

Appendix I

Alternate Geotechnical Investigation Report

I-1 – Alternate Geotechnical Program Request

I-2 – Response to AGIP Acceptance Letter

I-1 – Alternate Geotechnical Program Request

Alternate Geotechnical Program Request

Proposed Landfill Expansion

WDNR License No. 3268

VERSW 157634

Vernon County Landfill | December 13, 2021



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December 13, 2021

RE: Proposed Landfill Expansion
Alternate Geotechnical Program Request
Vernon County Landfill
WDNR License No. 3268
SEH No. VERSW 157634 4.00

Ms. Carolyn Cooper, Hydrogeologist
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711-5367

Dear Ms. Cooper:

The Vernon County Landfill (WDNR License No. 3268) proposes to expand the existing landfill for disposal of municipal solid waste. On behalf of Vernon County, Short Elliott Hendrickson Inc. (SEH®) is requesting approval of the Alternative Geotechnical Program Request (Request) as specified under NR 512.085 Wisconsin Administrative Code (Wis. Adm. Code).

As part of this Request, we have compiled information on existing data sources to be used in conjunction with proposed new data to meet the requirement of the NR 512 Wis. Adm. Code feasibility report for the expansion of the Vernon County Landfill (Landfill Expansion). Approving the use of these data will make the feasibility report process more economical for the County, as well as expediting the process while providing the geotechnical information necessary to meet the requirements of NR 512.09 Wis. Adm. Code. The project schedule includes completion of the feasibility report field work during Spring 2022. We would appreciate receiving your approval at your earliest convenience, so that we can continue to make progress with the landfill permitting process. Should you have any questions or wish to discuss the program proposed, please contact the undersigned.

Sincerely,

Brian L. Kent, CHMM
Project Manager

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Alternate Geotechnical Program Request

Proposed Landfill Expansion Vernon County Landfill

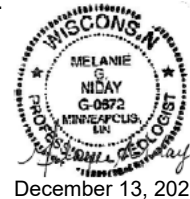
Prepared for:
Vernon County Landfill
Viroqua, Wisconsin

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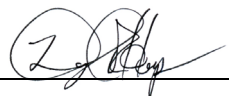
I, Melanie G. Niday, PG, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that to the best of my knowledge, all of the information contained in this document is correct and the document was pre-pared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.



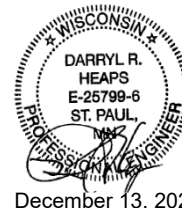
Melanie G. Niday, PG 672-013 12/13/2021
Project Hydrogeologist PG Number Date



I, Darryl R. Heaps, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered 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 700 to 726, Wis. Adm. Code.



Darryl R. Heaps, PE, CHMM E-25799 12/13/2021
Project Engineer PE Number Date



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Alternate Geotechnical Program Request

Proposed Landfill Expansion

Prepared for Vernon County Landfill

1 Introduction

The Vernon County Solid Waste Department (County) owns and manages the Vernon County Landfill operating under Wisconsin Department of Natural Resources (WDNR) License No. 3268. The County is proposing to expand the existing landfill (Landfill Expansion) for disposal of municipal solid waste (MSW), commercial waste, and industrial waste. On behalf of the County, Short Elliott Hendrickson Inc. (SEH®) is issuing this Alternate Geotechnical Program Request (Request) for your review and approval as specified under NR 512.085 Wisconsin Administrative Code (Wis. Admin. Code). This alternative geotechnical program requests approval to use existing borings, field and laboratory data, and monitoring wells to meet a portion of the site-specific geotechnical information requirements and to provide exemptions, when appropriate, where additional information is needed. A supplemental geotechnical program is proposed to complete additional borings, obtain field and laboratory data, and install additional monitoring wells.

Section 1 presents the project description and associated geotechnical requirements. **Section 2** evaluates existing data against regulatory geotechnical requirements and discusses discrepancies. **Section 3** presents the proposed alternatives and requests for variance approvals in relationship to geologic site characteristics, proposed soil borings, proposed well and piezometer installations, laboratory and field-testing programs, and baseline water quality assessment.

1.1 Site Description

The Vernon County Solid Waste Department owns and operates an integrated waste management system on approximately 250-acres located in the Town of Viroqua, Wisconsin. The integrated waste management system includes:

- An approximate 10-acre municipal solid waste landfill, with an approximate design capacity of 590,000 cubic yards (WDNR License No. 3268)
- A closed small sized (50,000 cubic yard) C&D Landfill (WDNR License No. 3712)
- A recyclable material processing and baling facility

A general site map that outlines the waste management system described above is illustrated on **Figure 1**. The Vernon County Landfill was originally designed and permitted in early 1992 with three horizontal phases consisting of a design capacity of 315,000 cubic yards. A vertical expansion was approved in 2005, which included three additional vertical sequences and added 275,000 cubic yards of air space.

1.2 Landfill Expansion Description

The proposed Landfill Expansion includes a contiguous horizontal and vertical expansion of approximately 9-acres over and east of the existing municipal solid waste landfill (WDNR License No. 3268). The contiguous design promotes a minimized landfill footprint. The horizontal component consists of an approximate 4.0-acre horizontal expansion due east and contiguous to Phase III. The vertical component will extend the existing landfill vertically over an approximate 5.0-acre area of the existing footprint. The Landfill Expansion will overlay its waste onto existing Phase III. The existing conditions in the proposed expansion area are illustrated on **Figure 2**.

The preliminary subbase, base and final cover grades for the Landfill Expansion have been generated following the design requirements of NR 504 Wis. Adm. Code and positioned at least 10-feet above the seasonal high groundwater elevation. The preliminary subbase and conceptual grading plan are illustrated in **Figure 3**. The horizontal expansion area will consist of a composite liner system with the base graded in a herringbone configuration to convey leachate to the center collection trench and low sump area located on the southern end of the proposed cell. Details of the subbase, base liner, and final grades will be presented with the Feasibility Report.

Traversing the Landfill Expansion area from south to north as illustrated in **Figure 3**, preliminary clay subbase elevations are anticipated to range from approximately 1206 to 1250 feet. Modification of subbase elevations may be necessary based on the findings of the geotechnical investigation, geological investigation, and groundwater conditions. The weathered bedrock surface is illustrated in **Figure 4**; note that data for the actual depth to weathered bedrock in the Landfill Expansion area is limited. The competent bedrock surface is illustrated in **Figure 5**; similar to the weathered bedrock surface, note that data for the actual depth to competent bedrock in the Landfill Expansion area is also limited.

Preliminary base grades for the horizontal expansion mirror the subbase elevations with an additional 5 feet of elevation for the compacted clay liner system. The base elevations for the vertical expansion are immediately above the top of final permitted waste grades within the expansion footprint. The preliminary final grades for the proposed expansion include a total final cover thickness of 6.5-feet over the waste with a 12-inch grading layer. In accordance with s. NR 504.07 Wis. Adm. Code, the final cover will consist of, starting from the grading layer, 2-feet of compacted clay, a 40-mil geomembrane, a 1-foot granular drainage layer, 2-feet of rooting zone soil layer, and 6-inches of topsoil.

1.3 Geotechnical Requirements

The table from NR 512.09 Wis. Adm. Code that summarizes the geotechnical requirements for borings, wells, and piezometers is included below:

Coarse-Grained Soil Environments			
Piezometers	Water Table Observation Wells	Borings	Area
2	5	10	First 5 or less acres
–	1	2	Each additional 5 or less acres
1	–	–	Each additional 10 or less acres
Fine-Grained Soil Environments			
Piezometers	Water Table Observation Wells	Borings	Area
4	5	10	First 5 or less acres
–	1	2	Each additional 5 or less acres
2	–	–	Each additional 10 or less acres

As described further in **Section 2.1**, the geology at the Vernon County Landfill consists of unconsolidated loess and residuum, underlain by weathered dolomite, and dolomite. The unconsolidated materials consist primarily of silt and clay, which meet the physical criteria of a fine-grained soil environment. Therefore, based on the horizontal Landfill Expansion footprint of 4.0-acres, the number of borings, water table monitoring wells, and piezometers required for the geotechnical investigation are summarized as follows:

- 10 Soil Borings
- 5 Water Table Monitoring Wells
- 4 Piezometers

As part of the alternative geotechnical program, we propose to use existing borings, water table wells, and piezometers to meet a portion of the requirements of NR 512.09(1) and (2) Wis. Adm. Code. Further details on geotechnical requirements as they may pertain to the Landfill Expansion are discussed in the following sections. In addition, NR 512.09(3) Wis. Adm. Code stipulates that all borings, well installations, well development, well abandonments, and in-field hydraulic conductivity testing shall be observed by a professional geologist or directly supervised by a professional geologist.

1.3.1 Borings

NR 512.09(1) stipulates that soil borings be completed for the following conditions:

- Borings shall extend 25-feet below the anticipated sub-base grade.
- One boring shall extend 5-feet into bedrock outside the proposed limits of filling.
- Samples shall be collected and retained in accordance with NR 507.05 and 507.14 Wis. Adm. Code.

1.3.2 Wells and Piezometers

NR 512.09(2) Wis. Adm. Code stipulates that water table wells and piezometers be completed for the following conditions:

- All wells shall be located no more than 300 feet from the proposed limits of filling.
- Half of the wells shall be located no more than 150 feet from the proposed limits of filling.

1.3.3 Laboratory and Field Analysis

NR 512.09(2) Wis. Adm. Code stipulates that laboratory and field analysis be completed as follows:

<u>Analysis</u>	<u>Frequency</u>
Grain Size Distribution (mechanical and hydrometer methods)	5 samples per major soil unit
Atterberg Limits (fine grained soils as appropriate)	5 samples per major soil unit
Soil Classification	All Samples
Laboratory Hydraulic Conductivity (fine grained soils as appropriate)	2 samples per major soil unit
In-Situ Hydraulic Conductivity	Each Well

1.3.4 Static Water Elevations

NR 512.09(4)(e) and (f) Wis. Adm. Code stipulate that stabilized water level measurements be obtained from wells and surface water features (within 1,000 feet of the proposed limits of filling) on a monthly basis for 6-months prior to the submittal of the feasibility report. After this period, quarterly water levels shall be obtained for at least four (4) quarters.

1.3.5 Baseline Groundwater Monitoring

NR 512.09(4)(g) Wis. Adm. Code stipulates that at least four (4) rounds of baseline groundwater monitoring must be performed on all observation wells and piezometers and submitted with the feasibility report.

2 Assessment of Existing Data

The area that comprises the horizontal Landfill Expansion consists of 4.0-acres located immediately east of the municipal solid waste landfill operating under WDNR License No. 3268. Due to the proximity of the Landfill Expansion to the existing permitted facilities, a number of existing borings, field and laboratory data, and monitoring wells are available to meet a portion of the site-specific geotechnical information requirements; where additional information is needed, a supplemental geotechnical program is proposed in **Section 3.0** to complete additional borings, obtain field and laboratory data, and install additional monitoring wells.

2.1 Geological Site Characteristics

The proposed Landfill Expansion is located in a geological environment typically characterized as follows from youngest to oldest (top to bottom):

- Loess – windblown fine sands and silt
- Residuum – pedogenic (soil formation) clay minerals and weathered in-place bedrock
- Competent bedrock

Locally, the ridges visible on the surface topography are capped by dolomite bedrock, weathered in-place as residuum, but having physical features characteristic of the bedrock such as dolomite fragments. However, the valleys often have sediment also previously referred to as residuum but has more recently been determined to be evidence of clay mineral formation with residual carbonate rock and altered loess and colluvium as parent material (Knox, et al., 1990; Evans and Hartemink; 2012).

Based on information from previous investigations presented in the Feasibility Report for the Vernon County Landfill Vertical Expansion (Central Wisconsin Engineers & Architects Inc, August 2003), the residuum and weathered bedrock can typically be drilled with solid stem or hollow stem auger. The shallower competent bedrock, primarily consisting of dolomite, can be drilled with an air rotary hammer or cored with an air rotary rig or a versa-sonic drilling rig. Although, low RQD occurred with use of a versa-sonic drilling rig during investigations completed in 2003. Deeper bedrock units encountered on-site consist of dolomitic sandstones, dolomite, siltstones, and sandstone.

2.2 Existing Boring Log Data

Since 1987 approximately 95 soil borings have been completed at the Vernon County Landfill (WDNR License No. 3268) ranging in depth from 5 to 234 feet. Approximately 73 soil borings were completed prior to the submittal of the original 1990 Feasibility Report. An additional 8 borings were completed between 1990 and 2003 as part of expansion efforts, monitoring well installation, or well replacement. An additional 14 borings were completed during 2021 as part of expansion efforts. For a majority of soil borings, soils were classified using the Unified Soil Classification System (USCS) following methods outlined in ASTM D2488 and information regarding standard penetration tests (ASTM D1586) are provided for the soil borings until competent bedrock was encountered.

The existing soil borings reviewed as part of this Request meet the intent of NR 512.09 Wis. Adm. Code. There are 18 soil borings that fall within 300 feet of the Landfill Expansion as listed in **Table 1**. Copies of available soil boring logs are included in **Appendix A**. Locations of existing soil boring and monitoring wells located within 300-feet of the landfill expansion are illustrated in **Figure 2**. Logs for additional on-site soil borings which are outside the 300-foot distance are also included in **Appendix A** and referenced in **Table 1** for supplemental information only.

Final subbase grade elevations have not been determined but aren't projected to go below 1200 feet NGVD (the preliminary subbase elevations are shown in **Figure 3**). The following information summarizes the depths and elevations of the 18 soil borings previously installed within 300 feet of the proposed expansion area:

- Soil borings range in depth from 15 to 210 feet; corresponding elevations of the bottom of the soil borings range from 1023.0 to 1217.9 feet.
- Weathered bedrock was encountered in all 18 soil borings; corresponding elevations of the weathered bedrock range from 1176.5 to 1220.9 feet.
- Competent bedrock was encountered in 11 of 18 soil borings; corresponding elevations of the competent bedrock range from 1147.5 to 1209.9 feet.
- Four (4) locations (9 of the 18 soil borings) within 300-feet of the proposed expansion area contained soil borings that were advanced a minimum of 25 feet below the estimated subbase grade elevation of 1200 feet, with the corresponding bottom elevations ranging from 1023.0 to 1113.4 feet.
- Four (4) locations (7 of the 18 soil borings) within 300-feet of the proposed expansion area contained soil borings that were advanced more than 5 feet (NR 512.09(1)(c)) into competent bedrock. The depth that borings were advanced into competent bedrock ranges from 42 to 145 feet.
- Soil borings were sampled in accordance with NR 507.05 and 507.14; however, given the dates of soil boring completion, no soil samples are currently retained.

In comparison with the soil boring criteria established in NR 512.09 Wis. Adm. Code, six (6) additional soil borings are required to meet the regulatory requirements. Information from the previously completed soil borings, generally characterize the soils for the Landfill Expansion; however, because additional wells and bedrock information will be needed to confirm weathered and competent bedrock elevations as part of proposed landfill expansion design and construction, additional soil borings are proposed as described in **Section 3.0**.

The data listed above will be used to supplement new data on the geological cross-sections presented in the Feasibility Report.

2.3 Existing Wells and Piezometers

Since 1987 more than 20 monitoring wells and piezometers have been completed at the Vernon County Landfill (WDNR License No. 3268) ranging in depth from 95 to 234 feet. More than 20 monitoring wells and piezometers were utilized to fulfill well and piezometer requirements previously with the most recent landfill expansion efforts occurring in 2003 (Central Wisconsin Engineers & Architects Inc, August 2003). There are currently 22 active monitoring wells and piezometers at the facility.

Table 2 lists the existing wells and piezometers within the Landfill Expansion footprint, within 150-feet of the Landfill Expansion, and within 300-feet of the Landfill Expansion that will be useful for evaluating groundwater conditions as part of the well and piezometer requirements of NR 512.09(1) and (2) Wis. Adm. Code. Copies of available well construction information are included in **Appendix B**. Locations of monitoring wells and piezometers located within 300-feet of the Landfill Expansion are illustrated in **Figure 2**. Information on additional monitoring wells and piezometers outside the 300-foot distance are also included in **Appendix B** and referenced in **Table 2** for supplemental information only.

In the vicinity of the Landfill Expansion area, information regarding the existing monitoring wells and piezometers are summarized as follows:

- Two (2) water table monitoring wells and five (5) piezometers are located within 300-feet of the Landfill Expansion area.
- One (1) water table monitoring well and two (2) piezometers are currently present within the Landfill Expansion footprint.
- One (1) piezometer is located within 150-feet of the Landfill Expansion footprint.

As stated above, it is understood that it is the WDNR's policy to allow the use of wells and piezometers for vertical expansion over existing landfill areas, but not for any horizontal expansion. The County requests an exemption to this policy to allow the use of these wells and piezometers to meet the referenced NR 512 requirements. With that approval, at a minimum, installation of three (3) monitoring wells are required to meet the minimum criteria of NR 512.9 Wis. Adm. Code. The proposed monitoring wells and piezometers are described in **Section 3.0**.

2.4 Existing Laboratory and Field Analysis

Since 1987 approximately 75 soil samples collected as part of past site investigations have been subjected to laboratory tests for the Vernon County Landfill (WDNR License No. 3268) as part of landfill investigations and construction projects. In addition, hydrogeologic conditions have been evaluated through routine measurements of static water elevations and performing in-field hydraulic conductivity tests and analysis. The following sections summarize information from laboratory and field data available for the site.

2.4.1 Soil Laboratory Testing

Table 3 summarizes laboratory tests completed on soil samples across the entire landfill site for sieve analysis, hydrometer tests, Atterberg limits, coefficient of permeability, and density. Previous soil laboratory testing data appears to meet the criteria established in NR 512.09 Wis.

Adm. Code. Given the lateral extent and type of formation of the geologic units present at the site, it is useful to evaluate the uniformity of the physical properties of the geologic units for the entire site. Based on the soil testing results, physical characteristics of the geologic units are well defined. The number of samples analyzed by geologic unit and laboratory results are summarized as follows:

- Loess (24 samples): Where present, loess deposits can be generally described as a light brown to dark brown silt with clay to clay with silt (ML or CL) averaging 0 percent gravel, 1.6 percent sand, 73.9 percent silt, and 25.0 percent clay. The fine-grained sediment content exhibits an average Liquid Limit of 37.7 and a Plasticity Index of 15.6. There was one Coefficient of Permeability test analyzed with a result of 2.4×10^{-7} cm/sec.
- Residuum (51 samples): The residuum can be generally described as brown to red-brown clay with silt (CL to CH), dolomite fragments, and occasional sandy layers. The sandy layers are generally described as yellow to yellow brown sand with silt and clay (SC to GM). The fine-grained residuum (CL to CH) averages 2.8 percent gravel, 21.2 percent sand, 36.9 percent silt, and 43.1 percent clay. Two “undisturbed” samples have been able to be obtained within the fine-grained residuum with an average for Coefficient of Permeability of 5.77×10^{-7} cm/sec (range of 2.34×10^{-8} cm/sec to 1.13×10^{-6} cm/sec). The coarse-grained residuum (SC to GM) averages 10.7 percent gravel, 61.8 percent sand, 14.1 percent silt, and 12.6 percent clay. Two “undisturbed” samples have been able to be obtained within the coarse-grained residuum with an average for Coefficient of Permeability of 6.75×10^{-3} cm/sec (range of 2.96×10^{-7} cm/sec to 1.35×10^{-2} cm/sec).

Although soil laboratory data for the landfill property is quite extensive and will provide the basis for evaluating the physical properties of the site, additional information will be needed to confirm geotechnical conditions as part of proposed Landfill Expansion design, additional soil laboratory testing is proposed as described in **Section 3.0**.

2.4.2 In-situ Field Testing

During 2003, slug tests (falling and/or rising head tests) were performed on 14 wells across the entire landfill property (Central Wisconsin Engineers & Architects Inc, August 2003); calculations for hydraulic conductivity were completed based on Bouwer and Rice. A summary of the existing hydraulic conductivities are provided in **Table 4**. For the locations where in-situ field testing was completed previously, the in-situ field testing appears to meet the criteria established in NR 512.09 Wis. Adm. Code.

Based on the minimum, geometric mean, and maximum values of hydraulic conductivity presented in **Table 4**, the hydrogeologic properties for each geologic unit can be described as follows:

- Loess (0 slug tests): Groundwater generally does not occur within loess deposits at the site; no wells are screened in loess and in-field hydraulic conductivity testing cannot be conducted.
- Residuum (0 slug tests): Groundwater generally does not occur within residuum deposits at the site; no wells are screened in residuum and in-field hydraulic conductivity testing cannot be conducted.
- Bedrock (14 slug tests): The hydraulic conductivity of the bedrock is separated into two units: dolomite, hard, with occasional small vugs and sandy dolomite to dolomitic sandstone. The dolomite has a range of 1.67×10^{-3} cm/sec to 1.27×10^{-2} cm/sec, with a

geometric mean of 5.47×10^{-3} cm/sec. The sandy dolomite to dolomitic sandstone has a range of 2.19×10^{-4} cm/sec to 3.07×10^{-2} cm/sec, with a geometric mean of 3.46×10^{-3} cm/sec. The bedrock (dolomite to sandy dolomite to dolomitic sandstone), as a geologic unit, would appear to provide more uniform hydraulic conductivity, but variability in the soil properties may also occur including presence of sandy lenses, differential weathering, fracturing, or preferred flow paths.

Hydraulic conductivity data for the landfill property is sufficient and will provide the basis for evaluating the hydrogeologic conditions at the site. However, because additional information will be needed to confirm in the vicinity of the Landfill Expansion, additional slug tests are proposed on any new well installations or wells not tested previously as described in **Section 3.0**.

2.4.3 Static Water Elevations

Static water levels are collected in all site monitoring wells and piezometers twice per year in conjunction with the routine monitoring program. **Table 5** provides a summary of the existing monitoring wells and piezometers that are routinely monitored for static water elevations across the site. Static water elevations for the past five years are included for all wells, although some water level data is available for several wells dating back to 1988. Recent groundwater elevations indicate the water table has risen within several monitoring wells across the landfill site by 8 to 15 feet between 2016 and 2020 with an even higher increase occurring in September of 2017. The increase is consistent with “groundwater flooding” occurring across the state of Wisconsin as described by the WDNR on their website. As a result, existing wells that were originally installed to monitor water table conditions, may now have water levels just above the screened interval; for purposes of site evaluation these wells that monitor “near” water table conditions are considered water table monitoring wells.

A water table contour map for the landfill property for September 2020, provided as **Figure 6**, indicates a groundwater divide occurs near well MW-14 north of the existing landfill and proposed expansion with groundwater flow to the northeast and groundwater flow to the south to southeast within the landfill disposal areas. Based on available nested wells, vertical components of flow in several well nests result in downward vertical gradients near or above one (1) indicating a strong resistance to vertical groundwater movement. Previous studies have presented the hydraulic conditions as indicative of perched groundwater.

In the vicinity of the Landfill Expansion, the depth to water ranges from around 60 to 90 feet below ground surface (bgs), which corresponds to an elevation ranging from 1130 to 1160 feet NGVD. Static water level data are available from several wells surrounding the Landfill Expansion area dating back to 1988.

Because additional information will be needed to confirm groundwater conditions as part of proposed landfill expansion design, additional monitoring wells and piezometers are proposed as described in **Section 3.0**. Water level measurements will be obtained monthly from new wells and piezometers for 6-months prior to the submittal of the Feasibility Report in accordance with NR 512.09(4)(e) and (f) Wis. Adm. Code, as well as quarterly water levels obtained for at least four (4) quarters following the submittal.

2.5 Existing Groundwater Monitoring Data

2.5.1 Local Groundwater Quality

Groundwater in the Lower Wisconsin River basin is generally of very good quality and is usable for most purposes. The main chemical constituents in the groundwater within the basin are calcium, magnesium, and bicarbonate ions, which are derived primarily from solution of dolomite and limestone bedrock. Regional differences in groundwater quality occur due to regional variability in the soil and rock through which the groundwater moves (Hindall, 1974).

Hardness as calcium carbonate is above 180 mg/L in 80 percent of sampled wells, and above 225 mg/L in 65 percent of sampled wells. This indicates hard water, and softening is often required for many domestic uses. The median dissolved solids content is approximately between 260 and 350 mg/L in groundwater in the drainage basin (Hindall, 1974).

2.5.2 Landfill Groundwater Monitoring

There are currently 22 active monitoring wells across the Vernon County Landfill (WDNR License No. 3268). The current groundwater monitoring wells located within 300-feet of the proposed expansion area have been in place since 1988, 1989, and 2003. The groundwater monitoring wells are routinely sampled twice per year under existing licenses, with the list of parameters varying between monitoring well and sampling event.

There are eleven (11) existing wells within the proposed expansion footprint and within 300-feet of the proposed expansion including three water table wells and four well nests (water table well and one to three piezometers). The wells include MW-5/MW-5A (within footprint, eastern edge, nested wells), MW-14/MW-14Z (within footprint, northern edge, nested wells), MW-3/MW-4/MW-4P/MW-6 (upgradient, nested wells), and MW-10/MW-11/MW-12 (downgradient, nested wells). Of the existing wells, MW-5/MW-5A and MW-14/MW-14Z are located side gradient of, and part of the monitoring system for the current municipal solid waste landfill (License No. 3268). Well nest MW-10/MW-11/MW-12 is located downgradient of, and part of the monitoring system for, the current municipal solid waste landfill (License No. 3268). Upgradient water quality data for the site is provided by monitoring well MW-3/MW-4/MW-4P/MW-6 located north and approximately 200 feet outside of the proposed expansion area. Annual or semi-annual monitoring has previously been collected from existing wells MW-5A, MW-14/MW-14Z, MW-3/MW-4/MW-4P/MW-6, and MW-10/MW-11/MW-12.

A majority of the wells located within 300-feet of the proposed expansion area show no to minimum impacts from the existing site activities. There are seven (7) parameters that are found to exceed their ch. NR 140 ES and/or PAL in at least one well located within 300-feet of the proposed expansion area. Four of these parameters (fluoride, iron, lead, and manganese) which are exceeded at least once within MW-3, MW-4P, MW-5A, MW-6, MW-10, MW-11, MW-12, and MW-14 are attributed to natural sources. One of these parameters (mercury) was exceeded one or two times within MW-5A, MW-10, MW-11, MW-14, and MW-14Z and probably represents “false positives”, which is a result of a sample and/or analytical error. Nitrate+nitrite has been exceeded at least once within MW-5A, MW-6, MW-14, and MW-14Z and is most likely due to agriculture which is a common land use in the surrounding area. Two wells (MW-5A and MW-12) had one PAL exceedance for Bromomethane in March 2020. This is the only detection of bromomethane in either of these wells in recent years and no trend or sufficient contamination

appears present. No other contaminations appear to be present within the 300-feet surrounding the proposed expansion area.

3 Alternative Geotechnical Program

As described in **Section 2.0**, a significant amount of data is available for the Vernon County Landfill site including the proposed Landfill Expansion area. However, supplemental information is proposed as part of the geotechnical evaluation at the site. The following section presents the proposed alternatives request as well as exemptions for approval in relationship to geologic site characteristics, proposed soil borings, proposed well and piezometer installations, laboratory and field-testing programs, and baseline water quality assessment.

3.1 Geological Site Characteristics Which Necessitate Exemptions

Previous investigations at the site have experienced difficulty in meeting several requirements of NR 507. To address the geological site characteristics related to the characteristics of the bedrock, Vernon County Landfill is requesting exemptions to the requirements of NR 507 as described in the following sections.

3.1.1 Bedrock Coring

NR 507.05(2) Wis. Adm. Code requires bedrock to be cored and the core samples to be retained. As described in **Section 2.1**, attempts to core bedrock have been unsuccessful primarily due to weathering, existing fractures, and layered heterogeneity of dolomite, dolomitic sandstone, and siltstone. Geologic data is available from previous borings completed at the site including coring at well nest MW-10/MW-11/MW-12 immediately south of the expansion and well nest MW-7/MW-8/MW-9. To improve recovery, versor-sonic was used to complete boring for well MW-14Z on the northern edge of the expansion as well as borings for wells MW-1RZ and MW-13P south of the existing landfill. Recovery improved, however, the versor-sonic method caused samples to be more disturbed making it sometimes difficult to distinguish bedrock features such as the presence of fractures and vugs. Therefore, the value of coring using versor-sonic and/or traditional coring methods is uncertain. In fact, mud rotary methods were effective at noting fracturing in the bedrock material. As a result, we request an exemption to NR 507.05(2) Wis. Adm. Code and propose that coring of bedrock not be attempted, and the rock be drilled and wash samples collected during drilling, as was implemented in previous investigations.

3.1.2 Drilling Fluids

NR 507. 06(1) Wis. Adm. Code requires that drilling fluids not be used unless no reasonable alternative exists. As described in **Section 2.2**, past investigations have shown that drilling within bedrock with hollow stem auger cannot be accomplished. We therefore request an exemption to use bentonite drilling mud to advance the drill holes to depth.

To ensure that the majority of the drilling mud has been removed from each well, well development will include removal of a minimum of five (5) well volumes (including filter pack) and measurements of field parameters between each well volume until measurements have stabilized and turbidity is negligible. This alternative procedure was approved in the past and we request approval to continue using it for wells installed for the feasibility and plan of operation and the proposed expansion.

3.2 Alternative Program of Borings

Vernon County Landfill is requesting an alternative program be approved regarding the boring program required under NR 512.09 Wis. Adm. Code.

It is understood that it is the WDNR's policy to allow the use of existing borings, wells, and piezometers for vertical expansion over existing landfill areas but not for any horizontal expansion. In such areas, the WDNR requires the landfill to construct the number of new borings, wells and piezometers necessary to meet the requirements of NR 512.09(1) and (2) Wis. Adm. Code.

Based on the information presented on in **Section 2.2**, six (6) additional soil borings would be required to meet the regulatory requirements by using existing information. However, because additional information is needed to confirm weathered and competent bedrock as part of proposed landfill expansion design and construction, eight (8) additional soil borings are proposed to meet the requirements of NR 512.09 Wis. Adm. Code. Along with the four (4) existing borings that meet regulatory requirements, a total of twelve (12) borings would be present within 300-feet of the proposed expansion area, as summarized in the table below. Proposed drilling depths are summarized on **Table 6**. The proposed drilling depths are based on proposed subbase elevations and groundwater elevations as shown in **Figures 3 and 6**, respectively. Locations proposed for soil borings are illustrated in **Figure 7**. Given the site topography, final locations for soil boring may need to be modified to accommodate accessibility of a drill rig.

<u>Soil Boring</u>	<u>Location Relative to Expansion</u>	<u>Boring Extends 25-feet Below Nearest Subbase (Yes/No)</u>	<u>Boring Extends 5-feet into Bedrock (Yes/No)</u>	<u>Notes</u>
Existing Borings				
MW-5	Within proposed limits of filling	Yes	Yes	Nested with MW-5A
MW-6	Outside proposed limits of filling, within 300-feet	Yes	Yes	Nested with MW-3, MW-4, and MW-4P
MW-10	Outside proposed limits of filling, within 300-feet	Yes	Yes	Nested with MW-11 and MW-12
MW-14Z	Within proposed limits of filling	Yes	Yes	Nested with MW-14
Proposed Borings				
MW-14WT	Outside proposed limits of filling within 300-feet	Yes	Yes	
MW-15WT	Outside proposed limits of filling within 300-feet	Yes	Yes	
MW-16	Outside proposed limits of filling within 300-feet	Yes	Yes	
MW-17WT	Outside proposed limits of filling within 300-feet	Yes	Yes	
B-18	Within proposed limits of filling	Yes	No	
B-19	Within proposed limits of filling	Yes	No	
B-20	Within proposed limits of filling	Yes	No	
B-21	Within proposed limits of filling	Yes	No	

Information regarding the proposed soil borings is summarized as follows:

- Four (4) drilling locations (MW-14WT, MW-15WT, MW-16, and MW-17WT) outside the Landfill Expansion footprint fall within 150 feet of the proposed waste boundary upgradient, sidegradient, and downgradient of the Landfill Expansion. Soil borings for wells MW-14WT, MW-15WT, and MW-17WT will be advanced into the water table for shallow well installation; the soil boring for well nest MW-16WT/MW-16 will be advanced below the water table to accommodate water table well and piezometer construction.
- Four (4) drilling locations (B-18 through B-21) fall within the Landfill Expansion footprint. Soil borings will all be advanced to at least 25 feet below the proposed landfill subbase elevation.

Allowing the use of existing soil borings (4) along with the proposed soil borings (8) will supplement the existing information to provide an adequate number of soil borings to meet the NR 512.09 Wis. Adm. Code requirements. Existing soil boring information as described in **Section 2.2** and provided in **Appendix A** will be used to supplement the proposed soil borings.

3.3 Alternative Program for Wells and Piezometers

Vernon County Landfill is requesting an alternative be approved regarding the wells and piezometers required under NR 512.09 Wis. Adm. Code.

As stated above, it is understood that it is the WDNR's policy to allow the use of existing wells, and piezometers for vertical expansion over existing landfill areas, but not for any horizontal expansion. However, given the proximity of the Landfill Expansion as sidegradient and contiguous to the existing permitted disposal facility, portions of the proposed monitoring system for the proposed expansion area are currently part of the existing monitoring program under License No. 3268.

As described in **Section 2.3**, existing wells MW-5A/MW-5, MW-14/MW-14Z, MW-3/MW-4/MW-4P/MW-6, and MW-10/MW-11/MW-12 were installed and monitored in conjunction with previous expansion activities. As a result, three (3) monitoring wells and eight (8) piezometers are located within the proposed expansion area or within 300 feet of the Landfill Expansion area which does not meet the total well and piezometer requirements under NR 512.09 Wis. Adm. Code. Each of these wells are useful in evaluating groundwater conditions of the Landfill Expansion area. To supplement the existing monitoring wells and piezometers, four (4) additional monitoring wells and one (1) additional piezometer are proposed as described in **Table 7** with proposed locations illustrated in **Figure 7**. Using the existing wells and piezometers along with those that are proposed, the combined total will include seven (7) monitoring wells and ten (10) piezometers to comply with NR 512.09 Wis. Adm. Code; a summary table of wells is provided below. Given the site topography, final locations for the monitoring wells and piezometer may need to be modified to accommodate accessibility of a drill rig. The proposed well and piezometer locations have been located to minimize the need to be removed to accommodate landfill construction and, therefore, should be available for long-term monitoring purposes.

<u>Monitoring Well</u>	<u>Distance from Expansion</u>	<u>Monitoring Point</u>	<u>Notes</u>
Existing Wells			
MW-3	within 300-feet	Piezometer	Nested with MW-4P, MW-4, and MW-6
MW-4P	within 300-feet	Water Table	Nested with MW-3, MW-4, and MW-6
MW-4	within 300-feet	Piezometer	Nested with MW-3, MW-4P, and MW-6
MW-5A	within footprint	Water Table	Nested with MW-5
MW-5	within footprint	Piezometer	Nested with MW-5A
MW-6	within 300-feet	Piezometer	Nested with MW-3, MW-4P, and MW-4
MW-10	within 300-feet	Piezometer	Nested with MW-11 and MW-12
MW-11	within 300-feet	Piezometer	Nested with MW-10 and MW-12
MW-12	within 300-feet	Water Table	Nested with MW-10 and MW-11
MW-14	within 150-feet	Piezometer	Nested with MW-14Z
MW-14Z	within footprint	Piezometer	Nested with MW-14
Proposed Wells			
MW-14WT	within 150-feet	Water Table	
MW-15WT	within 150-feet	Water Table	
MW-16WT	within 150-feet	Water Table	Nested with MW-16
MW-16	within 150-feet	Piezometer	Nested with MW-16WT
MW-17WT	within 150-feet	Water Table	

Information on the proposed wells and piezometer is summarized as follows:

- Four (4) shallow or water table wells are proposed for installation. One well (MW-14WT) is proposed north and upgradient of the Landfill Expansion; one well (MW-15WT) is proposed east and sidegradient of the Landfill Expansion; one well (MW-16WT) is located east and sidegradient to the Landfill Expansion; and one well (MW-17WT) is located southeast and downgradient to the Landfill Expansion. Each well will be constructed with a 10-foot long screen situated approximately 7-feet into the water table as observed during drilling.
- One (1) piezometer is proposed for installation. The one proposed piezometer (MW-16) will be nested with the shallow water table well MW-16WT. The piezometer will be constructed with a 5-foot screen situated a minimum of 15-feet below the bottom elevation of the water table well.

Allowing the use of existing wells, the proposed new wells and piezometer will supplement the existing information to provide an adequate number of wells and piezometers to meet the NR 512.09 Wis. Adm. Code requirements. These wells will be background groundwater quality wells for the Landfill Expansion. Due to the required grading to accommodate construction, the existing monitoring wells MW-5/MW-5A and MW-14/MW-14Z will need to be sealed as they are located within the Landfill Expansion Footprint or very close to the footprint. Also, due to grading needed to the east of the Landfill Expansion, top of casings at monitoring wells MW-15WT and MW-16WT/MW-16 will need to be adjusted during construction. These issues will be addressed in the plan of operation monitoring plan.

3.4 Alternative Program for Laboratory and Field Analysis

Vernon County Landfill is requesting an alternative program be approved regarding the laboratory and field analysis required under NR 512.09. The following section presents the requested

exemptions in reference to grain-size distribution and Atterberg limits and the Coefficient of Permeability. No exemption is being requested for in-field hydraulic conductivity analysis or measurement of static water levels.

3.4.1 Grain-size Distribution and Atterberg Limits

NR 512.09(4)(a) requires that for each major soil unit, at least five representative samples be analyzed for grain size distribution and Atterberg limits. The planned geotechnical program intends to fulfill geotechnical requirements of NR 512.09(1) and (2). However, because weathered dolomite and competent dolomite is present on-site, Atterberg limits cannot be established for these site soils.

The fine-grained units (loess and residuum) on-site will be tested for grain-size distribution using mechanical and hydrometer methods and Atterberg limits to meet the requirements of NR 512.09 Wis. Adm. Code.

3.4.2 Laboratory Hydraulic Conductivity

NR 512.09(4)(b) Wis. Adm. Code requires that hydraulic conductivity be conducted on two representative soil samples from each major fine-grained unit. The two fine-grained units identified on-site are loess and residuum. Two thin wall samples will be collected from each of the fine-grained units on-site to determine Coefficient of Permeability to meet the requirement of NR 512.09(4)(b) Wis Adm. Code.

In addition, we request an exemption from this requirement for the weathered dolomite and competent dolomite since relatively undisturbed samples cannot be obtained. If deemed feasible during field work, an alternate sampling method using the brass-lined split-spooned sampler (ASTM D 4700) will be attempted in weathered dolomite to collect undisturbed samples for laboratory testing.

3.5 Previously Collected Data

Vernon County Landfill requests an exemption to use all of the previously collected data to meet requirements of NR 512.09 Wis. Adm. Code. Use of this data would include, but not be limited to, the following:

- In-field hydraulic conductivity tests completed on the existing wells.
- Grain size analysis, Atterberg limits, soil classification, and laboratory hydraulic conductivity from past investigations.
- Soil boring logs from past investigations which are not totally compliant with the present NR 507.05 Wis. Adm. Code but provide useful and accurate data.
- Existing groundwater quality data as background data.

3.6 Alternative Program for Groundwater Monitoring

3.6.1 Water Elevation Data Collection

Vernon County Landfill is not requesting an alternative be approved regarding the collection of water elevation data under NR 512.09(4)(e) and (f) Wis. Adm. Code which stipulates water level measurements be collected on a monthly basis for 6-months prior to the submittal of the Feasibility Report.

Water elevations will be collected from all new wells on a monthly basis following installation for at least 6 months prior to submittal of the Feasibility Report. Water levels from existing wells within 300-feet of the Landfill Expansion will be collected on a schedule commensurate with new wells that will provide comparative data and meet current license requirements prior to submittal of the Feasibility Report.

3.6.2 Baseline Monitoring

Vernon County Landfill is not requesting an alternative be approved regarding the collecting of baseline monitoring data under NR 512.09 (4)(g) Wis. Adm. Code which stipulates that at least four (4) rounds of baseline groundwater monitoring must be performed on all observation wells and piezometers and submitted with the Feasibility Report.

Four rounds of baseline water monitoring of all new wells and piezometers that fall within 300-feet of the Landfill Expansion will be conducted prior to submittal of the Feasibility Report; existing wells and piezometers that have not been monitored for baseline requirements will also be sampled for four rounds of baseline monitoring. Semi-annual monitoring of the existing wells will continue in accordance with the facility permits.

3.7 Report Preparation

3.7.1 Geologic Cross-Sections

NR 512.11(2) Wis. Adm. Code requires that geological cross-sections be constructed through all borings. Since we have a considerable amount of boring and monitoring well data for the proposed Expansion, we request an exemption to the requirement and propose to construct cross sections only through the borings and wells that assist in defining the lateral and vertical extent of the major lithostratigraphic units.

3.7.2 Soil Boring Logs

NR 507.14 and NR 140.23 requires that soil boring information be presented on WDNR forms and include the information listed in NR 507.14(2), (3) and (4) Wis. Adm. Code. Some historic soil boring logs from the WDNR files for the year 1987 are not available. However, some historical soil boring descriptions are presented on geological figures in historical files. Although sufficient information is provided from available and proposed soil boring logs, we request an exemption of the use of all historical logs during final presentation in the Feasibility Report, if appropriate, to assist in the overall site interpretation.

4 Summary

On behalf of Vernon County, SEH requests approval of an alternative geotechnical program for the NR 512 feasibility report for the expansion of the Vernon County Landfill. The Landfill Expansion is proposed directly east of the current municipal solid waste landfill. The entire landfill site as well as the Landfill Expansion area have a wealth of geotechnical data available from past investigations which we wish to use for the feasibility report for the proposed expansion. Approving the use of these data will make the Feasibility Report process more economical for the County, as well as expediting the process.

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Tables

Table 1 – Existing Soil Borings for Landfill Property

Table 2 – Existing Monitoring Wells and Piezometers for Landfill Property

Table 3 – Existing Soil Laboratory Analysis for Landfill Property

Table 4 – Existing In-Field Hydraulic Conductivity for Landfill Property

Table 5 – Existing Static Water Elevations for Landfill Property (2016-2020)

Table 6 – Proposed Soil Borings for Landfill Expansion

Table 7 – Proposed Wells and Piezometers for Landfill Expansion

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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) ⁽¹⁾
Borings within 300-feet										
MW-3	1987	Ace Well Drilling	1233.0	180.0	1053.0	20.0	1213.0	80.0	1153.0	Y
MW-4/-4P	1987	Ace Well Drilling	1232.9	160.0	1072.9	20.0	1212.9	80.0	1152.9	Y
TB-4	1988	Wisconsin Test Drilling	1232.9	15.0	1217.9	12.0	1220.9	NE	NE	Y
TB-5	1988	Wisconsin Test Drilling	1221.0	25.0	1196.0	22.0	1199.0	NE	NE	Y
TB-6	1988	Wisconsin Test Drilling	1218.7	16.5	1202.2	13.5	1205.2	NE	NE	Y
TB-7	1988	Wisconsin Test Drilling	1245.4	47.5	1197.9	38.0	1207.4	NE	NE	Y
TB-8	1988	Wisconsin Test Drilling	1249.4	45.5	1203.9	42.0	1207.4	NE	NE	Y
MW-5A	1989	Exploration Technology	1224.0	103.0	1121.0	17.5	1206.5	NA	NA	Y*
MW-5	1988	Ace Well Drilling	1223.3	180.0	1043.3	20.0	1203.3	35.0	1188.3	Y
MW-6	1988	Ace Well Drilling	1233.0	210.0	1023.0	14.0	1219.0	80.0	1153.0	Y
MW-10	1989	Exploration Technology	1215.6	181.0	1034.6	24.5	1191.1	61.0	1154.6	Y
MW-11	1989	Exploration Technology	1216.4	163.0	1053.4	24.5	1191.9	61.0	1155.4	Y
MW-12	1989	Exploration Technology	1216.4	103.0	1113.4	24.5	1191.9	61.0	1155.4	Y
TB-15	1989	Exploration Technology	1193.5	12.0	1181.5	11.5	1182.0	NE	NE	Y
MW-14/14Z	2003	Traut Hydro Tech	1247.5	210.0	1037.5	71.0	1176.5	100.0	1147.5	Y
B-15	2021	Mathy Construction Co	1252.9	45.0	1207.9	40.0	1212.9	45.0	1207.9	Y
B-16	2021	Mathy Construction Co	1245.9	36.0	1209.9	32.0	1213.9	36.0	1209.9	Y
B-17	2021	Mathy Construction Co	1238.8	39.0	1199.8	28.0	1210.8	39.0	1199.8	Y
Borings outside 300-feet										
MW-1	1987	Ace Well Drilling	1236.4	200.0	1036.4	28.0	1208.4	80.0	1156.4	Y
MW-2	1987	Ace Well Drilling	1252.5	190.0	1062.5	30.0	1222.5	40.0	1212.5	Y
AB-1	1987	James Construction Co.	1255.5	19.0	1236.5	19.0	1236.5	NE	NE	Y
AB-2	1987	James Construction Co.	1256.7	8.0	1248.7	6.0	1250.7	8.0	1248.7	Y
AB-3	1987	James Construction Co.	1257.3	6.0	1251.3	6.0	1251.3	NE	NE	Y
AB-4	1987	James Construction Co.	1257.2	6.5	1250.7	6.5	1250.7	NE	NE	Y
AB-5	1987	NA	NA	NA	NA	NA	1243.0	NA	NA	N
AB-7	1987	James Construction Co.	1261.1	20.0	1241.1	20.0	1241.1	NE	NE	Y
AB-8	1987	James Construction Co.	1260.0	8.0	1252.0	8.0	1252.0	NE	NE	Y
AB-9	1987	NA	NA	NA	NA	NA	1238.0	NA	NA	N
AB-10	1987	NA	NA	NA	NA	NA	1228.0	NA	NA	N
AB-11	1987	James Construction Co.	1258.9	21.0	1237.9	21.0	1237.9	NE	NE	Y
AB-15	1987	NA	NA	NA	NA	NA	1224.0	NA	NA	N
AB-18	1987	NA	NA	NA	NA	NA	1237.0	NA	NA	N
AB-19	1987	NA	NA	NA	NA	NA	1241.0	NA	NA	N
AB-21	1987	NA	NA	NA	NA	NA	1248.0	NA	NA	N
AB-22	1987	NA	NA	NA	NA	NA	1240.0	NA	NA	N
AB-23	1987	NA	NA	NA	NA	NA	1235.0	NA	NA	N
AB-24	1987	NA	NA	NA	NA	NA	1223.0	NA	NA	N
AB-25	1987	NA	NA	NA	NA	NA	1218.0	NA	NA	N
AB-28	1987	NA	NA	NA	NA	NA	1221.0	NA	NA	N

Table 1
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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) ⁽¹⁾
Borings outside 300-feet										
AB-29	1987	NA	NA	NA	NA	NA	1209.0	NA	NA	N
AB-30	1987	NA	NA	NA	NA	NA	1207.0	NA	NA	N
TB-1	1988	Wisconsin Test Drilling	1234.9	17.0	1217.9	NE	NE	NE	NE	Y
TB-2	1988	Wisconsin Test Drilling	1252.7	19.5	1233.2	17.0	1235.7	NE	NE	Y
TB-3	1988	Wisconsin Test Drilling	1253.4	14.5	1238.9	14.0	1239.4	NE	NE	Y
TB-9	1988	Wisconsin Test Drilling	1236.2	22.0	1214.2	NE	NE	NE	NE	Y
TB-10	1989	Exploration Technology	1258.8	18.0	1240.8	16.0	1242.8	NE	NE	Y
TB-11	1989	Exploration Technology	1253.9	26.0	1227.9	15.0	1238.9	NE	NE	Y
TB-12	1989	Exploration Technology	1259.1	15.0	1244.1	12.0	1247.1	NE	NE	Y
TP-1	1989	NA	1245.5	5.0	1240.5	3.5	1242.0	NE	NE	Y
TP-2	1989	NA	1251.4	6.5	1244.9	6.5	1244.9	NE	NE	Y
TP-3	1989	NA	1254.6	9.5	1245.1	9.5	1245.1	NE	NE	Y
TP-4	1989	NA	1258.3	8.5	1249.8	7.5	1250.8	NE	NE	Y
TP-7	1989	NA	1258.9	10.0	1248.9	NE	NE	NE	NE	Y
TP-8	1989	NA	1251.9	8.5	1243.4	NE	NE	NE	NE	Y
TP-9	1989	NA	1239.4	8.0	1231.4	7.0	1232.4	NE	NE	Y
TP-10	1989	NA	1234.8	11.0	1223.8	NE	NE	NE	NE	Y
TP-11	1989	NA	1244.9	7.0	1237.9	7.0	1237.9	NE	NE	Y
TP-15	1989	NA	1250.7	NA	NA	NE	NE	NE	NE	Y
TP-16	1989	NA	1236.0	5.5	1230.5	NE	NE	NE	NE	Y
TP-18	1989	NA	1234.9	8.0	1226.9	NE	NE	NE	NE	Y
TP-19	1989	NA	1250.9	5.5	1245.4	NE	NE	NE	NE	Y
TP-20	1989	NA	1251.3	12.5	1238.8	NE	NE	NE	NE	Y
TP-21	1989	NA	1241.0	14.0	1227.0	NE	NE	NE	NE	Y
TP-22	1989	NA	1255.0	11.0	1244.0	11.0	1244.0	NE	NE	Y
TP-23	1989	NA	1252.3	12.0	1240.3	10.0	1242.3	NE	NE	Y
TP-24	1989	NA	1243.4	12.0	1231.4	NE	NE	NE	NE	Y
TP-25	1989	NA	1236.2	10.0	1226.2	NE	NE	NE	NE	Y
TP-26	1989	NA	1248.5	8.5	1240.0	8.5	1240.0	NE	NE	Y
TP-27	1989	NA	1251.0	NA	NA	NE	NE	NE	NE	Y
TP-28	1989	NA	1242.1	9.5	1232.6	NE	NE	NE	NE	Y
TP-A	1989	NA	1255.0	9.0	1246.0	9.0	1246.0	NE	NE	Y
TP-B	1989	NA	1258.0	9.0	1249.0	NE	NE	NE	NE	Y
TP-C	1989	NA	1257.8	11.5	1246.3	NE	NE	NE	NE	Y
TP-D	1989	NA	1252.0	8.5	1243.5	8.5	1243.5	NE	NE	Y
MW-7	1989	Exploration Technology	1255.7	234.5	1021.2	21.0	1234.7	44	1211.7	Y
MW-8R	1989	Exploration Technology	1256.1	207.0	1049.1	21.5	1234.6	44.0	1212.1	Y
MW-9	1989	Exploration Technology	1255.4	131.5	1123.9	21.5	1233.9	44.0	1211.4	Y
TP-100	1991	NA	1255.0	20.0	1235.0	NE	NE	NE	NE	Y

Table 1
Page 3 of 3
Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) ⁽¹⁾
Borings outside 300-feet										
TP-101	1991	NA	NA	26.0	NA	NE	NE	NE	NE	Y
TP-102	1991	NA	NA	18.0	NA	18.0	NA	NE	NE	Y
MW-1R	1994	Ace Well Drilling	1245.0	166.0	1079.0	55.0	1190.0	74.0	1171.0	Y
MW-1PR	1994	Ace Well Drilling	1245.0	126.0	1119.0	57.0	1188.0	57.0	1188.0	Y
MW-1RZ	2003	Traut Hydro Tech	1244.0	185.0	1059.0	75.0	1169.0	98.0	1146.0	Y
MW-13P	2003	Traut Hydro Tech	1224.5	100.0	1124.5	49.0	1175.5	75.0	1149.5	Y
B-1	2021	Mathy Construction Co	1252.8	25.0	1227.8	13.0	1239.8	25.0	1227.8	Y
B-2	2021	Mathy Construction Co	1252.2	50.0	1202.2	47.0	1205.2	50.0	1202.2	Y
B-3	2021	Mathy Construction Co	1251.1	11.0	1240.1	3.0	1248.1	11.0	1240.1	Y
B-5	2021	Mathy Construction Co	1257.4	19.0	1238.4	13.0	1244.4	19.0	1238.4	Y
B-6	2021	Mathy Construction Co	1254.9	12.0	1242.9	10.0	1244.9	12.0	1242.9	Y
B-8	2021	Mathy Construction Co	1258.7	38.0	1220.7	35.0	1223.7	38.0	1220.7	Y
B-9	2021	Mathy Construction Co	1253.7	42.0	1211.7	38.0	1215.7	42.0	1211.7	Y
B-11	2021	Mathy Construction Co	1253.9	17.0	1236.9	11.0	1242.9	17.0	1236.9	Y
B-12	2021	Mathy Construction Co	1259.9	47.0	1212.9	35.0	1224.9	47.0	1212.9	Y
B-13	2021	Mathy Construction Co	1258.2	43.0	1215.2	37.0	1221.2	43.0	1215.2	Y
B-14	2021	Mathy Construction Co	1257.3	49.0	1208.3	40.0	1217.3	49.0	1208.3	Y

Notes:

- NA - Information not available.
- (1) - If boring log isn't available but weathered and competent bedrock elevations are present. The elevations were taken from previously submitted site figures.
- NE - Not encountered.
- * - Only page 1 of the soil boring log is available.

Table 2
Existing Monitoring Wells and Piezometers for Landfill Property
Vernon County Landfill

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NGVD)	Top of Casing Elevation (feet NGVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NGVD)	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	Water Table	dolomite, hard
108	MW-5	2/17/1988	1223.3	1225.32	150.6	10.0	1072.7 - 1082.7	Piezometer	dolomite, hard
119	MW-14Z	3/7/2003	1247.5	1250.22	210.8	5.0	1036.7 - 1041.7	Piezometer	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	Piezometer	fractured dolomite and sandy dolomite
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	dolomite, hard
107	MW-4P	1/29/1988	1232.9	1235.19	95.0	10.0	1137.9 - 1147.9	Water Table	dolomite, hard
106	MW-4	1/28/1988	1233.2	1235.01	154.0	10.0	1079.2 - 1089.2	Piezometer	dolomite, hard, several crevices present
110	MW-6	2/20/1988	1233.0	1235.37	202.2	5.0	1030.8 - 1035.8	Piezometer	sandy dolomite
114	MW-10	9/15/1989	1215.6	1217.52	183.5	5.0	1032.1 - 1037.1	Piezometer	dolomitic sandstone to sandy dolomite
115	MW-11	9/29/1989	1216.4	1218.56	162.5	15.0	1053.9 - 1068.9	Piezometer	sandy dolomite to dolomitic sandstone
116	MW-12	9/22/1989	1216.4	1218.36	98.5	15.0	1117.9 - 1132.9	Water Table	dolomite with occasional small vugs
Monitoring Wells and Piezometers Outside 300-feet									
102	MW-1P	12/30/1987	1236.4	1238.41	111.1	10.0	1125.3 - 1135.3	Piezometer	dolomite, hard
101	MW-1	12/30/1987	1236.4	1238.11	158.0	10.0	1078.4 - 1088.4	Piezometer	dolomite, hard
121	MW-1PR	1/12/1994	1245.0	1247.61	127.7	15.0	1117.3 - 1132.3	Water Table	sandy dolomite to dolomitic sandstone
120	MW-1R	1/12/1994	1244.6	1247.25	164.6	15.0	1080.0 - 1095.0	Piezometer	dolomite, hard
123	MW-1RZ	3/12/2003	1244.0	1245.45	186.5	5.0	1057.5 - 1062.5	Piezometer	sandy dolomite to dolomitic sandstone
104	MW-2P	1/17/1988	1252.5	1254.88	124.8	10.0	1127.7 - 1137.7	Water Table	dolomite, hard, with occasional soft zones
103	MW-2	1/17/1988	1252.5	1254.35	174.6	10.0	1077.9 - 1087.9	Piezometer	dolomite, hard, with occasional soft zones
111	MW-7	11/7/1989	1255.7	1258.03	234.5	5.0	1021.2 - 1026.2	Piezometer	coring ended at 209 feet, no description
112	MW-8R	11/13/1989	1256.1	1258.84	202.5	15.0	1053.6 - 1068.6	Piezometer	sandy dolomite with sandstone interbeds
113	MW-9	8/29/1989	1255.4	1257.50	126.8	15.0	1128.6 - 1143.6	Water Table	dolomite with occasional small vugs
117	MW-13P	2/26/2003	1224.5	1227.42	102.4	15.0	1122.1 - 1137.1	Water Table	dolomite with occasional small vugs

Notes:

NA - Information not available.

Table 3
Page 1 of 2
Existing Soil Laboratory Analysis for Landfill Property
Vernon County Landfill

Boring ID	Sample No.	Sample Depth (feet bgs)	USCS Class	Grain-size Distribution					Atterberg Limits			Coefficient of Permeability (cm/sec)	Density (pcf)
				Percent Gravel	Percent Sand	Percent Passing No. 200 Sieve	Percent Silt	Percent Clay	Liquid Limit	Plastic Limit	Plasticity Index		
Loess													
MW-1RZ	S-1	3-6	CL	0.0	2.1	97.9	75.3	22.6	34.6	18.7	15.9	--	--
MW-7	S-4	4-5	CL	0.0	1.0	99.0	73.0	26.0	--	--	--	--	--
TB-1	1	2-5	CL	0.0	3.1	96.9	76.9	20.0	31.5	--	8.6	2.44E-07	--
TP-7	S1-7	1.5-2	CL	0.0	0.5	99.5	71.5	28.0	--	--	--	--	--
TB-7	--	2.5-16	CL	--	--	--	78.0	22.0	32.3	--	12.2	--	--
TB-8	--	2-6.5	CL	--	--	--	74.0	26.0	37.8	--	14.5	--	--
TB-9	--	1.5-9	CL	--	--	--	76.0	24.0	25.4	--	8.1	--	--
TB-10	S-2	3-4	CL	0.0	1.4	98.6	72.6	26.0	--	--	--	--	--
TP-8	1	3-4	CL	--	--	98.3	73.3	25.0	39.6	--	16.8	--	116.9
TP-10	1	2-3	CL	--	--	98.7	70.7	27.0	40.0	--	18.1	--	--
TP-11	1	1-2	CL	--	--	94.5	67.5	27.0	39.5	--	16.6	--	--
TP-15	1	1-2	CL	--	--	99.6	72.6	27.0	41.4	--	16.3	--	--
TP-15	2	3-4	CL	--	--	99.6	77.6	22.0	38.3	--	17.0	--	--
TP-20	1	2-3	CL	--	--	99.8	73.8	26.0	36.3	--	15.1	--	--
TP-20	2	4-5	CL	--	--	99.7	72.7	27.0	41.5	--	18.2	--	--
TP-20	3	8-9	CL	--	--	99.7	83.7	16.0	36.5	--	15.1	--	--
TP-21	1	2-3	CL	--	--	99.7	69.7	30.0	41.3	--	19.3	--	--
TP-21	2	6-7	CL	--	--	99.6	71.6	28.0	37.4	--	15.4	--	--
TP-22	1	3-4	CL	--	--	99.8	80.8	19.0	38.8	--	15.6	--	--
TP-25	1	1.5-2.5	CL	--	--	98.0	73.0	25.0	38.3	--	15.5	--	--
TP-27	1	1.5-2.5	CL	--	--	99.0	72.0	27.0	40.5	--	17.6	--	--
TP-C	1	3-3.5	CL	--	--	99.5	73.5	26.0	35.0	--	15.0	--	--
TP-C	2	5-6	CL	--	--	99.0	69.0	30.0	43.8	--	20.8	--	--
TP-D	1	3-4	CL	--	--	98.9	74.9	24.0	41.1	--	16.2	--	--
Average				0.0	1.6	98.8	73.9	25.0	37.7	18.7	15.6	2.44E-07	116.9
Minimum				0.0	0.5	94.5	67.5	16.0	25.4	18.7	8.1	2.44E-07	116.9
Maximum				0.0	3.1	99.8	83.7	30.0	43.8	18.7	20.8	2.44E-07	116.9
Fine-grained Residuum													
MW-1RZ	S-7	71-73	CH	13.4	26.3	60.3	32.9	27.4	71.3	30.4	40.9	--	--
MW-7	S-16	14-15	CH	2.4	23.4	74.2	30.2	44.0	--	--	--	--	--
MW-14Z	S-1	48-50	CH	0.9	3.4	95.7	39.7	56.0	91.2	36.2	55.0	--	--
MW-14Z	S-2	66	CL	0.6	29.9	69.5	48.1	21.4	32.4	16.5	15.9	--	--
TB-1	4	9.5-10.5	CL	--	--	--	58.0	42.0	51.8	--	35.2	--	--
TB-3	2 & 3	1.5-6.0	CL	--	--	--	58.0	42.0	47.1	--	27.9	2.34E-08	--
TB-3	--	8.5-13	CL	4.0	37.3	58.7	6.7	52.0	48.5	--	29.8	--	--
TB-4	2	2-4	CL	--	--	--	50.0	50.0	53.4	--	33.8	--	--
TB-5	--	2-7.5	CL	--	--	--	31.0	69.0	55.3	--	32.2	1.13E-06	--
TB-6	5 to 7	8-13.5	CL	--	--	--	53.0	47.0	--	--	--	--	--
TB-10	S-4	14-16	CH	0.0	18.4	81.6	27.6	54.0	--	--	--	--	--
TB-11	S-2	5-6	CL	0.0	14.3	85.7	60.7	25.0	--	--	--	--	--
TB-11	S-5	20-21	CH	0.8	16.6	82.7	44.8	37.9	--	--	--	--	--
TP-7	2	3-4.5	CL	--	--	88.6	62.6	26.0	35.0	--	15.2	--	--
TP-7	3	6-8	CH	--	--	78.5	28.5	50.0	56.0	--	29.9	--	--
TP-8	2	5-5.5	CL	--	--	52.8	26.8	26.0	42.3	--	23.5	--	--
TP-8	3	6-7	CH	--	--	95.3	70.3	25.0	54.8	--	29.4	--	--
TP-10	2	6-7	CL	--	--	43.5	14.5	29.0	48.9	--	24.3	--	--
TP-10	3	9-10	PT	--	--	96.9	28.9	68.0	113.5	--	56.4	--	--
TP-11	2	3.5-4	CL	--	--	73.6	31.6	42.0	47.8	--	25.9	--	--
TP-20	4	10-11	CL	--	--	61.2	22.2	39.0	45.0	--	23.3	--	--
TP-21	3	8-9	CH	--	--	59.8	27.8	32.0	55.5	--	30.8	--	--
TP-22	3	9-10	CL	--	--	73.4	37.4	36.0	49.5	--	23.6	--	--
TP-23	1	6.5-10	CL	--	--	--	--	--	--	--	--	--	113.5
TP-25	2	4-5	CH	--	--	78.9	21.9	57.0	63.6	--	35.7	--	--
TP-27	2	4-5	CH	--	--	84.0	34.0	50.0	65.0	--	32.6	--	--
TP-A	1	4-5	CH	--	--	91.5	37.5	54.0	62.8	--	32.4	--	--
TP-A	2	7-8	CH	--	--	78.6	28.6	50.0	58.2	--	31.0	--	--
TP-B	1	3-4	CL	--	--	96.4	62.4	34.0	38.9	--	16.4	--	--
TP-B	2	5-6	CL	--	--	73.1	34.1	39.0	45.3	--	22.7	--	--
TP-B	3	8-9	CH	--	--	84.8	15.8	69.0	63.5	--	32.5	--	--
TP-C	3	7-8	CL	--	--	60.9	18.9	42.0	54.2	--	28.7	--	--
Average				2.8	21.2	76.2	36.9	43.1	55.8	27.7	30.2	5.77E-07	113.5
Minimum				0.0	3.4	43.5	6.7	21.4	32.4	16.5	15.2	2.34E-08	113.5
Maximum				13.4	37.3	96.9	70.3	69.0	113.5	36.2	56.4	1.13E-06	113.5

Table 3
Page 2 of 2
Existing Soil Laboratory Analysis for Landfill Property
Vernon County Landfill

Boring ID	Sample No.	Sample Depth (feet bgs)	USCS Class	Grain-size Distribution					Atterberg Limits			Coefficient of Permeability (cm/sec)	Density (pcf)
				Percent Gravel	Percent Sand	Percent Passing No. 200 Sieve	Percent Silt	Percent Clay	Liquid Limit	Plastic Limit	Plasticity Index		
Coarse-grained Residuum													
MW-1RZ	S-2	13-15	SC	1.1	65.0	33.9	19.4	14.4	24.1	10.7	13.4	--	--
MW-1RZ	S-3	15-20	SM	0.0	77.4	22.6	--	--	--	--	--	--	--
MW-1RZ	S-4	33-34	SM	10.2	68.0	21.8	--	--	--	--	--	--	--
MW-1RZ	S-5	49-50	SC	6.9	57.9	35.2	17.3	18.0	40.1	17.6	22.5	--	--
MW-1RZ	S-6	58-60	GM	49.6	30.7	19.7	10.6	9.1	--	--	--	--	--
MW-1RZ	S-8	76-78	SM	2.3	51.4	46.3	--	--	--	--	--	--	--
MW-1RZ	S-9	86-88	SP-SM	0.9	87.8	11.3	--	--	--	--	--	--	--
MW-1RZ	S-10	88-90	SP-SM	67.7	21.1	11.2	--	--	--	--	--	--	--
MW-14Z	S-3	76-78	SM	12.5	66.8	20.7	--	--	--	--	--	--	--
TB-1	5	10.5-12	SC	0.0	55.4	44.6	--	--	--	--	--	--	--
TB-1	--	12-13	SC	0.0	50.6	49.4	--	--	--	--	--	--	--
TB-4	--	7-8	SC	6.7	74.5	18.8	--	--	--	--	--	--	--
TB-5	--	7.5-10	SC	0.2	63.2	36.6	--	--	--	--	--	--	--
TB-8	--	6.5-12	SC	0.5	81.3	18.2	9.2	9.0	--	--	--	1.35E-02	--
TB-8	--	14-22	SC	10.2	51.9	37.9	--	--	--	--	--	2.96E-07	--
TB-9	--	10-22	SM	1.7	86.2	12.1	--	--	--	--	--	--	--
TP-11	3	6-7	SC	--	--	33.6	--	--	--	--	--	--	--
TP-15	3	8-9	SC	--	--	29.1	--	--	--	--	--	--	--
TP-27	3	7-9	SC	--	--	32.2	--	--	--	--	--	--	--
Average				10.7	61.8	28.2	14.1	12.6	32.1	14.2	18.0	6.75E-03	--
Minimum				0.0	21.1	11.2	9.2	9.0	24.1	10.7	13.4	2.96E-07	--
Maximum				67.7	87.8	49.4	19.4	18.0	40.1	17.6	22.5	1.35E-02	--

Notes:

-- - Information not analysis or not available.

Table 4
Existing In-Field Hydraulic Conductivity for Landfill Property
Vernon County Landfill

Well Name	Geologic Description of Screened Interval	Method	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
Dolomite, hard, with occasional small vugs				
MW-3	dolomite, hard	Bower and Rice	1.67E-03	4.73
MW-4P	dolomite, hard	Bower and Rice	5.93E-03	16.82
MW-9	dolomite with occasional small vugs	Bower and Rice	1.18E-02	33.54
MW-12	dolomite with occasional small vugs	Bower and Rice	1.27E-02	36.04
MW-13P	dolomite with occasional small vugs	Bower and Rice	3.28E-03	9.29
Average			7.09E-03	20.08
Geometric Mean			5.47E-03	15.50
Minimum			1.67E-03	4.73
Maximum			1.27E-02	36.04
Sandy Dolomite to Dolomitic sandstone				
MW-1PR	sandy dolomite to dolomitic sandstone	Bower and Rice	5.97E-03	16.93
MW-1RZ	sandy dolomite to dolomitic sandstone	Bower and Rice	3.07E-02	87.11
MW-6	sandy dolomite	Bower and Rice	1.59E-03	4.51
MW-7	NA	Bower and Rice	1.05E-02	29.81
MW-8R	sandy dolomite with sandstone interbeds	Bower and Rice	3.19E-03	9.05
MW-10	dolomitic sandstone to sandy dolomite	Bower and Rice	2.01E-03	5.71
MW-11	sandy dolomite to dolomitic sandstone	Bower and Rice	2.19E-04	0.62
MW-14	fractured dolomite and sandy dolomite	Bower and Rice	1.39E-02	39.48
MW-14Z	silty dolomitic sandstone	Bower and Rice	1.18E-03	3.34
Average			7.70E-03	21.84
Geometric Mean			3.46E-03	9.81
Minimum			2.19E-04	0.62
Maximum			3.07E-02	87.11

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
Existing Static Water Elevations for Landfill Property (2016-2020)
Vernon County Landfill

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NGVD)	Top of Casing Elevation (feet NGVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NGVD)	Static Water Elevation by Date (feet NGVD)									
								Mar-16	Sep-16	Mar-17	Sep-17	Mar-18	Sep-18	Mar-19	Sep-19	Mar-20	Sep-20
102	MW-1P	12/30/1987	1236.4	1238.41	111.1	10.0	1125.3 - 1135.3	1131.09	1131.86	1132.15	1133.05	1132.01	1132.07	1132.55	1133.01	1132.6	1132.56
101	MW-1	12/30/1987	1236.4	1238.11	158.0	10.0	1078.4 - 1088.4	1088.95	1095.63	1100.57	1107.15	1098.79	1099.2	1103.13	1104.78	1103.09	1102.14
121	MW-1PR	1/12/1994	1245.0	1247.61	127.7	15.0	1117.3 - 1132.3	1134.06	1134.87	1135.22	1135.73	1134.86	1134.79	1135.15	1135.67	1135.4	1135.22
120	MW-1R	1/12/1994	1244.6	1247.25	164.6	15.0	1080.0 - 1095.0	1089.06	1095.71	1100.58	1107.05	1098.69	1099.14	1103.04	1104.59	1102.97	1102.03
123	MW-1RZ	3/12/2003	1244.0	1245.45	186.5	5.0	1057.5 - 1062.5	1088.58	1095.21	1100.11	1106.59	1098.3	1098.75	1102.6	1104.2	1102.54	1101.58
104	MW-2P	1/17/1988	1252.5	1254.88	124.8	10.0	1127.7 - 1137.7	1139.56	1140.67	1140.63	1141.67	1139.82	1140.34	1140.64	1141.85	1141.03	1140.76
103	MW-2	1/17/1988	1252.5	1254.35	174.6	10.0	1077.9 - 1087.9	1086.00	1090.11	1092.13	1098.43	1092.72	1092.53	1095.31	1096.67	1095.32	1094.86
105	MW-3	2/2/1988	1233.0	1235.25	180.0	5.0	1053.0 - 1058.0	1067.67	1072.73	1077.01	1083.01	1077.49	1077.22	1080.8	1082.59	1080.42	1080.22
107	MW-4P	1/29/1988	1232.9	1235.19	95.0	10.0	1137.9 - 1147.9	1149.36	1151.22	1151.54	1152.88	1149.04	1150.85	1151.66	1153.37	1150.88	1151.96
106	MW-4	1/28/1988	1233.2	1235.01	154.0	10.0	1079.2 - 1089.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
109	MW-5A	11/8/1989	1224.0	1225.81	103.3	15.0	1120.7 - 1135.7	1135.38	1136.48	1136.96	1139.3	1136.26	1136.54	1137.88	1139.73	1137.72	1138.27
108	MW-5	2/17/1988	1223.3	1225.32	150.6	10.0	1072.7 - 1082.7	1081.68	1083.57	1084.46	1087.71	1083.51	1083.69	1086.30	1087.23	1085.93	1086.23
110	MW-6	2/20/1988	1233.0	1235.37	202.2	5.0	1030.8 - 1035.8	1063.61	1068.35	1071.36	1076.13	1070.54	1071.89	1073.9	1075.63	1073.88	1073.53
111	MW-7	11/7/1989	1255.7	1258.03	234.5	5.0	1021.2 - 1026.2	1069.09	1074.14	1076.77	1081.39	1076.09	1077.19	1079.32	1080.77	1079.32	1078.89
112	MW-8R	11/13/1989	1256.1	1258.84	202.5	15.0	1053.6 - 1068.6	1074.86	1080.1	1084.4	1089.58	1084.56	1084.3	1087.91	1088.96	1087.42	1086.93
113	MW-9	8/29/1989	1255.4	1257.50	126.8	15.0	1128.6 - 1143.6	1139.69	1140.63	1140.73	1142.15	1140.24	1140.36	1141.06	1142.21	1140.92	1141.14
114	MW-10	9/15/1989	1215.6	1217.52	183.5	5.0	1032.1 - 1037.1	1080.59	1087.69	1093.68	1101.39	1092.78	1092.99	1097.75	1099.58	1098.09	1096.89
115	MW-11	9/29/1989	1216.4	1218.56	162.5	15.0	1053.9 - 1068.9	1088.05	1090.48	1098.93	1106.85	1097.89	1095.62	1102.91	1104.98	1100.85	1102.01
116	MW-12	9/22/1989	1216.4	1218.36	98.5	15.0	1117.9 - 1132.9	1132.59	1132.04	1133.75	1133.32	1130.62	1131.75	1132.41	1134.17	1132.29	1132.13
117	MW-13P	2/26/2003	1224.5	1227.42	102.4	15.0	1122.1 - 1137.1	1133.48	1134.13	1134.48	1135.01	1134.05	1134.08	1134.44	1134.98	1134.6	1134.56
118	MW-14	3/12/2003	1247.5	1249.69	186.1	15.0	1061.4 - 1076.4	1070.95	1077.48	1082.63	1088.25	1083.05	1082.42	1086.86	1087.89	1086.34	1086.00
119	MW-14Z	3/7/2003	1247.5	1250.22	210.8	5.0	1036.7 - 1041.7	1069.64	1073.9	1079.81	1085.48	1080.29	1078.48	1083.98	1082.36	1082.78	1083.11

Notes:

- NA - Information not available.
- NM - Not measured.

Table 6
Proposed Soil Borings for Landfill Expansion
Vernon County Landfill

Proposed Soil Boring	Approximate Coordinates		Existing Grade Elevation (feet NGVD)	Estimated Information			Proposed Information			
	Northing	Easting		Weathered Bedrock Elevation (feet NGVD)	Competent Bedrock Elevation (feet NGVD)	Water Table Elevation (feet NGVD)	Subbase Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Basis for Proposed Soil Boring Depth
MW-14WT	1362.5	1697.8	1243.8	1220	1160	1160	outside	94	1150	10 feet below the water table elevation
MW-15WT	974.5	1860.0	1219.3	1210	1181	1139	outside	90	1129	10 feet below the water table elevation
MW-16	546.6	1887.2	1179.2	1179	1172	1134	outside	85	1094	40 feet below the water table elevation
MW-17WT	306.0	1907.4	1199.9	1180	1162	1132	outside	78	1122	10 feet below the water table elevation
B-18	1128.2	1690.6	1239.0	1211	1174	1145	1239	25	1214	25 feet below subbase elevation
B-19	994.5	1690.3	1233.1	1205	1185	1140	1234	24	1209	25 feet below subbase elevation
B-20	679.5	1733.8	1215.1	1196	1180	1136	1219	21	1194	25 feet below subbase elevation
B-21	468.4	1612.9	1226.5	1191	1171	1134	1221	30	1196	25 feet below subbase elevation

Notes:

- Actual boring locations and depths may change due to field conditions.

Table 7
Proposed Monitoring Wells and Piezometers for Landfill Expansion
Vernon County Landfill

Proposed Well/ Piezometer	Approximate Coordinates		Existing Grade Elevation (feet NGVD)	Estimated Information			Proposed Information			
	Northing	Easting		Weathered Bedrock Elevation (feet NGVD)	Competent Bedrock Elevation (feet NGVD)	Water Table Elevation (feet bgs)	Soil Boring Depth (feet bgs)	Screen Length (feet)	Screened Elevation (feet NGVD)	Basis for Proposed Well Depth
MW-14WT	1362.5	1697.8	1243.8	1220	1160	1160	94	10.0	1153.0 - 1163.0	7 feet below the water table elevation
MW-15WT	974.5	1860.0	1219.3	1210	1181	1139	90	10.0	1132.0 - 1142.0	7 feet below the water table elevation
MW-16WT	546.6	1887.2	1179.2	1179	1172	1134	55	10.0	1127.0 - 1137.0	7 feet below the water table elevation
MW-16	546.6	1887.2	1179.2	1195	1172	1134	85	5.0	1117.2 - 1122.2	20 feet below bottom of MW-16WT
MW-17WT	306.0	1907.4	1199.9	1180	1162	1132	78	10.0	1125.0 - 1135.0	7 feet below the water table elevation

Notes:

- Actual boring locations and depths may change due to field conditions.

Figures

Figure 1 – General Site Map

Figure 2 – Expansion Area Existing Conditions and Site Map

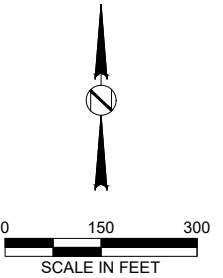
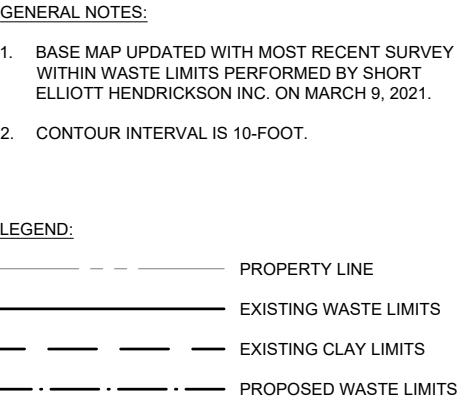
Figure 3 – Preliminary Subbase Grades and Conceptual Grading Plan

Figure 4 – Weathered Bedrock Contour Map

Figure 5 – Competent Bedrock Contour Map

Figure 6 – Water Table Contour Map

Figure 7 – Proposed Soil Borings, Wells, and Piezometer Locations



	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW				
NO	DATE	BY	REMARKS	NO	DATE	BY	REMARKS
REVISIONS				REVISIONS			

DESIGNED TTR	CHECKED DRH
DRAWN TTR	CHECKED MGN
DATE 12/09/2021	APPROVED DRH

PLANS PREPARED BY:

 329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:
VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO
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SEH PROJECT NO
VERSW 157634
FILE NAME
VC157634FIG1

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

GENERAL SITE MAP

FIG 1

1 OF 7

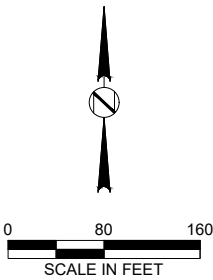
X:\UZV\VERSW\157634\15-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIVIL\TERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634FIG2.DWG



1. BASE MAP UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. CONTOUR INTERVAL IS 2-FOOT.

LEGEND:

- | | |
|--|------------------------------------|
|  | EXISTING WASTE LIMITS |
|  | EXISTING CLAY LIMITS |
|  | PROPOSED WASTE LIMITS |
|  | 150-FOOT DESIGN
MANAGEMENT ZONE |
|  | 300-FOOT WELL
SET BACK BOUNDARY |
| 
MW-2 | MONITORING WELL |
| 
TP-A | TEST PIT |
| 
TB-2 | TEST BORING |
| 
AB-21 | ALTERNATIVE BORING |
| 
B-6 | SOIL BORING |



	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW				
NO.	DATE	BY	REMARKS	NO.	DATE	BY	REMARKS
REVISIONS				REVISIONS			

DESIGNED TTR	CHECKED DRH
DRAWN TTR	CHECKED MGN
DATE 12/09/2021	APPROVED DRH

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VIROQUA, WISCONSIN

PROJECT/CONTRACT NO
VERNON COUNTY
SEH PROJECT NO
VERSW 157634
FILE NAME
VC157634FIG2

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

**EXPANSION AREA EXISTING CONDITIONS AND SITE
MAP**

FIG 2

2 OF 7

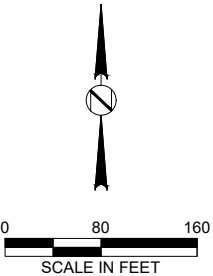
X:\UZ\VERSW157634\5-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIVIL\TERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634\FIG3.DWG



1. CONTOUR INTERVAL IS 2-FOOT.
2. EXISTING CONTOURS UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
3. PROPOSED CONTOURS WITHIN WASTE LIMITS REPRESENT PROPOSED CLAY SUB-BASE ELEVATIONS.
4. PROPOSED CONTOURS OUTSIDE WASTE LIMITS REPRESENT CONCEPTUAL SITE GRADING.

LEGEND:

-
- EXISTING WASTE LIMITS
 PROPOSED WASTE LIMITS
 820 EXISTING MAJOR CONTOUR
 EXISTING MINOR CONTOUR
 820 PROPOSED MAJOR CONTOUR
 PROPOSED MINOR CONTOUR



	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW				
Nº	DATE	BY	REMARKS	Nº	DATE	BY	REMARKS
REVISIONS				REVISIONS			

DESIGNED TTR	CHECKED DRH
DRAWN TTR	CHECKED MGN
DATE 12/09/2021	APPROVED DRH

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53705 CTH LF
VIROQUA, WISCONSIN

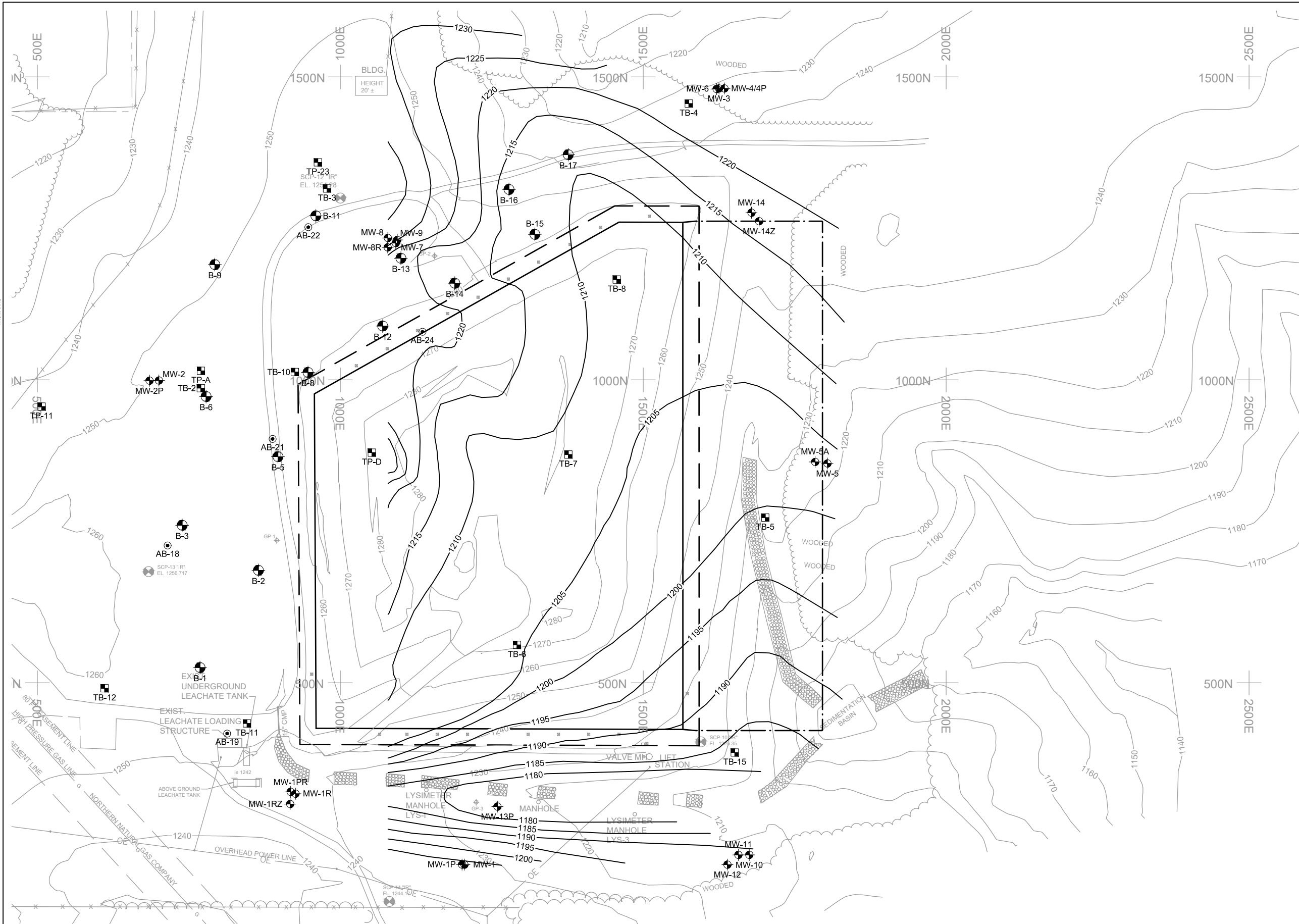
PROJECT/CONTRACT NO
VERNON COUNTY
SEH PROJECT NO
VERSW 157634
FILE NAME
VC157634FIG3

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

**PRELIMINARY SUBBASE GRADE
CONCEPTUAL GRADING PLAN**

FIG 3

3 OF 7



GENERAL NOTES:

1. EXISTING GRADE CONTOURS SHOWN IN 10-FOOT INTERVALS FOR CLARITY. CONTOURS UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. PROPOSED CONTOURS REPRESENT TOP OF WEATHERED BEDROCK SHOWN IN 5-FOOT INTERVALS.
3. WEATHERED BEDROCK SURFACE ESTIMATED FROM NON-ROTOSONIC BORING LOG INFORMATION AND FIELD GEOLOGIST INTERPRETATIONS.
4. WEATHERED BEDROCK SURFACE IS DEPICTING WHERE THE RESIDUUM IS BECOMING COARSER AND HIGH PERCENTAGES OF DOLOMITE FRAGMENTS ARE PRESENT.

LEGEND:

- | | |
|---|-------------------------------------|
|  | EXISTING WASTE LIMITS |
|  | PROPOSED WASTE LIMITS |
|  | 820 EXISTING MAJOR CONTOUR |
| | 820 WEATHERED BEDROCK MAJOR CONTOUR |
|  | MONITORING WELL |
| MW-2 | |
|  | TEST PIT |
| TP-A | |
|  | TEST BORING |
| TB-2 | |
|  | ALTERNATIVE BORING |
| AB-21 | |
|  | SOIL BORING |
| SB-6 | |

[illegible]

DESIGNED TTR	CHECKED DRH
DRAWN TTR	CHECKED MGN
DATE 12/09/2021	APPROVED DRH

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53705 CTH LF
VIROQUA, WISCONSIN

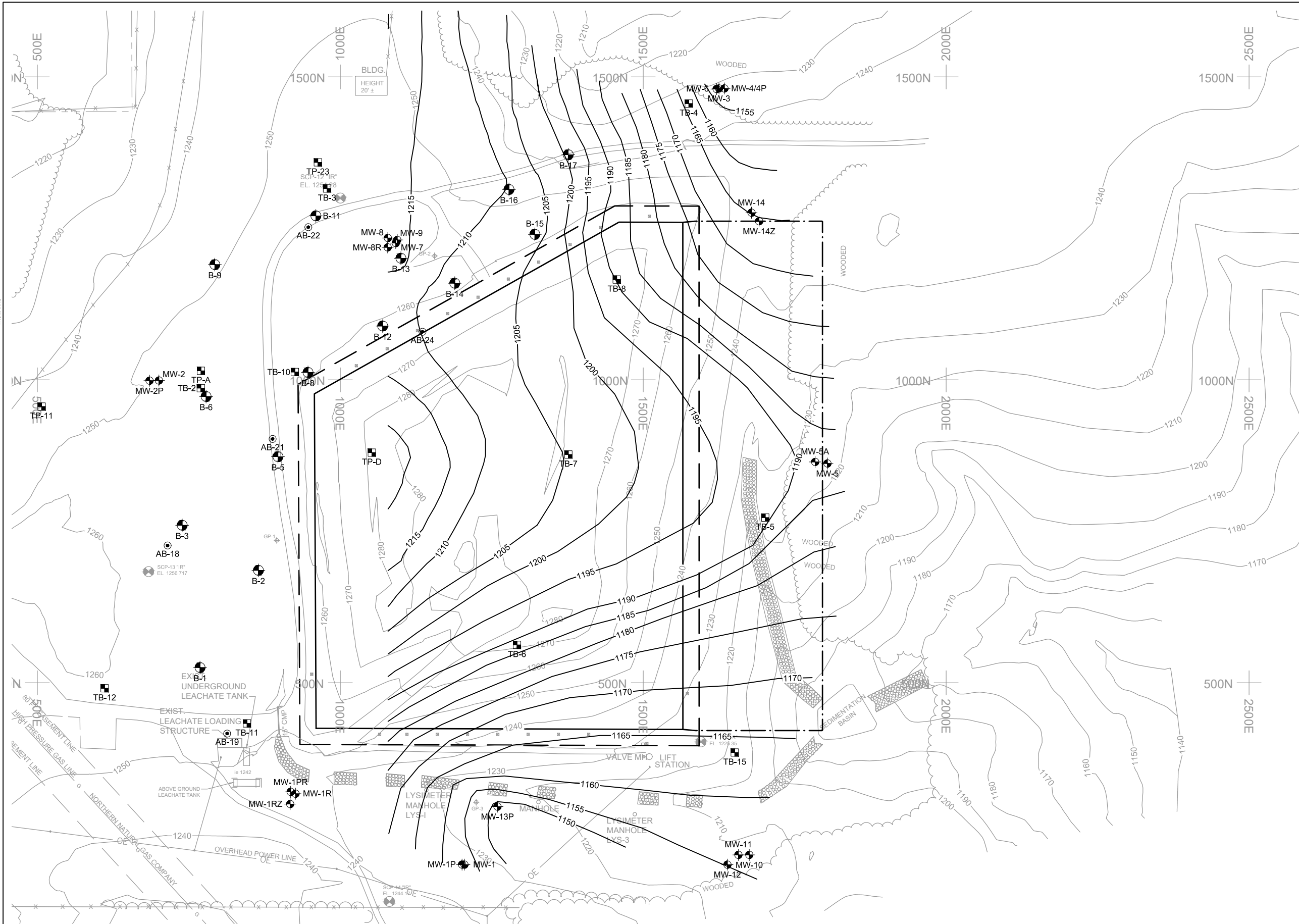
PROJECT/CONTRACT NO
VERNON COUNTY
SEH PROJECT NO
VERSW 157634
FILE NAME
VC157634FIG4

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

WEATHERED BEDROCK CONTOUR MAP

FIG 4

4 OF 7

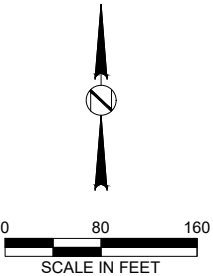


GENERAL NOTES:

1. EXISTING GRADE CONTOURS SHOWN IN 10-FOOT INTERVALS FOR CLARITY. CONTOURS UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. PROPOSED CONTOURS REPRESENT TOP OF COMPETENT BEDROCK SHOWN IN 5-FOOT INTERVALS.
3. COMPETENT BEDROCK SURFACE ESTIMATED FROM NON-ROTOSONIC BORING LOG INFORMATION AND FIELD GEOLOGIST INTERPRETATIONS.

LEGEND:

- | | |
|--|---------------------------------|
|  | EXISTING WASTE LIMITS |
|  | PROPOSED WASTE LIMITS |
|  | EXISTING MAJOR CONTOUR |
|  | COMPETENT BEDROCK MAJOR CONTOUR |
| 
MW-2 | MONITORING WELL |
| 
TP-A | TEST PIT |
| 
TB-2 | TEST BORING |
| 
AB-21 | ALTERNATIVE BORING |
| 
B-6 | SOIL BORING |



	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW				
NO	DATE	BY	REMARKS	NO	DATE	BY	REMARKS
REVISIONS				REVISIONS			

DESIGNED TTR	CHECKED DRH
DRAWN TTR	CHECKED MGN
DATE 12/09/2021	APPROVED DRH

PLANS PREPARED BY:

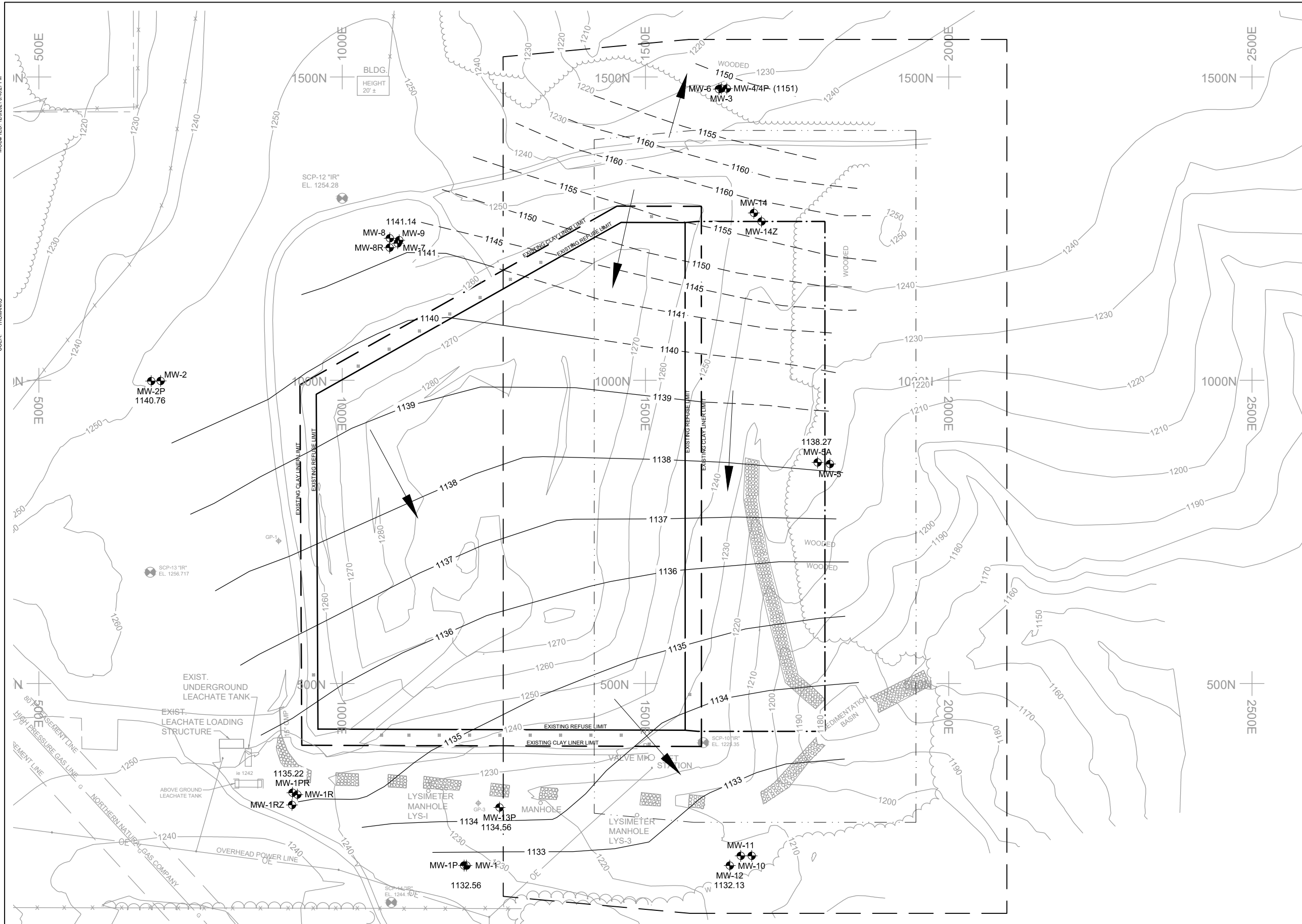
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FILE NAME
VC157634FIG5

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

COMPETENT BEDROCK CONTOUR MAP

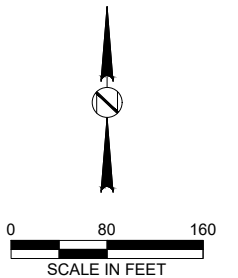


GENERAL NOTES:

1. EXISTING GRADE CONTOURS SHOWN IN 10-FOOT INTERVALS FOR CLARITY. CONTOURS WITHIN WASTE LIMITS UPDATED WITH MOST RECENT SURVEY PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. GROUNDWATER CONTOURS GENERATED FROM WATER TABLE MONITORING WELL READINGS FROM THE WDNR DATABASE IN SEPTEMBER, 2020.
3. STATIC WATER ELEVATIONS OBTAINED FROM MONITORING WELLS SCREENED AT OR NEAR THE WATER TABLE.

LEGEND:

- | | |
|--|----------------------------------|
|  | EXISTING WASTE LIMITS |
|  | PROPOSED WASTE LIMITS |
|  | 150' DESIGN MANAGEMENT ZONE |
|  | 300' WELL SETBACK BOUNDARY |
|  820 | EXISTING MAJOR CONTOUR |
|  | EXISTING MINOR CONTOUR |
|  820 | GROUNDWATER CONTOUR |
|  | GROUNDWATER CONTOUR (INFERRED) |
|  MW-2 | MONITORING WELL |
| 1138.27 | STATIC WATER ELEVATION |
| (1151) | ESTIMATED STATIC WATER ELEVATION |



	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW				
Nº	DATE	BY	REMARKS	Nº	DATE	BY	REMARKS
REVISIONS				REVISIONS			

DESIGNED	CHECKED
TTR	DRH
DRAWN	CHECKED
TTR	MGN
DATE	APPROVED
12/09/2021	DRH

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53705 CTH LF
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PROJECT/CONTRACT NO	VERNON COUNTY
SEH PROJECT NO	VERSW 157634
FILE NAME	VC157634FIG6

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

WATER TABLE CONTOUR MAP

FIG 6

X:\UZ\IVERSW\157634\5-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIVIL\TERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634\FIG7.DWG

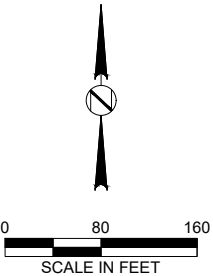


FIG 7

7 OF 7

Appendix A

Soil Boring Logs within 300-feet of Landfill Expansion

Soil Boring Logs within 300-feet of Landfill Expansion

BORING NO. MW-3

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	No Samples CORE RUN Obtained		CLASSIFICATION AND REMARKS Note: Logs based on drill cuttings.	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			Clay, Red					
			-20'				20	1213.0
			Dolomite, Broken Up With Several Crevices Between 70 and 80 ft. (1163.0 and 1153.0)				40	
			-80'				80	1153.0
			Dolomite, Hard				100	
							120	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED February 1, 1988

LOCATION Klahn Site, 14+81N 16+25E

GROUNDWTR 171.38 FT BELOW GS AT ELEV. OF 1061.62

DRILLERS Ace Well Drilling

JOB NO. 57786

DATE 12/21/88

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR 171.38 FT BELOW GS AT ELEV. OF 1061.62

DRILLERS

JOB NO. 57786

DATE 12/21/88

BORING NO. MW-4

CENTRAL WISCONSIN

SURFACE ELEV. 1232.9

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	No Samples CORE RUN Obtained	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM TO	Note: Logs based on drill cuttings.					
		Clay, Red					
		-20'				20	1212.9
		Dolomite, Broken With Several Small Crevices Between 70 and 80 ft. (1162.9 and 1152.9)				40	
		-80'				80	1152.90
		Dolomite, hard				100	
						120	

Note: Depth to Groundwater
refers to perched water.

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED January 28, 1988

LOCATION Klahn Site 14+81N, 16+34E

GROUNDWTR 87.41 FT BELOW GS AT ELEV. OF 1145.49

DRILLERS Ace Well Drilling

JOB NO. 57786

DATE 12/21/88

BORING NO. MW-4

CENTRAL WISCONSIN

SURFACE ELEV. 1232.9

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			Dolomite, Hard, With Several Crevices Between 145 and 150 ft. (1087.9 and 1082.9)					
			-----160'-----				160	1072.9
							180	
							200	
							220	
							50	
							55	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786

DATE

BORING NO. TB-4

CENTRAL WISCONSIN

SURFACE ELEV. 1232.9

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER A (140 lbs., 2" O.D.) H - FALLING 30") P			CLASSIFICATION AND REMARKS		M U N	U S C	GEOLOGY	D E P T H	ELEV. (ft.)
#	6"	6"	12"						
1	1	3		Clay, Brown, with Silt	10 YR 5/3	CL	LOESS		
	3	4							
2	3	4		Clay, Red-Brown to Brown, with Trace Sand and Gravel	5 YR 4/4	CL	RESIDUUM	2.5	1230.9
	8	11							
3	20	17			7.5 YR 4/6	CL		5	
	10	19							
4	18	15		Sand, Yellow, with Gravel, Clay	7.5 YR 7/6	SC		7.5	1225.9
	25	40							
5	12	11		Clay, Dark Brown, with Sand and Gravel	7.5 YR 3/4	CL			1224.9
	10	25							
6	2	5						10	
	5	6							
7	17	19		Weathered Dolomite	2.5 YR 8/6		WEATHERED DOLOMITE	12.5	1220.9
	19	20							
	27	80						15	1217.9
				15.0' E.O.B.					

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 28, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

BORING NO. TB-5

SURFACE ELEV. 1221.0

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER A (140 lbs., 2" O.D. M - FALLING 30") P # 6" 6" 12"			CLASSIFICATION AND REMARKS	M U N	U S C	GEOLOGY	D E P T H	ELEV. (ft.)
1	1	1	Silt, Brown, with Clay	10 YR		LOESS	-	
	2	2	-2.0'	4/3				1219.0
2	6	5	Clay, Red-Brown, with Trace	5 YR	CL	RESIDUUM	-	
	7	8	Sand and Gravel	4/4				
3	2	5		2.5 YR			5	
	8	10		3/4				
4	3	5	-7.5'					1213.5
	8	15	Sand, Red-Brown, with Clay and	5 YR	SC			
5	5	7	Occasional Gravel	5/8				
	13	15	-10.0'				10	1211.0
6	8	9	Clay, Red-Brown, with Sand	7.5 YR	CL			
	11	13	and Trace Gravel	4/6				
7	5	8		10 YR				
	11	13	-14.0'	7/8				1207.0
8	8	12	Clay, Red-Brown, with Dolomite	5 YR	CL		15	
	10	7	Fragments, Mottles (2.5 YR 2/0)	4/4				
9	10	12						
	18	34						
10	5	8						
	10	14		10 YR			20	
11	8	10		7/8				
	14	11	-22.0'					1199.0
12	32	36	Sand, with Dolomite Fragments	10 YR	SM	WEATHERED		
	27	57	and Silt	7/6		DOLOMITE		
13	32	100	-25.0'				25	1196.0
			E.O.B.					

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 27, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

BORING NO. TB-6

SURFACE ELEV. 1218.7

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER A (140 lbs., 2" O.D. M - FALLING 30") P			CLASSIFICATION AND REMARKS	M U N	U S C	GEOLOGY	D E P T H	ELEV. (ft.)
#	6"	6"	12"					
1	2	2						
			Clay, Brown, with Silt	10 YR	CL	LOESS	-	
	2	4	1.0'	4/3				1217.7
			Clay, Red-Brown, with Trace Sand	5 YR	CL	RESIDUUM	-	
2	3	6		3/2			2.5	
	7	14						
			4.0'					1214.7
3	4	5						
			Clay, Brown, with Trace Gravel	7.5 YR	CL			
	9	12		4/4			5	
			6.0'					1212.7
4	10	0						
			Clay, Red-Brown, with Sand and Occasional Gravel	5 YR	CL			
	10	12		4/4			7.5	
			8.0'					1210.7
5	5	5						
			Clay, Red-Brown, with Sand and Trace Gravel	5 YR	CL			
				3/3				
				5 YR				
				4/8			10	
6	9	21						
	7	10						
				2.5 YR				
				4/8				
7	18	19						
				7.5 YR			12.5	
				6/8				
			13.5'					1205.2
8	5	6				WEATHERED DOLOMITE		
			Weathered Dolomite (No Recovery)					
	7	11					15	
9	100							
			16.5'					1202.2
			E.O.B.					

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 26, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

BORING NO. TB-7

SURFACE ELEV. 1245.38

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER A (140 lbs., 2" O.D. M - FALLING 30") P # 6" 6" 12"				CLASSIFICATION AND REMARKS		M U N	U S C	GEOLOGY	D E P T H	ELEV. (ft.)
1	3	4		Clay, Brown, with Trace Sand and Silt		10 YR		LOESS	-	
	4	5				5/3	CL		-	
2	4	6				7.5 YR			-	
	10	10				4/4			-	
3	3	5				10 YR			5	
	6	6				3/3			-	
4	1	2							-	
	1	6				7.5 YR			-	
5	4	9				4/2			-	
	9	11		-----10.0'-----					10	1235.28
6	4	9		Clay, Red-Yellow, with Weathered Dolomite Fragments		5 YR		RESIDUUM	-	
	9	12				4/6			-	
7	9	11				7.5 YR			-	
	12	10				6/8			-	
8	8	9				5 YR			15	
	13	12		-----16.0'-----		4/3			-	1229.28
9	5	11		Clay, Brown, with Weathered Dolomite Fragments		10 YR	CL		-	
	16	19				6/4			-	
10	8	18				5 Y			-	
	30	24		-----21.0'-----		8/1			20	
11	10	26		Sand, Brown, with Clay		10 YR	SC		-	1224.28
	26	21				4/3			-	1223.28
12	8	9		Clay, Red-Brown		7.5 YR	CL		-	
	9	11				7/8			-	
13	8	9				5 YR			25	
	15	17				4/4			-	
14	6	7		Mottles (10 YR 8/6)		5 YR			-	
	7	10				5/8			-	
15	4	7				10 YR			-	
	19	16		-----31.0'-----		4/4			30	
16	9	62		Clay, Red-Brown, with Trace Gravel		7.5 YR			-	1214.28
	27	106				4/4	CL		-	
17	43	26				2.5 YR			-	
	14	18				4/6			-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 26, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786

DATE June 3, 1988

BORING NO. TB-8

SURFACE ELEV. 1249.42

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30")			CLASSIFICATION AND REMARKS	M U N	U S C	GEOLOGY	D E P T H	ELEV. (ft.)
#	6"	6"						
1	2	2	Silt, Brown, with Clay	10 YR	CL	LOESS	-	1242.92
	3	3		3/2			-	
2	5	7		7.5 YR			-	
	7	7	6.5'	4/4	SC	RESIDUUM	5	1242.92
3	3	5		2.5 YR			-	
	11	10		5/8			-	
4	5	8	Sand, Red, with Silt and Clay	7.5 YR	SC	RESIDUUM	-	1237.42
	12	14		7/8			10	
5	8	10		5 YR			-	
	13	11	12.0'	6/8	SC	RESIDUUM	-	1237.42
6	5	6		7.5 YR			-	
	7	8		7/8			-	
7	3	5	Weathered Dolomite, with Silt and Clay	7.5 YR	SC	RESIDUUM	-	1227.42
	10	24		4/8			15	
8	6	10		5 YR			-	
	15	24	Sand, Red-Brown, with Clay and Gravel	4/6	SC	RESIDUUM	-	1225.42
9	8	9		5 Y			20	
	16	17		6/2			-	
10	13	9	22.0'	5 YR	CL	CLAY	-	1225.42
	11	10		5/8			-	
11	3	5		12.5 YR			25	
	8	9	24.0'	4/6	SC	RESIDUUM	-	1221.42
12	9	10		10 YR			-	
	11	11		3/2			-	
13	5	10	28.0'	10 YR	SC	RESIDUUM	-	1221.42
	11	11		7/8			30	
14	15	9		5 YR			-	
	7	7	Sand, Lt. Brown, with Gravel	5/8	SC	RESIDUUM	-	1221.42
15	5	6		10 YR			-	
	11	18		8/3			-	
16	15	17					-	
	7	5					-	
17	11	5					-	
	13	9					-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 27 and 28, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

USC, = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR

FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786

DATE June 3, 1988

BORING NO. MW-5A

CENTRAL WISCONSIN

SURFACE ELEV. 1224.0

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER				CLASSIFICATION AND REMARKS	M U N	USC	GEOLOGY	D E P T H	ELEV. (ft.)	
A (140 lbs., 2" O.D. M - FALLING 30")	P									
#	6"	6"	12 "							
	4	3		0.5'						
1	6	9	15	Silt, Lt. Brown, With Clay	10 YR	ML	LOESS			
	7	7		3.0'	6/4				1221.0	
2	15	12	27	Clay, Red-Brown, With Sand	5YR	CL	RESIDUUM			
	8	8			4/6			5		
3	7	12	19	6.0'					1218.0	
	5	8			10 YR	SC				
4	12	14	26	Sand/Clay Mixture, Yellow to Red-Brown to Brown, With Dolomite Fragments and Silt	7/6					
	11	12			10 YR				1215.0	
5	9	12	21		6/6			10		
	4	8								
6	10	12	22		10 YR	SC				
	4	5			4/3					
7	10	13	23							
	6	9						15		
8	8	18	26		10 YR	SC			1208.5	
	19	35			4/4					
9	8	11	19	17.5'					1206.5	
	5	9		Weathered Dolomite With Silty Sand	10 YR		WEATHERED DOLOMITE			
10	15	41	56		7/2			20		
	50	-		20.5'					1203.5	
				No Samples: Rotary Drilling						
									25	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 23, 1989

LOCATION Klahn 8+64N 12+58E

GROUNDW 88.8 FT BELOW GS AT ELEV. OF 1135.18

DRILLERS Exploration Technology, Inc.

JOB NO. 703

DATE Jan. 3, 1990

BORING NO. MW-5

CENTRAL WISCONSIN

SURFACE ELEV. 1223.3

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	No Samples CORE RUN Obtained		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			Note: Logs based on drill cuttings.					
			Clay, Red					
			20'				20	1203.3
			Dolomite With Streaks of Clay					
			35'					1188.3
			Dolomite, Broken Up, With Crevices at:				40	
			43'-44' (1179.3-1180.3)					
			65'-67' (1156.3-1158.3)					
			87'-88' (1135.3-1136.3)				60	
			93'-94' (1129.3-1130.3)					
							80	
			102'				100	1121.3
			Dolomite, Hard					
							120	
			135'					1088.3

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

* = Well was dry on 12/21/88

PROJECT Vernon County Landfill

DATE(S) DRILLED February 16, 1988

LOCATION Klahn Site 8+62N, 18+04E

GROUNDWTR * FT BELOW GS AT ELEV. OF

DRILLERS Ace Well Drilling

JOB NO. 57786

DATE 12/21/88

RQD = ROCK QUALITY DESIGNATION

BORING NO. MW-6

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	No Samples CORE RUN Obtained		CLASSIFICATION AND REMARKS Note: Logs based on drill cuttings.	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			Clay, Red.					
			14'					1219.0
							20	
			Dolomite, Broken Up With Crevices At:					
			23'-25' (1208.0-1210.0)				40	
			28'-29' (1204.0-1205.0)					
							60	
			80'				80	1153.0
			Dolomite, Fairly Consistent					
							100	
							120	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED February 19, 1988

LOCATION Klahn Site, 14+80N, 16+21E

GROUNDWTR 174.15 FT BELOW GS AT ELEV. OF 1058.85

DRILLERS Ace Well Drilling

JOB NO. 57786

DATE 12/21/89

DATE _____

BORING NO. MW-10

CENTRAL WISCONSIN

SURFACE ELEV. 1215.6

ENGINEERS

Page 1 of 6

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER A (140 lbs., 2" O.D. M - FALLING 30") P #				CLASSIFICATION AND REMARKS		M U N	USC	GEOLOGY	D E P T H	ELEV. (ft.)
6"	6"	12"								
1	3	4		Topsoil Disturbed	10 YR			LOESS	-	
	6	7	13	0.5'	5/2				-	
2	5	6		Silt/Clay, Lt. Brown	10 YR		CL		-	
	13	16	29	4.5'	6/6				-	1211.1
3	6	6		Med. Sand, Red-Brown, With Some Clay	7.5YR		SC	RESIDUUM	5	
	7	11	18	7.0'	5/6				-	
4	4	6		Clay/Silt, Lt. Gray-Brown, With Pebbles @ 9.0'	10 YR		CL		-	1208.6
	10	13	23		7/1				-	
5	6	10		9.5'	7.5YR				-	
	12	20	32	Med. Sand, Red-Brown, With Some Clay	5/6				10	1206.1
6	7	9			7.5YR		SC		-	
	13	19	32		5/8				-	
	12	16							-	
7	24	25	49	14.5'					-	1201.1
	11	23							15	
8	18	19	37	Med. Sand, Tan to Brown, With Clay	10 YR		SC		-	
	5	22		18.0'	6/4				-	
9	29	20	49	Med. Sand, Yellow to Lt. Brown to Red-Brown, With Silt, Trace Clay	10 YR				-	1197.6
	10	15			7/8		SP-SM		20	
10	16	21	37		10 YR				-	
	10	15			6/4				-	
11	19	24	43						-	
	17	12							-	
12	11	12	23	24.5'					-	1191.1
	50	-	-	continued on page 2 of 6				WEATHERED DOLOMITE	25	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDW 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-10

CENTRAL WISCONSIN

SURFACE ELEV. 1215.6

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			No Samples - Poor Quality Dolomite w/Clay Residuum					

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE Jan. 5, 1990

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
1	61	66.5	61.0 Dolomite, With Occasional Small Vugs	18%	2.02	6.4%	65	1154.6
2	66.5	71.5		0%	-	-	70	
3	71.5	74.0	71.5 Poorly Consolidated Silty Sandstone	0%	-	0%	75	1144.1
4	76.5	80.0	74.0 Dolomite, With Occasional Small Vugs	75%	1.52	59%	80	1141.6
5	80	89		52%	3.2	17%	85	
6	89	99.5		100%	2.1	77%	90	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
7	99.5	106.8	100' Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds	90%	3.03	51.6%	100	1115.6
8	106.8	110.5	106.0 Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds	100%	1.1	100%	105	1109.6
9	110.5	120.5		100%	1.3	93%	115	
10	120.5	129.3		90%	1.3	80%	120	
							125	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
11	129.3	133		18%	6.0	0%		
			-----134-----					
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Numerous Small Vugs				135	1081.6
12	133	140.5		100%	2.3	63%		
			-----139.0-----					
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Few to No Vugs.				140	1076.6
13	140.5	150.5		100%	1.5	82%		
							145	
14	150.5	155.2		100%	0.9	96%		
							150	
15	155.2	157.5		100%	1.3	83%		
			-----155.5----- Dolomitic Sandstone, Brown				155	1060.1
			-----157.5-----					
			Sandy Dolomite With Occasional Sandstone and Gray-Green Shale Interbeds					1058.1
16	157.5	167		100%	1.7	73%		
							160	
			-----163.0-----					1052.6

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
17	167	177	Dolomitic Sandstone With Occasional Gray-Green Shale Interbeds -----167.0-----	100%	2.2	73%	170	1048.6
			Sandy Dolomite and Dolomitic Sandstone With Occasional Gray-Green Shale Interbeds -----172.5-----					1043.1
			Sandstone, Brown, Fine to Medium Grained With Occasional Cross Beds				175	
18	177	181	-----178.5-----	100%	2.0	79%		1037.1
			Dolomitic Sandstone With Some Sandy Dolomite -----181.0-----				180	1034.6
			E.O.B.				185	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR

FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN

ENGINEERS

Page 1 of 5

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E S	BLOWS ON SAMPLER			CLASSIFICATION AND REMARKS	M U N	USC	GEOLOGY	D E P T H	ELEV. (ft.)
	(140 lbs., 2" O.D. - FALLING 30")								
#	6"	6"	12"						
1	3	4		Topsoil Disturbed	10 YR		LOESS	-	
	6	7	13	-----0.5'-----	5/2			-	
2	5	6		Silt/Clay, Lt. Brown	10 YR	CL	RESIDUUM	-	
	13	16	29	-----4.5'-----	6/6			-	1211.1
3	6	6		Med. Sand, Red-Brown, With Some Clay	7.5YR	SC		5	
	7	11	18	-----7.0'-----	5/6			-	
4	4	6		Clay/Silt, Lt. Gray-Brown, With Pebbles @ 9.0'	10 YR	CL		-	1208.6
	10	13	23	-----9.5'-----	7/1			-	
5	6	10		Med. Sand, Red-Brown, With Some Clay	7.5YR		WEATHERED DOLOMITE	10	1206.1
	12	20	32	-----14.5'-----	5/6			-	
6	7	9		Med. Sand, Tan to Brown, With Clay	7.5YR	SC		-	
	13	19	32	-----18.0'-----	5/8			-	
7	12	16		Med. Sand, Yellow to Lt. Brown to Red-Brown, With Silt, Trace Clay	10 YR			-	1197.6
	24	25	49	-----24.5'-----	6/4			-	
8	11	23		continued on page 2 of 5				-	1191.1
	18	19	37					25	
9	5	22						-	
	29	20	49					-	
10	10	15						-	
	16	21	37					-	
11	10	15						-	
	19	24	43					-	
12	17	12						-	
	11	12	23					-	
	50	-	-					-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDWT 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			No Samples - Poor Quality Dolomite w/Clay Residium					

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE Jan. 5, 1990

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
1	61	66.5	61.0 Dolomite, With Occasional Small Vugs	18%	2.02	6.4%	65	1154.6
2	66.5	71.5		0%	-	-	70	1144.1
3	71.5	74.0	71.5 Poorly Consolidated Silty Sandstone	0%	-	0%	75	1141.6
4	76.5	80.0	74.0 Dolomite, With Occasional Small Vugs	75%	1.52	59%	80	
5	80	89		52%	3.2	17%	85	
6	89	99.5		100%	2.1	77%	90	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
7	99.5	106.8	-100'- Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds	90%	3.03	51.6%	100	1115.6
8	106.8	110.5	-106.0'- Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds	100%	1.1	100%	105	1109.6
9	110.5	120.5		100%	1.3	93%	110	
							115	
							120	
10	120.5	129.3		90%	1.3	80%	125	

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
11	129.3	133		18%	6.0	0%	-	
			-----134-----				-	1081.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Numerous Small Vugs				135	
12	133	140.5		100%	2.3	63%	-	
			-----139.0-----				-	1076.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Few to No Vugs.				140	
13	140.5	150.5		100%	1.5	82%	-	
							145	
							-	
							-	
							150	
14	150.5	155.2		100%	0.9	96%	-	
							-	
							-	
			-----155.5-----				155	
15	155.2	157.5	Dolomitic Sandstone, Brown	100%	1.3	83%	-	1060.1
			-----157.5-----				-	1058.1
			Sandy Dolomite With Occasional Sandstone and Gray-Green Shale Interbeds				160	
16	157.5	167		100%	1.7	73%	-	
			-----163.0-----				-	1052.6
			End of Boring - Set Well				-	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-12

CENTRAL WISCONSIN

SURFACE ELEV. 1216.4

ENGINEERS

Page 1 of 4

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	BLOWS ON SAMPLER			CLASSIFICATION AND REMARKS	M U N	USC	GEOLOGY	D E P T H	ELEV. (ft.)
A	(140 lbs., 2" O.D.								
M	- FALLING 30")								
P									
#	6"	6"	12 "						
	3	4		Topsoil Disturbed	10 YR		LOESS	-	
1	6	7	13	-----0.5'-----	5/2			-	
	5	6		Silt/Clay, Lt. Brown	10 YR	CL		-	
2	13	16	29	-----4.5'-----	6/6			-	1211.1
	6	6		Med. Sand, Red-Brown,	7.5YR	SC	RESIDUUM	5	
3	7	11	18	With Some Clay	5/6			-	
	4	6		-----7.0'-----	10 YR			-	1208.6
4	10	13	23	Clay/Silt, Lt. Gray-Brown,	7/1	CL		-	
	6	10		With Pebbles @ 9.0'	7.5YR			-	
5	12	20	32	-----9.5'-----	5/6			10	1206.1
	7	9		Med. Sand, Red-Brown,	7.5YR	SC		-	
6	13	19	32	With Some Clay	5/8			-	
	12	16		-----14.5'-----				-	1201.1
7	24	25	49					15	
	11	23		Med. Sand, Tan to Brown,	10 YR	SC		-	
8	18	19	37	With Clay	6/4			-	
	5	22		-----18.0'-----				-	1197.6
9	29	20	49	Med. Sand, Yellow to Lt. Brown	10 YR	SP-SM		20	
	10	15		to Red-Brown,	7/8			-	
10	16	21	37	With Silt, Trace Clay	10 YR			-	
	10	15		-----24.5'-----	6/4			-	1191.1
11	19	24	43					-	
	17	12		continued on page 2 of 4			WEATHERED DOLOMITE	25	
12	11	12	23					-	
	50	-	-					-	
								-	
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KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDW 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703

DATE Jan. 3, 1990

BORING NO. MW-12

CENTRAL WISCONSIN

SURFACE ELEV. 1216.4

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			No Samples - Poor Quality Dolomite w/Clay Residuum				-	
							-	
							-	
							-	
							30	
							-	
							-	
							-	
							35	
							-	
							-	
							-	
							40	
							-	
							-	
							45	
							-	
							-	
							50	
							-	
							-	
							55	
							-	
							-	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE Jan. 5, 1990

BORING NO. MW-12

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			-----61.0-----					1154.6
1	61	66.5	Dolomite, With Occasional Small Vugs	18%	2.02	6.4%	65	
2	66.5	71.5		0%	-	-	70	
			-----71.5-----					1144.1
3	71.5	74.0	Poorly Consolidated Silty Sandstone	0%	-	0%		
			-----74.0-----				75	1141.6
4	76.5	80.0	Dolomite, With Occasional Small Vugs	75%	1.52	59%		
5	80	89		52%	3.2	17%	85	
6	89	99.5		100%	2.1	77%	90	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. TB-15

SURFACE ELEV. 1193.5

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER A (140 lbs., 2" O.D.) M - FALLING 30") P # 6" 6" 12"				CLASSIFICATION AND REMARKS		M U N	USC	GEOLOGY	D E P T H	ELEV. (ft.)
1	4	8	26	Topsoil Disturbed 0.5'		10 YR 6/2				
2	6	12	49	Clay, Lt. Brown to Brown, With Silt 3.5'		10 YR 6/4	CL	LOESS		1190.0
3	14	14	28	Clay, Lt. Brown to Brown, with Dolomite Fragments and Occasional Sandy Layers		5 YR 4/4	CL	RESIDUUM	5	1185.5
4	8	9	17			7.5 YR 5/6	CL			
5	10	50	60						10	
6	14	13	27	Weathered Dolomite 11.5' 12.0' E.O.B.				WEATHERED DOLOMITE		1182.0 1181.5
									15	
									20	
									25	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 3+85N 16+51E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703

DATE Jan. 3, 1990

Facility/Project Name Vernon Co. Balefill			License/Permit/Monitoring Number 03268		Boring Number MW-14
Boring Drilled By (Firm name and name of crew chief) Traut Hydro Tech Daryl Karasch			Date Drilling Started 03/10/2003	Date Drilling Completed 03/12/2003	Drilling Method Versa Sonic
DNR Facility Well No. 118	WI Unique Well No. JX072	Common Well Name MW-14	Final Static Water Level 1066.87 Feet MSL	Surface Elevation 1247.5 Feet MSL	Borehole Diameter 7.0" inches
Boring Location State Plane N, E SW 1/4, SE 1/4, Sec. 15, T13N, R4E			Lat 43 / 35' / 49.49" Long 90 / 4.' / 14.85"		Local Grid Location (if applicable) 1275.90 Feet N 1678.68 Feet E

County Vernon	DNR 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	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					P 200	RdD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index			
			2 4 6 8 10 12 14 16 18 20 22	See Boring Log for MW-14Z											

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

Signature 	Firm Central Wisconsin Engineers & Architects
---	---

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

[illegible]

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[illegible]

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			186 188 190 192 194 196 198 200 202 204 206 208 210 212 214 216 218 220 222	E.O.B. @ 190'										

Facility/Project Name Vernon Co. Balefill			License/Permit/Monitoring Number 03268		Boring Number MW-14Z
Boring Drilled By (Firm name and name of crew chief) Traut Hydro Tech Daryl Karasch			Date Drilling Started 03/05/2003	Date Drilling Completed 03/07/2003	Drilling Method Versa Sonic
DNR Facility Well No. 119	WI Unique Well No. JX073	Common Well Name MW-14Z	Final Static Water Level 1067.07 Feet MSL	Surface Elevation 1247.5 Feet MSL	Borehole Diameter 7.0 inches
Boring Location State Plane N, E SW 1/4, SE 1/4, Sec. 15, T13N, R4E			Lat 43 / 35' / 49.49" Long 90 / 43' / 14.85"		Local Grid Location (if applicable) 1261.80 Feet N 1691.28 Feet E

County Vernon	DNR 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	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	10/10		2	Yellowish brown clayey silt, little sand	CL									
			4	(Loess)										
			6	Reddish brown sandy clayey silt	CL									
			8											
	10/10		10	Red, yellow, brown silty sand w/varying amounts of clay	SC									
			12											
			14		SM									
			16											
			18											
			20	Red, yellow, brown sandy, clayey silt	CL									
	10/10		22											
					SM									

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

Signature 	Firm Central Wisconsin Engineers & Architects
---	---

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	10/10		26	Red, yellow, brown silty sand w/varying amounts of clay	SM			10YR 7/8						
			28											
			30											
			32											
	9/10		34	Yellow, red, brown sandy, clayey silt w/little gravel	CL			10YR 6/8						
			36											
			38											
			40											
	8/10		42	Brown sandy clayey silt and silty clay w/little gravel	CH			10YR 4/4						
			44											
			46											
			48											
			50	Yellowish brown silty sand w/varying amounts of clay and occasional clay lenses	SM			10YR 7/4						
			52											
			54											
			56											
	6/10		58		SP/SM			10YR 7/4						
			60											
			62											
	8/10				SM									
					SC									

Figure 10: The first 10 eigenfunctions of the Laplacian on the domain Ω .

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RGD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	9/10		106	(Highly fractured zone @ 110' - 111')	Bdrk								FF: 5.6/ft	
			108										RGD: 4%	
			110											
			112										Rec: 75%	
	9/10		114	FF: 5.1/ft										
			116	RGD: 0%										
			118											
			120	(Highly fractured zone @ 118' - 120')										
			122											
			124											
	10/10		126											
			128	Sandy Dolomite									RGD: 41%	
			130											
			132	Dolomite									Rec: 97%	
	10/10		134	Sandy Dolomite with Grey-Green Shale and Sandstone Interbeds	FF: 2.6/ft									
			136		RGD: 69%									
			138											
			140											
	9/10		142	Dolomite, occasional small vugs										
				(Highly fractured zone @ 142' - 143')	Rec: 69%									

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RGD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	9/10		146	(Highly fractured zone @ 154' - 156')	Bdrk								FF: 4.4/ft	
			148										RGD: 17%	
			150											
			152											
	9/10		154											
			156											
			158										(Highly fractured zone @ 158' - 159')	
			160										Dolomite, occasional small vugs	
			162										Rec: 8%	
			164										FF: 5.9/ft	
			166										RGD: 0%	
	9/10		168											
			170											
			172											
			174										Rec: 87%	
			176										FF: 4.1/ft	
			178										RGD: 31%	
	8/10		180	(Highly fractured zone @ 175'- 177')										
			182	Sandy siltstone										
			184											
	8/10		186	Dolomite									Rec: 72%	
			188										FF: 4.6/ft	
			190										RGD: 18%	
			192											
			194											
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[illegible]

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

Page 1 of 2

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-15	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger						
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,252.9 Feet MSL	Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Lat 90° 50' 375.0"		Local Grid Location ☐ N ☐ E	
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Long 43° 35' 934.0"		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	
1 AU				TOPSOIL	OL									
			2.5	Brown, sandy, LEAN CLAY, little gravel										
2 AU			5.0											
					CL									
3 AU			7.5											
4 AU			10.0											
5 AU			12.5											
							</							

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
---------------------------------	---	--------------

Boring Number		Use only as an attachment to Form 4400-122.										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	
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel, occasional hard pan layers <i>(continued)</i>	CL									
8 AU		35.0												
		37.5												
9 AU			40.0	BEDROCK, dolomite	BR									
		42.5												
		45.0												
				Boring Refusal at 45 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Page 1 of 2

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation		License/Permit/Monitoring Number 3268		Boring Number B-17	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.		Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,238.8 Feet MSL	Borehole Diameter 4.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, 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 90° 50' 363.0" Long 43° 35' 955.0"		

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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some fine sand, layers of numerous cobbles and gravel	CL									
2 AU			5.0											
			7.5											
			10.0											
3 AU			12.5											
			15.0											
4 AU			17.5											
			20.0											
5 AU			22.5											
			25.0											
6 AU			27.5											
			30.0	BEDROCK, likely dolomite	BR									

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
------------------------------	--	--------------

Boring Number		Use only as an attachment to Form 4400-122.										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	
7 AU			32.5	BEDROCK, likely dolomite (<i>continued</i>)	BR									
			35.0											
8 AU			37.5											
				Boring Refusal at 39 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

Soil Boring Logs outside 300-feet of Landfill Expansion

BORING NO. MW-1

SURFACE ELEV. 1236.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	No Samples CORE RUN Obtained		CLASSIFICATION AND REMARKS Note: Logs based on drill cuttings.	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			Clay, Red				20	
			28'					1208.4
			Dolomite - Broken Up					
			38'					1198.4
							40	
			Dolomite, Broken Up, With Some Streaks of Clay					
							60	
			80'				80	1156.4
			Dolomite, Hard					
							100	
							120	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED December 29, 1987

LOCATION Klahn Site, 2+00N, 12+01E

GROUNDWTR 154.84 FT BELOW GS AT ELEV. OF 1081.56

DRILLERS Ace Well Drilling

JOB NO. 57786

DATE 12/21/88

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			Crevice From 145' to 148' (1091.4 to 1088.4)					
			Set Well at 156.26' (1080.14)				160	1080.14
							180	
							200	1036.4
			200' E.O.B.				220	

KEY

REC = PERCENT RECOVERY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR 154.84 FT BELOW GS AT ELEV. OF 1081.56

DRILLERS

JOB NO. 57786

DATE 12/21/88

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED Jan. 12 and Jan. 16, 1988

LOCATION Klahn Site 9+99N, 7+03E

GROUNDWTR 169.08 FT BELOW GS AT ELEV. OF 1083.42

DRILLERS Ace

JOB NO. 57786

DATE 12/21/88

DATE 12/21/88

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED July 6, 1989

LOCATION Klahn Site, 12+31N, 10+94E

GROUNDWTR 193.9 FT BELOW GS AT ELEV. OF 1061.84

DRILLERS Exploration Technology

JOB NO. 70389 DATE Dec. 22, 1989

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
1	25'	26'	Weathered Dolomite With Interspersed Red Clay Residuum	20%	?	0%	-	
2	26'	27'		80%	6-10	0%	-	
3	27'	30'		50%	?	0%	-	
4	30'	32.5'		25%	?	0%	30	
							-	
5	32.5'	40'		0.0%	-	0%	35	
							-	
							-	
							40	
							-	
			44'					1211.70
6	44'	47.5'	Dolomite, With Occasional Small Vugs and Chert	86%	2.0	57%	45	
7	47.5'	50.0'		88%	2.0	62%	-	
8	50.0'	52.0'		60%	2.5	40%	50	
9	52.0'	60.0'					55	
							-	
			58'	74%	1.0	63%		1197.70

KEY

REC = PERCENT RECOVERY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE _____

BORING NO. MW-7
 SURFACE ELEV. 1255.7

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			4" Brown Clay Seam					
10	60'	70'	Dolomite, With Occasional Large Vugs	70%	1.7	53%	65	
							70	
								1183.70
							75	
11	70'	80'	Dolomite, With Occasional Small Vugs	73%	1.2	52%		
					5.0		80	
12	80'	90'		67%	3-5	28%	85	
							90	

KEY

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
13	90'	100'	(1.5 ft. Weathered Zone With Red-Brown Clay)	48%	1-5	20%	-	1155.7
14	100'	103'		66%	-	0%	100	
15	103'	110'		86%	3.8	39%	105	
			Dolomite, With Occasional Small Vugs				110	
16	110'	120'		100%	2.4	64%	115	
							120	
17	120'	127'	(3" White Silty Clay Seam)	100%	3.8	34%	125	
18	127'	135'		100%	1.1	90%	-	1125.70

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-7

CENTRAL WISCONSIN

SURFACE ELEV. 1255.7

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
19	135'	145'	Sandy Dolomite, With Occasional Gray-Green Shale Interbeds; Few to No Vugs	100%	1.9	70.0%	135 140 145	
20	145'	155'	Dolomite, With Occasional Sandy To Shaly Interbeds; Few Small Vugs	100%	2.1	73.3%	148 150 153 155	1107.7 1102.7 1100.7
21	155	160	Dolomite, With Occasional Sandy to Shaly Interbeds; Few Small Vugs	100%	2.4	59%	155 160	
22	160'	170'		70%	1.57	54.5%		

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			-----169'-----					1086.7
23	170'	175'	Sandy Dolomite, With Occasional Brown Sandstone Interbeds; Few to No Vugs	70%	2.86	19%	170	
24	173.5	180.5		53%	1.6	23%	175	
25	180.5	188.5		88%	4.2	16%	180	
			-----186.5-----				185	1069.2
			Sand, Brown, Med-Fine					
			-----188.5-----				190	1067.2
26	188.5	198.5	Dolomite, With Occasional Sandy to Shaly Interbeds	100%	1.4	76.5		1062.7
			-----193-----				195	
			Sandy Dolomite With Occasional White to Brown Sandstone and Gray-Green Shale Interbeds; Few to No Vugs					

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-7
 SURFACE ELEV. 1255.7

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
27	198.5	209	(206'-207', Sandstone, White With Gray-Green Shale Interbeds)	76%	1.13	63%	205	1049.7
			209'				210	1046.7
			End of Coring				215	
							220	
							225	
							230	
			234.5					1021.2
			End of Boring - Set Well					

KEY

REC = PERCENT RECOVERY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. TB-1

SURFACE ELEV. 1234.93

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30")			CLASSIFICATION AND REMARKS	M U N	U S C	GEOLOGY	D E P T H	ELEV. (ft.)
#	6"	6"						
			Clay, Brown with Trace Silt	10 YR 4/3	CL	LOESS	2.5	
				7.5 YR 3/4				
2	3	3		7.5 YR 4/4			5	
	5	7						
3	4	4					7.5	
	6	10						
4	3	7						
	12	14	9.5'	5 YR 4/4	CL	RESIDUUM	10	1225.43
5	3	14	10.5'	7.5 YR 4/4	SC			1224.43
	11	10		10 YR 6/4	SC		12.5	
6	3	11	13.0'	5 YR 4/6	CL			1221.93
	18	23	Clay, Red-Brown, with Weathered Dolomite Fragments					
7	20	34		10 YR 6/3			15	
	18	31						
8	100		17.0'					1217.93

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 25 and 26, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 28, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

BORING NO. TB-3

SURFACE ELEV. 1253.35

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER A (140 lbs., 2" O.D.) M - FALLING 30") P			CLASSIFICATION AND REMARKS			M U N	U S C	GEOLOGY	D E P T H	ELEV. (ft.)
#	6"	6"	12"							
1	2	3		Clay, Brown, with Silt	10 YR 5/3		CL	LOESS	-	1251.85
	3	5		1.5'					-	
2	7	12		Clay, Red-Brown to Brown, with Sand and Occasional Gravel	5 YR 4/4		CL	RESIDUUM	2.5	
	10	12							-	
3	9	12							-	1244.85
	14	12							5	
4	8	7			5 YR 4/6		CL		-	
	8	7			7.5 YR 4/4				7.5	
5	7	6		8.5'	10 YR 8/4				-	1240.35
	12	11		2" Layer of Fine to Medium Sand					-	
6	4	8		Clay, Brown, with Trace Sand and Gravel, Mottles (10 YR 8/8)	10 YR 4/4		CL		10	
	12	13							-	
7	10	14			7.5 YR 3/2				12.5	1239.35
	15	52		13.0'					-	
				Sand, with Clay, Trace Gravel	7.5 YR 4/4		SC		-	
				14.0'					-	
8	100			Weathered Dolomite	2.5 YR 8/4			WEATHERED DOLOMITE	15	1238.85
				14.5'					-	
				E.O.B.					-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 28, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 25, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786

DATE June 3, 1988

BORING NO. TB-10

SURFACE ELEV. 1258.8

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30")			CLASSIFICATION AND REMARKS	M U N	USC	GEOLOGY	D E P T H	ELEV. (ft.)
	6"	6"	12"						
1	5	5	17	Topsoil -0.5'	10 YR		LOESS	-	
2	8	9	14	Clay, Gray to Lt. Brown, With Silt	6/2	CL		-	
3	2	6	38	Clay, Red-Brown to Gray-Brown, With Silt and Fine Sand	2.5YR	CL	RESIDUUM	5	1252.8
4	7	7	28	-6.0'	7/4			-	
5	5	11	62	Clay, Lt. Brown to Yellow-Brown, With Silt, Dolomite Fragments	7.5YR	CL		10	1248.8
6	29	9	23	-10.0'	7/4			-	
7	5	17	19	Med. Sand, Yellow-Brown, With Silt, Dolomite Fragments	7.5YR	CL		15	1242.8
8	10	18	109	-16.0'	5/6			-	
9	2	8	109	18.0'	10 YR	CL		20	1240.8
10	39	9	14	E.O.B. Rock	6/6			-	
	7	7						25	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 15, 1989

LOCATION Klahn Site 10+13N 9+25E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703

DATE Jan. 3, 1990

BORING NO. TB-11

SURFACE ELEV. 1253.9

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30")			CLASSIFICATION AND REMARKS	M U N	USC	GEOLOGY	D E P T H	ELEV. (ft.)
	6"	6"	12"						
1	3	4	14	Topsoil -0.5'	10 YR 7/2				
2	3	5	16	Clay, Lt. Brown, with Silt		CL	LOESS		
3	10	11	21	-6.0'				5	1247.9
4	8	11	23	Clay, Red-Brown to Yellow-Brown, with Silt and Occasional Sandy Layers	5 YR 6/6	CL	RESIDUUM		
5	12	14	26					10	
6	58	26	84	Dolomite Fragments at 12'	7.5YR 5/8	CL			
7	7	33	45						
8	7	12	26	-15.0'				15	1238.9
9	5	16	58	Weathered Dolomite with Red-Brown Clay and Silt	10 YR 8/2		WEATHERED DOLOMITE		
10	18	40	11					20	
11	15	13	19						
12	6	5	24	-23.0'					1230.9
13	10	14	24	Weathered Dolomite with Yellow-Brown Silty Sand	10 YR 7/6			25	1227.9
	6	14		-26.0'					
	27	18	45	E.O.B.					

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 23, 1989

LOCATION Klahn Site 4+33N 8+46E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703

DATE Jan. 3, 1990

TB-12

1259.1

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 23, 1989

LOCATION Klahn Site 4+91N 6+11E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

TEST PIT TP-1

CENTRAL WISCONSIN

SURFACE ELEV. 1245.50

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
	From	To					
			Topsoil			-	
			.5'			-	
	NO	SAMPLES	Clay, Light Brown with silt (CL)			-	
						2	
						-	
						-	
						-	
			3.5'	None		-	
			Rock, Limestone and Chert			4	1242.0
						-	
			5.0'			-	1240.5
			E.O.P.			-	
						-	
						6	
						-	
						-	
						-	
						8	
						-	
						-	
						-	
						10	
						-	
						-	
						-	
						12	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 7+72N 1+00 E

JOB NO. 70389 DATE Dec. 13, 1989

TP-2

1251.40

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
	From	To					
			Topsoil				
		.5'					
	NO	SAMPLES	Clay, Light Brown with silt (CL)				
						2	
				None			
		3.0'					1248.4
			Clay, Light Brown with many rock fragments				
						4	
							1240.5
						6	
						8	
						10	
						12	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 7+02N 170.6 E

JOB NO. 70389 DATE Dec. 13, 1989

TP-3

CENTRAL WISCONSIN

1254.6

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U	D	ELEV.
A					S	P	(ft.)
M					C	T	
P						H	
#	From	To					
			Topsoil			-	
1	2'	3'	.5'			-	
			Clay, Light Brown with silt (CL)			-	
						2	
						-	
						-	
			3.5'			-	1251.1
						4	
						-	
			Sand, Red-orange with clay (SC)			-	
						6	
						-	
						-	
						8	
						-	
						-	
			9.5'			-	1245.1
			E.O.P. Rock			10	
						-	
						-	
						-	
						12	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 6+30N, 2+40 E

JOB NO. 70389 DATE Dec. 13, 1989

TP-7

CENTRAL WISCONSIN

1258.9

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U	D	ELEV.
A					S	E	(ft.)
M					C	P	
P						T	
#	From	To				H	
			Topsoil				
1	1.5'	2.0'	.5'				
			Clay, Light Brown with silt	P200 = 99.53%			
				CLAY = 28.0%			
				LL = 37.7	CL	2	
				Pi = 19.4			
2	3.0'	4.5'		P200 = 88.58%			
				CLAY = 26.0%			
				LL = 35.0	CL	4	
				Pi = 15.2			
			5.5'				
			Clay, Red, Sandy				1253.4
			6.0'				
						6	1252.9
3	6.0'	8.0'	Clay, Yellow	P200 = 78.53%			
				CLAY = 50%	CH		
				LL = 56.0			
				Pi = 29.9		8	
			9.0'				
			Sand, orange				1249.9
			10.0'				
			E.O.P.			10	
						12	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 6+12N, 6+14E

JOB NO. 70389 DATE Dec. 13, 1989

TP-8

CENTRAL WISCONSIN

1251.9

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
#	From	To					
			Topsoil				
			.5				
			Clay, Lt. Brown with Silt	P200=98.25% Clay=25% LL=39.6 Pi=16.8 Max D.O.=116.9 pcf O.M.=16.1%	CL	2	
1	3'	4'					
			4.5	P200=52.8% Clay=26.0% LL=42.3 Pi=23.5	CL	4	1247.4
2	5'	5.5'	Clay, Red with Rock Fragments				
			6.0			6	1245.9
3	6'	7'	Clay, Yellow-Green	P200=95.3% Clay=25.0% LL=54.8 Pi=29.4	CH		
			7.0				1244.9
			Sand, Orange				
			8.5			8	1243.4
			E.O.P.				
						10	
						12	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

7+38N, 4+59E

JOB NO. 70389

DATE Dec. 13, 1989

CENTRAL WISCONSIN

ENGINEERS

[illegible]

Pi = PLASTICITY INDEX

TEST PIT TP-10

CENTRAL WISCONSIN

SURFACE ELEV. 1234.8

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
A							
M							
P							
#	From	To					
			.5			-	
			Topsoil			-	
1	2'	3'	Clay, Lt. Brown with Silt	P200=98.71% Clay=27.0% LL=40.0 Pi=18.1	CL	2	
						-	
						-	
						-	
						-	
			5.0			4	
						-	1229.8
			Clay, Red with Sand			-	
2	6'	7'		P200=43.54% Clay=29.0% LL=48.9 Pi=24.3	CL	6	
						-	
						-	
			7.5			-	1227.3
			Clay, Black/Green, Organic	P200=96.9% Clay=68.0% LL=113.5 Pi=56.4	Pt	8	
3	9'	10'				-	
						-	
						-	
			11.0			10	
						-	1223.8
			E.O.P.			12	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 10+20N, 4+30E

JOB NO. 70389

DATE Dec. 13, 1989

TEST PIT TP-15

CENTRAL WISCONSIN

SURFACE ELEV. 1250.7

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	A	M	P	#	From	To	CLASSIFICATION AND REMARKS	LAB TESTS	U	S	C	D	E	P	H	ELEV. (ft.)
							Topsoil									-
							.5									-
1					1'	-2'	Clay, Lt. Brown with Silt	P200=99.63% Clay=27.0% LL=41.4 Pi=16.27						2		-
2					3'	-4'			CL							-
																-
								P200=99.56% Clay=22.0% LL=38.3 Pi=17.03						4		-
									CL							-
																-
																-
							6.5							6		-
																-
3					8'	-9'	Clay, Red with Sand	P200=29.12								-
																-
									SC					8		-
																-
																-
																-
														10		-
																-
							11.0									-
																-
																-
														12		-
																-
																-
																-
																-
																-

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 7+97N, 10+21E

JOB NO. 70389

DATE Dec. 13, 1989

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 11+75, 5+56E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-18

CENTRAL WISCONSIN

SURFACE ELEV. 1234.9

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	A	M	P	#	From	To	CLASSIFICATION AND REMARKS	LAB TESTS	U	S	C	D	E	P	T	H	ELEV. (ft.)
							Topsoil										-
							.5										-
1					1'	1.5'	Clay, Light Brown with Silt (CL)										-
							2.0						2				1232.9
							Rocky Seam										-
							2.5										-
							Clay, Red-Yellow, with Sand (CL)										-
													4				-
2					4'	5'											-
							5.0										-
							Clay, Light Brown with Silt (CL)										1229.9
													6				-
																	-
3					6'	7'											-
							8.0						8				1226.9
							E.O.P.										-
																	-
																	-
													10				-
																	-
																	-
																	-
													12				-
																	-
																	-
																	-

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 13+30N, 6+82E

JOB NO. 70389

DATE Dec. 14, 1989

TEST PIT TP-19

CENTRAL WISCONSIN

SURFACE ELEV. 1250.9

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S							D		
A	SAMPLE DEPTH		CLASSIFICATION AND REMARKS		LAB TESTS		U	E	
M							S	P	
P							C	T	
#	From	To						H	
			Topsoil					-	
			.5					-	
No	Samples							-	
								2	
								-	
								-	
			3.5					-	
			Clay, Light Brown, with a lot of Sand and Rock					-	
								4	
								-	
								-	
			5.5					-	
			E.O.P.					-	
								6	
								-	
								-	
								-	
								8	
								-	
								-	
								-	
								10	
								-	
								-	
								-	
								12	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 12+04N, 8+37E

JOB NO. 70389

DATE Dec. 14, 1989

TEST PIT TP-20

CENTRAL WISCONSIN

SURFACE ELEV. 1251.3

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	A	M	P	#	From	To	CLASSIFICATION AND REMARKS	LAB TESTS	U	S	C	D	E	P	T	H	ELEV. (ft.)
							Topsoil										-
							.5										-
																	-
																	2
1					2'	3'	Clay, Light Brown with Silt	P200=99.8% Clay=26.0% LL=36.3 Pi=15.12	CL								-
																	-
																	-
																	4
2					4'	5'		P200=99.7% Clay=27.0% LL=41.5 Pi=18.19	CL								-
																	-
																	-
																	6
																	-
																	-
																	8
								P200=99.7 Clay=16.0 LL=36.5 Pi=15.05	CL								-
3					8'	9'											-
																	-
							10.0										10
																	1241.3
4					10'	11'	Clay, Yellow-Brown with Sand	P200=61.21 Clay=39.0 LL=45.0 Pi=23.3	CL								-
																	-
																	12
							12.5										-
																	1238.8
																	-
							E.O.P.										-

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 9+52N, 11+47E

JOB NO. 70389

DATE Dec. 14, 1989

TP-23

CENTRAL WISCONSIN

1252.3

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
	From	To					
			Topsoil				
		.5					
			Clay, Light Brown with Silt				
		2.5				2	1249.8
			Clay, Red with Some Rock				
						4	
						6	1245.8
1	6.5'	10'	Clay, Red, Yellow, and White with Sand and Some Rock	Proctor Max DD=113.5 pcf O.M.=19.2		8	
		10.0				10	1242.3
			Weathered Rock				
		12.0				12	1240.3
			E.O.P.				

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

P_i = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 13+59N, 9+63E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-24

CENTRAL WISCONSIN

SURFACE ELEV. 1243.4

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	A	M	P	#	From	To	CLASSIFICATION AND REMARKS	LAB TESTS	U	S	C	D	E	P	T	H	ELEV. (ft.)
							Topsoil										
							.5										
1					1'	2'	Clay, Light Brown with Silt										
							3.0										1240.4
							Clay, Red, With Silt and Some Rock										
3					4'	5'											
							6.0										1237.4
3					7'	8'	Clay, Yellow with Silt and Some Fine Sand										
4					10'	11'											
							12.0										1231.4
							E.O.P.										

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site

JOB NO. 70389

DATE Dec. 14, 1989

TEST PIT TP-25

CENTRAL WISCONSIN

SURFACE ELEV. 1236.2

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
	From	To					
			Topsoil				
			.5				
1	1.5'	2.5'	Clay, Light Brown with Silt	P200=98.0% Clay=25.0% LL=38.3 Pi=15.45	CL	2	
			2.5				1233.7
			Clay, Red with Some Rock	P200=78.9% Clay=57.0% LL=63.6 Pi=35.7	CH	4	
2	4'	5'					
			6.0			6	1230.2
			Clay, Red-Yellow with Sand and White Clay Lenses			8	
			10.0			10	1226.2
			E.O.P.			12	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 15+48N, 7+30E

JOB NO. 70389

DATE Dec. 14, 1989

TEST PIT TP-26

CENTRAL WISCONSIN

SURFACE ELEV. 1248.5

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	A	M	P	#	From	To	CLASSIFICATION AND REMARKS	LAB TESTS	U	S	C	D	E	P	T	H	ELEV. (ft.)
							Topsoil										
							.5										
							Clay, Red with Silt and Occasional Sand and Rock						2				
													4				
													6				
													8				
							8.5										1240.0
							E.O.P. Rock										
													10				
													12				

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn 16+40N, 9+33E

JOB NO. 70389

DATE Dec. 14, 1989

TEST PIT TP-27

CENTRAL WISCONSIN

SURFACE ELEV. 1251.0

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	A	M	P	#	From	To	CLASSIFICATION AND REMARKS	LAB TESTS	U	S	C	D	E	P	T	H	ELEV. (ft.)
							Topsoil										
							.5										
1					1.5'	-2.5'	Clay, Light Brown with Silt	P200=98.95% Clay=27.0% LL=40.5 Pi=17.6	CL					2			
							3.5										1247.5
							Clay, Red with Trace of Sand							4			
2					4'	-5'		P200=84.04% Clay=50.0% LL=65.0 Pi=32.55	CH					6			
							7.0										
3					7'	-9'	Clay, Red with a lot of Sand	P200=32.24%	SC					8			
							11.5							10			
																	1239.5
														12			

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 15+20N, 10+88E

JOB NO. 70389

DATE Dec. 14, 1989

TP-28

CENTRAL WISCONSIN

1242.1

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 14+01N, 12+58E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-A

SURFACE ELEV. 1255.0

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
	From	To					
			Topsoil			-	
			.5			-	
			Clay, Light Brown with Silt			-	
			2.5			2	1252.5
			Clay, Red with Some Rock			-	
1	4'	5'		P200=91.5% Clay=54.0% LL=62.8 Pi=32.4	CH	4	
			6.5			6	1248.5
2	7'	8'	Clay, Green/Orange with Some Rock	P200=78.6% Clay=50.0% LL=58.2 Pi=31.0	CH	8	
			9.0			-	1246.0
			E.O.P. Rock			10	
						12	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 10+15N, 7+70E

JOB NO. 70389

DATE Dec. 14, 1989

TEST PIT TP-B

SURFACE ELEV. 1258.0

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
	From	To					
			Topsoil			-	
			.5			-	
			Clay, Light Brown with Silt	P200=96.4% Clay=34.0% LL=38.9 Pi=16.4	CL	2	
1	3'	4'				-	
			4.0			4	1254.0
			Clay, Red with Trace of Sand	P200=73.09 Clay=39.0 LL=45.3 Pi=22.72	CL	-	
2	5'	6'				6	
				P200=84.76% Clay=69.0% LL=63.5 Pi=32.5	CH	-	
3	8'	9'				8	
			9.0			-	1249.0
			E.O.P. Red Sand			10	
						-	
						12	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 9+20N, 8+65E

JOB NO. 70389

DATE Dec. 14, 1989

TEST PIT TP-C

SURFACE ELEV. 1257.8

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P L E #	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
	From	To					
			Topsoil				
			.5				
			Clay, Light Brown with Silt				
1	3'	3.5'		P200=99.5% Clay=26.0% LL=35.0 Pi=15.0	CL	2	
						4	
2	5'	6'		P200=99.0% Clay=30.0% LL=43.8 Pi=20.8	CL		
			7.0				1250.8
3	7'	8'	Clay, Red-Yellow	P200=60.9% Clay=42.0% LL=54.2 Pi=28.7	CL		
			8.0				1249.8
			Sand, Red-Yellow with Clay				
						10	
			11.5				
			E.O.P.			12	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 10+50N, 9+40E

JOB NO. 70389

DATE Dec. 14, 1989

TEST PIT TP-0

CENTRAL WISCONSIN

SURFACE ELEV. 1252.0

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S	SAMPLE DEPTH		CLASSIFICATION AND REMARKS	LAB TESTS	U S C	D E P T H	ELEV. (ft.)
A	From	To					
M							
P							
#							
			Topsoil			-	
			.5			-	
			Clay, Light Brown with Silt			-	
				P200=98.9% Clay=24.0% LL=41.1 Pi=16.23	CL	2	
1	3'	4'				-	
						4	
						-	
			5.0			-	1247.0
			Sand, Orange with Clay			6	
						-	
						-	
			8.5			8	1243.5
			E.O.P. Rock			-	
						-	
						10	
						-	
						-	
						-	
						12	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 8+80N, 10+52E

JOB NO. 70389

DATE Dec. 14, 1989

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

MUN = MUNSELL SOIL COLOR

JOB NO.

DATE _____

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
1			Weathered Dolomite With Interspersed Red Clay Residuum		?	%	-	1244
2							-	
3							-	
4							30	
5							-	
6			Dolomite, With Occasional Small Vugs and Chert				35	1244
7							-	
8							-	
9							40	
10							-	
11			Dolomite, With Occasional Small Vugs and Chert				44'	1244
12							-	
13							-	
14							45	
15							-	
16			Dolomite, With Occasional Small Vugs and Chert				50	1244
17							-	
18							-	
19							-	
20							55	
21	52.0'	60.0'	Dolomite, With Occasional Small Vugs and Chert				58'	1244
22							-	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR	FT BELOW GS AT ELEV. OF
1	10
2	10
3	10
4	10
5	10
6	10
7	10
8	10
9	10
10	10
11	10
12	10
13	10
14	10
15	10
16	10
17	10
18	10
19	10
20	10
21	10
22	10
23	10
24	10
25	10
26	10
27	10
28	10
29	10
30	10
31	10
32	10
33	10
34	10
35	10
36	10
37	10
38	10
39	10
40	10
41	10
42	10
43	10
44	10
45	10
46	10
47	10
48	10
49	10
50	10
51	10
52	10
53	10
54	10
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57	10
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59	10
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61	10
62	10
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68	10
69	10
70	10
71	10
72	10
73	10
74	10
75	10
76	10
77	10
78	10
79	10
80	10
81	10
82	10
83	10
84	10
85	10
86	10
87	10
88	10
89	10
90	10
91	10
92	10
93	10
94	10
95	10
96	10
97	10
98	10
99	10
100	10

DRILLERS

JOB NO. 70389

DATE _____

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
13			(1.5 ft. Weathered Zone With Red-Brown Clay)				-	
14							100	1155.7
15							105	
							110	
			Dolomite, With Occasional Small Vugs				115	
16							120	
17							125	
			(3" White Silty Clay Seam)					
18								
			130'		1.1			1125.70

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
#	FROM	TO					
						-	
						-	
						-	
						-	
						135 --	
						-	
						-	
19						-	
						140 --	
						-	
						-	
						145 --	
						-	
						-	
						148' --	
20						-	1107.7
						-	
						150 --	
						-	
						-	
						153' --	1102.7
						-	
						155' --	1100.7
21						-	
						-	
						-	
						160 --	
						-	
						-	
22						-	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE _____

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			169'				-	
23	170'	175'		70%	2.86	19%	170	1086.7
24	173.5	180.5	No v.	53%	1.6	23%	175	
25	180.5	188.5		88%	4.2	16%	180	
			186.5				185	1069.2
			188.5				190	1067.2
26	188.5	198.5	Sary	100%	1.4	76.5	195	1062.7

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-BR

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
27			-207'	76%	1.13	63%	205	1049.7
			End of Boring - Set Well					1048.7
							210	
							215	
							220	
							225	
							230	
								1021.2

KEY

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FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-9

SURFACE ELEV. 1255.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S BLOWS ON SAMPLER A (140 lbs., 2" O.D. M - FALLING 30") P				CLASSIFICATION AND REMARKS		M	U	GEOLOGY	D	ELEV.
#	6"	6"	12"			N	C		T	(ft.)
				Topsoil					H	
				-----1.0-----		10 YR				
1	4	4	8	Clay, Light Brown to Gray-Brown, with Silt		4/4	CL	LOESS		
2	6	6								
3	11	22	33							
4	8	4								
5	4	6	10			10 YR			5	1250.7
6	5	32		-----7.0-----		5/6	CL			
7	14	19	33	Clay, Red-Brown to Yellow, With Red Sand						1248.7
9	6	5				2.5 YR		RESIDUUM		
10	5	7	12			4/6	SC		10	1245.2
12	7	17								
	27	20	47	Clay, Red-Brown, With Occasional Silt and Sand						
13	2	3								
	7	8	15			10 YR				
14	30	35				3/3	CL		15	
15	25	27	52							
	17	27								
	21	2	23							
	3	3								
16	6	7	13						20	
17	11	28		-----21.5-----						1234.20
	19	17	36	continued on page 2 of 5				WEATHERED DOLOMITE		
	95	33								
	10	35	45							
19	31	28							25	
	20									

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED July 6, 1989

LOCATION Klahn Site, 12+31N, 10+94E

GROUNDWTR 193.9 FT BELOW GS AT ELEV. OF 1061.84

DRILLERS Exploration Technology

JOB NO. 70389

DATE Dec. 22, 1989

*Geologic
Descriptions from
MW-7*

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

[illegible]

RQD = ROCK QUALITY DESIGNATION

DATE _____

BORING NO. MW-9

SURFACE ELEV. 1255.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			4" Brown Clay Seam					
10	60'	70'	Dolomite, With Occasional Large Vugs	70%	1.7	53%	65	
							70	
								1183.70
11	70'	80'	Dolomite, With Occasional Small Vugs	73%	1.2	52%	75	
					5.0		80	
12	80'	90'		67%	3-5	28%	85	
							90	

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-9

CENTRAL WISCONSIN

SURFACE ELEV. 1255.4

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
13	90'	100'	(1.5 ft. Weathered Zone With Red-Brown Clay)	48%	1-5	20%	-	1155.7
14	100'	103'		66%	-	0%	100	
15	103'	110'		86%	3.8	39%	105	
							110	
			Dolomite, With Occasional Small Vugs				115	
16	110'	120'		100%	2.4	64%	120	
							125	
17	120'	127'		100%	3.8	34%	125	
			(3" White Silty Clay Seam)					
18	127'	135'		100%	1.1	90%		
			-----130'-----					1125.70

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

BORING NO. MW-9

SURFACE ELEV. 1255.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

S A M P #	CORE RUN		CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	D E P T H	ELEV. (ft.)
	FROM	TO						
			----- 131.5' ----- End of Boring - Set Well				-	1123.9
							135	
19	135'	145'					140	
							145	
20	145'	155'					150	
							155	
21	155	160					160	
22	160'	170'						

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389

DATE

Facility/Project Name Vernon Co. Balefill		License/Permit/Monitoring Number 03268		Boring Number MW-13P	
Boring Drilled By (Firm name and name of crew chief) Traut Hydro Tech Daryl Karasch		Date Drilling Started 02/25/2003		Date Drilling Completed 02/26/2003	
Drilling Method Versa Sonic					
DNR Facility Well No. 117	WI Unique Well No. JX071	Common Well Name MW-13P	Final Static Water Level 1127.97 Feet MSL	Surface Elevation 1224.5 Feet MSL	Borehole Diameter 7.0" inches
Boring Location State Plane N, E SW 1/4, SE 1/4, Sec.15, T13N, R4W			Lat 43 / 35' / 49.49" Long 90 / 43' / 14.85"		Local Grid Location (if applicable) 295.72 Feet N 1259.36 Feet E

County Vernon	DNR 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	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					P 200	RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index			
	7/10		2	Grayish brown clayey silt, trace sand	CL										
			4												
			6	(Loess)											
			8		CL/SC										
			10	Yellowish reddish brown sandy, clayey silt, and silty, clayey sand											
			12												
	5/10		14		CL/CH										
			16												
			18												
			20	Yellowish light brown clayey, silty sand, trace to little gravel	SC										
			22												
	5/10														
				Blue-gray and brown clayey silt	CL										

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

Signature 	Firm Central Wisconsin Engineers & Architects
---	---

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	5/10		26	Yellowish light brown clayey, silty sand, little fine gravel	CL									
			28		SC									
	30		Yellowish brown clayey, silty sand and clayey, sandy silt, little fine gravel		SC/CL									
	32													
	34													
	36													
	8/10		38	Yellowish brown clayey silt, little sand and fine gravel	SM									
			40											
			42											
			44											
	9/10		46	CL										
			48											
50		SM	Yellowish light brown silty fine sand, trace clay, little gravel (Weathered sandstone) Gravel content increases with depth											
52														
54														
56														
58														
60														
8/10	62	SM/SC												

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RGD/ Comments											
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200												
	8/10		66	Light brown silty sand and silty, clayey sand, some gravel (Weathered sandstone)	SM/SC																				
	9/10		70												Dolomite, occasional small vugs (Highly fractured zone @ 76'-77')										Rec: 60% FF: 6/ft RGD= 0%
	9/10		72	Shaley, sandy siltstone, poorly consolidated										Rec: 60% FF: 5.7/ft RGD= 0%											
	9/10		74												Dolomite, occasional small vugs	Bdrk									Rec: 85% FF: 6.1/ft RGD= 0%
	8/10		76											Rec: 50% FF: -- RGD= 0%											
	8/10		78																						Rec: 60% FF: 6/ft RGD= 0%
	8/10		80																						
	8/10		82																						
	8/10		84																						
	8/10		86																						
	8/10		88																						
	8/10		90																						
	8/10		92																						
	8/10		94																						
	8/10		96																						
	8/10</																								

- ☒ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

94690000

Page 1 of 2

Facility/Project Name Vernon Co. Borefill		License/Permit/Monitoring Number		Boring Number MWIR	
Boring Drilled By (Firm name and name of crew chief) Ace Well Drilling David Holzem		Date Drilling Started 01/10/94 M M D D Y Y		Date Drilling Completed 01/11/94 M M D D Y Y	
DNR Facility Well No. / WI Unique Well No.		Common Well Name MWIR		Final Static Water Level 1095 Feet MSL	
				Surface Elevation 1245 Feet MSL	
				Borehole Diameter 6 inches	
Boring Location State Plane 582, 646 N, 1, 776, 298 E S/C/N Lat		Local Grid Location (If applicable)			
SE 1/4 of SW 1/4 of Section 15 , T 13 N, R 4 E W Long		317 Feet ☒ N ☐ S 926 Feet ☐ E ☐ W			
County Vernon		DNR 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	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number	Length Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
			0-166'	Earth Drilled No samples collected										
			0-55'	unconsolidated, silty, sandy clay	CL									
			55'-74'	Sandy dolomite to dolomitic sandstone, yellow/tan, thinly bedded, with shaley partings.										
			74-140'	Light tan, dolomite, more competent and harder than previous interval, massive texture.										
				void/fracture - rod dropped										
				void/fracture										

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

Signature <i>Sandra S. Brabe</i>	Firm CENTRAL WIS. ENGINEERS, INC.
-------------------------------------	---

- ☒ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

94690000

Page 1 of 2

Facility/Project Name Vernon Co. Bafefill		License/Permit/Monitoring Number		Boring Number MW1PR	
Boring Drilled By (Firm name and name of crew chief) Ace Well Drilling David Holzem		Date Drilling Started 01/12/94 M M D D Y Y		Date Drilling Completed 01/12/94 M M D D Y Y	
DNR Facility Well No. / Unique Well No.		Common Well Name MW1PR		Final Static Water Level 1130 Feet MSL	
Boring Location State Plane 582,646 N, 1,776,298 E S/C/N		Local Grid Location (If applicable) 320 Feet ☒ N ☐ E		Drilling Method Air Rotary	
SE 1/4 of SW 1/4 of Section 15 , T 13 N, R 4 E		Long		Borehole Diameter 6 inches	
County Vernon		DNR County Code 63		Civil (Town) City/ or Village Viroqua	

Sample Number	Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
			0-126'	Earth Drilled No samples collected 0-57' unconsolidated, red silty, sandy clay CL										
			57-126'	Tan sandy dolomite to dolomitic sandstone void / fracture 6" - 10" in width										

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

Signature

Firm

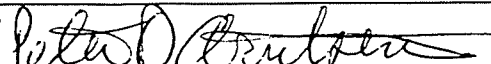
CENTRAL WIS. ENGINEERS, INC.

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

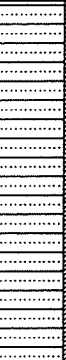
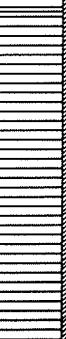
Facility/Project Name Vernon Co. Balfill		License/Permit/Monitoring Number 03268		Boring Number MW-IRZ	
Boring Drilled By (Firm name and name of crew chief) Traut Hydro Tech Jaryl Karasch		Date Drilling Started 03/12/2003		Date Drilling Completed 03/12/2003	
DNR Facility Well No. 123		WI Unique Well No. JX074		Common Well Name MW-IRZ	
Final Static Water Level 1085.52 Feet MSL		Surface Elevation 1244.0 Feet MSL		Borehole Diameter 7.0 inches	
Boring Location State Plane SE 1/4, SW 1/4, Sec.15, T13N, R4W		Lat 43 / 35' / 49.49" Long 90 / 43' / 14.85"		Local Grid Location (if applicable) 299 Feet N 918 Feet E	

County Vernon	DNR County Code 63	Civil Town/City/ or Village Viroqua
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Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
8/10			2	Yellowish brown clayey silt, trace fine sand	CL									
			4	(Loess)										
9/10			6	Yellowish reddish brown sandy, clayey silt, trace fine gravel	CL				5YR 4/6					
			8	Yellowish reddish brown silty sand, little fine gravel	SM				7.5YR 5/8					
			10	Reddish brown clayey, sandy silt, trace fine gravel	CL				10YR 5/4					
			12	Yellowish reddish brown clayey, silty sand, trace fine gravel	SC				7.5YR 5/8					
6/10			14	Yellowish light brown silty sand, little clay, trace fine gravel	SM									
			16											
			18											
			20											
			22											

I hereby certify that the information on this form is true and correct to the best of my knowledge.	
Signature 	Firm Central Wisconsin Engineers & Architects

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	6/10		26	Yellowish light brown silty sand, little clay, little gravel, with gravelly layers	SM			7.5YR 6/8						
			28											
			30											
	7/10		32	Yellowish reddish brown clayey, silty sand, little gravel	SC			7.5YR 7/8						
			34											
			36											
	4/10		38	Yellowish light brown clayey, silty sand, some coarse gravel	CL			7.5YR 5/8						
			40											
			42											
	5/10		44	Yellowish light brown sandy, clayey silt, some coarse gravel	CL/CH			5G 6/2						
			46											
			48	Aqua blue and brown clayey silt, trace to little sand and gravel										
	5/10		50	Brown sandy, clayey silt and sandy, silty clay, trace gravel	CL/CH			7.5YR 4/6						
			52											
			54											
	5/10		56	Yellowish light brown gravelly, sandy, clayey silt	CL			7.5YR 5/8						
			58											
			60											
			62	Brown clayey silt and silty clay, trace to little sand and gravel	CH/CL			7.5YR 4/6						

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments						
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200							
	8/10		106	(Highly fractured zone @ 103'–106')	Bdrk								RQD: 3%							
	9/10		108										(Highly fractured zone @ 110'–115')							Rec: 80%
			110																	
			112																	
			114																	
			116																	
	10/10		118	Sandy dolomite															Rec: 93%	
			120																	
			122																	
			124																	
			126																	
	10/10		128	Dolomite															FF: 5.2/ft	
130																				
132																				
134																				
136																				
10/10	138	Sandy dolomite with gray–green shale and sandstone interbeds							RQD: 19%											
	140																			
	142																			
	144																			
	146																			
10/10	148	Dolomite, occasional small vugs							Rec: 96%											
	150																			
	152	(Highly fractured zone @ 140'–141')							FF: 3.4/ft											
	154									RQD: 61%										
	156	Dolomite, occasional small vugs							Rec: 88%											
	158									FF: 5.5/ft										
	160	(Highly fractured zone @ 140'–141')							RQD: 3%											
	162																			

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	10/10		146	(Highly fractured zone @ 150'-154')										RQD: 13%
			148											
			150											
			152											Rec: 66%
	7/10		154	(Highly fractured zone @ 155'-157')										FF: 6.8/ft
			156											RQD: 3%
			158											
			160											
			162	Dolomitic sandy siltstone, poorly consolidated	Bdrk									Rec: 83%
	10/10		164											FF: 4.3/ft
			166											RQD: 20%
			168											
			170											Rec: 85%
	10/10		172											FF: 4.3/ft
			174											RQD: 22%
			176											
			178	Sandy dolomite and dolomitic sandstone										Rec: 80%
			180											
	4/5		182											FF: 3.9/ft
				(Highly fractured zone @ 180'-181')										

[illegible]

TEST PITS (TP) EXCAVATED MAY 25, 1991

TP 100

TP 100 was excavated at the location of TP 22, where rock had previously been reported at a depth of 11 feet. Using a larger backhoe, TP 100 was excavated to a depth of approximately 20 feet (10 feet below the proposed landfill sub-base) without encountering competent bedrock. Although several bouldery soil zones were present (including one at 10 to 12 feet below surface), most of the material at this location was sandy to silty clay (SC, CL) or clay (CH). Two pictures of TP 100 are shown below.

TP 100: Upper 16 feet



TP 100: Bottom of Pit



TP 101

TP 101 was excavated near the western edge of the proposed waste limits at a location where depth to bedrock was a concern. This excavation proceeded to a depth of approximately 26 feet (9 feet below the proposed landfill sub-base) without encountering competent bedrock. The majority of the material at this location was sandy to silty clay (SC, CL) or clay (CH). Two pictures of TP 101 are shown below.

TP 101: Top of Pit



TP 101: Bottom of Pit



TP 102

TP 102 was excavated at the location of AB 26, where rock had previously been reported at a depth of 5.5 feet. TP 102 was excavated to a depth of approximately 18 feet (12 feet below the proposed landfill sub-base) before encountering what appeared to be weathered bedrock. Although several bouldery soil zones were present, most of the material at this location was sandy to silty clay (SC,CL) or clay (CH). Two pictures of TP 102 are shown below.

TP 102: Top of Pit



TP 102: Bottom of Pit



SURFACE ELEV. 1255.52 FT.

Central Wisconsin

Engineers

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

[illegible]

KEY
C = ROCK CORE
A = AUGER SAMPLE
X = SPLIT SPOON
S = SHELBY TUBE

PROJECT Leonard Klahn, Vernon County Landfill

DATE(S) DRILLED April 30, 1987

LOCATION T 13 N R 4 W Section 15

GROUNDWATER --- FT. BELOW GS. AT ELEV. OF

DRILLERS James Construction Co. JOB NO. 57786

DATE 4-30-87

SURFACE ELEV. 1256.69 FT.

Central Wisconsin

Engineers

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

[illegible]

KEY
C = ROCK CORE
A = AUGER SAMPLE
X = SPLIT SPOON
S = SHELBY TUBE
=

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
DATE 4-30-87

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

[illegible]

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
 DATE 4/30/87

BORING NO. AB - 4
 SURFACE ELEV. 1257.21 FT.

Central Wisconsin Engineers

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30")			CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV.
	6"	6"	per ft.							
0.0				Topsoil						
				-----0.5'						1256.71
				Sand, red brown w/clay		SC				
5.0										
				-----6.5'						1250.71
				E.O.B.						
				rock						
0.0										
5.0										
10.0										
5.0										
10.0										

KEY
 C = ROCK CORE
 A = AUGER SAMPLE
 X = SPLIT SPOON
 S = SHELBY TUBE
 =

PROJECT Leonard Klahn, Vernon County Landfill
 DATE(S) DRILLED April 30, 1987
 LOCATION T 13 N R 4 W Section 15
 GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
 DRILLERS James Construction Co. JOB NO. 57786
 DATE 4/30/87

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

[illegible]

KEY
C = ROCK CORE
A = AUGER SAMPLE
X = SPLIT SPOON
S = SHELBY TUBE
- =

PROJECT Leonard Klahn, Vernon County Landfill

DATE(S) DRILLED April 30, 1987

LOCATION T 13 N R 4 W Section 15

GROUNDWATER FT. BELOW GS. AT ELEV. OF

DRILLERS James Construction Co.

JOB NO. 57786

DATE 4/30/87

BORING NO. AB - 11SURFACE EVEV. 1258.91 FT.**Central Wisconsin**

Engineers

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30")			CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV.
	6"	6"	per ft.							
0.0				Topsoil						
				-----0.5'-----						1258.41
				Clay red brown w/sand		CL				
5.0										
10.0				-----10.0'-----						1248.91
				Sand red M-F w/clay		SC				
15.0										
20.0				-----21.0'-----						1237.41
				E.O.B.						
				rock						
25.0										
30.0										

KEY
 C = ROCK CORE
 A = AUGER SAMPLE
 X = SPLIT SPOON
 S = SHELBY TUBE
 =

PROJECT Leonard Klahn, Vernon County Landfill
 DATE(S) DRILLED April 30, 1987
 LOCATION T 13 N R 4 W Section 15
 GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
 DRILLERS James Construction Co. JOB NO. 57786
 DATE 4/30/87

BORING NO. AB - 7
 SURFACE ELEV. 1261.10 FT.

Central Wisconsin Engineers

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30")			CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV
	6"	6"	per ft.							
0.0				Topsoil						
				-----0.5'-----						1260
				clay dark brown w/sand		CL				
5.0				-----5.0'-----						1256
				sand, yellow, M-F w/clay		SC				
0.0										
5.0										
10.0				-----20.0'-----						1241
				E.O.B. rock						
5.0										
0.0										

KEY
 C = ROCK CORE
 A = AUGER SAMPLE
 X = SPLIT SPOON
 S = SHELBY TUBE
 =

PROJECT Leonard Klahn, Vernon County Landfill
 DATE(S) DRILLED April 30, 1987
 LOCATION T 13 N R 4 W Section 15
 GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
 DRILLERS James Construction Co. JOB NO. 57786
 DATE 4/30/87

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

Page 1 of 1

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-1	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
WI Unique Well No.		DNR Well ID No.	Common Well Name		Drilling Method flight auger	
			Final Static Water Level Feet MSL		Surface Elevation 1,252.8 Feet MSL	
					Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Lat 90° 50' 501.0"		Local Grid Location	
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Long 43° 35' 818.0"		☐ N ☐ E ☐ S ☐ W	

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0											
			12.5											
			15.0	BEDROCK, dolomite										
4 AU			17.5		BR									
			20.0											
5 AU			22.5											
			25.0											
				Boring Refusal at 25 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson 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 - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-2	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger						
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,252.2 Feet MSL	Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Lat 90° 50' 479.0" Long 43° 35' 844.0"		Local Grid Location ☐ N ☐ E ☐ S ☐ W	

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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			2.5	TOPSOIL Brown, LEAN CLAY, some sand, little gravel	OL									
2 AU			5.0											
3 AU			7.5											
4 AU			10.0											
5 AU			12.5											
6 AU			15.0											
			17.5											
			20.0											
			22.5											
			25.0											
			27.5											
			30.0											

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

Signature 	Firm Short Elliot Henrickson Inc.	Tel: Fax:
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Boring Number		Use only as an attachment to Form 4400-122.										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	
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel <i>(continued)</i>	CL									
8 AU		35.0												
9 AU		37.5												
10 AU		40.0												
			42.5											
			45.0											
			47.5	BEDROCK, dolomite	BR									
			50.0	Boring Refusal at 50 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Page 1 of 1

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation		License/Permit/Monitoring Number 3268		Boring Number B-3	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.		Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,251.1 Feet MSL	Borehole Diameter 4.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Local Grid Location ☐ N ☐ E ☐ S ☐ W		
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Lat 90° 50' 506.0" Long 43° 35' 856.0"		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL											
			2.5	Brown, LEAN CLAY, some sand, little gravel	CL											
2 AU			5.0	BEDROCK, dolomite	BR											
			7.5													
3 AU			10.0													
				Boring Refusal at 11 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.												

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
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Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 1

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-5	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
WI Unique Well No.		DNR Well ID No.	Common Well Name		Drilling Method flight auger	
			Final Static Water Level Feet MSL		Surface Elevation 1,257.4 Feet MSL	
					Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Lat 90° 50' 471.0"		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Long 43° 35' 874.0"			

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				SAND & GRAVEL, basecourse										
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0											
			12.5											
			15.0	BEDROCK, dolomite	BR									
4 AU			17.5											
				Boring Refusal at 19 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
------------------------------	--	--------------

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

Page 1 of 1

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-6	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger						
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,254.9 Feet MSL	Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Lat 90° 50' 497.0"		Local Grid Location ☐ N ☐ E	
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Long 43° 35' 890.0"		Feet ☐ S Feet ☐ W	

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0	BEDROCK, dolomite	BR									
				Boring Refusal at 12 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson 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 - 2021 Geotech Investigation		License/Permit/Monitoring Number 3268		Boring Number B-8	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.		Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,258.7 Feet MSL	Borehole Diameter 4.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Local Grid Location ☐ N ☐ E ☐ S ☐ W		
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Lat 90° 50' 459.0" Long 43° 35' 897.0"		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel, occassional cobbles										
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5											
			30.0											

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
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[illegible]

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

Page 1 of 2

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation		License/Permit/Monitoring Number 3268		Boring Number B-9	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.		Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,253.7 Feet MSL	Borehole Diameter 4.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Local Grid Location ☐ N ☐ E ☐ S ☐ W		
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Lat 90° 50' 492.0" Long 43° 35' 925.0"		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel, occassional cobbles										
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5											
			30.0											

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
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[illegible]

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

Page 1 of 1

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation		License/Permit/Monitoring Number 3268		Boring Number B-11	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.		Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,253.9 Feet MSL	Borehole Diameter 4.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Local Grid Location ☐ N ☐ E ☐ S ☐ W		
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Lat 90° 50' 455.0" Long 43° 35' 938.0"		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				SAND & GRAVEL, basecourse										
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0											
			12.5	BEDROCK, dolomite	BR									
4 AU			15.0											
				Boring Refusal at 17 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson 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 - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-12	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger						
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,259.9 Feet MSL	Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Lat 90° 50' 432.0"		Local Grid Location	
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Long 43° 35' 909.0"		☐ N ☐ E ☐ S ☐ W	

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5											
			30.0											

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
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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	
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel <i>(continued)</i>	CL									
8 AU			35.0	BEDROCK, fine sandstone, some shale	BR									
			37.5											
9 AU			40.0	BEDROCK, dolomite	BR									
			42.5											
10 AU			45.0	Boring Refusal at 47 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										
				Boring Refusal at 47 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Page 1 of 2

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-13	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
WI Unique Well No.		DNR Well ID No.	Common Well Name		Drilling Method flight auger	
			Final Static Water Level Feet MSL		Surface Elevation 1,258.2 Feet MSL	
					Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Lat 90° 50' 425.0"		Local Grid Location	
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Long 43° 35' 927.0"		☐ N ☐ E ☐ S ☐ W	

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0	Brown, LEAN CLAY, some sand, little gravel, occasional cobbles										
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0	Brown, LEAN CLAY, some sand, little gravel										
			22.5											
6 AU			25.0		CL									
			27.5											
			30.0											

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
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Boring Number		Use only as an attachment to Form 4400-122.										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	
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel (<i>continued</i>)	CL									
8 AU			35.0											
			37.5	BEDROCK, dolomite	BR									
9 AU			40.0											
			42.5											
				Boring Refusal at 43 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Page 1 of 2

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-14	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
Drilling Method flight auger						
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,257.3 Feet MSL	Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Lat 90° 50' 405.0"		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Long 43° 35' 921.0"			

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel	CL									
2 AU			5.0	Brown, LEAN CLAY, some sand, little gravel, occasional cobbles										
			7.5											
3 AU			10.0		CL									
			12.5											
4 AU			15.0	Brown, LEAN CLAY, some sand, little gravel										
			17.5											
5 AU			20.0											
			22.5		CL									
			25.0											
6 AU			27.5											
			30.0											

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
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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.

Boring Number		Use only as an attachment to Form 4400-122.										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	
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel <i>(continued)</i>	CL									
8 AU		35.0												
		37.5												
9 AU			40.0	BEDROCK, dolomite	BR									
		42.5												
10 AU		45.0												
			47.5											
				Boring Refusal at 49 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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

Page 1 of 2

Facility/Project Name Vernon County Landfill - 2021 Geotech Investigation			License/Permit/Monitoring Number 3268		Boring Number B-16	
Boring Drilled By: Name of crew chief (first, last) and Firm Chris B. Mathy Construction Co.			Date Drilling Started 5/20/2021		Date Drilling Completed 5/20/2021	
WI Unique Well No.		DNR Well ID No.	Common Well Name		Drilling Method flight auger	
			Final Static Water Level Feet MSL		Surface Elevation 1,245.9 Feet MSL	
					Borehole Diameter 4.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane N, E S/C/N			Lat 90° 50' 385.0"		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W			Long 43° 35' 946.0"			

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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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				TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some fine sand, little gravel										
														
2 AU			5.0											
			7.5											
														
3 AU			10.0											
			12.5											
														
4 AU			15.0		CL									
			17.5											
														
5 AU			20.0											
			22.5											
														
6 AU			25.0											
			27.5											
			30.0											

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

Signature <i>Jim E. Hall</i>	Firm Short Elliot Henrickson Inc.	Tel: Fax:
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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	
7 AU					CL									
			32.5	BEDROCK, dolomite	BR									
8 AU			35.0	Boring Refusal at 36 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

Appendix B

Well Construction Records for Wells within 300-feet of Landfill Expansion

Monitoring Wells and Piezometers Inside Expansion Footprint

Facility/Project Name Vernon County	Grid Location 863.8 ft. ☒ N. ☐ S. 1794.6 ft. ☒ E. ☐ W.	Well Name MW-5A
Facility License, Permit or Monitoring Number 03-68		Wis. Unique Well Number DNR Well Number
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location SE 1/4 of SW 1/4 of Section 15 T 13 N, R 4 ☐ E ☒ W	Date Well Installed 11 / 08 / 89 m m d d y y
Distance Well Is From Waste/Source Boundary 55' From Prop. Waste Limits ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known	Well Installed By: (Person's Name and Firm) Gus Pech
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No		Exploration Technology, Inc.

A. Protective pipe, top elevation 1225.81 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 1226.17 ft. MSL	2. Protective cover pipe: a. Inside diameter: 4.0 in. b. Length: 5.0 ft. c. Material: Steel ☒ 04 Other ☐ d. Additional protection? If yes, describe:
C. Land surface elevation 1224.0 ft. MSL	3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐
D. Surface seal, bottom 1446.7 ft. MSL or 79.5 ft.	4. Material between well casing and protective pipe: Bentonite ☒ 30 Annular space seal ☐ Other ☐
USCS classification of soil near screen: ☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☒ Bedrock	5. Annular space seal: Granular Bentonite ☒ 33 Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 Lbs/gal mud weight ... Bentonite slurry ☐ 31 % Bentonite ... Bentonite-cement grout ☐ 50 13.5 Ft ³ volume added for any of the above How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08
E. Sieve analysis attached? ☐ Yes ☒ No	6. Bentonite seal: Bentonite granules ☐ 33 ☒ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32 Other ☐
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	7. Fine sand material: Manufacturer, product name and mesh size Ottawa Sand Volume added 0.4 ft ³
15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☒ 03 None ☐ 99	8. Filter pack material: Manufacturer, product name and mesh size Waupaca Materials No. 30 Flint Volume added 3.5 ft ³
16. Drilling additives used? ☒ Yes ☐ No Describe Foam	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
17. Source of water (attach analysis): City of Viroqua Municipal Water	10. Screen material: Sch. 80 PVC Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
Pentonite seal, top 1146.7 ft. MSL or 79.5 ft.	Manufacturer Northern Air & Supply Slot size: 0.010 in. Slotted length: 13.5 ft.
Fine sand, top 1145.7 ft. MSL or 80.5 ft.	11. Backfill material (below filter pack): None ☒ Other ☐
Filter pack, top 1143.7 ft. MSL or 82.5 ft.	
Well screen, top 1137.9 ft. MSL or 88.3 ft.	
Well screen, bottom 1122.9 ft. MSL or 103.3 ft.	
Filter pack, bottom 1122.9 ft. MSL or 103.3 ft.	
Borehole, bottom 1122.9 ft. MSL or 103.3 ft.	
Borehole, diameter 6.0 in.	
O.D. well casing 2.40 in.	
I.D. well casing 2.00 in.	

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

Signature Karl Thornton Firm Central Wisconsin Engineers

Use complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with

ch. 14, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation.

NOTE: Shaded areas are for DNR use only. See instructions for more information.

Facility/Project Name <u>VERNON COUNTY</u>	Local Grid Location of Well _____ ft. ☐ N _____ ft. ☐ E _____ ft. ☐ S _____ ft. ☐ W	Well Name <u>MW-5</u>
Facility License, Permit or Monitoring Number _____	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location of Waste/Source <u>SW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 E, W.</u>	Date Well Installed <u>02/16/88</u> m m d d y y
Distance Well Is From Waste/Source Boundary _____ ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm) <u>ACE WELL</u>
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

- A. Protective pipe, top elevation 1226.50 ft. MSL
- B. Well casing, top elevation 1225.32 ft. MSL
- C. Land surface elevation 1223.2 ft. MSL
- D. Surface seal, bottom 1218.2 ft. MSL or 5.0 ft.
1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ 04
Other ☐

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50
Hollow Stem Auger ☐ 41
Other ☐

15. Drilling fluid used: Water ☐ 02 Air ☒ 01
Drilling Mud ☐ 03 None ☐ 99

16. Drilling additives used? ☒ Yes ☐ No

Describe QUITE FOAM

17. Source of water (attach analysis):

HILLSBORO CITY WATER

- E. Bentonite seal, top 1102.6 ft. MSL or 120.6 ft.
- F. Fine sand, top _____ ft. MSL or _____ ft.
- G. Filter pack, top 1091.6 ft. MSL or 131.6 ft.
- H. Screen joint, top 1082.6 ft. MSL or 140.6 ft.
- I. Well bottom 1072.6 ft. MSL or 150.6 ft.
- J. Filter pack, bottom _____ ft. MSL or _____ ft.
- K. Borehole, bottom 1043.2 ft. MSL or 180.0 ft.
- L. Borehole, diameter 6.0 in.
- M. O.D. well casing 2.40 in.
- N. I.D. well casing 1.80 in.
3. Surface seal: Bentonite ☐ 30
Concrete ☒ 01
Other ☐
4. Material between well casing and protective pipe:
Bentonite ☐ 30
Annular space seal ☐
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31
d. 50 % Bentonite ... Bentonite-cement grout ☒ 50
e. 40.10 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☒ 32
c. VOICLAY Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft³
8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 18.09 ft³
9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
Other ☐
10. Screen material: PVC Sch 80
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
Other ☐
- b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ 14
Other ☐

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

Signature William R. ... Firm CENTRAL WISCONSIN ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Facility/Project Name Vernon Co. Baletill	Local Grid Location of Well 1261.80 Feet N, 1691.28 Feet E	Well Name MW-14Z
Facility License, Permit or Monitoring Number 03268	Grid Origin Location	Wis. Unique Well Number JX073
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12	Section Location of Waste/Source SW 1/4, SE 1/4, Sec. 15, T13N, R4E	DNR Well Number 119
Distance Well is From Waste/Source Boundary 115 ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Date Well Installed 03/07/2003
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No	Well Installed By: (Person's Name and Firm) Daryl Karasch Traut Hydro Tech	

A. Protective pipe, top elevation <u>1250.5</u> ft. MSL B. Well casing, top elevation <u>1250.22</u> ft. MSL C. Land surface elevation <u>1247.5</u> ft. MSL D. Surface seal, bottom _____ 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 attached? ☐ Yes ☒ No 14. Drilling method used: Rotary ☐ 50 Hollow Stem Auger ☐ 41 x _____ Other ☒ Versa Sonic 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): Viroqua	1. Cap and lock? ☒ Yes ☐ No 2. Protective cover pipe: a. Inside diameter: 6.0 in. b. Length: 7 ft. c. Material: Steel ☐ 04 Other ☐ d. Additional protection? ☐ Yes ☒ No If yes, describe: _____ 3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐ 4. Material between well casing and protective pipe: Bentonite ☒ 30 Annular space seal ☐ Other ☐ 5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight _____ Bentonite-sand slurry ☒ 35 c. _____ Lbs/gal mud weight _____ Bentonite slurry ☐ 31 d. _____ % Bentonite _____ Bentonite-cement grout ☐ 50 e. _____ Ft³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08 6. Bentonite seal: a. Bentonite Granules ☐ 33 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32 c. _____ Other ☐ 7. Fine sand material: Manufacturer, product name and mesh size a. Unimin #70 b. Volume added <u>0.66</u> ft³ 8. Filter pack material: Manufacturer, product name and mesh size a. Red Flint #40 b. Volume added <u>2.2</u> ft³ 9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐ 10. Screen material: PVC a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ b. Manufacturer <u>Johnson</u> c. Slot size: 0.010 in. d. Slotted length: 5.0 ft. 11. Backfill material (below filter pack): None ☒ 14 Other ☐
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E. Bentonite seal, top _____ ft. MSL or 194.5 ft.

F. Fine sand, top _____ ft. MSL or 199.5 ft.

G. Filter pack, top _____ ft. MSL or 201.5 ft.

H. Screen joint, top _____ ft. MSL or 203.5 ft.

I. Well bottom _____ ft. MSL or 208.5 ft.

J. Filter pack, bottom _____ ft. MSL or 210 ft.

K. Borehole, bottom _____ ft. MSL or 210 ft.

L. Borehole, diameter 7.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 1.94 in.

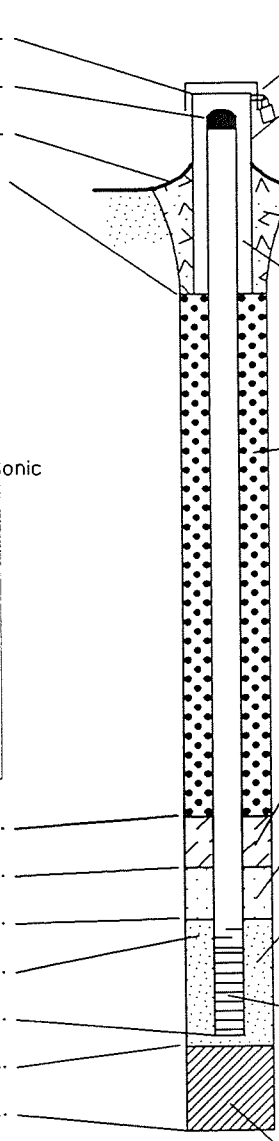
I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [Signature] Firm Central Wisconsin Engineers & Architects

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Monitoring Wells and Piezometers within 150-feet of Landfill Expansion

Facility/Project Name Vernon Co. Bafell	Local Grid Location of Well 1275.90 Feet N, 1678.68 Feet E	Well Name MW-14
Facility License, Permit or Monitoring Number 03268	Grid Origin Location	Wis. Unique Well Number JX072
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location of Waste/Source SW 1/4, SE 1/4, Sec. 15, T13N, R4E	DNR Well Number 118
Distance Well Is From Waste/Source Boundary 100 ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Date Well Installed 03/12/2003
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		Well Installed By: (Person's Name and Firm) Daryl Karasch Traut Hydro Tech

A. Protective pipe, top elevation 1250.0 ft. MSL B. Well casing, top elevation 1249.69 ft. MSL C. Land surface elevation 1247.5 ft. MSL D. Surface seal, bottom _____ 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 attached? ☐ Yes ☒ No 14. Drilling method used: Rotary ☐ 50 Hollow Stem Auger ☐ 41 x _____ Other ☒ Versa Sonic 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): City of Viroqua Airport	 1. Cap and lock? ☒ Yes ☐ No 2. Protective cover pipe: a. Inside diameter: 6.0 in. b. Length: 7 ft. c. Material: Steel ☐ 04 Other ☐ d. Additional protection? ☐ Yes ☒ No If yes, describe: _____ 3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐ 4. Material between well casing and protective pipe: Bentonite ☒ 30 Annular space seal ☐ Other ☐ 5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight _____ Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight _____ Bentonite slurry ☒ 31 d. _____ % Bentonite _____ Bentonite-cement grout ☐ 50 e. _____ Ft³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08 6. Bentonite seal: a. Bentonite Granules ☐ 33 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32 c. _____ Other ☐ 7. Fine sand material: Manufacturer, product name and mesh size a. Unimin #70 b. Volume added 0.66 ft³ 8. Filter pack material: Manufacturer, product name and mesh size a. Red Flint #40 b. Volume added 5.9 ft³ 9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐ 10. Screen material: PVC a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ b. Manufacturer Johnson c. Slot size: 0.010 in. d. Slotted length: 15 ft. 11. Backfill material (below filter pack): None ☐ 14 Sand #30 ☒
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E. Bentonite seal, top _____ ft. MSL or 161 ft.	
F. Fine sand, top _____ ft. MSL or 166 ft.	
G. Filter pack, top _____ ft. MSL or 168 ft.	
H. Screen joint, top _____ ft. MSL or 170 ft.	
I. Well bottom _____ ft. MSL or 185 ft.	
J. Filter pack, bottom _____ ft. MSL or 185 ft.	
K. Borehole, bottom _____ ft. MSL or 190 ft.	
L. Borehole, diameter 7.0 in.	
M. O.D. well casing 2.40 in.	
N. I.D. well casing 1.94 in.	

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

Signature Ronald Brutsen

Firm Central Wisconsin Engineers & Architects

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Monitoring Wells and Piezometers within 300-feet of Landfill Expansion

Facility/Project Name <u>VERNON COUNTY</u>	Local Grid Location of Well ft. ☐ N ☐ S ☐ E ☐ W	Well Name <u>MW-3</u>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12	Section Location of Waste/Source <u>NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 E W.</u>	Date Well Installed <u>02/01/88</u> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm) <u>ACE WELL</u>
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation <u>1235.39</u> ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation <u>1235.32</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>4.0</u> ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation <u>1233.1</u> ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom <u>1228.1</u> ft. MSL or <u>5.0</u> ft.	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	4. Material between well casing and protective pipe: Bentonite ☐ 30 Annular space seal ☐
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 d. <u>50</u> % Bentonite ... Bentonite-cement grout ☒ 50 e. <u>53.74</u> Ft ³ volume added for any of the above
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08
15. Drilling fluid used: Water ☐ 02 Air ☒ 01 Drilling Mud ☐ 03 None ☐ 99	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☐ 32 c. <u>VOCLAY</u> Other ☐
16. Drilling additives used? ☒ Yes ☐ No Describe <u>QUICK FOAM</u>	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft ³
17. Source of water (attach analysis): <u>HILLSBORO CITY WATER</u>	8. Filter pack material: Manufacturer, product name and mesh size a. <u>SAND</u> b. Volume added <u>8.1</u> ft ³
E. Bentonite seal, top <u>1071.7</u> ft. MSL or <u>161.4</u> ft.	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
F. Fine sand, top _____ ft. MSL or _____ ft.	10. Screen material: <u>PVC Sch 80</u> a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
G. Filter pack, top <u>1067.2</u> ft. MSL or <u>165.9</u> ft.	b. Manufacturer _____ c. Slot size: <u>0.010</u> in. d. Slotted length: _____ ft.
H. Screen joint, top <u>1058.2</u> ft. MSL or <u>174.9</u> ft.	11. Backfill material (below filter pack): None ☐ 14 Other ☐
I. Well bottom <u>1053.2</u> ft. MSL or <u>179.9</u> ft.	
J. Filter pack, bottom _____ ft. MSL or _____ ft.	
K. Borehole, bottom <u>1053.1</u> ft. MSL or <u>180.0</u> ft.	
L. Borehole, diameter <u>6.0</u> in.	
M. O.D. well casing <u>2.40</u> in.	
N. I.D. well casing <u>1.80</u> in.	

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

Signature William R. Vach Firm CENTRAL WISCONSIN ENGINEERS INC.

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Facility/Project Name VERNON COUNTY	Local Grid Location of Well ft. ☐ N ☐ S ☐ E ☐ W	Well Name MW-4
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location of Waste/Source NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 E W.	Date Well Installed 01/28/88 m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm) ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation 1235.31 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 1235.01 ft. MSL	2. Protective cover pipe: a. Inside diameter: 6.0 in. b. Length: 4.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 1233.2 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom 128.2 ft. MSL or 5.0 ft.	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	4. Material between well casing and protective pipe: Bentonite ☐ 30 Annular space seal ☐ Other ☐
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 d. 50 % Bentonite ... Bentonite-cement grout ☒ 50 e. 26.7 Ft ³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☒ 32 c. VOICLAY Other ☐
15. Drilling fluid used: Water ☐ 02 Air ☒ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft ³
16. Drilling additives used? ☒ Yes ☐ No Describe QUICK FOAM	8. Filter pack material: Manufacturer, product name and mesh size a. SAND b. Volume added 5.4 ft ³
17. Source of water (attach analysis): HILLSBORO CITY WELL	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
E. Bentonite seal, top 1099.7 ft. MSL or 133.5 ft.	10. Screen material: PVC Sch 80 a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
F. Fine sand, top _____ ft. MSL or _____ ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 10.0 ft.
G. Filter pack, top 1096.9 ft. MSL or 136.3 ft.	11. Backfill material (below filter pack): None ☐ 14 Other ☐
H. Screen joint, top 1089.2 ft. MSL or 144.0 ft.	
I. Well bottom 1079.2 ft. MSL or 154.0 ft.	
J. Filter pack, bottom _____ ft. MSL or _____ ft.	
K. Borehole, bottom 1073.2 ft. MSL or 160.0 ft.	
L. Borehole, diameter 6.0 in.	
M. O.D. well casing 2.40 in.	
N. I.D. well casing 2.00 in.	

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

Signature William R. Vlach Firm CENTRAL WISCONSIN ENGINEERS

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Facility/Project Name VERNON COUNTY	Local Grid Location of Well ft. ☐ N ☐ S ☐ E ☐ W	Well Name MW-40
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or _____	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	St. Plane _____ ft. N. _____ ft. E.	Date Well Installed 01/28/88 m m d d y y
Distance Well Is From Waste/Source Boundary ft. _____	Section Location of Waste/Source NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 W.	Well Installed By: (Person's Name and Firm) ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation 1235.31 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 1235.19 ft. MSL	2. Protective cover pipe: a. Inside diameter: 6.0 in. b. Length: 4.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 1233.2 ft. MSL	d. Additional protection? ☐ Yes ☐ No If yes, describe: _____
D. Surface seal, bottom 1228.2 ft. MSL or 5.0 ft.	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	4. Material between well casing and protective pipe: Bentonite ☐ 30 Annular space seal ☐ Other ☐
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 d. 50 % Bentonite ... Bentonite-cement grout ☒ 50 e. 26.7 Ft ³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☒ 32 c. Volclay Other ☐
15. Drilling fluid used: Water ☐ 02 Air ☒ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft ³
16. Drilling additives used? ☒ Yes ☐ No Describe Quick Foam	8. Filter pack material: Manufacturer, product name and mesh size a. SAND b. Volume added 12.15 ft ³
17. Source of water (attach analysis): HILLSBORO CITY WATER	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
E. Bentonite seal, top 1159.1 ft. MSL or 74.1 ft.	10. Screen material: PVC Sch 80 a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
F. Fine sand, top _____ ft. MSL or _____ ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 10.0 ft.
G. Filter pack, top 1156.1 ft. MSL or 77.1 ft.	11. Backfill material (below filter pack): None ☐ 14 Other ☐
H. Screen joint, top 1148.3 ft. MSL or 84.9 ft.	
I. Well bottom 1138.3 ft. MSL or 94.9 ft.	
J. Filter pack, bottom _____ ft. MSL or _____ ft.	
K. Borehole, bottom 1073.2 ft. MSL or 160.0 ft.	
L. Borehole, diameter 6.0 in.	
M. O.D. well casing 24.0 in.	
N. I.D. well casing 18.0 in.	

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

Signature William R. Abel Firm CENTRAL WISCONSIN ENGINEERS

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Facility/Project Name <u>VERNON COUNTY</u>	Local Grid Location of Well ft. <u>8</u> S. <u>8</u> E.	Well Name <u>MW-6</u>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12	Section Location of Waste/Source <u>N 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4</u>	Date Well Installed <u>02/19/88</u> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm) <u>ACE WELL</u>
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation <u>1235.47</u> ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation <u>1235.7</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>4.0</u> ft. c. Material: Steel ☒ 04 Other ☐ d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
C. Land surface elevation <u>1233.0</u> ft. MSL	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐
D. Surface seal, bottom <u>1228.0</u> ft. MSL or <u>5.0</u> ft.	4. Material between well casing and protective pipe: Bentonite ☐ 30 Annular space seal ☐ Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 d. <u>50</u> % Bentonite ... Bentonite-cement grout ☒ 50 e. <u>80.2</u> Ft ³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08
13. Sieve analysis attached? ☐ Yes ☒ No	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☒ 32 c. <u>Volclay</u> Other ☐
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft ³
15. Drilling fluid used: Water ☐ 02 Air ☒ 01 Drilling Mud ☐ 03 None ☐ 99	8. Filter pack material: Manufacturer, product name and mesh size a. <u>SAND</u> b. Volume added <u>6.75</u> ft ³
16. Drilling additives used? ☒ Yes ☐ No Describe <u>QUICK FOAM</u>	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
17. Source of water (attach analysis): <u>HILLSBORO CITY WELL</u>	10. Screen material: <u>Sch 80 PVC</u> a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
E. Bentonite seal, top <u>1046.0</u> ft. MSL or <u>187.0</u> ft.	b. Manufacturer _____ c. Slot size: <u>0.010</u> in. d. Slotted length: _____ ft.
F. Fine sand, top _____ ft. MSL or _____ ft.	11. Backfill material (below filter pack): None ☐ 14 Other ☐
G. Filter pack, top <u>1042.0</u> ft. MSL or <u>191.0</u> ft.	
H. Screen joint, top <u>1035.7</u> ft. MSL or <u>197.3</u> ft.	
I. Well bottom <u>1025.7</u> ft. MSL or <u>202.3</u> ft.	
J. Filter pack, bottom _____ ft. MSL or _____ ft.	
K. Borehole, bottom <u>1023.0</u> ft. MSL or <u>210.0</u> ft.	
L. Borehole, diameter <u>6.0</u> in.	
M. O.D. well casing <u>2.40</u> in.	
N. I.D. well casing <u>1.80</u> in.	

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

Signature

Firm

CENTRAL WISCONSIN ENGINEERS

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Facility/Project Name <u>Vernon Co.</u>		Grid Location 215.7 ft. ☒ N. ☐ S. 1656.6 ft. ☒ E. ☐ W.		Well Name MW-10	
Facility License, Permit or Monitoring Number <u>03268</u>				Wis. Unique Well Number _____ DNR Well Number _____	
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12		Section Location SE 1/4 of SW 1/4 of Section 15 T 13 N, R 4 ☐ E ☒ W		Date Well Installed <u>09</u> / <u>15</u> / <u>89</u> m m d d y y	
Distance Well Is From Waste/Source Boundary 140' From Prop. Waste Limits		Location of Well Relative to Waste/Source ☒ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known		Well Installed By: (Person's Name and Firm) <u>Gus Pech</u> <u>Exploration Technology Inc.</u>	
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No					

A. Protective pipe, top elevation <u>1217.50</u> ft. MSL B. Well casing, top elevation <u>1217.45</u> ft. MSL C. Land surface elevation <u>1215.6</u> ft. MSL D. Surface seal, bottom <u>1041.0</u> ft. MSL or <u>176.5</u> ft. E. USCS classification of soil near screen: ☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☒ Bedrock F. Sieve analysis attached? ☐ Yes ☒ No G. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐ _____ H. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☒ 03 None ☐ 99 I. Drilling additives used? ☐ Yes ☒ No J. Describe _____ K. Source of water (attach analysis): <u>City of Wiroqua Municipal Water</u>	1. Cap and lock? ☒ Yes ☐ No 2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>5.0</u> ft. c. Material: Steel ☒ 04 Other ☐ _____ d. Additional protection? ☐ Yes ☒ No If yes, describe: _____ 3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐ _____ 4. Material between well casing and protective pipe: Bentonite ☒ 30 Annular space seal ☐ _____ Other ☐ _____ 5. Annular space seal: Granular Bentonite ☒ 33 Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35 Lbs/gal mud weight Bentonite slurry ☐ 31 % Bentonite Bentonite-cement grout ☐ 50 <u>29.5</u> Ft³ volume added for any of the above How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08 6. Bentonite seal: Bentonite granules ☐ 33 ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32 <u>No. 8 Bentonite Hole Plug</u> Other ☒ _____ 7. Fine sand material: Manufacturer, product name and mesh size <u>Ottawa Sand</u> Volume added <u>0.4</u> ft³ 8. Filter pack material: Manufacturer, product name and mesh size <u>Waupaca Materials No. 30 Flint</u> Volume added <u>0.9</u> ft³ 9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐ _____ 10. Screen material: <u>Sch. 80 PVC</u> Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ _____ Manufacturer <u>Northern Air & Supply</u> Slot size: <u>0.010</u> in. Slotted length: <u>4.5</u> ft. 11. Backfill material (below filter pack): None ☐ <u>No. 30 Flint Sand</u> Other ☐ _____
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I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [Signature] Firm Central Wisconsin Engineers

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Facility/Project Name <u>Vernon Co.</u>	Grid Location <u>204.8</u> ft. ☒ N. ☐ S. <u>1652.4</u> ft. ☒ E. ☐ W.	Well Name <u>MW-11</u>
Ability License, Permit or Monitoring Number <u>03268</u>		Wis. Unique Well Number <u> </u> DNR Well Number <u> </u>
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12	Section Location <u>SE</u> 1/4 of <u>SW</u> 1/4 of Section <u>15</u> T <u>13</u> N. R. <u>4</u> ☐ E ☒ W	Date Well Installed <u>09</u> / <u>29</u> / <u>89</u> m m d d y y
Distance Well Is From Waste/Source Boundary <u>150'</u> From Prop. Waste Unit ft.	Location of Well Relative to Waste/Source ☒ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	Well Installed By: (Person's Name and Firm) <u>Gus Pech</u> <u>Exploration Technology, Inc.</u>
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No		

A. Protective pipe, top elevation <u>1218.00</u> ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation <u>1218.54</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>5.0</u> ft. c. Material: Steel ☒ 04 Other ☐ <u> </u>
C. Land surface elevation <u>1216.4</u> ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: <u> </u>
D. Surface seal, bottom <u>1080.0</u> ft. MSL or <u>138.5</u> ft.	3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐ <u> </u>
USCS classification of soil near screen: ☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☒ Bedrock	4. Material between well casing and protective pipe: Bentonite ☒ 30 Annular space seal ☐ <u> </u> Other ☐ <u> </u>
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: Granular Bentonite ☒ 33 Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 Lbs/gal mud weight ... Bentonite slurry ☐ 31 % Bentonite ... Bentonite-cement grout ☐ 50 <u>23.0</u> Ft ³ volume added for any of the above
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐ <u> </u>	How installed: Tremie ☒ 01 Tremie pumped ☐ 02 Gravity ☒ 08
15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☒ 03 None ☐ 99	6. Bentonite seal: Bentonite granules ☐ 33 ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32 No. 8 Bentonite Hole Plug Other ☒ <u> </u>
16. Drilling additives used? ☐ Yes ☒ No	7. Fine sand material: Manufacturer, product name and mesh size <u>Ottawa Sand</u> Volume added <u>0.5</u> ft ³
Describe <u> </u>	8. Filter pack material: Manufacturer, product name and mesh size <u>Waupaca Materials No. 30 Flint</u> Volume added <u>5.5</u> ft ³
17. Source of water (attach analysis): <u> </u>	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐ <u> </u>
Bentonite seal, top <u>N/A</u> ft. MSL or <u>N/A</u> ft.	10. Screen material: <u>Sch. 80 PVC</u> Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ <u> </u>
Fine sand, top <u>1080.0</u> ft. MSL or <u>138.5</u> ft.	Manufacturer <u>Northern Air & Supply</u> Slot size: <u>0.010</u> in. Slotted length: <u>13.5</u> ft.
Filter pack, top <u>1077.0</u> ft. MSL or <u>141.5</u> ft.	11. Backfill material (below filter pack): None ☐ <u>No. 30 Flint Sand</u> Other ☐
Well screen, top <u>1071.0</u> ft. MSL or <u>147.5</u> ft.	
Well screen, bottom <u>1056.0</u> ft. MSL or <u>162.5</u> ft.	
Filter pack, bottom <u>1056.0</u> ft. MSL or <u>162.5</u> ft.	
Borehole, bottom <u>1053.0</u> ft. MSL or <u>165.5</u> ft.	
Borehole, diameter <u>6.0</u> in.	
O.D. well casing <u>2.40</u> in.	
I.D. well casing <u>2.00</u> in.	

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

Signature Kirk Thornton Firm Central Wisconsin Engineers

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Facility/Project Name <u>Vernon Co.</u>		Grid Location 200.0 ft. ☒ N. ☐ S. 1647.2 ft. ☒ E. ☐ W.		Well Name MW-12	
Facility License, Permit or Monitoring Number <u>03268</u>				Wis. Unique Well Number _____ DNR Well Number _____	
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12		Section Location SE 1/4 of SW 1/4 of Section 15		Date Well Installed <u>09</u> / <u>22</u> / <u>89</u> m m d d y y	
Distance Well Is From Waste/Source Boundary 155' From Prop. Waste Limits ft.		T <u>13</u> N, R <u>4</u> ☐ E ☒ W		Well Installed By: (Person's Name and Firm) Gus Pech	
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No		Location of Well Relative to Waste/Source ☒ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known		Exploration Technology, Inc.	

1. Protective pipe, top elevation <u>1218.10</u> ft. MSL 2. Well casing, top elevation <u>1218.36</u> ft. MSL 3. Land surface elevation <u>1216.4</u> ft. MSL 4. Surface seal, bottom <u>1142.9</u> ft. MSL or <u>75.5</u> ft. 5. USCS classification of soil near screen: ☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☒ Bedrock 6. Sieve analysis attached? ☐ Yes ☒ No 7. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐ 8. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☒ 03 None ☐ 99 9. Drilling additives used? ☐ Yes ☒ No Describe _____ 10. Source of water (attach analysis): <u>City of Viroqua Municipal Water</u>		1. Cap and lock? ☒ Yes ☐ No 2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>5.0</u> ft. c. Material: Steel ☒ 04 Other ☐ d. Additional protection? ☐ Yes ☒ No If yes, describe: _____ 3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐ 4. Material between well casing and protective pipe: Bentonite ☒ 30 Annular space seal ☐ Other ☐ 5. Annular space seal: Granular Bentonite ☒ 33 _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 _____ % Bentonite ... Bentonite-cement grout ☐ 50 <u>12.5</u> Ft ³ volume added for any of the above How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08 6. Bentonite seal: Bentonite granules ☐ 33 ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32 <u>No. 8 Bentonite Hole Plug</u> Other ☒ 7. Fine sand material: Manufacturer, product name and mesh size <u>Ottawa Sand</u> Volume added <u>0.4</u> ft ³ 8. Filter pack material: Manufacturer, product name and mesh size <u>Waupaca Materials. No. 30 Flint</u> Volume added <u>3.2</u> ft ³ 9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐ 10. Screen material: <u>Sch. 80 PVC</u> Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ Manufacturer <u>Northern Air & Supply</u> Slot size: <u>0.010</u> in. Slotted length: <u>13.5</u> ft. 11. Backfill material (below filter pack): None ☐ <u>No. 30 Flint Sand</u> Other ☐
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I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Gus Pech Firm Central Wisconsin Engineers

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Monitoring Wells and Piezometers outside 300-feet of Landfill Expansion

Facility/Project Name <u>VERNON COUNTY</u>	Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.	Well Name <u>MW# 1</u>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or _____	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	St. Plane _____ ft. N. _____ ft. E.	Date Well Installed <u>12/29/87</u> m m d d y y
Distance Well Is From Waste/Source Boundary ft. _____	Section Location of Waste/Source <u>SE 1/4 of SW 1/4 of Sec. 15, T. 13 N, R. 4</u> ☐ E. ☒ W.	Well Installed By: (Person's Name and Firm) <u>ACE WELL</u>
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation <u>1238.90</u> ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation <u>1238.11</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>6.0</u> in. b. Length: <u>4.0</u> ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation <u>1236.4</u> ft. MSL	d. Additional protection? ☐ Yes ☐ No If yes, describe: _____
D. Surface seal, bottom <u>1231.4</u> ft. MSL or <u>5.0</u> ft.	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☐	4. Material between well casing and protective pipe: Bentonite ☐ 30 Annular space seal ☐
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 d. <u>50</u> % Bentonite ... Bentonite-cement grout ☒ 50 e. <u>93.58</u> Ft ³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☒ 32 c. <u>VOICLAY PELLETS</u> Other ☐
15. Drilling fluid used: Water ☐ 02 Air ☒ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft ³
16. Drilling additives used? ☒ Yes ☐ No Describe <u>QUICK FOAM (NL BARSTO)</u>	8. Filter pack material: Manufacturer, product name and mesh size a. <u>SAND</u> b. Volume added <u>13.5</u> ft ³
17. Source of water (attach analysis): <u>HILLSBORO CITY WELL</u>	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
E. Bentonite seal, top <u>1102.1</u> ft. MSL or <u>134.3</u> ft.	10. Screen material: <u>PVC Sch 80</u> a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
F. Fine sand, top _____ ft. MSL or _____ ft.	b. Manufacturer _____ c. Slot size: <u>0.010</u> in. d. Slotted length: <u>10.0</u> ft.
G. Filter pack, top <u>1094.3</u> ft. MSL or <u>142.1</u> ft.	11. Backfill material (below filter pack): None ☐ 14 Other ☐
H. Screen joint, top <u>1088.5</u> ft. MSL or <u>147.9</u> ft.	
I. Well bottom <u>1078.5</u> ft. MSL or <u>157.9</u> ft.	
J. Filter pack, bottom _____ ft. MSL or _____ ft.	
K. Borehole, bottom <u>1036.4</u> ft. MSL or <u>200.0</u> ft.	
L. Borehole, diameter <u>6.0</u> in.	
M. O.D. well casing <u>2.50</u> in.	
N. I.D. well casing <u>1.80</u> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature William R. Vach Firm CENTRAL WISCONSIN ENGINEERS, INC.

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Facility/Project Name VERNON COUNTY	Local Grid Location of Well ft. ☐ N ☐ S ☐ E ☐ W	Well Name MW-1P
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location of Waste/Source SE 1/4 of SW 1/4 of Sec. 15, T. 13 N, R. 4	Date Well Installed 12/29/87 m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm) ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation 1238.90 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 1238.41 ft. MSL	2. Protective cover pipe: a. Inside diameter: 6.0 in. b. Length: 4.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 1236.4 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom 1231.4 ft. MSL or 5.0 ft.	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	4. Material between well casing and protective pipe: Bentonite ☐ 30 Annular space seal ☐
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 d. 50 % Bentonite ... Bentonite-cement grout ☒ 50 e. 93.5 Ft ³ volume added for any of the above
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08
15. Drilling fluid used: Water ☐ 02 Air ☒ 01 Drilling Mud ☐ 03 None ☐ 99	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☒ 32 c. VOLCLAY PELLETS Other ☐
16. Drilling additives used? ☒ Yes ☐ No Describe QUICK FOAM	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft ³
17. Source of water (attach analysis): HILLSBORO CITY WELL	8. Filter pack material: Manufacturer, product name and mesh size a. SAND b. Volume added 19.98 ft ³
E. Bentonite seal, top 1155.8 ft. MSL or 80.6 ft.	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
F. Fine sand, top _____ ft. MSL or _____ ft.	10. Screen material: PVC Sch 80 a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
G. Filter pack, top 1148.2 ft. MSL or 88.2 ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 10.0 ft.
H. Screen joint, top 1135.4 ft. MSL or 101.0 ft.	11. Backfill material (below filter pack): None ☐ 14 Other ☐
I. Well bottom 1125.4 ft. MSL or 111.0 ft.	
J. Filter pack, bottom _____ ft. MSL or _____ ft.	
K. Borehole, bottom 1036.4 ft. MSL or 200.0 ft.	
L. Borehole, diameter 6.0 in.	
M. O.D. well casing 2.50 in.	
N. I.D. well casing 1.80 in.	

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

Signature William Rivach Firm CENTRAL WISCONSIN ENGINEERS, INC.

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94690000

State of Wisconsin
Department of Natural ResourcesRoute to: Solid Waste ☒ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name

Vernon Co. Balefill

Facility License, Permit or Monitoring Number

Local Grid Location of Well

320 ft. N 918 ft. W

Grid Origin Location

Lat. Long. or

St. Plane 582,646 ft. N. 1,776,298 ft. E.

Section Location of Waste/Source

SE 1/4 of SW 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

Well Name

MW1PR

Wis. Unique Well Number DNR Well Number

Date Well Installed

01/12/94

Well Installed By: (Person's Name and Firm)

Carole Eldredge

CENTRAL WIS. ENGINEERS, INC.

A. Protective pipe, top elevation 1247.65 ft. MSL

B. Well casing, top elevation 1247.61 ft. MSL

C. Land surface elevation 1244.9 ft. MSL

D. Surface seal, bottom 1239.9 ft. MSL or -5.0 ft.

12. USCS classification of soil near screen:

GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐Bedrock ☒13. Sieve analysis attached? ☐ Yes ☒ No14. Drilling method used: Rotary ☒ 50Hollow Stem Auger ☐ 41Other ☐15. Drilling fluid used: Water ☐ 02 Air ☒ 01Drilling Mud ☐ 03 None ☐ 9916. Drilling additives used? ☒ Yes ☐ No

Describe Baroid Quick-Foam

17. Source of water (attach analysis):

Vernon Co Balefill

E. Bentonite seal, top 1151.9 ft. MSL or -93.0 ft.

F. Fine sand, top 1146.9 ft. MSL or -98.0 ft.

G. Filter pack, top 1140.9 ft. MSL or -104.0 ft.

H. Screen joint, top 1134.9 ft. MSL or -110.0 ft.

I. Well bottom 1119.9 ft. MSL or -125.0 ft.

J. Filter pack, bottom 1118.9 ft. MSL or -126.0 ft.

K. Borehole, bottom 1118.9 ft. MSL or -126.0 ft.

L. Borehole, diameter -6.0 in.

M. O.D. well casing -3.40 in.

N. I.D. well casing -1.94 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:

a. Inside diameter: 4.9 in.

b. Length: 7.0 ft.

c. Material: Steel ☒ 04Other ☐d. Additional protection? ☐ Yes ☒ No

If yes, describe:

3. Surface seal:

Bentonite ☒ 30Concrete ☐ 01Other ☐

4. Material between well casing and protective pipe:

Bentonite ☒ 30Annular space seal ☐Other ☐

5. Annular space seal:

a. Granular Bentonite ☐ 33b. Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35c. 1/1 Lbs/gal mud weight ... Bentonite slurry ☒ 31d. % Bentonite ... Bentonite-cement grout ☐ 50e. 14.5 Ft³ volume added for any of the abovef. How installed: Tremie ☐ 01Tremie pumped ☒ 02Gravity ☐ 08

6. Bentonite seal:

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

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

a. Badger Silica #45

b. Volume added 1.0 ft³

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

a. Badger Filter 60/40

b. Volume added 5.3 ft³9. Well casing: Flush threaded PVC schedule 40 ☐ 23Flush threaded PVC schedule 80 ☒ 24Other ☐

10. Screen material: Same as #9

a. Screen type: Factory cut ☒ 11Continuous slot ☐ 01Other ☐

b. Manufacturer Northern Air & Supply

c. Slot size: 0.010 in.

d. Slotted length: 15.0 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

Carole Eldredge

Firm

CENTRAL WIS. ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

94690000

State of Wisconsin
Department of Natural ResourcesRoute 10: ☒ Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name

Vernon Co. Balefill

Facility License, Permit or Monitoring Number

Local Grid Location of Well

317 ft. ☒ N. 926 ft. ☒ E.

Grid Origin Location

Lat. _____ Long. _____ or _____

Type of Well Water Table Observation Well ☒ 11Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary

~ 150 ft.

Is Well A Point of Enforcement Std. Application?

☒ Yes ☐ No

Location of Well Relative to Waste/Source

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

Well Name

MWIR

Wis. Unique Well Number DNR Well Number

Date Well Installed 01/12/94
m m d d y y

Well Installed By: (Person's Name and Firm)

Carole Eldredge

CENTRAL WIS. ENGINEERS, INC.

A. Protective pipe, top elevation 1247.29 ft. MSL

B. Well casing, top elevation 1247.25 ft. MSL

C. Land surface elevation 1244.6 ft. MSL

D. Surface seal, bottom 1239.6 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:

GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐Bedrock ☒13. Sieve analysis attached? ☐ Yes ☒ No14. Drilling method used: Rotary ☒ 50Hollow Stem Auger ☐ 41Other ☐15. Drilling fluid used: Water ☐ 02 Air ☒ 01Drilling Mud ☐ 03 None ☐ 9916. Drilling additives used? ☒ Yes ☐ No

Describe Baroid Quick-Foam

17. Source of water (attach analysis):

Vernon Co. Balefill

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:

a. Inside diameter: 4.0 in.

b. Length: 7.0 ft.

c. Material: Steel ☒ 04Other ☐d. Additional protection? ☐ Yes ☒ No

If yes, describe: _____

3. Surface seal:

Bentonite ☒ 30Concrete ☐ 01Other ☐

4. Material between well casing and protective pipe:

Bentonite ☒ 30Annular space seal ☐Other ☐

5. Annular space seal:

a. Granular Bentonite ☐ 33b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35c. _____ Lbs/gal mud weight ... Bentonite slurry ☒ 31d. _____ % Bentonite ... Bentonite-cement grout ☐ 50e. 22 Ft³ volume added for any of the abovef. How installed: Tremie ☐ 01Tremie pumped ☒ 02Gravity ☐ 08

6. Bentonite seal:

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

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

a. Badger Filter 60/140

b. Volume added 8.0 ft³

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

a. See #7

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

10. Screen material: Same as #7

a. Screen type: Factory cut ☒ 11Continuous slot ☐ 01Other ☐

b. Manufacturer Northern Air & Supply

c. Slot size: 0.010 in.

d. Slotted length: 15.0 ft.

11. Backfill material (below filter pack): None ☒ 14Other ☐

E. Bentonite seal, top 1102.6 ft. MSL or 136.0 ft.

F. Fine sand, top 1103.6 ft. MSL or 141.0 ft.

G. Filter pack, top 1103.6 ft. MSL or 141.0 ft.

H. Screen joint, top 1097.6 ft. MSL or 147.0 ft.

I. Well bottom 1082.6 ft. MSL or 163.0 ft.

J. Filter pack, bottom 1079.6 ft. MSL or 165.0 ft.

K. Borehole, bottom 1078.6 ft. MSL or 166.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 34.0 in.

N. I.D. well casing 19.4 in.

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

Signature

Carole Eldredge

Firm

CENTRAL WIS. ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Facility/Project Name <i>Vernon Co. Balfill</i>	Local Grid Location of Well <i>299 Feet N, 918 Feet E</i>	Well Name <i>MW-1RZ</i>
Facility License, Permit or Monitoring Number <i>03268</i>	Grid Origin Location	Wis. Unique Well Number <i>JX074</i> DNR Well Number <i>123</i>
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12	Section Location of Waste/Source <i>S</i> <i>SE 1/4, SW 1/4, Sec.15, T13N, R4W</i>	Date Well Installed <i>03/12/2003</i>
Distance Well Is From Waste/Source Boundary <i>130 ft.</i>	Location of Well Relative to Waste/Source u ☒ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm) <i>Daryl Karasch Traut Hydro Tech</i>
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 7 ft.
c. Material: Steel ☒ 04
Other ☐

d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
Other ☐

4. Material between well casing and protective pipe:
Bentonite ☒ 30
Annular space seal ☐
Other ☐

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight _____ Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight _____ Bentonite slurry ☒ 31
d. _____ % Bentonite _____ Bentonite-cement grout ☐ 50
e. _____ Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☒ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite Granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
c. _____ Other ☐

7. Fine sand material: Manufacturer, product name and mesh size
a. *Unimin #70*
b. Volume added *0.66* ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. *Red Flint #40*
b. Volume added *3.3* ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
Other ☐

b. Manufacturer *Johnson*
c. Slot size: 0.010 in.
d. Slotted length: _____ ft.

11. Backfill material (below filter pack): None ☒ 14
Other ☐

A. Protective pipe, top elevation *1445.8* ft. MSL

B. Well casing, top elevation *1245.45* ft. MSL

C. Land surface elevation *1244.0* ft. MSL

D. Surface seal, bottom _____ 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 attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
x _____ Other ☒ Versa Sonic

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):
City of Viroqua Airport

G. Bentonite seal, top _____ ft. MSL or *170* ft.

H. Fine sand, top _____ ft. MSL or *175* ft.

I. Filter pack, top _____ ft. MSL or *177* ft.

J. Screen joint, top _____ ft. MSL or *180* ft.

K. Well bottom _____ ft. MSL or *185* ft.

L. Filter pack, bottom _____ ft. MSL or *185* ft.

M. Borehole, bottom _____ ft. MSL or *185* ft.

N. Borehole, diameter *7.0* in.

O. O.D. well casing *2.40* in.

P. I.D. well casing *1.94* in.

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

Signature *Peter D. Brubaker*

Firm *Central Wisconsin Engineers & Architects*

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Facility/Project Name <u>VERNON COUNTY</u>	Local Grid Location of Well ft. <u>8</u> N. <u>8</u> E. <u>W</u>	Well Name <u>MW # 2</u>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location of Waste/Source <u>SE 1/4 of SW 1/4 of Sec. 15, T. 13 N, R. 4 W.</u>	Date Well Installed <u>01/16/89</u> m m d d y y
Distance Well Is From Waste/Source Boundary ft. _____	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm) <u>ACE WELL</u>
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation <u>1255.07</u> ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation <u>1254.35</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>6.0</u> in. b. Length: <u>4.0</u> ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation <u>1252.8</u> ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom <u>1247.8</u> ft. MSL or <u>-5.0</u> ft.	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	4. Material between well casing and protective pipe: Bentonite ☐ 30 Annular space seal ☐
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 d. <u>50</u> % Bentonite ... Bentonite-cement grout ☒ 50 e. <u>66.8</u> Ft ³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☒ 02 Gravity ☐ 08
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☐ 32 c. <u>Volclay</u> Other ☐
15. Drilling fluid used: Water ☐ 02 Air ☒ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft ³
16. Drilling additives used? ☒ Yes ☐ No	8. Filter pack material: Manufacturer, product name and mesh size a. <u>SAND</u> b. Volume added <u>13.5</u> ft ³
Describe <u>Quick Form</u>	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
17. Source of water (attach analysis): <u>HILLSBORO CITY WELL</u>	10. Screen material: <u>PVC Sch 80</u> a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
E. Bentonite seal, top <u>1105.3</u> ft. MSL or <u>147.5</u> ft.	b. Manufacturer _____ c. Slot size: <u>0.010</u> in. d. Slotted length: <u>10.0</u> ft.
F. Fine sand, top _____ ft. MSL or _____ ft.	11. Backfill material (below filter pack): None ☐ 14 Other ☐
G. Filter pack, top <u>1097.8</u> ft. MSL or <u>155.0</u> ft.	
H. Screen joint, top <u>1088.3</u> ft. MSL or <u>164.5</u> ft.	
I. Well bottom <u>1078.3</u> ft. MSL or <u>174.5</u> ft.	
J. Filter pack, bottom _____ ft. MSL or _____ ft.	
K. Borehole, bottom <u>1062.8</u> ft. MSL or <u>190.0</u> ft.	
L. Borehole, diameter <u>6.0</u> in.	
M. O.D. well casing <u>2.40</u> in.	
N. I.D. well casing <u>1.80</u> in.	

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

Signature William R. Vach

Firm CENTRAL WISCONSIN ENGINEERS

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Facility/Project Name VERNON COUNTY	Local Grid Location of Well ft. ☐ N ☐ S ☐ E ☐ W	Well Name MW-2P
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or	Wis. Unique Well Number DNR Well Number
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	St. Plane _____ ft. N. _____ ft. E.	Date Well Installed 01/16/88 m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Section Location of Waste/Source SE 1/4 of SW 1/4 of Sec. 15, T. 13, N. R. 4 ☐ E ☒ W	Well Installed By: (Person's Name and Firm) ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation 1255.02 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 1254.88 ft. MSL	2. Protective cover pipe: a. Inside diameter: 6.0 in. b. Length: 4.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 1252.8 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom 1247.8 ft. MSL or 5.0 ft.	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	4. Material between well casing and protective pipe: Bentonite ☐ 30 Annular space seal ☐ Other ☐
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: a. Granular Bentonite ☐ 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 d. 50 % Bentonite ... Bentonite-cement grout ☒ 50 e. 66.8 Ft ³ volume added for any of the above f. How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☐ 08
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	6. Bentonite seal: a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☐ 32 c. Volclay Other ☐
15. Drilling fluid used: Water ☐ 02 Air ☒ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft ³
16. Drilling additives used? ☒ Yes ☐ No Describe Quik Foam	8. Filter pack material: Manufacturer, product name and mesh size a. SAND b. Volume added 27.0 ft ³
17. Source of water (attach analysis): HILLSBORO CITY WELL	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
E. Bentonite seal, top 1149.2 ft. MSL or 103.6 ft.	10. Screen material: PVC SCH 80 a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
F. Fine sand, top _____ ft. MSL or _____ ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 10.0 ft.
G. Filter pack, top 1147.2 ft. MSL or 105.6 ft.	11. Backfill material (below filter pack): None ☐ 14 Other ☐
H. Screen joint, top 1138.0 ft. MSL or 114.8 ft.	
I. Well bottom 1128.0 ft. MSL or 124.8 ft.	
J. Filter pack, bottom _____ ft. MSL or _____ ft.	
K. Borehole, bottom 1062.8 ft. MSL or 190.0 ft.	
L. Borehole, diameter 6.0 in.	
M. O.D. well casing 2.40 in.	
N. I.D. well casing 1.80 in.	

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

Signature William R. Vach Firm **CENTRAL WISCONSIN ENGINEERS, INC.**

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Signature Kirk Throner Firm Central Wisconsin Engineers

Facility/Project Name Vernon Co.	Grid Location 1236.3 ft. ☒ N. ☐ S. 1081.6 ft. ☒ E. ☐ W.	Well Name MW-8R
Facility License, Permit or Monitoring Number 03268		Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location SE 1/4 of SW 1/4 of Section 15	Date Well Installed 11 / 13 / 89 m m d d y y
Distance Well Is From Waste/Source Boundary 100' From Prop. Waste Limits ft.	T 13 N, R 4 ☐ E ☒ W	Well Installed By: (Person's Name and Firm) Gus Pech
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No	Location of Well Relative to Waste/Source ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known	Exploration Technology, Inc.

A. Protective pipe, top elevation 1258.59 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 1258.83 ft. MSL	2. Protective cover pipe: a. Inside diameter: 4.0 in. b. Length: 5.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 1256.1 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom 1079.3 ft. MSL or 179.5 ft.	3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐
E. USCS classification of soil near screen: ☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☒ Bedrock	4. Material between well casing and protective pipe: Bentonite ☒ 30 Annular space seal ☐ Other ☐
F. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: Granular Bentonite ☒ 33 Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 Lbs/gal mud weight ... Bentonite slurry ☐ 31 % Bentonite ... Bentonite-cement grout ☐ 50 30.0 Ft ³ volume added for any of the above
G. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐	How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08
H. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☒ 03 None ☐ 99	6. Bentonite seal: Bentonite granules ☐ 33 ☒ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32 Other ☐
I. Drilling additives used? ☒ Yes ☐ No Describe: Foam	7. Fine sand material: Manufacturer, product name and mesh size Ottawa Sand Volume added 0.4 ft ³
J. Source of water (attach analysis): City of Viroqua Municipal Water	8. Filter pack material: Manufacturer, product name and mesh size Waupaca Materials No. 30 Flint Volume added 3.0 ft ³
K. Bentonite seal, top 1079.3 ft. MSL or 179.5 ft.	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐
L. Fine sand, top 1076.3 ft. MSL or 182.5 ft.	10. Screen material: Sch. 80 PVC Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
M. Filter pack, top 1074.3 ft. MSL or 184.5 ft.	Manufacturer Northern Air & Supply Slot size: 0.010 in. Slotted length: 13.5 ft.
N. Well screen, top 1071.3 ft. MSL or 187.5 ft.	11. Backfill material (below filter pack): None ☐ No. 30 Flint Sand ☐
O. Well screen, bottom 1056.3 ft. MSL or 202.5 ft.	
P. Filter pack, bottom 1056.3 ft. MSL or 202.5 ft.	
Q. Borehole, bottom 1049.3 ft. MSL or 209.5 ft.	
R. Borehole, diameter 6.0 in.	
S. O.D. well casing 2.40 in.	
T. I.D. well casing 2.00 in.	

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

Signature [Signature] Firm Central Wisconsin Engineers

Use complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation.

NOTE: Shaded areas are for DNR use only. See instructions for more information.

Facility/Project Name <u>Vernon Co.</u>	Grid Location <u>1239.9</u> ft. ☒ N. ☐ S. <u>1099.3</u> ft. ☒ E. ☐ W.	Well Name <u>MW-9</u>
Facility License, Permit or Monitoring Number <u>03268</u>		Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location <u>SE</u> 1/4 of <u>SW</u> 1/4 of Section <u>15</u> T <u>13</u> N, R <u>4</u> ☐ E ☒ W	Date Well Installed <u>0</u> <u>8</u> / <u>2</u> <u>9</u> / <u>8</u> <u>9</u> m m d d y y
Distance Well Is From Waste/Source Boundary <u>95'</u> From Prop. Waste Limits ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known	Well Installed By: (Person's Name and Firm) <u>Gus Pech</u> <u>Exploration Technology, Inc.</u>
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No		

A. Protective pipe, top elevation <u>1257.22</u> ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation <u>1257.50</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>5.0</u> ft. c. Material: Steel ☒ 04 Other ☐ _____ d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
C. Land surface elevation <u>1255.4</u> ft. MSL	3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐ _____
D. Surface seal, bottom <u>161.5</u> ft. MSL or <u>960</u> ft.	4. Material between well casing and protective pipe: Bentonite ☒ 30 Annular space seal ☐ _____ Other ☐ _____
1. USCS classification of soil near screen: ☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☒ Bedrock	5. Annular space seal: Granular Bentonite ☒ 33 ____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 ____ Lbs/gal mud weight ... Bentonite slurry ☐ 31 ____ % Bentonite ... Bentonite-cement grout ☐ 50 <u>16.0</u> Ft ³ volume added for any of the above How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08
15. Sieve analysis attached? ☐ Yes ☒ No	6. Bentonite seal: Bentonite granules ☐ 33 ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32 <u>No. 8 Bentonite Hole Plug</u> Other ☒ _____
14. Drilling method used: Rotary ☒ 50 Hollow Stem Auger ☐ 41 Other ☐ _____	7. Fine sand material: Manufacturer, product name and mesh size <u>Ottawa Sand</u> Volume added <u>0.5</u> ft ³
1. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☒ 03 None ☐ 99	8. Filter pack material: Manufacturer, product name and mesh size <u>Waupaca Materials No. 30 Flint</u> Volume added <u>4.2</u> ft ³
16. Drilling additives used? ☐ Yes ☒ No	9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☒ 24 Other ☐ _____
Describe _____	10. Screen material: <u>Sch. 80 PVC</u> Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ _____
17. Source of water (attach analysis): <u>City of Viroqua Municipal Water</u>	Manufacturer <u>Northern Air & Supply</u> Slot size: <u>0.010</u> in. Slotted length: <u>13.5</u> ft.
Bentonite seal, top <u>1161.5</u> ft. MSL or <u>96.0</u> ft.	11. Backfill material (below filter pack): None ☐ <u>Natural Soils</u> Other ☐ _____
Fine sand, top <u>1158.7</u> ft. MSL or <u>98.8</u> ft.	
Filter pack, top <u>1155.7</u> ft. MSL or <u>101.8</u> ft.	
Well screen, top <u>1145.7</u> ft. MSL or <u>111.8</u> ft.	
Well screen, bottom <u>1130.7</u> ft. MSL or <u>126.8</u> ft.	
Filter pack, bottom <u>1130.7</u> ft. MSL or <u>126.8</u> ft.	
Borehole, bottom <u>1124.0</u> ft. MSL or <u>133.5</u> ft.	
Borehole, diameter <u>6.0</u> in.	
O.D. well casing <u>2.40</u> in.	
I.D. well casing <u>2.00</u> in.	

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

Signature Rick Thornton Firm Central Wisconsin Engineers

Use complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation.

NOTE: Shaded areas are for DNR use only. See instructions for more information.

Facility/Project Name <i>Vernon Co. Balefill</i>	Local Grid Location of Well <i>295.72 Feet N, 1259.36 Feet E</i>	Well Name <i>MW-13P</i>
Facility License, Permit or Monitoring Number <i>03268</i>	Grid Origin Location	Wis. Unique Well Number <i>JX071</i>
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location of Waste/Source <i>SW 1/4, SE 1/4, Sec.15, T13N, R4W</i>	DNR Well Number <i>117</i>
Distance Well Is From Waste/Source Boundary <i>110 ft.</i>	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Date Well Installed <i>02/26/2003</i>
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		Well Installed By: (Person's Name and Firm) <i>Daryl Karasch Traut Hydro Tech</i>

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 7 ft.
c. Material: Steel ☐ 04
Other ☐

d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
Other ☐

4. Material between well casing and protective pipe:
Bentonite ☒ 30
Annular space seal ☐
Other ☐

5. Annular space seal: a. Granular Bentonite ☐ 33
b. Lbs/gal mud weight Bentonite-sand slurry ☐ 35
c. Lbs/gal mud weight Bentonite slurry ☐ 31
d. % Bentonite Bentonite-cement grout ☒ 50
e. Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☒ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite Granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
c. Other ☐

7. Fine sand material: Manufacturer, product name and mesh size
a. *Unimin #70*
b. Volume added *0.66* ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. *Red Flint #40*
b. Volume added *4.6* ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
Other ☐

10. Screen material: *PVC*
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
Other ☐
b. Manufacturer *Johnson*
c. Slot size: 0.010 in.
d. Slotted length: 15.0 ft.

11. Backfill material (below filter pack): None ☒ 14
Other ☐

A. Protective pipe, top elevation *1227.7* ft. MSL

B. Well casing, top elevation *1227.42* ft. MSL

C. Land surface elevation *1224.5* ft. MSL

D. Surface seal, bottom _____ 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 attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
x Other ☒ Versa Sonic

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):
City of Viroqua Airport

E. Bentonite seal, top _____ ft. MSL or *76* ft.

F. Fine sand, top _____ ft. MSL or *81* ft.

G. Filter pack, top _____ ft. MSL or *83* ft.

H. Screen joint, top _____ ft. MSL or *85* ft.

I. Well bottom _____ ft. MSL or *100* ft.

J. Filter pack, bottom _____ ft. MSL or *100* ft.

K. Borehole, bottom _____ ft. MSL or *100* ft.

L. Borehole, diameter *7.0* in.

M. O.D. well casing *2.40* in.

N. I.D. well casing *1.94* in.

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

Signature *Peter D. Bruntjen*

Firm *Central Wisconsin Engineers & Architects*

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160 Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144 Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147 Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

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I-2 – Response to AGIP Acceptance Letter



July 27, 2022

RE: Vernon County Landfill
Response to AGIP Acceptance Letter
SEH No. VERSW 167824 14.00

Carolyn Cooper, Hydrogeologist
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711-5367

Dear Ms. Cooper:

On behalf of the Vernon County Landfill, Short Elliott Hendrickson Inc. (SEH®) submitted an Alternative Geotechnical Program Request (AGIP) to the Wisconsin Department of Natural Resources (WDNR) on December 12, 2021. The WDNR accepted the AGIP in a letter submitted to Vernon County Landfill on March 30, 2022. The WDNR and SEH also had a virtual meeting on June 9, 2022, to discuss several of the WDNR comments. This letter provides a response to a few outstanding items that were stated by the WDNR within the AGIP acceptance letter and discussed at the June 2022 meeting. The following discussion re-states the pertinent portions of the WDNR comments followed by the respective response.

WDNR Comment 1 – Bedrock Coring and Geophysics: *In lieu of bedrock core sampling, downhole geophysical logging should be used to evaluate bedrock fractures including their size, frequency, distribution, connectivity, and hydraulic conductivity.*

Response: This item was discussed with the WDNR at the June 9 meeting. Bedrock coring is now being proposed at one location, MW-14WT, at the location shown on **Figure 1**. Based on previous coring efforts and its location on the ridge, this location was selected because it is anticipated to have the most competent bedrock to make coring successful; weathering of bedrock is generally deeper within valleys.

Based on the June 9 discussion, we are also proposing to conduct borehole geophysics at each of the four new well locations (only the deepest well will be logged at the MW-16WT/MW-16 location). Due to the depth to groundwater, borehole geophysical methods will be limited to natural gamma. The natural gamma radiation may allow identification of vertical lithologic variations, particularly in reference to shales, that could potentially cause groundwater perching or diversion during percolation. In addition, natural gamma radiation may be useful for establishing marker horizons across the site to better correlate between boreholes.

In reference to borehole geophysics, we also are proposing to log natural gamma radiation at eight existing well locations (**Figure 1**). Each of the wells proposed for geophysics is the deepest well within the respective well nest. Natural gamma radiation measurements can be collected through the existing steel casing. As indicated above, natural gamma radiation may allow identification of vertical lithologic variations and establish marker horizons across the site to correlate between past and new boreholes. The following table is a summary of the existing wells and proposed borings for borehole geophysics.

Engineers | Architects | Planners | Scientists

Short Elliott Hendrickson Inc., 329 Jay Street, Suite 301, La Crosse, WI 54601-4034

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Existing Well ID	Depth (feet)	Proposed Well ID	Proposed Depth (feet)
MW-1	200	MW-14WT	97
MW-1RZ	185	MW-15WT	90
MW-2	190	MW-16	85
MW-6	210	MW-17WT	78
MW-5	190		
MW-7	234.5		
MW-10	181		
MW-14Z	210		

WDNR Comment 2 – Well Development: *Note, that additional well volumes may need to be removed if the turbidity and field parameters indicate additional purging is warranted.*

Response: Concur; additional well volumes will be removed until the turbidity/water clarity indicates proper well development. In accordance with Wis. Adm. Code NR 507.07, a sample will be taken from each well within 24 hours of completion of well development and analyzed for total suspended solids. Because drilling fluid will be used, COD will also be analyzed.

WDNR Comment 3 – Borings within Cross-Sections: *However, it (AGIP, Section 2.2) does not discuss which borings can be used to characterize the subsurface of the vertical overlay component. The previously installed borings used to characterize the subsurface of the area within 300 feet of the vertical overlay for past feasibility reports should also be used to draw the cross-sections.*

Response: Concur; all previously installed borings that characterize the subsurface within 300 feet of the expansion will be used in the development of geologic cross-sections.

WDNR Comment 4 – Location of Monitoring Well: *The department requests that Vernon County consider installing a water table well northeast of the expansion area, east of the word “wooded” on Figure 7 of the AGIP. This well could help better define the groundwater divide to the north of the proposed expansion area and would be a northern point beyond the limits of waste on an east-west cross-section.*

Response: This item was discussed with the DNR at the June 9 meeting. The proposed location of well MW-14WT has been moved to the east in order to monitor the area northeast of the proposed expansion. The new proposed MW-14WT location is provided on **Figure 1**. Due to proposed well MW-14WT moving locations, the summary table for the drilling program has been revised to indicate a new proposed boring depth table and included in **Table 1**.

WDNR Comment 5 – Soil Data: *The department will allow the use of previously collected soil laboratory testing data toward meeting the requirements of s. NR 512.09(4), Wis. Adm. Code. This data, along with newly acquired data, must be submitted with the feasibility report.*

Response: Concur; the previously collected and newly acquired data will be submitted with the feasibility report in accordance with Wis. Adm. Code NR 512.09(04).

WDNR Comment 6 – Hydraulic Conductivity Data: *The department will allow the use of previously collected hydraulic conductivity data toward meeting the requirements of s. NR 512.09(4), Wis. Adm. Code. This data, along with any newly acquired data, must be submitted with the feasibility report.*

Response: Concur; the previously collected and newly acquired data will be submitted with the feasibility report in accordance with Wis. Adm. Code NR 512.09(04).

WDNR Comment 7 – Retention of Core Samples: *Core samples obtained from newly drilled borings should be retained through the feasibility determination in accordance with the requirements of s. NR 507.05(1)(e), Wis. Adm. Code.*

Response: Concur; the core samples obtained at proposed MW-14WT will be retained through the feasibility determination in accordance with Wis. Adm. Code NR 507.05(1)(e).

WDNR Comment 8 – Geologic Cross-Sections: *All of the borings, wells and piezometers that are used to define the subsurface for the area of the vertical and horizontal expansion should be used to draw the cross-sections. This would include those borings, wells, and piezometers within 300 feet of the limits of the vertical and horizontal expansion. The department does not agree with this request.*

Response: All test pits, borings, wells, and piezometers within 300-feet of the proposed expansion limits will be included to create the geological cross-sections submitted within the feasibility. However, several data situations exist outside of the 300-foot limits that need clarification on how or if they can or should be utilized in geologic cross-section development. For reference, all borings within the site are provided on **Table 2** with locations illustrated on **Figure 1**. Special consideration needs to be given for the following boring log and test pit scenarios (several borings or test pits may fall into multiple categories):

- **No Boring Log Available:** As indicated in **Table 2**, logs are not available for the following borings completed in 1987: AB-5, AB-9, AB-10, AB-15, AB-18, AB-19, AB-21, AB-22 AB-23, AB-24, AB-25, AB-28, AB-29, and AB-30. Limited information on depth to bedrock or bedrock elevation may have been included in tables or figures from previous reports. Data from these old logs will be utilized in cross-section development if the information can be substantiated and/or appears representative of anticipated conditions.
- **Shallow Borings/Test Pits:** Many borings or test pits were completed as part of the original landfill siting (prior to landfill development) or as part of soil borrow investigations. As indicated in **Table 2**, nearly 20 of these are less than 10 feet deep. Due to site development, soils in these areas may have been completely removed. Data from these old logs will be utilized in cross-section development if the information is pertinent to geologic interpretation.
- **Distant Borings/Test Pits:** Many borings or test pits were completed as part of the original landfill siting (prior to landfill development) or as part of soil borrow investigations. As a result, several of these borings and test pits are generally situated greater than 500 feet from the existing landfill footprint and are not included on **Figure 1** due to their location. As a result, geologic cross-sections are not anticipated to intersect the following distant borings and test pits: AB-1, AB-2, AB-3, AB-4, AB-5, AB-7, AB-8, AB-9, AB-10, AB-11, TP-1, TP-2, T-3, TP-4, TP-9, and TP-26.
- **Nested Boring/Well Locations:** Several locations across the site have nested monitoring wells and corresponding boring logs. Since the original borings were completed within a few feet of each other, they often simply reference a corresponding deeper log. Due to the proximity of the borings, providing the lithology or soil classification for each log would cause overlap when illustrated to scale on the cross-sections, making the information difficult to read. Therefore, it is proposed that the deepest and/or most accurate boring log be used from each well nest/grouping; this also applies to test pits completed in the vicinity of deeper borings and/or well installations. Any unique or pertinent information from other boring logs within the well nest/grouping will be provided within the cross-section via footnote, as appropriate. The following are the well nests/groupings present within 300-feet of the proposed expansion and existing landfill where multiple logs are available, and the best existing and most complete information is proposed to be illustrated on the geologic cross-sections:
 - MW-1/MW-1P
 - MW-1R/MW-1PR/MW-1RZ

- MW-2/MW-2P
- MW-3/MW-4/MW-4P/MW-6
- MW-5/MW-5A
- MW-7/MW-8R/MW-9, B-13
- MW-10/MW-11/MW-12
- MW-14/MW-14Z
- B-3, AB-18
- B-5, AB-21
- B-6, TB-2, TP-A
- B-8, TB-10
- B-11, AB-22
- TB-11, AB-19
- TP-23, TB-3

Note: All well construction details will still be displayed within the cross-section in accordance with Wis. Adm. Code NR 512.11(02)(d) but only one boring will list the USCS classification codes/bedrock lithology.

WDNR Comment 9 – Boring Logs: *All available boring logs within 300 feet of the proposed limits of the vertical and horizontal expansion that were used for previous feasibility reports should be provided.*

Response: Concur; all available boring logs within 300 feet of the proposed expansion will be provided within the feasibility report.

Currently, the AGIP drilling program is scheduled to begin in late August 2022. If you have any additional questions or comments, please feel free to contact Melanie Niday (320.229.4346 or mniday@sehinc.com) or Brian Kent (715.456.4621 or bkent@sehinc.com).

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.



Melanie G. Niday, PG
Project Hydrogeologist



MAL/MGN/BLK

Attachments: Figure 1, Table 1, and Table 2

- c: Bridget Kelly, Wisconsin Department of Natural Resources
 Colin Maus, Wisconsin Department of Natural Resources
 Joe Lourigan, Wisconsin Department of Natural Resources
 Valerie Joosten, Wisconsin Department of Natural Resources
 Stacie Sanborn, Vernon County Landfill
 Darryl Heaps, Short Elliott Hendrickson Inc.
 Brian Kent, Short Elliott Hendrickson Inc.

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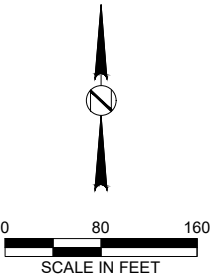


FIG 1

1 OF 1

Table 1
Proposed Soil Borings for Landfill Expansion
Vernon County Landfill

Proposed Soil Boring	Approximate Coordinates		Existing Grade Elevation (feet NGVD)	Estimated Information			Proposed Information			
	Northing	Easting		Weathered Bedrock Elevation (feet NGVD)	Competent Bedrock Elevation (feet NGVD)	Water Table Elevation (feet NGVD)	Subbase Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Basis for Proposed Soil Boring Depth
MW-14WT	1341.6	1907.0	1247.0	1220	1160	1160	outside	97	1150	10 feet below the water table elevation
MW-15WT	990.3	1939.7	1219.3	1210	1181	1139	outside	90	1129	10 feet below the water table elevation
MW-16	546.6	1887.2	1179.2	1179	1172	1134	outside	85	1094	30 feet below the water table elevation
MW-17WT	306.0	1907.4	1199.9	1180	1162	1132	outside	78	1122	10 feet below the water table elevation
B-18	1128.2	1690.6	1239.0	1211	1174	1145	1239	25	1214	25 feet below subbase elevation
B-19	994.5	1690.3	1233.1	1205	1185	1140	1234	24	1209	25 feet below subbase elevation
B-20	679.5	1733.8	1215.1	1196	1180	1136	1219	21	1194	25 feet below subbase elevation
B-21	468.4	1621.3	1226.5	1191	1171	1134	1221	30	1196	25 feet below subbase elevation

Notes:

- Actual boring locations and depths may change due to field conditions.

Table 2
Page 1 of 3
Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) ⁽¹⁾
Borings within 300-feet of the Proposed Expansion										
MW-3	1987	Ace Well Drilling	1233.0	180.0	1053.0	20.0	1213.0	80.0	1153.0	Y
MW-4/-4P	1987	Ace Well Drilling	1232.9	160.0	1072.9	20.0	1212.9	80.0	1152.9	Y
MW-6	1988	Ace Well Drilling	1233.0	210.0	1023.0	14.0	1219.0	80.0	1153.0	Y
TB-4	1988	Wisconsin Test Drilling	1232.9	15.0	1217.9	12.0	1220.9	NE	NE	Y
TB-5	1988	Wisconsin Test Drilling	1221.0	25.0	1196.0	22.0	1199.0	NE	NE	Y
TB-6	1988	Wisconsin Test Drilling	1218.7	16.5	1202.2	13.5	1205.2	NE	NE	Y
TB-7	1988	Wisconsin Test Drilling	1245.4	47.5	1197.9	38.0	1207.4	NE	NE	Y
TB-8	1988	Wisconsin Test Drilling	1249.4	45.5	1203.9	42.0	1207.4	NE	NE	Y
MW-5A	1989	Exploration Technology	1224.0	103.0	1121.0	17.5	1206.5	NA	NA	Y*
MW-5	1988	Ace Well Drilling	1223.3	180.0	1043.3	20.0	1203.3	35.0	1188.3	Y
MW-10	1989	Exploration Technology	1215.6	181.0	1034.6	24.5	1191.1	61.0	1154.6	Y
MW-11	1989	Exploration Technology	1216.4	163.0	1053.4	24.5	1191.9	61.0	1155.4	Y
MW-12	1989	Exploration Technology	1216.4	103.0	1113.4	24.5	1191.9	61.0	1155.4	Y
TB-15	1989	Exploration Technology	1193.5	12.0	1181.5	11.5	1182.0	NE	NE	Y
MW-14	2003	Traut Hydro Tech	1247.5	190.0	1057.5	71.0	1176.5	100.0	1147.5	Y
MW-14Z	2003	Traut Hydro Tech	1247.5	210.0	1037.5	71.0	1176.5	100.0	1147.5	Y
B-15	2021	Mathy Construction Co	1252.9	45.0	1207.9	40.0	1212.9	45.0	1207.9	Y
B-16	2021	Mathy Construction Co	1245.9	36.0	1209.9	32.0	1213.9	36.0	1209.9	Y
B-17	2021	Mathy Construction Co	1238.8	39.0	1199.8	28.0	1210.8	39.0	1199.8	Y
Borings outside 300-feet of the Proposed Expansion										
MW-1/-1P	1987	Ace Well Drilling	1236.4	200.0	1036.4	28.0	1208.4	80.0	1156.4	Y
MW-2/-2P	1987	Ace Well Drilling	1252.5	190.0	1062.5	30.0	1222.5	40.0	1212.5	Y
AB-1	1987	James Construction Co.	1255.5	19.0	1236.5	19.0	1236.5	NE	NE	Y
AB-2	1987	James Construction Co.	1256.7	8.0	1248.7	6.0	1250.7	8.0	1248.7	Y
AB-3	1987	James Construction Co.	1257.3	6.0	1251.3	6.0	1251.3	NE	NE	Y
AB-4	1987	James Construction Co.	1257.2	6.5	1250.7	6.5	1250.7	NE	NE	Y
AB-5	1987	NA	NA	NA	NA	NA	1243.0	NA	NA	N
AB-7	1987	James Construction Co.	1261.1	20.0	1241.1	20.0	1241.1	NE	NE	Y
AB-8	1987	James Construction Co.	1260.0	8.0	1252.0	8.0	1252.0	NE	NE	Y
AB-9	1987	NA	NA	NA	NA	NA	1238.0	NA	NA	N
AB-10	1987	NA	NA	NA	NA	NA	1228.0	NA	NA	N
AB-11	1987	James Construction Co.	1258.9	21.0	1237.9	21.0	1237.9	NE	NE	Y
AB-15	1987	NA	NA	NA	NA	NA	1224.0	NA	NA	N
AB-18	1987	NA	NA	NA	NA	NA	1237.0	NA	NA	N
AB-19	1987	NA	NA	NA	NA	NA	1241.0	NA	NA	N
AB-21	1987	NA	NA	NA	NA	NA	1248.0	NA	NA	N
AB-22	1987	NA	NA	NA	NA	NA	1240.0	NA	NA	N
AB-23	1987	NA	NA	NA	NA	NA	1235.0	NA	NA	N
AB-24	1987	NA	NA	NA	NA	NA	1223.0	NA	NA	N
AB-25	1987	NA	NA	NA	NA	NA	1218.0	NA	NA	N
AB-28	1987	NA	NA	NA	NA	NA	1221.0	NA	NA	N

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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) ⁽¹⁾
Borings outside 300-feet of the Proposed Expansion										
AB-29	1987	NA	NA	NA	NA	NA	1209.0	NA	NA	N
AB-30	1987	NA	NA	NA	NA	NA	1207.0	NA	NA	N
TB-1	1988	Wisconsin Test Drilling	1234.9	17.0	1217.9	NE	NE	NE	NE	Y
TB-2	1988	Wisconsin Test Drilling	1252.7	19.5	1233.2	17.0	1235.7	NE	NE	Y
TB-3	1988	Wisconsin Test Drilling	1253.4	14.5	1238.9	14.0	1239.4	NE	NE	Y
TB-9	1988	Wisconsin Test Drilling	1236.2	22.0	1214.2	NE	NE	NE	NE	Y
TB-10	1989	Exploration Technology	1258.8	18.0	1240.8	16.0	1242.8	NE	NE	Y
TB-11	1989	Exploration Technology	1253.9	26.0	1227.9	15.0	1238.9	NE	NE	Y
TB-12	1989	Exploration Technology	1259.1	15.0	1244.1	12.0	1247.1	NE	NE	Y
TP-1	1989	NA	1245.5	5.0	1240.5	3.5	1242.0	NE	NE	Y
TP-2	1989	NA	1251.4	6.5	1244.9	6.5	1244.9	NE	NE	Y
TP-3	1989	NA	1254.6	9.5	1245.1	9.5	1245.1	NE	NE	Y
TP-4	1989	NA	1258.3	8.5	1249.8	7.5	1250.8	NE	NE	Y
TP-7	1989	NA	1258.9	10.0	1248.9	NE	NE	NE	NE	Y
TP-8	1989	NA	1251.9	8.5	1243.4	NE	NE	NE	NE	Y
TP-9	1989	NA	1239.4	8.0	1231.4	7.0	1232.4	NE	NE	Y
TP-10	1989	NA	1234.8	11.0	1223.8	NE	NE	NE	NE	Y
TP-11	1989	NA	1244.9	7.0	1237.9	7.0	1237.9	NE	NE	Y
TP-15	1989	NA	1250.7	NA	NA	NE	NE	NE	NE	Y
TP-16	1989	NA	1236.0	5.5	1230.5	NE	NE	NE	NE	Y
TP-18	1989	NA	1234.9	8.0	1226.9	NE	NE	NE	NE	Y
TP-19	1989	NA	1250.9	5.5	1245.4	NE	NE	NE	NE	Y
TP-20	1989	NA	1251.3	12.5	1238.8	NE	NE	NE	NE	Y
TP-21	1989	NA	1241.0	14.0	1227.0	NE	NE	NE	NE	Y
TP-22	1989	NA	1255.0	11.0	1244.0	11.0	1244.0	NE	NE	Y
TP-23	1989	NA	1252.3	12.0	1240.3	10.0	1242.3	NE	NE	Y
TP-24	1989	NA	1243.4	12.0	1231.4	NE	NE	NE	NE	Y
TP-25	1989	NA	1236.2	10.0	1226.2	NE	NE	NE	NE	Y
TP-26	1989	NA	1248.5	8.5	1240.0	8.5	1240.0	NE	NE	Y
TP-27	1989	NA	1251.0	NA	NA	NE	NE	NE	NE	Y
TP-28	1989	NA	1242.1	9.5	1232.6	NE	NE	NE	NE	Y
TP-A	1989	NA	1255.0	9.0	1246.0	9.0	1246.0	NE	NE	Y
TP-B	1989	NA	1258.0	9.0	1249.0	NE	NE	NE	NE	Y
TP-C	1989	NA	1257.8	11.5	1246.3	NE	NE	NE	NE	Y
TP-D	1989	NA	1252.0	8.5	1243.5	8.5	1243.5	NE	NE	Y
MW-7	1989	Exploration Technology	1255.7	234.5	1021.2	21.0	1234.7	44	1211.7	Y
MW-8R	1989	Exploration Technology	1256.1	207.0	1049.1	21.5	1234.6	44.0	1212.1	Y
MW-9	1989	Exploration Technology	1255.4	131.5	1123.9	21.5	1233.9	44.0	1211.4	Y
TP-100	1991	NA	1255.0	20.0	1235.0	NE	NE	NE	NE	Y

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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) ⁽¹⁾
Borings outside 300-feet of the Proposed Expansion										
TP-101	1991	NA	NA	26.0	NA	NE	NE	NE	NE	Y
TP-102	1991	NA	NA	18.0	NA	18.0	NA	NE	NE	Y
MW-1R	1994	Ace Well Drilling	1245.0	166.0	1079.0	55.0	1190.0	74.0	1171.0	Y
MW-1PR	1994	Ace Well Drilling	1245.0	126.0	1119.0	57.0	1188.0	57.0	1188.0	Y
MW-1RZ	2003	Traut Hydro Tech	1244.0	185.0	1059.0	75.0	1169.0	98.0	1146.0	Y
MW-13P	2003	Traut Hydro Tech	1224.5	100.0	1124.5	49.0	1175.5	75.0	1149.5	Y
B-1	2021	Mathy Construction Co	1252.8	25.0	1227.8	13.0	1239.8	25.0	1227.8	Y
B-2	2021	Mathy Construction Co	1252.2	50.0	1202.2	47.0	1205.2	50.0	1202.2	Y
B-3	2021	Mathy Construction Co	1251.1	11.0	1240.1	3.0	1248.1	11.0	1240.1	Y
B-5	2021	Mathy Construction Co	1257.4	19.0	1238.4	13.0	1244.4	19.0	1238.4	Y
B-6	2021	Mathy Construction Co	1254.9	12.0	1242.9	10.0	1244.9	12.0	1242.9	Y
B-8	2021	Mathy Construction Co	1258.7	38.0	1220.7	35.0	1223.7	38.0	1220.7	Y
B-9	2021	Mathy Construction Co	1253.7	42.0	1211.7	38.0	1215.7	42.0	1211.7	Y
B-11	2021	Mathy Construction Co	1253.9	17.0	1236.9	11.0	1242.9	17.0	1236.9	Y
B-12	2021	Mathy Construction Co	1259.9	47.0	1212.9	35.0	1224.9	47.0	1212.9	Y
B-13	2021	Mathy Construction Co	1258.2	43.0	1215.2	37.0	1221.2	43.0	1215.2	Y
B-14	2021	Mathy Construction Co	1257.3	49.0	1208.3	40.0	1217.3	49.0	1208.3	Y

Notes:

NA - Information not available.

(1) - If boring log isn't available but weathered and competent bedrock elevations are present. The elevations were taken from previously submitted site figures.

NE - Not encountered.

* - Only page 1 of the soil boring log is available.

- Boring may not be included within the feasibility report cross-sections due to lack of boring log.

- Boring may not be included within the feasibility report cross-sections due to greater than 300-feet from the proposed expansion and the existing landfill footprint.