock are primarily present above groundwater in bedrock on-site.
 - Dissolution cavities occur primarily as small voids and do not appear to be interconnected.
 - Bedrock, in general, is often highly fractured and the fractures are likely interconnected.
 - Under hydraulic conditions, fractured bedrock above the water table would likely function as a porous media with only localized shale and clay layers providing limitations to the vertical percolation of water.
- Natural gamma radiation geophysics established five marker horizons (H1 to H5) across the site. Identification of the five marker horizons across the site confirms that the bedrock geology across the site is consistent and predictable and provides correlation between historic boring logs and current boring logs as well as correlation from weathered to unweathered bedrock.

- The St. Peter-Prairie du Chien-Jordan aquifer is the hydrogeologic unit being monitored on-site. Shallow groundwater will generally be assessed in reference to water table conditions, and it has been determined that a perched water table and a regional water table exist on-site. The following has been determined about the groundwater systems on-site:
 - Perched groundwater conditions diminish along the eastern edge of the site and transition to the underlying regional water table system.
 - The diminishing of the perched water table and transition to the regional water table occurs within saprolite where competent bedrock elevation decreases within valleys and sandstone lithology where no low permeability, confining unit is present.
 - Vertical hydraulic gradients in the formation may bias depth to water measurements (water table versus a potentiometric conditions) during the drilling of deeper borings.
 - The perched water table, with depth to water ranging from 60 to 115 feet bgs, flows to the south-southeast and the head loss decreases dramatically within the southeast edge of the proposed landfill expansion area near MW-16WT. This is due to the bedrock valley within this area causing the perched water table to diminish as it transitions to the underlying regional water table.
 - The regional water table surface slopes generally from south to northeast across the site. The depth to the regional water table ranges from 80 to 172 feet bgs. The overlying perched water table diminishes and transitions to the regional water table at higher elevations within the southeast edge of the proposed landfill Expansion area near MW-16 and MW-19.
 - The potentiometric groundwater conditions indicate a flow pattern similar to the regional water table conditions with the highest elevations in the south-southeast and the lowest elevations to the northeast.
- Slug tests were completed across the Landfill Property to aid in historical hydraulic conductivity results.
 - The hydraulic conductivity of the Perched Water Table system varies widely. The interbedded nature of the shallower dolostone and sandstone bedrock would provide variable hydraulic conditions depending on the material in the screened interval of each well. Although hydraulic conditions are variable, the hydraulic conductivity testing indicates the formations screened are responding as porous media without turbulent flow that would be associated with interconnected dissolution cavities or fractures.
 - The hydraulic conductivity of the Regional Water Table and the basal Prairie du Chien (piezometers) are more consistent which is reflective of more uniform hydraulic conditions for the uniform bedrock physical properties. The hydraulic conductivity is relatively high and is reflective of a uniform porous media.
- The vertical hydraulic conductivity can vary for fine-grained residuum, and coarse-grained residuum across the site, but the overall hydraulic conductivity is relatively low. The low hydraulic conductivity of any unconsolidated deposits below the landfill would provide additional protection from landfill development to the underlying groundwater.
- Flow velocity can vary locally across the site due to variations in hydraulic conductivity and hydraulic gradients with a downward component of flow. The overall horizontal flow velocity is generally consistent throughout the year at approximately 587 feet per year

toward the south-southeast within the perched water table but is more uniform at approximately 248 feet per year toward the north-northeast within the regional water table.

- There is currently no evidence that the active MSW Landfill (WDNR License No. 3268) has caused groundwater contamination at the facility.

5 Recommendation

Vernon County believes that the responses presented in this Addendum 01 satisfactorily address the additional information requested by the WDNR in their Incompleteness Letter dated December 19, 2023. Vernon County is requesting the WDNR review this Feasibility Report Addendum 01 and approve the Feasibility Report so Vernon County can continue to make progress with the landfill permitting process.

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Tables

Table 1 – Soil Borings within 300 feet of Proposed Expansion and Extend at Least 25 feet below Proposed Sub-base Grades

Table 2 – Summary of Monitoring Wells and Piezometers within 300 feet of Proposed Expansion

Table 3 – Existing Static Water Elevations for Landfill Property (2020-2024)

Table 4 – In-Field Hydraulic Conductivity Testing for the Landfill Property

Table 5 – Vertical Hydraulic Gradients (2020-2024)

Table 1
Soil Borings within 300 feet of Proposed Expansion and Extend at Least 25 feet below Subbase Elevation
Vernon County Landfill - Proposed Eastern Expansion

Soil Boring Nomenclature	Year Completed	Drilling Company	Ground Elevation (feet NAVD)	Depth to Saprolite (feet bgs)	Saprolite Elevation (feet NAVD)	Depth to Bedrock (feet bgs)	Bedrock Elevation (feet NAVD)	Total Depth of Boring (feet bgs)	Bottom Elevation of Boring (feet NAVD)	Sub-base Elevation (feet NAVD)	Depth Below Sub-base Elevation (feet) ⁽¹⁾
Existing Borings within 300-feet											
TB-4	1988	Wisconsin Test Drilling	1232.9	12.0	1220.9	14.5	1218.4	15.0	1217.9	1255	37.4
TB-5	1988	Wisconsin Test Drilling	1221.0	22.0	1199.0	NE	NE	25.0	1196.0	1222	26.3
TB-7	1988	Wisconsin Test Drilling	1245.4	38.0	1207.4	NE	NE	47.5	1197.9	1239	41.0
TB-8	1988	Wisconsin Test Drilling	1249.4	42.0	1207.4	45.0	1204.4	45.5	1203.9	1251	47.1
TB-15	1989	Exploration Technology	1193.5	11.5	1182.0	NE	NE	12.0	1181.5	1220	38.5
B-18	2022	Braun Intertec	1239.0	18.0	1221.0	24.0	1215.0	30.0	1209.0	1238	29.4
B-19	2022	Braun Intertec	1233.3	20.0	1213.3	24.0	1209.3	28.0	1205.3	1232	26.5
B-20	2022	Braun Intertec	1215.8	20.8	1195.0	24.0	1191.8	30.0	1185.8	1219	33.5
MW-5	1988	Ace Well Drilling	1223.3	20.0	1203.3	35.0	1188.3	180.0	1043.3	1238	195.2
MW-6	1988	Ace Well Drilling	1233.0	14.0	1219.0	14.0	1219.0	210.0	1023.0	1255	232.3
MW-10	1989	Exploration Technology	1215.6	24.5	1191.1	61.0	1154.6	181.0	1034.6	1220	185.4
MW-14Z	2003	Traut Hydro Tech	1247.5	NONE	NONE	27.5 ⁽²⁾	1220.0	210.0	1037.5	1254	216.3
MW-14WT	2022	Braun Intertec	1247.2	28.5	1218.7	30.0	1217.2	109.0	1138.2	1255	117.1
MW-15WT	2022	Braun Intertec	1220.6	39.5	1181.1	69.5	1151.1	99.0	1121.6	1244	122.2
MW-16	2022	Braun Intertec	1184.3	34.5	1149.8	79.5	1104.8	98.0	1086.3	1225	139.1
MW-17WT	2022	Braun Intertec	1196.4	11.0	1185.4	65.0	1131.4	93.0	1103.4	1220	116.6
Borings completed during 2024 within 300-feet											
B-22	2024	Cascade Drilling	1225.6	23.0	1202.6	55.0	1170.6	105.0	1120.6	1210	89.4
MW-16Z	2024	Cascade Drilling	1184.5	59.0	1125.5	79.0	1105.5	120.0	1064.5	1225	160.5
MW-18	2024	Cascade Drilling	1209.8	30.0	1179.8	87.0	1122.8	117.0	1092.8	1234	141.2
MW-19Z	2024	Cascade Drilling	1190.2	10.0	1180.2	28.0	1162.2	130.0	1060.2	1220	159.8

Notes:

- bgs - Below ground surface.
- NE - Not encountered.
- NONE - No Saprolite present at this location.
- (1) - Only page 1 of the soil boring log is available.
- (2) - Depth to bedrock on the boring log appears to be skewed due to the Rotasonic drilling method used. The depth to bedrock provided here was determined using surrounding boring logs and geologic cross-section interpretations.

Table 2
Summary of Monitoring Wells and Piezometers within 300 feet of Proposed Expansion
Vernon County Landfill - Proposed Eastern Expansion

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NAVD)	Top of Casing Elevation (feet NAVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NAVD)	Monitoring Point	Geologic Description of Screened Interval
Monitoring Wells and Piezometers Inside Expansion Footprint									
109	MW-5A	11/8/1989	1224.0	1225.81	103.3	15.0	1120.7 - 1135.7	Perched Water Table	dolomite, hard
108	MW-5	2/17/1988	1223.3	1225.32	150.6	10.0	1072.7 - 1082.7	Regional Water Table	dolomite, hard
119	MW-14Z	3/7/2003	1247.5	1250.22	210.8	5.0	1036.7 - 1041.7	Piezometer, Lower Zone	silty dolomitic sandstone
Monitoring Wells and Piezometers Within 150-feet									
118	MW-14	3/12/2003	1247.5	1249.69	186.1	15.0	1061.4 - 1076.4	Regional Water Table	fractured dolomite and sandy dolomite
125	MW-14WT	9/20/2022	1247.2	1249.70	106.0	15.0	1141.2 - 1156.2	Perched Water Table	dolostone
127	MW-15WT	9/28/2022	1220.6	1223.24	85.0	10.0	1135.6 - 1145.6	Perched Water Table	sandy dolostone
129	MW-16WT*	9/21/2022	1184.7	1186.97	75.0	10.0	1109.7 - 1119.7	Perched Water Table	sandy dolostone to shale
131	MW-16	8/25/2022	1184.3	1186.92	97.0	5.0	1087.3 - 1092.3	Regional Water Table	sandy dolostone
135	MW-16Z	8/6/2024	1184.5	1186.50	120.0	5.0	1064.5 - 1069.5	Piezometer, Upper Zone	weathered sandy dolostone
133	MW-17WT	9/26/2022	1196.4	1199.18	92.0	10.0	1104.4 - 1114.4	Perched Water Table	weathered sandstone
137	MW-18WT	8/2/2024	1210.1	1212.24	87.0	10.0	1123.1 - 1133.1	Perched Water Table	weathered sandy dolostone
139	MW-18	7/31/2024	1209.8	1212.00	117.0	10.0	1092.8 - 1102.8	Regional Water Table	sandy dolostone
Monitoring Wells and Piezometers Within 300-feet									
105	MW-3	2/2/1988	1233.0	1235.25	180.0	5.0	1053.0 - 1058.0	Piezometer, Upper Zone	dolomite, hard
107	MW-4P	1/29/1988	1232.9	1235.19	95.0	10.0	1137.9 - 1147.9	Perched Water Table	dolomite, hard
110	MW-6	2/20/1988	1233.0	1235.37	202.2	5.0	1030.8 - 1035.8	Piezometer, Lower Zone	sandy dolomite
114	MW-10	9/15/1989	1215.6	1217.52	183.5	5.0	1032.1 - 1037.1	Piezometer, Lower Zone	dolomitic sandstone to sandy dolomite
115	MW-11	9/29/1989	1216.4	1218.56	162.5	15.0	1053.9 - 1068.9	Piezometer, Upper Zone	sandy dolomite to dolomitic sandstone
116	MW-12	9/22/1989	1216.4	1218.36	98.5	15.0	1117.9 - 1132.9	Perched Water Table	dolomite with occasional small vugs
141	MW-19	8/13/2024	1190.5	1192.82	103.0	10.0	1087.5 - 1097.5	Regional Water Table	sandstone
143	MW-19Z	8/9/2024	1190.2	1192.34	130.0	5.0	1060.2 - 1065.2	Piezometer, Upper Zone	clayey sandstone

Notes:

- bgs - Below ground surface.
- * - TOC revised and re-surveyed on 07/22/2024.

Table 3
Existing Static Water Elevations for Landfill Property (2020-2024)
Vernon County Landfill - Proposed Eastern Expansion

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NAVD)	Top of Casing Elevation (feet NAVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NAVD)	Well Type/ Groundwater Zone	Static Water Elevation by Date (feet NAVD)															
									3/9/2020	9/14/2020	3/1/2021	9/1/2021	3/1/2022	9/22/2022	12/20/2022	1/24/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023	9/11/2023	3/11/2024	8/27/2024	10/2/2024
102	MW-1P	12/30/1987	1236.4	1238.41	111.1	10.0	1125.4 - 1135.4	Perched Water Table	1132.6	1132.56	1131.67	1131.76	1131.42	1130.90	1130.02	1131.71	1131.70	1131.59	1131.98	1132.64	1132.58	1132.85	1132.63	1132.43
101	MW-1	12/30/1987	1236.4	1238.11	158.0	10.0	1078.5 - 1088.5	Regional Water Table	1103.09	1102.14	1096.58	1093.67	1091.85	1089.95	1089.70	1089.62	1089.62	1090.36	1092.19	1094.43	1093.24	1089.42	1090.20	1090.17
121	MW-1PR	1/12/1994	1245.0	1247.61	127.7	15.0	1119.9 - 1134.9	Perched Water Table	1135.4	1135.22	1134.80	1134.34	1134.23	1133.50	1134.07	1134.04	1134.22	1134.14	1134.72	1134.97	1134.09	1133.50	1134.47	1134.35
120	MW-1R	1/12/1994	1244.6	1247.25	164.6	15.0	1082.6 - 1097.6	Regional Water Table	1102.97	1102.03	1096.50	1093.58	1091.81	1089.95	1090.85	1090.60	1089.61	1090.36	1092.13	1094.46	1093.06	1088.64	1090.46	1090.48
123	MW-1RZ	3/12/2003	1244.0	1245.45	186.5	5.0	1057.5 - 1062.5	Piezometer, Upper Zone	1102.54	1101.58	1096.12	1093.19	1091.28	1089.51	1088.33	1089.11	1089.15	1089.84	1090.72	1093.86	1092.61	1088.21	1089.86	1089.43
104	MW-2P	1/17/1988	1252.5	1254.88	124.8	10.0	1128.0 - 1138.0	Perched Water Table	1141.03	1140.76	1139.87	1139.39	1139.33	1138.79	1138.81	1138.45	1139.36	1139.24	1139.98	1141.11	1139.41	1138.69	1138.98	1139.65
103	MW-2	1/17/1988	1252.5	1254.35	174.6	10.0	1078.3 - 1088.3	Regional Water Table	1095.32	1094.86	1091.56	1089.58	1087.79	1085.92	1086.19	1085.23	1086.01	1086.60	1087.51	1090.35	1089.29	1085.27	1086.88	1086.37
105	MW-3	2/2/1988	1233.0	1235.25	180.0	5.0	1053.2 - 1058.2	Piezometer, Upper Zone	1080.42	1080.22	1076.06	1073.14	1070.69	1069.14	1068.69	1068.66	1068.69	1069.06	1069.19	1071.08	NM	1068.83	1068.90	1068.30
107	MW-4P	1/29/1988	1232.9	1235.19	95.0	10.0	1138.3 - 1148.3	Perched Water Table	1150.88	1151.96	1149.32	1149.32	1148.16	1148.92	1147.07	1146.72	1148.30	1148.18	1148.24	1151.19	1149.58	1147.14	1150.67	1149.96
109	MW-5A	11/8/1989	1224.0	1225.81	103.3	15.0	1122.9 - 1137.9	Perched Water Table	1137.72	1138.27	1136.34	1135.86	1135.52	1135.74	1134.78	1134.27	1134.29	1135.12	1135.58	1136.90	1135.73	1135.52	1135.50	1135.29
108	MW-5	2/17/1988	1223.3	1225.32	150.6	10.0	1072.6 - 1082.6	Regional Water Table	1085.93	1086.23	1084.59	1084.36	1083.94	1084.05	1081.46	1082.51	1082.60	1083.14	1083.50	1086.28	1084.20	1083.29	1083.31	1082.90
110	MW-6	1/12/1900	1233.0	1235.37	202.2	5.0	1025.7 - 1030.7	Piezometer, Lower Zone	1073.88	1073.53	1069.39	1067.35	1065.30	1063.84	1062.81	1062.48	1062.35	1062.48	1062.25	1063.27	1066.09	1062.71	1064.13	1063.81
111	MW-7	11/7/1989	1255.7	1258.03	234.5	5.0	1023.5 - 1028.5	Piezometer, Lower Zone	1079.32	1078.89	1074.92	1072.83	1070.92	1069.39	1069.50	1068.20	1069.34	1074.93	1069.71	1070.14	1071.57	1068.29	1069.56	1069.25
112	MW-8R	11/13/1989	1256.1	1258.84	202.5	15.0	1056.3 - 1071.3	Piezometer, Upper Zone	1087.42	1086.93	1082.78	1079.31	1077.00	1075.30	1076.74	1075.12	1075.04	1075.74	1076.15	1079.52	1078.77	1074.93	1077.32	1077.24
113	MW-9	8/29/1989	1255.4	1257.50	126.8	15.0	1130.7 - 1145.7	Perched Water Table	1140.92	1141.14	1140.16	1139.74	1139.22	1138.73	1139.07	1139.25	1139.35	1139.24	1139.13	1139.79	1139.65	1138.94	1145.25	1143.16
114	MW-10	9/15/1989	1215.6	1217.52	183.5	5.0	1034.0 - 1039.0	Piezometer, Lower Zone	1098.09	1096.89	1090.39	1086.65	1084.18	1082.08	1083.12	1081.66	1080.14	1082.75	1081.73	1086.63	1085.79	1080.78	1081.67	1081.25
115	MW-11	9/29/1989	1216.4	1218.56	162.5	15.0	1056.0 - 1071.0	Piezometer, Upper Zone	1100.85	1102.01	1093.69	1089.81	1089.22	1085.59	1086.25	1086.73	1086.75	1087.68	1090.31	1092.04	1189.51	1084.33	1087.06	1087.21
116	MW-12	9/22/1989	1216.4	1218.36	98.5	15.0	1119.9 - 1134.9	Perched Water Table	1132.29	1132.13	1130.62	1130.50	1129.69	1130.45	1128.48	1130.17	1130.87	1131.77	1133.62	1133.71	1130.34	1129.07	1132.66	1132.02
117	MW-13P	2/26/2003	1224.5	1227.42	102.4	15.0	1122.1 - 1137.1	Perched Water Table	1134.6	1134.56	1134.00	1133.64	1133.46	1132.81	1133.40	1133.40	1133.21	1133.60	1134.40	1134.33	1133.34	1132.76	1133.89	1133.53
125	MW-14WT	9/20/2022	1247.2	1249.70	106.0	15.0	1141.2 - 1156.2	Perched Water Table	--	--	--	--	--	--	1141.87	1146.01	1145.92	1146.67	1146.77	1146.98	NM	NM	1146.52	1146.16
118	MW-14	3/12/2003	1247.5	1249.69	186.1	15.0	1061.4 - 1076.4	Regional Water Table	1086.34	1086.00	1081.36	1077.76	1075.24	1073.32	1073.63	1072.80	1072.54	1073.44	1073.91	1077.46	1076.76	1072.71	1074.77	1074.63
119	MW-14Z	3/7/2003	1247.5	1250.22	210.8	5.0	1036.7 - 1041.7	Piezometer, Lower Zone	1082.78	1083.11	1078.69	1073.19	1072.26	1071.89	1071.20	1071.17	1071.09	1071.30	1071.96	1072.58	1075.15	1068.74	1072.01	1071.80
127	MW-15WT	9/28/2022	1220.6	1223.24	85.0	10.0	1135.6 - 1145.6	Perched Water Table	--	--	--	--	--	--	DRY	DRY	DRY	DRY	DRY	DRY	NM	NM	DRY	DRY
129	MW-16WT**	9/21/2022	1184.7	1186.97	75.0	10.0	1109.7 - 1119.7	Perched Water Table	--	--	--	--	--	--	DRY	DRY	DRY	DRY	DRY	DRY	NM	NM	DRY	DRY
131	MW-16	8/25/2022	1184.3	1186.92	97.0	5.0	1087.3 - 1092.3	Regional Water Table	--	--	--	--	--	--	1093.09*	1101.68	1102.48	1104.29	1104.38	1107.62	NM	NM	1099.47	1099.37
135	MW-16Z	8/13/2024	1184.5	1186.503	120.0	5.0	1064.5 - 1069.5	Piezometer, Upper Zone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1093.88	1093.94
133	MW-17WT	9/26/2022	1196.4	1199.18	92.0	10.0	1104.4 - 1114.4	Perched Water Table	--	--	--	--	--	--	1116.64	1117.78	FROZEN	1121.62	1124.88	1122.04	NM	NM	1120.55	1119.75
137	MW-18WT	8/6/2024	1210.1	1212.241	87.0	10.0	1123.1 - 1133.1	Perched Water Table	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1130.15	1132.41
139	MW-18	7/31/2024	1209.8	1211.995	117.0	10.0	1092.8 - 1102.8	Regional Water Table	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1104.35	1104.20
141	MW-19	8/8/2024	1190.5	1192.818	103.0	10.0	1087.5 - 1097.5	Regional Water Table	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1095.60	1092.96
143	MW-19Z	8/12/2024	1190.2	1192.342	130.0	5.0	1060.2 - 1065.2	Piezometer, Upper Zone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1094.04	1093.77

Notes:

- bgs - Below ground surface.
- NM - Not measured.
- - Data not available due to monitoring point not yet installed.
- * - Groundwater elevation not representative due to well still stabilizing post-well development.
- ** - TOC revised and re-surveyed on 07/22/2024.

BOLD -Monitoring well or piezometer used in monitoring of the proposed landfill expansion area.



Table 4
In-Field Hydraulic Conductivity Testing for the Landfill Property
Vernon County Landfill - Proposed Eastern Expansion

Well Name	Screen Interval Elevation (feet NAVD)	Well Type/ Groundwater Zone	Geologic Description of Screened Interval	Year Completed	Method	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
Perched Water Table Wells							
MW-1PR	1120 - 1135	Perched Water Table	sandy dolostone to dolomitic sandstone	2003	Bouwer-Rice	5.97E-03	16.93
MW-2P	1128.0 - 1138.0	Perched Water Table	dolostone, hard	2023	Bouwer-Rice	1.64E-03	4.64
MW-4P	1138 - 1148	Perched Water Table	dolostone, hard	2003	Bouwer-Rice	5.93E-03	16.82
MW-5A	1123 - 1138	Perched Water Table	dolostone, hard	2024	Bouwer-Rice	3.98E-03	11.28
MW-9	1131 - 1146	Perched Water Table	dolostone with occasional small vugs	2003	Bouwer-Rice	1.18E-02	33.54
MW-12	1120 - 1135	Perched Water Table	dolostone with occasional small vugs	2023	Bouwer-Rice	1.18E-03	3.34
MW-13P	1122 - 1137	Perched Water Table	dolostone with occasional small vugs	2003	Bouwer-Rice	3.28E-03	9.29
MW-14WT	1141 - 1156	Perched Water Table	dolostone	2023	Bouwer-Rice	9.94E-03	28.18
MW-17WT	1104 - 1114	Perched Water Table	clayey sandstone	2023	Bouwer-Rice	2.43E-05	0.07
MW-18WT	1125 - 1135	Perched Water Table	weathered sandy dolostone	2024	Bouwer-Rice	2.34E-03	6.62
Average						4.61E-03	13.07
Geometric Mean						2.39E-03	6.76
Minimum						2.43E-05	0.07
Maximum						1.18E-02	33.54
Regional Water Table Wells							
MW-1	1079 - 1089	Regional Water Table	dolostone, hard	1988	NA	1.86E-04	0.53
MW-1R	1083 - 1098	Regional Water Table	dolostone, hard	2023	Bouwer-Rice	6.67E-02	189.18
MW-2	1078 - 1088	Regional Water Table	dolostone, hard	1988	NA	4.63E-04	1.31
MW-5	1073 - 1083	Regional Water Table	dolostone, hard	1988	NA	2.62E-04	0.74
MW-14	1061 - 1076	Regional Water Table	fractured dolostone and sandy dolostone	2003	Bouwer-Rice	1.39E-02	39.48
MW-16	1087 - 1092	Regional Water Table	sandy dolostone	2023	Bouwer-Rice	3.71E-04	1.05
MW-18	1095.0 - 1105.0	Regional Water Table	sandy dolostone	2024	Bouwer-Rice	2.07E-04	0.59
MW-19	1090 - 1100	Regional Water Table	sandstone	2024	Bouwer-Rice	1.04E-04	0.29
Average						1.63E-02	46.25
Geometric Mean						1.84E-03	5.21
Minimum						1.86E-04	0.53
Maximum						6.67E-02	189.18
Piezometers							
MW-1RZ	1058 - 1063	Piezometer, Upper Zone	sandy dolostone to dolomitic sandstone	2003	Bouwer-Rice	3.07E-02	87.11
MW-3	1053 - 1058	Piezometer, Upper Zone	dolostone, hard	2003	Bouwer-Rice	1.67E-03	4.73
MW-6	1026 - 1031	Piezometer, Lower Zone	sandy dolostone	2003	Bouwer-Rice	1.59E-03	4.51
MW-7	1024 - 1029	Piezometer, Lower Zone	sandy dolostone with sandstone and shale interbeds	2003	Bouwer-Rice	1.05E-02	29.81
MW-8R	1056 - 1071	Piezometer, Upper Zone	sandy dolostone with sandstone interbeds	2003	Bouwer-Rice	3.19E-03	9.05
MW-10	1034.0 - 1039.0	Piezometer, Lower Zone	dolomitic sandstone to sandy dolostone	2003	Bouwer-Rice	2.01E-03	5.71
MW-11	1056.0 - 1071.0	Piezometer, Upper Zone	sandy dolostone to dolomitic sandstone	2003	Bouwer-Rice	2.19E-04	0.62
MW-14Z	1037 - 1042	Piezometer, Lower Zone	silty dolomitic sandstone	2003	Bouwer-Rice	1.18E-03	3.34
MW-16Z	1067 - 1072	Piezometer, Upper Zone	weathered sandy dolostone	2024	Bouwer-Rice	1.07E-04	0.30
MW-19Z	1062 - 1067	Piezometer, Upper Zone	clayey sandstone	2024	Bouwer-Rice	2.13E-04	0.60
Average						6.39E-03	18.11
Geometric Mean						2.48E-03	7.02
Minimum						2.19E-04	0.62
Maximum						3.07E-02	87.11
Summary of All Hydraulic Conductivity Values							
Average						7.77E-03	22.04
Geometric Mean						2.28E-03	6.47
Minimum						2.43E-05	0.07
Maximum						6.67E-02	189.18

Notes:
cm/sec - centimeters per second.
ft/day - feet per day.
NA - Not available due to no description present on soil boring log.

Table 5
Vertical Hydraulic Gradients
Vernon County Landfill - Proposed Eastern Expansion

Well Name	TOC Elevation (feet NAVD)	Ground Elevation (feet NAVD)	Screen Bottom Elevation (feet NAVD)	Screen Top Elevation (feet NAVD)	Screen Interval Elevation (feet NAVD)	Vertical Gradient by Date														Average	Direction
						3/9/2020	9/14/2020	3/1/2021	9/1/2021	3/1/2022	9/22/2022	12/20/2022	1/24/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023	8/27/2024	10/2/2024		
Perched Water Table vs Regional Water Table																					
MW-1P	1238.41	1236.4	1125.4	1135.4	1125.4 - 1135.4	29.510	30.420	35.090	38.090	39.570	40.950	40.320	42.090	42.080	41.230	39.790	38.210	42.430	42.260		
MWV-1	1238.11	1236.4	1078.5	1088.5	1078.5 - 1088.5	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900		
MW-1P/MW-1						0.629	0.649	0.748	0.812	0.844	0.873	0.860	0.897	0.897	0.879	0.848	0.815	0.905	0.901	0.789	Downward
MW-1PR	1247.61	1245.0	1119.9	1134.9	1119.9 - 1134.9	32.430	33.190	38.300	40.760	42.420	43.550	43.220	43.440	44.610	43.780	42.590	40.510	44.010	43.870		
MW-1R	1247.25	1244.6	1082.6	1097.6	1082.6 - 1097.6	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300		
MW-1PR/MW-1R						0.869	0.890	1.027	1.093	1.137	1.168	1.159	1.165	1.196	1.174	1.142	1.086	1.180	1.176	1.060	Downward
MW-2P	1254.88	1252.5	1128.0	1138.0	1128 - 1138	45.710	45.900	48.310	49.810	51.540	52.870	52.620	53.220	53.350	52.640	52.470	50.760	52.100	53.280		
MWV-2	1254.35	1252.5	1078.3	1088.3	1078.3 - 1088.3	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700		
MW-2P/MW-2						0.920	0.924	0.972	1.002	1.037	1.064	1.059	1.071	1.073	1.059	1.056	1.021	1.048	1.072	1.001	Downward
MW-5A	1225.81	1224.0	1122.9	1137.9	1122.9 - 1137.9	51.790	52.040	51.750	51.500	51.580	51.690	53.320	51.760	51.690	51.980	52.080	50.620	52.190	52.390		
MW-5	1225.32	1223.3	1072.6	1082.6	1072.6 - 1082.6	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800		
MW-5A/MW-5						0.981	0.986	0.980	0.975	0.977	0.979	1.010	0.980	0.979	0.984	0.986	0.959	0.988	0.992	0.985	Downward
MW-18WT	1212.24	1210.1	1123.1	1133.1	1123.1-1133.1	--	--	--	--	--	--	--	--	--	--	--	--	25.806	28.216		
MW-18	1212.00	1209.8	1092.8	1102.8	1092.8-1102.8	--	--	--	--	--	--	--	--	--	--	--	--	30.278	30.278		
MW-18WT/MW-18						--	--	--	--	--	--	--	--	--	--	--	--	0.852	0.932	1.452	Downward
Regional Water Table vs Piezometer																					
MW-1R	1247.25	1244.6	1082.6	1097.6	1082.6 - 1097.6	0.430	0.450	0.380	0.390	0.530	0.440	2.520	1.490	0.460	0.520	1.410	0.600	0.600	1.050		
MW-1RZ	1245.45	1244.0	1057.5	1062.5	1057.5 - 1062.5	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100		
MW-1R/MW-1RZ						0.014	0.015	0.013	0.013	0.018	0.015	0.084	0.050	0.015	0.017	0.047	0.020	0.020	0.035	0.024	Downward
MW-14	1249.69	1247.5	1061.4	1076.4	1061.4 - 1076.4	3.560	2.890	2.670	4.570	2.980	1.430	2.430	1.630	1.450	2.140	1.950	4.880	2.760	2.830		
MW-14Z	1250.22	1247.5	1036.7	1041.7	1036.7 - 1041.7	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700		
MW-14/MW-14Z						0.120	0.097	0.090	0.154	0.100	0.048	0.082	0.055	0.049	0.072	0.066	0.164	0.093	0.095	0.100	Downward
MW-16	1186.92	1184.3	1087.3	1092.3	1087.3 - 1092.3	--	--	--	--	--	--	--	--	--	--	--	--	5.587	5.427		
MW-16Z	1186.50	1184.5	1064.5	1069.5	1064.5 - 1069.5	--	--	--	--	--	--	--	--	--	--	--	--	22.757	22.757		
MW-16/MW-16Z						--	--	--	--	--	--	--	--	--	--	--	--	0.246	0.238	0.242	Downward
MW-19	1192.82	1190.5	1087.5	1097.5	1087.5 - 1097.5	--	--	--	--	--	--	--	--	--	--	--	--	1.556	-0.814		
MW-19Z	1192.34	1190.2	1060.2	1065.2	1060.2 - 1065.2	--	--	--	--	--	--	--	--	--	--	--	--	29.821	29.821		
MW-19/MW-19Z						--	--	--	--	--	--	--	--	--	--	--	--	0.052	-0.027	0.012	Varies
Upper Piezometer vs Lower Piezometer																					
MWV-3	1235.25	1233.0	1053.2	1058.2	1053.2 - 1058.2	6.540	6.690	6.670	5.790	5.390	5.300	5.880	6.180	6.340	6.580	6.940	7.810	4.770	4.490		
MWV-6	1235.37	1233.0	1025.7	1030.7	1025.7 - 1030.7	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500		
MWV-3/MWV-6						0.238	0.243	0.243	0.211	0.196	0.193	0.214	0.225	0.231	0.239	0.252	0.284	0.173	0.163	0.225	Downward
MWV-8R	1258.84	1256.1	1056.3	1071.3	1056.3 - 1071.3	8.100	8.040	7.860	6.480	6.080	5.910	7.240	6.920	5.700	0.810	6.440	9.380	7.760	7.990		
MWV-7	1258.03	1255.7	1023.5	1028.5	1023.5 - 1028.5	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800		
MWV-8R/MWV-7						0.214	0.213	0.208	0.171	0.161	0.156	0.192	0.183	0.151	0.021	0.170	0.248	0.205	0.211	0.187	Downward
MWV-11	1218.56	1216.4	1056.0	1071.0	1056 - 1071	2.760	5.120	3.300	3.160	5.040	3.510	3.130	5.070	6.610	4.930	8.580	5.410	5.390	5.960		
MWV-10	1217.52	1215.6	1034.0	1039.0	1034 - 1039	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000		
MWV-11/MWV-10						0.102	0.190	0.122	0.117	0.187	0.130	0.116	0.188	0.245	0.183	0.318	0.200	0.200	0.221	0.178	Downward

Notes:

Appendix A

WDNR Incompleteness Determination Letter dated December 19, 2023



December 19, 2023

FID # 663038310
Vernon County
SW/Correspondence

Ms. Stacie Sanborn
Vernon County, Director of Solid Waste
S3075 County Road LF
Viroqua, WI 54665

Subject: Incompleteness Determination for the Feasibility Report for the Proposed Vernon County
Landfill Eastern Expansion, License #3268

Dear Ms. Sanborn:

The Department of Natural Resources (department) has reviewed for completeness the report entitled "Feasibility Report - Proposed Eastern Expansion (WDNR License No. 3268)" dated September 11, 2023. The feasibility report (the report) was prepared by Short Elliot Hendrickson Inc., (SEH) on behalf the Vernon County Solid Waste Department. The department received the report on September 15, 2023. Based on the report review, the department has determined that the feasibility report does not contain the minimum information required by ch. NR 512, Wis. Adm. Code. Therefore, the report is not complete.

Part A below lists the items needed to determine the report is complete. Part B below provides comments and information the department wishes to share with you regarding the proposal. In your response, please include the information listed in part A and any additional information to address items listed in part B as an addendum to the feasibility report. This information is intended for use by the public as well as the department in reviewing the proposed project. Be sure to provide a copy of all information submitted to the department to each recipient of the feasibility report as required by s. 289.23(4), Wis. Stats.

The lists below are placed in the sequential order of the code citations, followed by the sequential order of the feasibility report sections with the exception of all items related to the geotechnical investigation. These items are grouped together because it is a significant subject and responses to some items may relate to other geotechnical items.

- A. The following information must be provided for the department to issue a determination that the feasibility report is complete:

Geotechnical Information

1. **Site-Specific Geotechnical Information [s. NR 512.09(1)(c) and (d), Wis. Adm. Code]:** Soil boring B-21 does not extend to at least 25 feet below sub-base grade.
2. **Site-Specific Geotechnical Information [s. NR 512.09(2)(a), Wis. Adm. Code]:** The minimal requirement to adequately define the water table surface and horizontal gradients is not met to the east of the proposed expansion area, in part because new groundwater monitoring wells MW-15WT and MW-16WT are dry. The flow toward the merger point of the perched aquifer and regional water table aquifer near the MW-16/MW-16WT groundwater monitoring well point as interpreted in the report needs to be more accurately defined by additional hydrogeological investigation (i.e., data from additional borings and

groundwater monitoring wells), as this area would likely be the collection point of a hypothetical discharge from the proposed expansion. Once the assumed merger zone of the perched and regional water tables is confirmed, downgradient regional water table wells will be needed to monitor transport of a hypothetical discharge once it reaches the regional water table as required in s. NR 507.19 (1), Wis. Adm. Code.

3. **Subsurface Data Analysis [s. NR 512.10(4), Wis. Adm. Code]:** The report appendices do not include raw data for groundwater level measurements. Either field notes/forms or inclusion of measured depth-to-water readings on the data tables would satisfy the requirement.
4. **Data Presentation [s. NR 512.11(2)(a), Wis. Adm Code]:** Inferred or questionable lithostratigraphic boundaries are not marked with a dashed line or question mark.
5. **Section 1.3.1, Baseline Sampling of New Wells Subsection, Section 4.9, Section 5.4:** Manganese concentrations in groundwater monitoring well MW-14WT are significantly higher than in other groundwater monitoring wells at the facility, including but not limited to upgradient groundwater monitoring wells and groundwater monitoring wells for which manganese exemptions have been previously granted. Additional discussion on the potential source of the manganese in MW-14WT is needed to evaluate the requested exemption under s. NR 140.28, Wis. Adm. Code.
6. **Section 5, Alternative Geotechnical Investigation Plan and Geophysical Investigation:** Statements and other information provided in the feasibility report, including the boring logs, indicate that there is a respectable amount of fractured or preferential flow in the dolostone for the perched aquifer and the regional aquifer. Fractured and preferential groundwater flow may be challenging to effectively monitor because it may be difficult or impossible to determine the appropriate locations for groundwater monitoring wells with the capability to detect any hypothetical landfill leakage as required in s. NR 507.19 (1), Wis. Adm. Code. In addition, the reported horizontal flow velocities in section 5.4.2.10 of the report indicate a relatively fast groundwater flow regime. A relatively fast flow matrix is consistent with fractured flow behavior and makes it more difficult to effectively monitor groundwater at the landfill. It is not known if additional geotechnical work would provide sufficient additional information regarding the fractured flow matrix. The department is concerned about the ability to effectively monitor groundwater quality at the site. Vernon Co. may propose additional geophysical methods as part of the installation of additional borings and groundwater monitoring wells to define the groundwater flow of the perched aquifer as it converges with the regional aquifer or as part of any other additional work.

Additional geophysical methods to be considered should be applicable to investigation in an open borehole and may include, but not are not limited to: electrical methods (e.g., resistivity and similar methods) electromagnetic methods (e.g., electromagnetic induction); additional nuclear methods; physical/imaging methods (e.g., caliper log, acoustic televiewer, optical televiewer, video camera); and fluid column methods (applicable to saturated portions of a borehole). Multiple test methods for each borehole would provide additional lines of evidence to predict groundwater flow. Again, it is not known how feasible any of these additional methods would be and if they would yield sufficient additional information or additional information favorable to the expansion of the landfill.

7. **Section 5.4.1.2:** Provide the following additional information and clarification regarding the MW-16 groundwater monitoring well nest drilling.
 - a. The MW-16 boring log provided in Appendix J states that the borehole lost water from 70 feet to termination. Further explain the interpretation provided in the report text that the water loss was due to the head pressure exerted by the confinement of weathered sandy dolostone between two shale layers, and whether the pressure/fluid loss characteristics changed after the lower shale layer was

penetrated and the borehole advanced through similar sandy dolostone material. In addition, please indicate if a fractured flow regime and/or other reasons were considered as the cause of the water loss, and why the confining layer was selected as the most probable reason.

- b. Clarify the source of the observation of groundwater at 68.4 feet below ground surface (bgs) on 8/24/2022 (during advancement of MW-16) on the MW-16WT boring log. This information was not provided on the MW-16 boring log.
8. **Section 5.4.1.3:** Please clarify the statement that dissolution cavities and fractures are primarily present above groundwater and address or discuss what information indicates the absence of fractures and voids below the water table. Cored borings MW-10, MW-12, and MW-14Z document vugs and fractures, and other boring logs provided in Appendix K document numerous crevices below groundwater in bedrock.
9. **Section 5.4.1.4 Geophysical Horizons:** Explain the access issues that prevented geophysical investigation at the MW-16/ MW-16WT groundwater monitoring well nest, and whether the access issues are ongoing.
10. **Section 5.4.2.4, Section J-J' and Flow Net:** Based on the information provided in the feasibility report, the department questions the assumption stated in this section and others that the site represents a homogenous, isotropic system due to soil classifications and hydraulic conductivity values. Other comments pertinent to this section and the other sections referenced in the flow net assumptions discussion are as follows:
 - a. Hydraulic conductivity values within each of the three dolostone zones identified (perched water table, regional water table, piezometers) vary by two or more orders of magnitude.
 - b. Variations in lithology within the residuum layer and portions of saprolite and competent bedrock above groundwater, and variations in vertical hydraulic conductivity measurements, do not provide sufficient evidence to support a low likelihood of potential impacts from the landfill to the water table.
 - c. Based on the limited data, vertical gradients within the upper portion of the regional water table formation vary by approximately one order of magnitude.
 - d. Bedrock quality data with respect to fracture regimes or voids collected during the geotechnical investigation are limited; however, it is observed in Section 5.4.1.3 that bedrock is highly fractured in general with a likelihood of interconnected fractures. Boring logs are marked with zones consisting of fractures, vugs and voids.

Depending on the resolution of this comment and the results of any further groundwater investigation at the landfill, the flow net presented in cross section J-J' may need to be modified. The department notes that map view flow nets of both the perched water table and regional water table may enhance understanding of flow from the proposed expansion area to and within groundwater.

11. **Appendix J:** Explain the differences in the SEH boring logs and the Braun Intertec Logs for the same borings, in particular differences in total borehole depth (B-19 and B-20), differences in depth to bedrock/saprolite (B-18 through B-20, MW-14WT, MW-16, MW-17WT), and differences in bedrock/saprolite lithology (B-20, MW-16, MW-17WT).

12. **Table 5-4:** Clarify the “Frozen” designation for the March 2023 water table elevation at MW-17WT. Given that the static water level in this groundwater monitoring well is generally significantly below ground surface, a frozen water surface does not seem likely.

General Information

13. **General Submittal Requirements [s. NR 500.05(6)(g), Wis. Adm. Code]:** The local survey grid used does not appear to be referenced to state plane coordinates or other datum accepted by the department, and the department did not find discussion or documentation that the coordinate system is based on monuments in the field.
14. **Performance Standards [s. NR 504.04(4)(d), Wis. Adm. Code] and General Submittal Requirements [s. NR 512.05, Wis. Adm. Code]:** The department was unable to locate in Appendix Q the recent nitrate + nitrite data that was referenced in Section 5.4.3.1. These data are necessary to justify how applicable s. NR 140.28, Wis. Adm. Code criteria are met.
14. **Proposed Physical Changes [s. NR 512.16(2)(b), Wis. Adm. Code]:** The discharge rates provided are anticipated during active operations and do not compare to existing rates or rates anticipated following closure conditions.
15. **Environmental Review [s. NR 512.16(2)(e), Wis. Adm. Code]:** Please provide clarification regarding whether the perimeter access road will be designed on the east side of the proposed expansion and how that may affect perimeter storm water ditches, toe drains, and other engineering features. Revise the plan set for consistency in depiction of the eastern side of the landfill.
16. **Existing Environment [s. NR 512.16(3), Wis. Adm. Code]:** The report does not discuss the dominant animal species found in the area of the expansion.
17. **Environmental Review [s. 512.16(2)(c), Wis. Adm. Code]:** The report does not discuss the miles of access roads (or estimated length using other units) to be constructed.
18. **Environmental Review [s. 512.16(2)(d), Wis. Adm. Code]:** The report does not discuss the potential for post-closure gas production, emissions, or discharges.
19. **Section 6.3 and 8.8.1, Maximum Open Area:** Clarify the maximum open acreage of landfill in these sections of the narrative.
20. **Section 8.8.2 Geotextile:** Clarify the minimum thickness of the geotextile used.
21. **Table 8-1:** Include quantities of structural fill needed for support berms and other structure features for the expansion in the soil balance table.
22. **Section 11, Need and Design Capacity:** Resolve the following apparent discrepancies in the needs and site life analysis:
- a. The starting estimated disposal rate for the landfill provided in Table 11-7 (59,000 cubic yards) is not consistent with the average waste acceptance rate at the landfill presented in Table 11-2 (25,235 cubic yards). Evaluate the service area and needs analysis factors to explain this discrepancy and whether a more representative starting disposal rate would be appropriate.

- b. The annual growth rate used in Table 11-5 is 1.56% which is taken from Table 11-2. However, this annual growth rate is significantly higher than the annual population growth rate of 0.22%. While the 1.56% growth rate may be the most conservative calculated from Table 11-2, the actual waste volumes accepted at the landfill fluctuate slightly from year to year. The 1.56% growth rate does not represent a rate that is exponential in growth to be compounded annually like the behavior of a population growth rate. Furthermore, the latest trend is a declining waste acceptance rate at the landfill. If the population growth rate is used, the proposed expansion volume would exceed a 15-year site-life. The department is allowed to approve landfills with a maximum 15-year site-life. Please provide any additional explanation available regarding this that may assist the department in its determination of estimated site-life.
23. **Appendix S, Leachate Treatment Agreements [s. NR 512.13(3), Wis. Adm. Code]:** The leachate treatment agreements provided have expired prior to the submittal of this feasibility report. Provide updated leachate treatment agreements.
24. **Plan Sheet 32, Detail 3-32, Leachate Extraction Building (Phase VII):** Please clarify the thickness of clay liner and rooting zone layer, as these thicknesses are inconsistent with other details provided on the plan sheets and in the narrative.
25. **Appendix R, Sub Appendix B, Sheet 16 Leachate Headwells:** This sheet notes that multiple headwells on the landfill are damaged; please provide a current list of the headwells on site and the status of them as well as provide a history of headwells that are damaged, lost, or abandoned.
26. **Plan Sheets:** Provide a plan sheet with labeled leachate headwells, cleanouts, and leachate lines for the entire site with the proposed expansion.
27. **Plan Sheet 24, Plan Sheet 33, Detail 2-33, Leachate Headwell:** Please provide narrative on the general design of the sweep bend noted on Plan Sheet 24 Note 8 for the leachate collection line cleanouts.
28. **Plan Sheet 23 Horizontal Footprint:** Please discuss the design rationale behind the divot in the waste limits between exiting Phase III Modules 1&2 and proposed Phase VII and the exiting Phase III Modules 3&4 and proposed Phase IX.
29. **Storm Water Controls:** Please discuss the impacts of the expansion to the existing sedimentation basin.
- B. The department noted the following additional issues with the report during our review. Some of the items may affect the department's feasibility determination or plan of operation decision which Vernon County Landfill may choose to address. Should the department issue decisions favorable to the report, these items may result in conditions of either the feasibility determination or plan of operation approval if not addressed.
 1. The following apparent typographical errors are noted for the record.
 - a. Plan Sheet 9: Based on the groundwater elevation data presented, the date in the title should be May 2023.
 - b. Plan Sheet 15. The label of the D' location should be east instead of west.

This incompleteness determination is not a denial of your report, but merely indicates that additional information is needed to continue the review. Submittal of this information does not ensure a favorable determination, nor does it preclude the department from requiring additional information if continued review indicates it is needed. Upon receipt of the additional information, the department has 60 days to determine whether or not the feasibility

report is complete. Please be aware if additional review indicates the feasibility report is twice incomplete, the department may require an additional plan review fee as specified in ch. NR 520, Wis. Adm. Code, Table 3 (Note 1).

Please do not hesitate to contact Mark Peters, Hydrogeologist at (608) 516-0820 or mark.peters@wisconsin.gov or Colin Maus, Waste Management Engineer at (608) 516-2462 or colin.maus@wisconsin.gov if you have any questions about this letter.

Sincerely,

A handwritten signature in black ink, appearing to read 'Bridget Kelly', with a stylized flourish at the end.

Bridget Kelly
Waste and Materials Management Program Supervisor
South Central Region

cc: Brian Kent- SEH (bkent@sehinc.com)
Colin Maus- DNR/WA (e-copy)
Mark Peters – DNR/WA (e-copy)
Tess Brester – DNR/WA (e-copy)
Joe Lourigan – DNR/WA (e-copy)

Appendix B

Additional WDNR Comments via Email dated February 1, 2024

From: Peters, Mark J - DNR <Mark.Peters@wisconsin.gov>

Sent: Thursday, February 1, 2024 10:49 AM

To: stacie.sanborn@vernoncounty.org; Brian Kent <bkent@sehinc.com>; Melanie Niday <mniday@sehinc.com>; Darryl Heaps <dheaps@sehinc.com>

Cc: Kelly, Bridget B - DNR <BridgetB.Kelly@wisconsin.gov>; Maus, Colin J - DNR <colin.maus@wisconsin.gov>; Lourigan, Joseph J - DNR <Joseph.Lourigan@Wisconsin.gov>; Brester, Tess M - DNR <Tess.Brester@wisconsin.gov>

Subject: Additional Comments Regarding Vernon County Landfill Proposed Expansion Feasibility Report Incompleteness

All-

As noted in my January 24, 2024 email, the department is providing an additional summary of data needs for the Vernon County Landfill feasibility report dated September 11, 2023. The department has identified these items as follow-up to the discussion on January 19, 2024 between the department, Vernon County Solid Waste, and SEH representatives. Following are additional comments intended to supplement the discussion of additional data needs included in the December 19, 2023 incompleteness letter.

1. Generally, there are a number of gaps in the geologic and hydrogeologic information presented within the feasibility report. Items that remain not well understood include groundwater flow conditions around the southeast corner of the expansion area where SEH has interpreted a merger zone between the perched and regional aquifers. Groundwater flow information presented here appears to be largely interpretive given the number of data points available. For example, you have defined equipotential lines and a complex groundwater flow regime with very few data points (e.g., MW-12, MW-16, and MW-17WT), most of which are seated outside of the southeast area. The grey area shown on Plan Sheets 4 through 7 indicating the merger zone of the perched and regional water tables, appears to have been defined with a single data point (MW-16) from dry wells. The characterization of this area is further confused by what appears to be a contradiction in the information presented in cross section (Plan Sheet 17, cross section F-F') vs. the water table maps 4-7. In cross-section, the merger point is shown at MW-16, but in maps 4-7 the area of the merger shown in gray is a much larger area. It is not well understood how this interpretation was developed given the lack of corresponding geologic and hydrogeologic data.
2. Additionally, the geological cross-sections show both the perched water table and the regional water table; however, the cross-sections and narrative in section 5.4.2 of the report don't show or attempt to explain what supports the perched aquifer above the regional aquifer, other than touching on vertical gradients that appear to be showing the presence of low permeability formations restricting downward groundwater movement. The cross-sections generally depict the two water levels for each through the same geological formation. It may be that there is currently not sufficient geotechnical information to

provide a better explanation for what supports the perched aquifer. However, understanding geological formation that supports the perched aquifer may help to understand where and how it converges with the regional aquifer or the overall flow between the two aquifers.

3. As stated in Comment 2 of the December 19, 2023 letter and as noted in Comment 1 above, additional hydrogeological investigation (data from additional test borings and groundwater monitoring wells) is needed to adequately define the water table surface(s) and flow regime in the area of the merger point between the perched aquifer and regional water table aquifers. Equipotential lines on Plan Sheets 4 and 5 to the north, west, and east of the interpreted merger zone are based largely on data from two dry monitoring wells (MW-15WT and MW-16WT). Therefore, many of the equipotential lines shown are inferred and should be represented with dashed lines or question marks (refer to Comment 4 of the December 19, 2023 letter). Additional investigation could allow for additional perched aquifer wells to confirm the interpreted flow regime, or to provide data for an alternate flow scenario. A few potential areas to consider as starting points for additional investigation include, but are not limited to, the following areas.
 - a. A test boring and groundwater monitoring well or well nest in the southern portion of the proposed expansion area, in the general area of test boring B-21, could better define flow to the west of the currently interpreted merger zone and could provide geotechnical data in the vicinity of the sump area of the proposed expansion, which is an area where additional pressure on top of a landfill liner would typically be expected. This would also provide an opportunity to obtain geotechnical information at least 25 feet below sub-base grade in this area (refer to Comment 1).
 - b. Completion of a test boring and groundwater monitoring well nest between existing groundwater monitoring well nest MW-5/MW-5A and the currently interpreted merger zone, such as the MW-5R/MW-5AR well nest proposed on Plan Sheet 29, could better define groundwater flow in this area.
 - c. A test boring and groundwater monitoring well or well nest to the southeast of MW-15WT could better define groundwater flow in this area and could provide data that the merger zone area and groundwater flow from a potential release from the expansion area is adequately understood, and preclude the need to characterize groundwater flow further on the eastern portion of the merger zone.
4. The department considered comments made during the January 19, 2024 Teams call that borehole geophysical methods that are not specific to saturated boreholes would only provide data specific to the individual boreholes, and does not concur with this assessment. The use of borehole geophysics could provide fracture and/or potential flow data that has the potential for interpretation between boreholes as does inspection of wireline cores. If the landfill feels strongly that borehole geophysics will not be effective, they may consider revisiting wireline coring of the additional test borings and select what they feel is the better option. The landfill could also consider inter-point methods such as dye tracing or surface imaging geophysical investigation techniques to augment the geotechnical investigation data.

Please bear in mind this feedback the department is providing regarding data gaps should not be construed interpreted as a prescribed directive from the department; the information would be

merely intended to provide further detail regarding the information the department needs to continue its evaluation of the feasibility report and details regarding concerns or question the department has with the information presented in the feasibility report. While the department is able to provide feedback and some guidance, determining the details on how the information will be obtained remains the responsibility of the landfill applicant and its consultant. The department recognizes that further investigation may result in the need for follow-up work to meet the minimum requirement to adequately define water table surfaces and horizontal gradients at the facility and the overall groundwater flow regime across the site. Please let us know if you have any questions or comments regarding this email.

Regards,

We are committed to service excellence.

Visit our survey at <http://dnr.wi.gov/customersurvey> to evaluate how I did.

Mark Peters, P.G.

Waste and Materials Management Hydrogeologist

Southeast Region- Milwaukee Service Center

1027 West St. Paul Avenue

Milwaukee, WI 53233

Phone: (608) 516-0820

Mark.Peters@wisconsin.gov



dnr.wi.gov



Appendix C

Depth to Water Table Field Measurements

Water Level Monitoring Field Form Vernon County Landfill

WDNR Point ID Number	Well Name	Measured Depth to Water (feet btoc)					
		Date: 12/20/22	Date: 1/23/22	Date: 3/1/23	Date: 3/27/23	Date: 4/28/2023	Date: 5/30/2023
Newly Installed Monitoring Wells and Piezometers							
WC334	MW-14WT	107.83	103.69	103.78	103.03	102.93	102.72
WC335	MW-15WT	DRY	DRY	DRY	DRY	DRY	DRY
WC336	MW-16WT	DRY	DRY	DRY	DRY	DRY	DRY
WC337	MW-16	93.83	85.24	84.44	82.63	82.54	79.3
WC338	MW-17WT	82.54	81.4	FROZEN	77.56	74.3	77.14
Monitoring Wells and Piezometers Inside Expansion Footprint							
109	MW-5A	91.03	91.54	91.52	90.69	90.23	88.91
108	MW-5	143.86	142.81	142.72	142.18	141.82	139.04
119	MW-14Z	179.02	179.05	179.13	178.92	178.26	177.64
Monitoring Wells and Piezometers Within 150-feet							
118	MW-14	176.06	176.89	177.15	176.25	175.78	172.23
Monitoring Wells and Piezometers Within 300-feet							
105	MW-3	166.56	166.59	166.56	166.19	166.06	164.17
107	MW-4P	88.12	88.47	86.89	87.01	86.95	84.00
110	MW-6	172.56	172.89	173.02	172.89	173.12	172.1
114	MW-10	134.4	135.86	137.38	134.77	135.79	130.89
115	MW-11	132.31	131.83	131.81	130.88	128.25	126.52
116	MW-12	89.88	88.19	87.49	86.59	84.74	84.65
Monitoring Wells and Piezometers Outside 300-feet							
102	MW-1P	108.39	106.7	106.71	106.82	106.43	105.77
101	MW-1	148.41	148.49	148.49	147.75	145.92	143.68
121	MW-1PR	113.54	113.57	113.39	113.47	112.89	112.64
120	MW-1R	156.4	156.65	157.64	156.89	155.12	152.79
123	MW-1RZ	157.12	156.34	156.3	155.61	154.73	151.59
104	MW-2P	116.07	116.43	115.52	115.64	114.9	113.77
103	MW-2	168.16	169.12	168.34	167.75	166.84	164.00
111	MW-7	188.53	189.83	188.69	188.12	188.32	187.89
--	MW-8	181.5	181.68	181.73	181.1	180.78	177.15
112	MW-8R	182.1	183.72	183.8	183.1	182.69	179.32
113	MW-9	118.43	118.25	118.15	118.26	118.37	117.71
117	MW-13P	94.02	94.02	94.21	93.82	93.02	93.09

Notes:

btoc - Below top of casing.

Appendix D

Revised Select 2022 Soil Boring Logs

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 2

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number B-18	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec		Date Drilling Started 9/19/2022		Date Drilling Completed 9/19/2022	
Drilling Method hsa,mud rotary					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,239.0 Feet MSL	Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 164,513 N, 715,479 E S/C/N SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Local Grid Location Lat ° ' " Long ° ' " Feet ☐ N ☐ E Feet ☐ S ☐ W		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			LEAN CLAY (CL), brown to gray, moist, some sand, medium plasticity, mottled (Residuum)	CL					20	38	19	84	1% Gravel, 15% Sand
2 SS	18 7	2 3 4	1.5 3.0							27	64	40	86	0% Gravel, 14% Sand
3 SS	18 8	2 3 3	4.5 6.0							27	51	32	64	0% Gravel, 37% Sand
4 SS	18 14	3 7 8	7.5							10				
5 SS	18 14	3 7 9	9.0 10.5	CLAYEY SAND (SC), orangish brown, moist, fine grained, slightly cohesive (Residuum)	SC					15	39	24	41	0% Gravel, 59% Sand
6 SS	18 16	6 6 5	12.0 13.5							27	72	49	70.5	0% Gravel, 30% Sand
7 SS	18 16	5 8 8	15.0	LEAN CLAY (CL), dark brown to dark reddish brown, moist, little sand, medium plasticity, light brown sandy transition (Residuum)	CL					20				
8 SS	18 12	3 3 12	16.5 18.0							16				
9	18	14	19.5	WEATHERED SANDY DOLOSTONE, light brown, moist, fine grained, with fine to medium gravel, some clay (Saprolite)										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>Anton [Signature]</i>	Firm Short Elliott Hendrickson Inc.	Tel: Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Page 2 of 2

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
SS	 14	12 10	21.0	WEATHERED SANDY DOLOSTONE, light brown, moist, fine grained, with fine to medium gravel, some clay (Saprolite) <i>(continued)</i> NOTE: larger pieces of dolostone bedrock from 20 to 25 feet.										
			22.5											
			24.0											
10 SS	 24 5	50+	25.5											
			27.0											
			28.5											
			30.0											
11 SS	 12 1	50+	Boring Terminated at 29.5 feet.											

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

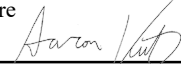
Page 1 of 2

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number B-19	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec		Date Drilling Started 9/19/2022		Date Drilling Completed 9/19/2022	
WI Unique Well No.		DNR Well ID No.		Common Well Name	
		Final Static Water Level Feet MSL		Surface Elevation 1,233.3 Feet MSL	
				Borehole Diameter 6.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒		State Plane 164,380 N, 715,477 E S/C/N		Lat ° ' "	
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W		Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			LEAN CLAY (CL), brown to gray, moist, little fine sand, medium plasticity (Residuum or Fill)	CL						50	33	75	0% Gravel, 26% Sand
2 SS	18 10	4 7 4	1.5 3.0							16	52	33	54	24% Gravel, 23% Sand
3 SS	18 10	2 3 2	4.5 6.0	LEAN CLAY (CL), brown to gray, moist, with sand, low to medium plasticity (Residuum)						44				
4 SS	18 12	4 2 2	7.5	NOTE: sand seam from 7 to 7.5 feet, fine to medium grained.	CL					53				
5 SS	18 14	2 2 2	9.0 10.5							54				
6 SS	18 6	1 2 1	12.0 13.5	NOTE: gravel from 12.5 to 13.5 feet of weathered bedrock.						33				
7 SS	18 8	1 1 1	15.0	FAT CLAY (CH), brown, moist, little sand and gravel, high plasticity, soft (Residuum)	CH					40				
8 SS	18 14	1 1 2	16.5 18.0							57	105	71	97	0% Gravel, 3% Sand
9	18	0	19.5							57				

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:

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Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

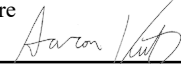
Page 1 of 2

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number B-20	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec		Date Drilling Started 9/19/2022		Date Drilling Completed 9/19/2022	
Drilling Method hsa,mud rotary					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,215.8 Feet MSL	Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 164,064 N, 715,518 E S/C/N			Local Grid Location ☐ N ☐ E ☐ S ☐ W		
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Lat _____ ' _____" Long _____ ' _____"		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			LEAN CLAY (CL), reddish brown, moist, with gravel, some sand, medium plasticity, medium stiff (Residuum)							58	42	65	0% Gravel, 35% Sand
2 SS	18 12	10 4 5	1.5 3.0		CL					19				
3 SS	18 12	3 4 6	4.5 6.0		CL					27				
4 SS	18 12	2 3 6	7.5	NOTE: decreased gravel content						33				
5 SS	18 12	2 12 11	9.0 10.5	SANDY LEAN CLAY (CL), brown, moist, low plasticity (Residuum)						15				
6 SS	18 12	3 4 5	12.0 13.5		CL					30				
7 SS	18 14	2 1 2	15.0							46				
8 SS	18 16	5 4 4	16.5 18.0	LEAN CLAY (CL), dark brown to brown, moist, little sand, low to medium plasticity (Residuum) NOTE: blue to green colored seam at 15 feet. NOTE: increased sand content between 17 to 17.5 feet.	CL					39				
9	18	4	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:

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Page 2 of 2

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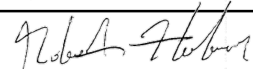
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 4

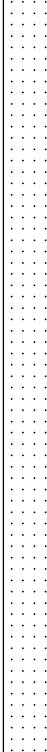
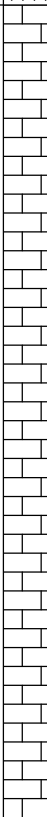
Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number MW-15WT	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec		Date Drilling Started 9/26/2022		Date Drilling Completed 9/27/2022	
Drilling Method hsa, mud rotary					
WI Unique Well No. WC335	DNR Well ID No. 127	Common Well Name MW-15WT	Final Static Water Level 1,136.4 Feet MSL	Surface Elevation 1,220.6 Feet MSL	Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 164,382 N, 715,726 E S/C/N SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Local Grid Location Lat ☐ ° ☐ ' ☐ " ☐ N ☐ E Long ☐ ° ☐ ' ☐ " ☐ S ☐ W		
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			SILTY SAND (SM), dark brown, moist, fine grained, trace organics (Topsoil)	SM									
2 SS	18 14	5 6 7	1.5 3.0	LEAN CLAY WITH SAND (CL), brown to dark brown, moist, with silt, low plasticity (Residuum)	CL									
3 SS	18 4	6 5 6	4.5 6.0											
4 SS	18 16	5 4 5	7.5	CLAYEY SAND (SC), reddish brown, moist, fine to medium grained, trace gravel (Residuum)	SC									
5 SS	18 14	6 6 22	9.0 10.5	LEAN CLAY WITH SAND (CL), light brown to to brown, moist, medium plasticity, stratified with light gray to red fat clay (CH) lenses < 1cm thick (Residuum)	CL									
6 SS	18 14	3 4 5	12.0 13.5	NOTE Occasional sand layers throughout sample 5. NOTE: Sample 6 highly disturbed due to gravel.										
7 SS	18 16	3 3 4	15.0	FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum)	CH									
8 SS	18 18	2 4 4	16.5 18.0							46	109	73	97	0% Gravel, 3% Sand
9	18	2	19.5	NOTE: Started mud rotary drilling after sample 8.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature  Firm **Short Elliott Hendrickson Inc.** Tel:
Fax:

Sample			Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)	Compressive Strength								Moisture Content	Liquid Limit	Plasticity Index	P 200		
SS	16	4 6	21.0 22.5 24.0	NOTE: Occasional clayey sand (SC) layers throughout sample 9. FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum) <i>(continued)</i>	CH										
10 SS	18 18	2 4 9	25.5 27.0 28.5												
11 SS	18 16	9 8 4	30.0 31.5 33.0												
12 SS	18 14	2 1 1	34.5 36.0 37.5												
13 SS	16 12	38 17 50	39.0 40.5 42.0												
14 SS	14 16	10 15 50	43.5 45.0 46.5												
15 SS	13 12	15 45 50	49.5 51.0 52.5												

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
16 SS	 18 14	32 27 24	54.0 55.5	WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite). <i>(continued)</i>										
17 SS	 18 14	6 5 10	64.5 66.0											
18 SS	 2 1	50	69.0											
			70.5	SANDY DOLOSTONE, light brown, moderately weathered to fresh.										
			75.0	NOTE: Borehole lost water at 75 feet bgs to termination.										
			84.0	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 84.2 feet bgs on 9/28/2022.										

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Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

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Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number MW-16	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec			Date Drilling Started 8/22/2022		Date Drilling Completed 8/26/2022	
Drilling Method hsa,mud rotary						
WI Unique Well No. WC337	DNR Well ID No. 131	Common Well Name MW-16	Final Static Water Level 1,103.9 Feet MSL	Surface Elevation 1,184.3 Feet MSL	Borehole Diameter 6.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 163,931 N, 715,671 E S/C/N SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua		

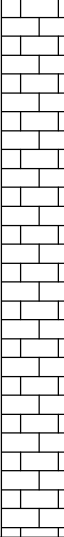
Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 CU	24 -		1.5	LEAN CLAY WITH SAND (CL), brown, moist, low plasticity, occasional fine roots (Fill)	CL									
2 SS	18 0	2 2 2	3.0											
3 SS	18 10	1 1 2	4.5 6.0											
4 ST	24 -		7.5								43	21		
5 ST	24 -		9.0 10.5	LEAN CLAY WITH SAND (CL), brown to light brown, moist, low to medium plasticity, mottled (Residium) NOTE: Trace gravel below 15 feet bgs.	CL					24	37	16	96	0% Gravel, 4% Sand, Permeability = 3.1E-08 cm/sec
6 SS	18 14	2 3 3	12.0 13.5											
7 SS	18 14	8 7 6	15.0 16.5											
8 SS	18 18	4 4 6	18.0											
9 X	18	4	19.5		CL									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:

Sample			Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)	Compressive Strength								Moisture Content	Liquid Limit	Plasticity Index	P 200		
9 SS	18	5 6	21.0	LEAN TO FAT CLAY (CL-CH), brown to light brown, moist, medium to high plasticity, mottled, occasional clayey sand (SC) layers less than 1" thick throughout (Residuum) <i>(continued)</i> NOTE: Occasional weathered sandstone layering at 25 to 26 feet bgs. NOTE: Sample 11 - All Sluff.	CL								0% Gravel, 62% Sand		
10 SS	18 14	4 4 5	22.5 24.0 25.5												
11 SS	18 8	8 7 5	30.0 31.5 33.0												
12 SS	18 8	22 28 30	34.5 36.0 37.5												
13 MC	18 -	6 15 42	40.5 42.0 43.5												
14 SS	18 16	5 8 16	45.0 46.5 48.0												
15 SS	18 16	8 10 26	49.5 51.0 52.5												
NOTE: Switched to mud rotary after sample 15.															

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
16 SS	5 4	50	54.0 55.5 57.0 58.5	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite) (<i>continued</i>)										
17 SS	9 8	15 50	60.0 61.5 63.0 64.5	NOTE: Borehole lost water at 60 feet bgs to termination.										
18 SS	18 18	35 8 3	64.5 66.0 67.5 69.0	WEATHERED SHALE, brown, moist, highly to completely weathered, little gravel (Saprolite) NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 68.4 feet bgs on 8/24/2022 when boring was drilled to 85 feet bgs.										
19 SS	3 3	50	69.0 70.5 72.0 73.5	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite)										
20 SS	18 18	3 9 25	75.0 76.5 78.0 79.5	NOTE: 6" layer of weathered shale at 75 feet bgs.										
21 SS	1 1	50	79.5 81.0 82.5 84.0	SANDY DOLOSTONE, brown to light brown, moist, fresh to moderately weathered NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 80.4 feet bgs on 8/26/2022.										
22 SS	1 1	50	85.5											

Boring Number		MW-16		Use only as an attachment to Form 4400-122.										Page 4 of 4	
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
23 SS	☒ 4 2	50	87.0	SANDY DOLOSTONE, brown to light brown, moist, fresh to moderately weathered (continued)											
			88.5												
			90.0												
			91.5												
			93.0												
24 SS	☐ 1 1	50	94.5	Boring Terminated at 98 feet.											
			96.0												
			97.5												

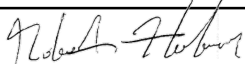
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 3

Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number MW-16WT	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec			Date Drilling Started 9/20/2022		Date Drilling Completed 9/21/2022	
Drilling Method hsa,mud rotary						
WI Unique Well No. WC336	DNR Well ID No. 129	Common Well Name MW-16WT	Final Static Water Level 1,116.3 Feet MSL	Surface Elevation 1,184.7 Feet MSL	Borehole Diameter 6.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 163,940 N, 715,674 E S/C/N SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua		

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1.5 3.0 4.5 6.0 7.5 9.0 10.5 12.0 13.5 15.0 16.5 18.0 19.5	See MW-16 for description.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			21.0	See MW-16 for description. <i>(continued)</i>										
			22.5											
			24.0											
			25.5											
			27.0											
			28.5											
			30.0											
			31.5											
			33.0											
			34.5											
			36.0											
			37.5											
			39.0											
			40.5											
			42.0											
			43.5											
			45.0											
			46.5											
			48.0											
			49.5											
			51.0											
			52.5											

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Appendix E

Survey Transformations

TRANSFORMATION: LOCAL TO WI STATE PLANE - SOUTH (US-FT) COORDINATE SYSTEM

Project file data		Coordinate System
Name:		United States/NAD83
Size:		Wisconsin South 4803
Modified:		NAD83(2011)
Time zone:		Global reference datum: NAD83(2011)
Reference number:		Global reference epoch: 2010
Description:		Geoid: GEOID18 (Conus)
Comment 1:		Vertical datum:
Comment 2:		Calibrated site:
Comment 3:		

Transform Survey Points Report

Measured Points (From)

Point ID	Northing	Easting	Elevation	Code	Northing Residual	Easting Residual	Elevation Residual
Local PT 16	1748.930 ft	2632.610 ft	1258.094 ft	CPT	0.005 ft	0.000 ft	0.000 ft
Local SCP-12	1300.000 ft	1000.020 ft	1254.290 ft	CPT	-0.006 ft	0.006 ft	0.000 ft
Local SCP-14	139.080 ft	1080.960 ft	1244.605 ft	CPT	0.002 ft	-0.007 ft	0.000 ft

Control Points (To)

Point ID	Northing	Easting	Elevation	Code
PT 16	584333.802 ft	1747439.502 ft	1258.094 ft	CPT
SCP-12	583919.985 ft	1745797.831 ft	1254.290 ft	CPT
SCP-14	582757.707 ft	1745853.901 ft	1244.605 ft	CPT

Least Squares Transformation

Translation		Scale	
Northing:	582619.979 ft	Horizontal:	0.9999002624
Easting:	1744797.817 ft	Vertical:	1.0000000000
Elevation:	0.000 ft	Scale/Rotation Origin	
Rotation		Northing:	1300.000 ft
X axis:	0°00'00.0"	Easting:	1000.020 ft
Y axis:	0°00'00.0"	Elevation:	1254.290 ft
Z axis:	1°13'37.1"	Transformation time:	11/15/2024 4:01:26 PM

Note: Final Point = Rotation * (Scale * (Initial Point - Origin)) + Origin + Translation. Rotations are clockwise positive and are applied in the order YXZ.

Transformation Statistics

Overall Residual

Standard deviation: 0.007 ft
Maximum (Local SCP-12): 0.009 ft
Mean: 0.000 ft

Easting Residual

Standard deviation: 0.005 ft
Maximum (Local SCP-14): -0.007 ft
Mean: 0.000 ft

Northing Residual

Standard deviation: 0.005 ft
Maximum (Local SCP-12): -0.006 ft
Mean: 0.000 ft

Elevation Residual

Standard deviation: 0.000 ft
Maximum (Local PT 16): 0.000 ft
Mean: 0.000 ft

Transformed Points - 3

Point ID	Northing	Easting	Elevation	Code
Local PT 16	584333.806 ft	1747439.502 ft	1258.094 ft	CPT
Local SCP-12	583919.979 ft	1745797.837 ft	1254.290 ft	CPT
Local SCP-14	582757.708 ft	1745853.894 ft	1244.605 ft	CPT

11/15/2024 4:01:43 PM

Trimble Business Center

TRANSFORMATION: LOCAL TO VERNON COUNTY (US-FT) COORDINATE SYSTEM

Project file data		Coordinate System
Name:		United States/NAD83/WisCRS
Size:		Vernon
Modified:		NAD83(2011)
Time zone:		Global reference datum: NAD83(2011)
Reference number:		Global reference epoch: 2010
Description:		Geoid: Wisconsin GEOID18
Comment 1:		Vertical datum:
Comment 2:		Calibrated site:
Comment 3:		

Transform Survey Points Report

Measured Points (From)

Point ID	Northing	Easting	Elevation	Code	Northing Residual	Easting Residual	Elevation Residual
Local PT 16	1748.930 ft	2632.610 ft	1258.094 ft	CPT	0.005 ft	0.000 ft	0.000 ft
Local SCP-12	1300.000 ft	1000.020 ft	1254.290 ft	CPT	-0.006 ft	0.006 ft	0.000 ft
Local SCP-14	139.080 ft	1080.960 ft	1244.605 ft	CPT	0.002 ft	-0.007 ft	0.000 ft

Control Points (To)

Point ID	Northing	Easting	Elevation	Code
PT 16	165124.130 ft	716429.560 ft	1258.094 ft	CPT
SCP-12	164694.870 ft	714791.680 ft	1254.290 ft	CPT
SCP-14	163533.050 ft	714858.670 ft	1244.605 ft	CPT

Least Squares Transformation

Translation

Northing: 163394.864 ft
Easting: 713791.666 ft
Elevation: 0.000 ft

Rotation

X axis: 0°00'00.0"
Y axis: 0°00'00.0"
Z axis: 0°41'19.9"

Scale

Horizontal: 1.0000027029
Vertical: 1.0000000000

Scale/Rotation Origin

Northing: 1300.000 ft
Easting: 1000.020 ft
Elevation: 1254.290 ft
Transformation time: 11/15/2024 4:18:20 PM

Note: Final Point = Rotation * (Scale * (Initial Point - Origin)) + Origin + Translation. Rotations are clockwise positive and are applied in the order YXZ.

Transformation Statistics

Overall Residual

Standard deviation: 0.007 ft
 Maximum (Local SCP-12): 0.009 ft
 Mean: 0.000 ft

Easting Residual

Standard deviation: 0.005 ft
 Maximum (Local SCP-14): -0.007 ft
 Mean: 0.000 ft

Northing Residual

Standard deviation: 0.005 ft
 Maximum (Local SCP-12): -0.006 ft
 Mean: 0.000 ft

Elevation Residual

Standard deviation: 0.000 ft
 Maximum (Local PT 16): 0.000 ft
 Mean: 0.000 ft

Transformed Points - 3

Point ID	Northing	Easting	Elevation	Code
Local PT 16	165124.135 ft	716429.560 ft	1258.094 ft	CPT
Local SCP-12	164694.864 ft	714791.686 ft	1254.290 ft	CPT
Local SCP-14	163533.052 ft	714858.663 ft	1244.605 ft	CPT

11/15/2024 4:18:32 PM

Trimble Business Center

Appendix F

MW-6 Historical Water Quality

MW-6
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Notes:
NE - No standard established.
-- Not analyzed.
-< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results

MW-6

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Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date															
		PAL	ES	MW-6															
				12/30/93	3/30/94	6/23/94	9/20/94	12/14/94	3/28/95	6/7/95	9/18/95	12/12/95	3/18/96	6/5/96	9/19/96	12/3/96	3/27/97	6/19/97	9/11/97
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.4
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMP(L) (UG/L)	ug/L	12	60	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.4
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CaCO3)	mg/L	NE	NE	180	177	180	176	184	172	172	172	192	180	180	170	260	210	180	210
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	14.8	48.0	<	<	13.0	47.0	<	6.5	<	3.5	<	<	<1.0	<	<5	<2
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMP(L) (MG/L CL ⁽¹⁾)	mg/L	125	250	1.00	3.00	1.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.70	4.10	2.10	4.40
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	0.20	0.13	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CaCO3)	mg/L	NE	NE	192	176	184	185	168	171	173	180	180	180	190	190	200	1		

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		NR 140 Standards		Well No./Sampling Date																
Analytical Parameters		Units	PAL	ES	12/3/97	3/25/98	6/17/98	9/15/98	12/15/98	6/17/99	9/28/99	12/29/99	3/29/00	3/28/01	9/13/01	3/27/02	9/30/02	3/26/03	6/12/03	9/25/03
MW-6																				
VOCs (ug/L)																				
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)		ug/L	7	70	--	--	--	<0.1	--	--	<0.19	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)		ug/L	40	200	--	--	--	<0.2	--	--	<0.3	--	--	--	--	--	<0.42	--	--	<0.42
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)		ug/L	0.02	0.2	--	--	--	<0.2	--	--	<0.52	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)		ug/L	0.5	--	--	--	--	<0.1	--	--	<0.35	--	--	--	--	--	<0.5	--	--	<0.5
1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)		ug/L	85	850	--	--	--	<0.2	--	--	<0.2	--	--	--	--	--	<0.36	--	--	<0.36
1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)		ug/L	0.7	7	--	--	--	<0.2	--	--	<0.11	--	--	--	--	--	<0.39	--	--	<0.39
1,1-DICHLOROPROPENE (UG/L)		ug/L	NE	NE	--	--	--	<0.2	--	--	<0.25	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)		ug/L	NE	NE	--	--	--	<0.2	--	--	<0.052	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)		ug/L	12	60	--	--	--	<0.2	--	--	<0.99	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)		ug/L	14	70	--	--	--	<0.2	--	--	<0.05	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)		ug/L	96	480	--	--	--	<0.1	--	--	<0.46	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)		ug/L	0.02	0.2	--	--	--	<0.3	--	--	<0.23	--	--	--	--	--	<0.61	--	--	<0.61
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)		ug/L	0.005	0.05	--	--	--	<0.1	--	--	<0.1	--	--	--	--	--	<1.1	--	--	<1.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)		ug/L	0.5	5	--	--	--	<0.2	--	--	<0.35	--	--	--	--	--	<0.17	--	--	<0.17
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)		ug/L	0.5	5	--	--	--	<0.2	--	--	<0.094	--	--	--	--	--	<0.25	--	--	<0.25
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)		ug/L	96	480	--	--	--	<0.1	--	--	<0.35	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)		ug/L	120	600	--	--	--	<0.1	--	--	<0.26	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)		ug/L	NE	NE	--	--	--	<0.2	--	--	<0.78	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)		ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)		ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	0.5	5	--	--	--	<0.1	--	--	<0.19	--	--	--	--	--	<0.31	--	--	<0.31
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.34	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.17	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)		ug/L	0.06	0.6	--	--	--	<0.1	--	--	<0.25	--	--	--	--	--	<0.83	--	--	<0.83
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)		ug/L	1	10	--	--	--	<0.2	--	--	<0.5	--	--	--	--	--	<0.57	--	--	<0.57
BUTYLBENZENE, N- (UG/L)		ug/L	NE	NE	--	--	--	<0.2	--	--	<0.04	--	--	--	--	--	--	--	--	--
BUTYL BENZENE, SEC- (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.35	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.28	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)		ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)		ug/L	0.5	5	--	--	--	<0.2	--	--	<0.23	--	--	--	--	--	<0.59	--	--	<0.59
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)		ug/L	20	100	--	--	--	<0.2	--	--	<0.096	--	--	--	--	--	<0.31	--	--	<0.31
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)		ug/L	80	400	--	--	--	<0.3	--	--	<0.5	--	--	--	--	--	<0.44	--	--	<0.44
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)		ug/L	0.6	6	--	--	--	<0.2	--	--	<0.18	--	--	--	--	--	<0.27	--	--	<0.27
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)		ug/L	3	30	--	--	--	<0.2	--	--	<0.21	--	--	--	--	--	<0.29	--	--	<0.29
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)		ug/L	7	70	--	--	--	<0.2	--	--	<0.19	--	--	--	--	--	<0.23	--	--	<0.23
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.3	--	--	<0.096	--	--	--	--	--	<0.26	--	--	<0.26
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)		ug/L	6	60	--	--	--	<0.1	--	--	<0.19	--	--	--	--	--	<0.87	--	--	<0.87
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.33	--	--	--	--	--	<3	--	--	<3
DICHLORDIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)		ug/L	200	1000	--	--	--	<0.2	--	--	<0.27	--	--	--	--	--	<0.46	--	--	<0.46
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)		ug/L	0.5	5	--	--	--	<0.2	--	--	<0.25	--	--	--	--	--	<0.51	--	--	<0.51
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.4	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	140	700	--	--	--	<0.1	--	--	<0.19	--	--	--	--	--	<0.5	--	--	<0.5
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)		ug/L	398	3490	--	--	--	<0.1	--	--	<0.49	--	--	--	--	--	<0.7	--	--	<0.7
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.3	--	--	<0.074	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.23	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)		ug/L	120	600	--	--	--	<0.2	--	--	<0.49	--	--	--	--	--	<0.29	--	--	<0.29
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)		ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)		ug/L	12	60	--	--	--	<0.1	--	--	<0.73	--	--	--	--	--	<0.3	--	--	<0.3
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	10	100	--	--	--	<0.2	--	--	<0.082	--	--	--	--	--	<0.8	--	--	<0.8
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.2	--	--	<0.36	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.25	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)		ug/L	60	600	--	--	--	<0.1	--	--	<0.036	--	--	--	--	--	<0.51	--	--	<0.51
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.65	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)		ug/L	15	75	--	--	--	<0.2	--	--	<0.45	--	--	--	--	--	<0.3	--	--	<0.3
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.12	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	10	100	--	--	--	<0.2	--	--	<0.084	--	--	--	--	--	<0.29	--	--	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	0.5	5	--	--	--	<0.1	--	--	<0.34	--	--	--	--	--	<0.32	--	--	<0.32
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)		ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)		ug/L	160	800	--	--	--	<0.2	--	--	<0.11	--	--	--	--	--	<0.3	--	--	<0.3
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)		ug/L	20	100	--	--	--	<0.1	--	--	<0.21	--	--	--	--	--	<0.39	--	--	<0.39
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)		ug/L	NE	NE	--	--	--	<0.1	--	--	<0.14	--	--	--	--	--	<0.25	--	--	<0.25
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)		ug/L	0.44	4.4	--	--	--	<0.4	--	--	<0.45	--	--	--	--	--	<0.71	--	--	<0.71
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)		ug/L	0.5	5	--	--	--	<0.1	--	--	<0.21	--	--	--	--	--	<0.36	--	--	<0.36
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)		ug/L	0.02	0.2	--	--	--	<0.2	--	--	<0.14	--	--	--	--	--	<0.2	--	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)		ug/L	400	2000	--	--	--	<0.2	--	--	<0.39	--	--	--	--	--	<0.62	--	--	<0.62
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)		ug/L	400	2000	--	--	--	<0.1	--	--	<0.18	--	--	--	--	--	<0.3	--	--	<0.3
INORGANICS																				
ALKALINITY, TOTAL FILTERED (MGL AS CACO3)		mg/L	NE	NE	190	180	180	180	190	180	180	180	170	--	--	--	165	180	--	175
ARSENIC, DISSOLVED (UG/L AS)		ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)		ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)		ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MGL)		mg/L	NE	NE	<2	2.1	<2	<2	<2	<2	<2	<2	4.2	--	--	--	<3	<3	--	13.7
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MGL CL)¹¹)		mg/L	125	250	4.20	3.90	2.93	3.40	3.40	3.90	4.50	3.90	4.00	--	--	--	5.11	5.72	--	6.13
CHROMIUM, DISSOLVED (UG/L CR)		ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)		ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MGL F)		mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MGL AS CACO3)		mg/L	18	0	190	180	190	190	190	190	190	190	190	--	--	--	192	201	--	204
IRON, DISSOLVED (MGL FE)		ug/L	0.15	0.3	<0.006	<0.006	<18	<0.006	0.008	0.007	0.010	0.018	<0.006	--	--	--	<0.003	0.016	--	<
LEAD, DISSOLVED (UG/L PB)		ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)		ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)		ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MGL AS N)		mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)																				

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results

MW-6

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Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date																
		PAL	ES	MW-6																
				3/25/04	9/8/04	3/23/05	9/29/05	3/28/06	9/26/06	3/27/07	9/26/07	3/19/08	9/15/08	3/30/09	9/15/09	3/29/11	9/20/11	4/3/12	9/25/12	
VOCs (ug/L)																				
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.42	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.5	--	--	--	--	<0.9
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	--	--	--	<0.42
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.5	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.4	--	--	--	--	<0.75
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.5	--	<0.15	--	<0.15	--	<0.4	--	<0.4	--	<0.4	--	--	--	--	<0.57
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<1.3	--	<0.3	--	<0.35	--	<1	--	<1.3	--	<1.3	--	--	--	--	<1.7
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<1.1	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.3	--	--	--	--	<0.56
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.3	--	--	--	--	<0.36
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	--	--	--	<0.49
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	--	--	--	<5
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.31	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	<0.41
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.83	--	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	--	--	--	<0.56
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.8	--	<0.15	--	<0.15	--	<1	--	<1	--	<1	--	--	--	--	<0.91
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<0.2	--	<0.2	--	<1	--	<1	--	<1	--	--	--	--	<0.66
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--	--	--	--	<0.49
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.7	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.2	--	--	--	--	<0.41
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<1	--	<0.6	--	<0.6	--	<0.6	--	<0.6	--	<0.7	--	--	--	--	<0.97
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	<1.3
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.29	--	<0.2	--	<0.2	--	0.56	--	<0.4	--	<0.4	--	--	--	--	<0.24
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.4	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.4	--	--	--	--	<0.83
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.5	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	<0.2
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.87	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.4	--	--	--	--	<0.81
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<3	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	--	--	--	<0.6
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.7	--	<0.25	--	<0.25	--	<0.3	--	<0.3	--	<0.3	--	--	--	--	<0.99
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	--	--	--	<0.43
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.5	--	<0.1	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	--	--	--	<0.54
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	<1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	--	--	--	<0.79
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.5	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	<0.87
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	<2	--	<2	--	<2	--	<2	--	<2	--	--	--	--	<4.3
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.3	--	<0.1	--	<0.1	--	<0.2	--	<0.5	--	<0.5	--	--	--	--	<0.61
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.8	--	<1	--	<1	--	<1	--	<1	--	<1	--	--	--	--	<0.89
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.6	--	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	--	--	--	<0.83
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.6	--	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	--	--	--	<0.95
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.29	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	--	--	--	<0.86
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.45	--	<0.1	--	<0.1	--	<0.3	--	<0.3	--	<0.3	--	--	--	--	<0.45
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	<0.7	--	<0.7	--	<1	--	<1	--	<2	--	--	--	--	<1.7
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.3	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	--	--	--	<0.67
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.39	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.5	--	--	--	--	<0.89
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.25	--	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	--	--	--	<0.19
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.44	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	<0.94
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.2	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	--	--	--	<0.48
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.2	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	<0.18
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.62	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	--	--	--	<2.6
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.3	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	--
INORGANICS																				
ALKALINITY, TOTAL FILTERED (MG/L AS CaCO3)	mg/L	NE	NE	190	192	182	179	206	244	202	228	--	201	--	204	--	--	--	186	186
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--					

Groundwater Analytical Results

MW-6

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Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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				4/3/13	9/25/13	4/29/14	9/25/14	3/25/15	9/16/15	3/30/16	9/22/16	3/14/17	9/12/17	3/15/18	9/11/18	3/12/19	9/10/19	3/10/20	9/15/20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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Groundwater Analytical Results
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Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date			
		PAL	ES	MW-6			
				3/16/21	9/14/21	3/14/22	9/13/22
VOCs (ug/L)							
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.34	--	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.38	--	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.36	--	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.27	--	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.28	--	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.49	--	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.41	--	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.43	--	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.35	--	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.34	--	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.49	--	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.33	--	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.69	--	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.37	--	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.30	--	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.28	--	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.31	--	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<3.3	--	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	<3.7	--	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<4.1	--	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.47	--	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.33	--	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.26	--	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.76	--	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.72	--	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.34	--	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.33	--	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.27	--	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<0.83	--	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.37	--	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.37	--	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<1.1	--	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.46	--	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<1.3	--	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.41	--	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.34	--	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.36	--	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.45	--	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.63	--	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<1.2	--	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.26	--	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.42	--	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	<0.41	--	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.57	--	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.39	--	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.30	--	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<2.9	--	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.28	--	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.35	--	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.34	--	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.31	--	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.36	--	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.31	--	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.33	--	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.29	--	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.33	--	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.55	--	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<3.4	--	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.27	--	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.35	--	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.57	--	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.50	--	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.39	--	<0.39
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.15	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.74	--	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.72	--	<0.72
INORGANICS							
ALKALINITY, TOTAL FILTERED (MG/L AS CaCO3)	mg/L	NE	NE	200	190	190	210
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL) ⁽¹⁾	mg/L	125	250	9.70	7.70	8.40	9.50
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--
HARDNESS, TOTAL (MG/L AS CaCO3)	mg/L	NE	NE	236	209	251	244
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4) ⁽¹⁾	mg/L	125	250	6.00	5.30	5.30	5.60
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--
FIELD PARAMETERS							
COMMENT, SAMPLE COLOR		NE	NE	<	<	<	<
COMMENT, SAMPLE ODOR		NE	NE	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	<	<	<	<
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1069.39	1067.35	1065.30	1063.84
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.25	7.20	7.15	7.21
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	443	424	419	460
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.99	10.21	10.59	10.10

Notes:

NE - No standard established.

-- Not analyzed.

< - Not detected above the limit of detection.

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Appendix G

2023 Tonnage Data

Recycling Fee and License Fee Surcharge Report and Invoice

State of Wisconsin
Department of Natural Resources
Waste and Materials Management Program
<https://dnr.wisconsin.gov>

For Questions Contact:
Ariana Mankerian
DNRWALandfillReports@wisconsin.gov
608-982-6588

Notice: Use of this form is mandatory under s. NR 520.04(1)(d), Wis. Adm. Code, and s. 289.645, Wis. Stats. Failure to file the information requested would violate ch. 289, Wis. Stats. Violations could result in denial, suspension or revocation of your operating license and/or injunctive relief, and/or other penalties identified under s. 289.96(3), 289.97 and 299.95, Wis. Stats. Personal information collected will be used to implement the solid waste management regulatory program and may be provided to requesters as required by Wisconsin's Open Records law (s. 19.31 - 19.39, Wis. Stats.).

Reporting Period : First Quarter (Jan 1 - March 31)
Form must be returned by: May 01, 2023

Facility Information

County of Vernon
S3705 County Road Lf
Viroqua WI 54665-8198

Facility Identifiers
Facility Identification Number (FID): 663038310
Landfill License Number: 3268

Contact Information:
Stacie Sanborn
S3705 CNTY RD LF
VIROQUA WI 54665
608-634-2900
Stacie.Sanborn@vernoncounty.org

Fee Grid

Waste Category Number	Waste Category Description	Tons	Landfill License Fee Surcharge	Recycling Fee Amount (x \$7.00)	Total
1	Municipal Solid Waste (MSW)	2,529.91	379.49	17,709.37	18,088.86
2	Utility Ash	0.00	0.00		0.00
3	Papermill Sludge/Ash	0.00	0.00		0.00
4	Foundry Process Waste	0.00	0.00		0.00
5	Publicly Owned Treatment Works (POTW) Sludges	0.00	0.00	0.00	0.00
6	All Other Solid Waste (Non-Hazardous waste) - Non MSW	0.00	0.00	0.00	0.00
19	Waste Approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
20	Energy Recovery Incinerator Ash	0.00	0.00		0.00
21	High Volume Industrial Waste Approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
22	Shredder Fluff approved by the DNR for use Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
23	Treated Contaminated Soil approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
24	Unusable Papermaking Materials	0.00	0.00		0.00

25	Construction & Demolition (C&D) waste - (subject to all the same fees as Category 1 waste)	49.39	7.41	345.73	353.14
26	Sediments contaminated with PCBs	0.00	0.00		0.00
27	Waste generated by a non-profit organization that meets the criteria in s. 289.645(4)(b), Wis. Stats.	0.00	0.00		0.00
28	Solid Waste Materials generated as a result of a natural disaster.	0.00			
29	Waste removed at the request of the DNR in order to mitigate potential environmental impacts. Written authorization from DNR is required prior	0.00	0.00		0.00
30	Solid Waste Materials generated by a materials recovery facility in an amount equal to the weight of the residue generated by the facility or 10% of the total weight of material accepted by the facility, whichever is less. Residues that exceed the 10% cap should be reported	0.00	0.00		0.00
31	Solid Waste Materials generated by a licensed construction and demolition materials processor or licensed municipal solid waste combustor in an amount equal to the weight of the residue generated by the facility or 30% of the total weight of material accepted by the facility, whichever is less. Residues that exceed the 30% cap should be reported as Category 25 or Category 1 waste.	0.00	0.00		0.00
32	Waste exempted from all fees: waste generated by a Wisconsin state-funded project or waste generated from a licensed landfill and re-disposed of in a licensed landfill where tonnage fees were levied at the time of original disposal. Written authorization from DNR is required prior to use of Category 32.	0.00			
33	Soils and dredged sediments not mixed with other wastes and not included in other categories. (Effective July 1, 2022, under ss. 289.63 (6)(e), 289.64 (4)(e), 289.645 (4)(i), and 289.67 (1)(fp), Wis.	0.00	0.00		0.00
Total		2,579.30	386.90	18,055.10	18,442.00

Please Note: Written authorization from DNR is required prior to use of Category 29 or Category 32. Authorization must be emailed to: DNRWALandfillReports@wisconsin.gov.

Certification Confirmation

By checking the box to the right, I hereby certify that the information ☒ provided is true and accurate to the best of my knowledge.

Submittal Details

Name of person submitting report:

Email of person submitting report:

Recycling Fee and License Fee Surcharge Report and Invoice

State of Wisconsin
Department of Natural Resources
Waste and Materials Management Program
<https://dnr.wisconsin.gov>

For Questions Contact:
Ariana Mankerian
DNRWALandfillReports@wisconsin.gov
608-982-6588

Notice: Use of this form is mandatory under s. NR 520.04(1)(d), Wis. Adm. Code, and s. 289.645, Wis. Stats. Failure to file the information requested would violate ch. 289, Wis. Stats. Violations could result in denial, suspension or revocation of your operating license and/or injunctive relief, and/or other penalties identified under s. 289.96(3), 289.97 and 299.95, Wis. Stats. Personal information collected will be used to implement the solid waste management regulatory program and may be provided to requesters as required by Wisconsin's Open Records law (s. 19.31 - 19.39, Wis. Stats.).

Reporting Period : Second Quarter (April 1 - June 30)
Form must be returned by: August 01, 2023

Facility Information

County of Vernon
S3705 County Road Lf
Viroqua WI 54665-8198

Facility Identifiers
Facility Identification Number (FID): 663038310
Landfill License Number: 3268

Contact Information:
Stacie Sanborn
S3705 CNTY RD LF
VIROQUA WI 54665
608-634-2900
Stacie.Sanborn@vernoncounty.org

Fee Grid

Waste Category Number	Waste Category Description	Tons	Landfill License Fee Surcharge	Recycling Fee Amount (x \$7.00)	Total
1	Municipal Solid Waste (MSW)	4,533.27	679.99	31,732.89	32,412.88
2	Utility Ash	0.00	0.00		0.00
3	Papermill Sludge/Ash	0.00	0.00		0.00
4	Foundry Process Waste	0.00	0.00		0.00
5	Publicly Owned Treatment Works (POTW) Sludges	0.00	0.00	0.00	0.00
6	All Other Solid Waste (Non-Hazardous waste) - Non MSW	0.00	0.00	0.00	0.00
19	Waste Approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
20	Energy Recovery Incinerator Ash	0.00	0.00		0.00
21	High Volume Industrial Waste Approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
22	Shredder Fluff approved by the DNR for use Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
23	Treated Contaminated Soil approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
24	Unusable Papermaking Materials	0.00	0.00		0.00

25	Construction & Demolition (C&D) waste - (subject to all the same fees as Category 1 waste)	88.88	13.33	622.16	635.49
26	Sediments contaminated with PCBs	0.00	0.00		0.00
27	Waste generated by a non-profit organization that meets the criteria in s. 289.645(4)(b), Wis. Stats.	0.00	0.00		0.00
28	Solid Waste Materials generated as a result of a natural disaster.	0.00			
29	Waste removed at the request of the DNR in order to mitigate potential environmental impacts. Written authorization from DNR is required prior	0.00	0.00		0.00
30	Solid Waste Materials generated by a materials recovery facility in an amount equal to the weight of the residue generated by the facility or 10% of the total weight of material accepted by the facility, whichever is less. Residues that exceed the 10% cap should be reported	0.00	0.00		0.00
31	Solid Waste Materials generated by a licensed construction and demolition materials processor or licensed municipal solid waste combustor in an amount equal to the weight of the residue generated by the facility or 30% of the total weight of material accepted by the facility, whichever is less. Residues that exceed the 30% cap should be reported as Category 25 or Category 1 waste.	0.00	0.00		0.00
32	Waste exempted from all fees: waste generated by a Wisconsin state-funded project or waste generated from a licensed landfill and re-disposed of in a licensed landfill where tonnage fees were levied at the time of original disposal. Written authorization from DNR is required prior to use of Category 32.	0.00			
33	Soils and dredged sediments not mixed with other wastes and not included in other categories. (Effective July 1, 2022, under ss. 289.63 (6)(e), 289.64 (4)(e), 289.645 (4)(i), and 289.67 (1)(fp), Wis.	0.00	0.00		0.00
Total		4,622.15	693.32	32,355.05	33,048.37

Please Note: Written authorization from DNR is required prior to use of Category 29 or Category 32. Authorization must be emailed to: DNRWALandfillReports@wisconsin.gov.

Certification Confirmation

By checking the box to the right, I hereby certify that the information ☒ provided is true and accurate to the best of my knowledge.

Submittal Details

Name of person submitting report:

Email of person submitting report:

Recycling Fee and License Fee Surcharge Report and Invoice

State of Wisconsin
Department of Natural Resources
Waste and Materials Management Program
<https://dnr.wisconsin.gov>

For Questions Contact:
Ariana Mankerian
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608-982-6588

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Reporting Period : Third Quarter (July 1st - September 30th)
Form must be returned by: November 01, 2023

Facility Information

County of Vernon
S3705 County Road Lf
Viroqua WI 54665-8198

Facility Identifiers
Facility Identification Number (FID): 663038310
Landfill License Number: 3268

Contact Information:
Stacie Sanborn
S3705 CNTY RD LF
VIROQUA WI 54665
608-634-2900
Stacie.Sanborn@vernoncounty.org

Fee Grid

Waste Category Number	Waste Category Description	Tons	Landfill License Fee Surcharge	Recycling Fee Amount (x \$7.00)	Total
1	Municipal Solid Waste (MSW)	4,111.65	616.75	28,781.55	29,398.30
2	Utility Ash	0.00	0.00		0.00
3	Papermill Sludge/Ash	0.00	0.00		0.00
4	Foundry Process Waste	0.00	0.00		0.00
5	Publicly Owned Treatment Works (POTW) Sludges	0.00	0.00	0.00	0.00
6	All Other Solid Waste (Non-Hazardous waste) - Non MSW	0.00	0.00	0.00	0.00
19	Waste Approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	3,431.53			
20	Energy Recovery Incinerator Ash	0.00	0.00		0.00
21	High Volume Industrial Waste Approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
22	Shredder Fluff approved by the DNR for use Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
23	Treated Contaminated Soil approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
24	Unusable Papermaking Materials	0.00	0.00		0.00

25	Construction & Demolition (C&D) waste - (subject to all the same fees as Category 1 waste)	111.48	16.72	780.36	797.08
26	Sediments contaminated with PCBs	0.00	0.00		0.00
27	Waste generated by a non-profit organization that meets the criteria in s. 289.645(4)(b), Wis. Stats.	0.00	0.00		0.00
28	Solid Waste Materials generated as a result of a natural disaster.	0.00			
29	Waste removed at the request of the DNR in order to mitigate potential environmental impacts. Written authorization from DNR is required prior	0.00	0.00		0.00
30	Solid Waste Materials generated by a materials recovery facility in an amount equal to the weight of the residue generated by the facility or 10% of the total weight of material accepted by the facility, whichever is less. Residues that exceed the 10% cap should be reported	0.00	0.00		0.00
31	Solid Waste Materials generated by a licensed construction and demolition materials processor or licensed municipal solid waste combustor in an amount equal to the weight of the residue generated by the facility or 30% of the total weight of material accepted by the facility, whichever is less. Residues that exceed the 30% cap should be reported as Category 25 or Category 1 waste.	0.00	0.00		0.00
32	Waste exempted from all fees: waste generated by a Wisconsin state-funded project or waste generated from a licensed landfill and re-disposed of in a licensed landfill where tonnage fees were levied at the time of original disposal. Written authorization from DNR is required prior to use of Category 32.	0.00			
33	Soils and dredged sediments not mixed with other wastes and not included in other categories. (Effective July 1, 2022, under ss. 289.63 (6)(e), 289.64 (4)(e), 289.645 (4)(i), and 289.67 (1)(fp), Wis.	0.00	0.00		0.00
Total		7,654.66	633.47	29,561.91	30,195.38

Please Note: Written authorization from DNR is required prior to use of Category 29 or Category 32. Authorization must be emailed to: DNRWALandfillReports@wisconsin.gov.

Certification Confirmation

By checking the box to the right, I hereby certify that the information ☒ provided is true and accurate to the best of my knowledge.

Submittal Details

Name of person submitting report:

Email of person submitting report:

Recycling Fee and License Fee Surcharge Report and Invoice

State of Wisconsin
Department of Natural Resources
Waste and Materials Management Program
<https://dnr.wisconsin.gov>

For Questions Contact:
Ariana Mankerian
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Reporting Period : Fourth Quarter (October 1st - December 31st)
Form must be returned by: February 01, 2024

Facility Information

County of Vernon
S3705 County Road Lf
Viroqua WI 54665-8198

Facility Identifiers
Facility Identification Number (FID): 663038310
Landfill License Number: 3268

Contact Information:
Stacie Sanborn
S3705 CNTY RD LF
VIROQUA WI 54665
608-634-2900
Stacie.Sanborn@vernoncounty.org

Fee Grid

Waste Category Number	Waste Category Description	Tons	Landfill License Fee Surcharge	Recycling Fee Amount (x \$7.00)	Total
1	Municipal Solid Waste (MSW)	3,004.00	450.60	21,028.00	21,478.60
2	Utility Ash	0.00	0.00		0.00
3	Papermill Sludge/Ash	0.00	0.00		0.00
4	Foundry Process Waste	0.00	0.00		0.00
5	Publicly Owned Treatment Works (POTW) Sludges	0.00	0.00	0.00	0.00
6	All Other Solid Waste (Non-Hazardous waste) - Non MSW	0.00	0.00	0.00	0.00
19	Waste Approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
20	Energy Recovery Incinerator Ash	0.00	0.00		0.00
21	High Volume Industrial Waste Approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
22	Shredder Fluff approved by the DNR for use Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
23	Treated Contaminated Soil approved by the DNR for use as Daily Cover, Dikes, Berms, or Roads within the Landfill	0.00			
24	Unusable Papermaking Materials	0.00	0.00		0.00

25	Construction & Demolition (C&D) waste - (subject to all the same fees as Category 1 waste)	555.00	83.25	3,885.00	3,968.25
26	Sediments contaminated with PCBs	0.00	0.00		0.00
27	Waste generated by a non-profit organization that meets the criteria in s. 289.645(4)(b), Wis. Stats.	0.00	0.00		0.00
28	Solid Waste Materials generated as a result of a natural disaster.	0.00			
29	Waste removed at the request of the DNR in order to mitigate potential environmental impacts. Written authorization from DNR is required prior	0.00	0.00		0.00
30	Solid Waste Materials generated by a materials recovery facility in an amount equal to the weight of the residue generated by the facility or 10% of the total weight of material accepted by the facility, whichever is less. Residues that exceed the 10% cap should be reported	0.00	0.00		0.00
31	Solid Waste Materials generated by a licensed construction and demolition materials processor or licensed municipal solid waste combustor in an amount equal to the weight of the residue generated by the facility or 30% of the total weight of material accepted by the facility, whichever is less. Residues that exceed the 30% cap should be reported as Category 25 or Category 1 waste.	0.00	0.00		0.00
32	Waste exempted from all fees: waste generated by a Wisconsin state-funded project or waste generated from a licensed landfill and re-disposed of in a licensed landfill where tonnage fees were levied at the time of original disposal. Written authorization from DNR is required prior to use of Category 32.	0.00			
33	Soils and dredged sediments not mixed with other wastes and not included in other categories. (Effective July 1, 2022, under ss. 289.63 (6)(e), 289.64 (4)(e), 289.645 (4)(i), and 289.67 (1)(fp), Wis.	0.00	0.00		0.00
Total		3,559.00	533.85	24,913.00	25,446.85

Please Note: Written authorization from DNR is required prior to use of Category 29 or Category 32. Authorization must be emailed to: DNRWALandfillReports@wisconsin.gov.

Certification Confirmation

By checking the box to the right, I hereby certify that the information ☒ provided is true and accurate to the best of my knowledge.

Submittal Details

Name of person submitting report:

Email of person submitting report:

Submittal Date

Resubmission Date

Last Updated

Submitted By

Appendix H

Sparta Leachate Acceptance Agreement

Leachate Acceptance Agreement

THIS AGREEMENT, is entered into this February 1st, 2024 between the Vernon County Landfill and the City of Sparta Waste Water Treatment Facility.

Recitals

WHEREAS, the Vernon County Landfill generates leachate as part of its active landfill operations; and,

WHEREAS, the Vernon County Landfill generates an average of 2.5 million gallons of leachate per year; and,

WHEREAS, the Vernon County Landfill pursuant to NR 506.13 Wis. Admin. Code is required to remove all leachate from the leachate collection system and dispose of it at a wastewater treatment facility; and,

WHEREAS, the City of Sparta operates a waste water treatment facility at 805 Richgruber Road, Sparta, WI 54656; and,

WHEREAS, the Vernon County Landfill currently delivers leachate to the Sparta Waste Water Treatment Facility for treatment and disposal; and,

WHEREAS, the City of Sparta reserves the right to terminate this Agreement without prior notice if leachate is found to be toxic or incompatible with the City of Sparta Treatment Plant, or causes the treatment plant to exceed the limits set by the WPDES Permit: and,

NOW, THEREFORE, it is agreed between the City of Sparta Wastewater Treatment Facility and the Vernon County Landfill that the City of Sparta Wastewater Treatment Facility will continue to accept leachate from the Vernon County Landfill.

Vernon County Landfill:

City of Sparta Wastewater Treatment Facility:

Stacie Sanborn, Director

Ed Hansen, Waste Water Treatment Plant Manager

Appendix I

2020 Plan Modification Request and WDNR Approval



Building a Better World
for All of Us®

October 2, 2020

RE: Vernon County Landfill
FID # 663038310/WDNR Lic. #3268
Plan Modification Request
SEH No. VERSW153961 14.00

Mr. Marty Herrick, PE
Waste Management Engineer
Wisconsin Department of Natural Resources
3550 Mormon Coulee Road
La Crosse, WI 54601

Dear Mr. Herrick:

Short Elliott Hendrickson Inc. (SEH®), on behalf of the Vernon County Landfill (County) is submitting this letter to request a plan modification to the Plan of Operation for the Vernon County Landfill Vertical Expansion. The Vernon County Landfill Vertical Expansion Plan of Operation, dated January 2005, (and addenda) was conditionally approved by the Wisconsin Department of Natural Resources (WDNR) on July 29, 2005.

This plan modification request was prepared in general accordance with s. NR 514.04 (6) Wisconsin Administrative Code. Specifically, the County is requesting approval to:

- Establish an alternative method for evaluating leachate head on the landfill liner; and
- Revise long-term care cost estimates to cover cost associated with leachate head well replacement should it be necessary in the future.

LEACHATE HEAD MONITORING

Background

The most current plan of operation approval (July 29, 2005) requires monthly leachate head well monitoring be conducted at six leachate head wells. The head wells specified included 3 vertical well heads (LHW-1, LHW-2 and LHW-3) that existed at the time of the approval, and three horizontal side slope head wells (LHW-4, LHW-5, and LHW-6). At the time of the 2005 approval, only horizontal LHW-5 was installed.

Upon investigation, LHW-1 could not be located (presumably abandoned as its location is in the same vicinity as an access road), and LHW-2 and LHW-3 are obstructed approximately 20 feet below the waste surface, which is 10-15 feet above the bottom of the well and top of liner. The vertical wells are very apparently bent and bowed, likely due to waste settlement forces, especially on the side slope. Discussions with site personnel indicate the vertical leachate head wells have been hit several times during mowing and site operations. It is likely each well is damaged in multiple locations, and it is likely that attempts to repair or refurbish the wells would be unsuccessful and costly.

Engineers | Architects | Planners | Scientists

Short Elliott Hendrickson Inc., 329 Jay Street, Suite 301, La Crosse, WI 54601-4034
SEH is 100% employee-owned | sehinc.com | 608.782.3161 | 888.908.8166 fax



It also does not appear that horizontal LHW-4 was installed during the 2008 Phase II, Module 3 liner construction. Of the original six leachate head wells in the plan of operation, only LHW-5 and LHW-6 remain in usable condition. Inspection of both of these leachate head wells did not indicate any damage or issue.

Records indicate that leachate head well monitoring at the above referenced points has not been performed since approximately 2008. The County was periodically measuring liquid levels at Cleanout (CO) riser #10, located along the south side of the landfill (CO-10S), however, these measurements were not typically recorded and retained as they were primarily conducted to confirm pumping progress for the side slope riser pump.

After the above circumstances were discovered during May 2020, the County contacted the WDNR to notify them of the issue and discuss a plan moving forward to collect the appropriate leachate elevation data. Per the WDNR's recommendation, leachate head monitoring has been conducted at LHW-5 and LHW-6, additionally, leachate head monitoring has been conducted at each of the leachate cleanout lines installed along the north and south side of the landfill, and at the east and west ends of the leachate transport line constructed to convey leachate along the southern toe of slope to the sump in the southeast corner of the site. The attached leachate monitoring table (Table 1) summarizes this data.

Leachate head measurements collected during June indicated elevated leachate head measurements in the southeast portion of the landfill in the vicinity of LHW-5 and cleanouts CO-7S through CO-10S. Adjustments to the leachate pumping system were completed during July, and leachate head elevations have decreased since. Further adjustments to the float system in the side slope riser were completed during August in efforts to maintain liquid level on the liner to less than one foot. It should be noted that the liquid measurements in the cleanouts and transport pipes, and reported on the attached table, reflect actual measurements and not liquid thickness on the liner. Since the CO lines are situated in trenches approximately 18 inches lower than the base liner a correction of approximately 18 inches would be necessary determine the thickness of liquid on the liner.

Proposed Leachate Monitoring System

The Vernon County Landfill liner system consists of 5 ft of compacted clay which is covered with a 60-mil geomembrane. The drainage layer consists of 18 inches of coarse sand. The liner is graded in a herringbone pattern designed to flow to the southeast while the leachate collection trenches are oriented north and south. Leachate traveling over the liner on SE bias is designed to be intercepted by the trenches and flow to the south. Along the south toe of slope a transport pipe and trench intersects each trench, which conveys the leachate to the southeast corner of the landfill where the leachate sump and side slope riser pump is located which is the single low spot for the liner system and leachate collection system. Partial basin lysimeters are constructed beneath the leachate sump (LYS-3) and beneath the first phase of the liner constructed (LYS-1).

Attached are four figures:

- Sheet 6 shows the designed location and alignment of the leachate headwells and liner contours
- Sheet 16 provides the location and the designated leachate head well names and clean out monitoring locations
- Sheet 25 and Sheet 29 provide design details, as presented in the plan of operations, for the leachate collection and monitoring system.

Given that the entire liner system drains to the southeast corner with one collection system and perforated pipes and collection trenches exist to intercept leachate flow across the liner at intervals that exceed the requirements of s, NR504.06(5), we believe the existing horizontal leachate head wells

installed in the SE portion (LHW-5) and east side (LHW-6) provide ample information to assess compliance of liquid on the liner and achieve the requirement of two leachate head monitoring wells per major phase as required in of NR504.09(2)(i). However, in efforts to confirm that leachate is being conveyed as designed, and is not accumulating in areas up gradient of the leachate collection sump, the County proposes to perform head monitoring at CO-3S, CO-7S, CO-3N and CO-6N in addition to LHW-5 and LHW-6. These cleanout locations best represent the leachate data that would have been provided by the damaged leachate head wells LHW-1, LHW-2, and LHW-3, and missing leachate head well LHW-4. Please note that the liquid elevation measured at each of the wells will be adjusted by 18-inches to reflect leachate head elevation on the liner versus leachate collection trench. No change to the existing monthly monitoring schedule is proposed.

REVISED LONG-TERM CARE COSTS

The County proposes to revise the long-term care (LTC) financial assurance requirements to cover head well installation or replacement should it be necessary or required in the future. For purpose of the cost estimate, it is assumed that repairs or additions to the leachate head monitoring system would include the installation of up to three vertical leachate head wells. The head wells are assumed to be up to 50 feet below the landfill cap and constructed in a similar fashion as a landfill gas extraction well. The unit cost assumes 150 feet of well would be installed at a cost of \$150/ft, which includes design, construction and construction oversight.

Due to the uncertainty of if or when the leachate head wells would need to be installed or repaired, the costs for the leachate head well installation are amortized over a 20-year period, similar to the leachate tank replacement. Please refer to the attached Table 2 for the revised LTC estimate spreadsheet.

The LTC financial assurance approved in 2015 was \$2,594,110, which is equivalent to \$64,853 per year during the 40-year proof of responsibility period. This LTC adjustment has increased the total LTC requirement to approximately \$2,643,600, which is equivalent to \$66,090 per year.

CLOSING

We trust the above information is sufficient for the WDNR to approve this request. Please contact me at 608.498.4844 if you have any questions or need additional information relating to this submittal. Thank you for your consideration of this request.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.



Brian L. Kent, CHMM
Project Manager

BLK/blk/DRH
Enclosures

c: Stacie Sanborn, Vernon County Landfill
Darryl R. Heaps, SEH

Mr. Marty Herrick, PE
October 2, 2020
Page 4

"I, Darryl R. Heaps, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code."



Darryl R. Heaps, PE, CHMM
Project Engineer

E-25799
Certification #

10/1/2020
Date

Tables

Table 1 – Leachate Head Monitoring Summary

Table 2 – Long-Term Care Update

Table 1

Leachate Head Monitoring Summary
Vernon County Solid Waste Department

Facility ID/WDNR Point and Well No.	Monitoring Location Description	Leachate Head Thickness (Ft)											
		NA	NA	NA	NA	NA	6/19/2020	7/8/2020	8/13/2020	9/3/2020			
LHW-5	Horizontal LHW Southeast						7.7	8.2	1.0	1.0			
LHW-6	Horizontal LHW East						0.0	0.0	0.0	0.0			
CO-1S	Cleanout Trench 1 South						0.0	0.0	0.0	0.0			
CO-2S	Cleanout Trench 2 South						0.0	0.0	0.0	0.0			
CO-3S	Cleanout Trench 3 South						0.0	0.0	0.0	0.0			
CO-4S	Cleanout Trench 4 South						0.0	0.0	0.0	0.0			
CO-5S	Cleanout Trench 5 South						0.0	0.0	0.0	0.0			
CO-6S	Cleanout Trench 6 South						0.0	0.0	0.0	0.0			
CO-7S	Cleanout Trench 7 South						1.6	0.0	0.3	0.0			
CO-8S	Cleanout Trench 8 South						2.5	0.0	0.0	0.0			
CO-9S	Cleanout Trench 9 South						5.6	2.4	3.6	1.2			
CO-10S	Cleanout Trench 10 South						5.7	5.4	3.1	1.9			
CO-1N	Cleanout Trench 1 North						0.0	0.0	0.0	0.0			
CO-2N	Cleanout Trench 2 North						0.0	0.0	0.0	0.0			
CO-3N	Cleanout Trench 3 North						0.0	0.0	0.0	0.0			
CO-4N	Cleanout Trench 4 North						--	--	0.0	0.0			
CO-5N	Cleanout Trench 5 North						0.0	0.0	0.0	0.0			
CO-6N	Cleanout Trench 6 North						0.0	0.0	0.0	0.0			
CO-7N	Cleanout Trench 7 North						0.0	0.0	0.0	0.0			
CO-8N	Cleanout Trench 8 North						0.0	0.0	0.0	0.0			
CO-9N	Cleanout Trench 9 North						0.0	0.0	0.0	0.0			
CO-10N	Cleanout Trench 10 North						0.3	0.0	0.0	0.0			
TRANSPORT EAST	Conveyance Access East						8.3	5.8	1.2	1.2			
TRANSPORT WEST	Conveyance Access West						0.0	0.0	0.0	0.0			

Prepared by: MRS
Checked by: MJP

Table 2
Vernon County Landfill - 2020
Proposed Revisions to MSW Landfill (Lic. #3268)
Annual Long-Term Care Estimate

	Item	Units	Quantities	Cost/Unit	Extension
1.0	Land Surface Care				
	a. Semi- Annual site inspections (4hr/inspection)	HOURS	8	\$40.00	\$320.00
	b. Mowing/Snow Removal	HOURS	16	\$40.00	\$640.00
	c. Erosion Repair (0.3 acre annual)	AC	0.3	\$2,000.00	\$600.00
	d. Seed, fertilize, mulch (0.3 acre annual)	AC	0.3	\$2,500.00	\$750.00
	e. Sedimentation basing repairs (once every 5 years)	event	1.6	\$250.00	\$400.00
	f. Drainage system Repairs (w/equipment)	HOURS	8	\$40.00	\$320.00
	g. Road Grading (County)	HOURS	8	\$40.00	\$320.00
				<i>subtotal</i>	<i>\$3,350.00</i>
2.0	Leachate Extraction System				
	a. Annual inspection of pumps (16 hr/inspection)	HOURS	16	\$40.00	\$640.00
	b. Pump replacement/Maintenance (every 5 years, 1 pump)	EACH	0.2	\$5,000.00	\$1,000.00
	c. Televis System (every 5 yrs)	LS	0.2	\$15,000.00	\$3,000.00
	d. Jet clean pipelines (annual)	LS	1	\$2,400.00	\$2,400.00
	e. Leachate treatment (1" over 10 acres)	GALLONS	271,521	\$0.0500	\$13,576.05
	f. Replace storage tank after 20 yrs	LS	0.05	\$100,000.00	\$5,000.00
	f. Replace LHW (3 wells@50 feet) assumes install at 20 years	LS	0.05	\$22,500.00	\$1,125.00
				<i>subtotal</i>	<i>\$26,741.05</i>
3.0	Groundwater Monitoring				
	a. Semi-annual PW sampling (4 wells total)	HOURL	2	\$40.00	\$80.00
	b. Semi-annual PW/MW sampling (38 wells total)	HOURL	40	\$40.00	\$1,600.00
	c. MW Analytical costs (42 wells, semi-annual parameters-No VOC)	EACH	42	\$49.00	\$2,058.00
	d. MW Analytical costs (13 wells, annual VOCs)	EACH	13	\$65.00	\$845.00
	e. Analytical costs (12 wells, semi-annual VOCs)	EACH	12	\$65.00	\$780.00
				<i>subtotal</i>	<i>\$5,363.00</i>
4.0	Leachate/Lysimeter Monitoring				
	a. Semi-annual leachate head elevations (6 wells, 5 minutes each)	HOURL	1	\$40.00	\$40.00
	b. Semi-annual sampling	HOURL	3	\$40.00	\$120.00
	c. Analytical costs (semi-annual parameters-exfiltrate)	EACH	4	\$114.00	\$456.00
	d. Analytical costs (semi-annual parameters-leachate)	EACH	2	\$337.00	\$674.00
				<i>subtotal</i>	<i>\$1,290.00</i>
5.0	Surface Water Monitoring				
	a. Sed basin sampling and field parameters (1 basin, semi-annual)	HOURL	1	\$40.00	\$40.00
	b. Analytical costs (1 basin, semi-annual)	EACH	2	\$79.00	\$158.00
				<i>subtotal</i>	<i>\$198.00</i>
6.0	Landfill Gas Monitoring				
	a. Monitor gas wells (11 wells, quarterly- 15 minutes per well)	HOURL	11	\$40.00	\$440.00
	b. Perimeter gas probes (3 probes, quarterly 15 minutes per probe)	HOURL	3	\$40.00	\$120.00
				<i>subtotal</i>	<i>\$560.00</i>
7.0	Landfill Gas Extraction System				
	a. Flare inspect, equip. and maint. (2 times/mo- 1.5 hrs event+GEM)	HOURS	36	\$95.00	\$3,420.00
	b. Parts/Replacements/Equipment Maintenance	LS	1	\$5,000.00	\$5,000.00
				<i>subtotal</i>	<i>\$8,420.00</i>
8.0	Administration and Reporting				
	a. General Admin for Site (leachate/Gas)	HOURL	24	\$40.00	\$960.00
	b. Semi-annual GEMS Reporting	HOURL	40	\$40.00	\$1,600.00
				<i>subtotal</i>	<i>\$2,560.00</i>
9.0	Miscellaneous Engineering				
	a. Electric	LS	1	\$11,600.00	\$11,600.00
				<i>Subtotal=</i>	<i>\$60,082.05</i>
				<i>10% Contingency (per NR520)=</i>	<i>\$6,008.21</i>
				<i>Total Estimated Long-Term Care Costs=</i>	<i>\$66,090.26</i>

Prepared By: BLK
Checked by: DRH

Sep-20

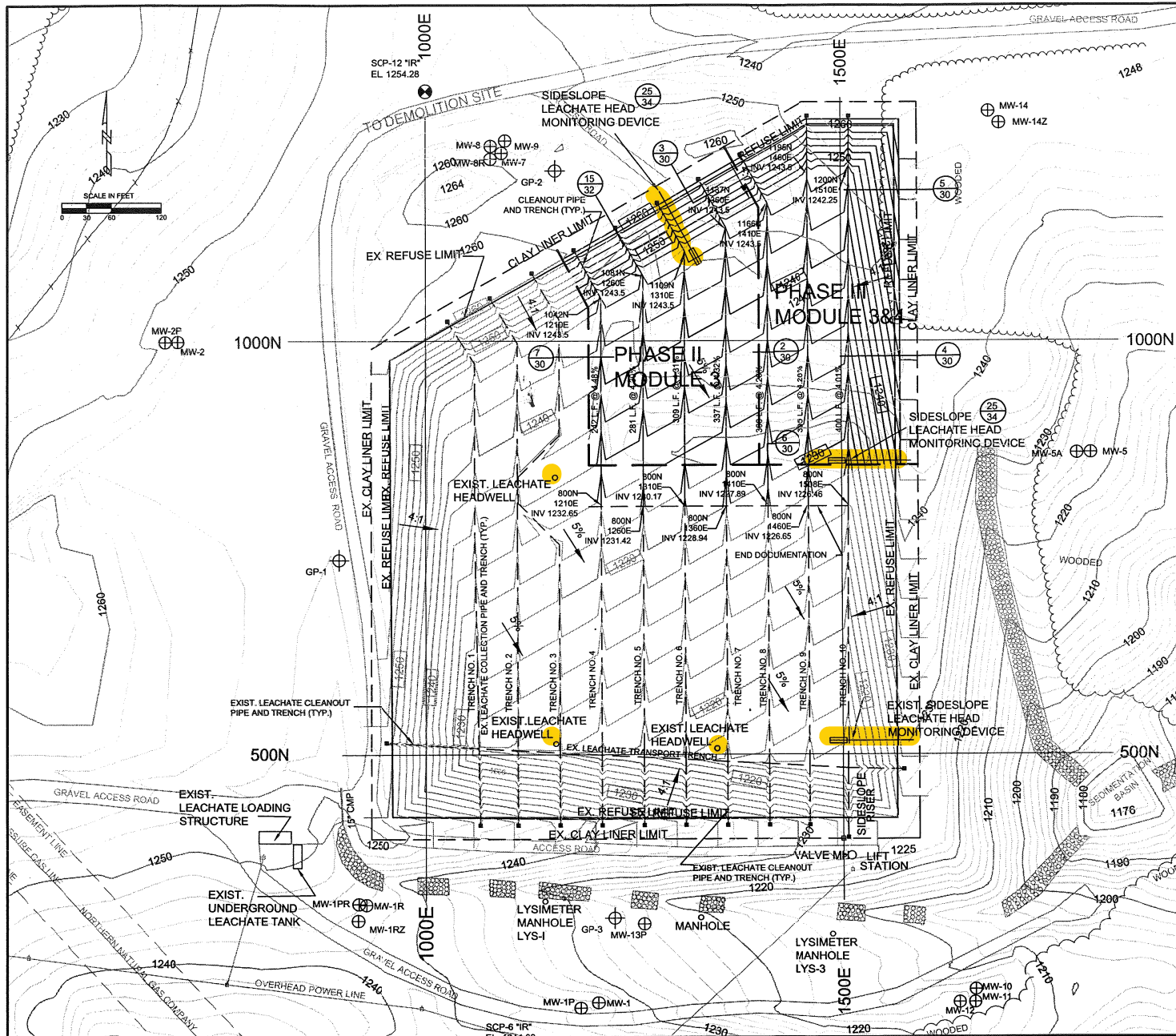
Figures

Sheet 6 (CWE, Plan of Operations)

Sheet 16 (CWE, Plan of Operations)

Sheet 25 (CWE, Plan of Operations)

Sheet 29 (CWE, Plan of Operations)



- ### LEGEND
- EXISTING EDGE OF WOODS
 - EXISTING POWER POLE
 - EXISTING RIPRAP
 - EXISTING SURVEY CONTROL POINT
 - SCP-6
 - EXISTING GAS PROBE
 - EXISTING MONITORING WELL
 - EXISTING FENCE
 - EXISTING CONTOURS INDEX (9/29/04)
 - EXISTING CONTOURS INTERMEDIATE (9/29/04)
 - EXISTING SUB-BASE CONTOURS INDEX
 - EXISTING SUB-BASE CONTOURS INTERMEDIATE
 - BASE CONTOURS INDEX
 - BASE CONTOURS INTERMEDIATE
 - PHASE LIMIT LINE AND CLAY LIMIT LINE

DETAIL REFERENCE NOTE

16 SEE DETAIL 16
32 ON PAGE 32

NOTE:
THIS BASE GRADE SHEET ILLUSTRATES:

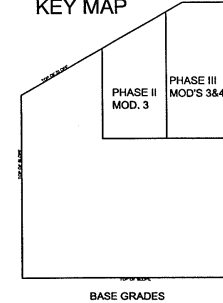
THE EXISTING BASE GRADES AND SLOPE PERCENTS AND SIDESLOPE SLOPE RATIOS CONSTRUCTED IN PRIOR MODULE DOCUMENTATION REPORTS.

THE INSTALLED LEACHATE COLLECTION SYSTEM CONSTRUCTED IN PRIOR MODULE DOCUMENTATION REPORTS.

THE EXISTING WASTE LIMIT AND CLAY LIMIT ESTABLISHED IN PRIOR MODULE DOCUMENTATION REPORTS.

THE REMAINING PHASES II & III CLAY LINER AREAS AND THEIR PERCENT SLOPE AND SIDESLOPE SLOPE RATIOS AND LEACHATE COLLECTION SYSTEM TO BE CONSTRUCTED IN THE NEW PLAN OF OPERATION.

KEY MAP



CWEA
CENTRAL
WISCONSIN
ENGINEERS &
ARCHITECTS

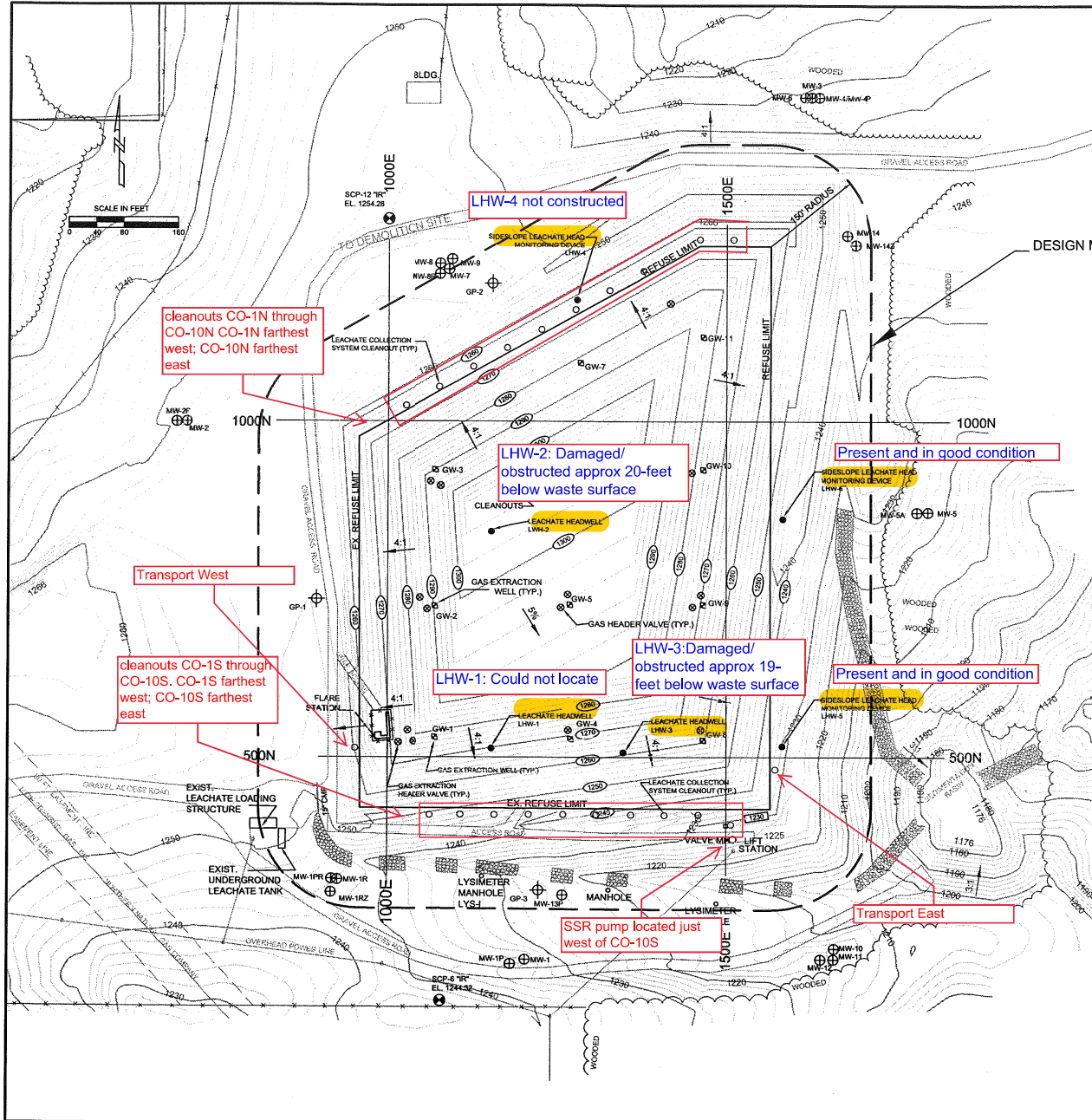
5707 SCHOFIELD AVENUE
WESTON, WISCONSIN
54785

PHONE: (715) 359-9400
FAX: (715) 355-1199
general@cweengineers.com
http://www.cweengineers.com

PROJECT:
BASE GRADES AND LEACHATE COLLECTION SYSTEM
VERNON COUNTY SANITARY BAFFILL
PLAN OF OPERATION FOR VERTICAL EXPANSION

REVISIONS:

PROJECT NO:	94602000
DRAWN BY:	D.H.
CHECKED BY:	P.A.
APPROVED BY:	H.Z.
DATE:	JAN 2005
SHEET:	6 OF 31

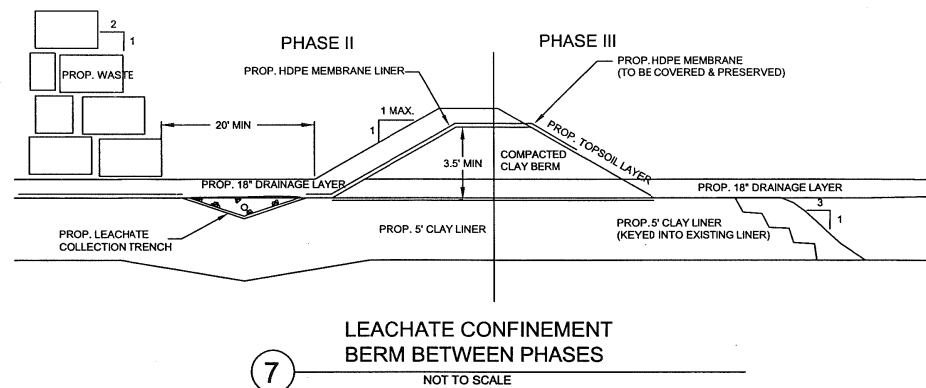
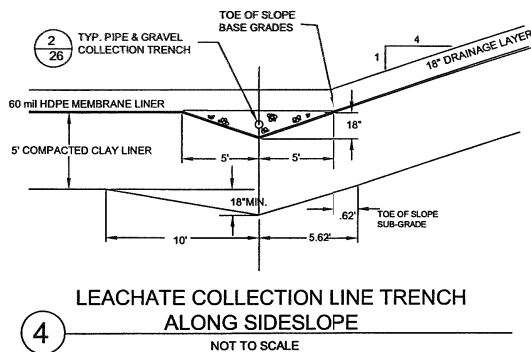
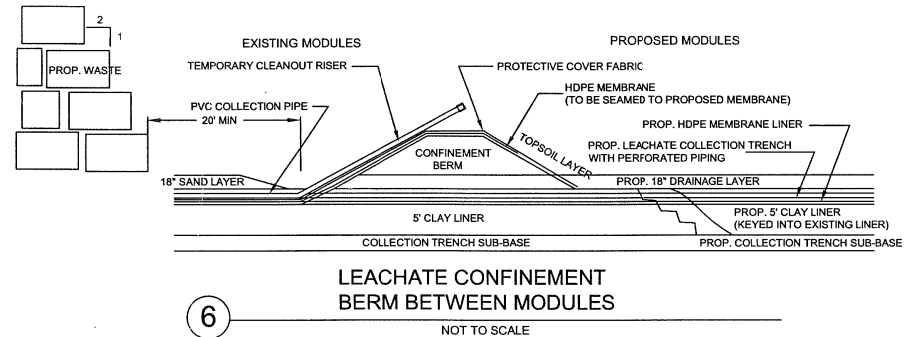
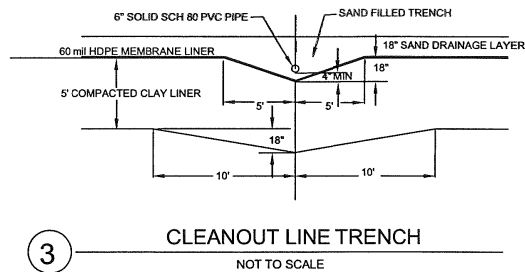
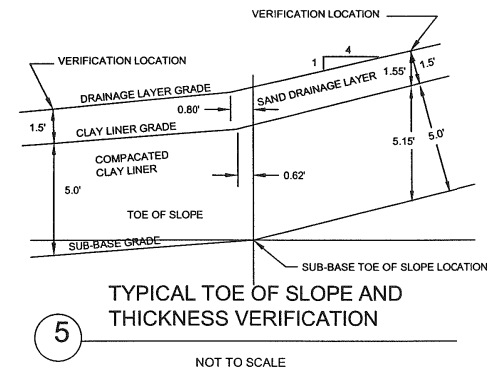
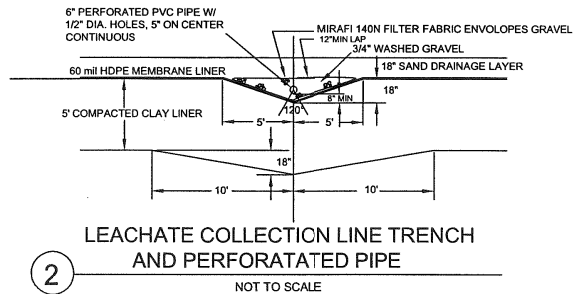


LEGEND

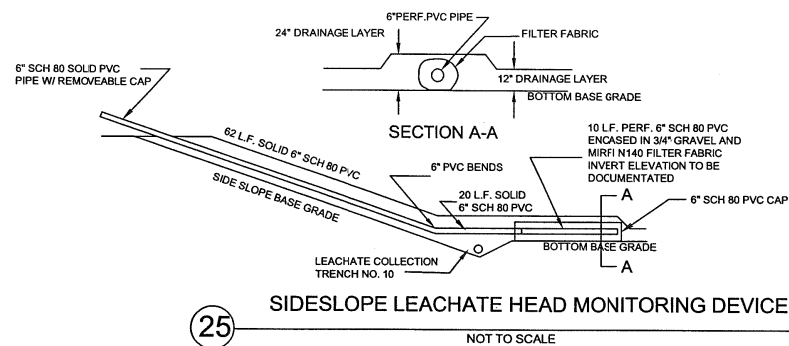
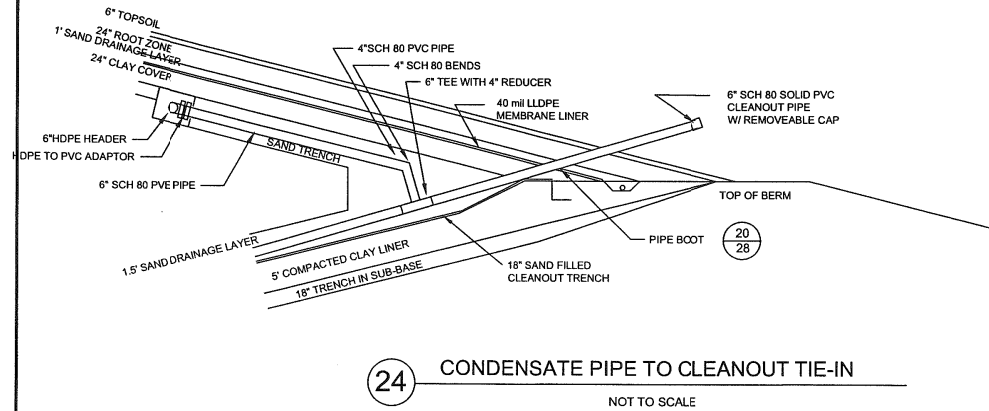
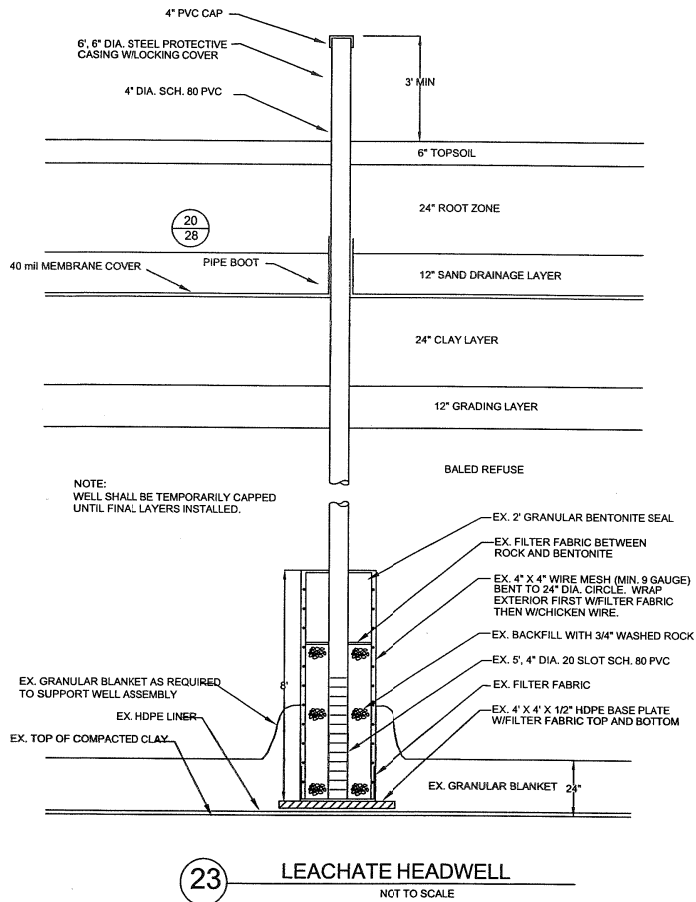
	EXISTING EDGE OF WOODS
	EXISTING POWER POLE
	EXISTING RIPRAP
	EXISTING SURVEY CONTROL POINT
	EXISTING GAS PROBE
	EXISTING MONITORING WELL
	EXISTING FENCE
	EXISTING CONTOURS INDEX
	EXISTING CONTOURS INTERMEDIATE
	FINAL CONTOURS INDEX
	FINAL CONTOURS INTERMEDIATE
	GAS EXTRACTION WELL

MONITORING DEVICES AND MONITORING FREQUENCY

Monitoring Device	Monitoring Frequency
Groundwater Monitoring Wells:	Semi-Annually
Water-Supply Wells	Semi-Annually
Gas Extraction Blower Station	Twice-monthly
Gas Extraction Wells	Monthly
Gas Probes	Semi-Annually
Gas System Condensate	Annually
Leachate Volume	Monthly
Leachate Chemistry	Semi-Annually
Leachate Head Well Volumes	Monthly
Leachate Line Cleaning	Annually
Lysimeters	Semi-Annually
Sedimentation Basin Chemistry	Semi-Annually
Sedimentation Basin Dredging	As Needed
Cover Vegetation Mowing	Annually
Inspections:	
Cover Vegetation	Semi-Annually
Runoff Control Structures	Semi-Annually
Cap Settlement	Semi-Annually
Roads	Semi-Annually
Leachate Collectors System	Semi-Annually
Lysimeters	Semi-Annually
Gas Extraction System	Monthly



J:\CRAFT\VERNON\PLAN OF OPERATION\DETAIL 1.dwg, Layout 5, 2/12/2005 12:33:29 PM





February 9, 2021

Ms. Stacie Sanborn, Solid Waste Manager
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

FID #663030810
Vernon Co.
SW/APPR File

Subject: Conditional Plan of Operation Approval Modification for the Vernon County Sanitary Balefill
Landfill, Town of Viroqua, Vernon County, License No. 3268

Dear Ms. Sanborn:

The Department of Natural Resources (department) has reviewed your plan modification request dated October 2, 2020 and prepared by Short Elliott Hendrickson Inc. (SEH). The department conditionally approves the proposed plan modification to revise leachate elevation monitoring and update long term care costs for the Vernon County Sanitary Balefill Landfill.

The proposed plan modification includes monitoring head at existing leachate clean-outs in lieu of replacing lost or missing leachate headwells. Condition 3 of this approval requires revised proof of financial responsibility to cover the costs of leachate headwell replacement at a future date should it be required by the department. The revised proof of financial responsibility should be established within 60 days of the date of this approval. Additionally, an updated Environmental Monitoring Plan has been attached to this approval and should be included with your plan of operation approvals in accordance with NR 506.17, Wis. Adm. Code. Please review all conditions for specific requirements.

Please keep in mind that this approval does not relieve you of obligations to meet all other applicable federal, state and local permits, as well as, zoning and regulatory requirements.

This approval should be attached to your July 20, 1992 and July 29, 2005 Plan of Operation Approvals. If you have any questions regarding this approval, please contact Martin Herrick at (608) 789-5518 or Martin.Herrick@wisconsin.gov.

Sincerely,

John Morris, Professional Soil Scientist
Waste and Materials Management Program Supervisor
Northern and West Central Region

cc: Martin Herrick-DNR/LAX
Valerie Joosten - DNR/NER
Carolyn Cooper-DNR/SCR
Dustin Sholly-DNR
Brian Kent-SEH

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
CONDITIONAL PLAN OF OPERATION APPROVAL MODIFICATION
FOR THE
VERNON COUNTY SANITARY BALEFILL LANDFILL
LICENSE #3268

FINDINGS OF FACT

The Department of Natural Resources (department) finds that:

1. Vernon County owns and operates a municipal balefill landfill located in the SE ¼ of the SW ¼ and the SW ¼ of the SE ¼ of Section 15, T13N, R5W, Town of Viroqua, Vernon County Wisconsin. The facility accepts residential, commercial and non-hazardous industrial wastes from Vernon County.
2. The department issued Conditional Plan of Operation Approvals for the Vernon County Sanitary Balefill Landfill facility on July 20, 1992 and July 29, 2005.
3. On October 2, 2020, SEH, Inc., on behalf of Vernon County, submitted a plan modification to the department proposing to revise the leachate elevation monitoring and associated long term care costs for replacement of vertical leachate headwells. The review fee of \$1,650 was received by the department on December 21, 2020.
4. Additional documents considered in connection with the modification request include the following:
 - a. The department's July 29, 2005 plan of operation approval.
 - b. The department's files pertaining to the Vernon County Sanitary Balefill Landfill, License #3268.
5. Additional facts relevant to the review of the plan modification request include:
 - a. The department's July 29, 2005 plan of operation approval required leachate head well monitoring at leachate head wells LHW-1, LHW-2, LHW-3, LHW-4, LHW-5 and LHW-6. Of the six required leachate head wells, only LHW-5 and LHW-6 are useable within the landfill.
 - b. Vernon County's October 2, 2020 proposal to monitor leachate head on the liner using leachate clean-outs in lieu of installing new leachate headwells provides enough lateral coverage to monitor whether leachate removal is complying with s. NR 504.07(5), Wis. Adm. Code.
 - c. Vernon County has proposed to provide proof of owner financial responsibility for long term care that includes the amount needed to replace the damaged or missing leachate headwells if requested by the department.
6. The special conditions set forth below are needed to assure that the facility is operated in an environmentally sound fashion. If the special conditions are complied with, the proposed modifications will not inhibit compliance with the standards set forth in the applicable portions of chs. NR 500-538, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The department has authority under s. 289.30(6), Wis. Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500-538, Wis. Adm. Code.
2. The department has authority to approve a plan of operation approval modification with special conditions if the conditions are needed to ensure compliance with chs. NR 500-538, Wis. Adm. Code.
3. The conditions of this approval are needed to ensure compliance with chs. NR 500-538, Wis. Adm. Code.
4. In accordance with the foregoing, the department has the authority under s. 289.30(6), Wis. Stats., to issue the following conditional plan of operation approval modification.

CONDITIONAL PLAN OF OPERATION APPROVAL MODIFICATION

The department hereby approves the proposed modification to the plan of operation for the Vernon County Sanitary Bafefill Landfill, subject to compliance with chs. NR 500 – 538, Wis. Adm. Code and the following conditions:

1. The leachate headwell monitoring points in Conditions 14 and 15 of the July 29, 2005 Conditional Plan of Operation Approval are replaced by the following leachate headwell monitoring points: CO-3S, CO-7S, CO-3N, CO-6N, LCH-5, and LCH-6. Measurements of leachate head in leachate clean-outs shall be adjusted so that depth of leachate (leachate head) relative to the liner is reported to the department.
2. Up to four replacement leachate headwells shall be installed upon request by the department if the department determines the headwells are necessary to evaluate or monitor leachate head on the landfill liner.
3. Revised proof of financial responsibility for long-term care shall be established in accordance with Ch. NR 520, Wis. Adm. Code, within 60 days of the date of this approval. The proof of financial responsibility shall be established based upon the approved annual long-term care cost estimate included in the attached table.

This approval is based on the information available to the department as of the date of approval. If additional information, project changes or other circumstances indicate possible need to modify this approval, the department may ask you to provide further information relating to this activity. Likewise, the department accepts proposals to modify approvals, as provided for in state statutes and administrative codes.

NOTICE OF APPEAL RIGHTS

If you believe you have the right to challenge this decision made by the department, you should know that Wisconsin Statutes and administrative codes establish time periods and requirements for reviewing department decisions.

To seek judicial review of the department's decision, sections 227.52 and 227.53, Stats., establish criteria for filling a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department. The petition shall name the Department of Natural Resources as the respondent.

Dated February 9, 2021

DEPARTMENT OF NATURAL RESOURCES
For the Secretary



John Morris, Professional Soil Scientist, Supervisor
Northern and West Central Regions
Waste and Materials Management Program

A handwritten signature in black ink, appearing to read "Martin Herrick", is positioned above a horizontal line.

Martin Herrick,
West Central Region
Waste and Materials Management Program

ANNUAL LONG-TERM CARE COST ESTIMATE:

Item	Quantity	Unit Cost	Estimated Cost/Year
Land Surface Care			
Semi Annual Inspections	8 hr	\$40.00	\$320.00
Mowing Snow Removal	16 hr	\$40.00	\$640.00
Erosion Repair	.3 AC	\$2000.00	\$600.00
Seed Fertilize Mulch	.3 AC	\$2500.00	\$750.00
Sed Basin Repairs (1/5 yr.)	1.6	\$250.00	\$400.00
Drainage Sys repairs	8 hr	\$40.00	\$320.00
Road Grading	8 hr	\$40.00	\$320.00
		Subtotal	\$3350.00
Leachate Extraction System			
Annual Inspection	16 hr	\$40.00	\$640.00
Pump replacement (1/5 yr.)	.2	\$5000.00	\$1000.00
Televise (1/5yr)	.2	\$15000.00	\$3000.00
Jetting	1	\$2400.00	\$2400.00
Leachate Treatment	271521 Gal	\$.05	\$13576.05
Storage tank (1/20yr)	.05	\$100000.00	\$5000.00
Vert. Leachate Headwell (assumes install at 20 years)	.05	\$30,000	\$1500.00
		Subtotal	\$26,866.05
Groundwater			
Semi-An PW smpl (4)	2 hr	\$40.00	\$80.00
Semi-An PW/MW smpl	40hr	\$40.00	\$1600.00
MW anlyt (SA No VOC))	42	\$49.00	\$2058.00
MW anlyt (A VOC)	13	\$65.00	\$845.00
Anlyt (SA)	12	\$65.00	\$780.00
		Subtotal	\$5363.00
Leachate/Lysimeter			
SA Head Elev	1 hr	\$40.00	\$40.00
SA Sampling	3 hr	\$40.00	\$120.00
Analyt SA exfiltrate	4	\$114.00	\$456.00
Analyt SA Leachate	2	\$337.00	\$674.00
		Subtotal	\$1290.00
Surface Water Mtg			
Sed basin sampling	1	\$40.00	\$40.00
Analytical (SA)	2	\$79.00	\$158.00
		Subtotal	\$198.00
Landfill Gas Mtg			
Mtr Gas Wells	11 hr	\$40.00	\$440.00
Perimeter Gas Probes	3 hr	\$40.00	\$120.00
		Subtotal	\$560.00
Landfill Gas Extraction			

Flare Maint	36 hr	\$95.00	\$3420.00
Parts	1 LS	\$5000.00	\$5000.00
		Subtotal	\$8420.00
Administration			
General	24 hr	\$40.00	\$960.00
Sa GEMS Rpt	40 hr	\$40.00	\$1600.00
		Subtotal	\$2560.00
Miscellaneous			
Electric	1	\$11600.00	\$11600.00
		Subtotal	\$60,207.05
		Contingency (10%)	\$6,020.70
		Total Cost/Year	\$66,227.75
		Total Cost/40-year	\$2,649,110
		LTC Period	

Prepared: Sep-2020

ENVIRONMENTAL MONITORING SUMMARY
VERNON COUNTY BALEFILL – LICENSE # 3268

Table A
 (Preventive Action Limits (PALs)-Indicator Parameters) **

Substance/Parameter	Monitoring Point/Well	PAL value (mg/L)
Alkalinity	MW-1RZ	310
	MW-13P	300
	MW-14	320
	MW-14Z	330
COD	Not applicable	Not applicable
Field Conductivity (specific conductance, umho/cm)	MW-1RZ	720
	MW-13P	630
	MW-14	(insufficient data)
	MW-14Z	760
Hardness	MW-1RZ	350
	MW-13P	310
	MW-14	330
	MW-14Z	380

Table B
 (Alternative Concentration Limits (ACLs)-Public Health and Welfare Parameters) **

Substance/Parameter	Monitoring Point/Well	ACL value (mg/L)
Iron	MW-1PR MW-1R MW-3 MW-5A MW-7 MW-9 MW-12 P-1	.34 .13 .6 .52 .37 1.2 .34 .76
Chloride	MW-1RZ MW-13P MW-14 MW-14Z	Baseline sampling indicated no results greater than the NR 140 PAL value.
Fluoride	MW-2 MW-2P MW-3 MW-4P MW-5A MW-6 MW-8R MW-11 MW-12	1.6 1.2 1.3 1.5 1.4 1.3 1.3 1.5 1.4
Manganese	MW-5A MW-6 MW-7 MW-9 MW-11 MW-14	(insufficient data) (insufficient data) (insufficient data) (insufficient data) (insufficient data) 270
Nitrate + Nitrite (as N)	MW-1R MW-1PR MW-1RZ MW-2 MW-2P MW-6 MW-7 MW-8R MW-9 MW-13P MW-14 MW-14Z	(insufficient data) (insufficient data) 8.5 (insufficient data) (insufficient data) (insufficient data) (insufficient data) (insufficient data) (insufficient data) (insufficient data) 3.6 6.6 11

Table 2A
(GROUNDWATER MONITORING)

MONITORING WELLS/ PIEZOMETERS	DNR ID	MONITORING FREQUENCY	PARAMETERS
MW-1 MW-1P MW-1R MW-1RZ MW-2 MW-2P MW-3 MW-4P MW-5 MW-6 MW-7 MW-8R MW-10 MW-11 MW-13P MW-14 MW-14Z MW-5A* MW-9* MW-12* MW-1PR* And others installed as needed.	101 102 120 123 103 104 105 107 108 110 111 112 114 115 117 118 119 109 113 116 121	Semi-Annually (March and September)	39036 Alkalinity, Total Filtered 00940 Chloride, Total or Dissolved 00094 Field conductivity (@ 25°C) 00400 pH, Field 00010 Temperature, Field 04189 Groundwater Elevation 22413 Hardness, Total Filtered 01046 Dissolved Iron 00001 Odor 00002 Color 00003 Turbidity
MW-1 MW-1R MW-1RZ MW-3 MW-4P MW-6 MW-7 MW-8R MW-10 MW-11 MW-13P MW-14 MW-14Z And others installed as needed.	101 120 123 105 107 110 111 112 114 115 117 118 119	Annually (September)	VOC scan (EPA method 8260 or 8021; NR 507 App. III list)
MW-5A* MW-9* MW-12* MW-1PR*	109 113 116 121	Semi-Annually (March and September)	VOC scan (EPA method 8260 or 8021; NR 507 App. III list)

Table 2A (cont'd)
(GROUNDWATER MONITORING)

PRIVATE WELLS	DNR ID	MONITORING FREQUENCY	PARAMETERS
FACILITY WELL (P-1)	201	Semi-annually (March and September)	00410 Alkalinity, Total Unfiltered
WILLIAMS WELL (P-2)	202		00940 Chloride, Total or Dissolved 00094 Field conductivity (@ 25°C) 00400 pH, Field 00010 Temperature, Field 00900 Hardness, Total Unfiltered VOC Scan (EPA method 8260, 8021, or SDWA Method 524)

Table 2B
(LYSIMETER MONITORING)

LYSIMETERS	DNR ID	MONITORING FREQUENCY	PARAMETERS
LYS-1 LYS-3	340 342	Monthly (reported semi-annually)	74064 Lysimeter volume removed 72002 Depth to Liquid
LYS-1 LYS-3	340 342	Semi-annually (March and September)	00094 Field conductivity (@25°C) 00400 pH, Field 00410 Alkalinity, Total 00900 Hardness, Total 00940 Chloride, Total 00625 Total Kjeldahl Nitrogen 00929 Sodium, Total 99423 Elevation, liquid 00945 Sulfate, Total
LYS-1 LYS-3	340 342	Annually (September)	VOC scan (EPA method 8260 or 8021; NR 507 App. III list)

Table 2C
(SURFACE WATER MONITORING)

SURFACE WATER MONITORING	DNR ID	MONITORING FREQUENCY	PARAMETERS
Sedimentation Basin (point 1)	502	Semi-Annual (March and September)	74010 Total Iron 00410 Alkalinity, Total Unfiltered 00940 Chloride, Total or Dissolved 00094 Field conductivity (@ 25°C) 00400 pH, Field 00010 Temperature, Field 99520 Surface Water Elevation 00900 Hardness, Total Unfiltered 00299 Dissolved Oxygen 00620 Nitrate (NO ₃ -N), Filtered 00665 Total Phosphorous 00001 Odor 00002 Color 00003 Turbidity

Table 2D
(LEACHATE MONITORING)

LEACHATE HEAD WELLS	DNR ID	MONITORING FREQUENCY	PARAMETERS
CO-3S CO-7S CO-3N CO-6N LCH-5 LCH-6 And any others installed as needed.	331 332 333 334 335 336	Monthly (submitted semi-annually)	00023 Leachate Head Elevation 00031 Depth of Leachate 00032 Volume of Leachate removed (volume pumped)
LEACHATE COLLECTION	DNR ID	MONITORING FREQUENCY	PARAMETERS
Leachate Storage Tank	300	Monthly (submitted semi-annually)	00032 Volume of Leachate removed (volume pumped)
Leachate Storage Tank	300	Semi-annually (March and September)	00310 BOD ₅ 00094 Field conductivity (@ 25°C) 00400 Field pH 00410 Alkalinity, Total Unfiltered 01027 Cadmium, Total Unfiltered 00940 Chloride, Total Unfiltered 00900 Hardness, Total Unfiltered 74010 Total Iron 01051 Lead, Total Unfiltered 01055 Manganese, Total Unfiltered 71900 Mercury, Total Unfiltered 00610 Ammonia Nitrogen, Total 00625 Total Kjeldahl Nitrogen 00929 Sodium, Total Unfiltered 00945 Sulfate, Total 00150 Total Suspended Solids VOC Scan (EPA method 8260 or 8021; NR 507 App. III list)
Leachate Storage Tank	300	Annually (September)	SVOC Scan (EPA method 8270; NR 507 App. IV list)

Table 2E
(GAS MONITORING)

GAS PROBES	DNR ID	MONITORING FREQUENCY	PARAMETERS
GP-1 GP-2R GP-3 And any others installed as needed.	460 463 464	Quarterly (March, June, September, December)	85547 % Methane 85550 % Oxygen 46388 Field Temperature 00025 Barometric pressure 46381 Pressure trend, barometric
GAS EXTRACTION WELLS	DNR ID	MONITORING FREQUENCY	PARAMETERS
GW-1 GW-2 GW-3 GW-4 GW-5 GW-6 GW-7 GW-8 GW-9 GW-10 GW-11 And any others installed as needed.	410 412 414 416 418 420 422 424 426 428 430	Quarterly (March, June, September, December)	46388 Field Temperature 85547 % Methane 85550 % Oxygen 46386 Flow Rate(s) 46382 Header Pressure (inches of water)
MISCELLANEOUS GAS SAMPLING	DNR ID	MONITORING FREQUENCY	PARAMETERS
BLOWER INLET*** BLOWER OUTLET***	400 401	Semi-monthly (twice per month)	46388 Field Temperature 85547 % Methane 85550 % Oxygen 85544 % Carbon Dioxide 99181 % Nitrogen 46390 Vacuum (inches of water column) 46386 Flow Rate 46382 Pressure
FLARE***	402	Semi-monthly (twice per month)	46386 Flow rate 46382 Header Pressure (inches of water)

*=Designated Subtitle “D” monitoring wells.

**=Only data submitted with the Feasibility Report and Plan of Operation Report was used to calculate these values. Some of the electronic data that would normally be used to calculate these numbers is either missing or unreported.

***=To be sampled when installed as part of the active gas extraction system.

Appendix J

2024 Addendum Field Investigation Summary Memorandum



MEMORANDUM

TO: Brian Kent

FROM: Robert Hawkins, Ben Kolter, Aaron Kutz, PG (WI), Melanie Niday, PG (WI), Mark Sherrill, PG (WI), Melissa Lindenfelser, PG (WI)

DATE: November 4, 2024

RE: 2024 Addendum Field Investigation Procedures
SEH No. VERSW 167824 14.00

INTRODUCTION

Vernon County submitted a Feasibility Report (FR) to the Wisconsin Department of Natural Resources (WDNR) dated September 11, 2023, for a proposed expansion of the Vernon County Landfill. The FR included information required to determine the feasibility for the proposed Eastern Expansion of the Vernon County Landfill, WDNR License No. 3268. Following their initial review of the Feasibility Report, the WDNR sent an Incompleteness Determination of the Feasibility Report letter to Vernon County dated December 19, 2023. A virtual meeting occurred between SEH, Vernon County, and the WDNR on January 19, 2024, to discuss the Incompleteness Determination of the Feasibility Report. The WDNR provided additional written comments via email to Vernon County as a follow-up to the virtual meeting on February 1, 2024.

In response to the Incompleteness Determination and the additional written comments from the WDNR, Vernon County completed a 2024 addendum field investigation to confirm and further define the geology and hydrogeology in the area of the proposed expansion.

The 2024 addendum field investigation included the completion of four new borings (B-22, MW-16Z, MW-18, and MW-19Z) were performed to provide additional bedrock data and groundwater data. One new perched water table monitoring well (MW-18WT), two new regional monitoring wells (MW-18 and MW-19), and two new piezometers (MW-16Z and MW-19Z) were completed during the addendum investigation of the proposed expansion area to provide additional groundwater data.

The field investigation included completion of soil borings, construction and development of monitoring wells/piezometers, field and laboratory geotechnical analysis, geophysics, in-field hydraulic conductivity testing, baseline water elevation monitoring, baseline groundwater monitoring, and survey.

Drilling and well installation was completed between July 29, 2024, and August 14, 2024, by Cascade Environmental (Cascade) utilizing a track mounted Rotasonic drill rig. Drilling oversight was provided by SEH geologists under the direction and supervision of a licensed Professional Geologist in Wisconsin. Well development, geophysics, groundwater monitoring, and in-situ hydraulic conductivity analyses were also conducted by SEH geologists and scientists. Groundwater sample analysis was performed by Eurofins Environmental Testing and boring and well survey was provided by SEH.

Engineers | Architects | Planners | Scientists

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SOIL BORINGS

Drilling Program

To supplement the existing soil boring information, the following additional four soil borings were completed to assess soil and bedrock conditions and bedrock elevations:

- MW-16Z and MW-18 were drilled outside the landfill expansion footprint but within 150 feet of the proposed waste boundary of the landfill expansion. The soil boring for well MW-16Z was advanced below the water table to accommodate piezometer construction. The soil boring for well MW-18 was advanced into the regional water table for a water table well installation.
- MW-19Z was drilled outside the landfill expansion footprint but within 300 feet of the proposed waste boundary of the landfill expansion. The soil boring for well MW-19Z was advanced below the water table to accommodate piezometer construction.
- B-22 was drilled within the landfill expansion footprint near the previously completed B-21. The soil boring B-22 was advanced at least 25 feet below the proposed landfill subbase elevation, as B-21 was only completed 15 feet below the proposed landfill subbase elevation due to a subbase elevation error. This boring was advanced to an elevation of 1120.6 where the perched water table was encountered.

Drilling and Sampling Methods

The soil borings were completed using Rotosonic methods. While Rotosonic does affect the fracture rate of the bedrock, it uses water only and drilling mud is generally not required. Therefore, it was more accurate in determining the depth to water immediately after drilling and enabled proper depth of perched water table and regional water table wells. Any fractures observed within bedrock during drilling were assessed for mechanical breakage or in-situ fractures to combat the fractures Rotosonic drilling may create.

Rotosonic samples were collected in the borings continuously throughout the entire boring length. Soil samples collected during drilling were visually classified in the field by a geologist under the direction of a Wisconsin registered Professional Geologist in accordance with the Unified Soil Classification System (USCS, ASTM D2487-17 and D2488-00).

Drilling water was utilized when necessary but minimal water was used in order to more easily determine when the perched water table and regional water table was encountered. During the bottom 20 feet at MW-19Z, a thin mud was required to be used ensure the tooling did not get stuck.

Rock coring was not attempted within these borings as it was attempted during past field investigation with little to no success. The Rotosonic drilling method had successful recovery for a majority of the drilling program, with recovery rate within saprolite and bedrock ranging generally between 80 to 100 percent, with one 50% recovery within MW-16Z.

Drilling Documentation

Upon completion of drilling, some soil borings were converted to monitoring wells or piezometers. The remainder of the boreholes were abandoned in accordance with NR141 Wis. Adm. Code requirements. Soil boring logs from the 2024 investigation are included in **Attachment A**. Borehole abandonment forms from the 2024 investigation are included in **Attachment B**. A summary of survey, depths, and geologic conditions for the soil borings completed in 2024 is provided in **Table 1**. The locations of the soil borings, monitoring wells, and piezometers for the proposed expansion are illustrated on **Plan Sheet 3**. No soil

samples were collected for geotechnical analysis during the 2024 field investigation, but soil and bedrock samples have been retained on-site. The soil samples will be retained until a feasibility determination is obtained. Upon receipt of the feasibility determination, Vernon County Landfill personnel will be notified to determine the subsequent disposition of the soil samples. Photographs of the soil samples are provided within **Attachment C**.

MONITORING WELLS AND PIEZOMETERS

Well Installation Program

The drilling program conducted in 2024 included the installation of one perched water table monitoring wells (MW-18WT), two regional monitoring wells (MW-18 and MW-19), and two piezometers (MW-16Z and MW-19Z). A summary of newly installed monitoring wells and piezometers is as follows:

- Well MW-18WT was installed to the east and sidegradient/downgradient to the landfill expansion and was installed with a 10-foot screen.
- Well MW-18 was installed to the east and upgradient to the landfill expansion. MW-19 was installed to the southeast and upgradient to the landfill expansion. Both regional water table wells were installed with a 10-foot screen.
- Piezometer MW-16Z was nested with the shallower water table wells MW-16WT and MW-16 to the southeast of the landfill expansion. Piezometer MW-19Z was nested with the shallower regional water table well MW-19. The piezometers were constructed with a 5-foot screen situated a minimum of 15-feet below the bottom elevation of shallower wells.

Well Installation Methods

The monitoring wells and piezometers were installed following completion of the associated soil boring described above. Because groundwater conditions could not always be observed during drilling, determining an appropriate depth of the proposed water table well at the four drilling locations presented a challenge. Similar issues for establishing water levels during drilling was encountered during past well installations. Therefore, an attempt to estimate depth to groundwater was made by setting a temporary well within the outer casing of the borehole and allowing the borehole to sit overnight; depth to water then was measured the next day and used to establish well construction depth. This approach was successful with all monitoring wells installed during 2024.

Monitoring wells and the piezometer were constructed using 2-inch diameter, PVC screen, coupled with 2-inch, Schedule 40 or 80 PVC riser. All monitoring wells were constructed with a 10-foot screened interval. The piezometers were constructed with a 5-foot screen. The borehole annular space was filled with a filter pack that extended approximately 2-feet above the top of the screen. An approximate 1-foot layer of fine sand was placed above the filter pack and a layer of bentonite seal was placed above the fine sand. The bentonite seal was then followed by a high-solids bentonite grout to approximately ground surface. Wells were then completed with a protective casing with a locking vented cap, concrete collar/pad, and bollards. No significant grout loss or settling was present during well installation.

The observation and documentation of well installation was provided by SEH geologists under the direction and supervision of a licensed Professional Geologist in Wisconsin. Final well construction logs prepared by Cascade are included within **Attachment C**. A summary of survey, depths, and screened geologic conditions for the monitoring wells and piezometer completed in 2024 is provided in **Table 2**. The locations of the monitoring wells and piezometers for the proposed expansion are illustrated on **Plan Sheet 3**.

WELL DEVELOPMENT

Following installation, wells were developed on August 14, 2024, in substantial conformance with NR141.21 and NR507.07 utilizing a surge block and pump. Procedures and equipment used for initial development were recorded and field forms are provided in **Attachment D**. From wells that produced sufficient water, at least ten times the standing water volume in the well and sand pack was removed from each newly installed well with appropriate documentation of stabilization/recovery parameters. No water, dispersing agents, acids, or disinfectants were added to the well to assist development. Well development forms from the new wells installed for the 2024 investigation are included in **Attachment E**.

BOREHOLE GEOPHYSICS

Borehole geophysics was completed at each of the three new well locations (MW-16Z, MW-18, and MW-19Z) and at one control location (MW-5). When well nests were present, geophysics was completed within the deepest well within the well nest.

Geophysical Logging Program

The new wells were gamma logged to aid with lithologic correlation and interpretation of soil strata across the site. A gamma log provides a continuous record of the total natural gamma radiation (photo emissions) of soil and rock strata detected adjacent to a borehole or well. Gamma radiation found in soil and rock strata is generated by the radioactive decay of potassium 40, uranium 238 and thorium 232. A gamma log most often indicates increasing radiation as the content of potassium-rich clay increases in soil or rock. As a result, clays, claystones, and shales can be distinguished from quartz sands, sandstones or carbonate rocks such as dolomite or limestone by examining the relative difference in gamma counts per second (cps). Gamma logs can then be compared to each other and utilized for determining and correlating the underlying stratigraphy across the study area.

Borehole geophysics conducted at each well location used natural gamma radiation, which can be collected through the existing well casing since other geophysical method conditions could not be met like the open hole requirements of caliper logging or the open hole filled with water or drilling fluid requirements (i.e., electric, caliper, resistivity spontaneous potential, etc.). The gamma logging in this investigation utilized a portable Mount Sopris Model 5MXA-1000 Matrix Acquisition Console. This unit includes a 200-meter mini-motorized winch and a digital interface. The probe used in conjunction with this system was a Mount Sopris Model 2PGA-1000 Poly-Gamma Probe. The logger was operated from the back of the field vehicle and powered by a portable generator. In addition, LoggerSuite Software (Version 13.6.1) was utilized during data acquisition to display and save data in the field while data was collected. WellCad (Version 5.8) Software was used to process the data and format to other software for presentation and data interpretation.

Geophysical Logging Procedure

Gamma logging was completed within the casing/screen of the new wells. The logging procedure began by setting up a winch and tri-pod system to guide the probe and cable. The probe was then placed inside the well casing and referenced to ground surface. The data acquisition program was then activated and logging parameters, including the starting reference depth were entered. The probe was then lowered to the bottom of the well while monitoring the data to ensure a gamma response was indicated. Data was recorded as the probe was being lowered down the well and as the probe was raised from the bottom of the well. Logging speed was conducted at a standard rate of approximately 15 feet per minute. The depth digitized interval (frequency per reading) for logging was 0.16 feet. The depth digitized interval used

during the 2022 geophysical program was 0.03 feet. At the completion of the logging process, a field plot of the data was reviewed and evaluated for correlation with available geologic information. Stored data files were saved for further processing following the field investigation.

Geophysics Logging Documentation

Data files stored during the field investigation were processed following the field investigation using WellCad (Version 5.8) Software. The data was processed and formatted to other software such as gINT and AutoCAD for presentation and data interpretation. On the logs, the relatively high or low gamma counts produce high or low spikes, which can typically be traced from one log to another by identifying similar gamma spikes with the context of similar vertical sequences. These laterally traceable spikes are called marker horizons, and in some cases, they may be traced (or correlated) over great distances before they become obscure. For the purposes of this study, five marker horizons, designated in ascending order as H1 through H5, were selected as illustrated on geologic cross-sections. Natural gamma radiation logs and gamma log marker horizons were added to existing soil boring logs and are provided within **Attachment F**. Note, that the frequency per reading was more frequent during the 2022 geophysics compared to the 2024; therefore, the gamma logs between the events look slightly different but marker horizons were still able to be identified during both events.

IN-FIELD HYDRAULIC CONDUCTIVITY ANALYSIS

NR 512.09(4)(d) Wisconsin Administrative Code requires that an in-field test be conducted on each well to determine the in-situ hydraulic conductivity as part of the feasibility study for landfill development. To fulfill this requirement, SEH field staff completed in-field hydraulic conductivity analysis at the five new monitoring wells and piezometers (MW-16Z, MW-18WT, MW-18, MW-19, and MW-19Z) and on one existing monitoring well (MW-5A) as a control on September 25, 2024. Aqtesolv® data analysis is detailed in **Attachment G**. A summary of hydraulic conductivities from the 2024 in-field testing is provided in **Table 3**.

In-Field Data Collection

The data collection process for hydraulic conductivity analysis was performed using in-field single well aquifer response tests, specifically through the use of slug tests. A slug test consists of displacing a volume of water in a well and monitoring the recovery of the aquifer to the pre-stressed condition. The insertion or removal of a slug tool from a well is equivalent to displacing an equal volume of water. By monitoring the transient water level in the well, it is possible to estimate the conductivity immediately surrounding the sand pack.

The slug tool used to displace water in the monitoring wells was a nominal 1.5-inch by 48-inch Solid H_(o) Slug® designed by Midwest Geosciences Group. This water-tight assembly will displace approximately 24 inches of water in a 2-inch diameter monitoring well. The water elevation and time required for the well to dissipate the water and return to the initial static level was measured using an In-Situ pressure transducer (vented Level TROLL 700 Data Logger with wireless TROLL com). The unit provides uninterrupted, real-time water level monitoring using a pressure sensor when submerged at a fixed level under the water surface and measures the equivalent hydrostatic pressure of the water above the sensor diaphragm to calculate the total water depth. Water elevation readings were collected at half second intervals.

The pressure transducer was set at a depth greater than the slug was lowered, taking care not to set the transducer on the bottom of the well. The transducer was secured in place (using tape, hose clamps,

twine, etc.) with care being taken not to pinch the lead to the pressure transducer. Once in place, the pressure transducer was checked via monitoring the water column readings above the transducer on the wireless TROLL com through Bluetooth to the VuSitu Phone application. Prior to insertion of the slug, measurements of the water column were taken in the well to ensure the water level was at equilibrium and to check for background fluctuations in the water column.

The decontaminated slug was submerged into the water as quickly as possible, without dropping, as the impact on the water surface may damage the pressure transducer or create oscillations in the water level. Once in place, the slug was secured so it did not move. This was considered the "falling head" phase of the slug test, as the transducer measured the rate at which the water level took to return to the initial static elevation before the insertion of the slug.

After the well had dissipated at least 90 percent of the water deflected as part of the falling head phase of the test, the slug was removed from the well as quickly as it was submerged to initiate the "rising head" phase of the slug test. This created a drop in water level and the transducer measured the rate at which the water level in the well took to recover to the initial static water level before the start of the test. This rising head phase of the test was considered complete after the water in the well has recovered to at least 90 percent of its pre-stressed level. The data logger was set up to record water levels during the recovery phase of the test at the same schedule as the dissipation phase of the test was recorded (at 0.5 second intervals).

Post Collection Analysis of Field Data

The data collected from each, rising head and falling head, slug test (performed at the six monitoring wells and piezometers listed above) was downloaded from the VuSitu application. Results from the slug tests were analyzed within Aqtesolv® Aquifer Data Analysis software.

The Bower and Rice (1976) mathematical solution within Aqtesolv® was utilized in determining hydraulic conductivity for all slug tests. This solution allowed for a correction for the effective porosity of the filter pack when screened across the water table. Curve matching solutions accounted for double-straight line effects for wells screened across the water table and additionally matched to the recommended normalized head ranges for each method's straight-line match.

The purpose of these simulated 2-D groundwater models was to approximate hydraulic conductivity values for the near vicinity geologic material. Results for all tests are depicted in **Attachment G**.

2024 Results

A summary of hydraulic conductivities from the 2024 in-field testing is provided in **Table 3**. All wells analyzed for hydraulic conductivity during the 2024 investigation were screened within dolostone or sandstone bedrock.

As discussed above, both Rising Head and Falling Head slug tests were performed as part of the 2024 hydraulic conductivity analysis. Comparison of the two tests at each well/piezometer generally produced hydraulic conductivity values that were within acceptable ranges of each other and therefore, all results are presented on **Table 3**. Comparison of slug tests completed during 2024 across the site gives a hydraulic conductivity range of $6.67\text{E-}2$ cm/sec (MW-1R) to $2.43\text{E-}5$ cm/sec (MW-17WT), indicating some heterogeneities within the bedrock. After review of the soil boring log for MW-1R, the high hydraulic conductivity may be due to the fracture zone noted immediately below the monitoring well screen. The

lower hydraulic conductivity at MW-17WT in most likely due to the clayey sandstone that the well is screened within.

Slug tests were performed on well MW-5A during 1998 and tested again in 2024 for comparison. The 2024 result for the Rising Head test was an order of magnitude higher at $3.98\text{E-}03$ cm/sec compared to 1998 result of $3.64\text{E-}04$ cm/sec. Due to newer technology, the 2024 slug test data and analysis are considered more representative of hydraulic conductivity for the vicinity of well MW-5A.

BASELINE WATER ELEVATION MONITORING

Groundwater level measurements and sampling activities for the proposed expansion were performed in accordance with NR512.09(4)(f) and NR512.09(4)(g). Due to the special circumstances, only two round of water levels were collected within the newly installed wells prior to the Feasibility Report Addendum 01 was submitted. The remaining required events will be collected prior to the Plan of Operation submittal. Depth-to-water measurements were collected using an electronic water level indicator and were recorded to the nearest 0.01 foot. For baseline water elevations, water level measurements were taken on August 27, 2024, and October 2, 2024. Water levels were collected from all existing wells for the entire solid waste facility. Depth-to-water measurements recorded in the field were used to calculate groundwater elevations. All available water elevation data collected over the past five years for all monitoring wells and piezometers at the site are provided on **Table 4**. A map showing the location of all site monitoring wells is provide on **Plan Sheet 3**. The field form for water level monitoring is provided within **Attachment H**.

The groundwater elevations calculated for water table wells and piezometers were used to establish groundwater flow direction, vertical and horizontal gradients, and the position of the water table. Both groundwater monitoring events completed in 2024 are illustrated on groundwater contour maps. The perched water table maps for both events are provided on **Figure 1** and **Figure 2**. The regional water table maps are provided on **Figure 3** and **Figure 4**. The upper potentiometric maps are provided within **Figure 5** and **Figure 6**. These groundwater contour maps are discussed in further detail within **Section 4.3.5**, **Section 4.3.6**, and **Section 4.3.7** of the Feasibility Report Addendum 01.

DRILLING WATER AND POST WELL DEVELOPMENT ANALYSIS

Water used during drilling, decontamination, and well development was obtained from Vernon County Highway Department. Samples of the water source were tested for the parameters required by NR507.18. No volatile organic compounds were detected within the drilling water. Hardness as calcium carbonate was detected at 170 mg/L. Analytical results for water source are provided in **Attachment H**.

Post well development water samples were collected and analyzed for TSS and COD in accordance with NR507. The analytical results for the post well development water samples are included on the well development forms included in **Attachment E** and within the laboratory reports provided within **Attachment I**.

BASELINE GROUNDWATER MONITORING

Due to the circumstances, only two round of baseline groundwater monitoring were collected within the newly installed wells prior to the Feasibility Report Addendum 01 was submitted. The remaining required events will be collected prior to the Plan of Operation submittal.

Baseline groundwater monitoring was completed at the one perched water table monitoring wells (MW-18WT), two regional monitoring wells (MW-18 and MW-19), and two piezometers (MW-16Z and MW-19Z). These five wells were sampled on August 27, 2024, and October 2, 2024.

Groundwater samples collected from the monitoring wells and piezometers used for observation for the landfill expansion were analyzed per NR507.17 and NR507.18 requirements for the baseline and detection monitoring parameters (summarized in NR507 and NR503) for landfills accepting municipal solid waste and construction and demolition material. VOCs were also analyzed at all monitoring locations during the baseline monitoring events. A list of the parameters utilized at each monitoring location during baseline monitoring is provided on **Table 5**. The analytical results for each monitoring location are provided on **Table 6**. The laboratory reports for the baseline groundwater quality monitoring for the proposed expansion are provided in **Attachment I** and **Attachment J**.

Additional background groundwater quality sampling events are ongoing at the proposed expansion. Once enough valid baseline monitoring samples are collected, well-specific standards will be developed, as applicable. An update on the status of well-specific standards will be provided as part of the Plan of Operation report.

SURVEY

Horizontal locations and vertical elevations (i.e., ground surface, top of casing, and top of protective casing) were surveyed for the borings and wells installed as part of the AGIP. Survey activities were performed on August 26, 2024, by SEH. Horizontal locations are referenced to the Vernon County coordinate system (Datum). The grid system is based in the southwest and southeast $\frac{1}{4}$ of Section 15, T13N, R4W, City of Viroqua, Vernon County, Wisconsin. Vertical elevations are referenced to feet above mean sea level (NAVD88(2011)) datum. Elevations and horizontal locations were measured to 0.01 feet. Final survey elevations for 2024 soil borings and 2024 wells are shown on **Table 1** and **Table 2**, respectively.

TABLES

Table 1 – 2024 Soil Boring Summary

Table 2 – 2024 Monitoring Well Installation Summary

Table 3 – 2024 In-Field Hydraulic Conductivity Summary

Table 4 – Groundwater Elevations (2020-2024)

Table 5 – Baseline Monitoring Parameters

Table 6 – Baseline Monitoring Results

ATTACHMENTS

Attachment A – 2024 Soil Boring Logs

Attachment B – 2024 Abandonment Form

Attachment C – Photographs of 2024 Soil Samples

Attachment D – 2024 Well Construction Logs

Attachment E – 2024 Well Development Forms

Attachment F – 2024 Geophysics Boring Logs

Attachment G – 2024 In-Field Hydraulic Conductivity Results

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November 4, 2024
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Attachment H – 2024 Water Level Monitoring Field Form

Attachment I – August 27, 2024, Laboratory Report

Attachment J – October 2, 2024, Laboratory Report

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appendix\draft\2024 field procedures memo.docx

Tables

- Table 1 - 2024 Soil Boring Summary
- Table 2 - 2024 Monitoring Well Installation Summary
- Table 3 - 2024 In-Field Hydraulic Conductivity Summary
- Table 4 - Groundwater Elevations (2020-2024)
- Table 5 - Baseline Monitoring Parameters
- Table 6 - Baseline Monitoring Results

Table 1
2024 Soil Boring Summary
Vernon County Landfill - Proposed Eastern Expansion

Boring ID	Coordinates*		Ground Surface Elevation (feet NAVD)	Depth to Bedrock (feet bgs)	Bedrock Elevation (feet NAVD)	Subbase Elevation (feet NAVD)	Total Depth of Boring (feet bgs)	Bottom Elevation of Boring (feet NAVD)
	Northing	Easting						
B-22	1746386.4	583056.1	1225.6	55.0	1170.6	1210	105.0	1120.6
MW-16Z	1746679.1	583168.4	1184.5	79.0	1105.5	outside	120.0	1064.5
MW-18WT	1746690.8	583413.3	1210.1	87.0	1123.1	outside	87.0	1123.1
MW-18	583413.3	583407.8	1209.8	87.0	1122.8	outside	117.0	1092.8
MW-19	1746831.1	582931.4	1190.5	28.0	1162.5	outside	103.0	1087.5
MW-19Z	1746831.5	582939.8	1190.2	28.0	1162.2	outside	130.0	1060.2

Notes:

- bgs - Below ground surface.
- NE - Not encountered.

Table 2
2024 Monitoring Well Installation Summary
Vernon County Landfill - Proposed Eastern Expansion

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NAVD)	Top of Casing Elevation (feet NAVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NAVD)	Monitoring Point	Screened Geologic Unit
135	MW-16Z	08/06/24	1184.54	1186.50	120.0	5.0	1066.5 - 1071.5	Piezometer, Upper Zone	weathered sandy dolostone
137	MW-18WT	08/02/24	1210.06	1212.241	87.0	10.0	1125.2 - 1135.2	Perched Water Table	weathered sandy dolostone
139	MW-18	07/31/24	1209.78	1211.995	117.0	10.0	1095.0 - 1105.0	Regional Water Table	sandy dolostone
141	MW-19	08/13/24	1190.55	1192.818	103.0	10.0	1089.8 - 1099.8	Regional Water Table	sandstone
143	MW-19Z	08/09/24	1190.23	1192.342	130.0	5.0	1062.3 - 1067.3	Piezometer, Upper Zone	clayey sandstone

Notes:

bgs - below ground surface.

Table 3
2024 In-Field Hydraulic Conductivity Summary
Vernon County Landfill - Proposed Eastern Expansion

Monitoring Well ID	Well Type/ Groundwater Zone	Screened Geologic Unit	Test Type	Method	Screened Elevation (feet NAVD)	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
MW-5A	Perched Water Table	dolostone, hard	Falling Head	Bouwer-Rice	1122.9-1137.9	1.09E-03	3.08
MW-5A	Perched Water Table	dolostone, hard	Rising Head	Bouwer-Rice	1122.9-1137.9	3.98E-03	11.28
MW-16Z	Piezometer, Upper Zone	weathered sandy dolostone	Falling Head	Bouwer-Rice	1066.5-1071.5	2.77E-03	7.86
MW-16Z	Piezometer, Upper Zone	weathered sandy dolostone	Rising Head	Bouwer-Rice	1066.5-1071.5	1.07E-04	0.30
MW-18WT	Perched Water Table	weathered sandy dolostone	Falling Head	Bouwer-Rice	1125.2-1135.2	1.66E-03	4.71
MW-18WT	Perched Water Table	weathered sandy dolostone	Rising Head	Bouwer-Rice	1125.2-1135.2	2.34E-03	6.62
MW-18	Regional Water Table	sandy dolostone	Falling Head	Bouwer-Rice	1095.0-1105.0	2.66E-04	0.75
MW-18	Regional Water Table	sandy dolostone	Rising Head	Bouwer-Rice	1095.0-1105.0	2.07E-04	0.59
MW-19	Regional Water Table	sandstone	Falling Head	Bouwer-Rice	1089.8-1099.8	1.08E-04	0.31
MW-19	Regional Water Table	sandstone	Rising Head	Bouwer-Rice	1089.8-1099.8	1.04E-04	0.29
MW-19Z	Piezometer, Upper Zone	clayey sandstone	Falling Head	Bouwer-Rice	1062.3-1067.3	5.72E-04	1.62
MW-19Z	Piezometer, Upper Zone	clayey sandstone	Rising Head	Bouwer-Rice	1062.3-1067.3	2.13E-04	0.60
Average:						1.12E-03	3.17
Geometric Mean:						5.18E-04	1.47
Minimum:						1.04E-04	0.29
Maximum:						3.98E-03	11.28

Notes:

- All of the tests performed were "slug tests".
- All tests completed on September 25, 2024.
- cm/sec - centimeters per second.
- ft/day - feet per day.

Table 4
Existing Static Water Elevations for Landfill Property (2020-2024)
Vernon County Landfill - Proposed Eastern Expansion

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NAVD)	Top of Casing Elevation (feet NAVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NAVD)	Well Type/ Groundwater Zone	Static Water Elevation by Date (feet NAVD)																
									3/9/2020	9/14/2020	3/1/2021	9/1/2021	3/1/2022	9/22/2022	12/20/2022	1/24/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023	9/11/2023	3/11/2024	8/27/2024	10/2/2024	
102	MW-1P	12/30/1987	1236.4	1238.41	111.1	10.0	1125.4 - 1135.4	Perched Water Table	1132.6	1132.56	1131.67	1131.76	1131.42	1130.90	1130.02	1131.71	1131.70	1131.59	1131.98	1132.64	1132.58	1132.85	1132.63	1132.43	
101	MW-1	12/30/1987	1236.4	1238.11	158.0	10.0	1078.5 - 1088.5	Regional Water Table	1103.09	1102.14	1096.58	1093.67	1091.85	1089.95	1089.70	1089.62	1089.62	1090.36	1092.19	1094.43	1093.24	1089.42	1090.20	1090.17	
121	MW-1PR	1/12/1994	1245.0	1247.61	127.7	15.0	1119.9 - 1134.9	Perched Water Table	1135.4	1135.22	1134.80	1134.34	1134.23	1133.50	1134.07	1134.04	1134.22	1134.14	1134.72	1134.97	1134.09	1133.50	1134.47	1134.35	
120	MW-1R	1/12/1994	1244.6	1247.25	164.6	15.0	1082.6 - 1097.6	Regional Water Table	1102.97	1102.03	1096.50	1093.58	1091.81	1089.95	1090.85	1090.60	1089.61	1090.36	1092.13	1094.46	1093.06	1088.64	1090.46	1090.48	
123	MW-1RZ	3/12/2003	1244.0	1245.45	186.5	5.0	1057.5 - 1062.5	Piezometer, Upper Zone	1102.54	1101.58	1096.12	1093.19	1091.28	1089.51	1088.33	1089.11	1089.15	1089.84	1090.72	1093.86	1092.61	1088.21	1089.86	1089.43	
104	MW-2P	1/17/1988	1252.5	1254.88	124.8	10.0	1128.0 - 1138.0	Perched Water Table	1141.03	1140.76	1139.87	1139.39	1139.33	1138.79	1138.81	1138.45	1139.36	1139.24	1139.98	1141.11	1139.41	1138.69	1138.98	1139.65	
103	MW-2	1/17/1988	1252.5	1254.35	174.6	10.0	1078.3 - 1088.3	Regional Water Table	1095.32	1094.86	1091.56	1089.58	1087.79	1085.92	1086.19	1085.23	1086.01	1086.60	1087.51	1090.35	1089.29	1085.27	1086.88	1086.37	
105	MW-3	2/2/1988	1233.0	1235.25	180.0	5.0	1053.2 - 1058.2	Piezometer, Upper Zone	1080.42	1080.22	1076.06	1073.14	1070.69	1069.14	1068.69	1068.66	1068.69	1069.06	1069.19	1071.08	NM	1068.83	1068.90	1068.30	
107	MW-4P	1/29/1988	1232.9	1235.19	95.0	10.0	1138.3 - 1148.3	Perched Water Table	1150.88	1151.96	1149.32	1149.32	1148.16	1148.92	1147.07	1146.72	1148.30	1148.18	1148.24	1151.19	1149.58	1147.14	1150.67	1149.96	
109	MW-5A	11/8/1989	1224.0	1225.81	103.3	15.0	1122.9 - 1137.9	Perched Water Table	1137.72	1138.27	1136.34	1135.86	1135.52	1135.74	1134.78	1134.27	1134.29	1135.12	1135.58	1136.90	1135.73	1135.52	1135.50	1135.29	
108	MW-5	2/17/1988	1223.3	1225.32	150.6	10.0	1072.6 - 1082.6	Regional Water Table	1085.93	1086.23	1084.59	1084.36	1083.94	1084.05	1081.46	1082.51	1082.60	1083.14	1083.50	1086.28	1084.20	1083.29	1083.31	1082.90	
110	MW-6	1/12/1900	1233.0	1235.37	202.2	5.0	1025.7 - 1030.7	Piezometer, Lower Zone	1073.88	1073.53	1069.39	1067.35	1065.30	1063.84	1062.81	1062.48	1062.35	1062.48	1062.25	1063.27	1066.09	1062.71	1064.13	1063.81	
111	MW-7	11/7/1989	1255.7	1258.03	234.5	5.0	1023.5 - 1028.5	Piezometer, Lower Zone	1079.32	1078.89	1074.92	1072.83	1070.92	1069.39	1069.50	1068.20	1069.34	1074.93	1069.71	1070.14	1071.57	1068.29	1069.56	1069.25	
112	MW-8R	11/13/1989	1256.1	1258.84	202.5	15.0	1056.3 - 1071.3	Piezometer, Upper Zone	1087.42	1086.93	1082.78	1079.31	1077.00	1075.30	1076.74	1075.12	1075.04	1075.74	1076.15	1079.52	1078.77	1074.93	1077.32	1077.24	
113	MW-9	8/29/1989	1255.4	1257.50	126.8	15.0	1130.7 - 1145.7	Perched Water Table	1140.92	1141.14	1140.16	1139.74	1139.22	1138.73	1139.07	1139.25	1139.35	1139.24	1139.13	1139.79	1139.65	1138.94	1145.25	1143.16	
114	MW-10	9/15/1989	1215.6	1217.52	183.5	5.0	1034.0 - 1039.0	Piezometer, Lower Zone	1098.09	1096.89	1090.39	1086.65	1084.18	1082.08	1083.12	1081.66	1080.14	1082.75	1081.73	1086.63	1085.79	1080.78	1081.67	1081.25	
115	MW-11	9/29/1989	1216.4	1218.56	162.5	15.0	1056.0 - 1071.0	Piezometer, Upper Zone	1100.85	1102.01	1093.69	1089.81	1089.22	1085.59	1086.25	1086.73	1086.75	1087.68	1090.31	1092.04	1189.51	1084.33	1087.06	1087.21	
116	MW-12	9/22/1989	1216.4	1218.36	98.5	15.0	1119.9 - 1134.9	Perched Water Table	1132.29	1132.13	1130.62	1130.50	1129.69	1130.45	1128.48	1130.17	1130.87	1131.77	1133.62	1133.71	1130.34	1129.07	1132.66	1132.02	
117	MW-13P	2/26/2003	1224.5	1227.42	102.4	15.0	1122.1 - 1137.1	Perched Water Table	1134.6	1134.56	1134.00	1133.64	1133.46	1132.81	1133.40	1133.40	1133.21	1133.60	1134.40	1134.33	1133.34	1132.76	1133.89	1133.53	
125	MW-14WT	9/20/2022	1247.2	1249.70	106.0	15.0	1141.2 - 1156.2	Perched Water Table	--	--	--	--	--	--	1141.87	1146.01	1145.92	1146.67	1146.77	1146.98	NM	NM	1146.52	1146.16	
118	MW-14	3/12/2003	1247.5	1249.69	186.1	15.0	1061.4 - 1076.4	Regional Water Table	1086.34	1086.00	1081.36	1077.76	1075.24	1073.32	1073.63	1072.80	1072.54	1073.44	1073.91	1077.46	1076.76	1072.71	1074.77	1074.63	
119	MW-14Z	3/7/2003	1247.5	1250.22	210.8	5.0	1036.7 - 1041.7	Piezometer, Lower Zone	1082.78	1083.11	1078.69	1073.19	1072.26	1071.89	1071.20	1071.17	1071.09	1071.30	1071.96	1072.58	1075.15	1068.74	1072.01	1071.80	
127	MW-15WT	9/28/2022	1220.6	1223.24	85.0	10.0	1135.6 - 1145.6	Perched Water Table	--	--	--	--	--	--	DRY	DRY	DRY	DRY	DRY	DRY	NM	NM	DRY	DRY	
129	MW-16WT	9/21/2022	1184.7	1187.41	75.0	10.0	1109.7 - 1119.7	Perched Water Table	--	--	--	--	--	--	DRY	DRY	DRY	DRY	DRY	DRY	NM	NM	DRY	DRY	
131	MW-16	8/25/2022	1184.3	1186.92	97.0	5.0	1087.3 - 1092.3	Regional Water Table	--	--	--	--	--	--	1093.09*	1101.68	1102.48	1104.29	1104.38	1107.62	NM	NM	1099.47	1099.37	
135	MW-16Z	8/13/2024	1184.5	1186.503	120.0	5.0	1064.5 - 1069.5	Piezometer, Upper Zone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1093.88	1093.94	
133	MW-17WT	9/26/2022	1196.4	1199.18	92.0	10.0	1104.4 - 1114.4	Perched Water Table	--	--	--	--	--	--	1116.64	1117.78	FROZEN	1121.62	1124.88	1122.04	NM	NM	1120.55	1119.75	
137	MW-18WT	8/6/2024	1210.1	1212.241	87.0	10.0	1123.1 - 1133.1	Perched Water Table	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1130.15	1132.41
139	MW-18	7/31/2024	1209.8	1211.995	117.0	10.0	1092.8 - 1102.8	Regional Water Table	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1104.35	1104.20
141	MW-19	8/8/2024	1190.5	1192.818	103.0	10.0	1087.5 - 1097.5	Regional Water Table	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1095.60	1092.96
143	MW-19Z	8/12/2024	1190.2	1192.342	130.0	5.0	1060.2 - 1065.2	Piezometer, Upper Zone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1094.04	1093.77

Notes:

- NM - Not measured.
- - Data not available due to monitoring point not yet installed.
- * - Groundwater elevation not representative due to well still stabilizing post-well development.
- BOLD** -Monitoring well or piezometer used in monitoring of the proposed landfill expansion area.

Table 5
Analytical Parameters included in Baseline Monitoring
Vernon County Landfill - Proposed Eastern Expansion

Analytical Parameters					
	MW-16Z	MW-18WT	MW-18	MW-19	MW-19Z
Baseline/Detection					
Alkalinity	x	x	x	x	x
Chloride	x	x	x	x	x
Hardness	x	x	x	x	x
Conductivity (field)	x	x	x	x	x
pH (field)	x	x	x	x	x
Temperature (field)	x	x	x	x	x
Public Welfare					
Copper	x	x	x	x	x
Manganese	x	x	x	x	x
Sulfate	x	x	x	x	x
Zinc	x	x	x	x	x
Public Health					
Arsenic	x	x	x	x	x
Barium	x	x	x	x	x
Cadmium	x	x	x	x	x
Chromium	x	x	x	x	x
Flouride	x	x	x	x	x
Lead	x	x	x	x	x
Mercury	x	x	x	x	x
N+N	x	x	x	x	x
Selenium	x	x	x	x	x
Silver	x	x	x	x	x
Boron	x	x	x	x	x
Other					
VOCs (8260)	x	x	x	x	x

Notes:

x	- Parameter is analyzed for.

Table 6
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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-16Z

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
			MW-16Z	
	PAL	ES	8/27/2024	10/2/2024
VOCs (ug/L)				
1,1,1,2-Tetrachloroethane	7	70	<0.67	<0.67
1,1,1-Trichloroethane	40	200	<0.45	<0.45
1,1,2,2-Tetrachloroethane	0.02	0.2	<0.65	<0.65
1,1,2-Trichloroethane	0.5	5	<0.73	<0.73
1,1-Dichloroethane	85	850	<0.36	<0.36
1,1-Dichloroethene	0.7	7	<0.48	<0.48
1,1-Dichloropropene	NE	NE	<0.33	<0.33
1,2,3-Trichlorobenzene	NE	NE	<0.35	<0.35
1,2,3-Trichloropropane	12	60	<1.5	<1.5
1,2,4-Trichlorobenzene	14	70	<0.31	<0.31
1,2,4-Trimethylbenzene	96	480	<0.3	<0.3
1,2-Dibromo-3-Chloropropane	0.02	0.2	<3.9	<3.9
1,2-Dibromoethane (EDB)	0.01	0.05	<0.56	<0.56
1,2-Dichlorobenzene	60	600	<0.48	<0.48
1,2-Dichloroethane	0.5	5	<0.58	<0.58
1,2-Dichloropropane	0.5	5	<0.37	<0.37
1,3,5-Trimethylbenzene	96	480	<0.29	<0.29
1,3-Dichlorobenzene	120	600	<0.41	<0.41
1,3-Dichloropropane	NE	NE	<0.56	<0.56
1,4-Dichlorobenzene	15	75	<0.45	<0.45
2,2-Dichloropropane	NE	NE	<0.48	<0.48
2-Butanone (MEK)	800	4000	<2.3	<2.3
2-Chlorotoluene	NE	NE	<0.36	<0.36
4-Chlorotoluene	NE	NE	<0.34	<0.34
Acetone	1800	9000	<4.3	<4.3
Benzene	0.5	5	<0.18	<0.18
Bromobenzene	NE	NE	<0.6	<0.6
Bromochloromethane	NE	NE	<0.5	<0.5
Bromodichloromethane	0.06	0.6	<0.57	<0.57
Bromoform	0.44	4.4	<0.96	<0.96
Bromomethane	1	10	<1.8	<1.8
Carbon disulfide	200	1000	<1.1	<1.1
Carbon tetrachloride	0.5	5	<0.41	<0.41
Chlorobenzene	20	100	<0.41	<0.41
Chlorodibromomethane	6	60	<0.83	<0.83
Chloroethane	80	400	<0.47	<0.47
Chloroform	0.6	6	<0.92	<0.92
Chloromethane	3	30	<0.79	<0.79
cis-1,2-Dichloroethene	7	70	<0.42	<0.42
cis-1,3-Dichloropropene	NE	NE	<0.52	<0.52
Dibromomethane	NE	NE	<0.58	<0.58
Dichlorodifluoromethane	200	1000	<1.8	<1.8
Ethylbenzene	140	700	<0.2	<0.2
Hexachlorobutadiene	NE	NE	<0.54	<0.54
Isopropyl ether	NE	NE	<0.38	<0.38
Isopropylbenzene	NE	NE	<0.29	<0.29
Methyl tert-butyl ether	12	60	<0.43	<0.43
Methylene Chloride	0.5	5	<3.6	<3.6
Naphthalene	10	100	<0.44	<0.44
n-Butylbenzene	NE	NE	<0.33	<0.33
N-Propylbenzene	NE	NE	<0.32	<0.32
p-Isopropyltoluene	NE	NE	<0.29	<0.29
sec-Butylbenzene	NE	NE	<0.27	<0.27
Styrene	10	100	<0.31	<0.31
tert-Butylbenzene	NE	NE	<0.26	<0.26
Tetrachloroethene	0.5	5	<0.39	<0.39
Tetrahydrofuran	10	50	<3.9	<3.9
Toluene	160	800	<0.21	<0.21
trans-1,2-Dichloroethene	20	100	<0.44	<0.44
trans-1,3-Dichloropropene	NE	NE	<0.63	<0.63
Trichloroethene	0.5	5	<0.15	<0.15
Trichlorofluoromethane	698	3490	<0.44	<0.44
Vinyl chloride	0.02	0.2	<0.47	<0.47
Xylenes, Total	400	2000	<0.3	<0.3

Table 6
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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-16Z

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
			MW-16Z	
	PAL	ES	8/27/2024	10/2/2024
Inorganics				
Alkalinity - mg/L	NE	NE	300	310
Arsenic - ug/L	1	10	0.25	0.23
Barium - ug/L	400	2000	98	74
Boron - mg/L	0.2	1	0.024	0.045
Cadmium - ug/L	0.5	5	<0.17	0.5
Chloride - mg/L	125	250	9	10
Chromium - ug/L	10	100	<1.1	<1.1
Copper - ug/L	130	1300	1.9	2.7
Fluoride - mg/L	0.8	4	<0.19	<0.19
Hardness as calcium carbonate - mg/L	NE	NE	320	340
Lead - ug/L	1.5	15	<0.19	0.23
Manganese - ug/L	60	300	530	71
Mercury - ug/L	0.2	2	<0.076	<0.076
Nitrate Nitrite as N - mg/L	2	10	1	0.087
Selenium - ug/L	10	50	<0.98	<0.98
Silver - ug/L	10	50	<0.12	<0.12
Sulfate - mg/L	125	250	12	11
Zinc - ug/L	250	500	<6.9	92
Field Parameters				
Depth to Water (ft from MP)	NE	NE	92.62	92.56
Field Conductivity	NE	NE	540	606
Field pH	NE	NE	7.52	7.49
Field Temperature	NE	NE	14.4	10.3

Notes:

NE: No standard established.

< : Indicates the analyte was analyzed for but not detected above the detection limit.

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

Table 6
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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-18WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
			MW-18WT	
	PAL	ES	8/27/2024	10/2/2024
VOCs (ug/L)				
1,1,1,2-Tetrachloroethane	7	70	<0.67	<0.67
1,1,1-Trichloroethane	40	200	<0.45	<0.45
1,1,2,2-Tetrachloroethane	0.02	0.2	<0.65	<0.65
1,1,2-Trichloroethane	0.5	5	<0.73	<0.73
1,1-Dichloroethane	85	850	<0.36	<0.36
1,1-Dichloroethene	0.7	7	<0.48	<0.48
1,1-Dichloropropene	NE	NE	<0.33	<0.33
1,2,3-Trichlorobenzene	NE	NE	<0.35	<0.35
1,2,3-Trichloropropane	12	60	<1.5	<1.5
1,2,4-Trichlorobenzene	14	70	<0.31	<0.31
1,2,4-Trimethylbenzene	96	480	<0.3	<0.3
1,2-Dibromo-3-Chloropropane	0.02	0.2	<3.9	<3.9
1,2-Dibromoethane (EDB)	0.01	0.05	<0.56	<0.56
1,2-Dichlorobenzene	60	600	<0.48	<0.48
1,2-Dichloroethane	0.5	5	<0.58	<0.58
1,2-Dichloropropane	0.5	5	<0.37	<0.37
1,3,5-Trimethylbenzene	96	480	<0.29	<0.29
1,3-Dichlorobenzene	120	600	<0.41	<0.41
1,3-Dichloropropane	NE	NE	<0.56	<0.56
1,4-Dichlorobenzene	15	75	<0.45	<0.45
2,2-Dichloropropane	NE	NE	<0.48	<0.48
2-Butanone (MEK)	800	4000	<2.3	<2.3
2-Chlorotoluene	NE	NE	<0.36	<0.36
4-Chlorotoluene	NE	NE	<0.34	<0.34
Acetone	1800	9000	<4.3	<4.3
Benzene	0.5	5	<0.18	<0.18
Bromobenzene	NE	NE	<0.6	<0.6
Bromochloromethane	NE	NE	<0.5	<0.5
Bromodichloromethane	0.06	0.6	<0.57	<0.57
Bromoform	0.44	4.4	<0.96	<0.96
Bromomethane	1	10	<1.8	<1.8
Carbon disulfide	200	1000	<1.1	<1.1
Carbon tetrachloride	0.5	5	<0.41	<0.41
Chlorobenzene	20	100	<0.41	<0.41
Chlorodibromomethane	6	60	<0.83	<0.83
Chloroethane	80	400	<0.47	<0.47
Chloroform	0.6	6	<0.92	<0.92
Chloromethane	3	30	<0.79	<0.79
cis-1,2-Dichloroethene	7	70	<0.42	<0.42
cis-1,3-Dichloropropene	NE	NE	<0.52	<0.52
Dibromomethane	NE	NE	<0.58	<0.58
Dichlorodifluoromethane	200	1000	<1.8	<1.8
Ethylbenzene	140	700	<0.2	<0.2
Hexachlorobutadiene	NE	NE	<0.54	<0.54
Isopropyl ether	NE	NE	<0.38	<0.38
Isopropylbenzene	NE	NE	<0.29	<0.29
Methyl tert-butyl ether	12	60	<0.43	<0.43
Methylene Chloride	0.5	5	<3.6	<3.6
Naphthalene	10	100	<0.44	<0.44
n-Butylbenzene	NE	NE	<0.33	<0.33
N-Propylbenzene	NE	NE	<0.32	<0.32
p-Isopropyltoluene	NE	NE	<0.29	<0.29
sec-Butylbenzene	NE	NE	<0.27	<0.27
Styrene	10	100	<0.31	<0.31
tert-Butylbenzene	NE	NE	<0.26	<0.26
Tetrachloroethene	0.5	5	<0.39	<0.39
Tetrahydrofuran	10	50	<3.9	<3.9
Toluene	160	800	<0.21	<0.21
trans-1,2-Dichloroethene	20	100	<0.44	<0.44
trans-1,3-Dichloropropene	NE	NE	<0.63	<0.63
Trichloroethene	0.5	5	<0.15	<0.15
Trichlorofluoromethane	698	3490	<0.44	<0.44
Vinyl chloride	0.02	0.2	<0.47	<0.47
Xylenes, Total	400	2000	<0.3	<0.3

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-18WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
			MW-18WT	
	PAL	ES	8/27/2024	10/2/2024
Inorganics				
Alkalinity - mg/L	NE	NE	280	280
Arsenic - ug/L	1	10	11	<0.23
Barium - ug/L	400	2000	210	39
Boron - mg/L	0.2	1	0.031	0.024
Cadmium - ug/L	0.5	5	0.39	<0.17
Chloride - mg/L	125	250	2.7	2.6
Chromium - ug/L	10	100	35	<1.1
Copper - ug/L	130	1300	42	<0.50
Fluoride - mg/L	0.8	4	<0.19	<0.19
Hardness as calcium carbonate - mg/L	NE	NE	640	330
Lead - ug/L	1.5	15	18	<0.19
Manganese - ug/L	60	300	1800	3.3
Mercury - ug/L	0.2	2	<0.076	<0.076
Nitrate Nitrite as N - mg/L	2	10	3.9	1.3
Selenium - ug/L	10	50	3.4	<0.98
Silver - ug/L	10	50	0.13	<0.12
Sulfate - mg/L	125	250	7.6	7.5
Zinc - ug/L	250	500	64	<6.9
Field Parameters				
Depth to Water (ft from MP)	NE	NE	82.09	79.83
Field Conductivity	NE	NE	492	540
Field pH	NE	NE	7.46	7.29
Field Temperature	NE	NE	14.8	9.7

Notes:

NE: No standard established.

< : Indicates the analyte was analyzed for but not detected above the detection limit.

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-18

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
			MW-18	
	PAL	ES	8/27/2024	10/2/2024
VOCs (ug/L)				
1,1,1,2-Tetrachloroethane	7	70	<0.67	<0.67
1,1,1-Trichloroethane	40	200	<0.45	<0.45
1,1,2,2-Tetrachloroethane	0.02	0.2	<0.65	<0.65
1,1,2-Trichloroethane	0.5	5	<0.73	<0.73
1,1-Dichloroethane	85	850	<0.36	<0.36
1,1-Dichloroethene	0.7	7	<0.48	<0.48
1,1-Dichloropropene	NE	NE	<0.33	<0.33
1,2,3-Trichlorobenzene	NE	NE	<0.35	<0.35
1,2,3-Trichloropropane	12	60	<1.5	<1.5
1,2,4-Trichlorobenzene	14	70	<0.31	<0.31
1,2,4-Trimethylbenzene	96	480	<0.3	<0.3
1,2-Dibromo-3-Chloropropane	0.02	0.2	<3.9	<3.9
1,2-Dibromoethane (EDB)	0.01	0.05	<0.56	<0.56
1,2-Dichlorobenzene	60	600	<0.48	<0.48
1,2-Dichloroethane	0.5	5	<0.58	<0.58
1,2-Dichloropropane	0.5	5	<0.37	<0.37
1,3,5-Trimethylbenzene	96	480	<0.29	<0.29
1,3-Dichlorobenzene	120	600	<0.41	<0.41
1,3-Dichloropropane	NE	NE	<0.56	<0.56
1,4-Dichlorobenzene	15	75	<0.45	<0.45
2,2-Dichloropropane	NE	NE	<0.48	<0.48
2-Butanone (MEK)	800	4000	<2.3	<2.3
2-Chlorotoluene	NE	NE	<0.36	<0.36
4-Chlorotoluene	NE	NE	<0.34	<0.34
Acetone	1800	9000	<4.3	<4.3
Benzene	0.5	5	<0.18	<0.18
Bromobenzene	NE	NE	<0.6	<0.6
Bromochloromethane	NE	NE	<0.5	<0.5
Bromodichloromethane	0.06	0.6	<0.57	<0.57
Bromoform	0.44	4.4	<0.96	<0.96
Bromomethane	1	10	<1.8	<1.8
Carbon disulfide	200	1000	<1.1	<1.1
Carbon tetrachloride	0.5	5	<0.41	<0.41
Chlorobenzene	20	100	<0.41	<0.41
Chlorodibromomethane	6	60	<0.83	<0.83
Chloroethane	80	400	<0.47	<0.47
Chloroform	0.6	6	<0.92	<0.92
Chloromethane	3	30	<0.79	<0.79
cis-1,2-Dichloroethene	7	70	<0.42	<0.42
cis-1,3-Dichloropropene	NE	NE	<0.52	<0.52
Dibromomethane	NE	NE	<0.58	<0.58
Dichlorodifluoromethane	200	1000	<1.8	<1.8
Ethylbenzene	140	700	<0.2	<0.2
Hexachlorobutadiene	NE	NE	<0.54	<0.54
Isopropyl ether	NE	NE	<0.38	<0.38
Isopropylbenzene	NE	NE	<0.29	<0.29
Methyl tert-butyl ether	12	60	<0.43	<0.43
Methylene Chloride	0.5	5	<3.6	<3.6
Naphthalene	10	100	<0.44	<0.44
n-Butylbenzene	NE	NE	<0.33	<0.33
N-Propylbenzene	NE	NE	<0.32	<0.32
p-Isopropyltoluene	NE	NE	<0.29	<0.29
sec-Butylbenzene	NE	NE	<0.27	<0.27
Styrene	10	100	<0.31	<0.31
tert-Butylbenzene	NE	NE	<0.26	<0.26
Tetrachloroethene	0.5	5	<0.39	<0.39
Tetrahydrofuran	10	50	<3.9	<3.9
Toluene	160	800	<0.21	<0.21
trans-1,2-Dichloroethene	20	100	<0.44	<0.44
trans-1,3-Dichloropropene	NE	NE	<0.63	<0.63
Trichloroethene	0.5	5	<0.15	<0.15
Trichlorofluoromethane	698	3490	<0.44	<0.44
Vinyl chloride	0.02	0.2	<0.47	<0.47
Xylenes, Total	400	2000	<0.3	<0.3

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-18

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
			MW-18	
	PAL	ES	8/27/2024	10/2/2024
Inorganics				
Alkalinity - mg/L	NE	NE	230	260
Arsenic - ug/L	1	10	<0.23	<0.23
Barium - ug/L	400	2000	38	36
Boron - mg/L	0.2	1	0.017	0.027
Cadmium - ug/L	0.5	5	<0.17	<0.17
Chloride - mg/L	125	250	4.8	4.2
Chromium - ug/L	10	100	<1.1	<1.1
Copper - ug/L	130	1300	1.4	<0.50
Fluoride - mg/L	0.8	4	<0.19	<0.19
Hardness as calcium carbonate - mg/L	NE	NE	320	320
Lead - ug/L	1.5	15	<0.19	<0.19
Manganese - ug/L	60	300	12	2.9
Mercury - ug/L	0.2	2	<0.076	<0.076
Nitrate Nitrite as N - mg/L	2	10	5.2	0.76
Selenium - ug/L	10	50	<0.98	<0.98
Silver - ug/L	10	50	<0.12	<0.12
Sulfate - mg/L	125	250	9.7	9.9
Zinc - ug/L	250	500	<6.9	<6.9
Field Parameters				
Depth to Water (ft from MP)	NE	NE	107.65	107.8
Field Conductivity	NE	NE	480	534
Field pH	NE	NE	7.43	7.63
Field Temperature	NE	NE	14.3	9.5

Notes:

NE: No standard established.

< : Indicates the analyte was analyzed for but not detected above the detection limit.

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-19

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
	PAL	ES	MW-19	
			8/27/2024	10/2/2024
VOCs (ug/L)				
1,1,1,2-Tetrachloroethane	7	70	<0.67	<0.67
1,1,1-Trichloroethane	40	200	<0.45	<0.45
1,1,2,2-Tetrachloroethane	0.02	0.2	<0.65	<0.65
1,1,2-Trichloroethane	0.5	5	<0.73	<0.73
1,1-Dichloroethane	85	850	<0.36	<0.36
1,1-Dichloroethene	0.7	7	<0.48	<0.48
1,1-Dichloropropene	NE	NE	<0.33	<0.33
1,2,3-Trichlorobenzene	NE	NE	<0.35	<0.35
1,2,3-Trichloropropane	12	60	<1.5	<1.5
1,2,4-Trichlorobenzene	14	70	<0.31	<0.31
1,2,4-Trimethylbenzene	96	480	2.1	<0.3
1,2-Dibromo-3-Chloropropane	0.02	0.2	<3.9	<3.9
1,2-Dibromoethane (EDB)	0.01	0.05	<0.56	<0.56
1,2-Dichlorobenzene	60	600	<0.48	<0.48
1,2-Dichloroethane	0.5	5	<0.58	<0.58
1,2-Dichloropropane	0.5	5	<0.37	<0.37
1,3,5-Trimethylbenzene	96	480	0.34	<0.29
1,3-Dichlorobenzene	120	600	<0.41	<0.41
1,3-Dichloropropane	NE	NE	<0.56	<0.56
1,4-Dichlorobenzene	15	75	<0.45	<0.45
2,2-Dichloropropane	NE	NE	<0.48	<0.48
2-Butanone (MEK)	800	4000	<2.3	<2.3
2-Chlorotoluene	NE	NE	<0.36	<0.36
4-Chlorotoluene	NE	NE	<0.34	<0.34
Acetone	1800	9000	16	4.8
Benzene	0.5	5	47	0.38
Bromobenzene	NE	NE	<0.60	<0.6
Bromochloromethane	NE	NE	<0.50	<0.5
Bromodichloromethane	0.06	0.6	<0.57	<0.57
Bromoform	0.44	4.4	<0.96	<0.96
Bromomethane	1	10	<1.8	<1.8
Carbon disulfide	200	1000	<1.1	<1.1
Carbon tetrachloride	0.5	5	<0.41	<0.41
Chlorobenzene	20	100	<0.41	<0.41
Chlorodibromomethane	6	60	<0.83	<0.83
Chloroethane	80	400	<0.47	<0.47
Chloroform	0.6	6	<0.92	<0.92
Chloromethane	3	30	<0.79	<0.79
cis-1,2-Dichloroethene	7	70	<0.42	<0.42
cis-1,3-Dichloropropene	NE	NE	<0.52	<0.52
Dibromomethane	NE	NE	<0.58	<0.58
Dichlorodifluoromethane	200	1000	<1.8	<1.8
Ethylbenzene	140	700	9.5	<0.2
Hexachlorobutadiene	NE	NE	<0.54	<0.54
Isopropyl ether	NE	NE	<0.38	<0.38
Isopropylbenzene	NE	NE	0.6	<0.29
Methyl tert-butyl ether	12	60	<0.43	<0.43
Methylene Chloride	0.5	5	<3.6	<3.6
Naphthalene	10	100	9.5	<0.44
n-Butylbenzene	NE	NE	0.79	<0.33
N-Propylbenzene	NE	NE	2.7	<0.32
p-Isopropyltoluene	NE	NE	<0.29	<0.29
sec-Butylbenzene	NE	NE	<0.27	<0.27
Styrene	10	100	<0.31	<0.31
tert-Butylbenzene	NE	NE	<0.26	<0.26
Tetrachloroethene	0.5	5	<0.39	<0.39
Tetrahydrofuran	10	50	<3.9	<3.9
Toluene	160	800	35	0.23
trans-1,2-Dichloroethene	20	100	<0.44	<0.44
trans-1,3-Dichloropropene	NE	NE	<0.63	<0.63
Trichloroethene	0.5	5	<0.15	<0.15
Trichlorofluoromethane	698	3490	<0.44	<0.44
Vinyl chloride	0.02	0.2	<0.47	<0.47
Xlenes, Total	400	2000	17	<0.3

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-19

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
			MW-19	
	PAL	ES	8/27/2024	10/2/2024
Inorganics				
Alkalinity - mg/L	NE	NE	140	1.3
Arsenic - ug/L	1	10	5.3	<0.23
Barium - ug/L	400	2000	120	2.7
Boron - mg/L	0.2	1	0.025	0.025
Cadmium - ug/L	0.5	5	0.23	0.36
Chloride - mg/L	125	250	1.5	16
Chromium - ug/L	10	100	<u>62</u>	0.021
Copper - ug/L	130	1300	81	<0.50
Fluoride - mg/L	0.8	4	<0.19	<0.19
Hardness as calcium carbonate - mg/L	NE	NE	120	0.74
Lead - ug/L	1.5	15	<u>7</u>	<0.19
Manganese - ug/L	60	300	2400	1400
Mercury - ug/L	0.2	2	<0.076	<0.076
Nitrate Nitrite as N - mg/L	2	10	0.27	<0.020
Selenium - ug/L	10	50	1.5	<0.98
Silver - ug/L	10	50	0.13	<0.12
Sulfate - mg/L	125	250	3.1	61
Zinc - ug/L	250	500	21	56
Field Parameters				
Depth to Water (ft from MP)	NE	NE	97.22	99.86
Field Conductivity	NE	NE	195	137
Field pH	NE	NE	7.61	6.09
Field Temperature	NE	NE	15.3	10.4

Notes:

NE: No standard established.

< : Indicates the analyte was analyzed for but not detected above the detection limit.

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-19Z

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
	PAL	ES	MW-19Z	
			8/27/2024	10/2/2024
VOCs (ug/L)				
1,1,1,2-Tetrachloroethane	7	70	<0.67	<0.67
1,1,1-Trichloroethane	40	200	<0.45	<0.45
1,1,2,2-Tetrachloroethane	0.02	0.2	<0.65	<0.65
1,1,2-Trichloroethane	0.5	5	<0.73	<0.73
1,1-Dichloroethane	85	850	<0.36	<0.36
1,1-Dichloroethene	0.7	7	<0.48	<0.48
1,1-Dichloropropene	NE	NE	<0.33	<0.33
1,2,3-Trichlorobenzene	NE	NE	<0.35	<0.35
1,2,3-Trichloropropane	12	60	<1.5	<1.5
1,2,4-Trichlorobenzene	14	70	<0.31	<0.31
1,2,4-Trimethylbenzene	96	480	<0.30	<0.3
1,2-Dibromo-3-Chloropropane	0.02	0.2	<3.9	<3.9
1,2-Dibromoethane (EDB)	0.01	0.05	<0.56	<0.56
1,2-Dichlorobenzene	60	600	<0.48	<0.48
1,2-Dichloroethane	0.5	5	<0.58	<0.58
1,2-Dichloropropane	0.5	5	<0.37	<0.37
1,3,5-Trimethylbenzene	96	480	<0.29	<0.29
1,3-Dichlorobenzene	120	600	<0.41	<0.41
1,3-Dichloropropane	NE	NE	<0.56	<0.56
1,4-Dichlorobenzene	15	75	<0.45	<0.45
2,2-Dichloropropane	NE	NE	<0.48	<0.48
2-Butanone (MEK)	800	4000	<2.3	<2.3
2-Chlorotoluene	NE	NE	<0.36	<0.36
4-Chlorotoluene	NE	NE	<0.34	<0.34
Acetone	1800	9000	<4.3	<4.3
Benzene	0.5	5	<0.18	<0.18
Bromobenzene	NE	NE	<0.60	<0.6
Bromochloromethane	NE	NE	<0.50	<0.5
Bromodichloromethane	0.06	0.6	<0.57	<0.57
Bromoform	0.44	4.4	<0.96	<0.96
Bromomethane	1	10	<1.8	<1.8
Carbon disulfide	200	1000	<1.1	<1.1
Carbon tetrachloride	0.5	5	<0.41	<0.41
Chlorobenzene	20	100	<0.41	<0.41
Chlorodibromomethane	6	60	<0.83	<0.83
Chloroethane	80	400	<0.47	<0.47
Chloroform	0.6	6	<0.92	<0.92
Chloromethane	3	30	<0.79	<0.79
cis-1,2-Dichloroethene	7	70	<0.42	<0.42
cis-1,3-Dichloropropene	NE	NE	<0.52	<0.52
Dibromomethane	NE	NE	<0.58	<0.58
Dichlorodifluoromethane	200	1000	<1.8	<1.8
Ethylbenzene	140	700	<0.20	<0.2
Hexachlorobutadiene	NE	NE	<0.54	<0.54
Isopropyl ether	NE	NE	<0.38	<0.38
Isopropylbenzene	NE	NE	<0.29	<0.29
Methyl tert-butyl ether	12	60	<0.43	<0.43
Methylene Chloride	0.5	5	<3.6	<3.6
Naphthalene	10	100	<0.44	<0.44
n-Butylbenzene	NE	NE	<0.33	<0.33
N-Propylbenzene	NE	NE	<0.32	<0.32
p-Isopropyltoluene	NE	NE	<0.29	<0.29
sec-Butylbenzene	NE	NE	<0.27	<0.27
Styrene	10	100	<0.31	<0.31
tert-Butylbenzene	NE	NE	<0.26	<0.26
Tetrachloroethene	0.5	5	<0.39	<0.39
Tetrahydrofuran	10	50	<3.9	<3.9
Toluene	160	800	0.34	<0.21
trans-1,2-Dichloroethene	20	100	<0.44	<0.44
trans-1,3-Dichloropropene	NE	NE	<0.63	<0.63
Trichloroethene	0.5	5	<0.15	<0.15
Trichlorofluoromethane	698	3490	<0.44	<0.44
Vinyl chloride	0.02	0.2	<0.47	<0.47
Xlenes, Total	400	2000	<0.30	<0.3

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-19Z

Analytical Parameters	NR 140 Standards		Well No./Sampling Date	
			MW-19Z	
	PAL	ES	8/27/2024	10/2/2024
Inorganics				
Alkalinity - mg/L	NE	NE	82	83
Arsenic - ug/L	1	10	<0.23	<0.23
Barium - ug/L	400	2000	34	43
Boron - mg/L	0.2	1	0.018	0.024
Cadmium - ug/L	0.5	5	<0.17	<0.17
Chloride - mg/L	125	250	3.7	3.1
Chromium - ug/L	10	100	<1.1	<1.1
Copper - ug/L	130	1300	1.7	1.9
Fluoride - mg/L	0.8	4	<0.19	<0.19
Hardness as calcium carbonate - mg/L	NE	NE	85	88
Lead - ug/L	1.5	15	<0.19	<0.19
Manganese - ug/L	60	300	690	330
Mercury - ug/L	0.2	2	<0.076	<0.076
Nitrate Nitrite as N - mg/L	2	10	0.61	0.054
Selenium - ug/L	10	50	<0.98	<0.98
Silver - ug/L	10	50	<0.12	<0.12
Sulfate - mg/L	125	250	3.3	2.7
Zinc - ug/L	250	500	<6.9	33
Field Parameters				
Depth to Water (ft from MP)	NE	NE	98.3	98.57
Field Conductivity	NE	NE	166	176
Field pH	NE	NE	7.52	6.49
Field Temperature	NE	NE	15.4	9.1

Notes:

NE: No standard established.

< : Indicates the analyte was analyzed for but not detected above the detection limit.

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).

0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

Attachment A

2024 Soil Boring Logs

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

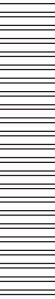
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Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number B-22	
Boring Drilled By: Name of crew chief (first, last) and Firm Cascade Environmental			Date Drilling Started 8/13/2024		Date Drilling Completed 8/14/2024	
Drilling Method Rotasonic			WI Unique Well No.		DNR Well ID No.	
Common Well Name			Final Static Water Level 1,121.6 Feet MSL		Surface Elevation 1,225.6 Feet MSL	
Borehole Diameter 6.0 inches			Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 449 N, 1,607 E S/C/N		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Lat _____° _____' _____"		Long _____° _____' _____"	
Facility ID 3268		County Vernon		County Code 63		Civil Town/City/ or Village Viroqua

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 GP	120 60		0	SANDY LEAN CLAY (CL), dark gray, moist, medium stiff, low plasticity (Fill).	CL									
			2											
			4											
			6	SANDY LEAN CLAY (CL), reddish brown, moist, medium stiff, low plasticity (Fill).	CL									
			8											
			10											
2 GP	72 72		12											
			14											
			16	SANDY LEAN CLAY (CL), dark gray, moist, medium stiff, low plasticity (Residuum).	CL									
3 GP	48 48		18											
			20											
4 GP	60 60		22											
			24	WEATHERED CLAYEY SANDSTONE, highly weathered (Saprolite).	BR									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Ben Kerk Firm **SEH** Tel: _____ Fax: _____

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
5 GP	60 60		26	WEATHERED CLAYEY SANDSTONE, highly weathered (Saprolite). <i>(continued)</i>	BR									
6 GP	60 60		30	WEATHERED CLAYEY SHALE, highly weathered, interbedded clay (Saprolite).	BR									
7 GP	60 60		36	WEATHERED CLAYEY SHALE, highly weathered (Saprolite).	BR									
8 GP	60 60		44	WEATHERED SANDSTONE, highly weathered, dry (Saprolite).	BR									
9 GP	60 60		46	WEATHERED CLAYEY SHALE, highly weathered (Saprolite).	BR									
10 GP	60		50		BR									
11 GP	60 60		56	DOLOSTONE, beginning of competent rock at 55 feet bgs; moist clay from 91 to 93 feet bgs, sporadic vugs <1/4 inch throughout, wet clay from 104 to 105 feet bgs.	BR									
12 GP	60 60		60		BR									
13 GP	60 60		66											

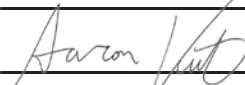
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 4

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number MW-16Z	
Boring Drilled By: Name of crew chief (first, last) and Firm Cascade Environmental		Date Drilling Started 8/2/2024		Date Drilling Completed 8/5/2024	
Drilling Method Rotasonic					
WI Unique Well No. WF528	DNR Well ID No.	Common Well Name MW-16Z	Final Static Water Level 1,078.5 Feet MSL	Surface Elevation 1,184.5 Feet MSL	Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 567 N, 1,897 E S/C/N SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Local Grid Location Lat ° ' " Long ° ' " Feet ☐ N ☐ E Feet ☐ S ☐ W		
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua	

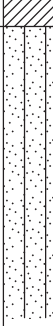
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 GP	120 96		2	LEAN CLAY (CL), dark brownish gray (10YR 4/2), moist, with sand, little gravel and roots/organics, medium stiff, low plasticity, no odor, no staining (Fill).	CL									
			4											
			6											
			8	LEAN CLAY (CL), dark yellowish brown (10YR 4/6), moist, medium stiff, moderate plasticity, no odor, no staining (Fill).	CL									
			10											
2 GP	120 108		12	SANDY LEAN CLAY (CL), yellow to strong brown (10YR 7/6 to 7.5YR 5/8), dry, with sandstone rock fragments, medium stiff, low plasticity, crushed rock from 25 to 27 feet, no odor, no staining (Residuum).	CL									
			14											
			16											
			18											
			20											
3 GP	120 108		22											
			24											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature  Firm **SEH** Tel:
Fax:

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Page 2 of 4

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well	Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
4 GP	120 102		26	SANDY LEAN CLAY (CL), yellow to strong brown (10YR 7/6 to 7.5YR 5/8), dry, with sandstone rock fragments, medium stiff, low plasticity, crushed rock from 25 to 27 feet, no odor, no staining (Residuum). <i>(continued)</i>	CL										
			28												
			30												
			32												
5 GP	120 108		36	LEAN CLAY (CL), light olive brown (10YR 4/2), moist, with sand, little gravel and roots/organics, medium stiff, low plasticity, no odor, no staining (Residuum).	CL										
			38												
			40												
			42												
6 GP	120 120		44												
			46												
			48												
			50												
7 GP	120 108		52	LEAN CLAY (CL), strong brown (7.5YR 4/6), moist, medium stiff, moderate plasticity, no odor, no staining (Residuum).	CL										
			54												
			56												
			58												
			60	SILTY SAND (SM), yellowish brown (10YR 5/4), dry, fine grained, poorly graded, no odor, no staining (Saprolite).	SM										
			62												
			64												
			66												

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
8 GP	120 108		68	SILTY SAND (SM), yellowish brown (10YR 5/4), dry, fine grained, poorly graded, no odor, no staining (Saprolite). <i>(continued)</i>	SM									
			70											
			72											
			74											
			76											
9 GP	120 108		76	Note: Temp well was installed from 69 to 79 feet bgs during drilling and left over the weekend. Water was present at 77.8 feet bgs.										
			78											
			80											
			82											
			84											
10 GP	120 120		84	SANDY DOLOSTONE, fine grained, slightly weathered, wet, minor vugs from 80 to 85 ft bgs, clayey lenses with wetness at 80 to 81.5 feet, 86 to 88 feet, and 90 to 95 feet.	BR									
			86											
			88											
			90											
			92											
11 GP	120 60		92	SANDY FAT CLAY (CH), strong brown (7.5YR 5/6), wet, soft, high plasticity, drop in rods and limited recovery from 98 to 100 feet, most likely transition from competent to weathered dolostone (Saprolite).	CH									
			94											
			96											
			98											
			100											
			100	Note: Static water level could not be directly observed during drilling. Groundwater encountered at 106.02 feet bgs on 8/7/2024.										
	102													
	104													
	106													
	108													

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Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

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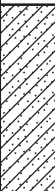
Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number MW-18	
Boring Drilled By: Name of crew chief (first, last) and Firm Cascade Environmental		Date Drilling Started 7/29/2024		Date Drilling Completed 7/31/2024	
Drilling Method Rotasonic					
WI Unique Well No. WF526	DNR Well ID No.	Common Well Name MW-18	Final Static Water Level 1,099.8 Feet MSL	Surface Elevation 1,209.8 Feet MSL	Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 807 N, 1,909 E S/C/N		Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W					
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua	

Sample			Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)	Compressive Strength								Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	120 72		0	SANDY LEAN CLAY (CL), dark yellowish brown (10YR 3/4), fine grained, moist, soft, some roots and organics, low plasticity, no odor, no staining (Topsoil).	CL										
			2												
			4	SANDY LEAN CLAY (CL), yellowish brown to yellow (10YR 5/6 to 10YR 7/8), moist, with sandstone fragments, medium stiff, moderate plasticity, no odor, no staining, large fragment of sandstone at 4 feet, (Residuum).											
			6												
			8												
2 GP	120 120		10												
			12												
			14												
			16	SANDY FAT CLAY (CL), dark yellowish brown to yellowish brown (10YR 3/4 to 10YR 5/8), moist, with gravel, soft, high plasticity, no odor, no staining, increased moisture from 15 to 19 feet, sandy lense from 19 to 20 feet (Residuum).	CH										
			18												
			20												
			22												
			24												

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature *Aaron [Signature]* Firm **SEH** Tel:
Fax:

Page 2 of 4

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
4 GP	120 120		26	CLAYEY SAND (SC), brown (10YR 5/3), fine grained, dry, poorly graded, loose, no odor, no staining (Residuum).	SC									
			28											
5 GP	120 120		30	POORLY GRADED SAND (SP), pale yellow to yellow (2.5Y 7/3 to 2.5Y 7/8), fine grained, dry, loose, some sandstone fragments, clayey lenses with sandstone fragments from 40 to 43 feet (Saprolite).	SP									
			32											
6 GP	120 120		34											
			36											
7 GP	120 120		38											
			40											
			42											
			44											
			46											
			48											
			50											
			52											
			54											
			56											
			58											
			60											
			62											
			64											
			66		SM									

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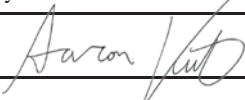
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 3

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number MW-18WT	
Boring Drilled By: Name of crew chief (first, last) and Firm Cascade Environmental		Date Drilling Started 8/1/2024		Date Drilling Completed 8/1/2024	
Drilling Method Rotasonic					
WI Unique Well No. WF527	DNR Well ID No.	Common Well Name MW-18WT	Final Static Water Level 1,130.8 Feet MSL	Surface Elevation 1,210.1 Feet MSL	Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 812 N, 1,904 E S/C/N SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Local Grid Location Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____" ☐ N ☐ E Feet ☐ S Feet ☐ W		
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua	

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2 4 6 8 10 12 14 16 18 20 22 24	See MW-18 for description.										

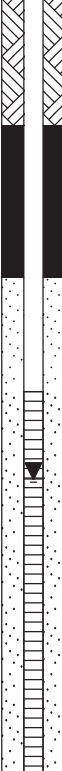
I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm SEH	Tel: Fax:

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Page 2 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			26	See MW-18 for description. <i>(continued)</i>										
			28											
			30											
			32											
			34											
			36											
			38											
			40											
			42											
			44											
			46											
			48											
			50											
			52											
			54											
			56											
			58											
			60											
			62											
			64											
			66											

Boring Number		MW-18WT		Use only as an attachment to Form 4400-122.										Page 3 of 3	
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			68	See MW-18 for description. <i>(continued)</i>											
			70												
			72												
			74												
			76												
			78												
			80												
			82												
			84												
			86												
				Boring Terminated at 87 feet.											

Note: During drilling of MW-18 a temp well was set from 80 to 85 feet bgs. Water was observed at 79.7 feet bgs on 7/31/2024.

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 3

Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number MW-19	
Boring Drilled By: Name of crew chief (first, last) and Firm Cascade Environmental			Date Drilling Started 8/9/2024		Date Drilling Completed 8/13/2024	
Drilling Method Rotasonic						
WI Unique Well No. WF530		DNR Well ID No.		Common Well Name MW-19		Final Static Water Level 1,096.0 Feet MSL
				Surface Elevation 1,190.5 Feet MSL		Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 333 N, 2,054 E S/C/N SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____"			Local Grid Location ☐ N ☐ E ☐ S ☐ W
Facility ID 3268		County Vernon		County Code 63		Civil Town/City/ or Village Viroqua

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2	See MW-19Z for description.										
			4											
			6											
			8											
			10											
			12											
			14											
			16											
			18											
			20											
			22											
			24											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>Ben Kerk</i>	Firm SEH	Tel: Fax:

Page 2 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			26	See MW-19Z for description. <i>(continued)</i>										
			28											
			30											
			32											
			34											
			36											
			38											
			40											
			42											
			44											
			46											
			48											
			50											
			52											
			54											
			56											
			58											
			60											
			62											
			64											
			66											

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Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

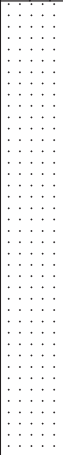
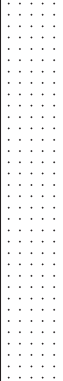
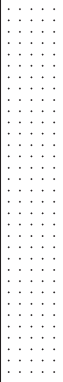
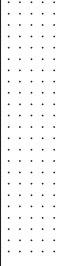
Page 1 of 4

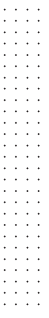
Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number MW-19Z	
Boring Drilled By: Name of crew chief (first, last) and Firm Cascade Environmental		Date Drilling Started 8/6/2024		Date Drilling Completed 8/9/2024	
Drilling Method Rotasonic					
WI Unique Well No. WF529	DNR Well ID No.	Common Well Name MW-19Z	Final Static Water Level 1,095.2 Feet MSL	Surface Elevation 1,190.2 Feet MSL	Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 342 N, 2,054 E S/C/N SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Local Grid Location Lat ° ' " Long ° ' " Feet ☐ N ☐ E Feet ☐ S ☐ W		
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua	

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 GP	120 72		2	SANDY LEAN CLAY (CL), strong brown (7.5YR 4/6), moist, some roots and organics, medium stiff, low plasticity, large dolostone fragments throughout, dolostone fragments contain vugs, chert remineralization, and small fractures (Fill). SANDY LEAN CLAY (CL), very dark grayish brown (10YR 3/2), fine grained, moist, some roots and organics, medium stiff, low plasticity, no odor, no staining (Topsoil).	CL									
			4		CL									
			6											
			8											
2 GP	120 96		10	POORLY GRADED SAND (SP), brownish yellow (10YR 6/8), fine grained, moist, poorly graded, medium dense, some minor bands of iron oxide staining (Saprolite).	SP									
			12											
			14											
			16											
			18											
			20											
3 GP	120 120		22	POORLY GRADED SAND (SP), yellow (2.5Y 7/6), fine grained, moist, poorly graded, medium dense, small sandstone fragments throughout, drilling hard at bottom (Saprolite).	SP									
			24											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Ben Korte Firm **SEH** Tel:
Fax:

Boring Number		MW-19Z		Use only as an attachment to Form 4400-122.										Page 2 of 4	
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
4 GP	120 120		26	SANDSTONE, slightly weathered, fine grained, dry, some iron oxide staining present.	SP										
			28												
5 GP	120 120		30												
			32												
6 GP	120 120		34												
			36												
7 GP	120 120		40		BR										
			42												
			44												
			46												
			48												
			50												
			52												
			54												
			56												
			58												
			60												
			62												
			64												
			66												

Boring Number		MW-19Z		Use only as an attachment to Form 4400-122.										Page 3 of 4	
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
8 GP	120 120		68	SANDSTONE, slightly weathered, fine grained, dry, some iron oxide staining present. <i>(continued)</i>	BR										
			70												
			72												
			74												
			76												
	78														
9 GP	120 120		80												
			82												
			84												
			86												
			88												
10 GP	120 120		90												
			92												
			94												
			96												
			98												
11 GP	120 120		100	SANDSTONE, slightly weathered, fine grained, wet. Note: Static water level could not be directly observed during drilling. Groundwater encountered at 100 feet bgs on 8/9/2024.	BR										
			102												
			104												
			106												
			108												

Boring Number		MW-19Z		Use only as an attachment to Form 4400-122.										Page 4 of 4	
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
12 GP	120 1440		110	CLAYEY SANDSTONE, highly weathered, very fine grained, wet, iron oxide staining present.	BR										
			112												
			114												
			116												
			118												
			120		BR										
			122												
			124												
			126												
			128												
13 GP	120 120		130	Boring Terminated at 130 feet.											

Attachment B

2024 Abandonment Form

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☒ Verification Only of Fill and Seal

Route to DNR Bureau:

☐ Drinking Water

☐ Watershed/Wastewater

☒ Remediation/Redevelopment

☐ Waste Management

☐ Other.

6-22

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Vernon		
Latitude / Longitude (see instructions)	Format Code	Method Code
43°35'47.87" N	☐ DD	☒ GPS008
90°50'18.61" W	☒ DDM	☐ SCR002
		☐ OTH001
SW/SE or Gov't Lot #	Section	Township
	15	13 N
Well Street Address	Range	
	4	☒ W

2. Facility / Owner Information

Facility Name
Vernon County Landfill Expansion
Facility ID (FID or PWS)
License/Permit/Monitoring #
3268
Original Well Owner
Present Well Owner
Vernon County Solid Waste Facility
Mailing Address of Present Owner
s 3705 County Hwy LF
City of Present Owner
Viroqua
State
WI
ZIP Code
54665

Reason for Removal from Service

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well	Original Construction Date (mm/dd/yyyy)
☐ Water Well	
☒ Borehole / Drillhole	If a Well Construction Report is available, please attach.
Construction Type:	
☒ Drilled	☐ Driven (Sandpoint)
☐ Other (specify):	☐ Dug

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☒ Yes	☐ No	☐ N/A
Did material settle after 24 hours?	☒ Yes	☐ No	☐ N/A
If yes, was hole retopped?	☒ Yes	☐ No	☐ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☒ Yes	☐ No	☐ N/A

Formation Type:

☒ Unconsolidated Formation

☒ Bedrock

Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity

☒ Conductor Pipe-Pumped

☐ Screened & Poured (Bentonite Chips)

☐ Other (Explain):

Total Well Depth From Ground Surface (ft.)

105'

Casing Diameter (in.)

Lower Drillhole Diameter (in.)

Casing Depth (ft.)

Was well annular space grouted?

☐ Yes

☐ No

☐ Unknown

If yes, to what depth (feet)?

Depth to Water (feet)

na

Sealing Materials

☐ Neat Cement Grout

☐ Concrete

☐ Sand-Cement (Concrete) Grout

☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:

☒ Bentonite Chips

☐ Bentonite - Cement Grout

☐ Granular Bentonite

☒ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

Material	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Blend Weight
High Solids Bentonite Grout/Aqua Guard Grout	Surface	105'	150 gals	#10
3/8 Bentonite Chips - Top off hole	Surface	20'	6 bags	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)	Date Received	Noted By
Cascade		8/15/2024		
Street or Route	Telephone Number	Comments		
301 Alderson ST	()			
City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Schofield	WI	54476		

Attachment C

Photographs of 2024 Soil Samples



MW-16Z

100ft

0ft

10ft

20ft

30ft

40ft

50ft

70ft

80ft

110ft

50ft

90ft



MW-18



MW-19

10 20 30 40 50 60 70 80 90 100 110 120 130





Attachment D

2024 Well Construction Logs

Facility/Project Name Vernon County LF		Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.		Well Name MW-18	
Facility License, Permit or Monitoring No. 3268		Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. 43° 35' 52" Long. 90° 50' 17" or		Wis. Unique Well No. WF526 DNR Well ID No.	
Facility ID		St. Plane ft. N. ft. E. S/C/N		Date Well Installed 08/01/2024	
Type of Well Well Code 11 / MW		Section Location of Waste/Source SW 1/4 of SE 1/4 of Sec. 15 T. 13 N. R. 4 ☒ W		Well Installed By: Name (first, last) and Firm Todd Schmalfeldt	
Distance from Waste/Source ft.		Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☒ Downgradient ☐ Not Known		Gov. Lot Number	
Enf. Sids. Apply ☐				CASCADE	

A. Protective pipe, top elevation	2.5 ft. MSL	1. Cap and lock?	☒ Yes ☐ No
B. Well casing, top elevation	2.5 ft. MSL	2. Protective cover pipe:	
C. Land surface elevation	1209.8 ft. MSL	a. Inside diameter:	4 in.
D. Surface seal, bottom	100 ft. MSL or	b. Length:	7 ft.
		c. Material:	Steel ☒ 0 4 Other ☐
12. USCS classification of soil near screen:		d. Additional protection?	☒ Yes ☐ No
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐		If yes, describe:	Bumper posts
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐			
Bedrock ☒		3. Surface seal:	Bentonite ☒ 3 0 Concrete ☐ 0 1 Other ☐
13. Sieve analysis performed?	☐ Yes ☒ No	4. Material between well casing and protective pipe:	Bentonite ☐ 3 0 Other ☒
14. Drilling method used:	Rotary ☐ 5 0 Hollow Stem Auger ☐ 4 1 Sonic ☒	# 40 sand	
15. Drilling fluid used: Water ☐ 0 2 Air ☐ 0 1		5. Annular space seal:	a. Granular/Chipped Bentonite ☐ 3 3 b. Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5 c. 13 Lbs/gal mud weight Bentonite slurry ☒ 3 1 d. % Bentonite Bentonite-cement grout ☐ 5 0 e. 125 gal ft ³ volume added for any of the above
16. Drilling additives used?	☐ Yes ☒ No	f. How installed:	Tremie ☐ 0 1 Tremie pumped ☒ 0 2 Gravity ☐ 0 8
Describe		6. Bentonite seal:	a. Bentonite granules ☐ 3 3 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 3 2 c. Other ☐
17. Source of water (attach analysis, if required):		7. Fine sand material: Manufacturer, product name & mesh size	a. #7 Red Flint
		b. Volume added	.5 ft ³
		8. Filter pack material: Manufacturer, product name & mesh size	a. #40 Red Flint
		b. Volume added	2.0 ft ³
E. Bentonite seal, top	100 ft. MSL or	9. Well casing:	Flush threaded PVC schedule 40 ☐ 2 3 Flush threaded PVC schedule 80 ☒ 2 4 Other ☐
F. Fine sand, top	104 ft. MSL or	10. Screen material:	PVC
G. Filter pack, top	105 ft. MSL or	a. Screen type:	Factory cut ☒ 1 1 Continuous slot ☐ 0 1 Other ☐
H. Screen joint, top	107 ft. MSL or	b. Manufacturer	Hole Products
I. Well bottom	117 ft. MSL or	c. Slot size:	0.10 in.
J. Filter pack, bottom	117 ft. MSL or	d. Slotted length:	10 ft.
K. Borehole, bottom	117 ft. MSL or	11. Backfill material (below filter pack):	None ☒ 1 4 Other ☐
L. Borehole, diameter	6 in.		
M. O.D. well casing	2.375 in.		
N. I.D. well casing	1.939 in.		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm

CASCADE

Facility/Project Name Vernon County LF		Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.		Well Name MW-18-WT	
Facility License, Permit or Monitoring No. 3268		Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. 43° 35' 52" Long. 90° 50' 17"		Wis. Unique Well No. WF527 DNR Well ID No. _____	
Facility ID _____		St. Plane _____ ft. N. _____ ft. E. S/C/N _____		Date Well Installed 08/02/2024	
Type of Well Well Code 11 / MW		Section Location of Waste/Source SW 1/4 of SE 1/4 of Sec. 15, T. 13, N. R. 4 ☒ W		Well Installed By: Name (first, last) and Firm Todd Schmalfeldt	
Distance from Waste/Source _____ ft.		Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☒ Downgradient ☐ Not Known		Gov. Lot Number _____	
Enf. Stds. Apply ☐		Location of Well Relative to Waste/Source		Well Installed By: Name (first, last) and Firm CASCADE	

A. Protective pipe, top elevation _____ 2.5 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation _____ 2.5 ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ 4 in.
C. Land surface elevation _____ 1210.1 ft. MSL	b. Length: _____ 7 ft.
D. Surface seal, bottom _____ 70 ft. MSL or _____ ft.	c. Material: Steel ☒ 04 Other ☐
12. USCS classification of soil near screen: GP ☐ OM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	d. Additional protection? ☒ Yes ☐ No If yes, describe: Bumper posts
13. Sieve analysis performed? ☐ Yes ☒ No	3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐
14. Drilling method used: Rotary ☐ 50 Hollow Stem Auger ☐ 41 Sonic ☒ Other ☐	4. Material between well casing and protective pipe: Bentonite ☐ 30 Other ☒
15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☒ 99	5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. 13 Lbs/gal mud weight ... Bentonite slurry ☒ 31 d. _____ % Bentonite ... Bentonite-cement grout ☐ 50 e. 125 gal ft³ volume added for any of the above
16. Drilling additives used? ☐ Yes ☒ No	f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08
Describe _____	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32 c. _____ Other ☐
17. Source of water (attach analysis, if required): _____	7. Fine sand material: Manufacturer, product name & mesh size a. #7 Red Flint b. Volume added .5 ft ³
E. Bentonite seal, top _____ 70 ft. MSL or _____ ft.	8. Filter pack material: Manufacturer, product name & mesh size a. #40 Red Flint b. Volume added 2.0 ft ³
F. Fine sand, top _____ 74 ft. MSL or _____ ft.	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
G. Filter pack, top _____ 75 ft. MSL or _____ ft.	10. Screen material: PVC a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
H. Screen joint, top _____ 77 ft. MSL or _____ ft.	b. Manufacturer Hole Products
I. Well bottom _____ 87 ft. MSL or _____ ft.	c. Slot size: 0.10 in.
J. Filter pack, bottom _____ 87 ft. MSL or _____ ft.	d. Slotted length: 10 ft.
K. Borehole, bottom _____ 87 ft. MSL or _____ ft.	11. Backfill material (below filter pack): None ☒ 14 Other ☐
L. Borehole, diameter _____ 6 in.	
M. O.D. well casing _____ 2.375 in.	
N. I.D. well casing _____ 1.939 in.	

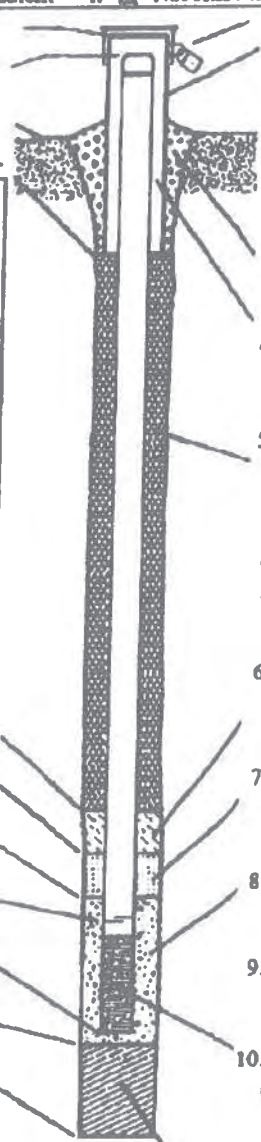
I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm

CASCADE

Facility/Project Name Vernon County LF		Local Grid Location of Well N. ☐ S. ☐ E. ☐ W. ☐		Well Name MW-19-	
Facility License, Permit or Monitoring No. 3268		Local Grid Origin (estimated: ☐) or Well Location ☐ Lat. 43° 35' 46" Long. 90° 50' 12"		Wis. Unique Well No. WF530 DNR WaID No. ---	
Facility ID ---		St. Plane N. ft. N. ft. E. S/C/N ---		Date Well Installed 8/13/2024	
Type of Well Well Code 11 / MW		Section Location of Waste/Source SW 1/4 of SE 1/4 of Sec. 15 T. 13 N. R. 4 E. W. 8		Well Installed By: Name (first, last) and Firm Todd Schmalfeldt	
Distance from Waste/Source --- ft.		Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☒ Not Known		Gov. Lot Number CASCADE	
Enf. Stds. Apply ☐					

A. Protective pipe, top elevation	2.5 ft. MSL		1. Cap and lock?	☒ Yes ☐ No
B. Well casing, top elevation	2.5 ft. MSL		2. Protective cover pipe: a. Inside diameter 4 in. b. Length: 7 ft. c. Material: Steel ☒ 04 Other ☐	d. Additional protection? If yes, describe: Bumper posts ☒ Yes ☐ No
C. Land surface elevation	1190.5 ft. MSL		3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐	4. Material between well casing and protective pipe: Bentonite ☐ 30 Other ☒
D. Surface seal, bottom	86 ft. MSL or --- ft.		5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33 b. --- Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. 13 Lbs/gal mud weight ... Bentonite slurry ☒ 31 d. --- % Bentonite ... Bentonite-cement grout ☐ 50 e. 125 gal ft ³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08	
12. USCS classification of soil near screen: GP ☐ GM ☐ OC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒				
13. Sieve analysis performed? ☐ Yes ☒ No				
14. Drilling method used: Rotary ☐ 50 Hollow Stem Auger ☐ 41 Sonic ☒ Other ☐				
15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☒ 99				
16. Drilling additives used? ☐ Yes ☒ No Describe: ---				
17. Source of water (attach analysis, if required): ---				
E. Bentonite seal, top	86 ft. MSL or --- ft.	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32 c. --- Other ☐	7. Fine sand material: Manufacturer, product name & mesh size a. #7 Red Flint b. Volume added .5 ft ³	
F. Fine sand, top	90 ft. MSL or --- ft.	8. Filter pack material: Manufacturer, product name & mesh size a. #40 Red Flint b. Volume added 2.0 ft ³	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐	
G. Filter pack, top	91 ft. MSL or --- ft.	10. Screen material: PVC a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐	b. Manufacturer Hole Products c. Slot size: 0.10 in. d. Slotted length: 10 ft.	
H. Screen joint, top	93 ft. MSL or --- ft.	11. Backfill material (below filter pack): None ☒ 14 Other ☐		
I. Well bottom	103 ft. MSL or --- ft.			
J. Filter pack, bottom	103 ft. MSL or --- ft.			
K. Borehole, bottom	103 ft. MSL or --- ft.			
L. Borehole, diameter	6 in.			
M. O.D. well casing	2.375 in.			
N. I.D. well casing	1.939 in.			

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm

CASCADE

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name Vernon County LF	Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.	Well Name MW-19-Z
Facility License, Permit or Monitoring No. 3268	Local Grid Origin (estimated: ☐) or Well Location ☐ Lat. 43° 35' 46" Long. 90° 50' 12" or	Wis. Unique Well No. WF529 DNR Well ID No. ---
Facility ID ---	St. Plane --- ft. N. --- ft. E. S/C/N ---	Date Well Installed 08/09/2024
Type of Well Well Code 12 / PZ	Section Location of Waste/Source SW 1/4 of SE 1/4 of Sec. 15, T. 13 N. R. 4 ☒ E ☐ W	Well Installed By: Name (first, last) and Firm Todd Schmalfeldt
Distance from Waste/Source --- ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☒ Not Known	CASCADE
Enf. Stds. Apply ☐	Gov. Lot Number ---	

A. Protective pipe, top elevation **2.5** ft. MSL
B. Well casing, top elevation **2.5** ft. MSL
C. Land surface elevation **1190.2** ft. MSL
D. Surface seal, bottom **98** ft. MSL or **---** ft.

12. USCS classification of soil near screen:

GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No14. Drilling method used: Rotary ☐ 50

Sonic

Hollow Stem Auger ☐ 41Other ☒ 9915. Drilling fluid used: Water ☐ 02 Air ☐ 01Drilling Mud ☐ 03 None ☒ 9916. Drilling additives used? ☐ Yes ☒ NoDescribe **---**17. Source of water (attach analysis, if required): **---**1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:

a. Inside diameter: **4** in.b. Length: **7** ft.c. Material: Steel ☒ 04Other ☐ **---**d. Additional protection? ☒ Yes ☐ NoIf yes, describe: **Bumper posts**3. Surface seal: Bentonite ☒ 30Concrete ☐ 01Other ☐ **---**

4. Material between well casing and protective pipe:

Bentonite ☐ 30Other ☒ **---**5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33b. **---** Lbs/gal mud weight **---** Bentonite-sand slurry ☐ 35c. **13** Lbs/gal mud weight **---** Bentonite slurry ☒ 31d. **---** % Bentonite **---** Bentonite-cement grout ☐ 50e. **175** gal ft³ volume added for any of the abovef. How installed: Tremie ☐ 01Tremie pumped ☒ 02Gravity ☐ 086. Bentonite seal: a. Bentonite granules ☐ 33b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32c. **---** Other ☐ **---**

7. Fine sand material: Manufacturer, product name & mesh size

a. **#7 Red Flint**b. Volume added **.5** ft³

8. Filter pack material: Manufacturer, product name & mesh size

a. **#40 Red Flint**b. Volume added **1.0** ft³9. Well casing: Flush threaded PVC schedule 40 ☐ 23Flush threaded PVC schedule 80 ☒ 24Other ☐ **---**10. Screen material: **PVC**a. Screen type: Factory cut ☒ 11Continuous slot ☐ 01Other ☐ **---**b. Manufacturer **Hole Products**c. Slot size: **0.10** in.d. Slotted length: **5** ft.11. Backfill material (below filter pack): None ☒ 14Other ☐ **---**

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm

CASCADE

Facility/Project Name
Vernon County LFFacility License, Permit or Monitoring No.
3268

Facility ID

Local Grid Location of Well

ft. ☐ N. ☐ S. ☐ E. ☐ W.Local Grid Origin ☐ (estimated: ☐) or Well Location ☐

Lat. 43° 35' 49" Long. 90° 50' 15" or

St. Plane ft. N. ft. E. S/C/N

Section Location of Waste/Source

SW 1/4 of SE 1/4 of Sec. 15 T. 13 N. R. 4 ☒ W

Location of Well Relative to Waste/Source

u ☐ Upgradient s ☐ Sidegradientd ☐ Downgradient n ☒ Not Known

Gov. Lot Number

Well Name

MW-16-Z

Wis. Unique Well No.

WF528

DNR Well ID No.

Date Well Installed

08/06/2024

Well Installed By: Name (first, last) and Firm

Todd Schmalfeldt

CASCADE

Type of Well

Well Code 12 / PZ

Distance from Waste/

Enf. Stds.

Source ft.

Apply ☐

A. Protective pipe, top elevation

2.5 ft. MSL

B. Well casing, top elevation

2.5 ft. MSL

C. Land surface elevation

1184.5 ft. MSL

D. Surface seal, bottom

98 ft. MSL or ft.

12. USCS classification of soil near screen:

GP ☐ OM ☐ OC ☐ OW ☐ SW ☐ SP ☐SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐Bedrock ☒

13. Sieve analysis performed?

☐ Yes ☒ No

14. Drilling method used:

Rotary ☐ 50

Sonic

Hollow Stem Auger ☐ 41Other ☒15. Drilling fluid used: Water ☐ 02Air ☐ 01Drilling Mud ☐ 03None ☒ 99

16. Drilling additives used?

☐ Yes ☒ No

Describe

17. Source of water (attach analysis, if required):

E. Bentonite seal, top 98 ft. MSL or ft.

F. Fine sand, top 112 ft. MSL or ft.

G. Filter pack, top 113 ft. MSL or ft.

H. Screen joint, top 115 ft. MSL or ft.

I. Well bottom 120 ft. MSL or ft.

J. Filter pack, bottom 120 ft. MSL or ft.

K. Borehole, bottom 120 ft. MSL or ft.

L. Borehole, diameter 6 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 1.939 in.

1. Cap and lock?

☒ Yes ☐ No

2. Protective cover pipe:

a. Inside diameter:

4 in.

b. Length:

7 ft.

c. Material:

Steel ☒ 04Other ☐

d. Additional protection?

☒ Yes ☐ No

If yes, describe: Bumper posts

3. Surface seal:

Bentonite ☒ 30Concrete ☐ 01Other ☐

4. Material between well casing and protective pipe:

Bentonite ☐ 30Other ☒

5. Annular space seal:

a. Granular/Chipped Bentonite ☐ 33b. Lbs/gal mud weight Bentonite-sand slurry ☐ 35c. 13 Lbs/gal mud weight Bentonite slurry ☒ 31d. % Bentonite Bentonite-cement grout ☐ 50e. 150 gal ft³ volume added for any of the above

f. How installed:

Tremie ☐ 01Tremie pumped ☒ 02Gravity ☐ 08

6. Bentonite seal:

a. Bentonite granules ☐ 33b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32c. Other ☐

7. Fine sand material: Manufacturer, product name & mesh size

a. #7 Red Flint

b. Volume added .5 ft³

8. Filter pack material: Manufacturer, product name & mesh size

a. #40 Red Flint

b. Volume added 1.0 ft³9. Well casing: Flush threaded PVC schedule 40 ☐ 23Flush threaded PVC schedule 80 ☒ 24Other ☐

10. Screen material:

PVC

a. Screen type:

Factory cut ☒ 11Continuous slot ☐ 01Other ☐

b. Manufacturer Hole Products

c. Slot size:

0.10 in.

d. Slotted length:

5 ft.

11. Backfill material (below filter pack):

None ☒ 14Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm

Attachment E

2024 Well Development Forms

Route to: Watershed/Wastewater ☐

Waste Management ☐

Remediation/Redevelopment ☒

Other ☐

Facility/Project Name <u>Vernon County Landfill Export</u>	County Name <u>Vernon</u>	Well Name <u>mw-18</u>
Facility License, Permit or Monitoring Number <u>3268</u>	County Code <u>63</u>	Wis. Unique Well Number <u>WF 526</u>
		DNR Well ID Number _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

- surged with bailer and bailed ☐ 41
 surged with bailer and pumped ☐ 61
 surged with block and bailed ☐ 42
 surged with block and pumped ☐ 62
 surged with block, bailed and pumped ☐ 70
 compressed air ☐ 20
 bailed only ☐ 10
 pumped only ☐ 51
 pumped slowly ☐ 50
 Other Surge down / pump & pump ☒

3. Time spent developing well 92 min.

4. Depth of well (from top of well casing) 120.0 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 2 gal.

7. Volume of water removed from well 130.0 gal.

8. Volume of water added (if any) _____ gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☒ No
(If yes, attach results)

17. Additional comments on development:

N 43.597661°

W 90.837317°

Pumping @ 1.58 PM

Before Development After Development

11. Depth to Water
(from top of well casing)

a. 108.07 ft. 109.02 ft.

Date

b. 08/14/2024 08/14/2024
m m d d y y y y m m d d y y y y

Time

c. 8:00 ☒ a.m. 9:32 ☒ a.m.
p.m. p.m.

12. Sediment in well bottom

3 inches 0 inches

13. Water clarity

Clear ☐ 10 Clear ☐ 20
Turbid ☒ 15 Turbid ☐ 25

(Describe)

(Describe)

Brown
(Turbid)

Slightly
Brown

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids _____ mg/l 1,900 mg/l

15. COD _____ mg/l <6.0 mg/l

16. Well developed by: Name (first, last) and Firm

First Name: Tono

Last Name: Schmalz

Firm: Cascade

Name and Address of Facility Contact (Owner/Responsible Party)

First Name: _____ Last Name: _____
Name: _____

Facility/Firm: Vernon County Solid Waste

Street: S 3705 County Hwy LF

City/State/Zip: Wiroqua WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Print Name: _____

Firm: _____

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name <u>Vernon County Landfill Expansion</u>	County Name <u>Vernon</u>	Well Name <u>MW-18WT</u>
Facility License, Permit or Monitoring Number <u>3268</u>	County Code <u>63</u>	Wis. Unique Well Number <u>WF527</u>
		DNR Well ID Number _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

- surged with bailer and bailed ☐ 41
surged with bailer and pumped ☐ 61
surged with block and bailed ☐ 42
surged with block and pumped ☐ 62
surged with block, bailed and pumped ☐ 70
compressed air ☐ 20
bailed only ☐ 10
pumped only ☐ 51
pumped slowly ☐ 50
Other Pump & Surge w/pump ☒ --

3. Time spent developing well 35 min.

4. Depth of well (from top of well casing) 89.6 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 2 gal.

7. Volume of water removed from well 80.0 gal.

8. Volume of water added (if any) _____ gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☒ No
(If yes, attach results)

17. Additional comments on development:

N 43.597700°
W 90.837324°

Before Development After Development

11. Depth to Water (from top of well casing) a. 81.60 ft. 82.00 ft.

Date b. 08/14/2024 08/14/2024
m m d d y y y y m m d d y y y y

Time c. 9:40 ☒ a.m. 10:15 ☒ a.m.
☐ p.m. ☐ p.m.

12. Sediment in well bottom 0 inches 0 inches

13. Water clarity Clear ☐ 10 Clear ☒ 20
Turbid ☒ 15 Turbid ☐ 25
(Describe) (Describe)

BROWN

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids _____ mg/l 2,900 mg/l

15. COD _____ mg/l 6.7 mg/l

16. Well developed by: Name (first, last) and Firm

First Name: Todd Last Name: Schmalz

Firm: Cascade

2.58pm

Name and Address of Facility Contact /Owner/Responsible Party

First Name: _____ Last Name: _____

Facility/Firm: Vernon County Solid Waste

Street: 53705 County road LF

City/State/Zip: Viroqua WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [Signature]

Print Name: Todd T Schmalz

Firm: Cascade

Route to: Watershed/Wastewater ☐

Waste Management ☒

Remediation/Redevelopment ☐

Other ☐

Facility/Project Name <u>Vernon County Landfill Expansion</u>	County Name <u>Vernon</u>	Well Name <u>MW-192</u>
Facility License, Permit or Monitoring Number <u>3268</u>	County Code <u>63</u>	Wis. Unique Well Number <u>WF529</u>
		DNR Well ID Number <u>---</u>

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

- surged with bailer and bailed ☐ 41
 surged with bailer and pumped ☐ 61
 surged with block and bailed ☐ 42
 surged with block and pumped ☐ 62
 surged with block, bailed and pumped ☐ 70
 compressed air ☐ 20
 bailed only ☐ 10
 pumped only ☐ 51
 pumped slowly ☐ 50
 Other Barge w/pump & pump ☒

3. Time spent developing well 100 min.

4. Depth of well (from top of well casing) 131.2 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 6 gal.

7. Volume of water removed from well 22.0 gal.

8. Volume of water added (if any) --- gal.

9. Source of water added ---

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

17. Additional comments on development:

N 43.596378°
W 90.836807°

Pumped Dry
5-Times

Before Development After Development

11. Depth to Water (from top of well casing) a. 96.60 ft. DRY ft.

Date b. 08/14/2024 08/14/2024
m m d d y y y y m m d d y y y y

Time c. 2:20 ☐ a.m. 4:00 ☒ p.m.

12. Sediment in well bottom 6 inches 0 inches

13. Water clarity Clear ☐ 10 Clear ☐ 20
Turbid ☒ 15 Turbid ☐ 25
(Describe) Red (Describe) Redish
Turbid Faint

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids --- mg/l 150.0 mg/l

15. COD --- mg/l 16.0 mg/l

16. Well developed by: Name (first, last) and Firm

First Name: Tino Last Name: Schmuck
Firm: Cascadia

Name and Address of Facility Contact /Owner/Responsible Party

First Name: Vernon County Solid Waste Last Name: ---

Facility/Firm: Vernon County Solid Waste

Street: S 3705

City/State/Zip: Viroqua WI
54665

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [Signature]

Print Name: Tino T Schmuck

Firm: Cascadia

Route to: Watershed/Wastewater ☐

Waste Management ☒

Remediation/Redevelopment ☐

Other ☐

Facility/Project Name <u>Vernon County Landfill Expansion</u>	County Name <u>Vernon</u>	Well Name <u>MW-19</u>
Facility License, Permit or Monitoring Number <u>3268</u>	County Code <u>63</u>	Wis. Unique Well Number <u>WF530</u>
		DNR Well ID Number _____

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

- ☐ 41 surged with bailer and bailed
☐ 61 surged with bailer and pumped
☐ 42 surged with block and bailed
☐ 62 surged with block and pumped
☐ 70 surged with block, bailed and pumped
☐ 20 compressed air
☐ 10 bailed only
☐ 51 pumped only
☐ 50 pumped slowly
☒ Other Surge w/pump & Pump

3. Time spent developing well 50 min.

4. Depth of well (from top of well casing) 106.0 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 2 ~~600~~ gal.

7. Volume of water removed from well 60.0 gal.

8. Volume of water added (if any) _____ gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

Before Development After Development

11. Depth to Water (from top of well casing) a. 95.00 ft. PRY ft.

Date b. 08/14/2024 08/14/2024
m m d d y y y y m m d d y y y y

Time c. 4:10 ☐ a.m. 5:00 ☐ a.m.
☒ p.m. ☒ p.m.

12. Sediment in well bottom 0 inches 0 inches

13. Water clarity Clear ☐ 10 Clear ☐ 20
Turbid ☐ 15 Turbid ☐ 25
(Describe) Brown Cloudy
Turbid Brown

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids _____ mg/l 2,400 mg/l

15. COD _____ mg/l 26.0 mg/l

16. Well developed by: Name (first, last) and Firm

First Name: Tom Last Name: Schmalz

Firm: Cascade

17. Additional comments on development:

N 43.596348°

W 90.836808°

Pumped Dry
3-Times

Name and Address of Facility Contact/Owner/Responsible Party

First Name: _____ Last Name: _____

Facility/Firm: Vernon County Solid Waste

Street: S 3705 County Rd WF

City/State/Zip: Viroqua Wis
54665

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [Signature]

Print Name: Tom T Schmalz

Firm: Cascade

Route to: Watershed/Wastewater ☐

Waste Management ☐

Remediation/Redevelopment ☐

Other ☐

Facility/Project Name <u>Vernon County Solid Waste Expansion</u>	County Name <u>Vernon</u>	Well Name <u>MW-162</u>
Facility License, Permit or Monitoring Number <u>3268</u>	County Code <u>63</u>	Wis. Unique Well Number <u>WF-528</u>
		DNR Well ID Number <u>---</u>

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

- surged with bailer and bailed ☐ 41
 surged with bailer and pumped ☐ 61
 surged with block and bailed ☐ 42
 surged with block and pumped ☐ 62
 surged with block, bailed and pumped ☐ 70
 compressed air ☐ 20
 bailed only ☐ 10
 pumped only ☐ 51
 pumped slowly ☐ 50
 Other Surge w/pump & pump ☒ --

3. Time spent developing well 130 min.

4. Depth of well (from top of well casing) 123.1 ft.

5. Inside diameter of well 2.22 in.

6. Volume of water in filter pack and well casing 6 gal.

7. Volume of water removed from well 122.2 gal.

8. Volume of water added (if any) --- gal.

9. Source of water added ---

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

17. Additional comments on development:

N 43.597008°
W 90.837383°

Before Development After Development

11. Depth to Water (from top of well casing) a. 82.50 ft. 102.05 ft.

Date b. 08/14/2024 08/14/2024
m m d d y y y y m m d d y y y y

Time c. 10:50 ☒ a.m. ☐ p.m. 11:15 ☒ a.m. ☐ p.m.

12. Sediment in well bottom --- inches --- inches

13. Water clarity Clear ☐ 10 Clear ☐ 20
Turbid ☒ 15 Turbid ☐ 25
(Describe) Brown Slight
Turbid Brown Tint

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids --- mg/l 43.0 mg/l

15. COD --- mg/l 6.2 mg/l

16. Well developed by: Name (first, last) and Firm

First Name: Tom Last Name: Schmuck

Firm: Cascade

Name and Address of Facility Contact/Owner/Responsible Party

First Name: Vernon County Solid Waste Last Name: ---

Facility/Firm: Vernon County Solid Waste

Street: S 3705 County Hwy LF

City/State/Zip: Viroqua Wi 54662

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [Signature]

Print Name: Tom J Schmuck

Firm: Cascade

Attachment F

2024 Geophysics Boring Logs

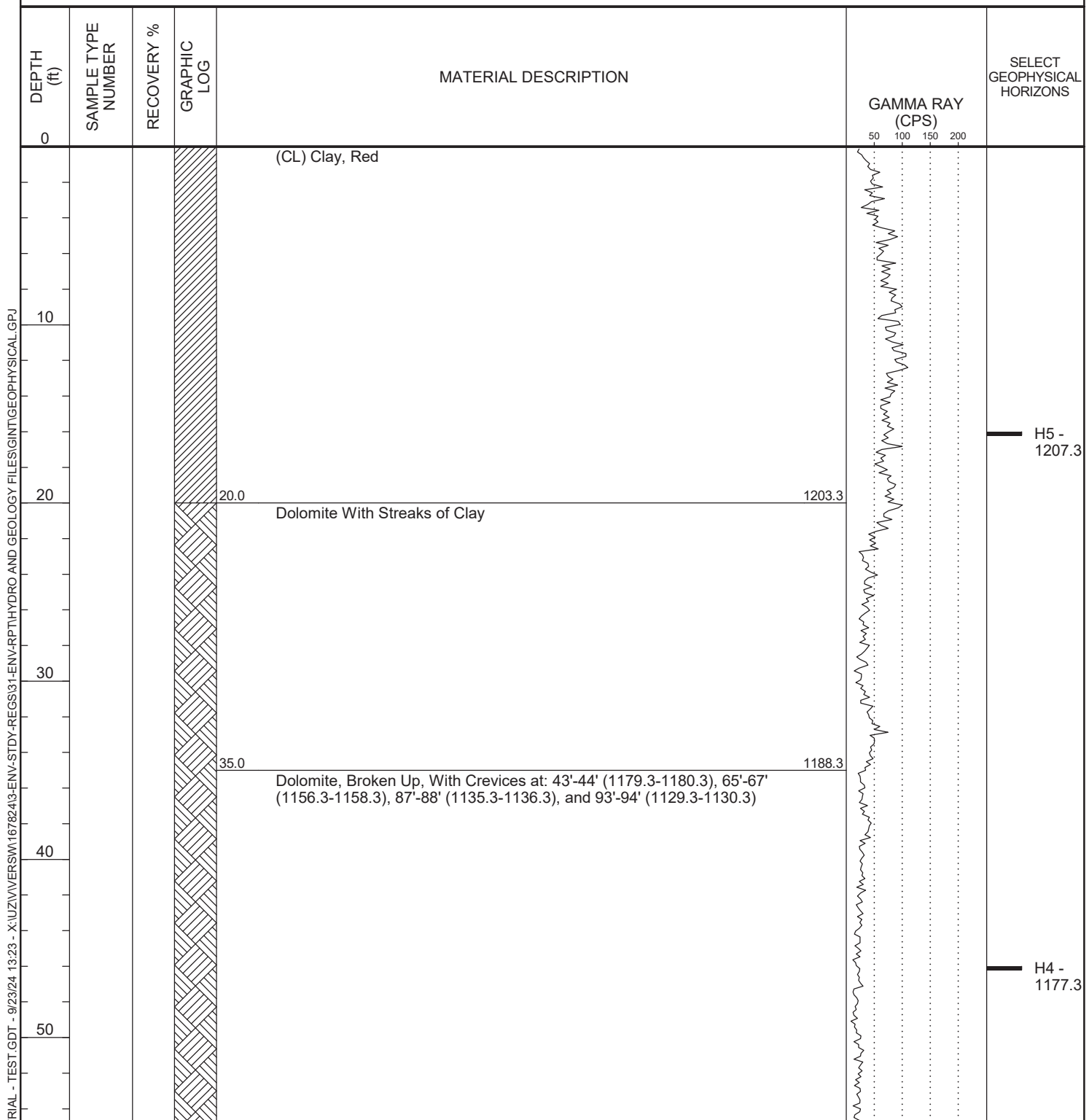


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BORING NUMBER MW-5

PAGE 1 OF 3

CLIENT	Vernon County	PROJECT NAME	Vernon County Landfill
PROJECT NUMBER	VERSW 167824	PROJECT LOCATION	Viroqua, Wisconsin
DATE STARTED	2/16/88	COMPLETED	2/16/88
GROUND ELEVATION	1223.3 ft	HOLE SIZE	6 inches
DRILLING CONTRACTOR	Ace Well Drilling	GROUND WATER LEVELS:	
DRILLING METHOD	Air Rotary	AT TIME OF DRILLING	---
LOGGED BY	Central Wis. Engineers	CHECKED BY	
AT END OF DRILLING	---	AFTER DRILLING	---
NOTES	Geophysical log completed by SEH during September 2024.		



(Continued Next Page)



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BORING NUMBER MW-5

PAGE 2 OF 3

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)				SELECT GEOPHYSICAL HORIZONS
					50	100	150	200	
60				Dolomite, Broken Up, With Crevices at: 43'-44' (1179.3-1180.3), 65'-67' (1156.3-1158.3), 87'-88' (1135.3-1136.3), and 93'-94' (1129.3-1130.3) (continued)					
70									H3 - 1157.3
80									
90									
100									
110				102.0 Dolomite, Hard	1121.3				H2 - 1118.3
									H1 - 1107.3

TRIAL - TEST.GDT - 9/23/24 13:23 - X:\UZIV\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

(Continued Next Page)



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BORING NUMBER MW-5

PAGE 3 OF 3

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
120				Dolomite, Hard (<i>continued</i>)		
130						
140				135.0 Dolomite, Broken Up, With Crevices at: 135' to 137' (1086.3-1088.3), 158' to 160' (1063.3-1065.3), Set Well at 158.57' (1064.73)	1088.3	
150						
160						
170						
180				180.0	1043.3	

TRIAL - TEST.GDT - 9/23/24 13:23 - X:\UZIV\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

Bottom of borehole at 180.0 feet.



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BORING NUMBER MW-16Z

PAGE 1 OF 3

CLIENT	Vernon County	PROJECT NAME	Vernon County Landfill
PROJECT NUMBER	VERSW 167824	PROJECT LOCATION	Viroqua, Wisconsin
DATE STARTED	8/2/24	COMPLETED	8/2/24
GROUND ELEVATION	1184.5 ft	HOLE SIZE	6 inches
DRILLING CONTRACTOR	Cascade Environmental	GROUND WATER LEVELS:	
DRILLING METHOD	Rotasonic	AT TIME OF DRILLING	---
LOGGED BY	A. Kutz	CHECKED BY	
AT END OF DRILLING	---	AFTER DRILLING	---
NOTES	Geophysical log completed by SEH during September 2024.		

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)	SELECT GEOPHYSICAL HORIZONS
0					50 100 150 200	
				(CL) LEAN CLAY (CL), dark brownish gray (10YR 4/2), moist, with sand, little gravel and roots/organics, medium stiff, low plasticity, no odor, no staining (Fill).		
				6.0 1178.5		
				(CL) LEAN CLAY (CL), dark yellowish brown (10YR 4/6), moist, medium stiff, moderate plasticity, no odor, no staining (Fill).		
10				10.0 1174.5		H4 - 1174.5
				(CL) SANDY LEAN CLAY (CL), yellow to strong brown (10YR 7/6 to 7.5YR 5/8), dry, with sandstone rock fragments, medium stiff, low plasticity, crushed rock from 25 to 27 feet, no odor, no staining (Residuum).		
20						
30						
				36.0 1148.5		H3 - 1159.5
				(CL) LEAN CLAY (CL), light olive brown (10YR 4/2), moist, with sand, little gravel and roots/organics, medium stiff, low plasticity, no odor, no staining (Residuum).		
40						
50						
				55.0 1129.5		

(Continued Next Page)



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BORING NUMBER MW-16Z

PAGE 2 OF 3

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)	SELECT GEOPHYSICAL HORIZONS
60				(CL) LEAN CLAY (CL), strong brown (7.5YR 4/6), moist, medium stiff, moderate plasticity, no odor, no staining (Residuum). 1125.5	50 100 150 200	
70				(SM) SILTY SAND (SM), yellowish brown (10YR 5/4), dry, fine grained, poorly graded, no odor, no staining (Saprolite). 1105.5		H2 - 1118.5
80				SANDY DOLOSTONE, fine grained, slightly weathered, wet, minor vugs from 80 to 85 ft bgs, clayey lenses with wetness at 80 to 81.5 feet, 86 to 88 feet, and 90 to 95 feet. 1086.5		H1 - 1106.5
90						
100				(CH) SANDY FAT CLAY (CH), strong brown (7.5YR 5/6), wet, soft, high plasticity, drop in rods and limited recovery from 98 to 100 feet, most likely transition from competent to weathered dolostone (Saprolite). 1074.5		
110				(CL) SANDY LEAN CLAY (CL), strong brown to yellow (7.5YR 5/6 to 10YR 7/8), moist, medium stiff, high plasticity (Saprolite).		

(Continued Next Page)



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BORING NUMBER MW-16Z

PAGE 3 OF 3

CLIENT Vernon County PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824 PROJECT LOCATION Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)	SELECT GEOPHYSICAL HORIZONS
120				(CL) SANDY LEAN CLAY (CL), strong brown to yellow (7.5YR 5/6 to 10YR 7/8), moist, medium stiff, high plasticity (Saprolite). (continued)	1064.5	

Boring Terminated at 120 feet.
Bottom of borehole at 120.0 feet.

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

DATE STARTED 7/29/24 **COMPLETED** 7/31/24

GROUND ELEVATION 1209.8 ft **HOLE SIZE** 6 inches

DRILLING CONTRACTOR Cascade Environmental

GROUND WATER LEVELS:

DRILLING METHOD Rotasonic

AT TIME OF DRILLING ---

LOGGED BY A. Kutz CHECKED BY _____

AT END OF DRILLING ---

NOTES Geophysical log completed by SEH during September 2024.

AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)	SELECT GEOPHYSICAL HORIZONS
0					50 100 150 200	
0.5				(CL) SANDY LEAN CLAY (CL), dark yellowish brown (10YR 3/4), fine grained, moist, soft, some roots and organics, low plasticity, no odor, no staining (Topsoil).	1209.3	
14.0				(CL) SANDY LEAN CLAY (CL), yellowish brown to yellow (10YR 5/6 to 10YR 7/8), moist, with sandstone fragments, medium stiff, moderate plasticity, no odor, no staining, large fragment of sandstone at 4 feet, (Residuum).	1195.8	
25.0				(CH) SANDY FAT CLAY (CL), dark yellowish brown to yellowish brown (10YR 3/4 to 10YR 5/8), moist, with gravel, soft, high plasticity, no odor, no staining, increased moisture from 15 to 19 feet, sandy lense from 19 to 20 feet (Residuum).	1184.8	
30.0				(SC) CLAYEY SAND (SC), brown (10YR 5/3), fine grained, dry, poorly graded, loose, no odor, no staining (Residuum).	1179.8	
40				(SP) POORLY GRADED SAND (SP), pale yellow to yellow (2.5Y 7/3 to 2.5Y 7/8), fine grained, dry, loose, some sandstone fragments, clayey lenses with sandstone fragments from 40 to 43 feet (Saprolite).		H4 - 1175.8
50						

(Continued Next Page)



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BORING NUMBER MW-18

PAGE 2 OF 3

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)				SELECT GEOPHYSICAL HORIZONS
					50	100	150	200	
60				(SP) POORLY GRADED SAND (SP), pale yellow to yellow (2.5Y 7/3 to 2.5Y 7/8), fine grained, dry, loose, some sandstone fragments, clayey lenses with sandstone fragments from 40 to 43 feet (Saprolite). <i>(continued)</i>					H3 - 1154.8
				65.0 1144.8					
70				(SM) SILTY SAND (SM), pale yellow to yellow (2.5Y 8/2 to 2.5Y 7/6), fine grained, dry, poorly graded, with dolostone fragments, sandy clay lense from 70 to 71 feet (Saprolite).					
				80.0 1129.8					
80				(SM) SILTY SAND (SM), pale yellow to yellow (2.5Y 8/2 to 2.5Y 7/6), fine grained, wet, poorly graded, with dolostone fragments, sandy clay seams at 80 to 81 feet, 83 to 84 feet, and 85 to 87 feet (Saprolite).					
				87.0 1122.8					
90				SANDY DOLOSTONE, slight weathering, pale yellow to yellow, fine grained.					H2 - 1117.8
100									H1 - 1107.8
110				110.0 1099.8					
				SANDY DOLOSTONE, slight weathering, pale yellow to yellow, fine grained, wet, clayey lenses with wetness at 110 and 115 feet.					
				117.0 1092.8					

(Continued Next Page)



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CLIENT Vernon County **PROJECT NAME** Vernon County Landfill
PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)	SELECT GEOPHYSICAL HORIZONS

50 100 150 200

Boring Terminated at 117 feet.
Bottom of borehole at 117.0 feet.

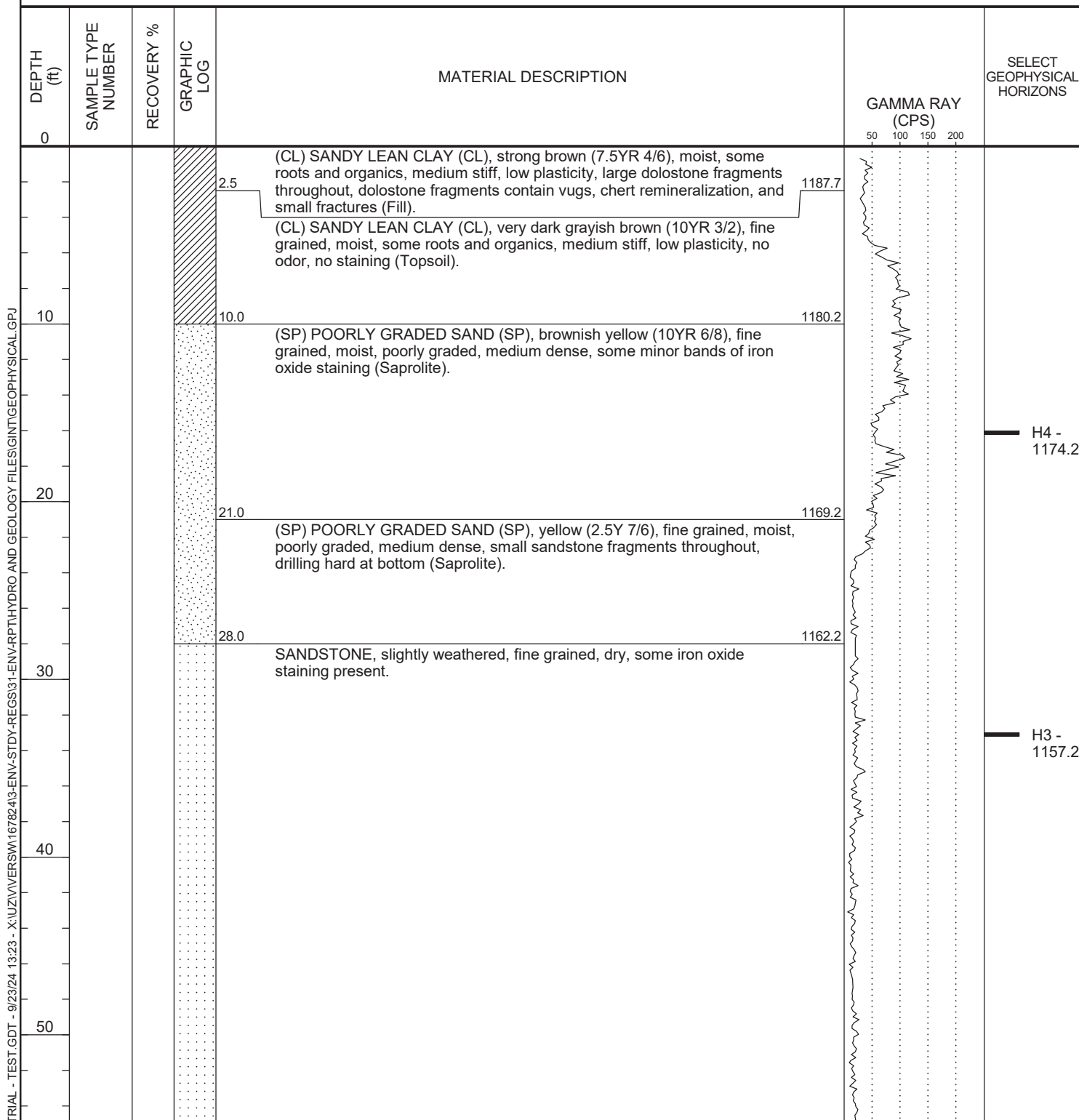


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BORING NUMBER MW-19Z

PAGE 1 OF 3

CLIENT	Vernon County	PROJECT NAME	Vernon County Landfill
PROJECT NUMBER	VERSW 167824	PROJECT LOCATION	Viroqua, Wisconsin
DATE STARTED	8/6/24	COMPLETED	8/9/24
DRILLING CONTRACTOR	Cascade Environmental	GROUND ELEVATION	1190.2 ft
DRILLING METHOD	Rotasonic	HOLE SIZE	6 inches
LOGGED BY	B. Kolter	CHECKED BY	
NOTES	Geophysical log completed by SEH during September 2024.		
GROUND WATER LEVELS:		AT TIME OF DRILLING ---	
		AT END OF DRILLING ---	
		AFTER DRILLING ---	



(Continued Next Page)



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BORING NUMBER MW-19Z

PAGE 2 OF 3

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)				SELECT GEOPHYSICAL HORIZONS
					50	100	150	200	
60				SANDSTONE, slightly weathered, fine grained, dry, some iron oxide staining present. <i>(continued)</i>					
70									
80									H2 - 1117.2
90									H1 - 1106.2
100				100.0 SANDSTONE, slightly weathered, fine grained, wet. 1090.2					
110				110.0 CLAYEY SANDSTONE, highly weathered, very fine grained, wet, iron oxide staining present. 1080.2					

(Continued Next Page)



Short Elliott Hendrickson, Inc.
3535 Vadnais Center Drive
St. Paul, Minnesota 55110
Telephone: 651.490.2000
Fax: 651.490.2150

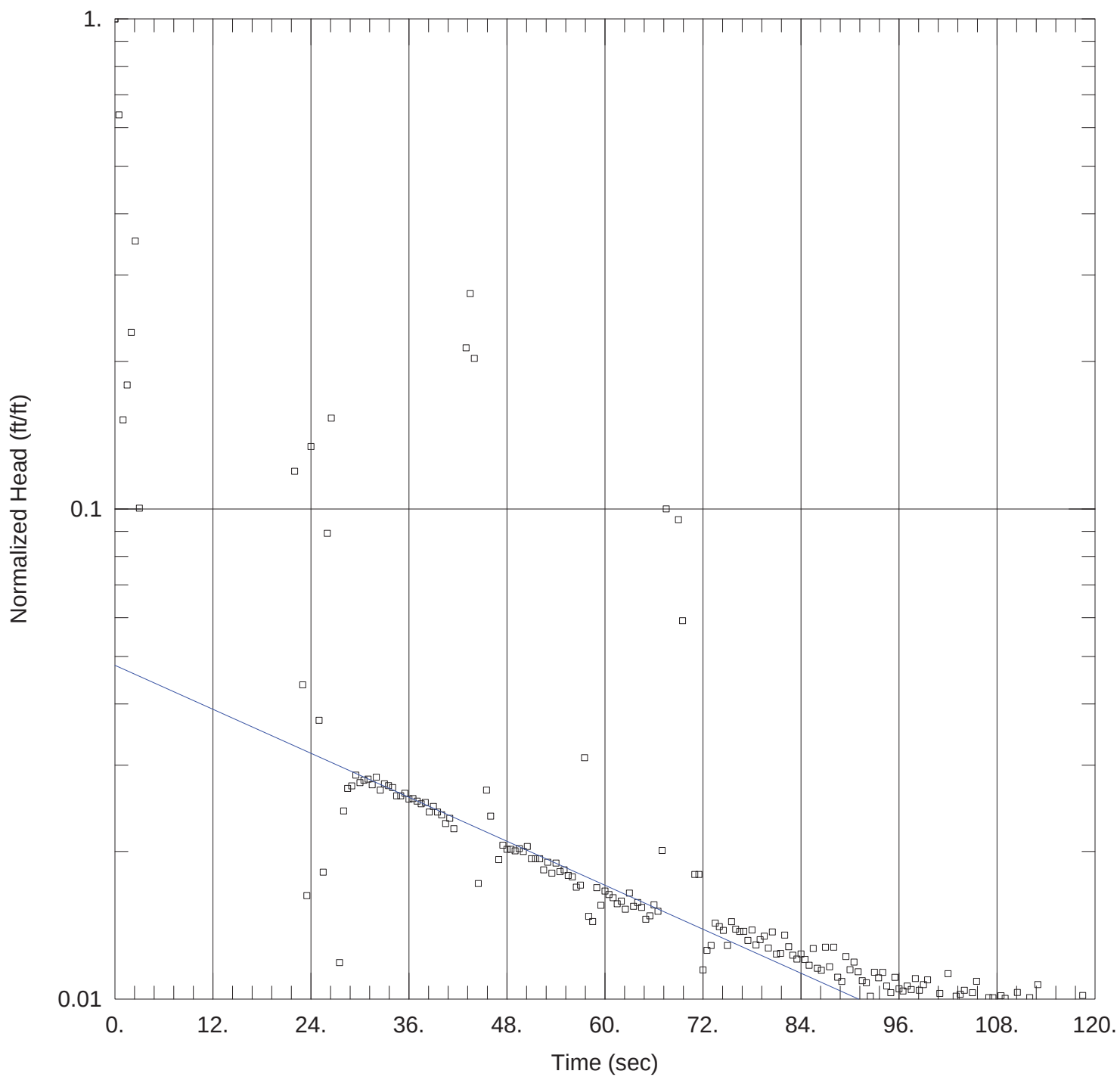
CLIENT Vernon County **PROJECT NAME** Vernon County Landfill
PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)	SELECT GEOPHYSICAL HORIZONS
120				CLAYEY SANDSTONE, highly weathered, very fine grained, wet, iron oxide staining present. (continued)	50 100 150 200	
130					1060.2	

Boring Terminated at 130 feet.
Bottom of borehole at 130.0 feet.

Attachment G

2024 In-Field Hydraulic Conductivity Results



MW-5A FALLING HEAD TEST

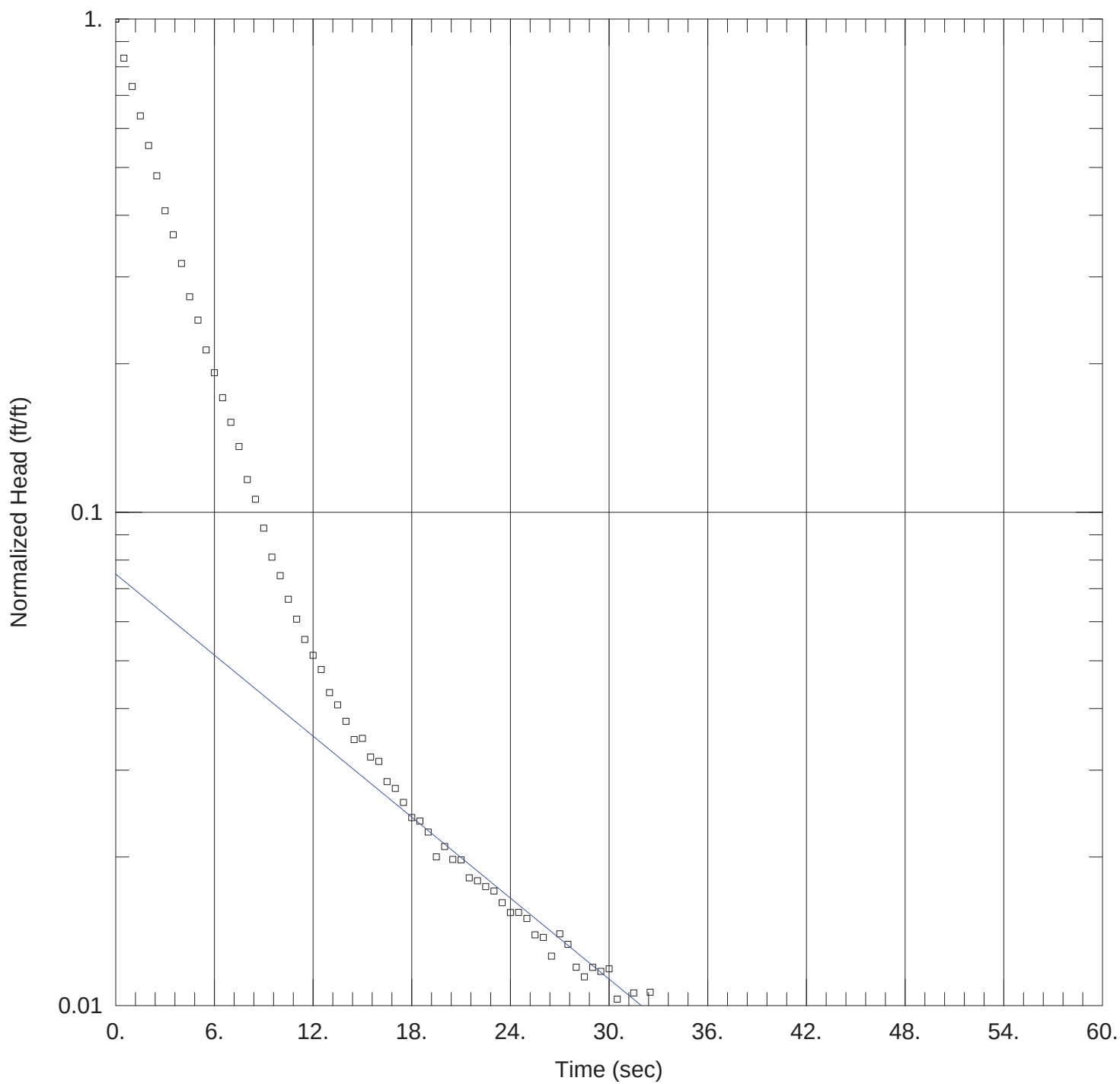
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001088 cm/sec

y0 = 0.0962 ft



MW-5A RISING HEAD TEST

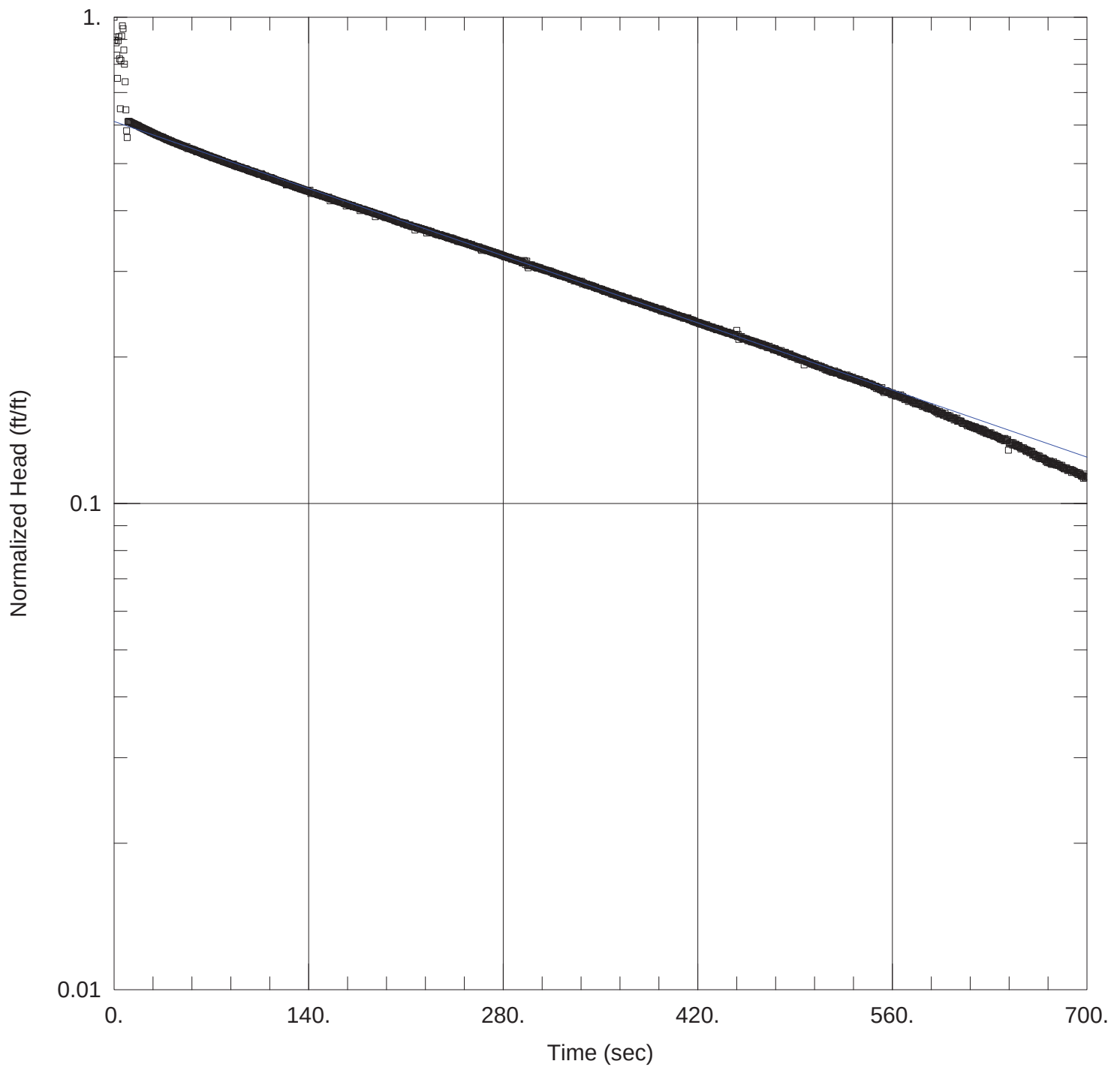
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.00398 cm/sec

y0 = 0.136 ft



MW-16Z FALLING HEAD TEST

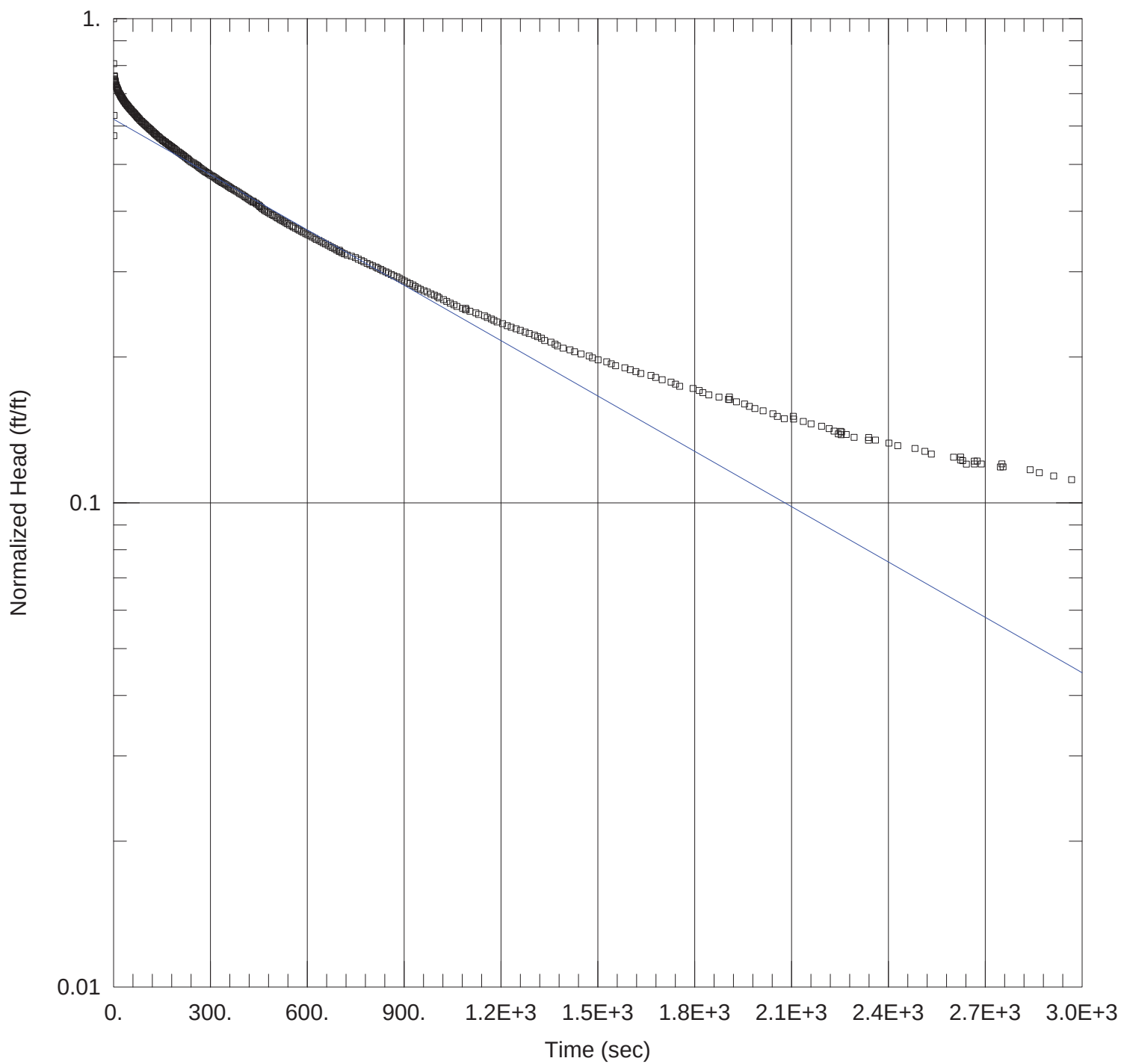
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0002772 cm/sec

y0 = 1.647 ft



MW-16Z RISING HEAD TEST

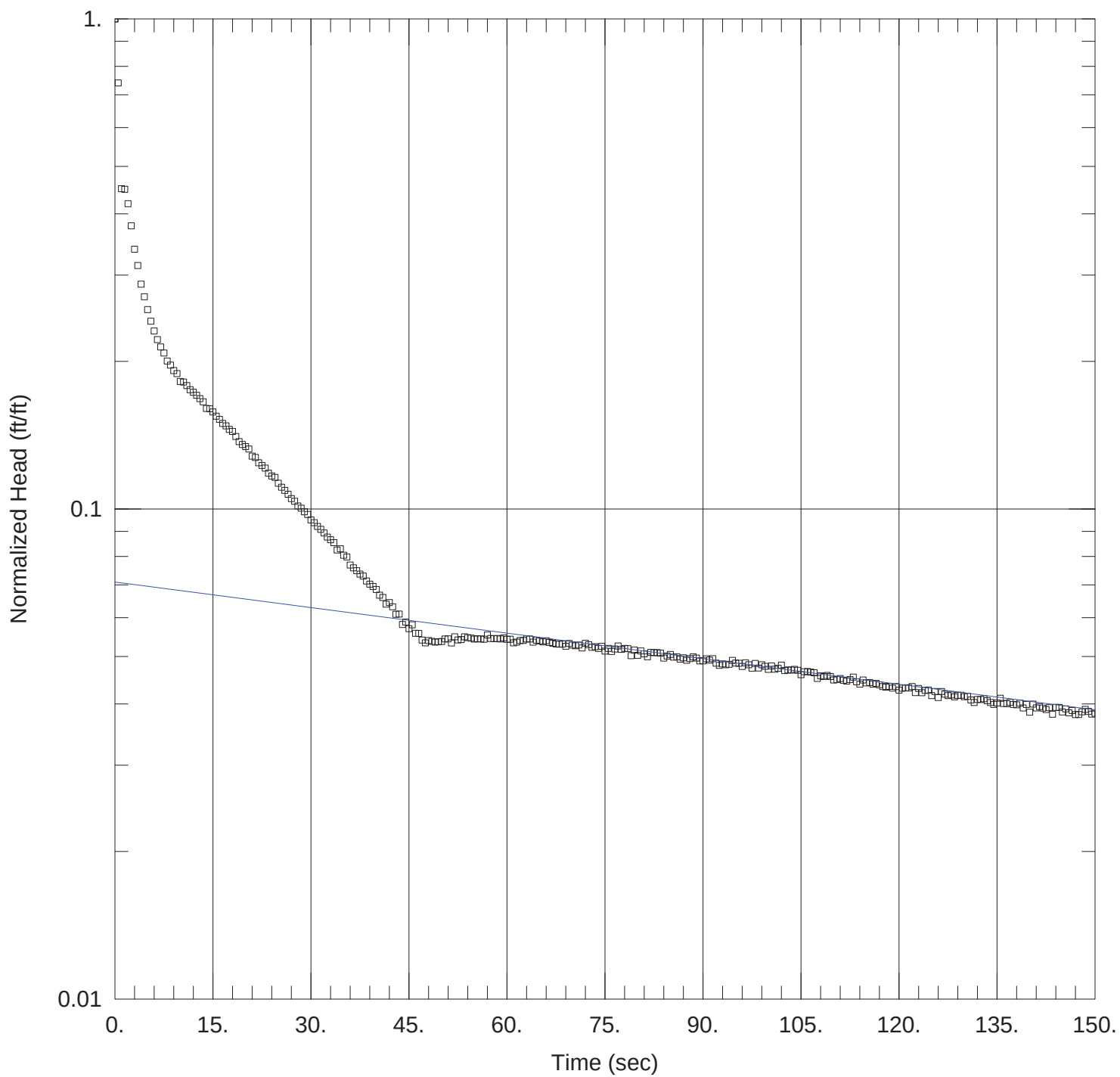
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0001071 cm/sec

y0 = 1.909 ft



MW-18 FALLING HEAD TEST

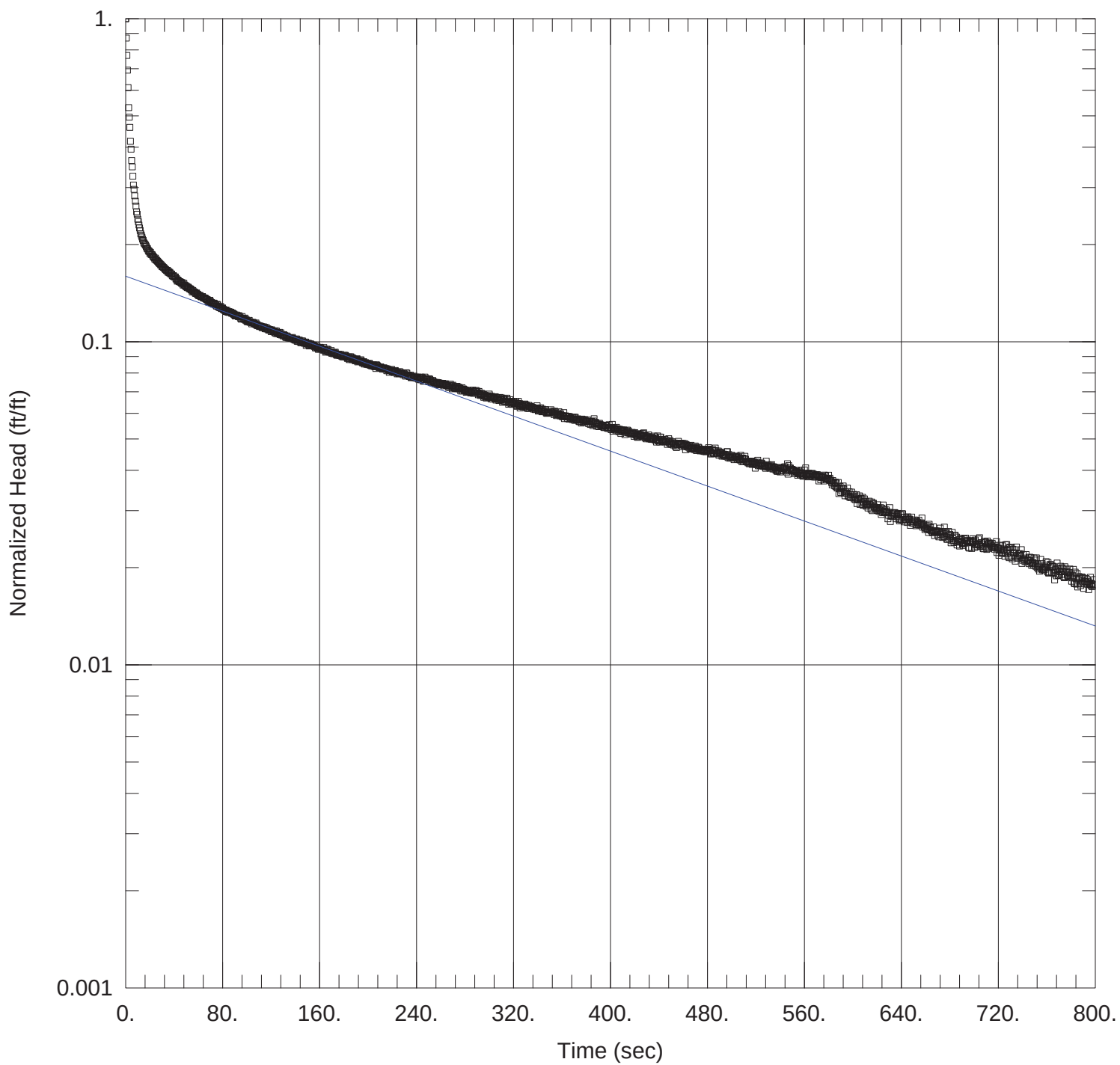
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.000266 cm/sec

y0 = 0.1665 ft



MW-18 RISING HEAD TEST

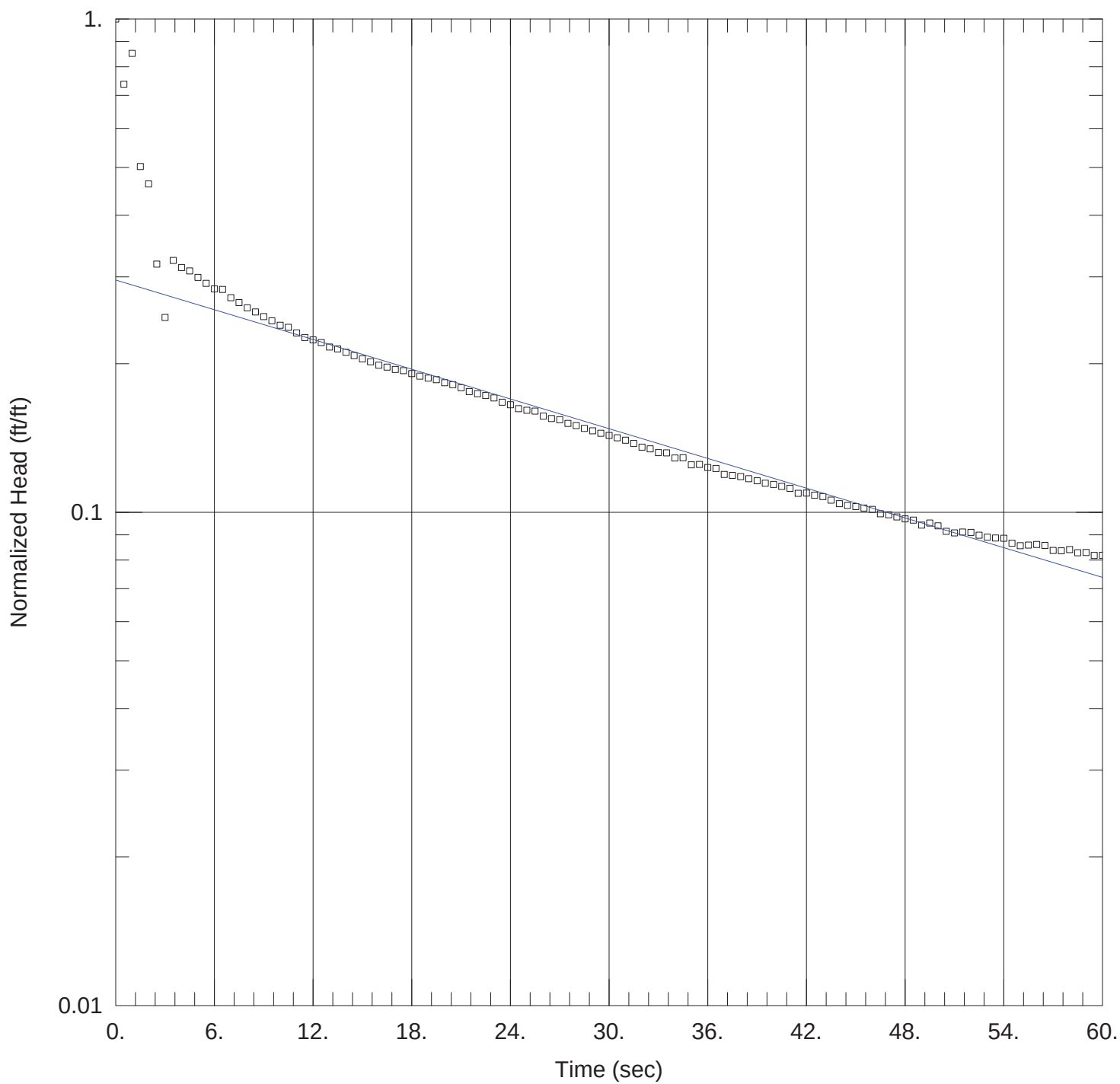
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0002072 cm/sec

y0 = 0.2808 ft



MW-18WT FALLING HEAD TEST

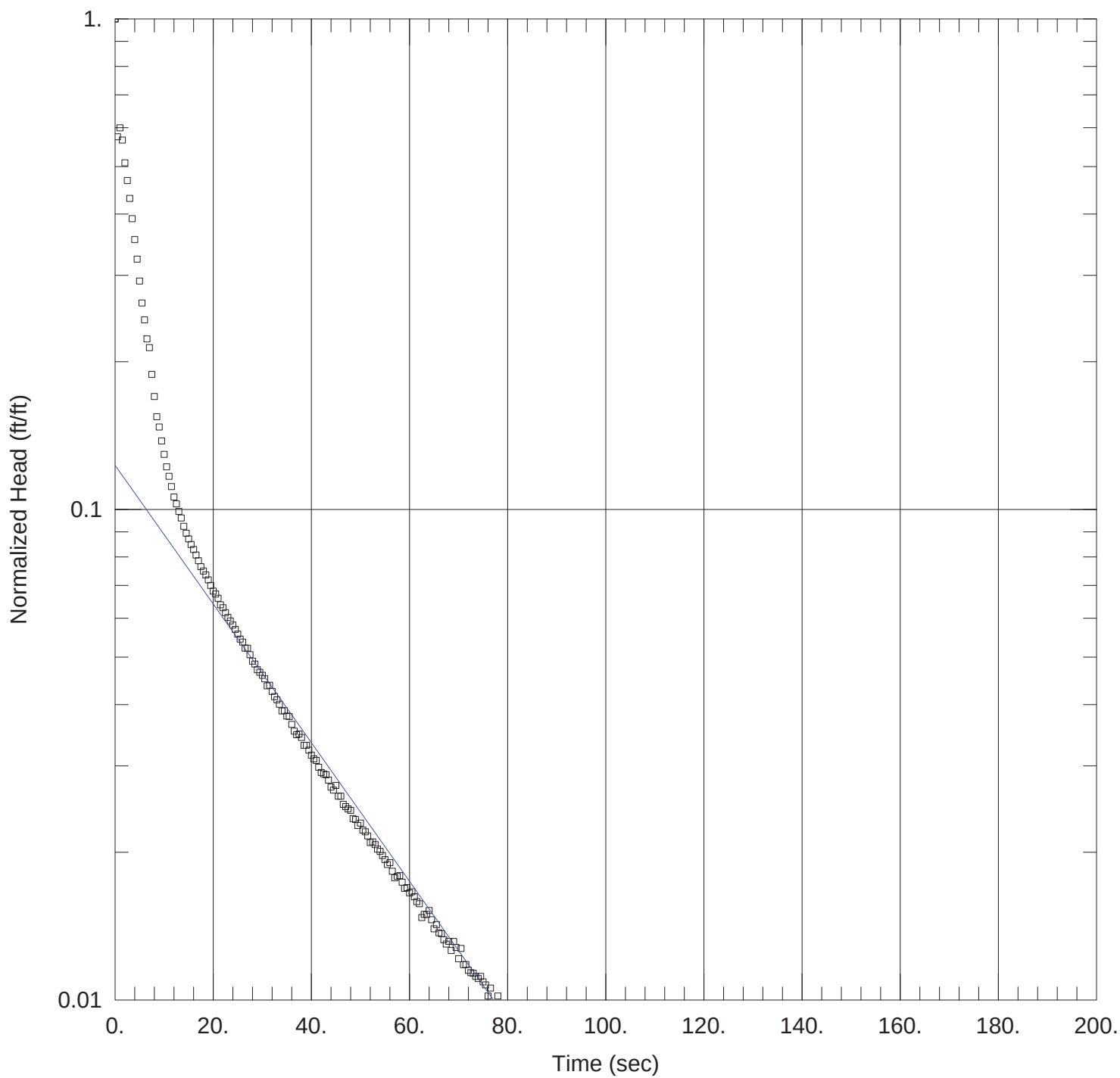
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001661 cm/sec

y0 = 0.4187 ft



MW-18WT RISING HEAD TEST

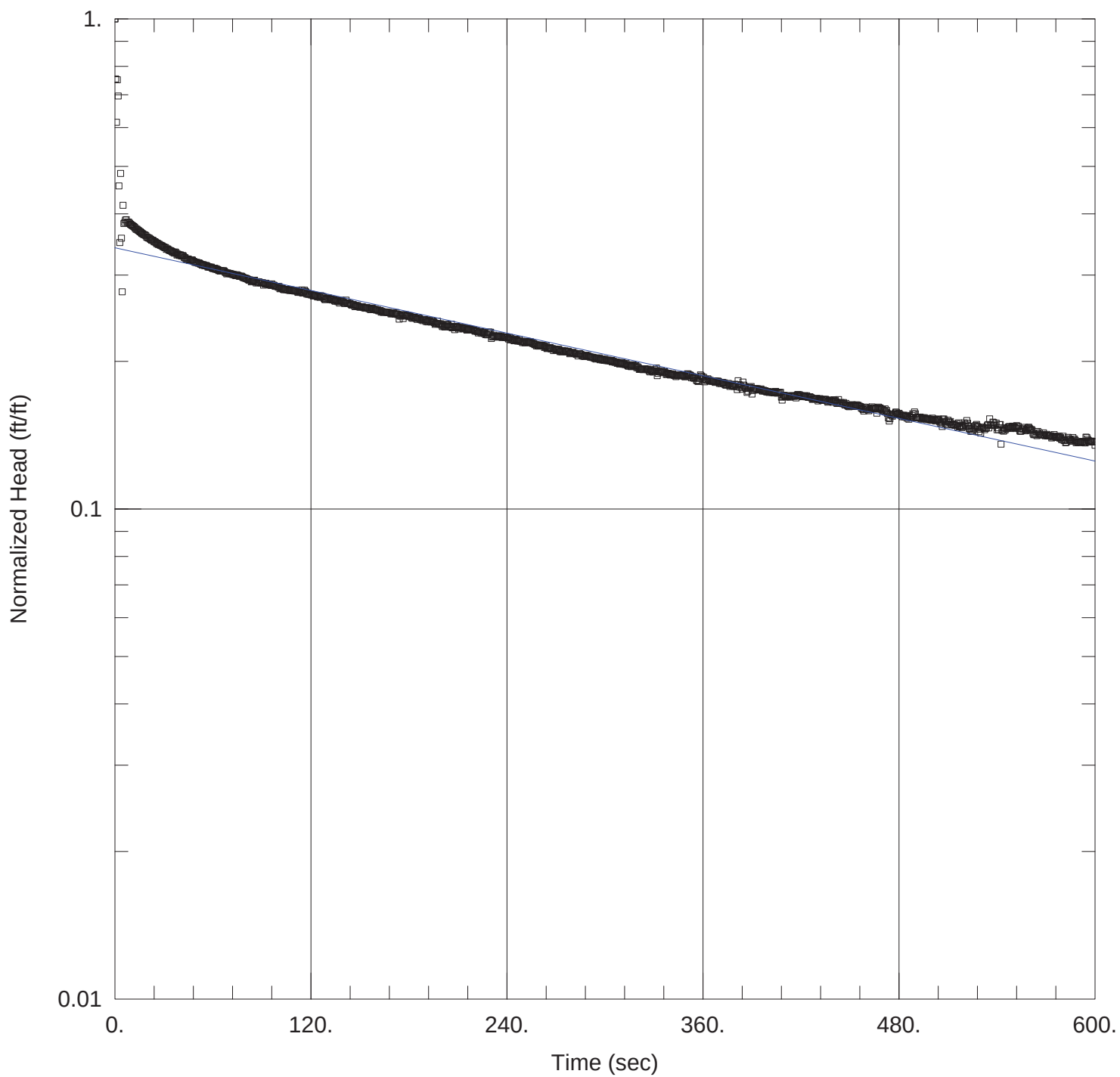
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.002336 cm/sec

y0 = 0.3603 ft



MW-19 FALLING HEAD TEST

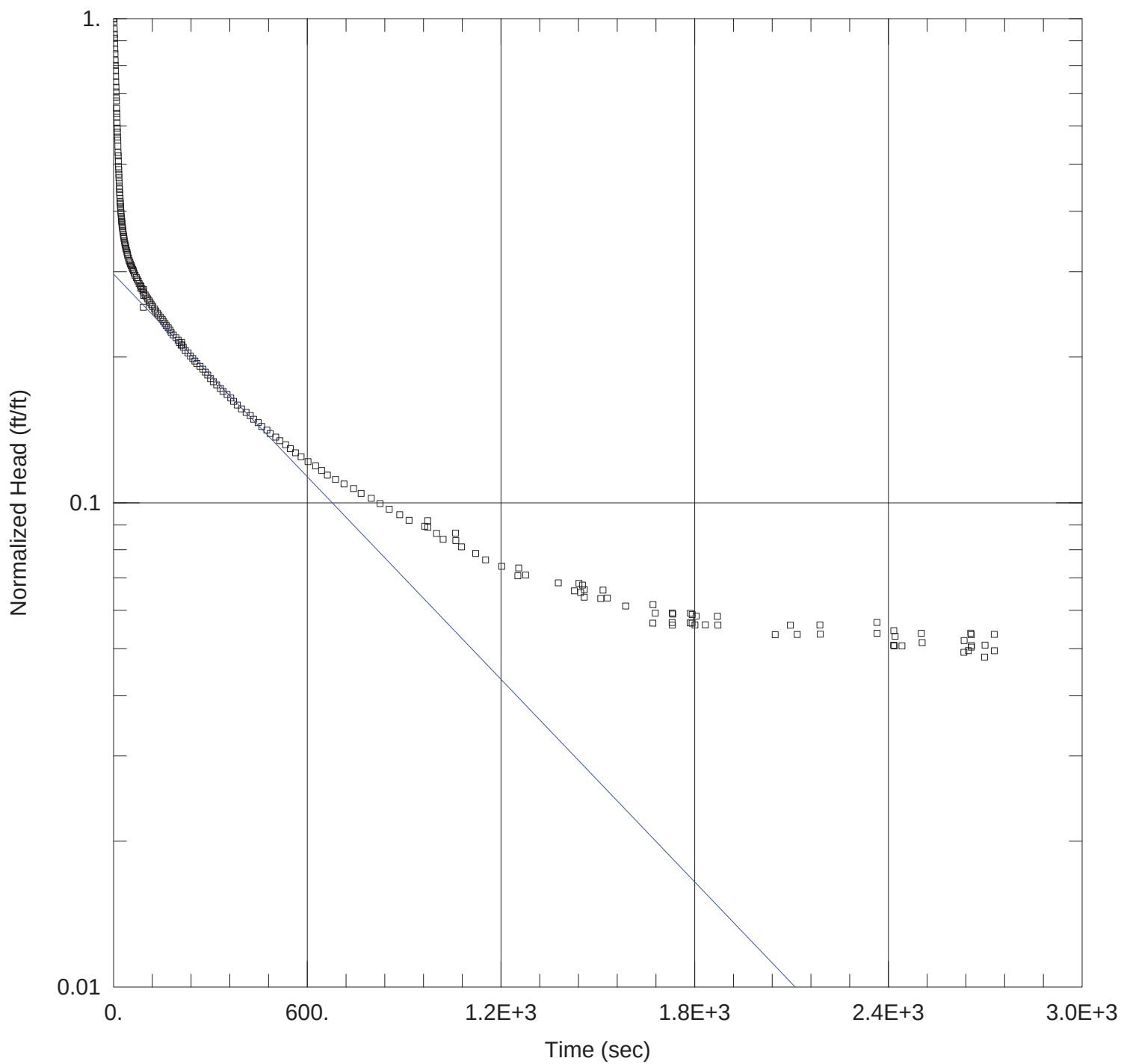
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0001081 cm/sec

y0 = 0.6147 ft



MW-19 RISING HEAD TEST

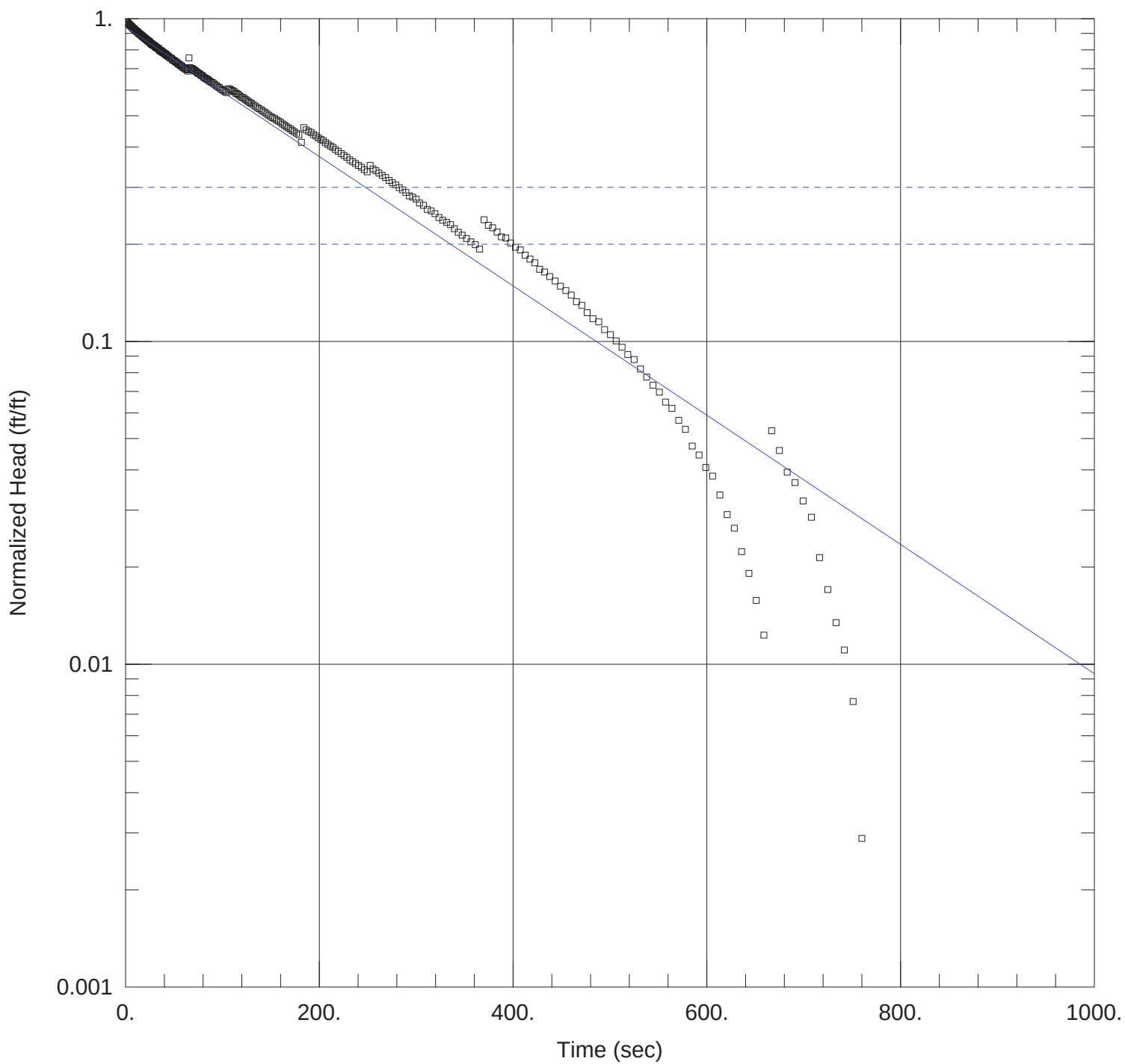
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0001039 cm/sec

y0 = 0.6455 ft



MW-19z FALLING HEAD TEST

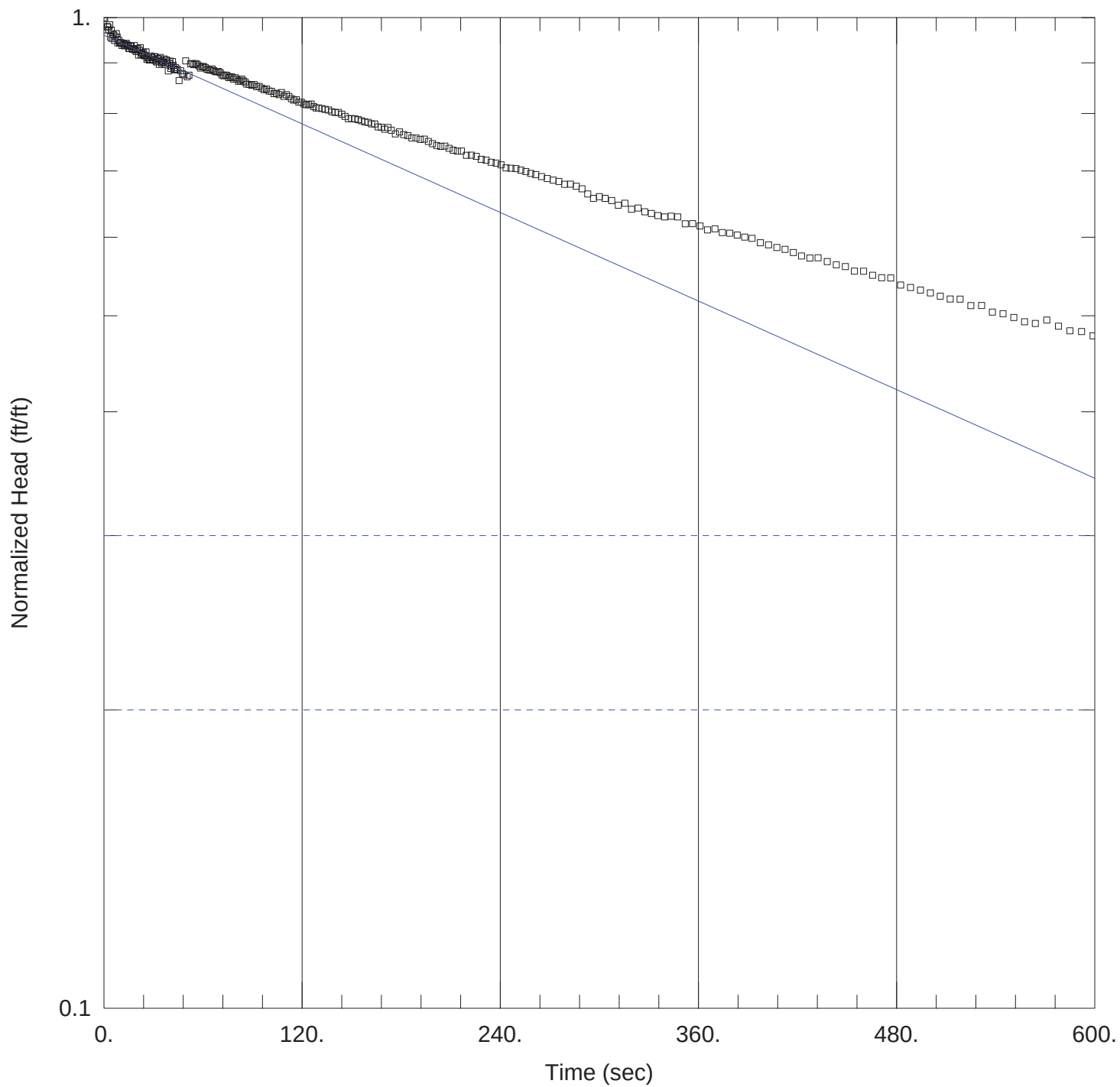
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0005716 cm/sec

y0 = 2.096 ft



MW-19Z RISING HEAD TEST

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0002127 cm/sec

y0 = 0.7857 ft

Attachment H

2024 Water Level Monitoring Field Form

**Water Level Monitoring Field Form
Vernon County Landfill**

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NGVD)	Top of Casing Elevation (feet NGVD)	Well Depth (feet btoc)	Screen Length (feet)	Screen Interval Elevation (feet NGVD)	Previous Depths to Water (feet btoc)	Measured Depth to Water (feet btoc)	Measured Depth to Water (feet btoc)
									Date: 08/27/2024	Date: 10/2/2024
2024 Monitoring Wells and Piezometers										
	MW-18WT	8/2/2024	1210.1	1212.24	91.5	10.0	1120.7 - 1130.7	N/A	82.09	79.83
	MW-18	7/31/2024	1209.8	1212.00	122.4	10.0	1089.6 - 1099.6	N/A	107.65	107.8
	MW-16Z	8/6/2024	1184.5	1186.50	124.7	5.0	1061.8 - 1066.8	N/A	92.62	92.56
	MW-19	8/13/2024	1190.5	1192.82	107.5	10.0	1085.3 - 1095.3	N/A	97.22	99.86
	MW-19Z	8/9/2024	1190.2	1192.34	134.9	5.0	1057.4 - 1062.4	N/A	98.3	98.57
2022 Monitoring Wells and Piezometers										
WC334	MW-14WT	9/20/2022	1247.2	1249.78	107.6	15.0	1142.2 - 1157.2	103.3	103.18	103.54
WC335	MW-15WT	9/28/2022	1220.6	1223.38	85.4	10.0	1138.0 - 1148.0	DRY	DRY	DRY
WC336	MW-16WT	9/21/2022	1184.7	1187.51	77.6	10.0	1109.9 - 1119.9	DRY	DRY	DRY
WC337	MW-16	8/25/2022	1184.3	1186.95	99.6	5.0	1087.4 - 1092.4	84.5	87.45	87.55
WC338	MW-17WT	9/26/2022	1196.4	1199.24	89.6	10.0	1109.6 - 1119.6	85.5	78.63	79.43
Monitoring Wells and Piezometers Inside Expansion Footprint										
109	MW-5A	11/8/1989	1224.0	1225.81	105.1	15.0	1120.7 - 1135.7	90.3	90.31	90.52
108	MW-5	2/17/1988	1223.3	1225.32	152.6	10.0	1072.7 - 1082.7	141.4	142.01	142.42
119	MW-14Z	3/7/2003	1247.5	1250.22	213.5	5.0	1036.7 - 1041.7	178.0	178.21	178.42
Monitoring Wells and Piezometers Within 150-feet										
118	MW-14	3/12/2003	1247.5	1249.69	188.3	15.0	1061.4 - 1076.4	174.5	174.92	175.06
Monitoring Wells and Piezometers Within 300-feet										
105	MW-3	2/2/1988	1233.0	1235.25	182.3	5.0	1053.0 - 1058.0	164.6	166.35	166.95
107	MW-4P	1/29/1988	1232.9	1235.19	97.3	10.0	1137.9 - 1147.9	87.0	84.52	85.23
110	MW-6	2/20/1988	1233.0	1235.37	204.6	5.0	1030.8 - 1035.8	170.1	171.24	171.56
114	MW-10	9/15/1989	1215.6	1217.52	185.4	5.0	1032.1 - 1037.1	133.3	135.85	136.27
115	MW-11	9/29/1989	1216.4	1218.56	164.7	15.0	1053.9 - 1068.9	129.3	131.5	131.35
116	MW-12	9/22/1989	1216.4	1218.36	100.5	15.0	1117.9 - 1132.9	88.7	85.7	86.34
Monitoring Wells and Piezometers Outside 300-feet ⁽¹⁾										
102	MW-1P	12/30/1987	1236.4	1238.41	113.1	10.0	1125.3 - 1135.3	107.0	105.78	105.98
101	MW-1	12/30/1987	1236.4	1238.11	159.7	10.0	1078.4 - 1088.4	146.3	147.91	147.94
121	MW-1PR	1/12/1994	1245.0	1247.61	130.3	15.0	1117.3 - 1132.3	113.4	113.14	113.26
120	MW-1R	1/12/1994	1244.6	1247.25	167.3	15.0	1080.0 - 1095.0	155.4	156.79	156.77
123	MW-1RZ	3/12/2003	1244.0	1245.45	188.0	5.0	1057.5 - 1062.5	154.2	155.59	156.02
104	MW-2P	1/17/1988	1252.5	1254.88	127.2	10.0	1127.7 - 1137.7	115.6	115.9	115.23
103	MW-2	1/17/1988	1252.5	1254.35	176.5	10.0	1077.9 - 1087.9	166.6	167.47	167.98
111	MW-7	11/7/1989	1255.7	1258.03	236.8	5.0	1021.2 - 1026.2	187.1	188.47	188.78
112	MW-8R	11/13/1989	1256.1	1258.84	205.2	15.0	1053.6 - 1068.6	181.8	181.52	181.6
113	MW-9	8/29/1989	1255.4	1257.50	128.9	15.0	1128.6 - 1143.6	118.3	112.25	114.34
117	MW-13P	2/26/2003	1224.5	1227.42	105.3	15.0	1122.1 - 1137.1	94.0	93.53	93.89

Notes:

NA - Information not available.

bgs - Below ground surface.

btoc - Below top of casing.

(1) - Monitoring wells outside 300-feet of the proposed expansion are not required to be monitored for water level but should be monitored during at least the first two water level monitoring events to assess groundwater conditions across the site.

Attachment I

August 27, 2024, Laboratory Report

ANALYTICAL REPORT

PREPARED FOR

Attn: Mr. Brian L. Kent
Short Elliott Hendrickson, Inc. dba SEH
10 North Bridge Street
Chippewa Falls, Wisconsin 54729-3374

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JOB DESCRIPTION

Vernon Co. LF

JOB NUMBER

500-255810-1

Eurofins Chicago

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

Results relate only to the items tested and the sample(s) as received by the laboratory. The results, detection limits (LOD) and Quantitation Limits (LOQ) have been adjusted for sample dilutions and/or solids content.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Compliance Statement

The LOD and LOQ reported are adjusted by the dilution factor when a dilution factor greater than 1 is needed. Additionally, where results are indicated as being reported on a dry weight basis, the LOD and LOQ are adjusted for moisture content as well.

Definitions of Limits

- LOD = Limit of Detection = MDL as defined by 40 CFR part 136 Appendix B
- LOQ = Limit of Quantitation = $3.33 \times \text{LOD}$ as defined by Wisconsin
- RL = Report Limit = a concentration supported by a standard in the calibration curves

Authorization



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Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

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Case Narrative

Client: Short Elliott Hendrickson, Inc. dba SEH
Project: Vernon Co. LF

Job ID: 500-255810-1

Job ID: 500-255810-1

Eurofins Chicago

Job Narrative 500-255810-1

Receipt

The samples were received on 8/29/2024 10:05 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7° C and 2.4° C.

Receipt Exceptions

A trip blank was submitted for analysis with these samples; however, it was not listed on the Chain of Custody (COC). Added to COC and logged in.

GC/MS VOA

Method 8260D: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 500-784176 recovered outside control limits for the following analytes: 1,2-Dibromo-3-Chloropropane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

Method 6020B: The method blank for preparation batch 500-783976 and analytical batch 500-785047 contained Copper above the reporting limit (RL). An associated sample was not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Field Service / Mobile Lab

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

Method SM 2320B: The method blank for analytical batch 500-785123 contained Alkalinity above the reporting limit (RL). Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

Methods 300.0, 9056A: The method blank for analytical batch 500-784419 contained Chloride above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Eurofins Chicago

Method Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
300.0	Anions, Ion Chromatography	EPA	EET CHI
N07-0003	Enzymatic Nitrate-Nitrite Nitrogen	EPA	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	EET CHI
SM 4500 Cl- E	Chloride, Total	SM	EET CHI
SM 5220C	COD	SM	EET CHI
Field Sampling	Field Sampling	EPA	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
5030B	Purge and Trap	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI
SM 5220	COD	SM	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-255810-1	MW-16Z	Water	08/27/24 14:30	08/29/24 10:05
500-255810-2	MW-18WT	Water	08/27/24 13:00	08/29/24 10:05
500-255810-3	MW-18	Water	08/27/24 13:50	08/29/24 10:05
500-255810-4	MW-19	Water	08/27/24 10:00	08/29/24 10:05
500-255810-5	MW-19Z	Water	08/27/24 10:45	08/29/24 10:05
500-255810-6	DWS-1	Water	08/27/24 15:00	08/29/24 10:05
500-255810-7	Trip Blank	Water	08/27/24 00:00	08/29/24 10:05

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-16Z

Lab Sample ID: 500-255810-1

Date Collected: 08/27/24 14:30

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			09/03/24 21:35	1
Benzene	<0.18		0.50	0.18	ug/L			09/03/24 21:35	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/03/24 21:35	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/03/24 21:35	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/03/24 21:35	1
Bromoform	<0.96		1.0	0.96	ug/L			09/03/24 21:35	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/03/24 21:35	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/03/24 21:35	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/03/24 21:35	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/03/24 21:35	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 21:35	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/03/24 21:35	1
Chloroform	<0.92		2.0	0.92	ug/L			09/03/24 21:35	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/03/24 21:35	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/03/24 21:35	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/03/24 21:35	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/03/24 21:35	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/03/24 21:35	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/03/24 21:35	1
1,2-Dibromo-3-Chloropropane	<3.9	+	5.0	3.9	ug/L			09/03/24 21:35	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/03/24 21:35	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/03/24 21:35	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/03/24 21:35	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 21:35	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/03/24 21:35	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/03/24 21:35	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/03/24 21:35	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/03/24 21:35	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/03/24 21:35	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/03/24 21:35	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/03/24 21:35	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/03/24 21:35	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/03/24 21:35	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			09/03/24 21:35	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/03/24 21:35	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 21:35	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/03/24 21:35	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			09/03/24 21:35	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/03/24 21:35	1
Naphthalene	<0.44		1.0	0.44	ug/L			09/03/24 21:35	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			09/03/24 21:35	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			09/03/24 21:35	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/03/24 21:35	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/03/24 21:35	1
Styrene	<0.31		1.0	0.31	ug/L			09/03/24 21:35	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/03/24 21:35	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/03/24 21:35	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/03/24 21:35	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/03/24 21:35	1

Eurofins Chicago

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-16Z

Lab Sample ID: 500-255810-1

Date Collected: 08/27/24 14:30

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/03/24 21:35	1
Toluene	<0.21		0.50	0.21	ug/L			09/03/24 21:35	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/03/24 21:35	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/03/24 21:35	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/03/24 21:35	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/03/24 21:35	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/03/24 21:35	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/03/24 21:35	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/03/24 21:35	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/03/24 21:35	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/03/24 21:35	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			09/03/24 21:35	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 21:35	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/03/24 21:35	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			09/03/24 21:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		72 - 124		09/03/24 21:35	1
Dibromofluoromethane (Surr)	108		75 - 120		09/03/24 21:35	1
1,2-Dichloroethane-d4 (Surr)	108		75 - 126		09/03/24 21:35	1
Toluene-d8 (Surr)	95		75 - 120		09/03/24 21:35	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.25	J	1.0	0.23	ug/L		08/30/24 08:14	09/04/24 14:05	1
Barium	98		2.5	0.73	ug/L		08/30/24 08:14	09/04/24 14:05	1
Boron	24	J B	50	13	ug/L		08/30/24 08:14	09/04/24 14:05	1
Cadmium	<0.17		0.50	0.17	ug/L		08/30/24 08:14	09/04/24 14:05	1
Chromium	<1.1		5.0	1.1	ug/L		08/30/24 08:14	09/04/24 14:05	1
Copper	1.9	J	2.0	0.50	ug/L		09/06/24 08:49	09/09/24 16:17	1
Lead	<0.19		0.50	0.19	ug/L		08/30/24 08:14	09/04/24 14:05	1
Manganese	530	B	2.5	0.79	ug/L		08/30/24 08:14	09/06/24 17:06	1
Selenium	<0.98		2.5	0.98	ug/L		08/30/24 08:14	09/04/24 14:05	1
Silver	<0.12		0.50	0.12	ug/L		08/30/24 08:14	09/04/24 14:05	1
Zinc	<6.9		20	6.9	ug/L		08/30/24 08:14	09/04/24 14:05	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		09/11/24 10:45	09/12/24 08:40	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	320		0.91	0.46	mg/L		08/30/24 08:14	09/05/24 10:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	43		5.0	1.9	mg/L			08/29/24 16:21	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-16Z

Lab Sample ID: 500-255810-1

Date Collected: 08/27/24 14:30

Matrix: Water

Date Received: 08/29/24 10:05

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	9.0	B	1.0	0.12	mg/L			09/04/24 15:53	1
Sulfate (EPA 300.0)	12		1.0	0.21	mg/L			09/04/24 15:53	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			09/04/24 15:53	1
Nitrate Nitrite as N (EPA N07-0003)	1.0		0.10	0.041	mg/L			09/12/24 12:07	1
Alkalinity (SM 2320B)	300	B	5.0	3.7	mg/L			09/06/24 11:16	1
Chemical Oxygen Demand (SM 5220C)	6.2	J	10	6.0	mg/L		09/03/24 09:51	09/03/24 14:58	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	92.62				ft			08/27/24 14:30	1
Field Color	N				NONE			08/27/24 14:30	1
Field Conductivity	540				umhos/cm			08/27/24 14:30	1
Field Odor	N				NONE			08/27/24 14:30	1
Field pH	7.52				SU			08/27/24 14:30	1
Field Temperature	14.4				Degrees C			08/27/24 14:30	1
Field Turbidity	N				NONE			08/27/24 14:30	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-18WT

Lab Sample ID: 500-255810-2

Date Collected: 08/27/24 13:00

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			09/03/24 21:59	1
Benzene	<0.18		0.50	0.18	ug/L			09/03/24 21:59	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/03/24 21:59	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/03/24 21:59	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/03/24 21:59	1
Bromoform	<0.96		1.0	0.96	ug/L			09/03/24 21:59	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/03/24 21:59	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/03/24 21:59	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/03/24 21:59	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/03/24 21:59	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 21:59	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/03/24 21:59	1
Chloroform	<0.92		2.0	0.92	ug/L			09/03/24 21:59	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/03/24 21:59	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/03/24 21:59	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/03/24 21:59	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/03/24 21:59	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/03/24 21:59	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/03/24 21:59	1
1,2-Dibromo-3-Chloropropane	<3.9	*+	5.0	3.9	ug/L			09/03/24 21:59	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/03/24 21:59	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/03/24 21:59	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/03/24 21:59	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 21:59	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/03/24 21:59	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/03/24 21:59	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/03/24 21:59	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/03/24 21:59	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/03/24 21:59	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/03/24 21:59	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/03/24 21:59	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/03/24 21:59	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/03/24 21:59	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			09/03/24 21:59	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/03/24 21:59	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 21:59	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/03/24 21:59	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			09/03/24 21:59	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/03/24 21:59	1
Naphthalene	<0.44		1.0	0.44	ug/L			09/03/24 21:59	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			09/03/24 21:59	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			09/03/24 21:59	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/03/24 21:59	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/03/24 21:59	1
Styrene	<0.31		1.0	0.31	ug/L			09/03/24 21:59	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/03/24 21:59	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/03/24 21:59	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/03/24 21:59	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/03/24 21:59	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-18WT

Lab Sample ID: 500-255810-2

Date Collected: 08/27/24 13:00

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/03/24 21:59	1
Toluene	<0.21		0.50	0.21	ug/L			09/03/24 21:59	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/03/24 21:59	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/03/24 21:59	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/03/24 21:59	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/03/24 21:59	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/03/24 21:59	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/03/24 21:59	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/03/24 21:59	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/03/24 21:59	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/03/24 21:59	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			09/03/24 21:59	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 21:59	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/03/24 21:59	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			09/03/24 21:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	104		72 - 124		09/03/24 21:59	1
Dibromofluoromethane (Surr)	111		75 - 120		09/03/24 21:59	1
1,2-Dichloroethane-d4 (Surr)	110		75 - 126		09/03/24 21:59	1
Toluene-d8 (Surr)	95		75 - 120		09/03/24 21:59	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	11		1.0	0.23	ug/L		08/30/24 08:14	09/04/24 14:08	1
Barium	210		2.5	0.73	ug/L		08/30/24 08:14	09/04/24 14:08	1
Boron	31	J B	50	13	ug/L		08/30/24 08:14	09/04/24 14:08	1
Cadmium	0.39	J	0.50	0.17	ug/L		08/30/24 08:14	09/04/24 14:08	1
Chromium	35		5.0	1.1	ug/L		08/30/24 08:14	09/04/24 14:08	1
Copper	42		2.0	0.50	ug/L		09/06/24 08:49	09/09/24 16:19	1
Lead	18		0.50	0.19	ug/L		08/30/24 08:14	09/04/24 14:08	1
Manganese	1800	B	2.5	0.79	ug/L		08/30/24 08:14	09/06/24 17:08	1
Selenium	3.4		2.5	0.98	ug/L		08/30/24 08:14	09/04/24 14:08	1
Silver	0.13	J	0.50	0.12	ug/L		08/30/24 08:14	09/04/24 14:08	1
Zinc	64		20	6.9	ug/L		08/30/24 08:14	09/04/24 14:08	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		09/11/24 10:45	09/12/24 08:42	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	640		0.91	0.46	mg/L		08/30/24 08:14	09/05/24 10:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	2900		500	190	mg/L			08/29/24 16:24	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-18WT

Lab Sample ID: 500-255810-2

Date Collected: 08/27/24 13:00

Matrix: Water

Date Received: 08/29/24 10:05

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	2.7	B	1.0	0.12	mg/L			09/04/24 17:09	1
Sulfate (EPA 300.0)	7.6		1.0	0.21	mg/L			09/04/24 17:09	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			09/04/24 17:09	1
Nitrate Nitrite as N (EPA N07-0003)	3.9		0.50	0.21	mg/L			09/12/24 14:49	5
Alkalinity (SM 2320B)	280	B	5.0	3.7	mg/L			09/06/24 11:26	1
Chemical Oxygen Demand (SM 5220C)	6.7	J	10	6.0	mg/L		09/03/24 09:51	09/03/24 15:02	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	82.09				ft			08/27/24 13:00	1
Field Color	Y				NONE			08/27/24 13:00	1
Field Conductivity	492				umhos/cm			08/27/24 13:00	1
Field Odor	N				NONE			08/27/24 13:00	1
Field pH	7.46				SU			08/27/24 13:00	1
Field Temperature	14.8				Degrees C			08/27/24 13:00	1
Field Turbidity	Y				NONE			08/27/24 13:00	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-18

Lab Sample ID: 500-255810-3

Date Collected: 08/27/24 13:50

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			09/03/24 22:22	1
Benzene	<0.18		0.50	0.18	ug/L			09/03/24 22:22	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/03/24 22:22	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/03/24 22:22	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/03/24 22:22	1
Bromoform	<0.96		1.0	0.96	ug/L			09/03/24 22:22	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/03/24 22:22	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/03/24 22:22	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/03/24 22:22	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/03/24 22:22	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 22:22	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/03/24 22:22	1
Chloroform	<0.92		2.0	0.92	ug/L			09/03/24 22:22	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/03/24 22:22	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/03/24 22:22	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/03/24 22:22	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/03/24 22:22	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/03/24 22:22	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/03/24 22:22	1
1,2-Dibromo-3-Chloropropane	<3.9	+	5.0	3.9	ug/L			09/03/24 22:22	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/03/24 22:22	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/03/24 22:22	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/03/24 22:22	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 22:22	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/03/24 22:22	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/03/24 22:22	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/03/24 22:22	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/03/24 22:22	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/03/24 22:22	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/03/24 22:22	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/03/24 22:22	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/03/24 22:22	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/03/24 22:22	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			09/03/24 22:22	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/03/24 22:22	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 22:22	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/03/24 22:22	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			09/03/24 22:22	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/03/24 22:22	1
Naphthalene	<0.44		1.0	0.44	ug/L			09/03/24 22:22	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			09/03/24 22:22	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			09/03/24 22:22	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/03/24 22:22	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/03/24 22:22	1
Styrene	<0.31		1.0	0.31	ug/L			09/03/24 22:22	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/03/24 22:22	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/03/24 22:22	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/03/24 22:22	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/03/24 22:22	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-18

Lab Sample ID: 500-255810-3

Date Collected: 08/27/24 13:50

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/03/24 22:22	1
Toluene	<0.21		0.50	0.21	ug/L			09/03/24 22:22	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/03/24 22:22	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/03/24 22:22	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/03/24 22:22	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/03/24 22:22	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/03/24 22:22	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/03/24 22:22	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/03/24 22:22	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/03/24 22:22	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/03/24 22:22	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			09/03/24 22:22	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 22:22	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/03/24 22:22	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			09/03/24 22:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		72 - 124		09/03/24 22:22	1
Dibromofluoromethane (Surr)	109		75 - 120		09/03/24 22:22	1
1,2-Dichloroethane-d4 (Surr)	105		75 - 126		09/03/24 22:22	1
Toluene-d8 (Surr)	97		75 - 120		09/03/24 22:22	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		08/30/24 08:14	09/04/24 14:10	1
Barium	38		2.5	0.73	ug/L		08/30/24 08:14	09/04/24 14:10	1
Boron	17	J B	50	13	ug/L		08/30/24 08:14	09/04/24 14:10	1
Cadmium	<0.17		0.50	0.17	ug/L		08/30/24 08:14	09/04/24 14:10	1
Chromium	<1.1		5.0	1.1	ug/L		08/30/24 08:14	09/04/24 14:10	1
Copper	1.4	J	2.0	0.50	ug/L		09/06/24 08:49	09/09/24 16:21	1
Lead	<0.19		0.50	0.19	ug/L		08/30/24 08:14	09/04/24 14:10	1
Manganese	12	B	2.5	0.79	ug/L		08/30/24 08:14	09/06/24 17:10	1
Selenium	<0.98		2.5	0.98	ug/L		08/30/24 08:14	09/04/24 14:10	1
Silver	<0.12		0.50	0.12	ug/L		08/30/24 08:14	09/04/24 14:10	1
Zinc	<6.9		20	6.9	ug/L		08/30/24 08:14	09/04/24 14:10	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		09/11/24 10:45	09/12/24 08:45	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	320		0.91	0.46	mg/L		08/30/24 08:14	09/05/24 10:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	1900		250	97	mg/L			08/29/24 16:27	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-18

Lab Sample ID: 500-255810-3

Date Collected: 08/27/24 13:50

Matrix: Water

Date Received: 08/29/24 10:05

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	4.8	B	1.0	0.12	mg/L			09/04/24 17:24	1
Sulfate (EPA 300.0)	9.7		1.0	0.21	mg/L			09/04/24 17:24	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			09/04/24 17:24	1
Nitrate Nitrite as N (EPA N07-0003)	5.2		1.0	0.41	mg/L			09/12/24 14:49	10
Alkalinity (SM 2320B)	230	B	5.0	3.7	mg/L			09/06/24 11:35	1
Chemical Oxygen Demand (SM 5220C)	<6.0		10	6.0	mg/L		09/03/24 09:51	09/03/24 15:04	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	107.65				ft			08/27/24 13:50	1
Field Color	Y				NONE			08/27/24 13:50	1
Field Conductivity	480				umhos/cm			08/27/24 13:50	1
Field Odor	N				NONE			08/27/24 13:50	1
Field pH	7.43				SU			08/27/24 13:50	1
Field Temperature	14.3				Degrees C			08/27/24 13:50	1
Field Turbidity	Y				NONE			08/27/24 13:50	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-19

Lab Sample ID: 500-255810-4

Date Collected: 08/27/24 10:00

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	16		10	4.3	ug/L			09/03/24 22:45	1
Benzene	47		0.50	0.18	ug/L			09/03/24 22:45	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/03/24 22:45	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/03/24 22:45	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/03/24 22:45	1
Bromoform	<0.96		1.0	0.96	ug/L			09/03/24 22:45	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/03/24 22:45	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/03/24 22:45	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/03/24 22:45	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/03/24 22:45	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 22:45	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/03/24 22:45	1
Chloroform	<0.92		2.0	0.92	ug/L			09/03/24 22:45	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/03/24 22:45	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/03/24 22:45	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/03/24 22:45	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/03/24 22:45	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/03/24 22:45	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/03/24 22:45	1
1,2-Dibromo-3-Chloropropane	<3.9	*+	5.0	3.9	ug/L			09/03/24 22:45	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/03/24 22:45	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/03/24 22:45	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/03/24 22:45	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 22:45	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/03/24 22:45	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/03/24 22:45	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/03/24 22:45	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/03/24 22:45	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/03/24 22:45	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/03/24 22:45	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/03/24 22:45	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/03/24 22:45	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/03/24 22:45	1
Ethylbenzene	9.5		0.50	0.20	ug/L			09/03/24 22:45	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/03/24 22:45	1
Isopropylbenzene	0.60	J	1.0	0.29	ug/L			09/03/24 22:45	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/03/24 22:45	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			09/03/24 22:45	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/03/24 22:45	1
Naphthalene	9.5		1.0	0.44	ug/L			09/03/24 22:45	1
n-Butylbenzene	0.79	J	1.0	0.33	ug/L			09/03/24 22:45	1
N-Propylbenzene	2.7		1.0	0.32	ug/L			09/03/24 22:45	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/03/24 22:45	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/03/24 22:45	1
Styrene	<0.31		1.0	0.31	ug/L			09/03/24 22:45	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/03/24 22:45	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/03/24 22:45	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/03/24 22:45	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/03/24 22:45	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-19

Lab Sample ID: 500-255810-4

Date Collected: 08/27/24 10:00

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/03/24 22:45	1
Toluene	35		0.50	0.21	ug/L			09/03/24 22:45	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/03/24 22:45	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/03/24 22:45	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/03/24 22:45	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/03/24 22:45	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/03/24 22:45	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/03/24 22:45	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/03/24 22:45	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/03/24 22:45	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/03/24 22:45	1
1,2,4-Trimethylbenzene	2.1		1.0	0.30	ug/L			09/03/24 22:45	1
1,3,5-Trimethylbenzene	0.34 J		1.0	0.29	ug/L			09/03/24 22:45	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/03/24 22:45	1
Xylenes, Total	17		1.0	0.30	ug/L			09/03/24 22:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		72 - 124		09/03/24 22:45	1
Dibromofluoromethane (Surr)	106		75 - 120		09/03/24 22:45	1
1,2-Dichloroethane-d4 (Surr)	105		75 - 126		09/03/24 22:45	1
Toluene-d8 (Surr)	93		75 - 120		09/03/24 22:45	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.3		1.0	0.23	ug/L		08/30/24 08:14	09/04/24 14:12	1
Barium	120		2.5	0.73	ug/L		08/30/24 08:14	09/04/24 14:12	1
Boron	25 J B		50	13	ug/L		08/30/24 08:14	09/04/24 14:12	1
Cadmium	0.23 J		0.50	0.17	ug/L		08/30/24 08:14	09/04/24 14:12	1
Chromium	62		5.0	1.1	ug/L		08/30/24 08:14	09/04/24 14:12	1
Copper	81 B		2.0	0.50	ug/L		08/30/24 08:14	09/06/24 17:13	1
Lead	7.0		0.50	0.19	ug/L		08/30/24 08:14	09/04/24 14:12	1
Manganese	2400 B		2.5	0.79	ug/L		08/30/24 08:14	09/06/24 17:13	1
Selenium	1.5 J		2.5	0.98	ug/L		08/30/24 08:14	09/04/24 14:12	1
Silver	0.13 J		0.50	0.12	ug/L		08/30/24 08:14	09/04/24 14:12	1
Zinc	21		20	6.9	ug/L		08/30/24 08:14	09/04/24 14:12	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		09/11/24 10:45	09/12/24 08:47	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	120		0.91	0.46	mg/L		08/30/24 08:14	09/05/24 10:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	2400		250	97	mg/L			08/29/24 16:29	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-19

Lab Sample ID: 500-255810-4

Date Collected: 08/27/24 10:00

Matrix: Water

Date Received: 08/29/24 10:05

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	1.5	B	1.0	0.12	mg/L			09/04/24 17:39	1
Sulfate (EPA 300.0)	3.1		1.0	0.21	mg/L			09/04/24 17:39	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			09/04/24 17:39	1
Nitrate Nitrite as N (EPA N07-0003)	0.27		0.10	0.041	mg/L			09/12/24 12:09	1
Alkalinity (SM 2320B)	140	B	5.0	3.7	mg/L			09/06/24 11:45	1
Chemical Oxygen Demand (SM 5220C)	26		10	6.0	mg/L		09/03/24 09:51	09/03/24 15:05	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	97.22				ft			08/27/24 10:00	1
Field Color	Y				NONE			08/27/24 10:00	1
Field Conductivity	195				umhos/cm			08/27/24 10:00	1
Field Odor	N				NONE			08/27/24 10:00	1
Field pH	7.61				SU			08/27/24 10:00	1
Field Temperature	15.3				Degrees C			08/27/24 10:00	1
Field Turbidity	Y				NONE			08/27/24 10:00	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-19Z

Lab Sample ID: 500-255810-5

Date Collected: 08/27/24 10:45

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			09/03/24 23:09	1
Benzene	<0.18		0.50	0.18	ug/L			09/03/24 23:09	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/03/24 23:09	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/03/24 23:09	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/03/24 23:09	1
Bromoform	<0.96		1.0	0.96	ug/L			09/03/24 23:09	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/03/24 23:09	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/03/24 23:09	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/03/24 23:09	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/03/24 23:09	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 23:09	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/03/24 23:09	1
Chloroform	<0.92		2.0	0.92	ug/L			09/03/24 23:09	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/03/24 23:09	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/03/24 23:09	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/03/24 23:09	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/03/24 23:09	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/03/24 23:09	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/03/24 23:09	1
1,2-Dibromo-3-Chloropropane	<3.9	+	5.0	3.9	ug/L			09/03/24 23:09	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/03/24 23:09	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/03/24 23:09	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/03/24 23:09	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 23:09	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/03/24 23:09	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/03/24 23:09	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/03/24 23:09	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/03/24 23:09	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/03/24 23:09	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/03/24 23:09	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/03/24 23:09	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/03/24 23:09	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/03/24 23:09	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			09/03/24 23:09	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/03/24 23:09	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 23:09	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/03/24 23:09	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			09/03/24 23:09	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/03/24 23:09	1
Naphthalene	<0.44		1.0	0.44	ug/L			09/03/24 23:09	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			09/03/24 23:09	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			09/03/24 23:09	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/03/24 23:09	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/03/24 23:09	1
Styrene	<0.31		1.0	0.31	ug/L			09/03/24 23:09	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/03/24 23:09	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/03/24 23:09	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/03/24 23:09	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/03/24 23:09	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-19Z

Lab Sample ID: 500-255810-5

Date Collected: 08/27/24 10:45

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/03/24 23:09	1
Toluene	0.34	J	0.50	0.21	ug/L			09/03/24 23:09	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/03/24 23:09	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/03/24 23:09	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/03/24 23:09	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/03/24 23:09	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/03/24 23:09	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/03/24 23:09	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/03/24 23:09	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/03/24 23:09	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/03/24 23:09	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			09/03/24 23:09	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 23:09	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/03/24 23:09	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			09/03/24 23:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	104		72 - 124		09/03/24 23:09	1
Dibromofluoromethane (Surr)	110		75 - 120		09/03/24 23:09	1
1,2-Dichloroethane-d4 (Surr)	111		75 - 126		09/03/24 23:09	1
Toluene-d8 (Surr)	98		75 - 120		09/03/24 23:09	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		08/30/24 08:14	09/04/24 14:14	1
Barium	34		2.5	0.73	ug/L		08/30/24 08:14	09/04/24 14:14	1
Boron	18	J B	50	13	ug/L		08/30/24 08:14	09/04/24 14:14	1
Cadmium	<0.17		0.50	0.17	ug/L		08/30/24 08:14	09/04/24 14:14	1
Chromium	<1.1		5.0	1.1	ug/L		08/30/24 08:14	09/04/24 14:14	1
Copper	1.7	J	2.0	0.50	ug/L		09/06/24 08:49	09/09/24 16:24	1
Lead	<0.19		0.50	0.19	ug/L		08/30/24 08:14	09/04/24 14:14	1
Manganese	690	B	2.5	0.79	ug/L		08/30/24 08:14	09/06/24 17:15	1
Selenium	<0.98		2.5	0.98	ug/L		08/30/24 08:14	09/04/24 14:14	1
Silver	<0.12		0.50	0.12	ug/L		08/30/24 08:14	09/04/24 14:14	1
Zinc	<6.9		20	6.9	ug/L		08/30/24 08:14	09/04/24 14:14	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		09/11/24 10:45	09/12/24 08:59	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	85		0.91	0.46	mg/L		08/30/24 08:14	09/05/24 10:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	150		25	9.7	mg/L			08/30/24 14:02	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-19Z

Lab Sample ID: 500-255810-5

Date Collected: 08/27/24 10:45

Matrix: Water

Date Received: 08/29/24 10:05

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	3.7	B	1.0	0.12	mg/L			09/04/24 17:54	1
Sulfate (EPA 300.0)	3.3		1.0	0.21	mg/L			09/04/24 17:54	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			09/04/24 17:54	1
Nitrate Nitrite as N (EPA N07-0003)	0.61		0.10	0.041	mg/L			09/12/24 12:09	1
Alkalinity (SM 2320B)	82	B	5.0	3.7	mg/L			09/06/24 11:53	1
Chemical Oxygen Demand (SM 5220C)	16		10	6.0	mg/L		09/03/24 09:51	09/03/24 15:07	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	98.3				ft			08/27/24 10:45	1
Field Color	Y				NONE			08/27/24 10:45	1
Field Conductivity	166				umhos/cm			08/27/24 10:45	1
Field Odor	N				NONE			08/27/24 10:45	1
Field pH	7.52				SU			08/27/24 10:45	1
Field Temperature	15.4				Degrees C			08/27/24 10:45	1
Field Turbidity	Y				NONE			08/27/24 10:45	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: DWS-1

Lab Sample ID: 500-255810-6

Date Collected: 08/27/24 15:00

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			09/10/24 11:14	1
Benzene	<0.18		0.50	0.18	ug/L			09/10/24 11:14	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/10/24 11:14	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/10/24 11:14	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/10/24 11:14	1
Bromoform	<0.96		1.0	0.96	ug/L			09/10/24 11:14	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/10/24 11:14	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/10/24 11:14	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/10/24 11:14	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/10/24 11:14	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/10/24 11:14	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/10/24 11:14	1
Chloroform	<0.92		2.0	0.92	ug/L			09/10/24 11:14	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/10/24 11:14	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/10/24 11:14	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/10/24 11:14	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/10/24 11:14	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/10/24 11:14	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/10/24 11:14	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			09/10/24 11:14	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/10/24 11:14	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/10/24 11:14	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/10/24 11:14	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/10/24 11:14	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/10/24 11:14	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/10/24 11:14	1
1,1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/10/24 11:14	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/10/24 11:14	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/10/24 11:14	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/10/24 11:14	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/10/24 11:14	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/10/24 11:14	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/10/24 11:14	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			09/10/24 11:14	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/10/24 11:14	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			09/10/24 11:14	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/10/24 11:14	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			09/10/24 11:14	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/10/24 11:14	1
Naphthalene	<0.44		1.0	0.44	ug/L			09/10/24 11:14	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			09/10/24 11:14	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			09/10/24 11:14	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/10/24 11:14	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/10/24 11:14	1
Styrene	<0.31		1.0	0.31	ug/L			09/10/24 11:14	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/10/24 11:14	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/10/24 11:14	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/10/24 11:14	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/10/24 11:14	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: DWS-1

Lab Sample ID: 500-255810-6

Date Collected: 08/27/24 15:00

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/10/24 11:14	1
Toluene	<0.21		0.50	0.21	ug/L			09/10/24 11:14	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/10/24 11:14	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/10/24 11:14	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/10/24 11:14	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/10/24 11:14	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/10/24 11:14	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/10/24 11:14	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/10/24 11:14	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/10/24 11:14	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/10/24 11:14	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			09/10/24 11:14	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			09/10/24 11:14	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/10/24 11:14	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			09/10/24 11:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		72 - 124		09/10/24 11:14	1
Dibromofluoromethane (Surr)	83		75 - 120		09/10/24 11:14	1
1,2-Dichloroethane-d4 (Surr)	90		75 - 126		09/10/24 11:14	1
Toluene-d8 (Surr)	87		75 - 120		09/10/24 11:14	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<47		100	47	ug/L		08/30/24 08:14	09/04/24 14:21	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	170		0.91	0.46	mg/L		08/30/24 08:14	09/05/24 10:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SM 4500 Cl- E)	<1.0		2.0	1.0	mg/L			09/04/24 11:52	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field Color	N				NONE			08/27/24 15:00	1
Field Conductivity	278				umhos/cm			08/27/24 15:00	1
Field Odor	N				NONE			08/27/24 15:00	1
Field pH	7.21				SU			08/27/24 15:00	1
Field Temperature	15.1				Degrees C			08/27/24 15:00	1
Field Turbidity	N				NONE			08/27/24 15:00	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: Trip Blank

Lab Sample ID: 500-255810-7

Date Collected: 08/27/24 00:00

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			09/03/24 16:32	1
Benzene	<0.18		0.50	0.18	ug/L			09/03/24 16:32	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/03/24 16:32	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/03/24 16:32	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/03/24 16:32	1
Bromoform	<0.96		1.0	0.96	ug/L			09/03/24 16:32	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/03/24 16:32	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/03/24 16:32	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/03/24 16:32	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/03/24 16:32	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 16:32	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/03/24 16:32	1
Chloroform	<0.92		2.0	0.92	ug/L			09/03/24 16:32	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/03/24 16:32	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/03/24 16:32	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/03/24 16:32	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/03/24 16:32	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/03/24 16:32	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/03/24 16:32	1
1,2-Dibromo-3-Chloropropane	<3.9	+	5.0	3.9	ug/L			09/03/24 16:32	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/03/24 16:32	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/03/24 16:32	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/03/24 16:32	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 16:32	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/03/24 16:32	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/03/24 16:32	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/03/24 16:32	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/03/24 16:32	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/03/24 16:32	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/03/24 16:32	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/03/24 16:32	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/03/24 16:32	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/03/24 16:32	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			09/03/24 16:32	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/03/24 16:32	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 16:32	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/03/24 16:32	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			09/03/24 16:32	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/03/24 16:32	1
Naphthalene	<0.44		1.0	0.44	ug/L			09/03/24 16:32	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			09/03/24 16:32	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			09/03/24 16:32	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/03/24 16:32	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/03/24 16:32	1
Styrene	<0.31		1.0	0.31	ug/L			09/03/24 16:32	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/03/24 16:32	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/03/24 16:32	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/03/24 16:32	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/03/24 16:32	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: Trip Blank

Lab Sample ID: 500-255810-7

Date Collected: 08/27/24 00:00

Matrix: Water

Date Received: 08/29/24 10:05

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/03/24 16:32	1
Toluene	<0.21		0.50	0.21	ug/L			09/03/24 16:32	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/03/24 16:32	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/03/24 16:32	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/03/24 16:32	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/03/24 16:32	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/03/24 16:32	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/03/24 16:32	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/03/24 16:32	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/03/24 16:32	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/03/24 16:32	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			09/03/24 16:32	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 16:32	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/03/24 16:32	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			09/03/24 16:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	104		72 - 124		09/03/24 16:32	1
Dibromofluoromethane (Surr)	107		75 - 120		09/03/24 16:32	1
1,2-Dichloroethane-d4 (Surr)	106		75 - 126		09/03/24 16:32	1
Toluene-d8 (Surr)	95		75 - 120		09/03/24 16:32	1

Definitions/Glossary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
⌘	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

GC/MS VOA

Analysis Batch: 784176

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Total/NA	Water	8260D	
500-255810-2	MW-18WT	Total/NA	Water	8260D	
500-255810-3	MW-18	Total/NA	Water	8260D	
500-255810-4	MW-19	Total/NA	Water	8260D	
500-255810-5	MW-19Z	Total/NA	Water	8260D	
500-255810-7	Trip Blank	Total/NA	Water	8260D	
MB 500-784176/9	Method Blank	Total/NA	Water	8260D	
LCS 500-784176/6	Lab Control Sample	Total/NA	Water	8260D	
LCSD 500-784176/10	Lab Control Sample Dup	Total/NA	Water	8260D	

Analysis Batch: 785226

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-6	DWS-1	Total/NA	Water	8260D	
MB 500-785226/7	Method Blank	Total/NA	Water	8260D	
LCS 500-785226/4	Lab Control Sample	Total/NA	Water	8260D	

Metals

Prep Batch: 783976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	3005A	
500-255810-2	MW-18WT	Dissolved	Water	3005A	
500-255810-3	MW-18	Dissolved	Water	3005A	
500-255810-4	MW-19	Dissolved	Water	3005A	
500-255810-5	MW-19Z	Dissolved	Water	3005A	
500-255810-6	DWS-1	Total Recoverable	Water	3005A	
MB 500-783976/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-783976/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 784622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	6020B	783976
500-255810-2	MW-18WT	Dissolved	Water	6020B	783976
500-255810-3	MW-18	Dissolved	Water	6020B	783976
500-255810-4	MW-19	Dissolved	Water	6020B	783976
500-255810-5	MW-19Z	Dissolved	Water	6020B	783976
500-255810-6	DWS-1	Total Recoverable	Water	6020B	783976
MB 500-783976/1-A	Method Blank	Total Recoverable	Water	6020B	783976
LCS 500-783976/2-A	Lab Control Sample	Total Recoverable	Water	6020B	783976

Analysis Batch: 784677

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	SM 2340B	783976
500-255810-2	MW-18WT	Dissolved	Water	SM 2340B	783976
500-255810-3	MW-18	Dissolved	Water	SM 2340B	783976
500-255810-4	MW-19	Dissolved	Water	SM 2340B	783976
500-255810-5	MW-19Z	Dissolved	Water	SM 2340B	783976
500-255810-6	DWS-1	Total Recoverable	Water	SM 2340B	783976

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QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Metals

Prep Batch: 784847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	3005A	
500-255810-2	MW-18WT	Dissolved	Water	3005A	
500-255810-3	MW-18	Dissolved	Water	3005A	
500-255810-5	MW-19Z	Dissolved	Water	3005A	
MB 500-784847/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-784847/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 785047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	6020B	783976
500-255810-2	MW-18WT	Dissolved	Water	6020B	783976
500-255810-3	MW-18	Dissolved	Water	6020B	783976
500-255810-4	MW-19	Dissolved	Water	6020B	783976
500-255810-5	MW-19Z	Dissolved	Water	6020B	783976
MB 500-783976/1-A	Method Blank	Total Recoverable	Water	6020B	783976
LCS 500-783976/2-A	Lab Control Sample	Total Recoverable	Water	6020B	783976

Analysis Batch: 785268

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	6020B	784847
500-255810-2	MW-18WT	Dissolved	Water	6020B	784847
500-255810-3	MW-18	Dissolved	Water	6020B	784847
500-255810-5	MW-19Z	Dissolved	Water	6020B	784847
MB 500-784847/1-A	Method Blank	Total Recoverable	Water	6020B	784847
LCS 500-784847/2-A	Lab Control Sample	Total Recoverable	Water	6020B	784847

Prep Batch: 785510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	7470A	
500-255810-2	MW-18WT	Dissolved	Water	7470A	
500-255810-3	MW-18	Dissolved	Water	7470A	
500-255810-4	MW-19	Dissolved	Water	7470A	
500-255810-5	MW-19Z	Dissolved	Water	7470A	
MB 500-785510/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-785510/13-A	Lab Control Sample	Total/NA	Water	7470A	
500-255810-4 MS	MW-19	Dissolved	Water	7470A	
500-255810-4 MSD	MW-19	Dissolved	Water	7470A	
500-255810-4 DU	MW-19	Dissolved	Water	7470A	

Analysis Batch: 785725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	7470A	785510
500-255810-2	MW-18WT	Dissolved	Water	7470A	785510
500-255810-3	MW-18	Dissolved	Water	7470A	785510
500-255810-4	MW-19	Dissolved	Water	7470A	785510
500-255810-5	MW-19Z	Dissolved	Water	7470A	785510
MB 500-785510/12-A	Method Blank	Total/NA	Water	7470A	785510
LCS 500-785510/13-A	Lab Control Sample	Total/NA	Water	7470A	785510
500-255810-4 MS	MW-19	Dissolved	Water	7470A	785510
500-255810-4 MSD	MW-19	Dissolved	Water	7470A	785510
500-255810-4 DU	MW-19	Dissolved	Water	7470A	785510

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QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

General Chemistry

Analysis Batch: 783908

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Total/NA	Water	SM 2540D	
500-255810-2	MW-18WT	Total/NA	Water	SM 2540D	
500-255810-3	MW-18	Total/NA	Water	SM 2540D	
500-255810-4	MW-19	Total/NA	Water	SM 2540D	
MB 500-783908/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 500-783908/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 784068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-5	MW-19Z	Total/NA	Water	SM 2540D	
MB 500-784068/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 500-784068/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Prep Batch: 784271

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	SM 5220	
500-255810-2	MW-18WT	Dissolved	Water	SM 5220	
500-255810-3	MW-18	Dissolved	Water	SM 5220	
500-255810-4	MW-19	Dissolved	Water	SM 5220	
500-255810-5	MW-19Z	Dissolved	Water	SM 5220	
MB 500-784271/1-A	Method Blank	Total/NA	Water	SM 5220	
LCS 500-784271/2-A	Lab Control Sample	Total/NA	Water	SM 5220	
500-255810-1 MS	MW-16Z	Dissolved	Water	SM 5220	
500-255810-1 MSD	MW-16Z	Dissolved	Water	SM 5220	

Analysis Batch: 784280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	SM 5220C	784271
500-255810-2	MW-18WT	Dissolved	Water	SM 5220C	784271
500-255810-3	MW-18	Dissolved	Water	SM 5220C	784271
500-255810-4	MW-19	Dissolved	Water	SM 5220C	784271
500-255810-5	MW-19Z	Dissolved	Water	SM 5220C	784271
MB 500-784271/1-A	Method Blank	Total/NA	Water	SM 5220C	784271
LCS 500-784271/2-A	Lab Control Sample	Total/NA	Water	SM 5220C	784271
500-255810-1 MS	MW-16Z	Dissolved	Water	SM 5220C	784271
500-255810-1 MSD	MW-16Z	Dissolved	Water	SM 5220C	784271

Analysis Batch: 784419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	300.0	
500-255810-2	MW-18WT	Dissolved	Water	300.0	
500-255810-3	MW-18	Dissolved	Water	300.0	
500-255810-4	MW-19	Dissolved	Water	300.0	
500-255810-5	MW-19Z	Dissolved	Water	300.0	
MB 500-784419/3	Method Blank	Total/NA	Water	300.0	
LCS 500-784419/4	Lab Control Sample	Total/NA	Water	300.0	
500-255810-1 MS	MW-16Z	Dissolved	Water	300.0	
500-255810-1 MSD	MW-16Z	Dissolved	Water	300.0	

QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

General Chemistry

Analysis Batch: 784483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-6	DWS-1	Total/NA	Water	SM 4500 Cl- E	
MB 500-784483/16	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-784483/17	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 785123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	SM 2320B	
500-255810-2	MW-18WT	Dissolved	Water	SM 2320B	
500-255810-3	MW-18	Dissolved	Water	SM 2320B	
500-255810-4	MW-19	Dissolved	Water	SM 2320B	
500-255810-5	MW-19Z	Dissolved	Water	SM 2320B	
MB 500-785123/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-785123/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 785824

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Dissolved	Water	N07-0003	
500-255810-2	MW-18WT	Dissolved	Water	N07-0003	
500-255810-3	MW-18	Dissolved	Water	N07-0003	
500-255810-4	MW-19	Dissolved	Water	N07-0003	
500-255810-5	MW-19Z	Dissolved	Water	N07-0003	
MB 500-785824/19	Method Blank	Total/NA	Water	N07-0003	
LCS 500-785824/20	Lab Control Sample	Total/NA	Water	N07-0003	

Field Service / Mobile Lab

Analysis Batch: 784445

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-255810-1	MW-16Z	Total/NA	Water	Field Sampling	
500-255810-2	MW-18WT	Total/NA	Water	Field Sampling	
500-255810-3	MW-18	Total/NA	Water	Field Sampling	
500-255810-4	MW-19	Total/NA	Water	Field Sampling	
500-255810-5	MW-19Z	Total/NA	Water	Field Sampling	
500-255810-6	DWS-1	Total/NA	Water	Field Sampling	

Surrogate Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (72-124)	DBFM (75-120)	DCA (75-126)	TOL (75-120)
500-255810-1	MW-16Z	102	108	108	95
500-255810-2	MW-18WT	104	111	110	95
500-255810-3	MW-18	102	109	105	97
500-255810-4	MW-19	102	106	105	93
500-255810-5	MW-19Z	104	110	111	98
500-255810-6	DWS-1	98	83	90	87
500-255810-7	Trip Blank	104	107	106	95
LCS 500-784176/6	Lab Control Sample	97	103	108	97
LCS 500-785226/4	Lab Control Sample	95	84	88	96
LCSD 500-784176/10	Lab Control Sample Dup	99	103	107	97
MB 500-784176/9	Method Blank	109	109	110	95
MB 500-785226/7	Method Blank	95	84	91	90

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

DCA = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)

QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 500-784176/9

Matrix: Water

Analysis Batch: 784176

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			09/03/24 16:09	1
Benzene	<0.18		0.50	0.18	ug/L			09/03/24 16:09	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/03/24 16:09	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/03/24 16:09	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/03/24 16:09	1
Bromoform	<0.96		1.0	0.96	ug/L			09/03/24 16:09	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/03/24 16:09	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/03/24 16:09	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/03/24 16:09	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/03/24 16:09	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 16:09	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/03/24 16:09	1
Chloroform	<0.92		2.0	0.92	ug/L			09/03/24 16:09	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/03/24 16:09	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/03/24 16:09	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/03/24 16:09	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/03/24 16:09	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/03/24 16:09	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/03/24 16:09	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			09/03/24 16:09	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/03/24 16:09	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/03/24 16:09	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/03/24 16:09	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/03/24 16:09	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/03/24 16:09	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/03/24 16:09	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/03/24 16:09	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/03/24 16:09	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/03/24 16:09	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/03/24 16:09	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/03/24 16:09	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/03/24 16:09	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/03/24 16:09	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			09/03/24 16:09	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/03/24 16:09	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 16:09	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/03/24 16:09	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			09/03/24 16:09	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/03/24 16:09	1
Naphthalene	<0.44		1.0	0.44	ug/L			09/03/24 16:09	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			09/03/24 16:09	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			09/03/24 16:09	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/03/24 16:09	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/03/24 16:09	1
Styrene	<0.31		1.0	0.31	ug/L			09/03/24 16:09	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/03/24 16:09	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/03/24 16:09	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/03/24 16:09	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 500-784176/9

Matrix: Water

Analysis Batch: 784176

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/03/24 16:09	1
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/03/24 16:09	1
Toluene	<0.21		0.50	0.21	ug/L			09/03/24 16:09	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/03/24 16:09	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/03/24 16:09	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/03/24 16:09	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/03/24 16:09	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/03/24 16:09	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/03/24 16:09	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/03/24 16:09	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/03/24 16:09	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/03/24 16:09	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			09/03/24 16:09	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			09/03/24 16:09	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/03/24 16:09	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			09/03/24 16:09	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		79 - 194		02/03/94 1: 502	1
Dibromofluoromethane (Surr)	102		78 - 190		02/03/94 1: 502	1
1,9-Dichloroethane-d4 (Surr)	110		78 - 19:		02/03/94 1: 502	1
6oluene-dT (Surr)	28		78 - 190		02/03/94 1: 502	1

Lab Sample ID: LCS 500-784176/6

Matrix: Water

Analysis Batch: 784176

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	50.0	58.4		ug/L		117	40 - 143
Benzene	50.0	53.3		ug/L		107	70 - 120
Bromobenzene	50.0	55.9		ug/L		112	70 - 122
Bromochloromethane	50.0	52.1		ug/L		104	65 - 122
Bromodichloromethane	50.0	55.2		ug/L		110	69 - 120
Bromoform	50.0	61.4		ug/L		123	56 - 132
Bromomethane	50.0	42.8		ug/L		86	40 - 152
2-Butanone (MEK)	50.0	63.3		ug/L		127	46 - 144
Carbon disulfide	50.0	46.1		ug/L		92	66 - 120
Carbon tetrachloride	50.0	61.8		ug/L		124	59 - 133
Chlorobenzene	50.0	52.1		ug/L		104	70 - 120
Chloroethane	50.0	46.4		ug/L		93	48 - 136
Chloroform	50.0	54.6		ug/L		109	70 - 120
Chloromethane	50.0	47.5		ug/L		95	56 - 152
2-Chlorotoluene	50.0	53.8		ug/L		108	70 - 125
4-Chlorotoluene	50.0	56.2		ug/L		112	68 - 124
cis-1,2-Dichloroethene	50.0	49.4		ug/L		99	70 - 125
cis-1,3-Dichloropropene	50.0	53.3		ug/L		107	64 - 127
Chlorodibromomethane	50.0	60.6		ug/L		121	68 - 125
1,2-Dibromo-3-Chloropropane	50.0	67.9	*+	ug/L		136	56 - 123

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 500-784176/6

Matrix: Water

Analysis Batch: 784176

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	50.0	61.2		ug/L		122	70 - 125
Dibromomethane	50.0	57.1		ug/L		114	70 - 120
1,2-Dichlorobenzene	50.0	54.7		ug/L		109	70 - 125
1,3-Dichlorobenzene	50.0	55.7		ug/L		111	70 - 125
1,4-Dichlorobenzene	50.0	53.1		ug/L		106	70 - 120
Dichlorodifluoromethane	50.0	59.7		ug/L		119	40 - 159
1,1-Dichloroethane	50.0	51.5		ug/L		103	70 - 125
1,2-Dichloroethane	50.0	56.8		ug/L		114	68 - 127
1,1-Dichloroethene	50.0	45.4		ug/L		91	67 - 122
1,2-Dichloropropane	50.0	49.8		ug/L		100	67 - 130
1,3-Dichloropropane	50.0	56.6		ug/L		113	62 - 136
2,2-Dichloropropane	50.0	52.9		ug/L		106	58 - 139
1,1-Dichloropropene	50.0	54.4		ug/L		109	70 - 121
Ethylbenzene	50.0	54.0		ug/L		108	70 - 123
Hexachlorobutadiene	50.0	54.6		ug/L		109	51 - 150
Isopropylbenzene	50.0	52.9		ug/L		106	70 - 126
Methylene Chloride	50.0	45.8		ug/L		92	69 - 125
Methyl tert-butyl ether	50.0	57.4		ug/L		115	55 - 123
Naphthalene	50.0	66.4		ug/L		133	53 - 144
n-Butylbenzene	50.0	54.8		ug/L		110	68 - 125
N-Propylbenzene	50.0	53.8		ug/L		108	69 - 127
p-Isopropyltoluene	50.0	55.9		ug/L		112	70 - 125
sec-Butylbenzene	50.0	54.4		ug/L		109	70 - 123
Styrene	50.0	43.6		ug/L		87	70 - 120
tert-Butylbenzene	50.0	53.2		ug/L		106	70 - 121
1,1,1,2-Tetrachloroethane	50.0	56.4		ug/L		113	70 - 125
1,1,2,2-Tetrachloroethane	50.0	58.3		ug/L		117	62 - 140
Tetrachloroethene	50.0	56.2		ug/L		112	70 - 128
Tetrahydrofuran	100	134		ug/L		134	59 - 139
Toluene	50.0	51.0		ug/L		102	70 - 125
trans-1,2-Dichloroethene	50.0	49.9		ug/L		100	70 - 125
trans-1,3-Dichloropropene	50.0	58.3		ug/L		117	62 - 128
1,2,3-Trichlorobenzene	50.0	57.0		ug/L		114	51 - 145
1,2,4-Trichlorobenzene	50.0	57.1		ug/L		114	57 - 137
1,1,1-Trichloroethane	50.0	56.7		ug/L		113	70 - 125
1,1,2-Trichloroethane	50.0	57.7		ug/L		115	71 - 130
Trichloroethene	50.0	51.9		ug/L		104	70 - 125
Trichlorofluoromethane	50.0	52.8		ug/L		106	55 - 128
1,2,3-Trichloropropane	50.0	65.8		ug/L		132	50 - 133
1,2,4-Trimethylbenzene	50.0	54.6		ug/L		109	70 - 123
1,3,5-Trimethylbenzene	50.0	54.8		ug/L		110	70 - 123
Vinyl chloride	50.0	51.2		ug/L		102	64 - 126
Xylenes, Total	100	110		ug/L		110	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	27		79 - 194
Dibromofluoromethane (Surr)	103		78 - 190
1,9-Dichloroethane-d4 (Surr)	10T		78 - 19:

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 500-784176/6

Matrix: Water

Analysis Batch: 784176

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
6oluene-dT (Surr)	27		78 - 190

Lab Sample ID: LCSD 500-784176/10

Matrix: Water

Analysis Batch: 784176

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone	50.0	58.5		ug/L		117	40 - 143	0	20
Benzene	50.0	52.4		ug/L		105	70 - 120	2	20
Bromobenzene	50.0	57.9		ug/L		116	70 - 122	4	20
Bromochloromethane	50.0	51.2		ug/L		102	65 - 122	2	20
Bromodichloromethane	50.0	53.5		ug/L		107	69 - 120	3	20
Bromoform	50.0	61.2		ug/L		122	56 - 132	0	20
Bromomethane	50.0	48.0		ug/L		96	40 - 152	12	20
2-Butanone (MEK)	50.0	68.3		ug/L		137	46 - 144	8	20
Carbon disulfide	50.0	45.6		ug/L		91	66 - 120	1	20
Carbon tetrachloride	50.0	61.0		ug/L		122	59 - 133	1	20
Chlorobenzene	50.0	52.3		ug/L		105	70 - 120	0	20
Chloroethane	50.0	48.0		ug/L		96	48 - 136	3	20
Chloroform	50.0	54.6		ug/L		109	70 - 120	0	20
Chloromethane	50.0	47.4		ug/L		95	56 - 152	0	20
2-Chlorotoluene	50.0	55.0		ug/L		110	70 - 125	2	20
4-Chlorotoluene	50.0	57.4		ug/L		115	68 - 124	2	20
cis-1,2-Dichloroethene	50.0	49.5		ug/L		99	70 - 125	0	20
cis-1,3-Dichloropropene	50.0	53.9		ug/L		108	64 - 127	1	20
Chlorodibromomethane	50.0	59.8		ug/L		120	68 - 125	1	20
1,2-Dibromo-3-Chloropropane	50.0	69.5	*+	ug/L		139	56 - 123	2	20
1,2-Dibromoethane (EDB)	50.0	60.3		ug/L		121	70 - 125	1	20
Dibromomethane	50.0	58.3		ug/L		117	70 - 120	2	20
1,2-Dichlorobenzene	50.0	55.3		ug/L		111	70 - 125	1	20
1,3-Dichlorobenzene	50.0	56.6		ug/L		113	70 - 125	2	20
1,4-Dichlorobenzene	50.0	54.3		ug/L		109	70 - 120	2	20
Dichlorodifluoromethane	50.0	61.5		ug/L		123	40 - 159	3	20
1,1-Dichloroethane	50.0	51.5		ug/L		103	70 - 125	0	20
1,2-Dichloroethane	50.0	56.5		ug/L		113	68 - 127	1	20
1,1-Dichloroethene	50.0	44.6		ug/L		89	67 - 122	2	20
1,2-Dichloropropane	50.0	50.5		ug/L		101	67 - 130	1	20
1,3-Dichloropropane	50.0	56.9		ug/L		114	62 - 136	1	20
2,2-Dichloropropane	50.0	53.1		ug/L		106	58 - 139	0	20
1,1-Dichloropropene	50.0	53.9		ug/L		108	70 - 121	1	20
Ethylbenzene	50.0	53.2		ug/L		106	70 - 123	2	20
Hexachlorobutadiene	50.0	56.7		ug/L		113	51 - 150	4	20
Isopropylbenzene	50.0	53.6		ug/L		107	70 - 126	1	20
Methylene Chloride	50.0	44.6		ug/L		89	69 - 125	3	20
Methyl tert-butyl ether	50.0	57.7		ug/L		115	55 - 123	0	20
Naphthalene	50.0	67.3		ug/L		135	53 - 144	1	20
n-Butylbenzene	50.0	55.7		ug/L		111	68 - 125	2	20
N-Propylbenzene	50.0	54.7		ug/L		109	69 - 127	2	20

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 500-784176/10

Matrix: Water

Analysis Batch: 784176

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
p-Isopropyltoluene	50.0	55.6		ug/L		111	70 - 125	1	20
sec-Butylbenzene	50.0	55.2		ug/L		110	70 - 123	1	20
Styrene	50.0	42.5		ug/L		85	70 - 120	2	20
tert-Butylbenzene	50.0	54.3		ug/L		109	70 - 121	2	20
1,1,1,2-Tetrachloroethane	50.0	55.6		ug/L		111	70 - 125	1	20
1,1,1,2-Tetrachloroethane	50.0	60.6		ug/L		121	62 - 140	4	20
Tetrachloroethene	50.0	56.1		ug/L		112	70 - 128	0	20
Tetrahydrofuran	100	139		ug/L		139	59 - 139	4	20
Toluene	50.0	50.7		ug/L		101	70 - 125	1	20
trans-1,2-Dichloroethene	50.0	49.3		ug/L		99	70 - 125	1	20
trans-1,3-Dichloropropene	50.0	55.8		ug/L		112	62 - 128	4	20
1,2,3-Trichlorobenzene	50.0	57.7		ug/L		115	51 - 145	1	20
1,2,4-Trichlorobenzene	50.0	57.3		ug/L		115	57 - 137	0	20
1,1,1-Trichloroethane	50.0	57.5		ug/L		115	70 - 125	1	20
1,1,2-Trichloroethane	50.0	56.7		ug/L		113	71 - 130	2	20
Trichloroethene	50.0	51.7		ug/L		103	70 - 125	0	20
Trichlorofluoromethane	50.0	55.1		ug/L		110	55 - 128	4	20
1,2,3-Trichloropropane	50.0	64.1		ug/L		128	50 - 133	3	20
1,2,4-Trimethylbenzene	50.0	55.6		ug/L		111	70 - 123	2	20
1,3,5-Trimethylbenzene	50.0	56.4		ug/L		113	70 - 123	3	20
Vinyl chloride	50.0	51.3		ug/L		103	64 - 126	0	20
Xylenes, Total	100	108		ug/L		108	70 - 125	2	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	22		79 - 194
Dibromofluoromethane (Surr)	103		78 - 190
1,9-Dichloroethane-d4 (Surr)	107		78 - 190
6luene-dT (Surr)	27		78 - 190

Lab Sample ID: MB 500-785226/7

Matrix: Water

Analysis Batch: 785226

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			09/10/24 10:50	1
Benzene	<0.18		0.50	0.18	ug/L			09/10/24 10:50	1
Bromobenzene	<0.60		1.0	0.60	ug/L			09/10/24 10:50	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			09/10/24 10:50	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			09/10/24 10:50	1
Bromoform	<0.96		1.0	0.96	ug/L			09/10/24 10:50	1
Bromomethane	<1.8		3.0	1.8	ug/L			09/10/24 10:50	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			09/10/24 10:50	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			09/10/24 10:50	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			09/10/24 10:50	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			09/10/24 10:50	1
Chloroethane	<0.47		5.0	0.47	ug/L			09/10/24 10:50	1
Chloroform	<0.92		2.0	0.92	ug/L			09/10/24 10:50	1
Chloromethane	<0.79		5.0	0.79	ug/L			09/10/24 10:50	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 500-785226/7

Matrix: Water

Analysis Batch: 785226

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			09/10/24 10:50	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			09/10/24 10:50	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			09/10/24 10:50	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			09/10/24 10:50	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			09/10/24 10:50	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			09/10/24 10:50	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			09/10/24 10:50	1
Dibromomethane	<0.58		1.0	0.58	ug/L			09/10/24 10:50	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			09/10/24 10:50	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			09/10/24 10:50	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			09/10/24 10:50	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			09/10/24 10:50	1
1,1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			09/10/24 10:50	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			09/10/24 10:50	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			09/10/24 10:50	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			09/10/24 10:50	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			09/10/24 10:50	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			09/10/24 10:50	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			09/10/24 10:50	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			09/10/24 10:50	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			09/10/24 10:50	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			09/10/24 10:50	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			09/10/24 10:50	1
Methylene Chloride	3.66 J		5.0	3.6	ug/L			09/10/24 10:50	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			09/10/24 10:50	1
Naphthalene	<0.44		1.0	0.44	ug/L			09/10/24 10:50	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			09/10/24 10:50	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			09/10/24 10:50	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			09/10/24 10:50	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			09/10/24 10:50	1
Styrene	<0.31		1.0	0.31	ug/L			09/10/24 10:50	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			09/10/24 10:50	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			09/10/24 10:50	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			09/10/24 10:50	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			09/10/24 10:50	1
Tetrahydrofuran	<3.9		10	3.9	ug/L			09/10/24 10:50	1
Toluene	<0.21		0.50	0.21	ug/L			09/10/24 10:50	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			09/10/24 10:50	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			09/10/24 10:50	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			09/10/24 10:50	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			09/10/24 10:50	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			09/10/24 10:50	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			09/10/24 10:50	1
Trichloroethene	<0.15		0.50	0.15	ug/L			09/10/24 10:50	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			09/10/24 10:50	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			09/10/24 10:50	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			09/10/24 10:50	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			09/10/24 10:50	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			09/10/24 10:50	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 500-785226/7

Matrix: Water

Analysis Batch: 785226

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	<0.30		1.0	0.30	ug/L			09/10/24 10:50	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	28		79 - 194		02/10/94 10:30	1
Dibromofluoromethane (Surr)	T4		78 - 190		02/10/94 10:30	1
1,9-Dichloroethane-d4 (Surr)	21		78 - 19:		02/10/94 10:30	1
6oluene-dT (Surr)	20		78 - 190		02/10/94 10:30	1

Lab Sample ID: LCS 500-785226/4

Matrix: Water

Analysis Batch: 785226

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	50.0	44.7		ug/L		89	40 - 143
Benzene	50.0	45.1		ug/L		90	70 - 120
Bromobenzene	50.0	47.8		ug/L		96	70 - 122
Bromochloromethane	50.0	42.7		ug/L		85	65 - 122
Bromodichloromethane	50.0	44.4		ug/L		89	69 - 120
Bromoform	50.0	40.4		ug/L		81	56 - 132
Bromomethane	50.0	58.7		ug/L		117	40 - 152
2-Butanone (MEK)	50.0	40.3		ug/L		81	46 - 144
Carbon disulfide	50.0	51.3		ug/L		103	66 - 120
Carbon tetrachloride	50.0	54.1		ug/L		108	59 - 133
Chlorobenzene	50.0	47.8		ug/L		96	70 - 120
Chloroethane	50.0	59.7		ug/L		119	48 - 136
Chloroform	50.0	46.6		ug/L		93	70 - 120
Chloromethane	50.0	59.3		ug/L		119	56 - 152
2-Chlorotoluene	50.0	53.9		ug/L		108	70 - 125
4-Chlorotoluene	50.0	52.8		ug/L		106	68 - 124
cis-1,2-Dichloroethene	50.0	47.3		ug/L		95	70 - 125
cis-1,3-Dichloropropene	50.0	50.3		ug/L		101	64 - 127
Chlorodibromomethane	50.0	45.8		ug/L		92	68 - 125
1,2-Dibromo-3-Chloropropane	50.0	40.4		ug/L		81	56 - 123
1,2-Dibromoethane (EDB)	50.0	46.0		ug/L		92	70 - 125
Dibromomethane	50.0	43.8		ug/L		88	70 - 120
1,2-Dichlorobenzene	50.0	45.3		ug/L		91	70 - 125
1,3-Dichlorobenzene	50.0	48.0		ug/L		96	70 - 125
1,4-Dichlorobenzene	50.0	46.9		ug/L		94	70 - 120
Dichlorodifluoromethane	50.0	49.1		ug/L		98	40 - 159
1,1-Dichloroethane	50.0	50.1		ug/L		100	70 - 125
1,2-Dichloroethane	50.0	48.4		ug/L		97	68 - 127
1,1-Dichloroethene	50.0	52.7		ug/L		105	67 - 122
1,2-Dichloropropane	50.0	46.0		ug/L		92	67 - 130
1,3-Dichloropropane	50.0	48.1		ug/L		96	62 - 136
2,2-Dichloropropane	50.0	58.5		ug/L		117	58 - 139
1,1-Dichloropropene	50.0	50.6		ug/L		101	70 - 121
Ethylbenzene	50.0	48.0		ug/L		96	70 - 123
Hexachlorobutadiene	50.0	44.7		ug/L		89	51 - 150

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 500-785226/4

Matrix: Water

Analysis Batch: 785226

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Isopropylbenzene	50.0	49.5		ug/L		99	70 - 126
Methylene Chloride	50.0	48.2		ug/L		96	69 - 125
Methyl tert-butyl ether	50.0	43.1		ug/L		86	55 - 123
Naphthalene	50.0	32.9		ug/L		66	53 - 144
n-Butylbenzene	50.0	53.6		ug/L		107	68 - 125
N-Propylbenzene	50.0	54.1		ug/L		108	69 - 127
p-Isopropyltoluene	50.0	52.7		ug/L		105	70 - 125
sec-Butylbenzene	50.0	53.0		ug/L		106	70 - 123
Styrene	50.0	49.0		ug/L		98	70 - 120
tert-Butylbenzene	50.0	52.3		ug/L		105	70 - 121
1,1,1,2-Tetrachloroethane	50.0	49.5		ug/L		99	70 - 125
1,1,2,2-Tetrachloroethane	50.0	45.6		ug/L		91	62 - 140
Tetrachloroethene	50.0	53.3		ug/L		107	70 - 128
Tetrahydrofuran	100	83.9		ug/L		84	59 - 139
Toluene	50.0	47.1		ug/L		94	70 - 125
trans-1,2-Dichloroethene	50.0	49.4		ug/L		99	70 - 125
trans-1,3-Dichloropropene	50.0	46.2		ug/L		92	62 - 128
1,2,3-Trichlorobenzene	50.0	34.7		ug/L		69	51 - 145
1,2,4-Trichlorobenzene	50.0	40.2		ug/L		80	57 - 137
1,1,1-Trichloroethane	50.0	52.7		ug/L		105	70 - 125
1,1,2-Trichloroethane	50.0	44.7		ug/L		89	71 - 130
Trichloroethene	50.0	44.5		ug/L		89	70 - 125
Trichlorofluoromethane	50.0	59.2		ug/L		118	55 - 128
1,2,3-Trichloropropane	50.0	43.4		ug/L		87	50 - 133
1,2,4-Trimethylbenzene	50.0	50.7		ug/L		101	70 - 123
1,3,5-Trimethylbenzene	50.0	52.9		ug/L		106	70 - 123
Vinyl chloride	50.0	55.5		ug/L		111	64 - 126
Xylenes, Total	100	96.5		ug/L		96	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	28		79 - 194
Dibromofluoromethane (Surr)	T4		78 - 190
1,9-Dichloroethane-d4 (Surr)	TT		78 - 19:
6oluene-dT (Surr)	2:		78 - 190

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 500-783976/1-A

Matrix: Water

Analysis Batch: 784622

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 783976

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		08/30/24 08:14	09/04/24 13:29	1
Barium	<0.73		2.5	0.73	ug/L		08/30/24 08:14	09/04/24 13:29	1
Boron	22.7	J	50	13	ug/L		08/30/24 08:14	09/04/24 13:29	1
Iron	<47		100	47	ug/L		08/30/24 08:14	09/04/24 13:29	1
Cadmium	<0.17		0.50	0.17	ug/L		08/30/24 08:14	09/04/24 13:29	1
Chromium	<1.1		5.0	1.1	ug/L		08/30/24 08:14	09/04/24 13:29	1
Lead	<0.19		0.50	0.19	ug/L		08/30/24 08:14	09/04/24 13:29	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 500-783976/1-A
Matrix: Water
Analysis Batch: 784622

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783976

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	<0.98		2.5	0.98	ug/L		08/30/24 08:14	09/04/24 13:29	1
Silver	<0.12		0.50	0.12	ug/L		08/30/24 08:14	09/04/24 13:29	1
Zinc	<6.9		20	6.9	ug/L		08/30/24 08:14	09/04/24 13:29	1

Lab Sample ID: MB 500-783976/1-A
Matrix: Water
Analysis Batch: 785047

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783976

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	1.04	J	2.5	0.79	ug/L		08/30/24 08:14	09/06/24 16:56	1

Lab Sample ID: LCS 500-783976/2-A
Matrix: Water
Analysis Batch: 784622

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783976

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	98.1		ug/L		98	80 - 120
Barium	2000	2230		ug/L		111	80 - 120
Boron	1000	985		ug/L		99	80 - 120
Iron	1000	1050		ug/L		105	80 - 120
Cadmium	50.0	51.2		ug/L		102	80 - 120
Chromium	200	202		ug/L		101	80 - 120
Lead	100	104		ug/L		104	80 - 120
Selenium	100	98.7		ug/L		99	80 - 120
Silver	50.0	50.9		ug/L		102	80 - 120
Zinc	500	518		ug/L		104	80 - 120

Lab Sample ID: LCS 500-783976/2-A
Matrix: Water
Analysis Batch: 785047

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783976

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	500	525		ug/L		105	80 - 120

Lab Sample ID: MB 500-784847/1-A
Matrix: Water
Analysis Batch: 785268

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 784847

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	<0.50		2.0	0.50	ug/L		09/06/24 08:49	09/09/24 14:58	1

Lab Sample ID: LCS 500-784847/2-A
Matrix: Water
Analysis Batch: 785268

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 784847

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Copper	250	264		ug/L		106	80 - 120

QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-785510/12-A

Matrix: Water

Analysis Batch: 785725

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 785510

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		09/11/24 10:45	09/12/24 08:15	1

Lab Sample ID: LCS 500-785510/13-A

Matrix: Water

Analysis Batch: 785725

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 785510

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.00	2.02		ug/L		101	80 - 120

Lab Sample ID: 500-255810-4 MS

Matrix: Water

Analysis Batch: 785725

Client Sample ID: MW-19

Prep Type: Dissolved

Prep Batch: 785510

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.076		0.999	1.05		ug/L		105	75 - 125

Lab Sample ID: 500-255810-4 MSD

Matrix: Water

Analysis Batch: 785725

Client Sample ID: MW-19

Prep Type: Dissolved

Prep Batch: 785510

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.076		0.999	1.02		ug/L		102	75 - 125	3	20

Lab Sample ID: 500-255810-4 DU

Matrix: Water

Analysis Batch: 785725

Client Sample ID: MW-19

Prep Type: Dissolved

Prep Batch: 785510

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	<0.076		<0.076		ug/L		NC	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-784419/3

Matrix: Water

Analysis Batch: 784419

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.219	J	1.0	0.12	mg/L			09/04/24 10:49	1
Sulfate	<0.21		1.0	0.21	mg/L			09/04/24 10:49	1
Fluoride	<0.19		1.0	0.19	mg/L			09/04/24 10:49	1

Lab Sample ID: LCS 500-784419/4

Matrix: Water

Analysis Batch: 784419

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.5		mg/L		98	90 - 110
Sulfate	20.0	19.7		mg/L		98	90 - 110
Fluoride	20.0	19.7		mg/L		98	90 - 110

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 500-255810-1 MS

Matrix: Water

Analysis Batch: 784419

Client Sample ID: MW-16Z

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	9.0	B	10.0	18.4		mg/L		94	80 - 120
Sulfate	12		10.0	21.5		mg/L		100	80 - 120
Fluoride	<0.19		10.0	9.73		mg/L		97	80 - 120

Lab Sample ID: 500-255810-1 MSD

Matrix: Water

Analysis Batch: 784419

Client Sample ID: MW-16Z

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	9.0	B	10.0	18.7		mg/L		97	80 - 120	1	20
Sulfate	12		10.0	21.8		mg/L		102	80 - 120	1	20
Fluoride	<0.19		10.0	10.0		mg/L		100	80 - 120	3	20

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen

Lab Sample ID: MB 500-785824/19

Matrix: Water

Analysis Batch: 785824

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.041		0.10	0.041	mg/L			09/12/24 12:06	1

Lab Sample ID: LCS 500-785824/20

Matrix: Water

Analysis Batch: 785824

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	1.00	1.03		mg/L		103	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-785123/3

Matrix: Water

Analysis Batch: 785123

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.70		5.0	3.7	mg/L			09/06/24 09:29	1

Lab Sample ID: LCS 500-785123/4

Matrix: Water

Analysis Batch: 785123

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	101		mg/L		101	95 - 121

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-783908/1
Matrix: Water
Analysis Batch: 783908

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<1.9		5.0	1.9	mg/L			08/29/24 15:45	1

Lab Sample ID: LCS 500-783908/2
Matrix: Water
Analysis Batch: 783908

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	200	175		mg/L		88	80 - 120

Lab Sample ID: MB 500-784068/1
Matrix: Water
Analysis Batch: 784068

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<1.9		5.0	1.9	mg/L			08/30/24 13:54	1

Lab Sample ID: LCS 500-784068/2
Matrix: Water
Analysis Batch: 784068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	200	164		mg/L		82	80 - 120

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-784483/16
Matrix: Water
Analysis Batch: 784483

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		2.0	1.0	mg/L			09/04/24 11:49	1

Lab Sample ID: LCS 500-784483/17
Matrix: Water
Analysis Batch: 784483

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.8		mg/L		99	85 - 115

Method: SM 5220C - COD

Lab Sample ID: MB 500-784271/1-A
Matrix: Water
Analysis Batch: 784280

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 784271

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<6.0		10	6.0	mg/L		09/03/24 09:51	09/03/24 14:55	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Method: SM 5220C - COD (Continued)

Lab Sample ID: LCS 500-784271/2-A
Matrix: Water
Analysis Batch: 784280

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 784271

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	50.0	50.2		mg/L		100	85 - 115

Lab Sample ID: 500-255810-1 MS
Matrix: Water
Analysis Batch: 784280

Client Sample ID: MW-16Z
Prep Type: Dissolved
Prep Batch: 784271

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	6.2	J	50.0	52.3		mg/L		92	75 - 125

Lab Sample ID: 500-255810-1 MSD
Matrix: Water
Analysis Batch: 784280

Client Sample ID: MW-16Z
Prep Type: Dissolved
Prep Batch: 784271

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	6.2	J	50.0	51.3		mg/L		90	75 - 125	2	20

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-16Z

Date Collected: 08/27/24 14:30

Date Received: 08/29/24 10:05

Lab Sample ID: 500-255810-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	784176	SW1	EET CHI	09/03/24 21:35
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	784622	RN	EET CHI	09/04/24 14:05
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	785047	RN	EET CHI	09/06/24 17:06
Dissolved	Prep	3005A			784847	BDE	EET CHI	09/06/24 08:49 - 09/06/24 14:49 ¹
Dissolved	Analysis	6020B		1	785268	RN	EET CHI	09/09/24 16:17
Dissolved	Prep	7470A			785510	MJG	EET CHI	09/11/24 10:45 - 09/11/24 12:45 ¹
Dissolved	Analysis	7470A		1	785725	MJG	EET CHI	09/12/24 08:40
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	SM 2340B		1	784677	DAJ	EET CHI	09/05/24 10:19
Dissolved	Analysis	300.0		1	784419	MB	EET CHI	09/04/24 15:53
Dissolved	Analysis	N07-0003		1	785824	TR	EET CHI	09/12/24 12:07
Dissolved	Analysis	SM 2320B		1	785123	ER	EET CHI	09/06/24 11:16
Total/NA	Analysis	SM 2540D		1	783908	SO	EET CHI	08/29/24 16:21 - 08/29/24 16:24 ¹
Dissolved	Prep	SM 5220			784271	LB	EET CHI	09/03/24 09:51 - 09/03/24 11:51 ¹
Dissolved	Analysis	SM 5220C		1	784280	LB	EET CHI	09/03/24 14:58
Total/NA	Analysis	Field Sampling		1	784445	DN	EET CHI	08/27/24 14:30

Client Sample ID: MW-18WT

Date Collected: 08/27/24 13:00

Date Received: 08/29/24 10:05

Lab Sample ID: 500-255810-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	784176	SW1	EET CHI	09/03/24 21:59
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	784622	RN	EET CHI	09/04/24 14:08
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	785047	RN	EET CHI	09/06/24 17:08
Dissolved	Prep	3005A			784847	BDE	EET CHI	09/06/24 08:49 - 09/06/24 14:49 ¹
Dissolved	Analysis	6020B		1	785268	RN	EET CHI	09/09/24 16:19
Dissolved	Prep	7470A			785510	MJG	EET CHI	09/11/24 10:45 - 09/11/24 12:45 ¹
Dissolved	Analysis	7470A		1	785725	MJG	EET CHI	09/12/24 08:42
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	SM 2340B		1	784677	DAJ	EET CHI	09/05/24 10:19
Dissolved	Analysis	300.0		1	784419	MB	EET CHI	09/04/24 17:09
Dissolved	Analysis	N07-0003		5	785824	TR	EET CHI	09/12/24 14:49
Dissolved	Analysis	SM 2320B		1	785123	ER	EET CHI	09/06/24 11:26
Total/NA	Analysis	SM 2540D		1	783908	SO	EET CHI	08/29/24 16:24 - 08/29/24 16:27 ¹
Dissolved	Prep	SM 5220			784271	LB	EET CHI	09/03/24 09:51 - 09/03/24 11:51 ¹
Dissolved	Analysis	SM 5220C		1	784280	LB	EET CHI	09/03/24 15:02
Total/NA	Analysis	Field Sampling		1	784445	DN	EET CHI	08/27/24 13:00

Eurofins Chicago

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-18

Date Collected: 08/27/24 13:50

Date Received: 08/29/24 10:05

Lab Sample ID: 500-255810-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	784176	SW1	EET CHI	09/03/24 22:22
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	784622	RN	EET CHI	09/04/24 14:10
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	785047	RN	EET CHI	09/06/24 17:10
Dissolved	Prep	3005A			784847	BDE	EET CHI	09/06/24 08:49 - 09/06/24 14:49 ¹
Dissolved	Analysis	6020B		1	785268	RN	EET CHI	09/09/24 16:21
Dissolved	Prep	7470A			785510	MJG	EET CHI	09/11/24 10:45 - 09/11/24 12:45 ¹
Dissolved	Analysis	7470A		1	785725	MJG	EET CHI	09/12/24 08:45
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	SM 2340B		1	784677	DAJ	EET CHI	09/05/24 10:19
Dissolved	Analysis	300.0		1	784419	MB	EET CHI	09/04/24 17:24
Dissolved	Analysis	N07-0003		10	785824	TR	EET CHI	09/12/24 14:49
Dissolved	Analysis	SM 2320B		1	785123	ER	EET CHI	09/06/24 11:35
Total/NA	Analysis	SM 2540D		1	783908	SO	EET CHI	08/29/24 16:27 - 08/29/24 16:29 ¹
Dissolved	Prep	SM 5220			784271	LB	EET CHI	09/03/24 09:51 - 09/03/24 11:51 ¹
Dissolved	Analysis	SM 5220C		1	784280	LB	EET CHI	09/03/24 15:04
Total/NA	Analysis	Field Sampling		1	784445	DN	EET CHI	08/27/24 13:50

Client Sample ID: MW-19

Date Collected: 08/27/24 10:00

Date Received: 08/29/24 10:05

Lab Sample ID: 500-255810-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	784176	SW1	EET CHI	09/03/24 22:45
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	784622	RN	EET CHI	09/04/24 14:12
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	785047	RN	EET CHI	09/06/24 17:13
Dissolved	Prep	7470A			785510	MJG	EET CHI	09/11/24 10:45 - 09/11/24 12:45 ¹
Dissolved	Analysis	7470A		1	785725	MJG	EET CHI	09/12/24 08:47
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	SM 2340B		1	784677	DAJ	EET CHI	09/05/24 10:19
Dissolved	Analysis	300.0		1	784419	MB	EET CHI	09/04/24 17:39
Dissolved	Analysis	N07-0003		1	785824	TR	EET CHI	09/12/24 12:09
Dissolved	Analysis	SM 2320B		1	785123	ER	EET CHI	09/06/24 11:45
Total/NA	Analysis	SM 2540D		1	783908	SO	EET CHI	08/29/24 16:29 - 08/29/24 16:32 ¹
Dissolved	Prep	SM 5220			784271	LB	EET CHI	09/03/24 09:51 - 09/03/24 11:51 ¹
Dissolved	Analysis	SM 5220C		1	784280	LB	EET CHI	09/03/24 15:05
Total/NA	Analysis	Field Sampling		1	784445	DN	EET CHI	08/27/24 10:00

Eurofins Chicago

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Client Sample ID: MW-19Z

Date Collected: 08/27/24 10:45

Date Received: 08/29/24 10:05

Lab Sample ID: 500-255810-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	784176	SW1	EET CHI	09/03/24 23:09
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	784622	RN	EET CHI	09/04/24 14:14
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	6020B		1	785047	RN	EET CHI	09/06/24 17:15
Dissolved	Prep	3005A			784847	BDE	EET CHI	09/06/24 08:49 - 09/06/24 14:49 ¹
Dissolved	Analysis	6020B		1	785268	RN	EET CHI	09/09/24 16:24
Dissolved	Prep	7470A			785510	MJG	EET CHI	09/11/24 10:45 - 09/11/24 12:45 ¹
Dissolved	Analysis	7470A		1	785725	MJG	EET CHI	09/12/24 08:59
Dissolved	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Dissolved	Analysis	SM 2340B		1	784677	DAJ	EET CHI	09/05/24 10:19
Dissolved	Analysis	300.0		1	784419	MB	EET CHI	09/04/24 17:54
Dissolved	Analysis	N07-0003		1	785824	TR	EET CHI	09/12/24 12:09
Dissolved	Analysis	SM 2320B		1	785123	ER	EET CHI	09/06/24 11:53
Total/NA	Analysis	SM 2540D		1	784068	SO	EET CHI	08/30/24 14:02 - 08/30/24 14:06 ¹
Dissolved	Prep	SM 5220			784271	LB	EET CHI	09/03/24 09:51 - 09/03/24 11:51 ¹
Dissolved	Analysis	SM 5220C		1	784280	LB	EET CHI	09/03/24 15:07
Total/NA	Analysis	Field Sampling		1	784445	DN	EET CHI	08/27/24 10:45

Client Sample ID: DWS-1

Date Collected: 08/27/24 15:00

Date Received: 08/29/24 10:05

Lab Sample ID: 500-255810-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	785226	PMF	EET CHI	09/10/24 11:14
Total Recoverable	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Total Recoverable	Analysis	6020B		1	784622	RN	EET CHI	09/04/24 14:21
Total Recoverable	Prep	3005A			783976	BDE	EET CHI	08/30/24 08:14 - 08/30/24 14:14 ¹
Total Recoverable	Analysis	SM 2340B		1	784677	DAJ	EET CHI	09/05/24 10:19
Total/NA	Analysis	SM 4500 Cl- E		1	784483	TR	EET CHI	09/04/24 11:52
Total/NA	Analysis	Field Sampling		1	784445	DN	EET CHI	08/27/24 15:00

Client Sample ID: Trip Blank

Date Collected: 08/27/24 00:00

Date Received: 08/29/24 10:05

Lab Sample ID: 500-255810-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	784176	SW1	EET CHI	09/03/24 16:32

¹ This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Eurofins Chicago

Accreditation/Certification Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon Co. LF

Job ID: 500-255810-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-25

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Login Sample Receipt Checklist

Client: Short Elliott Hendrickson, Inc. dba SEH

Job Number: 500-255810-1

Login Number: 255810

List Source: Eurofins Chicago

List Number: 1

Creator: Scott, Sherri L

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.7,2.4
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

FW: 500-255810 Vernon Co. LF Sample Confirmation files from Eurofins North Central

Sandra Fredrick <Sandra.Fredrick@et.eurofinsus.com>

Wed 9/4/2024 10:39 AM

To:Dirk Nelson <Dirk.Nelson@et.eurofinsus.com>

Verified Sender: This email is from an internal and/or verified domain which passed security verifications. Remember to still be cautious with personal data and follow company policies.

Missing field below.
Thanks!

We are thankful for your business and hope that you have a wonderful day!

Sandie Fredrick

Project Manager

Eurofins Chicago

2417 Bond Street

University Park, IL 60484 USA

Phone: 920-261-1660

E-mail: Sandra.Fredrick@ET.EurofinsUS.com

www.EurofinsUS.com/ENV | [Facebook](#) | [LinkedIn](#)

From: Veronica Aranda <varanda@sehinc.com>

Sent: Wednesday, September 4, 2024 10:36 AM

To: Sandra Fredrick <Sandra.Fredrick@et.eurofinsus.com>; Brian Kent <bkent@sehinc.com>; Bill Warner <wwarner@sehinc.com>

Subject: Re: 500-255810 Vernon Co. LF Sample Confirmation files from Eurofins North Central

Unverified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Oops forgot it! There is.

Color: clear

Turb: none

Odor: none

pH: 7.21

Temp-15.1

Conduct-278

From: Sandra Fredrick <Sandra.Fredrick@et.eurofinsus.com>

Sent: Wednesday, September 4, 2024 10:32:42 AM

To: Veronica Aranda <varanda@sehinc.com>; Brian Kent <bkent@sehinc.com>; Bill Warner <wwarner@sehinc.com>

Subject: RE: 500-255810 Vernon Co. LF Sample Confirmation files from Eurofins North Central

Thanks Veronica. No field for sample DWS-1?

Thanks

Sandie

We are thankful for your business and hope that you have a wonderful day!

Sandie Fredrick

Project Manager

Eurofins Chicago

2417 Bond Street

University Park, IL 60484 USA
Phone: 920-261-1660
E-mail: Sandra.Fredrick@ET.EurofinsUS.com
www.EurofinsUS.com/ENV | [Facebook](#) | [LinkedIn](#)

From: Veronica Aranda <varanda@sehinc.com>
Sent: Wednesday, September 4, 2024 10:17 AM
To: Sandra Fredrick <Sandra.Fredrick@et.eurofinsus.com>; Brian Kent <bkent@sehinc.com>; Bill Warner <wwarner@sehinc.com>
Subject: RE: 500-255810 Vernon Co. LF Sample Confirmation files from Eurofins North Central

Unverified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Hi Sandie,

Field data is shown below. Please note we do not have Point IDs for these wells yet, so you can use a generic numbering system.

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NGVD)	Top of Casing Elevation (feet NGVD)	Well Depth (feet btoc)	Screen Length (feet)	Screen Interval Elevation (feet NGVD)	Previous Depths to Water (feet btoc)	Measured Depth to Water (feet btoc)		08.27.2024					
									Date: 08.27.2024	pH	Temp	Conductivity	Color	Turbidity	Odor	
2024 Monitoring Wells and Piezometers																
	MW-18WT				91.5		-91.5 - -91.5	N/A		82.09	7.46	14.8	492	slight	slight	none
	MW-18				122.4		-122.4 - -122.4	N/A		107.65	7.43	14.3	480	slight	slight	none
	MW-16Z				124.7		-124.7 - -124.7	N/A		92.62	7.52	14.4	540	none	none	none
	MW-19				107.5		-107.5 - -107.5	N/A		97.22	7.61	15.3	195	slight	moderate	none
	MW-19Z				134.9		-134.9 - -134.9	N/A		98.3	7.52	15.4	166	slight	slight	none

Thanks!

Veronica Aranda, GIT (WI)
Scientist II
Short Elliott Hendrickson Inc.
715.933.2351 mobile
Building a Better World for All of Us®
100% Employee Owned
Follow SEH on LinkedIn | Instagram

From: Sandie Fredrick <TALS@reports.et.eurofinsus.com>
Sent: Thursday, August 29, 2024 4:51 PM
To: Brian Kent <bkent@sehinc.com>; Veronica Aranda <varanda@sehinc.com>; Bill Warner <wwarner@sehinc.com>
Subject: 500-255810 Vernon Co. LF Sample Confirmation files from Eurofins North Central

Attachment J

October 2, 2024, Laboratory Report

ANALYTICAL REPORT

PREPARED FOR

Attn: Mr. Brian L. Kent
Short Elliott Hendrickson, Inc. dba SEH
10 North Bridge Street
Chippewa Falls, Wisconsin 54729-3374

Generated 10/18/2024 1:46:32 PM

JOB DESCRIPTION

Vernon County LF

JOB NUMBER

500-257918-1

Eurofins Chicago

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

Results relate only to the items tested and the sample(s) as received by the laboratory. The results, detection limits (LOD) and Quantitation Limits (LOQ) have been adjusted for sample dilutions and/or solids content.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Compliance Statement

The LOD and LOQ reported are adjusted by the dilution factor when a dilution factor greater than 1 is needed. Additionally, where results are indicated as being reported on a dry weight basis, the LOD and LOQ are adjusted for moisture content as well.

Definitions of Limits

- LOD = Limit of Detection = MDL as defined by 40 CFR part 136 Appendix B
- LOQ = Limit of Quantitation = $3.33 \times \text{LOD}$ as defined by Wisconsin
- RL = Report Limit = a concentration supported by a standard in the calibration curves

Authorization



Generated
10/18/2024 1:46:32 PM

Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660



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Case Narrative

Client: Short Elliott Hendrickson, Inc. dba SEH
Project: Vernon County LF

Job ID: 500-257918-1

Job ID: 500-257918-1

Eurofins Chicago

Job Narrative 500-257918-1

Receipt

The samples were received on 10/04/24 09:00. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 5.1° C.

GC/MS VOA

Method 8260D: The continuing calibration verification (CCV) analyzed in batch 500-790329 was outside the method criteria for the following analyte(s): Acetone and Bromomethane. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Method 8260D: The following sample was collected in a properly preserved vial; however, the pH was outside the required criteria when verified by the laboratory. The sample was analyzed outside the 7-day holding time specified for unpreserved samples but within the 14-day holding time specified for preserved samples: MW-18 (500-257918-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Field Service / Mobile Lab

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

Method 300.0: The method blank for analytical batch 500-790715 contained Chloride above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Eurofins Chicago

Method Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO ₃) by calculation	SM	EET CHI
300.0	Anions, Ion Chromatography	EPA	EET CHI
353.2	Nitrogen, Nitrate-Nitrite	EPA	EET BUF
SM 2320B	Alkalinity	SM	EET CHI
Field Sampling	Field Sampling	EPA	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
5030B	Purge and Trap	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET BUF = Eurofins Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-257918-1	MW-16Z	Water	10/02/24 09:20	10/04/24 09:00
500-257918-2	MW-18	Water	10/02/24 10:00	10/04/24 09:00
500-257918-3	MW-18WT	Water	10/02/24 10:30	10/04/24 09:00
500-257918-4	MW-19Z	Water	10/02/24 08:30	10/04/24 09:00
500-257918-5	MW-19	Water	10/02/24 08:55	10/04/24 09:00
500-257918-6	Trip Blank-VOC	Water	10/02/24 00:00	10/04/24 09:00

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-16Z

Lab Sample ID: 500-257918-1

Date Collected: 10/02/24 09:20

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			10/12/24 17:41	1
Benzene	<0.18		0.50	0.18	ug/L			10/12/24 17:41	1
Bromobenzene	<0.60		1.0	0.60	ug/L			10/12/24 17:41	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			10/12/24 17:41	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			10/12/24 17:41	1
Bromoform	<0.96		1.0	0.96	ug/L			10/12/24 17:41	1
Bromomethane	<1.8		3.0	1.8	ug/L			10/12/24 17:41	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			10/12/24 17:41	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			10/12/24 17:41	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			10/12/24 17:41	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 17:41	1
Chloroethane	<0.47		5.0	0.47	ug/L			10/12/24 17:41	1
Chloroform	<0.92		2.0	0.92	ug/L			10/12/24 17:41	1
Chloromethane	<0.79		5.0	0.79	ug/L			10/12/24 17:41	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			10/12/24 17:41	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			10/12/24 17:41	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			10/12/24 17:41	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			10/12/24 17:41	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			10/12/24 17:41	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			10/12/24 17:41	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			10/12/24 17:41	1
Dibromomethane	<0.58		1.0	0.58	ug/L			10/12/24 17:41	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			10/12/24 17:41	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 17:41	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			10/12/24 17:41	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			10/12/24 17:41	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			10/12/24 17:41	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			10/12/24 17:41	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			10/12/24 17:41	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			10/12/24 17:41	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			10/12/24 17:41	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			10/12/24 17:41	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			10/12/24 17:41	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			10/12/24 17:41	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			10/12/24 17:41	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 17:41	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			10/12/24 17:41	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			10/12/24 17:41	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			10/12/24 17:41	1
Naphthalene	<0.44		1.0	0.44	ug/L			10/12/24 17:41	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			10/12/24 17:41	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			10/12/24 17:41	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			10/12/24 17:41	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			10/12/24 17:41	1
Styrene	<0.31		1.0	0.31	ug/L			10/12/24 17:41	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			10/12/24 17:41	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			10/12/24 17:41	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			10/12/24 17:41	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			10/12/24 17:41	1

Eurofins Chicago

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-16Z

Lab Sample ID: 500-257918-1

Date Collected: 10/02/24 09:20

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			10/12/24 17:41	1
Toluene	<0.21		0.50	0.21	ug/L			10/12/24 17:41	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			10/12/24 17:41	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			10/12/24 17:41	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			10/12/24 17:41	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			10/12/24 17:41	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			10/12/24 17:41	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			10/12/24 17:41	1
Trichloroethene	<0.15		0.50	0.15	ug/L			10/12/24 17:41	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			10/12/24 17:41	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			10/12/24 17:41	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			10/12/24 17:41	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 17:41	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			10/12/24 17:41	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			10/12/24 17:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		79 - 194		10/19/94 17:31	1
1-Bromofluorobenzene (Surr)	102		7h - 190		10/19/94 17:31	1
1,2-Dichloroethene, 4 (Surr)	100		7h - 19d		10/19/94 17:31	1
6-Toluene, c (Surr)	100		7h - 190		10/19/94 17:31	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.23	J	1.0	0.23	ug/L		10/09/24 09:18	10/10/24 13:10	1
Barium	74		2.5	0.73	ug/L		10/09/24 09:18	10/10/24 13:10	1
Boron	45	J B	50	13	ug/L		10/09/24 09:18	10/15/24 14:04	1
Cadmium	0.50		0.50	0.17	ug/L		10/09/24 09:18	10/10/24 13:10	1
Chromium	<1.1		5.0	1.1	ug/L		10/09/24 09:18	10/10/24 13:10	1
Copper	2.7		2.0	0.50	ug/L		10/09/24 09:18	10/10/24 13:10	1
Lead	0.23	J	0.50	0.19	ug/L		10/09/24 09:18	10/10/24 13:10	1
Manganese	71		2.5	0.79	ug/L		10/09/24 09:18	10/10/24 13:10	1
Selenium	<0.98		2.5	0.98	ug/L		10/09/24 09:18	10/10/24 13:10	1
Silver	<0.12		0.50	0.12	ug/L		10/16/24 16:17	10/17/24 12:08	1
Zinc	92		20	6.9	ug/L		10/09/24 09:18	10/10/24 13:10	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		10/17/24 11:40	10/18/24 09:09	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	340		0.91	0.46	mg/L		10/09/24 09:18	10/11/24 09:49	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	10		1.0	0.12	mg/L			10/12/24 23:03	1
Sulfate (EPA 300.0)	11		1.0	0.21	mg/L			10/12/24 23:03	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			10/12/24 23:03	1
Nitrate Nitrite as N (EPA 353.2)	0.087		0.050	0.020	mg/L			10/11/24 11:44	1
Alkalinity (SM 2320B)	310		5.0	3.7	mg/L			10/15/24 14:18	1

Eurofins Chicago

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-16Z
Date Collected: 10/02/24 09:20
Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-1
Matrix: Water

Method: EPA Field Sampling - Field Sampling									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	92.56				ft			10/02/24 09:20	1
Field Color	N				NONE			10/02/24 09:20	1
Field Conductivity	606				umhos/cm			10/02/24 09:20	1
Field Odor	N				NONE			10/02/24 09:20	1
Field pH	7.49				SU			10/02/24 09:20	1
Field Temperature	10.3				Degrees C			10/02/24 09:20	1
Field Turbidity	N				NONE			10/02/24 09:20	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-18

Lab Sample ID: 500-257918-2

Date Collected: 10/02/24 10:00

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			10/12/24 17:18	1
Benzene	<0.18		0.50	0.18	ug/L			10/12/24 17:18	1
Bromobenzene	<0.60		1.0	0.60	ug/L			10/12/24 17:18	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			10/12/24 17:18	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			10/12/24 17:18	1
Bromoform	<0.96		1.0	0.96	ug/L			10/12/24 17:18	1
Bromomethane	<1.8		3.0	1.8	ug/L			10/12/24 17:18	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			10/12/24 17:18	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			10/12/24 17:18	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			10/12/24 17:18	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 17:18	1
Chloroethane	<0.47		5.0	0.47	ug/L			10/12/24 17:18	1
Chloroform	<0.92		2.0	0.92	ug/L			10/12/24 17:18	1
Chloromethane	<0.79		5.0	0.79	ug/L			10/12/24 17:18	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			10/12/24 17:18	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			10/12/24 17:18	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			10/12/24 17:18	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			10/12/24 17:18	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			10/12/24 17:18	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			10/12/24 17:18	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			10/12/24 17:18	1
Dibromomethane	<0.58		1.0	0.58	ug/L			10/12/24 17:18	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			10/12/24 17:18	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 17:18	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			10/12/24 17:18	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			10/12/24 17:18	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			10/12/24 17:18	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			10/12/24 17:18	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			10/12/24 17:18	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			10/12/24 17:18	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			10/12/24 17:18	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			10/12/24 17:18	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			10/12/24 17:18	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			10/12/24 17:18	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			10/12/24 17:18	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 17:18	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			10/12/24 17:18	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			10/12/24 17:18	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			10/12/24 17:18	1
Naphthalene	<0.44		1.0	0.44	ug/L			10/12/24 17:18	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			10/12/24 17:18	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			10/12/24 17:18	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			10/12/24 17:18	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			10/12/24 17:18	1
Styrene	<0.31		1.0	0.31	ug/L			10/12/24 17:18	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			10/12/24 17:18	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			10/12/24 17:18	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			10/12/24 17:18	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			10/12/24 17:18	1

Eurofins Chicago

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-18

Lab Sample ID: 500-257918-2

Date Collected: 10/02/24 10:00

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			10/12/24 17:18	1
Toluene	<0.21		0.50	0.21	ug/L			10/12/24 17:18	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			10/12/24 17:18	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			10/12/24 17:18	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			10/12/24 17:18	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			10/12/24 17:18	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			10/12/24 17:18	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			10/12/24 17:18	1
Trichloroethene	<0.15		0.50	0.15	ug/L			10/12/24 17:18	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			10/12/24 17:18	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			10/12/24 17:18	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			10/12/24 17:18	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 17:18	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			10/12/24 17:18	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			10/12/24 17:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	104		79 - 194		10/19/94 1731c	1
1-Bromofluorobenzene (Surr)	109		7h - 190		10/19/94 1731c	1
1,2-Dichloroethene, 4 (Surr)	107		7h - 19d		10/19/94 1731c	1
6-Toluene, c (Surr)	7c		7h - 190		10/19/94 1731c	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/09/24 09:18	10/10/24 13:17	1
Barium	36		2.5	0.73	ug/L		10/09/24 09:18	10/10/24 13:17	1
Boron	27	J B	50	13	ug/L		10/09/24 09:18	10/15/24 14:12	1
Cadmium	<0.17		0.50	0.17	ug/L		10/09/24 09:18	10/10/24 13:17	1
Chromium	<1.1		5.0	1.1	ug/L		10/09/24 09:18	10/10/24 13:17	1
Copper	<0.50		2.0	0.50	ug/L		10/09/24 09:18	10/10/24 13:17	1
Lead	<0.19		0.50	0.19	ug/L		10/09/24 09:18	10/10/24 13:17	1
Manganese	2.9		2.5	0.79	ug/L		10/09/24 09:18	10/10/24 13:17	1
Selenium	<0.98		2.5	0.98	ug/L		10/09/24 09:18	10/10/24 13:17	1
Silver	<0.12		0.50	0.12	ug/L		10/16/24 16:17	10/17/24 12:10	1
Zinc	<6.9		20	6.9	ug/L		10/09/24 09:18	10/10/24 13:17	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		10/17/24 11:40	10/18/24 09:11	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	320		0.91	0.46	mg/L		10/09/24 09:18	10/11/24 09:49	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	4.2	B	1.0	0.12	mg/L			10/15/24 16:13	1
Sulfate (EPA 300.0)	9.9		1.0	0.21	mg/L			10/15/24 16:13	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			10/15/24 16:13	1
Nitrate Nitrite as N (EPA 353.2)	0.76	F1	0.050	0.020	mg/L			10/11/24 11:49	1
Alkalinity (SM 2320B)	260		5.0	3.7	mg/L			10/15/24 14:32	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-18
Date Collected: 10/02/24 10:00
Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-2
Matrix: Water

Method: EPA Field Sampling - Field Sampling									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	107.8				ft			10/02/24 10:00	1
Field Color	Y				NONE			10/02/24 10:00	1
Field Conductivity	534				umhos/cm			10/02/24 10:00	1
Field Odor	N				NONE			10/02/24 10:00	1
Field pH	7.63				SU			10/02/24 10:00	1
Field Temperature	9.5				Degrees C			10/02/24 10:00	1
Field Turbidity	Y				NONE			10/02/24 10:00	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-18WT

Lab Sample ID: 500-257918-3

Date Collected: 10/02/24 10:30

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			10/12/24 16:55	1
Benzene	<0.18		0.50	0.18	ug/L			10/12/24 16:55	1
Bromobenzene	<0.60		1.0	0.60	ug/L			10/12/24 16:55	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			10/12/24 16:55	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			10/12/24 16:55	1
Bromoform	<0.96		1.0	0.96	ug/L			10/12/24 16:55	1
Bromomethane	<1.8		3.0	1.8	ug/L			10/12/24 16:55	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			10/12/24 16:55	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			10/12/24 16:55	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			10/12/24 16:55	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 16:55	1
Chloroethane	<0.47		5.0	0.47	ug/L			10/12/24 16:55	1
Chloroform	<0.92		2.0	0.92	ug/L			10/12/24 16:55	1
Chloromethane	<0.79		5.0	0.79	ug/L			10/12/24 16:55	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			10/12/24 16:55	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			10/12/24 16:55	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			10/12/24 16:55	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			10/12/24 16:55	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			10/12/24 16:55	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			10/12/24 16:55	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			10/12/24 16:55	1
Dibromomethane	<0.58		1.0	0.58	ug/L			10/12/24 16:55	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			10/12/24 16:55	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 16:55	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			10/12/24 16:55	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			10/12/24 16:55	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			10/12/24 16:55	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			10/12/24 16:55	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			10/12/24 16:55	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			10/12/24 16:55	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			10/12/24 16:55	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			10/12/24 16:55	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			10/12/24 16:55	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			10/12/24 16:55	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			10/12/24 16:55	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 16:55	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			10/12/24 16:55	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			10/12/24 16:55	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			10/12/24 16:55	1
Naphthalene	<0.44		1.0	0.44	ug/L			10/12/24 16:55	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			10/12/24 16:55	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			10/12/24 16:55	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			10/12/24 16:55	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			10/12/24 16:55	1
Styrene	<0.31		1.0	0.31	ug/L			10/12/24 16:55	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			10/12/24 16:55	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			10/12/24 16:55	1
1,1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			10/12/24 16:55	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			10/12/24 16:55	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-18WT

Lab Sample ID: 500-257918-3

Date Collected: 10/02/24 10:30

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			10/12/24 16:55	1
Toluene	<0.21		0.50	0.21	ug/L			10/12/24 16:55	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			10/12/24 16:55	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			10/12/24 16:55	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			10/12/24 16:55	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			10/12/24 16:55	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			10/12/24 16:55	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			10/12/24 16:55	1
Trichloroethene	<0.15		0.50	0.15	ug/L			10/12/24 16:55	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			10/12/24 16:55	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			10/12/24 16:55	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			10/12/24 16:55	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 16:55	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			10/12/24 16:55	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			10/12/24 16:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		79 - 194		10/19/94 1d3h	1
1-Bromofluorobenzene (Surr)	100		7h - 190		10/19/94 1d3h	1
1,2-Dichloroethene, 4 (Surr)	107		7h - 19d		10/19/94 1d3h	1
6-Toluene, c (Surr)	TT		7h - 190		10/19/94 1d3h	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/09/24 09:18	10/10/24 13:19	1
Barium	39		2.5	0.73	ug/L		10/09/24 09:18	10/10/24 13:19	1
Boron	24	J B	50	13	ug/L		10/09/24 09:18	10/15/24 14:14	1
Cadmium	<0.17		0.50	0.17	ug/L		10/09/24 09:18	10/10/24 13:19	1
Chromium	<1.1		5.0	1.1	ug/L		10/09/24 09:18	10/10/24 13:19	1
Copper	<0.50		2.0	0.50	ug/L		10/09/24 09:18	10/10/24 13:19	1
Lead	<0.19		0.50	0.19	ug/L		10/09/24 09:18	10/10/24 13:19	1
Manganese	3.3		2.5	0.79	ug/L		10/09/24 09:18	10/10/24 13:19	1
Selenium	<0.98		2.5	0.98	ug/L		10/09/24 09:18	10/10/24 13:19	1
Silver	<0.12		0.50	0.12	ug/L		10/16/24 16:17	10/17/24 12:17	1
Zinc	<6.9		20	6.9	ug/L		10/09/24 09:18	10/10/24 13:19	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		10/17/24 11:40	10/18/24 09:13	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	330		0.91	0.46	mg/L		10/09/24 09:18	10/11/24 09:49	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	2.6	B	1.0	0.12	mg/L			10/15/24 16:28	1
Sulfate (EPA 300.0)	7.5		1.0	0.21	mg/L			10/15/24 16:28	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			10/15/24 16:28	1
Nitrate Nitrite as N (EPA 353.2)	1.3		0.050	0.020	mg/L			10/11/24 11:52	1
Alkalinity (SM 2320B)	280		5.0	3.7	mg/L			10/15/24 14:43	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-18WT
Date Collected: 10/02/24 10:30
Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-3
Matrix: Water

Method: EPA Field Sampling - Field Sampling									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	79.83				ft			10/02/24 10:30	1
Field Color	Y				NONE			10/02/24 10:30	1
Field Conductivity	540				umhos/cm			10/02/24 10:30	1
Field Odor	N				NONE			10/02/24 10:30	1
Field pH	7.29				SU			10/02/24 10:30	1
Field Temperature	9.7				Degrees C			10/02/24 10:30	1
Field Turbidity	Y				NONE			10/02/24 10:30	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-19Z

Lab Sample ID: 500-257918-4

Date Collected: 10/02/24 08:30

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			10/12/24 16:32	1
Benzene	<0.18		0.50	0.18	ug/L			10/12/24 16:32	1
Bromobenzene	<0.60		1.0	0.60	ug/L			10/12/24 16:32	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			10/12/24 16:32	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			10/12/24 16:32	1
Bromoform	<0.96		1.0	0.96	ug/L			10/12/24 16:32	1
Bromomethane	<1.8		3.0	1.8	ug/L			10/12/24 16:32	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			10/12/24 16:32	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			10/12/24 16:32	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			10/12/24 16:32	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 16:32	1
Chloroethane	<0.47		5.0	0.47	ug/L			10/12/24 16:32	1
Chloroform	<0.92		2.0	0.92	ug/L			10/12/24 16:32	1
Chloromethane	<0.79		5.0	0.79	ug/L			10/12/24 16:32	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			10/12/24 16:32	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			10/12/24 16:32	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			10/12/24 16:32	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			10/12/24 16:32	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			10/12/24 16:32	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			10/12/24 16:32	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			10/12/24 16:32	1
Dibromomethane	<0.58		1.0	0.58	ug/L			10/12/24 16:32	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			10/12/24 16:32	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 16:32	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			10/12/24 16:32	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			10/12/24 16:32	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			10/12/24 16:32	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			10/12/24 16:32	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			10/12/24 16:32	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			10/12/24 16:32	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			10/12/24 16:32	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			10/12/24 16:32	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			10/12/24 16:32	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			10/12/24 16:32	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			10/12/24 16:32	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 16:32	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			10/12/24 16:32	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			10/12/24 16:32	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			10/12/24 16:32	1
Naphthalene	<0.44		1.0	0.44	ug/L			10/12/24 16:32	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			10/12/24 16:32	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			10/12/24 16:32	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			10/12/24 16:32	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			10/12/24 16:32	1
Styrene	<0.31		1.0	0.31	ug/L			10/12/24 16:32	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			10/12/24 16:32	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			10/12/24 16:32	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			10/12/24 16:32	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			10/12/24 16:32	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-19Z

Lab Sample ID: 500-257918-4

Date Collected: 10/02/24 08:30

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			10/12/24 16:32	1
Toluene	<0.21		0.50	0.21	ug/L			10/12/24 16:32	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			10/12/24 16:32	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			10/12/24 16:32	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			10/12/24 16:32	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			10/12/24 16:32	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			10/12/24 16:32	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			10/12/24 16:32	1
Trichloroethene	<0.15		0.50	0.15	ug/L			10/12/24 16:32	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			10/12/24 16:32	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			10/12/24 16:32	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			10/12/24 16:32	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 16:32	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			10/12/24 16:32	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			10/12/24 16:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	104		79 - 194		10/19/94 1d329	1
1-Bromofluorobenzene (Surr)	100		7h - 190		10/19/94 1d329	1
1,2-Dichloroethene, 4 (Surr)	10c		7h - 19d		10/19/94 1d329	1
6oluene-, c (Surr)	TT		7h - 190		10/19/94 1d329	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/09/24 09:18	10/10/24 13:21	1
Barium	43		2.5	0.73	ug/L		10/09/24 09:18	10/10/24 13:21	1
Boron	24	J B	50	13	ug/L		10/09/24 09:18	10/15/24 14:17	1
Cadmium	<0.17		0.50	0.17	ug/L		10/09/24 09:18	10/10/24 13:21	1
Chromium	<1.1		5.0	1.1	ug/L		10/09/24 09:18	10/10/24 13:21	1
Copper	1.9	J	2.0	0.50	ug/L		10/09/24 09:18	10/10/24 13:21	1
Lead	<0.19		0.50	0.19	ug/L		10/09/24 09:18	10/10/24 13:21	1
Manganese	330		2.5	0.79	ug/L		10/09/24 09:18	10/10/24 13:21	1
Selenium	<0.98		2.5	0.98	ug/L		10/09/24 09:18	10/10/24 13:21	1
Silver	<0.12		0.50	0.12	ug/L		10/16/24 16:17	10/17/24 12:19	1
Zinc	33		20	6.9	ug/L		10/09/24 09:18	10/10/24 13:21	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		10/17/24 11:40	10/18/24 09:15	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	88		0.91	0.46	mg/L		10/09/24 09:18	10/11/24 09:49	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	3.1	B	1.0	0.12	mg/L			10/15/24 16:43	1
Sulfate (EPA 300.0)	2.7		1.0	0.21	mg/L			10/15/24 16:43	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			10/15/24 16:43	1
Nitrate Nitrite as N (EPA 353.2)	0.054		0.050	0.020	mg/L			10/11/24 11:54	1
Alkalinity (SM 2320B)	83		5.0	3.7	mg/L			10/15/24 14:56	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-19Z
Date Collected: 10/02/24 08:30
Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-4
Matrix: Water

Method: EPA Field Sampling - Field Sampling									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	98.57				ft			10/02/24 08:30	1
Field Color	Y				NONE			10/02/24 08:30	1
Field Conductivity	176				umhos/cm			10/02/24 08:30	1
Field Odor	N				NONE			10/02/24 08:30	1
Field pH	6.49				SU			10/02/24 08:30	1
Field Temperature	9.1				Degrees C			10/02/24 08:30	1
Field Turbidity	Y				NONE			10/02/24 08:30	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-19

Lab Sample ID: 500-257918-5

Date Collected: 10/02/24 08:55

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	4.8	J	10	4.3	ug/L			10/12/24 16:09	1
Benzene	0.38	J	0.50	0.18	ug/L			10/12/24 16:09	1
Bromobenzene	<0.60		1.0	0.60	ug/L			10/12/24 16:09	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			10/12/24 16:09	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			10/12/24 16:09	1
Bromoform	<0.96		1.0	0.96	ug/L			10/12/24 16:09	1
Bromomethane	<1.8		3.0	1.8	ug/L			10/12/24 16:09	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			10/12/24 16:09	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			10/12/24 16:09	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			10/12/24 16:09	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 16:09	1
Chloroethane	<0.47		5.0	0.47	ug/L			10/12/24 16:09	1
Chloroform	<0.92		2.0	0.92	ug/L			10/12/24 16:09	1
Chloromethane	<0.79		5.0	0.79	ug/L			10/12/24 16:09	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			10/12/24 16:09	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			10/12/24 16:09	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			10/12/24 16:09	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			10/12/24 16:09	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			10/12/24 16:09	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			10/12/24 16:09	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			10/12/24 16:09	1
Dibromomethane	<0.58		1.0	0.58	ug/L			10/12/24 16:09	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			10/12/24 16:09	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 16:09	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			10/12/24 16:09	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			10/12/24 16:09	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			10/12/24 16:09	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			10/12/24 16:09	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			10/12/24 16:09	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			10/12/24 16:09	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			10/12/24 16:09	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			10/12/24 16:09	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			10/12/24 16:09	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			10/12/24 16:09	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			10/12/24 16:09	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 16:09	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			10/12/24 16:09	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			10/12/24 16:09	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			10/12/24 16:09	1
Naphthalene	<0.44		1.0	0.44	ug/L			10/12/24 16:09	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			10/12/24 16:09	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			10/12/24 16:09	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			10/12/24 16:09	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			10/12/24 16:09	1
Styrene	<0.31		1.0	0.31	ug/L			10/12/24 16:09	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			10/12/24 16:09	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			10/12/24 16:09	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			10/12/24 16:09	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			10/12/24 16:09	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-19

Lab Sample ID: 500-257918-5

Date Collected: 10/02/24 08:55

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			10/12/24 16:09	1
Toluene	0.23	J	0.50	0.21	ug/L			10/12/24 16:09	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			10/12/24 16:09	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			10/12/24 16:09	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			10/12/24 16:09	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			10/12/24 16:09	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			10/12/24 16:09	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			10/12/24 16:09	1
Trichloroethene	<0.15		0.50	0.15	ug/L			10/12/24 16:09	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			10/12/24 16:09	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			10/12/24 16:09	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			10/12/24 16:09	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 16:09	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			10/12/24 16:09	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			10/12/24 16:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		79 - 194		10/19/94 1d3T	1
5-Bromofluorobenzene (Surr)	101		7h - 190		10/19/94 1d3T	1
1,2-Dibromobenzene, 4 (Surr)	107		7h - 19d		10/19/94 1d3T	1
6-Toluene, c (Surr)	77		7h - 190		10/19/94 1d3T	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.36	J	1.0	0.23	ug/L		10/09/24 09:18	10/10/24 13:24	1
Barium	16		2.5	0.73	ug/L		10/09/24 09:18	10/10/24 13:24	1
Boron	21	J B	50	13	ug/L		10/09/24 09:18	10/15/24 14:20	1
Cadmium	<0.17		0.50	0.17	ug/L		10/09/24 09:18	10/10/24 13:24	1
Chromium	<1.1		5.0	1.1	ug/L		10/09/24 09:18	10/10/24 13:24	1
Copper	0.74	J	2.0	0.50	ug/L		10/09/24 09:18	10/10/24 13:24	1
Lead	<0.19		0.50	0.19	ug/L		10/09/24 09:18	10/10/24 13:24	1
Manganese	1400		2.5	0.79	ug/L		10/09/24 09:18	10/10/24 13:24	1
Selenium	<0.98		2.5	0.98	ug/L		10/09/24 09:18	10/10/24 13:24	1
Silver	<0.12		0.50	0.12	ug/L		10/16/24 16:17	10/17/24 12:21	1
Zinc	<6.9		20	6.9	ug/L		10/09/24 09:18	10/10/24 13:24	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		10/17/24 11:40	10/18/24 09:17	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	56		0.91	0.46	mg/L		10/09/24 09:18	10/11/24 09:49	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	1.3	B	1.0	0.12	mg/L			10/15/24 16:58	1
Sulfate (EPA 300.0)	2.7		1.0	0.21	mg/L			10/15/24 16:58	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			10/15/24 16:58	1
Nitrate Nitrite as N (EPA 353.2)	0.025	J	0.050	0.020	mg/L			10/11/24 11:56	1
Alkalinity (SM 2320B)	61		5.0	3.7	mg/L			10/15/24 15:05	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-19

Lab Sample ID: 500-257918-5

Date Collected: 10/02/24 08:55

Matrix: Water

Date Received: 10/04/24 09:00

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Depth to Water (ft from MP)	99.86				ft			10/02/24 08:55	1
Field Color	Y				NONE			10/02/24 08:55	1
Field Conductivity	137				umhos/cm			10/02/24 08:55	1
Field Odor	N				NONE			10/02/24 08:55	1
Field pH	6.09				SU			10/02/24 08:55	1
Field Temperature	10.4				Degrees C			10/02/24 08:55	1
Field Turbidity	Y				NONE			10/02/24 08:55	1

Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: Trip Blank-VOC

Lab Sample ID: 500-257918-6

Date Collected: 10/02/24 00:00

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			10/12/24 15:46	1
Benzene	<0.18		0.50	0.18	ug/L			10/12/24 15:46	1
Bromobenzene	<0.60		1.0	0.60	ug/L			10/12/24 15:46	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			10/12/24 15:46	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			10/12/24 15:46	1
Bromoform	<0.96		1.0	0.96	ug/L			10/12/24 15:46	1
Bromomethane	<1.8		3.0	1.8	ug/L			10/12/24 15:46	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			10/12/24 15:46	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			10/12/24 15:46	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			10/12/24 15:46	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 15:46	1
Chloroethane	<0.47		5.0	0.47	ug/L			10/12/24 15:46	1
Chloroform	<0.92		2.0	0.92	ug/L			10/12/24 15:46	1
Chloromethane	<0.79		5.0	0.79	ug/L			10/12/24 15:46	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			10/12/24 15:46	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			10/12/24 15:46	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			10/12/24 15:46	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			10/12/24 15:46	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			10/12/24 15:46	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			10/12/24 15:46	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			10/12/24 15:46	1
Dibromomethane	<0.58		1.0	0.58	ug/L			10/12/24 15:46	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			10/12/24 15:46	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 15:46	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			10/12/24 15:46	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			10/12/24 15:46	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			10/12/24 15:46	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			10/12/24 15:46	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			10/12/24 15:46	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			10/12/24 15:46	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			10/12/24 15:46	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			10/12/24 15:46	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			10/12/24 15:46	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			10/12/24 15:46	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			10/12/24 15:46	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 15:46	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			10/12/24 15:46	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			10/12/24 15:46	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			10/12/24 15:46	1
Naphthalene	<0.44		1.0	0.44	ug/L			10/12/24 15:46	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			10/12/24 15:46	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			10/12/24 15:46	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			10/12/24 15:46	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			10/12/24 15:46	1
Styrene	<0.31		1.0	0.31	ug/L			10/12/24 15:46	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			10/12/24 15:46	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			10/12/24 15:46	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			10/12/24 15:46	1
Tetrachloroethene	<0.39		1.0	0.39	ug/L			10/12/24 15:46	1

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Client Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: Trip Blank-VOC

Lab Sample ID: 500-257918-6

Date Collected: 10/02/24 00:00

Matrix: Water

Date Received: 10/04/24 09:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<3.9		10	3.9	ug/L			10/12/24 15:46	1
Toluene	<0.21		0.50	0.21	ug/L			10/12/24 15:46	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			10/12/24 15:46	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			10/12/24 15:46	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			10/12/24 15:46	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			10/12/24 15:46	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			10/12/24 15:46	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			10/12/24 15:46	1
Trichloroethene	<0.15		0.50	0.15	ug/L			10/12/24 15:46	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			10/12/24 15:46	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			10/12/24 15:46	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			10/12/24 15:46	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 15:46	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			10/12/24 15:46	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			10/12/24 15:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		79 - 194		10/19/94 1h34d	1
1-Bromofluorobenzene (Surr)	102		7h - 190		10/19/94 1h34d	1
1,2-Dichlorobenzene, 4 (Surr)	111		7h - 19d		10/19/94 1h34d	1
6luene-, c (Surr)	TT		7h - 190		10/19/94 1h34d	1

Definitions/Glossary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

GC/MS VOA

Analysis Batch: 784168

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Total/NA	Water	8260D	
500-257918-2	MW-18	Total/NA	Water	8260D	
500-257918-3	MW-18WT	Total/NA	Water	8260D	
500-257918-4	MW-19Z	Total/NA	Water	8260D	
500-257918-5	MW-19	Total/NA	Water	8260D	
500-257918-6	Trip Blank-VOC	Total/NA	Water	8260D	
MB 500-790329/8	Method Blank	Total/NA	Water	8260D	
LCS 500-790329/4	Lab Control Sample	Total/NA	Water	8260D	
LCSD 500-790329/5	Lab Control Sample Dup	Total/NA	Water	8260D	

Metals

Prep Batch: 758723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	3005A	
500-257918-2	MW-18	Dissolved	Water	3005A	
500-257918-3	MW-18WT	Dissolved	Water	3005A	
500-257918-4	MW-19Z	Dissolved	Water	3005A	
500-257918-5	MW-19	Dissolved	Water	3005A	
MB 500-789741/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-789741/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 784394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	6020B	789741
500-257918-2	MW-18	Dissolved	Water	6020B	789741
500-257918-3	MW-18WT	Dissolved	Water	6020B	789741
500-257918-4	MW-19Z	Dissolved	Water	6020B	789741
500-257918-5	MW-19	Dissolved	Water	6020B	789741
MB 500-789741/1-A	Method Blank	Total Recoverable	Water	6020B	789741
LCS 500-789741/2-A	Lab Control Sample	Total Recoverable	Water	6020B	789741

Analysis Batch: 784385

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	SM 2340B	789741
500-257918-2	MW-18	Dissolved	Water	SM 2340B	789741
500-257918-3	MW-18WT	Dissolved	Water	SM 2340B	789741
500-257918-4	MW-19Z	Dissolved	Water	SM 2340B	789741
500-257918-5	MW-19	Dissolved	Water	SM 2340B	789741

Analysis Batch: 784510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	6020B	789741
500-257918-2	MW-18	Dissolved	Water	6020B	789741
500-257918-3	MW-18WT	Dissolved	Water	6020B	789741
500-257918-4	MW-19Z	Dissolved	Water	6020B	789741
500-257918-5	MW-19	Dissolved	Water	6020B	789741
MB 500-789741/1-A	Method Blank	Total Recoverable	Water	6020B	789741
LCS 500-789741/2-A	Lab Control Sample	Total Recoverable	Water	6020B	789741

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QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Metals

Prep Batch: 784878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	3005A	
500-257918-2	MW-18	Dissolved	Water	3005A	
500-257918-3	MW-18WT	Dissolved	Water	3005A	
500-257918-4	MW-19Z	Dissolved	Water	3005A	
500-257918-5	MW-19	Dissolved	Water	3005A	
MB 500-790979/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-790979/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 783315

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	7470A	
500-257918-2	MW-18	Dissolved	Water	7470A	
500-257918-3	MW-18WT	Dissolved	Water	7470A	
500-257918-4	MW-19Z	Dissolved	Water	7470A	
500-257918-5	MW-19	Dissolved	Water	7470A	
MB 500-791138/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-791138/13-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 783650

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	6020B	790979
500-257918-2	MW-18	Dissolved	Water	6020B	790979
500-257918-3	MW-18WT	Dissolved	Water	6020B	790979
500-257918-4	MW-19Z	Dissolved	Water	6020B	790979
500-257918-5	MW-19	Dissolved	Water	6020B	790979
MB 500-790979/1-A	Method Blank	Total Recoverable	Water	6020B	790979
LCS 500-790979/2-A	Lab Control Sample	Total Recoverable	Water	6020B	790979

Analysis Batch: 783129

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	7470A	791138
500-257918-2	MW-18	Dissolved	Water	7470A	791138
500-257918-3	MW-18WT	Dissolved	Water	7470A	791138
500-257918-4	MW-19Z	Dissolved	Water	7470A	791138
500-257918-5	MW-19	Dissolved	Water	7470A	791138
MB 500-791138/12-A	Method Blank	Total/NA	Water	7470A	791138
LCS 500-791138/13-A	Lab Control Sample	Total/NA	Water	7470A	791138

General Chemistry

Analysis Batch: 767878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	353.2	
500-257918-2	MW-18	Dissolved	Water	353.2	
500-257918-3	MW-18WT	Dissolved	Water	353.2	
500-257918-4	MW-19Z	Dissolved	Water	353.2	
500-257918-5	MW-19	Dissolved	Water	353.2	
MB 480-727979/51	Method Blank	Total/NA	Water	353.2	
LCS 480-727979/52	Lab Control Sample	Total/NA	Water	353.2	
500-257918-2 MS	MW-18	Dissolved	Water	353.2	

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QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

General Chemistry

Analysis Batch: 784132

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	300.0	
MB 500-790314/3	Method Blank	Total/NA	Water	300.0	
LCS 500-790314/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 784730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-2	MW-18	Dissolved	Water	300.0	
500-257918-3	MW-18WT	Dissolved	Water	300.0	
500-257918-4	MW-19Z	Dissolved	Water	300.0	
500-257918-5	MW-19	Dissolved	Water	300.0	
MB 500-790715/3	Method Blank	Total/NA	Water	300.0	
LCS 500-790715/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 784505

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Dissolved	Water	SM 2320B	
500-257918-2	MW-18	Dissolved	Water	SM 2320B	
500-257918-3	MW-18WT	Dissolved	Water	SM 2320B	
500-257918-4	MW-19Z	Dissolved	Water	SM 2320B	
500-257918-5	MW-19	Dissolved	Water	SM 2320B	
MB 500-790858/28	Method Blank	Total/NA	Water	SM 2320B	
MB 500-790858/53	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-790858/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Field Service / Mobile Lab

Analysis Batch: 783477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-257918-1	MW-16Z	Total/NA	Water	Field Sampling	
500-257918-2	MW-18	Total/NA	Water	Field Sampling	
500-257918-3	MW-18WT	Total/NA	Water	Field Sampling	
500-257918-4	MW-19Z	Total/NA	Water	Field Sampling	
500-257918-5	MW-19	Total/NA	Water	Field Sampling	

Surrogate Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	BFB (72-124)	DBFM (75-120)	DCA (75-126)	TOL (75-120)
500-257918-1	MW-16Z	103	103	108	100
500-257918-2	MW-18	104	102	109	98
500-257918-3	MW-18WT	103	100	107	99
500-257918-4	MW-19Z	104	100	108	99
500-257918-5	MW-19	103	101	109	97
500-257918-6	Trip Blank-VOC	101	103	111	99
LCS 500-790329/4	Lab Control Sample	98	104	112	100
LCSD 500-790329/5	Lab Control Sample Dup	99	102	104	100
MB 500-790329/8	Method Blank	107	99	108	98

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

DCA = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)

QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 500-790329/8

Matrix: Water

Analysis Batch: 790329

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<4.3		10	4.3	ug/L			10/12/24 15:00	1
Benzene	<0.18		0.50	0.18	ug/L			10/12/24 15:00	1
Bromobenzene	<0.60		1.0	0.60	ug/L			10/12/24 15:00	1
Bromochloromethane	<0.50		1.0	0.50	ug/L			10/12/24 15:00	1
Bromodichloromethane	<0.57		1.0	0.57	ug/L			10/12/24 15:00	1
Bromoform	<0.96		1.0	0.96	ug/L			10/12/24 15:00	1
Bromomethane	<1.8		3.0	1.8	ug/L			10/12/24 15:00	1
2-Butanone (MEK)	<2.3		5.0	2.3	ug/L			10/12/24 15:00	1
Carbon disulfide	<1.1		2.0	1.1	ug/L			10/12/24 15:00	1
Carbon tetrachloride	<0.41		1.0	0.41	ug/L			10/12/24 15:00	1
Chlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 15:00	1
Chloroethane	<0.47		5.0	0.47	ug/L			10/12/24 15:00	1
Chloroform	<0.92		2.0	0.92	ug/L			10/12/24 15:00	1
Chloromethane	<0.79		5.0	0.79	ug/L			10/12/24 15:00	1
2-Chlorotoluene	<0.36		1.0	0.36	ug/L			10/12/24 15:00	1
4-Chlorotoluene	<0.34		1.0	0.34	ug/L			10/12/24 15:00	1
cis-1,2-Dichloroethene	<0.42		1.0	0.42	ug/L			10/12/24 15:00	1
cis-1,3-Dichloropropene	<0.52		1.0	0.52	ug/L			10/12/24 15:00	1
Chlorodibromomethane	<0.83		1.0	0.83	ug/L			10/12/24 15:00	1
1,2-Dibromo-3-Chloropropane	<3.9		5.0	3.9	ug/L			10/12/24 15:00	1
1,2-Dibromoethane (EDB)	<0.56		1.0	0.56	ug/L			10/12/24 15:00	1
Dibromomethane	<0.58		1.0	0.58	ug/L			10/12/24 15:00	1
1,2-Dichlorobenzene	<0.48		1.0	0.48	ug/L			10/12/24 15:00	1
1,3-Dichlorobenzene	<0.41		1.0	0.41	ug/L			10/12/24 15:00	1
1,4-Dichlorobenzene	<0.45		1.0	0.45	ug/L			10/12/24 15:00	1
Dichlorodifluoromethane	<1.8		3.0	1.8	ug/L			10/12/24 15:00	1
1,1-Dichloroethane	<0.36		1.0	0.36	ug/L			10/12/24 15:00	1
1,2-Dichloroethane	<0.58		1.0	0.58	ug/L			10/12/24 15:00	1
1,1-Dichloroethene	<0.48		1.0	0.48	ug/L			10/12/24 15:00	1
1,2-Dichloropropane	<0.37		1.0	0.37	ug/L			10/12/24 15:00	1
1,3-Dichloropropane	<0.56		1.0	0.56	ug/L			10/12/24 15:00	1
2,2-Dichloropropane	<0.48		5.0	0.48	ug/L			10/12/24 15:00	1
1,1-Dichloropropene	<0.33		1.0	0.33	ug/L			10/12/24 15:00	1
Ethylbenzene	<0.20		0.50	0.20	ug/L			10/12/24 15:00	1
Hexachlorobutadiene	<0.54		1.0	0.54	ug/L			10/12/24 15:00	1
Isopropylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 15:00	1
Isopropyl ether	<0.38		1.0	0.38	ug/L			10/12/24 15:00	1
Methylene Chloride	<3.6		5.0	3.6	ug/L			10/12/24 15:00	1
Methyl tert-butyl ether	<0.43		1.0	0.43	ug/L			10/12/24 15:00	1
Naphthalene	<0.44		1.0	0.44	ug/L			10/12/24 15:00	1
n-Butylbenzene	<0.33		1.0	0.33	ug/L			10/12/24 15:00	1
N-Propylbenzene	<0.32		1.0	0.32	ug/L			10/12/24 15:00	1
p-Isopropyltoluene	<0.29		1.0	0.29	ug/L			10/12/24 15:00	1
sec-Butylbenzene	<0.27		1.0	0.27	ug/L			10/12/24 15:00	1
Styrene	<0.31		1.0	0.31	ug/L			10/12/24 15:00	1
tert-Butylbenzene	<0.26		1.0	0.26	ug/L			10/12/24 15:00	1
1,1,1,2-Tetrachloroethane	<0.67		1.0	0.67	ug/L			10/12/24 15:00	1
1,1,2,2-Tetrachloroethane	<0.65		1.0	0.65	ug/L			10/12/24 15:00	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 500-790329/8

Matrix: Water

Analysis Batch: 790329

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<0.39		1.0	0.39	ug/L			10/12/24 15:00	1
Tetrahydrofuran	<3.9		10	3.9	ug/L			10/12/24 15:00	1
Toluene	<0.21		0.50	0.21	ug/L			10/12/24 15:00	1
trans-1,2-Dichloroethene	<0.44		1.0	0.44	ug/L			10/12/24 15:00	1
trans-1,3-Dichloropropene	<0.63		1.0	0.63	ug/L			10/12/24 15:00	1
1,2,3-Trichlorobenzene	<0.35		1.0	0.35	ug/L			10/12/24 15:00	1
1,2,4-Trichlorobenzene	<0.31		1.0	0.31	ug/L			10/12/24 15:00	1
1,1,1-Trichloroethane	<0.45		1.0	0.45	ug/L			10/12/24 15:00	1
1,1,2-Trichloroethane	<0.73		1.0	0.73	ug/L			10/12/24 15:00	1
Trichloroethene	<0.15		0.50	0.15	ug/L			10/12/24 15:00	1
Trichlorofluoromethane	<0.44		1.0	0.44	ug/L			10/12/24 15:00	1
1,2,3-Trichloropropane	<1.5		2.0	1.5	ug/L			10/12/24 15:00	1
1,2,4-Trimethylbenzene	<0.30		1.0	0.30	ug/L			10/12/24 15:00	1
1,3,5-Trimethylbenzene	<0.29		1.0	0.29	ug/L			10/12/24 15:00	1
Vinyl chloride	<0.47		1.0	0.47	ug/L			10/12/24 15:00	1
Xylenes, Total	<0.30		1.0	0.30	ug/L			10/12/24 15:00	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		72 - 124		10/12/24 15:00	1
Dibromofluoromethane (Surr)	99		75 - 120		10/12/24 15:00	1
1,2-Dichloroethane-d4 (Surr)	108		75 - 126		10/12/24 15:00	1
Toluene-d8 (Surr)	98		75 - 120		10/12/24 15:00	1

Lab Sample ID: LCS 500-790329/4

Matrix: Water

Analysis Batch: 790329

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	50.0	65.5		ug/L		131	40 - 143
Benzene	50.0	49.4		ug/L		99	70 - 120
Bromobenzene	50.0	46.1		ug/L		92	70 - 122
Bromochloromethane	50.0	50.5		ug/L		101	65 - 122
Bromodichloromethane	50.0	47.0		ug/L		94	69 - 120
Bromoform	50.0	48.0		ug/L		96	56 - 132
Bromomethane	50.0	43.5		ug/L		87	40 - 152
2-Butanone (MEK)	50.0	64.1		ug/L		128	46 - 144
Carbon disulfide	50.0	48.9		ug/L		98	66 - 120
Carbon tetrachloride	50.0	59.2		ug/L		118	59 - 133
Chlorobenzene	50.0	47.0		ug/L		94	70 - 120
Chloroethane	50.0	55.4		ug/L		111	48 - 136
Chloroform	50.0	47.8		ug/L		96	70 - 120
Chloromethane	50.0	54.1		ug/L		108	56 - 152
2-Chlorotoluene	50.0	46.8		ug/L		94	70 - 125
4-Chlorotoluene	50.0	47.1		ug/L		94	68 - 124
cis-1,2-Dichloroethene	50.0	48.7		ug/L		97	70 - 125
cis-1,3-Dichloropropene	50.0	47.6		ug/L		95	64 - 127
Chlorodibromomethane	50.0	48.5		ug/L		97	68 - 125
1,2-Dibromo-3-Chloropropane	50.0	54.4		ug/L		109	56 - 123

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 500-790329/4

Matrix: Water

Analysis Batch: 790329

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	50.0	49.2		ug/L		98	70 - 125
Dibromomethane	50.0	51.1		ug/L		102	70 - 120
1,2-Dichlorobenzene	50.0	46.0		ug/L		92	70 - 125
1,3-Dichlorobenzene	50.0	46.2		ug/L		92	70 - 125
1,4-Dichlorobenzene	50.0	47.1		ug/L		94	70 - 120
Dichlorodifluoromethane	50.0	54.3		ug/L		109	40 - 159
1,1-Dichloroethane	50.0	52.6		ug/L		105	70 - 125
1,2-Dichloroethane	50.0	52.4		ug/L		105	68 - 127
1,1-Dichloroethene	50.0	53.1		ug/L		106	67 - 122
1,2-Dichloropropane	50.0	48.1		ug/L		96	67 - 130
1,3-Dichloropropane	50.0	47.3		ug/L		95	62 - 136
2,2-Dichloropropane	50.0	57.2		ug/L		114	58 - 139
1,1-Dichloropropene	50.0	54.1		ug/L		108	70 - 121
Ethylbenzene	50.0	49.7		ug/L		99	70 - 123
Hexachlorobutadiene	50.0	49.6		ug/L		99	51 - 150
Isopropylbenzene	50.0	48.3		ug/L		97	70 - 126
Methylene Chloride	50.0	47.3		ug/L		95	69 - 125
Methyl tert-butyl ether	50.0	51.4		ug/L		103	55 - 123
Naphthalene	50.0	49.4		ug/L		99	53 - 144
n-Butylbenzene	50.0	49.0		ug/L		98	68 - 125
N-Propylbenzene	50.0	48.2		ug/L		96	69 - 127
p-Isopropyltoluene	50.0	49.8		ug/L		100	70 - 125
sec-Butylbenzene	50.0	48.8		ug/L		98	70 - 123
Styrene	50.0	48.5		ug/L		97	70 - 120
tert-Butylbenzene	50.0	48.9		ug/L		98	70 - 121
1,1,1,2-Tetrachloroethane	50.0	49.9		ug/L		100	70 - 125
1,1,2,2-Tetrachloroethane	50.0	46.0		ug/L		92	62 - 140
Tetrachloroethene	50.0	50.8		ug/L		102	70 - 128
Tetrahydrofuran	100	114		ug/L		114	59 - 139
Toluene	50.0	47.7		ug/L		95	70 - 125
trans-1,2-Dichloroethene	50.0	51.4		ug/L		103	70 - 125
trans-1,3-Dichloropropene	50.0	48.0		ug/L		96	62 - 128
1,2,3-Trichlorobenzene	50.0	48.6		ug/L		97	51 - 145
1,2,4-Trichlorobenzene	50.0	48.6		ug/L		97	57 - 137
1,1,1-Trichloroethane	50.0	57.5		ug/L		115	70 - 125
1,1,2-Trichloroethane	50.0	46.3		ug/L		93	71 - 130
Trichloroethene	50.0	52.1		ug/L		104	70 - 125
Trichlorofluoromethane	50.0	54.8		ug/L		110	55 - 128
1,2,3-Trichloropropane	50.0	48.1		ug/L		96	50 - 133
1,2,4-Trimethylbenzene	50.0	47.7		ug/L		95	70 - 123
1,3,5-Trimethylbenzene	50.0	48.4		ug/L		97	70 - 123
Vinyl chloride	50.0	54.7		ug/L		109	64 - 126
Xylenes, Total	100	100		ug/L		100	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		72 - 124
Dibromofluoromethane (Surr)	104		75 - 120
1,2-Dichloroethane-d4 (Surr)	112		75 - 126

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 500-790329/4

Matrix: Water

Analysis Batch: 790329

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	100		75 - 120

Lab Sample ID: LCSD 500-790329/5

Matrix: Water

Analysis Batch: 790329

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone	50.0	60.4		ug/L		121	40 - 143	8	20
Benzene	50.0	50.6		ug/L		101	70 - 120	2	20
Bromobenzene	50.0	48.0		ug/L		96	70 - 122	4	20
Bromochloromethane	50.0	50.7		ug/L		101	65 - 122	1	20
Bromodichloromethane	50.0	49.7		ug/L		99	69 - 120	5	20
Bromoform	50.0	50.1		ug/L		100	56 - 132	4	20
Bromomethane	50.0	53.2		ug/L		106	40 - 152	20	20
2-Butanone (MEK)	50.0	57.7		ug/L		115	46 - 144	11	20
Carbon disulfide	50.0	50.6		ug/L		101	66 - 120	3	20
Carbon tetrachloride	50.0	60.7		ug/L		121	59 - 133	3	20
Chlorobenzene	50.0	50.1		ug/L		100	70 - 120	6	20
Chloroethane	50.0	55.6		ug/L		111	48 - 136	0	20
Chloroform	50.0	50.0		ug/L		100	70 - 120	4	20
Chloromethane	50.0	53.7		ug/L		107	56 - 152	1	20
2-Chlorotoluene	50.0	49.3		ug/L		99	70 - 125	5	20
4-Chlorotoluene	50.0	51.3		ug/L		103	68 - 124	9	20
cis-1,2-Dichloroethene	50.0	48.9		ug/L		98	70 - 125	0	20
cis-1,3-Dichloropropene	50.0	50.1		ug/L		100	64 - 127	5	20
Chlorodibromomethane	50.0	49.8		ug/L		100	68 - 125	3	20
1,2-Dibromo-3-Chloropropane	50.0	54.2		ug/L		108	56 - 123	0	20
1,2-Dibromoethane (EDB)	50.0	50.4		ug/L		101	70 - 125	2	20
Dibromomethane	50.0	50.1		ug/L		100	70 - 120	2	20
1,2-Dichlorobenzene	50.0	49.3		ug/L		99	70 - 125	7	20
1,3-Dichlorobenzene	50.0	50.1		ug/L		100	70 - 125	8	20
1,4-Dichlorobenzene	50.0	49.9		ug/L		100	70 - 120	6	20
Dichlorodifluoromethane	50.0	54.3		ug/L		109	40 - 159	0	20
1,1-Dichloroethane	50.0	54.0		ug/L		108	70 - 125	3	20
1,2-Dichloroethane	50.0	52.7		ug/L		105	68 - 127	1	20
1,1-Dichloroethene	50.0	52.5		ug/L		105	67 - 122	1	20
1,2-Dichloropropane	50.0	48.4		ug/L		97	67 - 130	1	20
1,3-Dichloropropane	50.0	49.7		ug/L		99	62 - 136	5	20
2,2-Dichloropropane	50.0	58.8		ug/L		118	58 - 139	3	20
1,1-Dichloropropene	50.0	54.2		ug/L		108	70 - 121	0	20
Ethylbenzene	50.0	51.7		ug/L		103	70 - 123	4	20
Hexachlorobutadiene	50.0	54.5		ug/L		109	51 - 150	9	20
Isopropylbenzene	50.0	51.3		ug/L		103	70 - 126	6	20
Methylene Chloride	50.0	49.4		ug/L		99	69 - 125	4	20
Methyl tert-butyl ether	50.0	52.4		ug/L		105	55 - 123	2	20
Naphthalene	50.0	50.0		ug/L		100	53 - 144	1	20
n-Butylbenzene	50.0	52.9		ug/L		106	68 - 125	8	20
N-Propylbenzene	50.0	51.6		ug/L		103	69 - 127	7	20

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 500-790329/5

Matrix: Water

Analysis Batch: 790329

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
p-Isopropyltoluene	50.0	53.0		ug/L		106	70 - 125	6	20
sec-Butylbenzene	50.0	52.8		ug/L		106	70 - 123	8	20
Styrene	50.0	49.9		ug/L		100	70 - 120	3	20
tert-Butylbenzene	50.0	52.1		ug/L		104	70 - 121	6	20
1,1,1,2-Tetrachloroethane	50.0	50.4		ug/L		101	70 - 125	1	20
1,1,2,2-Tetrachloroethane	50.0	47.2		ug/L		94	62 - 140	3	20
Tetrachloroethene	50.0	54.0		ug/L		108	70 - 128	6	20
Tetrahydrofuran	100	108		ug/L		108	59 - 139	6	20
Toluene	50.0	50.0		ug/L		100	70 - 125	5	20
trans-1,2-Dichloroethene	50.0	53.3		ug/L		107	70 - 125	4	20
trans-1,3-Dichloropropene	50.0	50.6		ug/L		101	62 - 128	5	20
1,2,3-Trichlorobenzene	50.0	50.8		ug/L		102	51 - 145	4	20
1,2,4-Trichlorobenzene	50.0	51.4		ug/L		103	57 - 137	6	20
1,1,1-Trichloroethane	50.0	58.6		ug/L		117	70 - 125	2	20
1,1,2-Trichloroethane	50.0	46.8		ug/L		94	71 - 130	1	20
Trichloroethene	50.0	52.4		ug/L		105	70 - 125	1	20
Trichlorofluoromethane	50.0	57.0		ug/L		114	55 - 128	4	20
1,2,3-Trichloropropane	50.0	48.1		ug/L		96	50 - 133	0	20
1,2,4-Trimethylbenzene	50.0	51.3		ug/L		103	70 - 123	7	20
1,3,5-Trimethylbenzene	50.0	51.3		ug/L		103	70 - 123	6	20
Vinyl chloride	50.0	55.4		ug/L		111	64 - 126	1	20
Xylenes, Total	100	104		ug/L		104	70 - 125	3	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	99		72 - 124
Dibromofluoromethane (Surr)	102		75 - 120
1,2-Dichloroethane-d4 (Surr)	104		75 - 126
Toluene-d8 (Surr)	100		75 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 500-789741/1-A

Matrix: Water

Analysis Batch: 790160

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 789741

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/09/24 09:18	10/10/24 12:24	1
Barium	<0.73		2.5	0.73	ug/L		10/09/24 09:18	10/10/24 12:24	1
Cadmium	<0.17		0.50	0.17	ug/L		10/09/24 09:18	10/10/24 12:24	1
Chromium	<1.1		5.0	1.1	ug/L		10/09/24 09:18	10/10/24 12:24	1
Copper	<0.50		2.0	0.50	ug/L		10/09/24 09:18	10/10/24 12:24	1
Lead	<0.19		0.50	0.19	ug/L		10/09/24 09:18	10/10/24 12:24	1
Manganese	<0.79		2.5	0.79	ug/L		10/09/24 09:18	10/10/24 12:24	1
Selenium	<0.98		2.5	0.98	ug/L		10/09/24 09:18	10/10/24 12:24	1
Zinc	<6.9		20	6.9	ug/L		10/09/24 09:18	10/10/24 12:24	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 500-789741/1-A
Matrix: Water
Analysis Batch: 790835

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 789741

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	40.6	J	50	13	ug/L		10/09/24 09:18	10/15/24 13:40	1

Lab Sample ID: LCS 500-789741/2-A
Matrix: Water
Analysis Batch: 790160

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 789741

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	96.6		ug/L		97	80 - 120
Barium	500	500		ug/L		100	80 - 120
Cadmium	50.0	49.9		ug/L		100	80 - 120
Chromium	200	204		ug/L		102	80 - 120
Copper	250	256		ug/L		102	80 - 120
Lead	100	101		ug/L		101	80 - 120
Manganese	500	515		ug/L		103	80 - 120
Selenium	100	92.9		ug/L		93	80 - 120
Zinc	500	501		ug/L		100	80 - 120

Lab Sample ID: LCS 500-789741/2-A
Matrix: Water
Analysis Batch: 790835

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 789741

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1000	1030		ug/L		103	80 - 120

Lab Sample ID: MB 500-790979/1-A
Matrix: Water
Analysis Batch: 791285

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 790979

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.12		0.50	0.12	ug/L		10/16/24 16:17	10/17/24 12:03	1

Lab Sample ID: LCS 500-790979/2-A
Matrix: Water
Analysis Batch: 791285

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 790979

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Silver	50.0	51.4		ug/L		103	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-791138/12-A
Matrix: Water
Analysis Batch: 791346

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 791138

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.076		0.20	0.076	ug/L		10/17/24 11:40	10/18/24 08:18	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 500-791138/13-A
Matrix: Water
Analysis Batch: 791346

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 791138

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.00	2.07		ug/L		104	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-790314/3
Matrix: Water
Analysis Batch: 790314

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.12		1.0	0.12	mg/L			10/12/24 14:27	1
Sulfate	<0.21		1.0	0.21	mg/L			10/12/24 14:27	1
Fluoride	<0.19		1.0	0.19	mg/L			10/12/24 14:27	1

Lab Sample ID: LCS 500-790314/4
Matrix: Water
Analysis Batch: 790314

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.9		mg/L		100	90 - 110
Sulfate	20.0	20.7		mg/L		104	90 - 110
Fluoride	20.0	21.3		mg/L		106	90 - 110

Lab Sample ID: MB 500-790715/3
Matrix: Water
Analysis Batch: 790715

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.221	J	1.0	0.12	mg/L			10/15/24 12:40	1
Sulfate	<0.21		1.0	0.21	mg/L			10/15/24 12:40	1
Fluoride	<0.19		1.0	0.19	mg/L			10/15/24 12:40	1

Lab Sample ID: LCS 500-790715/4
Matrix: Water
Analysis Batch: 790715

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.0		mg/L		100	90 - 110
Sulfate	20.0	20.8		mg/L		104	90 - 110
Fluoride	20.0	19.9		mg/L		99	90 - 110

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 480-727979/51
Matrix: Water
Analysis Batch: 727979

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.020		0.050	0.020	mg/L			10/11/24 11:29	1

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QC Sample Results

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: LCS 480-727979/52

Matrix: Water

Analysis Batch: 727979

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	1.50	1.36		mg/L		90	90 - 110

Lab Sample ID: 500-257918-2 MS

Matrix: Water

Analysis Batch: 727979

Client Sample ID: MW-18

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	0.76	F1	0.998	0.852	F1	mg/L		10	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-790858/28

Matrix: Water

Analysis Batch: 790858

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			10/15/24 16:04	1

Lab Sample ID: MB 500-790858/53

Matrix: Water

Analysis Batch: 790858

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			10/15/24 20:26	1

Lab Sample ID: LCS 500-790858/4

Matrix: Water

Analysis Batch: 790858

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	106		mg/L		106	95 - 121

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-16Z

Date Collected: 10/02/24 09:20

Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	790329	PMF	EET CHI	10/12/24 17:41
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790160	RN	EET CHI	10/10/24 13:10
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790835	RN	EET CHI	10/15/24 14:04
Dissolved	Prep	3005A			790979	S1Z	EET CHI	10/16/24 16:17 - 10/16/24 22:17 ¹
Dissolved	Analysis	6020B		1	791285	RN	EET CHI	10/17/24 12:08
Dissolved	Prep	7470A			791138	MJG	EET CHI	10/17/24 11:40 - 10/17/24 13:40 ¹
Dissolved	Analysis	7470A		1	791346	MJG	EET CHI	10/18/24 09:09
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	SM 2340B		1	790198	TJW	EET CHI	10/11/24 09:49
Dissolved	Analysis	300.0		1	790314	W1T	EET CHI	10/12/24 23:03
Dissolved	Analysis	353.2		1	727979	AM	EET BUF	10/11/24 11:44
Dissolved	Analysis	SM 2320B		1	790858	SO	EET CHI	10/15/24 14:18
Total/NA	Analysis	Field Sampling		1	791077	DN	EET CHI	10/02/24 09:20

Client Sample ID: MW-18

Date Collected: 10/02/24 10:00

Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	790329	PMF	EET CHI	10/12/24 17:18
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790160	RN	EET CHI	10/10/24 13:17
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790835	RN	EET CHI	10/15/24 14:12
Dissolved	Prep	3005A			790979	S1Z	EET CHI	10/16/24 16:17 - 10/16/24 22:17 ¹
Dissolved	Analysis	6020B		1	791285	RN	EET CHI	10/17/24 12:10
Dissolved	Prep	7470A			791138	MJG	EET CHI	10/17/24 11:40 - 10/17/24 13:40 ¹
Dissolved	Analysis	7470A		1	791346	MJG	EET CHI	10/18/24 09:11
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	SM 2340B		1	790198	TJW	EET CHI	10/11/24 09:49
Dissolved	Analysis	300.0		1	790715	MM	EET CHI	10/15/24 16:13
Dissolved	Analysis	353.2		1	727979	AM	EET BUF	10/11/24 11:49
Dissolved	Analysis	SM 2320B		1	790858	SO	EET CHI	10/15/24 14:32
Total/NA	Analysis	Field Sampling		1	791077	DN	EET CHI	10/02/24 10:00

Client Sample ID: MW-18WT

Date Collected: 10/02/24 10:30

Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	790329	PMF	EET CHI	10/12/24 16:55

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Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-18WT

Lab Sample ID: 500-257918-3

Date Collected: 10/02/24 10:30

Matrix: Water

Date Received: 10/04/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790160	RN	EET CHI	10/10/24 13:19
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790835	RN	EET CHI	10/15/24 14:14
Dissolved	Prep	3005A			790979	S1Z	EET CHI	10/16/24 16:17 - 10/16/24 22:17 ¹
Dissolved	Analysis	6020B		1	791285	RN	EET CHI	10/17/24 12:17
Dissolved	Prep	7470A			791138	MJG	EET CHI	10/17/24 11:40 - 10/17/24 13:40 ¹
Dissolved	Analysis	7470A		1	791346	MJG	EET CHI	10/18/24 09:13
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	SM 2340B		1	790198	TJW	EET CHI	10/11/24 09:49
Dissolved	Analysis	300.0		1	790715	MM	EET CHI	10/15/24 16:28
Dissolved	Analysis	353.2		1	727979	AM	EET BUF	10/11/24 11:52
Dissolved	Analysis	SM 2320B		1	790858	SO	EET CHI	10/15/24 14:43
Total/NA	Analysis	Field Sampling		1	791077	DN	EET CHI	10/02/24 10:30

Client Sample ID: MW-19Z

Lab Sample ID: 500-257918-4

Date Collected: 10/02/24 08:30

Matrix: Water

Date Received: 10/04/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	790329	PMF	EET CHI	10/12/24 16:32
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790160	RN	EET CHI	10/10/24 13:21
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790835	RN	EET CHI	10/15/24 14:17
Dissolved	Prep	3005A			790979	S1Z	EET CHI	10/16/24 16:17 - 10/16/24 22:17 ¹
Dissolved	Analysis	6020B		1	791285	RN	EET CHI	10/17/24 12:19
Dissolved	Prep	7470A			791138	MJG	EET CHI	10/17/24 11:40 - 10/17/24 13:40 ¹
Dissolved	Analysis	7470A		1	791346	MJG	EET CHI	10/18/24 09:15
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	SM 2340B		1	790198	TJW	EET CHI	10/11/24 09:49
Dissolved	Analysis	300.0		1	790715	MM	EET CHI	10/15/24 16:43
Dissolved	Analysis	353.2		1	727979	AM	EET BUF	10/11/24 11:54
Dissolved	Analysis	SM 2320B		1	790858	SO	EET CHI	10/15/24 14:56
Total/NA	Analysis	Field Sampling		1	791077	DN	EET CHI	10/02/24 08:30

Client Sample ID: MW-19

Lab Sample ID: 500-257918-5

Date Collected: 10/02/24 08:55

Matrix: Water

Date Received: 10/04/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	790329	PMF	EET CHI	10/12/24 16:09
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790160	RN	EET CHI	10/10/24 13:24

Eurofins Chicago

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Client Sample ID: MW-19

Date Collected: 10/02/24 08:55

Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	6020B		1	790835	RN	EET CHI	10/15/24 14:20
Dissolved	Prep	3005A			790979	S1Z	EET CHI	10/16/24 16:17 - 10/16/24 22:17 ¹
Dissolved	Analysis	6020B		1	791285	RN	EET CHI	10/17/24 12:21
Dissolved	Prep	7470A			791138	MJG	EET CHI	10/17/24 11:40 - 10/17/24 13:40 ¹
Dissolved	Analysis	7470A		1	791346	MJG	EET CHI	10/18/24 09:17
Dissolved	Prep	3005A			789741	BDE	EET CHI	10/09/24 09:18 - 10/09/24 15:18 ¹
Dissolved	Analysis	SM 2340B		1	790198	TJW	EET CHI	10/11/24 09:49
Dissolved	Analysis	300.0		1	790715	MM	EET CHI	10/15/24 16:58
Dissolved	Analysis	353.2		1	727979	AM	EET BUF	10/11/24 11:56
Dissolved	Analysis	SM 2320B		1	790858	SO	EET CHI	10/15/24 15:05
Total/NA	Analysis	Field Sampling		1	791077	DN	EET CHI	10/02/24 08:55

Client Sample ID: Trip Blank-VOC

Date Collected: 10/02/24 00:00

Date Received: 10/04/24 09:00

Lab Sample ID: 500-257918-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	790329	PMF	EET CHI	10/12/24 15:46

¹ This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET BUF = Eurofins Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Vernon County LF

Job ID: 500-257918-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-25

Laboratory: Eurofins Buffalo

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	998310390	08-31-25

- 1
- 2
- 3
- 4
- 5
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- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Chain of Custody Record



fins

[illegible]

Client Information		Company		Address		City		State		Zip		Phone		Email		Project Name		Site							
Mr Brian Kent		Short Elliott Hendrickson Inc. dba SEH		10 North Bridge Street		Chippewa Falls		WI		54729-3374		500 257918 COC		bkent@sehinc.com		Vernon Co LF									
Lab PM Fredrick, Sandie		PWSID		Due Date Requested		TAT Requested (days)		Compliance Project		Purchase Order not required		Project #		SSOW#											
Carrier Tracking No(s) 500-129185-45310 1		Page Page 1 of 1		Job 500-257918		Preservation Codes A HCL D HNO3 N None S H2SO4		Total Number of Containers		Special Instructions/Note															
Sampler Vance Ande		Phone 715-933-2351		E-Mail Sandra.Fredrick@el.eurofinsus.com		Analysis Requested		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		8250B - VOC EPA SW946		6020A, 7470A, SM2340B (D.I.S.S.F.F)		2320B - Aik - Diss		300 - Chloride/Sulfate/Fluoride - Diss		353.2 - N+N S					
Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=Water, S=Soil, O=Other)		Preservation Code		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		8250B - VOC EPA SW946		6020A, 7470A, SM2340B (D.I.S.S.F.F)		2320B - Aik - Diss		300 - Chloride/Sulfate/Fluoride - Diss		353.2 - N+N S			
MW-102		10/2/24		9:20		Water		9		X		X		X		X		X		X		X		As, Ba, Cd, Cr, Pb, Se, Ag, B, Cu, Mn, Zn + Hg	
MW-18		10:00		Water						X		X		X		X		X		X		X		Chloride, Fluoride, Sulfate	
MW-18WT		10:30		Water						X		X		X		X		X		X		X			
MW-192		8:36		Water						X		X		X		X		X		X		X			
MW-19		8:55		Water						X		X		X		X		X		X		X			
TRP blank-VOC						Water				X		X		X		X		X		X		X			

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Deliverable Requested I, II, III, IV, Other (specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements

Empty Kit Relinquished by

Relinquished by _____ Date/Time 10/3/24

Relinquished by _____ Date/Time _____

Relinquished by _____ Date/Time _____

Custody Seal No

Relinquished by _____ Date/Time 10/3/24

Relinquished by _____ Date/Time _____

Relinquished by _____ Date/Time _____

Client Information

Client Contact: Mr Brian Kent

Phone: 715-933-2351

E-Mail: Sandra.Fredrick@el.eurofinsus.com

Company

Short Elliott Hendrickson Inc. dba SEH

Address: 10 North Bridge Street

City: Chippewa Falls

State: WI

Zip: 54729-3374

Phone: 500 257918 COC

Email: bkent@sehinc.com

Project Name: Vernon Co LF

Site:

Lab PM

Fredrick, Sandie

E-Mail:

Sandra.Fredrick@el.eurofinsus.com

Carrier Tracking No(s)

500-129185-45310 1

Page

Page 1 of 1

Job

500-257918

Preservation Codes

A HCL
D HNO3
N None
S H2SO4

Total Number of Containers

Special Instructions/Note

As, Ba, Cd, Cr, Pb, Se, Ag, B, Cu, Mn, Zn + Hg

Chloride, Fluoride, Sulfate



500-257918 Waybi

VENUE: 45 UU LB NNN
SHORT ELLIOTT HENDRICKSON, INC. SEH
10 NORTH BRIDGE STREET
CHIPPEWA FALLS, WI 54729
UNITED STATES US

TO SAMPLE RECEIPT
EUROFINS CHICAGO
2417 BOND ST.

UNIVERSITY PARK IL 60484

(708) 534-5200
REF: PD: DEPT:

RNA



FedEx
Express

135-00000 EXP 12/24

FRI - 04 OCT 11
PRIORITY OVER

FedEx
TRK# 4145 7025 7079
0221

NX JOTA



9316109 10/03 58C12/B254/C6C4

A
7079 10:04
5 10:30
RT 519
ST 23



Client Information (Sub Contract Lab)				Lab PM	Carrier Tracking No(s)	COC No.		
Client Contact				Frederick, Sandie		500-193622.1		
Shipping/Receiving				E-Mail	State of Origin	Page		
Company				Sandra.Fredrick@et.eurofins.com	Wisconsin	1 of 1		
Address					Job #			
City					500-257918-1			
State, Zip					Preservation Codes:			
Phone								
Email								
Project Name								
Vernon County LF								
Site								
Due Date Requested:				Analysis Requested				
10/17/2024								
TAT Requested (days):								
PO #								
WO #								
Project #								
50008595								
SSOW#								
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=oil, BT=tissue, A=air)	Field Filtered Sample (Yes or No)	353.2_Pres/FIELD_FLTRD N+N	Total Number of containers	Special Instructions/Note:
MW-16Z (500-257918-1)	10/2/24	09:20	Central	G	Water	X	1	
MW-18 (500-257918-2)	10/2/24	10:00	Central	G	Water	X	1	
MW-18WT (500-257918-3)	10/2/24	10:30	Central	G	Water	X	1	
MW-19Z (500-257918-4)	10/2/24	08:30	Central	G	Water	X	1	
MW-19 (500-257918-5)	10/2/24	08:55	Central	G	Water	X	1	
Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.								
Possible Hazard Identification Unclassified Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2								
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ☐ Months				Special Instructions/QC Requirements:				
Empty Kit Relinquished by: Relinquished by: <i>the boots</i> Date: 10/9/24 1530				Method of Shipment: Received by: <i>Y2</i> Date/Time: 10-10-24 1100 Company:				
Relinquished by: Date/Time:				Company:				
Relinquished by: Date/Time:				Company:				
Relinquished by: Date/Time:				Company:				
Custody Seals Intact: ☐ Yes ☐ No				Custody Seal No.:				

Login Sample Receipt Checklist

Client: Short Elliott Hendrickson, Inc. dba SEH

Job Number: 500-257918-1

Login Number: 257918

List Number: 1

Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Short Elliott Hendrickson, Inc. dba SEH

Job Number: 500-257918-1

Login Number: 257918

List Number: 2

Creator: Stapleton, Kaitlyn

List Source: Eurofins Buffalo

List Creation: 10/10/24 11:44 AM

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.0 IR#SC ice
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	



Outlook

Re: 500-257918 SEH Landfills Sample Confirmation files from Eurofins North Central

From Veronica Aranda <varanda@sehinc.com>
Date Thu 10/17/2024 10:25 AM
To Sandra Fredrick <Sandra.Fredrick@et.eurofinsus.com>
Cc Dirk Nelson <Dirk.Nelson@et.eurofinsus.com>

Unverified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Ah- forgot to add those!
MW-19-6.09
MW-19Z-6.49
MW-18WT-7.29
MW-18:7.63
MW-16Z: 7.49

From: Sandra Fredrick <Sandra.Fredrick@et.eurofinsus.com>
Sent: Thursday, October 17, 2024 9:22:10 AM
To: Veronica Aranda <varanda@sehinc.com>
Cc: Dirk Nelson <Dirk.Nelson@et.eurofinsus.com>
Subject: RE: 500-257918 SEH Landfills Sample Confirmation files from Eurofins North Central

One more quick question V – do you have pH values to add? Can you send them over to Dirk and I?
Thanks
S

We are thankful for your business and hope that you have a wonderful day!

Sandie Fredrick
Project Manager

Sandra Fredrick

From: Veronica Aranda <varanda@sehinc.com>
Sent: Wednesday, October 16, 2024 3:19 PM
To: Sandra Fredrick; Brian Kent
Subject: RE: 500-257918 SEH Landfills Sample Confirmation files from Eurofins North Central

Unverified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Hi Sandie,

Field parameters for this batch

	Date: 10.02.2024	Temp	Conductivity	Color	Turbidity	Odor	Notes
MW-18WT	79.83	9.7	540	slight	slight	none	silt
MW-18	107.8	9.5	534	slight	slight	none	silt
MW-16Z	92.56	10.3	606	none	none	none	no silt
MW-19	99.86	10.4	137	slight	slight	none	silt
MW-19Z	98.57	9.1	176	slight	slight	none	silt

Thanks!

Veronica Aranda, GIT (WI)
Scientist II
Short Elliott Hendrickson Inc.
715.933.2351 mobile
Building a Better World for All of Us®
100% Employee Owned
Follow SEH on LinkedIn | Instagram

From: Veronica Aranda <varanda@sehinc.com>
Sent: Friday, October 11, 2024 8:44 AM

Appendix K

Groundwater Monitoring Well and Point Information Form

GROUNDWATER MONITORING WELL AND POINT INFORMATION

Form 4400-089 (R 04/19)

Page 1 of 7

Use the Groundwater Monitoring Well and Point Information Form to record identification, location and construction information for groundwater monitoring wells and any other sample "points," (e.g., gas probes, lysimeters, leachate collection systems, etc.), that are part of the environmental monitoring program. **NOTE:** Not all fields will be applicable to all point types. Only **one** coordinate reference system may be used per site. Allowable coordinate systems are listed below. (Coordinates for each system require a minimum number of digits as described below.) Local grid coordinates cannot be accepted. Identify the Coordinate Reference System, Datum and Method used.

Facility Name Vernon County MSW Landfill			County Vernon				Facility ID No. (FID) 663038310		License, Permit or Monitoring No. 3268			Date 04/11/2023		Completed By (Name and Firm) Brian Kent, SEH		
DNR Point ID No.	Point Name ¹	WUWN ² (if app.)	Type	Status	Gradient	Enf. Stds. Y/N.	Construction Date	Elevations msl (ft)		Well Casing			Well Screen Length (ft)	Well (Pt) Total Length ⁵ (ft)	Coordinates ^{6,7,8,9}	
								Ground Surface	Well Top (of casing)	Type	Diam ³ (in)	Length ⁴ (ft)			Y / Lat / Northing	X / Long / Easting
102	MW-1P		11	A			12/30/1987	1236.4	1238.41	P	2	101.1	10	111.1	582809.9	1745957.3
101	MW-1		12	A			12/30/1987	1236.4	1238.11	P	2	148.0	10	158.0	582815.9	1745957.3
121	MW-1PR		11	A			01/12/1994	1245.0	1247.61	P	2	112.7	15	127.7	582942.0	1745694.8
120	MW-1R		12	A			01/12/1994	1244.6	1247.25	P	2	149.6	15	164.6	582940.8	1745703.8
123	MW-1RZ		12	A			03/12/2003	1244.0	1245.45	P	2	181.5	5	186.5	582921.9	1745693.6
104	MW-2P		11	A			01/17/1988	1252.5	1254.88	P	2	114.8	10	124.8	583625.4	1745476.5
103	MW-2		12	A			01/17/1988	1252.5	1254.35	P	2	164.6	10	174.6	583625.4	1745492.0
105	MW-3		12	A			02/02/1988	1233.0	1235.25	P	2	175.0	5	180.0	584086.5	1746427.4
107	MW-4P		11	A			01/29/1988	1232.9	1235.19	P	2	85.0	10	95.0	584086.2	1746438.4
109	MW-5A		11	A			11/08/1989	1224.0	1225.18	P	2	88.3	15	103.3	583467.8	1746571.9
108	MW-5		12	A			02/17/1988	1223.3	1225.32	P	2	140.6	10	150.6	583467.9	1746588.2
110	MW-6		12	A			02/20/1988	1233.0	1235.37	P	2	197.2	5	202.2	584086.7	1746417.4
111	MW-7		12	A			11/07/1989	1255.7	1258.03	P	2	229.5	5	234.5	583843.8	1745887.7
112	MW-8R		12	A			11/13/1989	1256.1	1258.84	P	2	187.5	15	202.5	583836.9	1745874.1
113	MW-9		11	A			08/29/1989	1255.4	1257.50	P	2	111.8	15	126.8	583858.6	1745892.2
114	MW-10		12	A			09/15/1989	1215.6	1217.52	P	2	178.5	5	183.5	582822.1	1746433.1
115	MW-11		12	A			09/22/1989	1216.4	1218.36	P	2	147.5	15	162.5	582806.2	1746431.9
116	MW-12		11	A			09/22/1989	1216.4	1218.36	P	2	83.5	15	98.5	582806.6	1746413.0
117	MW-13P		11	A			02/26/2003	1224.5	1227.42	P	2	87.4	15	102.4	582910.4	1746035.5
118	MW-14	JX072	12	A			03/12/2003	1247.5	1249.69	P	2	171.1	15	186.1	583881.3	1746475.7
119	MW-14Z	JX073	12	A			03/07/2003	1247.5	1250.22	P	2	205.8	5	210.8	583866.9	1746488.0
125	MW-14WT	WC334	11	A			09/20/2022	1247.2	1249.70	P	2	90.0	15	105.0	583964.7	1746693.0
127	MW-15WT	WC335	11	A			09/28/2022	1220.6	1223.24	P	2	72.8	10	82.8	583598.0	1746728.6

Completion of this form is mandatory under chs. 281, 289 and 292, Wis. Stats., and ss. NR 110.25, NR 507.14 and NR 716.15, Wis. Admin. Code

GROUNDWATER MONITORING WELL AND POINT INFORMATION

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DNR Point ID No.	Point Name ¹	WUWN ² (if app.)	Type	Status	Gradient	Enf. Stds. Y/N.	Construction Date	Elevations msl (ft)		Well Casing			Well Screen Length (ft)	Well (Pt) Total Length ⁵ (ft)	Coordinates ^{6,7,8,9}	
								Ground Surface	Well Top (of casing)	Type	Diam ³ (in)	Length ⁴ (ft)			Y / Lat / Northing	X / Long / Easting
129	MW-16WT	WC336	11	A			09/21/2022	1184.7	1187.41	P	2	64.9	10	74.9	583157.3	1746673.3
131	MW-16	WC337	12	A			08/25/2022	1184.3	1186.92	P	2	91.9	5	96.9	583147.8	1746669.6
133	MW-17WT	WC338	11	A			09/26/2022	1196.4	1199.18	P	2	76.9	10	86.9	582907.9	1746684.9
201	P-1 (Facility)	FU046	13	A			12/10/1992			S	6					
202	P-2 (Williams)	8IW730	13	A			07/10/1969			S	6					
502	Sedimentation Basin		22	A												
300	Leachate Storage Tank		23	A											583001.6	1745623.2
340	Lys-1		14	A											582940.4	1745918.7
341	Lys-2		14	A											582916.5	1746103.3
342	Lys-3		14	A											582892.9	1746261.9
310	LHW-1		24	A											583130.8	1745934.8
314	LHW-2		24	A											583452.2	1745941.7
318	LHW-3		24	A											583120.3	1746129.7
322	LHW-4		24	A											583793.7	1746077.0
326	LHW-5		24	A											583124.4	1746365.6
330	LHW-6		24	A											583461.2	1746372.4
460	GP-1		51	A											583357.5	1745680.9
462	GP-2		51	A											583821.2	1745951.2
464	GP-3		51	A											582918.3	1746000.6
135	MW-16Z	WF528	12	A			08/06/2024	1184.5	1186.50	P	2	117.0	5	122.0	583168.4	1746679.1
137	MW-18WT	WF527	11	A			08/02/2024	1210.1	1212.24	P	2	79.2	10	89.2	583413.3	1746690.8
139	MW-18	WF526	11	A			08/01/2024	1209.8	1212.00	P	2	109.2	10	119.2	583407.8	1746695.9
141	MW-19	WF530	11	A			08/13/2024	1190.5	1192.82	P	2	95.3	10	105.3	582931.4	1746831.1
143	MW-19Z	WF529	12	A			08/09/2024	1190.2	1192.34	P	2	127.1	5	132.1	582939.8	1746831.5

GROUNDWATER MONITORING WELL AND POINT INFORMATION

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¹Include previous name as well if one exists. ²Wisconsin Unique Well Number. ³Well Casing Diameter measures inside diameter. ⁴Length of well casing from top of casing to top of screen. ⁵Total length of well from top of casing to bottom of well. <i>Should equal sum of well casing length and screen length.</i>	⁶Identify Coordinate Reference System (only one system may be used per site): ☐ Lat/Long (Decimal Degrees) WGS84 (min. 8 digits total w/ 6 right of decimal, e.g., -89.123456) State Plane (min. 2 digits right of decimal) ☐ North ☐ Central ☒ South ☐ Wisc. Transverse Mercator WTM91 (min. 2 digits right of decimal) ☐ Local County Coord. Sys. (WISCRS) (min. digits vary by county)	⁷Identify Projection Datum and units* ☐ NAD83 ☐ NAD27 ☐ NAD83(91) ☒ NAD83(11) ☐ Other Describe: _____ Units used for State Plane, WTM or County Coord. Sys: ☐ meters ☒ feet *NOTE: A datum and units are not required for Lat/Long	⁸Identify the Method Used to Determine the Coordinates: ☒ GPS001-Survey grade ☐ GPS003-Mapping grade/real-time differential correction ☐ GPS004-Mapping grade/post processing ☐ SRV001-Classical terrestrial surveying techniques ☐ OTH001 (Other), Describe: _____ Remarks:	⁹Y / Lat / Northing describe the vertical axis. X / Long / Easting describe the horizontal axis. (include “-“ where needed, e.g., -89.123456)

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

When completed, this form provides a record of information for each well or sampling point that is part of a facility's environmental monitoring program. It provides the facility or consultant with a means of presenting point information required by the Department in a consistent format. This form should be updated as new points are added to the monitoring program or new information becomes available (e.g., re-surveyed elevation for existing points).

Complete the form with the necessary information as described below:

Facility Name: Enter the name of the site or landfill.

County: Enter the county the site or landfill is located.

Facility ID Number (FID): Enter the 9-digit Facility ID (FID) assigned to the site.

License/Permit/Monitoring Number: Enter the number assigned by the Department to the facility. If unknown, leave blank.

Date: Enter the date on which the form is completed (mm/dd/yyyy).

Completed By: Enter the name and firm of person completing the form.

DNR Point ID Number: Enter the 3-digit number assigned to the point by the Department, for use by the Department.

Point Name: Enter the common name given to the point by the facility or consultant; e.g. MW-2, GP-5. If the point had a previous name, please include and identify as such.

Wisconsin Unique Well Number (WUWN): Enter the Wisconsin Unique Well Number assigned to groundwater monitoring and private wells. WUWNs are available from the Department and are to be assigned to all newly installed monitoring and private wells.

Type: Enter the Numerical code describing the type of well or sampling point. Point type codes range from 11 to 99. *See list of Point Types beginning on page 4.*

Status: Enter the status of the well using the following codes:

A	–	<u>A</u> ctively monitored point
I	–	<u>I</u> nactive point (existing point not currently being monitored)
P	–	<u>P</u> ermanently abandoned point
L	-	<u>P</u> Lanned.

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

Gradient Position: Enter the location of the well in the groundwater flow system relative to the disposal site, spill, etc. *Use one of the six letters designated below. If gradient position is not known or does not apply to the type of point, leave blank.*

U = Up gradient

D = Down gradient

Y = Side-to-down gradient

S = Side gradient

X = Side-to-up gradient

N = Not known

Enf. Stds. Apply: Enter "Y" if enforcement standards apply at this well. Enforcement standards apply to any well beyond the **Design Management Zone (DMZ)** or the property boundary of the facility or to a water supply well. For spills, enforcement standards apply at every point at which groundwater is monitored. (For more information, see s. NR 140.22, Wis. Adm. Code.) *If the application of enforcement standards is not relevant to the type of point entered, leave blank.*

Construction Date: Enter the installation date of the point.

Elevations:

Ground Surface: The elevation, in feet, of the ground surface adjacent to the well using mean sea level (MSL) based on national geodetic vertical survey (i.e., NAVD88).

Well Top (of casing): The elevation, of the top of the well casing (not top of protective pipe), in feet using MSL based on national geodetic vertical survey (i.e., NAVD88).

Well Casing:

Type: The type of pipe used: plastic (P), steel (S), or other (O).

Diam: The inside diameter of the pipe used in the well construction, in inches.

Length: The length of the well casing from the top of the casing to the top of the screen, measured in feet.

Well Screen Length: The length of the screen measured in feet.

Well (Point) Total Length: The total length of the well (or point) from the top of the casing to the bottom of the well, measured in feet. *Should equal sum of well casing length and screen length.*

Point Coordinate Reference Systems: Only one coordinate reference system may be used on the form. Allowable coordinate systems are Lat/Long (in decimal degrees [DD] only), State Plane and Wisconsin Transverse Mercator (WTM91). County coordinate systems (WISCRS) may also be used. Local grid coordinates are *not* accepted. The field named "Y / Lat / Northing" describe the vertical axis and the field "X / Long / Easting" describe the horizontal axis.

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

Identify the coordinate reference system used:

- Latitude/Longitude WGS84 (Decimal Degrees, minimum 8 digits total w/ 6 right of decimal)
- State Plane (min. 2 digits right of decimal):
 - North
 - Central
 - South
- Wisc. Transverse Mercator (WTM91, min. 2 digits right of decimal)
- Local County Coordinate System (aka Wisconsin Coordinate Reference System (WISCRS), minimum digits vary by county)

Identify the projection datum used (listed below) by checking the appropriate box on the bottom of the form.

NOTE: A datum is not required for Lat/Long.

- NAD83
- NAD27
- NAD83(91)
- NAD83(11)
- Other

Identify the units used, meters or feet, for State Plane, WTM or Local County Coordinate System.

Identify the method used to determine the coordinates by checking the appropriate box on the bottom of the form.
The options are:

- GPS001-Survey grade GPS
- GPS003-Mapping grade GPS with real-time differential correction
- GPS004-Mapping grade GPS with post processing differential correction
- SRV001-Classical terrestrial surveying techniques
- OTH001 (Other)

Remarks: Include any comments applicable to the submittal (e.g., Re-surveyed top of well casing elevation).

List of Point Types

- 11 (mw) Water table observation well (monitoring well screen intersecting the water table) (non-Subtitle D well)
- 12 (pz) Piezometer (monitoring well with screen sealed below the water table (non-Subtitle D well)
- 13 (pw) Private well - potable water supply
- 14 (ly) Lysimeter
- 15 (sp) Spring
- 16 (rp) Resistivity probe
- 17 (gc) Gradient control
- 18 (at) Aquifer test well
- 19 (pn) Private well-non potable
- 21 (fs) Flow or seep
- 22 (sw) Surface water
- 23 (lc) Leachate collection system
- 24 (lh) Leachate head well
- 25 (lg) Leachate and gas combo
- 26 (ew) Groundwater extraction well
- 27 (he) Horizontal groundwater extraction well

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

- 28 (hw) Horizontal monitoring well
- 29 (ha) Horizontal vapor extraction well
- 31 (us) Upstream
- 32 (ms) Mid-site
- 33 (ds) Downstream
- 34 (ro) Run-off
- 35 (im) Impounded
- 36 (sg) Staff gauge
- 41 (tr) Treated
- 42 (pr) Pretreated
- 45 (pp) Private well primary treatment
- 46 (ps) Private well secondary treatment
- 49 (sh) Settlement hub
- 51 (gp) Gas probe
- 52 (nl) Non-landfill structure
- 53 (ge) Gas extraction system
- 54 (gu) Gas utilization or destruction
- 55 (gc) Gas condensate
- 56 (sc) Site conditions collection
- 57 (sv) Soil venting well (includes both soil vapor extraction and bioventing, includes both extraction and unsaturated zone gas phase injection wells installed in soil or fill, but not refuse)
- 58 (gm) Gas sample monitoring point
- 59 (sc) Stone column gas extraction well
- 61 (ij) Injection well (injection of liquids not gases)
- 62 (as) In situ air sparging well (injection well to inject gases into the aquifer)
- 63 (uv) Unterdruck Verdampfer Brunnen (UVB) wells (sparging wells where the gases remain in the well and are not injected into the aquifer)
- 64 (le) Groundwater and light non-aqueous phase liquid (LNAPL) extraction well
- 65 (de) Groundwater and dense non-aqueous phase liquid (DNAPL) extraction well
- 66 (ve) Vacuum enhanced groundwater extraction wells
- 67 (vi) Vacuum enhanced groundwater and LNAPL extraction well
- 68 (vd) Vacuum enhanced groundwater and DNAPL extraction well
- 71 (dw) Subtitle D water table observation well (see 11/mw)
- 72 (dp) Subtitle D piezometer (see 12/pz)
- 80 (mc) Municipal water supply well: cities, villages, and sanitary districts
- 81 (oc) Community-other-than-municipal (OTM) water supply well: mobile home parks, apartments, subdivisions, and condominium complexes
- 85 (nn) Noncommunity-Nontransient water supply well (schools, day care centers, and industries) A Noncommunity water system that regularly serves at least 25 of the same persons over 6 months per year
- 86 (tn) Noncommunity-Transient water supply well (motels, restaurants, parks, taverns, churches, and campgrounds) A Noncommunity water system that serves at least 25 people at least 60 days of the year
- 99 (ot) Other