



Appendix C

Alternative Geotechnical Investigation Program

January 8, 2021
File No. 25220091.00

Ms. Ann Bekta
Wisconsin Department of Natural Resources
South Central Region
2514 Morse Street
Janesville, WI 53545-0249

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

Subject: Alternative Geotechnical Investigation Program – Eastern Vertical Expansion
Dane County Landfill Site No. 2 (Rodefeld)
Madison, Wisconsin (License #3018)

Dear Ms. Bekta and Ms. Cooper:

The Alternative Geotechnical Investigation Program (AGIP) for the proposed Eastern Vertical Expansion at Dane County Landfill Site No. 2 (Rodefeld) has been prepared in response to, and in accordance with, the requirements of ch. NR 512, Wisconsin Administrative Code. The proposed Eastern Vertical Expansion will be located entirely within the limits of the Eastern Expansion area approved in 2014.

The purpose of this AGIP submittal is to request the Wisconsin Department of Natural Resources; (WDNR's) concurrence that the existing geotechnical data and conclusions submitted by TRC in the October 2012 AGIP in support of the Eastern Expansion satisfy the requirements of NR 512 with respect to the Eastern Vertical Expansion.

BACKGROUND

The Dane County Landfill Site No. 2 (Rodefeld) is located in the North $\frac{1}{2}$ of Section 25 and NE $\frac{1}{4}$ of SE $\frac{1}{4}$ of Section 25, T7N, R10E, City of Madison, Dane County. The locations of the existing landfill and proposed vertical expansion are shown on a United States Geological Survey (USGS) topographic map in **Figure 1**.

The Dane County Landfill Site No. 2 (Rodefeld) was initially permitted in the early 1980s, and an expansion to the west was permitted in the early 1990s. The subsurface conditions of the proposed vertical expansion area have been investigated during the feasibility for the original landfill in 1981 and 1982, and as part of the most recent Eastern Expansion permitted in 2014.

The AGIP for the Eastern Expansion was submitted to WDNR on October 12, 2012 (TRC, 2012a), along with an addendum submitted on October 25, 2012 (TRC, 2012b). The AGIP was approved by WDNR in a letter dated October 26, 2012.



GENERAL INFORMATION

Project Title:	Eastern Vertical Expansion Dane County Landfill Site No. 2 (Rodefeld)
Facility Owner:	Dane County Department of Waste & Renewables 7102 US Highway 12 & 18 Madison, WI 53718
Owner Contact:	Mr. John Welch, PE Director Dane County Department of Waste & Renewables 1919 Alliant Energy Center Way Madison, WI 53713 Cell: 608-516-4154 Welch@countyofdane.com
Consultant:	SCS Engineers 2830 Dairy Drive Madison, Wisconsin 53718
Consultant Contact:	Betsy Powers, PE Project Manager Office: 608-216-7347 Cell: 608-333-5408 bpowers@scsengineers.com
Facility Location:	N ½ of Section 25 and NE ¼ of SE ¼ of Section 25, Township 7 North, Range 10 East, City of Madison, Dane County, Wisconsin (Figure 1)

NR 512 REQUIREMENTS

The footprint of the Eastern Vertical Expansion includes an area of 21.3 acres within the currently permitted footprint of the Eastern Expansion. The table below documents that the minimum number of borings, piezometers and water table observation wells in the Eastern Vertical Expansion area have been met with previous investigations per 512.09. The boring and well locations are shown on **Plan Sheet 1**.

	Number Required	Number Existing
Borings	18	21
Piezometers	4	6
Water Table Observation Wells	9	10

Note: Number Required based on NR 512.09 requirements for a 21.3-acre area in a coarse-grained environment.

In the AGIP for the Eastern Expansion (TRC 2012a & TRC 2012b), TRC proposed using a mix of existing and new borings, wells, and piezometers to meet the requirements of NR 512. The Eastern Expansion Feasibility Report prepared by TRC in May 2013 documented information obtained from 10 new soil borings, five new water table wells, and three new piezometers in addition to the existing 11 soil borings, five water table wells, and three piezometers described in the 2012 AGIP.

An updated summary of the borings, monitoring wells, and piezometers used to fulfill the site characterization requirements are provided in **Table 1**. **Table 1** includes three replacement wells (MW 17AR, MW17BR, and MW303AR) not included with the Eastern Expansion. The replacement wells have not been counted towards the number of existing borings and wells, but are included in the **Table 1** to provide complete current information. Please note, replacement wells M17AR, M17BR, and M303AR have not had slug tests performed on them. Dane County anticipates submitting these results with the Feasibility Report.

Soil boring logs and borehole abandonment forms for the borings listed in **Table 1** are provided in **Attachment A**. Groundwater monitoring well construction forms, well development forms, and groundwater monitoring well information forms (WIFs) for the wells listed in **Table 1** are provided in **Attachment B**.

Test results for grain size analyses and field hydraulic conductivity for wells listed in **Table 1** are included in **Attachments C** and **D**, respectively.

Regional and site-specific geotechnical information from the Eastern Expansion Feasibility Report is included in **Attachment E**.

EXEMPTION/VARIANCE REQUESTS

Dane County requests the following exemptions from NR 512 requirements as part of the proposed Eastern Vertical Expansion AGIP. Exemptions will be formally requested in the Feasibility Report.

1. Dane County requests an exemption from NR 507.05(1)(c) requiring collection of soil samples at 5-foot intervals at existing borings M28 and M29. This exemption was requested in the Eastern Expansion AGIP (TRC, 2012b) and Feasibility Report (TRC, 2013), although the administrative code reference was listed as NR 507.04(c). The boring logs contain no record that samples were collected; however, a description of the soil is provided. The available existing subsurface information from other borings near these borings supports this request.
2. Dane County requests an exemption from NR 507.05(1)(d), which requires collection and testing of a soil sample from the screened interval of a monitoring well, for existing wells M6A, M6C, and M9B. This exemption was requested in the Eastern Expansion AGIP (TRC, 2012b) and Feasibility Report (TRC, 2013). These borings were completed during previous permitting processes and at the time of boring, it was not a standard practice to collect and test soil samples from the screened interval of a monitoring well. Additionally, significant amount of geotechnical data exists from the units in which these wells are screened.
3. Dane County requests an exemption from NR 507.05(1)(e), which requires retention of soil samples until the department approves the report that included documentation of the soil samples. This exemption was requested in the Eastern Expansion AGIP (TRC, 2012b) and Feasibility Report (TRC, 2013). The soil samples from the existing borings utilized for this AGIP as

summarized in **Table 1** have not been retained. The borings were completed during previous permitting processes and approved by WDNR.

4. Dane County requests an exemption from NR 507.06(1)(b) for borings M1C, M28, and M29, requiring standard penetration tests performed at each boring. This exemption was requested in the Eastern Expansion Feasibility Report (TRC, 2013). Sufficient information exists at borings surrounding these locations and in the geologic units within which these borings were drilled to warrant this exemption.
5. Dane County requests an exemption from NR 507.14(5), which requires submission of information on the most current version of WDNR forms. This exemption was requested in the Eastern Expansion AGIP (TRC, 2012b) and Feasibility Report (TRC, 2013). The boring log and monitoring well construction forms used for the existing borings and wells noted in **Table 1** are on older WDNR or non-WDNR logs or forms. We believe the required information is presented sufficiently on these existing forms (see **Attachments A and B**). In the Eastern Expansion Feasibility Report, TRC also stated that they believed that water was removed from wells M6A, M6B, M9A, M18A, and M17B following their installation/well development, despite the lack of documentation/development forms for these wells. These wells have been purged and sampled on numerous occasions since the mid-1980s and documented in the WDNR database.
6. Dane County requests an exemption from NR 512.09(1) and NR 512.09(2) to utilize existing borings, water table wells, and piezometers as shown in **Table 1**. No new borings, wells, or piezometers will be installed. This exemption is justified because of 1) the number of available borings and wells previously installed in this area of the site, and 2) the consistency of the site geologic and hydrogeologic conditions previously interpreted and documented at the site. This exemption was requested in the Eastern Expansion AGIP (TRC, 2012b) and Feasibility Report (TRC, 2013).
7. Dane County requests an exemption from NR 512.09(1)(a) and (2)(d), which require borings and wells, respectively, to be located within 300 feet of the proposed limits of filling. As documented in **Table 1**, some borings and wells used to define geotechnical properties of the proposed vertical expansion are located more than 300 feet from the proposed Eastern Vertical Expansion limits. Since the proposed expansion is a vertical expansion over a portion of the existing Eastern Expansion with no changes to the previously constructed and approved liner and base grades, Dane County believes the previous investigations adequately characterize the location of the landfill. Additional investigation within 300 feet of the proposed expansion limits is not warranted nor feasible.
8. Dane County requests an exemption from s. NR 512.09(4)(a), Wis. Admin. Code, which requires conducting five geotechnical grain-size tests on each major soil unit. Difficulty collecting the samples during the Eastern Expansion permitting, as described in Sections 1.4.1 and 6.1.1 of the Eastern Expansion Feasibility Report (TRC 2013), and the fact that geotechnical data was gathered at the site for the previous feasibility studies justify an exemption to this requirement. WDNR granted an exemption to s. NR 512.09(4)(a) as part of the Eastern Expansion Feasibility Determination dated February 3, 2014.
9. Dane County requests an exemption from s. NR 512.09(4)(b), Wis. Adm. Code, which requires conducting two laboratory hydraulic conductivity tests for each fine grained unit. Difficulty collecting the samples during the Eastern Expansion permitting, as described in Sections 1.4.1

and 6.1.1 of the Eastern Expansion Feasibility Report (TRC 2013), and the fact that geotechnical data was gathered at the site for the previous feasibility studies, justify an exemption to this requirement. WDNR granted an exemption from s. NR 512.09(4)(b), Wis. Adm. Code, as part of the Eastern Expansion Feasibility Determination dated February 3, 2014.

10. Dane County requests exemptions from s. NR 512.09(4)(e), Wis. Adm. Code, and NR 512.09(4)(f), Wis. Adm. Code, which require monthly and quarterly water level measurements at monitoring wells and surface water bodies including streams, lakes, ponds, drainage ditches, and wetlands located within 1,000 feet of the proposed limits of filling. There is a long history of water level measurements from the site monitoring wells and surface water bodies, and the Eastern Expansion design was based on the highest water levels measured in the 21 years prior to the design. WDNR granted an exemption from ss. NR 512.09 (4)(e), and NR 512.09 (4)(f), Wis. Adm. Code, as part of the Eastern Expansion Feasibility Determination dated February 3, 2014. Dane County will include the semiannual water level data collected under the routine monitoring program in the Feasibility Report, and will update the high and low water table maps and cross section water levels, as necessary.
11. Dane County requests an exemption from s. NR 512.09(4)(g), Wis. Admin. Code, requiring at least four rounds of baseline groundwater monitoring be performed on all observation wells and piezometers located outside the proposed limits of filling which were installed to evaluate the proposed property in accordance with s. NR 507.18 and submitted along with the Feasibility Report. The baseline groundwater monitoring was performed and submitted as part of previous permitting for the site; therefore, baseline monitoring data will not be included in the Feasibility Report for the Eastern Vertical Expansion. Recent groundwater monitoring results from the existing monitoring network will be discussed in the context of the evaluation of existing facility performance required under NR 512.13(4).
12. Dane County requests an exemption from s. NR 512.09(6)(b) and (c), Wis. Adm. Code, which requires conducting consolidation testing on samples collected from each geologic unit in each landfill phase. Difficulty collecting the samples during the Eastern Expansion permitting, as described in Sections 1.4.1 and 6.1.1 of the Eastern Expansion Feasibility Report (TRC 2013), and the fact that geotechnical data was gathered at the site for the previous feasibility studies, justify an exemption to this requirement. WDNR granted an exemption from s. NR 512.09(6)(b) and (c), Wis. Adm. Code as part of the Eastern Expansion Feasibility Determination dated February 3, 2014.
13. Dane County requests an exemption from NR 512.11(2), which requires that geologic cross-sections of a contiguous expansion extend to include all previous borings for the existing landfill. This exemption was requested in the Eastern Expansion AGIP (TRC, 2012b) and Feasibility Report (TRC, 2013). Based on this exemption request from the Eastern Expansion, WDNR concurred that the following cross sections through the existing site borings be prepared:
 - Two east-west oriented cross sections prepared that extend through the entire length of the existing landfill and Eastern Expansion area, which also includes the proposed Eastern Vertical Expansion area.
 - The remaining east-west oriented cross sections extended to a point approximately 300 feet or greater beyond the western extent of the Eastern Expansion vertical overlap.

- Additionally, north-south oriented cross sections prepared that extend through each existing boring in the vertical overlap area, as well as through one additional set of north-south oriented borings immediately west of the Eastern Expansion overlap.

The remaining cross sections prepared for the 1992 Feasibility Report sufficiently documented the geologic conditions beneath the existing site including the area beneath the vertical expansion. The geologic cross sections for the existing site that were prepared for the Eastern Expansion and the 1992 Feasibility Report will be provided with the Eastern Vertical Expansion Feasibility Report.

14. Dane County requests an exemption from s. NR 512.14(2)(b), Wis. Adm. Code, which requires geologic cross section sheets for the feasibility report to show the present topography, the proposed subbase, base, and final cover grades and the liner configuration. Issues regarding the depth of borings to be depicted, final grades, and the scale necessary to produce such a cross section make it difficult to fit on a standard plan sheet without distorting scales. WDNR granted an exemption from s. NR 512.14(2)(b), Wis. Adm. Code, as part of the Eastern Expansion Feasibility Determination dated February 3, 2014. As part of the granted exemption, WDNR required that the final grades be shown on the plan of operation cross sections (Condition of Approval 8). The proposed Eastern Vertical Expansion Plan of Operation cross sections will similarly show the final grades.

Most of the requested exemptions were previously approved by WDNR in the February 3, 2014 feasibility determination letter for the Eastern Expansion.

CONCLUSIONS

The geotechnical investigation program completed for the Eastern Expansion Feasibility Report has sufficiently characterized the site as required by NR 512, subject to the exemptions granted in the Determination of Site Feasibility for the Dane County Rodefild Eastern Landfill Expansion issued by WDNR on February 3, 2014. Since the Eastern Vertical Expansion lies completely within the area of the approved Eastern Expansion, SCS believes that the requirements of NR 512 have also been satisfied for the Eastern Vertical Expansion.

REFERENCES

TRC, 2012a, Alternative Geotechnical Investigation Program, Dane County Landfill #2 (Rodefild) – Eastern Expansion, Madison, Wisconsin, October 12, 2012.

TRC, 2012b, Alternative Geotechnical Investigation Program – Addendum No. 1, Dane County Landfill #2 (Rodefild) – Eastern Expansion, Madison, Wisconsin, October 25, 2012.

TRC, 2013, Eastern Expansion Feasibility Report, Dane County Landfill #2 (Rodefild), Madison, Wisconsin, May 20, 2013.

WDNR, 2012, Proposed Dane County Rodefild Landfill Eastern Expansion – Alternative Geotechnical Program for Feasibility Study, October 26, 2012.

WDNR, 2014, Determination of Site Feasibility, Dane County Rodefild Eastern Landfill Expansion, February 3, 2014.

Ms. Bekta and Ms. Cooper

January 8, 2021

Page 7

If you have any questions, please feel free to contact Betsy at 608.333.5408.

Sincerely,



Eric Oelkers, PG
Senior Project Manager/Hydrogeologist
SCS Engineers



Betsy Powers, PE
Senior Project Manager
SCS Engineers



Sherren Clark, PE, PG
Project Director
SCS Engineers

EO/lmh_jsn/BLP/SCC

cc: Ali Rathsack, Dane County
John Welch, Dane County
Roxanne Wienkes, Dane County
Joe Lourigan, WDNR (electronic copy)
Valerie Joosten, WDNR (electronic copy)

Encl. Table 1 – Summary of Borings and Monitoring Wells

Figure 1 – Site Location Map

Plan Sheet 1 – Existing Conditions

Attachment A – Soil Boring Logs and Borehole Abandonment Forms

Attachment B – Monitoring Well Forms

Attachment C – Geotechnical Test Results

Attachment D – Field Hydraulic Conductivity Test Results/Hydrogeologic Calculations

Attachment E – Regional and Site-specific Geotechnical Information

I:\25220091.00\Deliverables\AGIP\210108_Final AGIP.docx

CERTIFICATIONS

"I, Betsy Powers, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E8, Wis. Adm. Code; and that to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code."

Betsy Powers

Signature

Senior Project Manager, PE 32933
Title

January 8, 2021
Date



"I, Sherren Clark, hereby certify that I am a licensed professional geologist in the State of Wisconsin in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code; that the preparation of this document has not involved any unprofessional conduct as detailed in ch. GHSS 5, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code."

Sherren Clark

Signature

Vice President, PG 853
Title

1-8-2021
Date



Table 1

Summary of Borings and Monitoring Wells

Table 1. Summary of Borings and Monitoring Wells
Rodefeld Landfill Eastern Vertical Expansion / SCS Engineers Project #25220091

Boring/ Well ID	Distance from Vertical Expansion Limits	Hydraulic Position	Approximate Ground Surface Elevation (feet amsl)	Depth (feet)	Approximate Bottom Elevaton of Boring (feet amsl)	Sample Interval (feet)	Well Bottom Elevation (feet amsl)	Screened Interval	Well Type	FR Well (meets NR 512 requirements) (See Note 1)	FR Boring (meets NR 512 requirements) (See Note 1)	Hydraulic Conductivity (cm/sec)	Standard Penetration Test	Comments
M1C	97	within	906.0	95	811.0	5	NA	NA	NA	N	Y	$1.4 - 1.5 \times 10^{-3}$	N	Well abandoned /Exemption for standard penetration test
M3A	274	upgradient	894.1	40	854.1	5	NA	NA	NA	N	Y	--	Y	Well abandoned
M6A	588	downgradient	860.5	17	843.5	M6C	844.5	844.5-854.5	WT	Y	N	$2.3 - 3.3 \times 10^{-3}$	See M6C	Exemption for well development log / exemption for soil test in screen zone / exemption for distance
M6B	578	downgradient	861.6	35	826.6	M6C	828.6	828.6-831.6	P	N	N	$4.2 - 4.5 \times 10^{-3}$	See M6C	Exemption for well development log / exemption for soil test in screen zone / exemption for distance
M6C	582	downgradient	861.7	55	806.7	5	808.8	808.8-811.8	P	Y	Y	$8.8 - 9.4 \times 10^{-5}$	Y	Exemption for well development log / exemption for soil test in screen zone / exemption for distance
M9A	461	downgradient	872.8	30	842.8	M9B	844.7	844.7-854.7	WT	Y	N	$8.5 \times 10^{-6} - 1.5 \times 10^{-5}$	See M9B	Exemption for well development log / exemption for distance
M9B	449	downgradient	872.8	55	817.8	5	819.3	819.2-822.2	P	Y	Y	4.2×10^{-6}	Y	Exemption for well development log / exemption for soil test in screen zone / exemption for distance
M10A	133	within	883.7	45	838.7	5	NA	NA	NA	N	Y	$2.4 - 5.1 \times 10^{-5}$	Y	Well abandoned
M13B	within	sidegradient	911.0	83	828.0	5	NA	NA	NA	N	Y	--	Y	Well abandoned
M16	within	sidegradient	900.0	70	830.0	5	NA	NA	NA	N	Y	--	Y	
M17A	307	upgradient	879.3	28	851.3	M17B	852.3	852.3-862.3	WT	Y	N	$2.8 - 3.2 \times 10^{-3}$	See M17B	Abandoned; Exemption for well development log
M17AR	550	upgradient	886.1	31	855.1	M17BR	856.1	856.1-866.1	WT	Replacement	N	Pending	N	Slug test to be performed
M17B	311	upgradient	879.4	50	829.4	5	832.2	832.2-837.2	P	Y	Y	4×10^{-4}	Y	Abandoned; Exemption for well development log
M17BR	358	upgradient	886.1	51	835.1	5	837.1	837.1-842.1	P	Replacement	N	Pending	N	Slug test to be performed
M18	60	within	903.8	80	823.8	5	NA	NA	NA	N	Y	--	Y	Well Abandoned
M28	301	sidegradient	886.3	45	841.3	5	847.5	847.5-862.5	WT	Y	Y	$2.2 - 3.1 \times 10^{-2}$	N	Exemption for soil test in screen zone / exemption for standard penetration test
M29	417	sidegradient	904.2	59	845.2	5	847.7	847.7-862.7	WT	Y	Y	9.4×10^{-3}	N	Exemption for soil test in screen zone / exemption for standard penetration test
M301A	376	sidegradient	892.0	42	850.0	5	855	855.0-865.0	WY	Y	Y	7.06×10^{-4}	Y	
M302A	362	downgradient	878.0	26	852.0	M302B	854	854.0-864.0	WT	Y	N	1.11×10^{-3}	Y	
M302B	357	downgradient	877.9	63	814.9	5	816.9	816.9-821.9	P	Y	Y	4.22×10^{-3}	Y	
M303A	316	upgradient	884.9	44	840.9	5	855.9	855.9-865.9	WT	Y	Y	4.30×10^{-3}	Y	Abandoned
M303AR	412	upgradient	883.2	25	858.2	5	862.2	862.2-872.2	WT	Replacement	N	Pending	N	Slug test to be performed
M304A	within	within	882.7	31	851.7	M304B	853.2	853.2-863.2	WT	Y	N	9.03×10^{-4}	Y	
M304B	within	within	882.5	64	818.5	5	819.5	819.5-824.5	P	Y	Y	3.74×10^{-2}	Y	
M305A	within	within	890.4	34	856.4	M305B	856.4	856.4-868.4	WT	Y	N	4.22×10^{-2}	Y	
M305B	within	within	890.2	70	820.2	5	824.2	824.2-829.2	P	Y	Y	1.54×10^{-3}	Y	
B311	88	within	881.9	43	838.9	5	NA	NA	NA	N	Y	N	Y	
B312	within	within	885.3	41	844.3	5	NA	NA	NA	N	Y	N	Y	
B313	174	within	887.8	75	812.8	5	NA	NA	NA	N	Y	N	Y	
B314	79	within	884.5	45	839.5	5	NA	NA	NA	N	Y	N	Y	
B315	112	within	889.2	70	819.2	5	NA	NA	NA	N	Y	N	Y	

Table 1. Summary of Borings and Monitoring Wells
Rodefeld Landfill Eastern Vertical Expansion / SCS Engineers Project #25220091

Note:

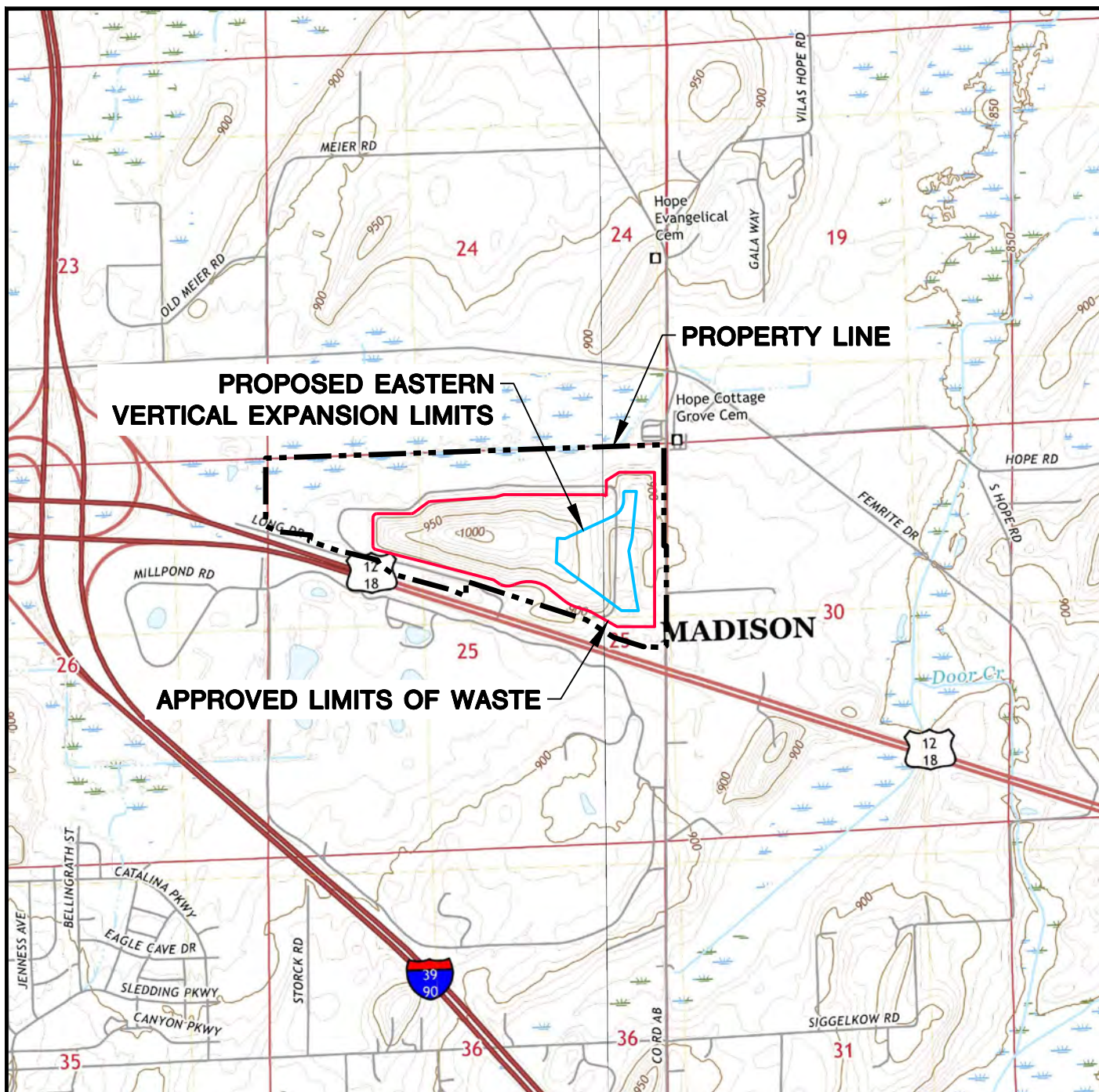
1. Information in this table is based on Table 6-1 from the Eastern Expansion Feasility Report, with the exception of replacement wells and the "Distance from Vertical Expansion" distances listed.

Abbreviations:
U = Boring/wll located upgradient from proposed limits of waste
S = Boring/wll located sidegradient from proposed limits of waste
D = Boring/wll located downgradient from proposed limits of waste
Within = Boring/well located within proposed landfill footprint
NA = Not Applicable/Not Available
WT = Water table
P = Piezometer
amsl = Above mean sea level
Y = Yes
N = No

Created by:	<u>EO</u>	Date:	<u>12/4/2020</u>
Last revision by:	<u>BLP</u>	Date:	<u>12/7/2020</u>
Checked by:	<u>JSN</u>	Date:	<u>12/4/2020</u>
Proj Mgr QA/QC:	<u>BP</u>	Date:	<u>1/8/2021</u>

I:\25220091.00\Deliverables\AGIP\Tables\[Summary of Borings and Wells_201215.xlsx]GW Natural Attenuation

Figure 1
Site Location Map



MADISON EAST AND COTTAGE GROVE QUADRANGLES
WISCONSIN-DANE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'



CLIENT	DANE COUNTY DEPARTMENT OF WASTE AND RENEWABLES 1919 ALLIANT ENERGY CENTER WAY MADISON, WI 53713		SITE	DANE COUNTY LANDFILL SITE NO. 2 7102 US HWY 12/18 MADISON, WISCONSIN		SITE LOCATION MAP	
	PROJECT NO.	25220091.00		DRAWN BY:	KP	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE 1
	DRAWN:	08/03/2020		CHECKED BY:	KG		
	REVISED:	08/12/2020		APPROVED BY:	BP 01/08/2021		

Plan Sheet 1
Existing Conditions

Attachment A

Soil Boring Logs and Borehole Abandonment Forms

LOG OF TEST BORING RESIDUALS MANAGEMENT TECHNOLOGY, INC. PROJECT: <u>DANE CO. LANDFILL</u> LOCATION: <u>RODEFELD SITE</u> DRILLED BY: <u>RPO</u> LOGGED BY: <u>DDR</u> DATE: <u>6-7-82</u>	JOB NO.: <u>8721</u> BORING NO.: <u>M-1C</u> SURFACE ELEV.: _____ SHEET NO.: <u>1</u>
--	--

SAMPLE					VISUAL CLASSIFICATION	
Recovery		Moisture		and Remarks		
No.	Type		N	Depth		
				5		
				10		
				15		
				20		
				25		
				30		
				35		
				40		

GENERAL NOTES	WATER LEVEL OBSERVATIONS
START: <u>6-7-82</u>	WHILE DRILLING: _____
COMPLETE: <u>6-7-82</u>	_____
RIG: <u>55</u>	UPON COMPLETION: _____
CREW CHIEF: <u>RPO</u>	TIME AFTER DRILLING: _____
DRILLING METHOD: <u>Hollow Stem</u>	DEPTH OF WATER: _____
<u>Augers & Drilling mud</u>	DEPTH OF CAVE-IN: _____

LOG OF TEST BORING		JOB NO.: E721
RESIDUALS MANAGEMENT TECHNOLOGY, INC.		
PROJECT: DANELO LANDFILL		BORING NO.: M-1C
LOCATION: ROSEFIELD SITE		SURFACE ELEV.:
DRILLED BY: RPD		SHEET NO.: 2
LOGGED BY: DDR		
DATE: 6-7-97		

SAMPLE					VISUAL CLASSIFICATION and Remarks
Recovery		Moisture		Depth	
No.	Type		N		
					[see log of M1] Tan. Fine-Med. Sand and Gravel
1	SS	8"	W	45	
					S.F.G.
2	SS	11"	S	50	
					Tan Silty Fine-Medium Sand and Gravel S.F.G.
3	SS	7 1/2"	S	55	
					Reddish-Brown From 69'-71' with layers of Silty Fine sand and Fine sand from 71'-77'
4	SS	7 1/2"	S	60	
					Reddish-Brown Silty Fine-Med. Sand and Gravel SM/GM?
5	SS	9 1/2"	S	65	
6	SS	2"	S	70	
7	SS	11"	S	75	
8	SS	9"	S	80	
9	SS	5"	S	85	

LOG OF TEST BORING

RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: DANE CO. LANDFILL

LOCATION: RODEFELD SITE

DRILLED BY: *RPO*

LOGGED BY: DDR

DATE: 6-7-82

JOB NO.: 8721

BORING NO.: M-1C

SURFACE ELEV.:

SHEET NO.: 3

SAMPLE					VISUAL CLASSIFICATION	
Recovery		Moisture		N	Depth	and Remarks
No.	Type					
10	SS	8½"	S	90		Reddish-Brown Silty Fine-Med. Sand and Gravel
11	SS	4"	S	*		* 40/6", 60/3"

GENERAL NOTES

START: _____
COMPLETE: _____
RIG: _____
CREW CHIEF: _____
DRILLING METHOD: _____

WATER LEVEL OBSERVATIONS

WHILE DRILLING: _____

 UPON COMPLETION: _____
 TIME AFTER DRILLING: _____
 DEPTH OF WATER: _____
 DEPTH OF CAVE-IN: _____

LOG OF TEST BORING		JOB NO.: <u>8721</u>
RESIDUALS MANAGEMENT TECHNOLOGY, INC.		BORING NO.: <u>M-6C</u>
PROJECT: <u>DANE CO. LANDFILL</u>		SURFACE ELEV.: _____
LOCATION: <u>RODEFELD SITE</u>		SHEET NO.: <u>5</u>
DRILLED BY: <u>RPO</u>		
LOGGED BY: <u>TEF</u>		
DATE: <u>6-21-82</u>		

SAMPLE						VISUAL CLASSIFICATION	
Recovery		Moisture		N	Depth		
No.	Type						
						and Remarks	
						Loamy Topsoil 0-4"?	
						Peaty Topsoil 4-7"	
1	SS	2"	M	4	1.5	Dark gray sandy clayey silt with some organics more sandy with gravel @ 5'-3" to 7'	
2	SS	7"	W	6	5		
3	SS	13"	S	18	10	Reddish-brown silty mostly fine sand with gravel	
4	SS	4"	S	6	15	Less silty @ 12' to 16'	
5	SS	8"	S	12	20	Alternate layers of tan, fine sand, fine-med sand and fine-coarse sand with gravel	
6	SS	8"	S	13	25	mostly fine sand with silt and silty seams and layers	
7	SS	6"	S	15	30	Gray @ 42' to 51' with clayey silt and silty clay seams and layers @ 47'-6"-10"	
8	SS	14"	S	10	35	mostly fine sand with silt and silty seams and layers	
9	SS	11"	S	4	40	Gray @ 42' to 51' with clayey silt and silty clay seams and layers @ 47'-6"-10"	

GENERAL NOTES START: <u>6-21-82</u> COMPLETE: <u>"</u> RIG: <u>SS</u> CREW CHIEF: <u>RPO</u> DRILLING METHOD: <u>Fuller Stem</u> <u>HYPER V" drilling mud</u>	WATER LEVEL OBSERVATIONS WHILE DRILLING: <u>6'-1"</u> UPON COMPLETION: _____ TIME AFTER DRILLING: _____ DEPTH OF WATER: _____ DEPTH OF CAVE-IN: <u>53'-9"</u>
---	--

LOG OF TEST BORING

RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: DANE CO. LANDFILL

LOCATION: RODEFELD SITE

DRILLED BY: RPO

LOGGED BY: TEE

DATE: 6-21-82

JOB NO.: 8721

BORING NO.: M-6C

SURFACE ELEV.: 100.00

SHEET NO.: 1

SAMPLE						VISUAL CLASSIFICATION and Remarks
Recovery		Moisture	N	Depth		
No.	Type					
						Mostly Fine Sand with silt and silty seams and layers 5P ⁶ Gray @ 42' to 51' with clayey silt and silty clay seams and layers @ 47'-6"
104 10	SS	13"	S	12	45	
117 11	SS	17"	S	4	50	
					51	Gray silty clay with clayey silt seams
124 12	SS	17"	S	16	55	
						End of Boring
					60	
					65	
					70	
					75	
					80	
					85	

PROJECT: DANE CO. LANDFILLLOCATION: RODEFELD SITEDRILLED BY: RPOLOGGED BY: DDRDATE: 6-17-82BORING NO.: M-93SURFACE ELEV.: 872.60SHEET NO.: 10

SAMPLE						VISUAL CLASSIFICATION	
Recovery			Moisture			and Remarks	
No.	Type			N	Depth		
1	SS	9"	M	5	5	Topsoil 0'-10"	
						Brown silty clay	
2	SS	6 1/2"	D	11	5.5	CL?	
						Brown silty sand with gravel	
3 1/2	SS	11"	M	16	10	Clayey layer 7'-8"	
						SP?	
4 1/2	SS	15"	S	9	15	Clayey layer 13'-16"	
5 1/2	SS	15"	S	14	20	Tan Fine sand with some	
						very fine layers	
6 1/2	SS	13"	S	15	25	SP?	
7 1/2	SS	18"	S	11	30	Gray silty clay	
						CL?	
8 1/2	SS	16"	S	12	35		
9 1/2	SS	19"	S	8	40		

GENERAL NOTES

START: 6-17-82COMPLETE: "RIG: SSCREW CHIEF: RPODRILLING METHOD: HOLLOW STEM

AUGER & DRILLING MUD

WATER LEVEL OBSERVATIONS

WHILE DRILLING: 17'-10"

UPON COMPLETION:

TIME AFTER DRILLING:

DEPTH OF WATER:

DEPTH OF CAVE-IN: 54'-0"

LOG OF TEST BORING RESIDUALS MANAGEMENT TECHNOLOGY, INC.		JOB NO.: 8721
PROJECT: DANE CO. LANDFILL		BORING NO.: M-9B
LOCATION: RODEFELD SITE		SURFACE ELEV.:
DRILLED BY: RPO		SHEET NO.: 71
LOGGED BY: DDR		
DATE: 6-17-82		

SAMPLE					VISUAL CLASSIFICATION	
Recovery		Moisture		N	Depth	and Remarks
No.	Type					
107 10	SS	20"	15	6	45	Gray Silty Clay
117 11	SS	18"	5	9	50	
127 12	SS	24"	5	9	55	End of boring
					60	
					65	
					70	
					75	
					80	
					85	

LOG OF TEST BORING RESIDUALS MANAGEMENT TECHNOLOGY, INC.		JOB NO.: <u>8721</u>
PROJECT: <u>DANE CO. LANDFILL</u>		BORING NO.: <u>M-10A</u>
LOCATION: <u>ROCHEFELD SITE</u>		SURFACE ELEV.: <u>883.1</u>
DRILLED BY: <u>RPO</u>		SHEET NO.: <u>12</u>
LOGGED BY: <u>DDR</u>		
DATE: <u>6-16-82</u>		

SAMPLE					Depth	VISUAL CLASSIFICATION and Remarks
No.	Type	Recovery	Moisture	N		
						Topsoil at top?
17	SS	2"	M	8		Brown silty clay with some gravel @ 6' CL?
22	SS	10"	D	12		
						Brown clayey sand with gravel Firmer at 7'-9" SL
37	SS	11"	M	10		Brown silty fine-medium sand SM?
47	SS	11 1/2"	M	42		
57	SS	18"	M	41		
67	SS	16"	W	26		
77	SS	15"	W	28		
87	SS	17"	W	27		Brown Fine-Medium Sand
97	SS	11"	S	12		

GENERAL NOTES START: <u>6-16-82</u> COMPLETE: <u>"</u> RIG: <u>SS</u> CREW CHIEF: <u>RPO</u> DRILLING METHOD: <u>HOLLOW STEM</u> AUGER & DRILLING MUD	WATER LEVEL OBSERVATIONS WHILE DRILLING: <u>23'-0"</u> UPON COMPLETION: TIME AFTER DRILLING: DEPTH OF WATER: DEPTH OF CAVE-IN:
--	--

F-204 (cont'd.)

LOG OF TEST BORING						JOB NO.:
RESIDUALS MANAGEMENT TECHNOLOGY, INC.						8731
PROJECT: DANE CO. LANDFILL						BORING NO.:
LOCATION: RODEFELD SITE						M-10A
DRILLED BY: RPO						SURFACE ELEV.:
LOGGED BY: DDR						
DATE: 6-16-82						SHEET NO.:
						13
SAMPLE					VISUAL CLASSIFICATION	
Recovery		Moisture		and Remarks		
No.	Type		N	Depth		
					Brown Fine-medium Sand	
10-	SS	73"	S 29	45	End of Boring	
				50		
				55		
				60		
				65		
				70		
				75		
				80		
				85		

LOG OF TEST BORING		JOB NO.: <u>8721</u>
RESIDUALS MANAGEMENT TECHNOLOGY, INC.		BORING NO.: <u>M-13B</u>
PROJECT: <u>DANE CO LANDFILL</u>		SURFACE ELEV.: <u> </u>
LOCATION: <u>RODEFELD SITE</u>		SHEET NO.: <u>17</u>
DRILLED BY: <u>RPO</u>		
LOGGED BY: <u>DDR</u>		
DATE: <u>6-10-82</u>		

SAMPLE						VISUAL CLASSIFICATION and Remarks	
Recovery			Moisture		N	Depth	
No.	Type						
1	SS	9"	M	5	5		Topsoil
2	SS	8 1/2"	M	6	5		Brown silty clay
3	SS	11"	M	11	10		Reddish-Brown clayey sand w/ gravel w/ much gravel at 5 1/2'
4	SS	10"	D	39	15		Brown slightly silty fine-med. sand and gravel.
5	SS	11 1/2"	D	25	20		Brown silty fine-medium sand and gravel.
6	SS	15"	M	31	25		(sm)* (SP)*
7	SS	14"	D	26	30		Tan fine-medium sand (SP)* and gravel
8	SS	16"	M	46	35		Brown silty fine-medium sand and gravel
9	SS	16"	D	72	40		Tan fine-medium sand and gravel

GENERAL NOTES START: <u>6-10-82</u> COMPLETE: <u>"</u> RIG: <u>55</u> CREW CHIEF: <u>RPO</u> DRILLING METHOD: <u>HOLLOW SHAFT</u> AUGER & DRILLING MUD	WATER LEVEL OBSERVATIONS WHILE DRILLING: <u>99'-0"</u> UPON COMPLETION: TIME AFTER DRILLING: <u> </u> DEPTH OF WATER: <u> </u> DEPTH OF CAVE-IN: <u> </u>
--	---

* Notes added during visual interpretation of soil samples in laboratory

LOG OF TEST BORING				JOB NO.:
RESIDUALS MANAGEMENT TECHNOLOGY, INC.				8721
PROJECT: <u>DANE CO LANDFILL</u>				BORING NO.: <u>M-13B</u>
LOCATION: <u>RODEFELD SITE</u>				SURFACE ELFV.: _____
DRILLED BY: <u>RPO</u>				SHEET NO.: <u>18</u>
LOGGED BY: <u>DDR</u>				
DATE: <u>6-10-82</u>				

SAMPLE					Depth	VISUAL CLASSIFICATION and Remarks
Recovery		Moisture		N		
No.	Type					
						Tan fine-medium sand and gravel
10 ⁷ 10	SS	79"	D	87	45	
						Mostly fine sand from 63' to 80'
11 ⁷ 11	SS	15"	W	51	50	
12 ⁷ 12	SS	24"	S	63	55	
13	SS	12"	S	32	60	
14 ⁷ 14	SS	29"	S	45	65	
15 ⁷ 15	SS	16"	S	97	70	
16 ⁷ 16	SS	16"	S	69	75	
17	SS	9"	S	59	80	
						End of boring
					85	

SHEET NO.: 22

LOG OF TEST BORING						JOB NO.: <u>8721</u>	
RESIDUALS MANAGEMENT TECHNOLOGY, INC.						BORING NO.: <u>M-16</u>	
PROJECT: <u>DANE CO LANDFILL</u>						SURFACE ELFV.: _____	
LOCATION: <u>RODEFELD</u>						SHEET NO.: <u>23</u>	
DRILLED BY: <u>RPO</u>							
LOGGED BY: <u>TEF</u>							
DATE: <u>6-9-82</u>							
SAMPLE					VISUAL CLASSIFICATION		
Recovery			Moisture		and Remarks		
No.	Type			N	Depth		
10-	SS	4"	S	34	45	(SP)	
11	SS	8"	S	34	50	Less gravel 49' to 59'-6"	
12	SS	None	S	45	55		
^{13 1/2} 13	SS	14"	S	59	60	With gray sandy silt and silty sand layers 59'-9" to 69'-9"	
^{14 1/2} 14	SS	12"	S	56	65	more gravel @ 68' to 70'	
15	SS	None	S	81	70	End of boring	
					75		
					80		
					85		

RESIDUALS MANAGEMENT TECHNOLOGY, INC.
 PROJECT: DANE CO LANDFILL
 LOCATION: RODEFELD SITE
 DRILLED BY: RLS
 LOGGED BY: DBM
 DATE: 6-4-82

BORING NO.: M-1-5
 SURFACE ELEV.: 878.00
 SHEET NO.: 20

SAMPLE						VISUAL CLASSIFICATION	
Recovery			Moisture			and Remarks	
No.	Type			N	Depth		
						Topsoil 0-4" to 4' 0"	
1	SS	3"	M	6		Brown and gray mottled silty clay	
2	SS	11"	W	13	4.5	Sandy @ 4' 3" to 4' 8" CL 2	
					5	Firmer @ 4' 8"	
						mostly fine sand and silty fine	
						sand @ 4' 8" to 7' 5" SP/M/CL 3	
3	SS	10"	W	28	10	Brown to gray varied layers of	
						fine sand, silty fine sand, silt,	
						clayey silt and silty clay	
4	SS	12"	W	21	15	Slightly firmer with gravel @ 14' 8"	
						Brown silty mostly fine sand	
						with some gravel - occasional	
5	SS	13"	S	15	20	cobbles and boulders with	
						clean fine to medium sand layers	
						@ 32' 9" to 39' 9"	
6	SS	18"	S	26	25		
7	SS	13"	S	13	30		
						Gray at 39' 9" to 37' 3"	
8	SS	18"	S	21	35		
9	SS	7"	S	52	40	Firmer at 37' 3" No gravel	
						Gray varied layers of fine sand	
						and silty fine sand and silt. SP/M/CL	

GENERAL NOTES
 START: 6-4-82
 COMPLETE: "
 RIG: 450
 CREW CHIEF: RLS
 DRILLING METHOD: HOLLOW STEM
 AUGER

WATER LEVEL OBSERVATIONS
 WHILE DRILLING: 31' - 7"
 UPON COMPLETION:
 TIME AFTER DRILLING: 1 1/4 hrs. 1 1/2 hr.
 DEPTH OF WATER: 18' 9" 17' 5"
 DEPTH OF CAVE-IN: 48' - 10"

LOG OF TEST BORING		JOB NO.: 6721
RESIDUALS MANAGEMENT TECHNOLOGY, INC.		BORING NO.: M-17A
PROJECT: DANE CO LANDFILL		SURFACE ELV.:
LOCATION: RUFFELD SITE		SHEET NO.: 25
DRILLED BY: RLS		
LOGGED BY: DAm		
DATE: 6-6-82		

SAMPLE						VISUAL CLASSIFICATION and Remarks
Recovery		Moisture		N	Depth	
No.	Type					
					41	Slightly softer with some gravel @ 42'-7" Tan clean fine sand with some gravel
10	SS	10"	S	17	45	
					46	Firm @ 45'-3" Brown to tan silty mostly fine sand with some gravel occasional cobbles and boulders
11	SS	2 1/2"	S	97	50	
					55	End of Boring
					60	
					65	
					70	
					75	
					80	
					85	

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

Page 1 of 2

Facility/Project Name Dane County Landfill No. 2 Rodefeld SCS#: 25217087.02			License/Permit/Monitoring Number 3018		Boring Number M-17AR	
Boring Drilled By: Name of crew chief (first, last) and Firm Tony Kapugi On-site Environmental Services, Inc.			Date Drilling Started 6/30/2020		Date Drilling Completed 6/30/2020	
Drilling Method hollow stem auger						
WI Unique Well No. WB260	DNR Well ID No. 166	Common Well Name M-17AR	Final Static Water Level Feet MSL	Surface Elevation 886.05 Feet MSL		Borehole Diameter 8.25 in.
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 380,565 N, 2,201,316 E S/C/N SE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____"		Local Grid Location Feet ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

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)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	Blind drilled to 31 feet. See M-17BR boring log for lithology.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10											
			11											
			12											
			13											
			14											
			15											

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

Signature <i>Jackie Rennebohm</i>	Firm SCS Engineers	Tel: Fax:
-----------------------------------	--------------------	--------------

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

Page 1 of 3

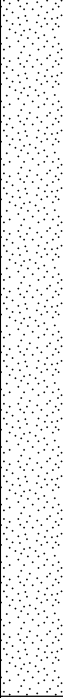
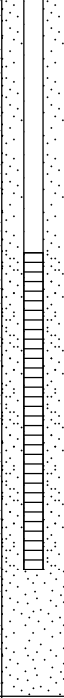
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
				ORGANIC SILT, brown, (topsoil).	OL										
	36		1	LEAN CLAY, brown (7.5YR 4/3), (fill).	CL				4.0	M					
	39		3	POORLY GRADED SAND, brown (7.5YR 5/4) to light brown, fine to medium, (fill).											
			8	Trace gravel.	SP					M					
	10		9	POORLY GRADED SAND, dark reddish brown (5YR 3/3), fine to medium, with trace gravel, (till).											
			10												
			11												
			12		SP					W					
			13												
			14												
			15												
														Geoprobed to 45 feet then overdrilled using 4.25" hollow stem augers.	
														Depth to water ~9 feet	

Signature <i>Jackie Rennsbohm</i>	Firm SCS Engineers	Tel: Fax:
-----------------------------------	--------------------	--------------

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

[illegible]

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number		Use only as an attachment to Form 4400-122.										Page 3 of 3			
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
	20		41 42 43 44 45 46 47 48 49 50 51	Same as above but brown (7.5YR 5/4) and fine to coarse.											
				End of Boring at 51 feet. Set well M17BR at 49 feet.											

Geoprobe core
barrel
sandlocked.

37.6

LOG OF BORING

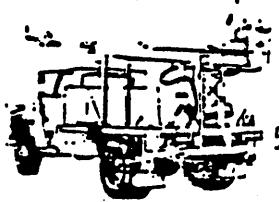
WISCONSIN TESTING LABORATORIES



PROJECT: Dane County Landfill	JOB NO.: S-8314
CLIENT: Residuals Management Technology, Inc.	BORING NO.: M-18
LOCATION: Rodefild Site, Madison, Wisconsin	GROUND ELEVATION: 58.17

BORING STARTED 2/17/83	GROUND WATER: During XX DRILLING 50'
BORING COMPLETED 2/18/83	At Completion XXXX HOURS AFTER DRILLING 50'±
TOTAL DEPTH BORING 80'	1/4 HOURS AFTER DRILLING

DRILLING DATA: BIT SIZE, TYPE, LOSS OR GAIN OF WATER, CASING SIZE, ETC.	SAMPLE NO.	NUMBER BLOWS	POCKET PENE. TSP	FT. DEPTH	SOIL CLASSIFICATION	LABORATORY RESULTS				ELEVATION
						P.S.F. Qu	% Mc	P.C.F. Dd	% S	
6-3/4 In. hollow stem auger casing used with carbide toothed finger bit for entire depth of boring.				0-	BLACK CLAYEY TOPSOIL moist.					
					BROWN SILTY SANDY CLAY moist. (1)					
	1	4/5/5		5-	LOOSE REDDISH-BROWN SILTY FINE TO COARSE SAND moist, trace fine to medium gravel.					
	2	5/10/16		10-	MEDIUM DENSE REDDISH-BROWN FINE TO COARSE SAND moist, trace fine to medium gravel. (2)					
	3	13/27/20		15-	MEDIUM DENSE REDDISH-BROWN SILTY CLAY moist, with fine to coarse sand, trace fine to medium sand.					
	4	12/12/10		20-	DENSE REDDISH-BROWN SILTY FINE TO COARSE SAND moist, trace to little fine to medium gravel.					
	5	13/18/14		25-						



DRILLING AND SAMPLING INFORMATION:

BORING LOGGED BY A. Olson	CHECKED BY Soils Engineer	CLASSIFICATION SYSTEM WTL
METHOD OF DRILLING Hollow Stem Augers, Truck Mounted Drill		MACHINE MODEL CME 55, Unit 12
PENETRATION TESTS: 2" O.D. x 1-3/8" I.D. SPLIT SPOON SAMPLER		

LOG OF BORING

PROJECT: Dane County Landfill CLIENT: Residuals Management Technology, Inc. LOCATION: Rodefeld Site, Madison, Wisconsin	JOB NO.: S-8314 BORING NO.: M-18 GROUND ELEVATION: 56.17
--	---

DRILLING DATA: BIT SIZE, TYPE, LOSS OR GAIN OF WATER, CASING SIZE, ETC.	SAMPLE NO.	NUMBER BLOWS	POCKET PENE. TSF	FT. DEPTH	SAMPLE TYPE	SOIL CLASSIFICATION	LABORATORY RESULTS				ELEVATION
							P.S.F. Qu	Mc	P.C.F. Dd	% S	
				25		DENSE REDDISH-BROWN SILTY FINE TO COARSE SAND moist, trace to little fine to medium gravel.					
	6	12/18/20		30		②					
	7	13/15/20		35							
	8	15/18/25		40		MEDIUM DENSE TO DENSE BROWN FINE TO COARSE SAND moist to wet, trace fine to medium gravel.					
	9	12/22/15		45							
	10	13/16/22		50		③					
	11	14/15/15		55							
	12	14/15/15		60		MEDIUM DENSE TO DENSE BROWN FINE TO COARSE SAND wet to saturated, with medium gravel.					

LOG OF BORING

PROJECT: Dane County Landfill
 CLIENT: Residuals Management Technology, Inc.
 LOCATION: Rodefild Site, Madison, Wisconsin

JOB NO.: S-8314
 BORING NO.: M-18
 GROUND ELEVATION: 58.17

DRILLING DATA: BIT SIZE, TYPE, LOSS OR GAIN OF WATER, CASING SIZE, ETC.	SAMPLE NO.	NUMBER BLOWS	POCKET PENE. TSE	FT. DEPTH	SAMPLE TYPE	SOIL CLASSIFICATION	LABORATORY RESULTS				ELEVATION
							P.S.F. Qu	% Mc	P.C.F. Dd	% S	
				60		MEDIUM DENSE TO DENSE BROWN FINE TO COARSE SAND wet to saturated, with medium gravel.					
	13	15/16/ 25		65							
	14	17/19/ 26		70							
	15	18/20/ 28		75							
						GRAY SILTY SANDY CLAY moist.					
	16			80	A						
						END OF BORING					
				85							
				90							

③

④

NOTE: 80 Ft.
sample was
taken from
drill head of
auger upon
withdrawal of
auger tools.

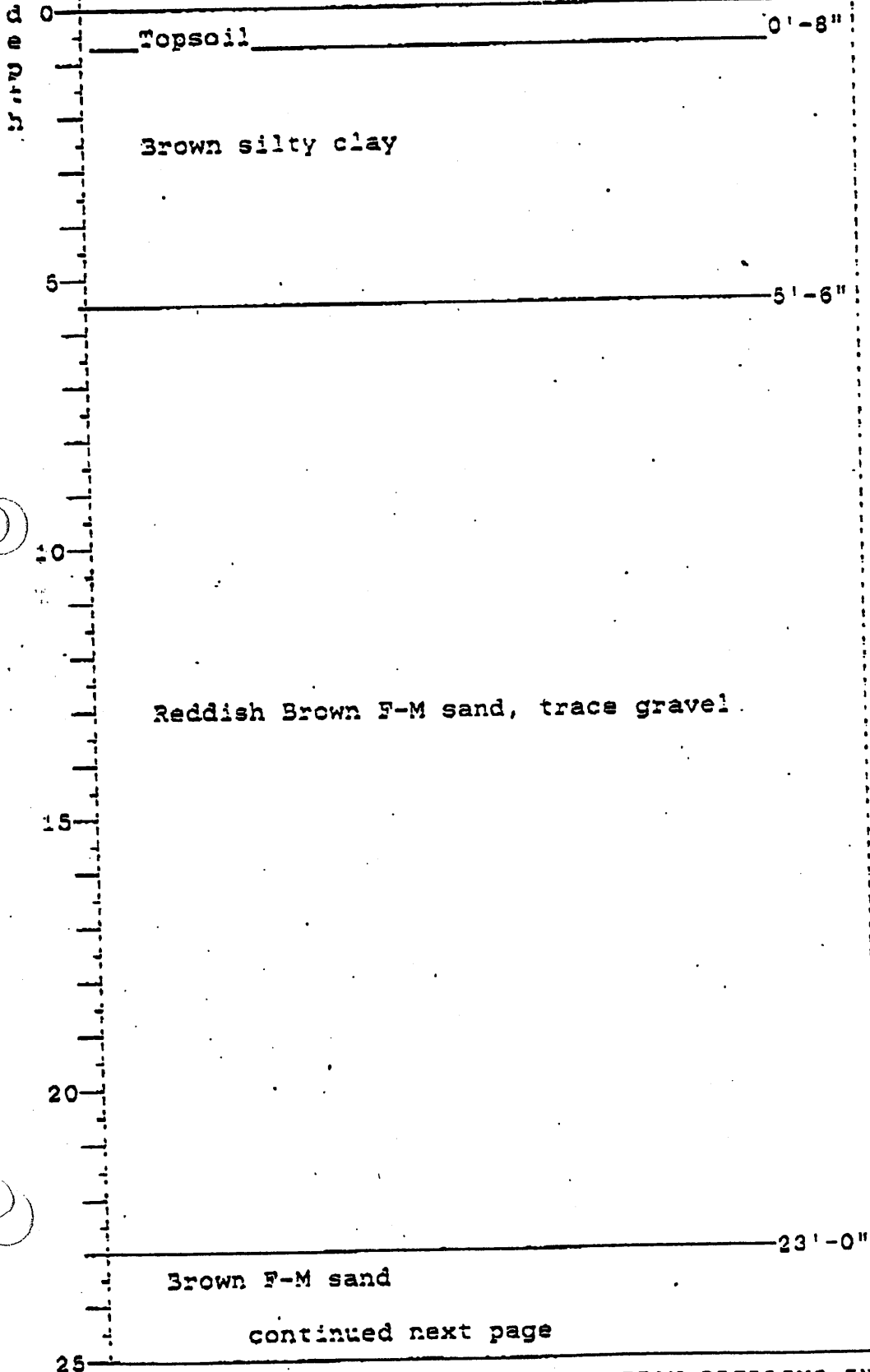
SOIL BORING LOG

BORING # M 28

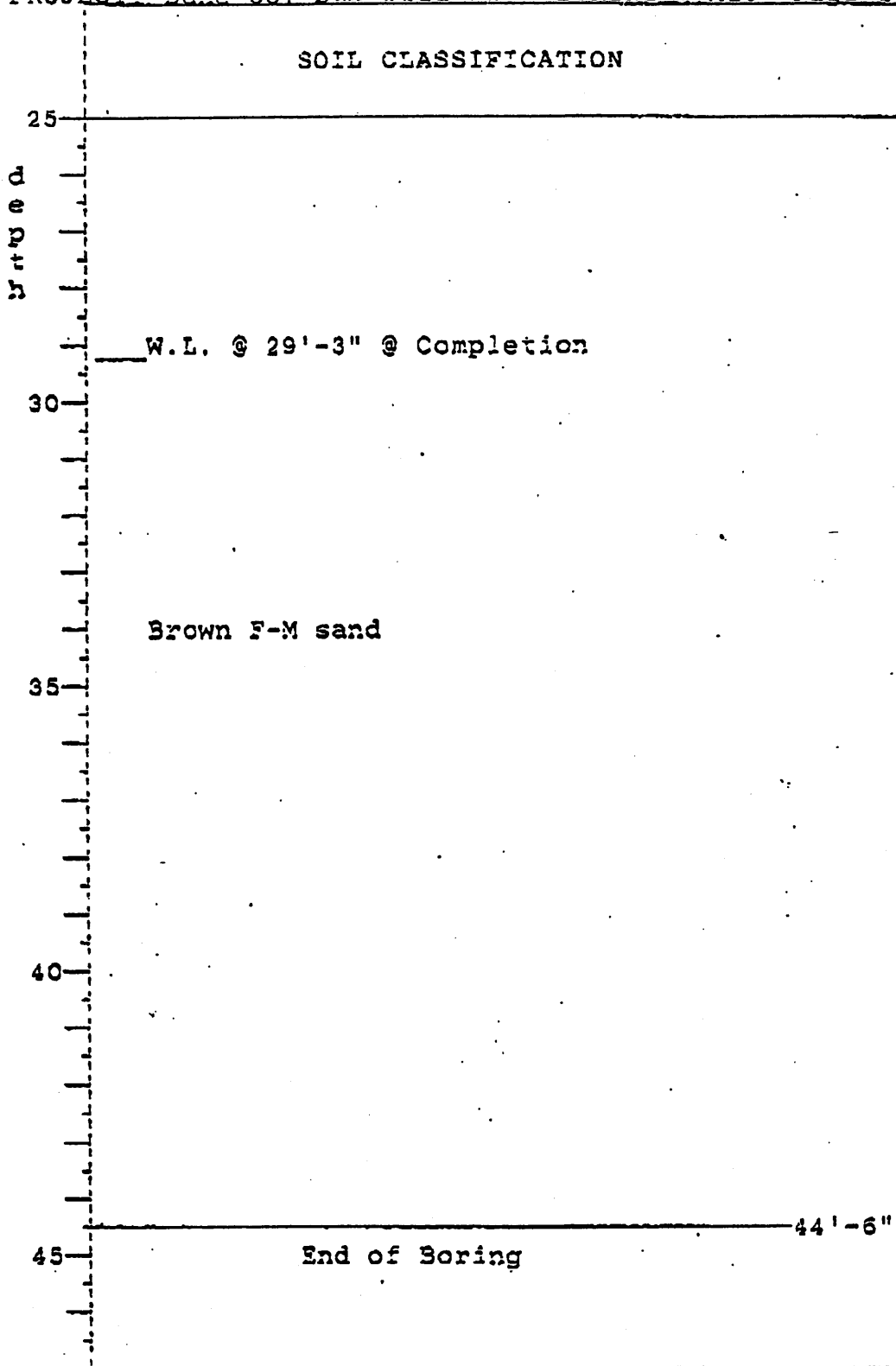
PROJECT: Dane County Landfill #2
LOCATION: as staked

Date completed: 7/21/89

SOIL CLASSIFICATION



continued next page



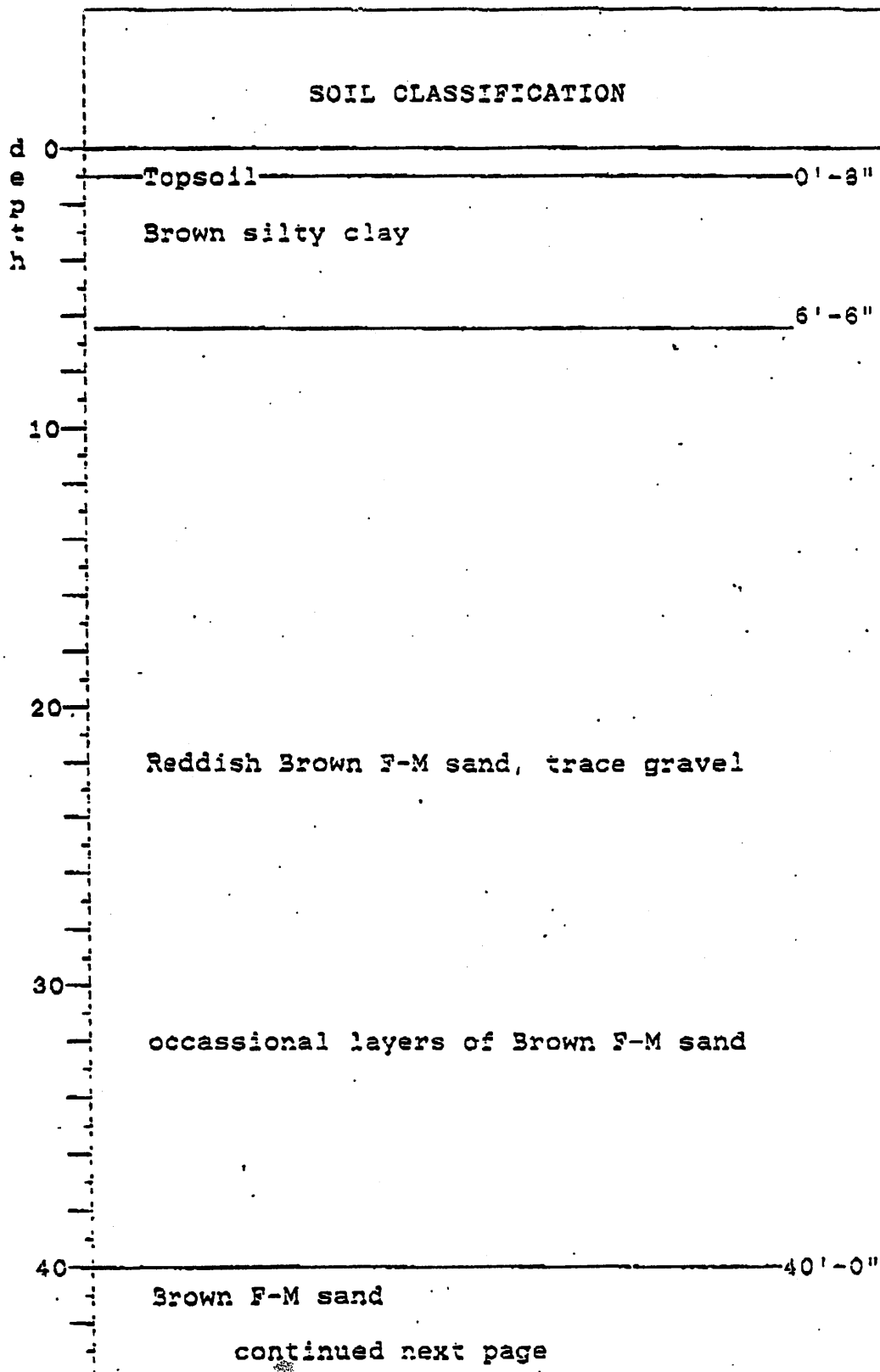
ENVIRONMENTAL & FOUNDATION DRILLING, INC.

SOIL BORING LOG

BORING # M29

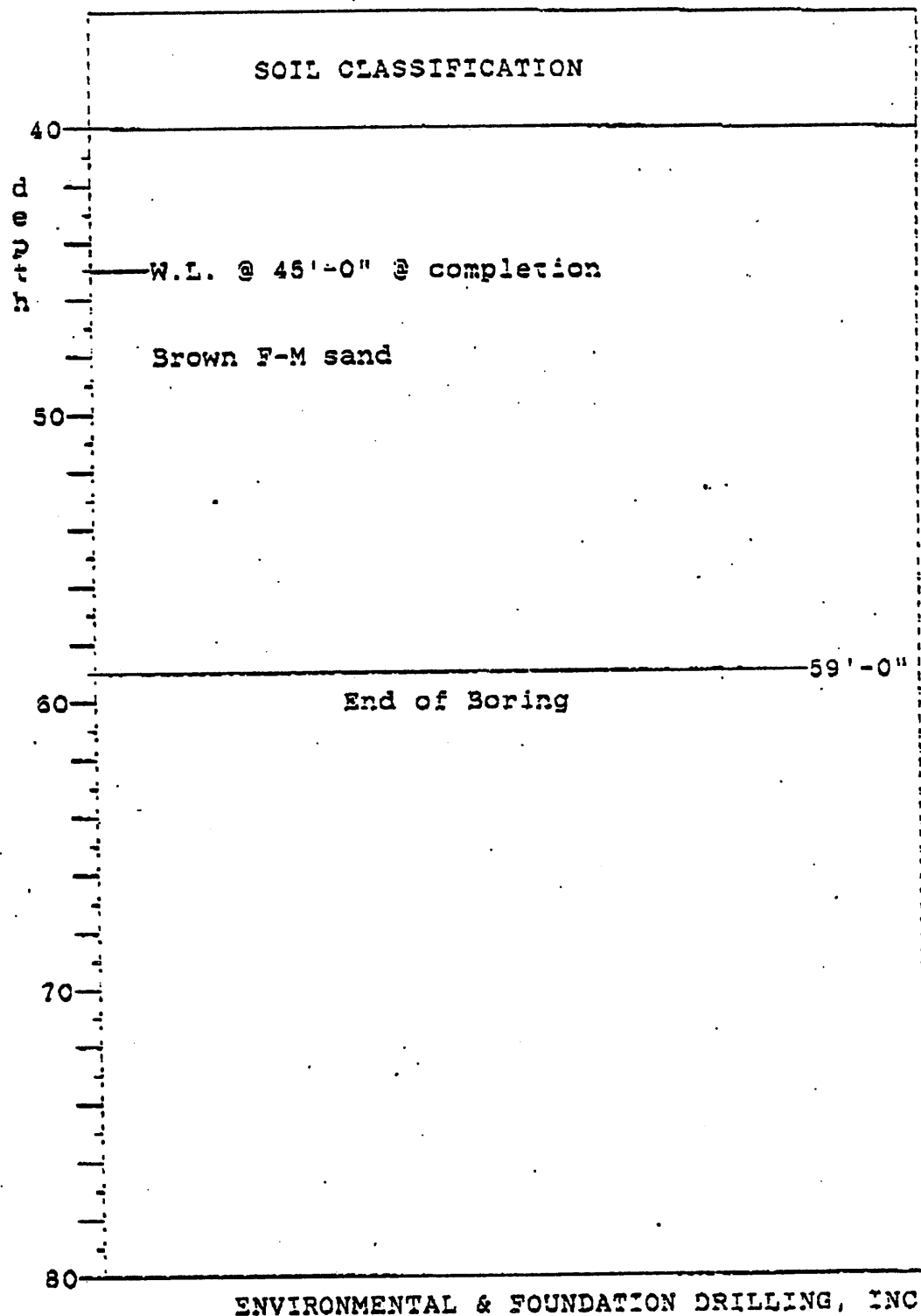
PROJECT: Dane County Landfill #2
LOCATION: as staked

Date completed: 7/24/89



ENVIRONMENTAL & FOUNDATION DRILLING INC.

PROJECT: Dane Co. Landfill #2 BORING # M29 Page 2 of 2



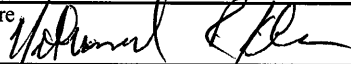
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 3

Facility/Project Name Dane County Landfill #2 (Rodefild)			License/Permit/Monitoring Number 03018		Boring Number M301A	
Boring Drilled By: Name of crew chief (first, last) and Firm Steve Hunger Soils and Engineering Services, Inc.			Date Drilling Started 11/8/2012		Date Drilling Completed 11/8/2012	
Drilling Method hollow stem auger						
WI Unique Well No. VM 942	DNR Well ID No. 150	Common Well Name M301A	Final Static Water Level 861.0 Feet MSL	Surface Elevation 892.0 Feet MSL	Borehole Diameter 8.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 381,349 N, 2,201,305 E ☒ C/N SE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

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	TOPSOIL , silt with sand, and organics, non plastic, 10YR 3/4 dark yellowish brown, no odor, moist. (LOESS)										
				2	SANDY LEAN CLAY (CL) , fine grained, low plasticity, 5YR 4/4 reddish brown, hard. (LOESS)	CL									
1	SS	24 20	5 5 5 8	3	SILTY SAND (SM). (LAB ANALYSIS) (TILL)	SM				4.5	NV	NV	NP	27.3	
				4											
				5											
				6											
				7	SILTY SAND WITH GRAVEL (SM) , fine grained, 10-15% small to medium gravel, 2.5YR 4/6 red, medium dense. (TILL)	SM									
2	SS	24 20	9 12 11 11	8											
				9											
				10											
				11											
				12											

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
---	---	--

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

Page 2 of 3

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 and Type	Length Att. & Recovered (in)	Compressive Strength								Moisture Content	Liquid Limit	Plasticity Index	P 200		
3 SS	24 20	4 7 9 11	13 14 15 16 17	As above, 2.5YR 5/4 reddish brown.	SM										
4 SS	24 18	14 14 11 11	18 19 20 21 22												
5 SS	24 20	6 9 13 15	23 24 25 26 27											As above, 7.5YR 6/6 reddish yellow, decreasing gravel.	
6 SS	24 6	5 9 11 13	28 29 30 31 32												As above, moist, small to large gravel.

[illegible]

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

Page 1 of 2

Facility/Project Name Dane County Landfill #2 (Rodefild)			License/Permit/Monitoring Number 03018		Boring Number M302A	
Boring Drilled By: Name of crew chief (first, last) and Firm Rich Olson Soils and Engineering Services, Inc.			Date Drilling Started 11/8/2012		Date Drilling Completed 11/8/2012	
Drilling Method hollow stem auger						
WI Unique Well No. VM 940	DNR Well ID No. 152	Common Well Name M302A	Final Static Water Level 856.0 Feet MSL	Surface Elevation 878.0 Feet MSL	Borehole Diameter 8.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 382,876 N, 2,201,149 E ☒ C/N NE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat ☐ ° ☐ ' ☐ " Long ☐ ° ☐ ' ☐ "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

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 2 3 4 5 6 7 8 9 10 11 12	Blind drilled to 26 feet bgs. See boring log for M302B for complete lithology.										

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
---	---	--

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

Page 2 of 2

[illegible]

Page 1 of 4

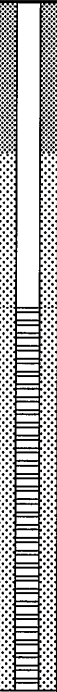
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 SS 2 SS	24 18 24 20	7	1	TOPSOIL, silt with sand, and organics, non plastic, 10YR 3/4 dark yellowish brown, no odor, moist. (LOESS) LEAN CLAY (CL), plastic, 7.5YR 5/6 strong brown, no odor, moist, medium dense. (LOESS) SILTY SAND WITH GRAVEL (SM), fine to medium grained, 20-30% fines, 10-15% small to large gravel, non plastic, 2.5YR 5/6 red, no odor, moist. (TILL)	CL									
		6	2											
		6	3											
		7	4											
		8	5											
			6											
			7											
			8											
		9	9											
		8	10											
		8	11											
			12											

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
---	--	--

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.

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 and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
3 SS	24 22	7 7 7 8	13 14 15 16 17	As above.	SM									
4 SS	24 18	3 3 4 5	18 19 20 21 22	As above, wet, loose.										
5 SS	24 18	7 13 15 16	23 24 25 26 27	As above, wet, medium dense.										
6 SS	24 10	1 4 7 7	28 29 30 31 32	As above.										

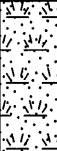
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
7 SS	24 0	7 4 4 6	33 34 35 36 37	As above, no recovery, loose.	SM									
8 SS	24 16	2 3 4 6	38 39 40 41 42	As above.										
9 SS	24 20	5 9 13 12	43 44 45 46 47	As above, medium dense.										
10 SS	24 18	8 16 20 23	48 49 50 51 52	As above with clay, very low plasticity, dense.										

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			
11 SS	24 16	7 14 19 22	53 54 55 56 57	SILTY SAND (SM) , fine to medium grained, less than 10% small to large gravel, 10YR 6/4 light yellowish brown, no odor, wet, dense. (TILL)	SM					11.8	NV	NP	18.8			
			58 59 60 61 62 63													
12 SS	24 0	7 13 16 16													As above, less fines, medium dense.	SM
															No recovery.	
				E.O.B. at 63 feet bgs.												

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

Page 1 of 3

Facility/Project Name Dane County Landfill #2 (Rodefeld)			License/Permit/Monitoring Number 03018		Boring Number M303A	
Boring Drilled By: Name of crew chief (first, last) and Firm Steve Hunger Soils and Engineering Services, Inc.			Date Drilling Started 11/8/2012		Date Drilling Completed 11/8/2012	
Drilling Method hollow stem auger						
WI Unique Well No. VM 943	DNR Well ID No. 156	Common Well Name M303A	Final Static Water Level 861.9 Feet MSL	Surface Elevation 884.9 Feet MSL	Borehole Diameter 8.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 380,837 N, 2,200,429 E ☒ S/C/N SE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

Sample				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)	Blow Counts	Depth In Feet						Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 SS	24 18	3 4 5 6	1	TOPSOIL , silt with sand, and organics, non plastic, 10YR 3/4 dark yellowish brown, no odor, moist. (LOESS)										
			2											
2 SS	24 20	7 11 12 11	3	SILTY CLAY (CL-ML) , fine to medium grained, 15-25% small to large gravel, plastic, 2.5YR 4/6 red, no odor, moist, soft - medium stiff, loose. (LOESS)	CL-ML					25.8	49	27	98.1	
			4											
			5											
			6											
			7											
			8											
			9											
			10											
			11											
			12											
2 SS	24 20	7 11 12 11	8	SILTY SAND WITH GRAVEL (SM) , non plastic, red brown, no odor, moist, medium dense. (TILL)	SM									
			9											

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

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.

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 Art. & Recovered (in)	Compressive Strength								Moisture Content	Liquid Limit	Plasticity Index	P 200		
7 SS	24 16	4 5 7 8	33 34 35 36 37	WELL GRADED SAND WITH GRAVEL (SW) , fine - coarse grained, 10-20% fine to medium gravel, non plastic, 10YR 5/6 yellowish brown, no odor, wet, medium dense. (OUTWASH)	SP										
8 SS	24 12	4 7 8 9	38 39 40 41		SW										
9 SS	24 12	4 8 12 14	42 43 44		E.O.B. at 44 feet bgs.										

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

Page 1 of 2

Facility/Project Name Dane County Landfill No. 2 Rodefeld SCS#: 25217087.02		License/Permit/Monitoring Number 3018		Boring Number M-303AR	
Boring Drilled By: Name of crew chief (first, last) and Firm Tony Kapugi On-site Environmental Services, Inc.		Date Drilling Started 6/29/2020		Date Drilling Completed 6/29/2020	
Drilling Method hollow stem auger					
WI Unique Well No. OX700	DNR Well ID No. 176	Common Well Name M-303AR	Final Static Water Level Feet MSL	Surface Elevation 883.19 Feet MSL	Borehole Diameter 8.25 in.
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 380,779 N, 2,200,339 E S/C/N SE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E		Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____"		Local Grid Location Feet ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison	

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)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
				ORGANIC SILT, brown, (topsoil).	OL										
	29		1	POORLY GRADED SAND, dark reddish brown (5YR 3/3), fine.							M				
			2												
			3												
			4												
			5												
			6	Trace angular gravel.											
	30		7								M				
			8		SP										
			9	Trace silt/clay.											
			10												
			11												
	38		12												
			13								W				Depth to water ~12 feet
			14												
			15												

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

Signature <i>Jackie Rennebohm</i>	Firm SCS Engineers	Tel: Fax:
--------------------------------------	-----------------------	--------------

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

[illegible]

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

Page 1 of 2

Facility/Project Name Dane County Landfill #2 (Rodefild)			License/Permit/Monitoring Number 03018		Boring Number M304A	
Boring Drilled By: Name of crew chief (first, last) and Firm Rich Olson Soils and Engineering Services, Inc.			Date Drilling Started 11/7/2012		Date Drilling Completed 11/7/2012	
Drilling Method hollow stem auger						
WI Unique Well No. VM 947	DNR Well ID No. 158	Common Well Name M304A	Final Static Water Level 857.7 Feet MSL	Surface Elevation 882.7 Feet MSL	Borehole Diameter 8.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 382,119 N, 2,200,739 E ☒ C/N NE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

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 2 3 4 5 6 7 8 9 10 11 12	BLIND DRILLED TO 31 FEET BGS. See boring log for M304B for complete lithology.										

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

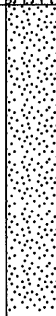
This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally 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.

[illegible]

Page 1 of 4

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

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.

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 and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200						
3 SS	24 20	17 24 19 23	13 14	As above, 7.5YR 6/4 light brown, very dense.	SM														
4 SH	12		15 16																
5 SS	24 22	17 27 23 28	18 19																
6 SS	24 22	14 24 29 40	23 24										13.6	NV	NP	13.5			
7 SS	24 10	4 5 9 11	28 29 30 31 32										SW						
WELL GRADED SAND (SW), fine to coarse grained, less than 10% gravel, non plastic, 7.5 YR 6/4 light brown, no odor, wet, medium dense. (OUTWASH)																			

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
8 SH	24		33	As above, loose.	SW									
			34											
			35											
			36											
			37											
9 SS	24 8	11 17 24 34	38	As above, coarser grained, dense.										
			39											
			40											
			41											
			42											
10 SS	24 0	5 9 14 22	43											
			44											
			45											
			46											
			47											
11 SS	24 10	6 9 13 16	48	As above, medium dense.										
			49											
			50											
			51											
			52											

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

Page 1 of 3

Facility/Project Name Dane County Landfill #2 (Rodefelf)			License/Permit/Monitoring Number 03018		Boring Number M305A	
Boring Drilled By: Name of crew chief (first, last) and Firm Rich Olson Soils and Engineering Services, Inc.			Date Drilling Started 11/6/2012		Date Drilling Completed 11/6/2012	
Drilling Method hollow stem auger						
WI Unique Well No. VM 948	DNR Well ID No. 162	Common Well Name M305A	Final Static Water Level 860.4 Feet MSL	Surface Elevation 890.4 Feet MSL	Borehole Diameter 8.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 381,402 N, 2,200,778 E ☒ C/N SE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	

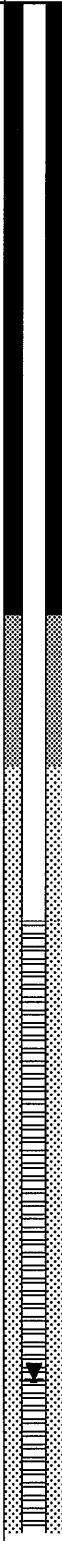
Facility ID 113127300	County Dane	County Code 13	Civil Town/City/ or Village Madison
---------------------------------	-----------------------	--------------------------	---

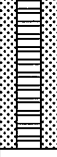
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 SH	24 24		1 2 3 4 5 6 7 8 9 10 11 12	Blind Drill to 34 feet bgs. See boring log M305B for complete lithology.						13.5	25	10	44.5	

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

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.

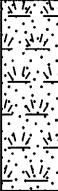
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
2 SH	11 11		13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32							15.5	NV	NP	3.1	Soil Results from M305B

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	
3 SH	12 0		33 34	E.O.B. at 34 feet bgs.										

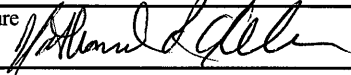
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 4

Facility/Project Name Dane County Landfill #2 (Rodefild)			License/Permit/Monitoring Number 03018		Boring Number M305B	
Boring Drilled By: Name of crew chief (first, last) and Firm Rich Olson Soils and Engineering Services, Inc.			Date Drilling Started 11/5/2012		Date Drilling Completed 11/6/2012	
WI Unique Well No. VM 949		DNR Well ID No. 164	Common Well Name M305B	Final Static Water Level 860.2 Feet MSL	Surface Elevation 890.2 Feet MSL	Borehole Diameter 8.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 381,394 N, 2,200,776 E ☒ C/N SE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

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 SS	24 22	5 8 10 9	1	TOPSOIL , silt with sand, and organics, non plastic, 10YR 3/4 dark yellowish brown, no odor, moist. (LOESS)											Soil classification of SC based on laboratory results from M305A.
			2												
			3	SILTY CLAY WITH SAND AND GRAVEL (CL-ML) , 10% fine grained sand, less than 10% small to medium gravel, low plasticity, 10YR 3/2 very dark greyish brown, no odor, moist, very stiff. (LOESS)	CL-ML										
2 SS	24 24	6 9 13 18	4	CLAYEY SAND (SC).	SC										
			5												
			6												
			7												
			8												
			9	SILTY SAND WITH GRAVEL (SM) , fine to medium grained sand, 10-15% small to large gravel, 2.5YR 4/6 red, medium dense. (TILL)	SM										
			10												
			11												
			12												

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

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 **M305B**

Use only as an attachment to Form 4400-122.

Page **2** of **4**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
3 SS	24 24	10 12 12 16	13 14 15 16 17	As above, less gravel.										
4 SS	24 18	19 10 11 19	18 19 20 21 22	As above.	SM									
5 SS	24 24	6 8 12 15	23 24 25 26 27	POORLY GRADED SAND (SP) , fine to medium sand, trace coarse grained, 10-15% small to medium gravel, trace fines, non plastic, 10YR 7/4 very pale brown, no odor, dry, medium dense. (OUTWASH)										
6 SS	24 18	6 7 9 11	28 29 30 31 32	As above, layers with small to medium gravel, wet.	SP					15.5	NV	NP	3.1	

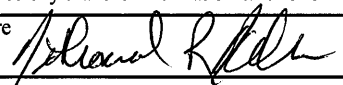
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 3

Facility/Project Name Dane County Landfill #2 (Rodefild)			License/Permit/Monitoring Number 03018		Boring Number B311	
Boring Drilled By: Name of crew chief (first, last) and Firm Steve Hunger Soils and Engineering Services, Inc.			Date Drilling Started 11/6/2012		Date Drilling Completed 11/6/2012	
Drilling Method hollow stem auger						
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level 857.9 Feet MSL	Surface Elevation 881.9 Feet MSL	Borehole Diameter 8.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 382,580 N, 2,200,706 E ☒ C/N NE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat 43° 2' 50.0" Long 89° 14' 57.4"		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

Sample				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)	Blow Counts	Depth In Feet						Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 SS	24 24	11 12 17 14	1	TOPSOIL , silt with sand, and organics, non plastic, 10YR 3/4 dark yellowish brown, no odor, moist. (LOESS) SILTY SAND WITH GRAVEL (SM) , mostly fine grained, 30% fines, fine to medium gravel, non plastic, 5YR 4/6 Yellowish/red, no odor, moist, medium dense. (TILL)	SM									
			2											
			3											
			4											
			5											
2 SS	24 12	6 5 4 6	6	As above, loose.										
			7											
			8											
			9											
			10											
			11											
			12											

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

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 **B311**

Use only as an attachment to Form 4400-122.

Page **2** of **3**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
3 SS	24 20	8 8 8 12	13 14 15 16 17	As above, less gravel, medium dense.	SM									
4 SS	24 20	10 16 18 16	18 19 20 21 22	WELL GRADED SAND WITH GRAVEL (SW) , fine to coarse grained, trace fines, non plastic, 10YR 6/6 brownish yellow, no odor, moist. (OUTWASH)										
5 SS	24 18	5 7 7 10	23 24 25 26 27	As above, wet, medium dense	SW									
6 SS	24 18	6 7 9 10	28 29 30 31 32	SILTY SAND (SM) , fine grained, 30-40% silt, 10YR 6/6 brownish yellow, no odor, wet, very stiff. (TILL)	SM				2.7					

Page 3 of 3

[illegible]

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

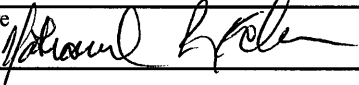
Page 1 of 3

Facility/Project Name Dane County Landfill #2 (Rodefild)			License/Permit/Monitoring Number 03018		Boring Number B312	
Boring Drilled By: Name of crew chief (first, last) and Firm Steve Hunger Soils and Engineering Services, Inc.			Date Drilling Started 11/5/2012		Date Drilling Completed 11/5/2012	
Drilling Method hollow stem auger						
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level 860.3 Feet MSL	Surface Elevation 885.3 Feet MSL	Borehole Diameter 8.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 381,832 N, 2,200,716 E ☒ S/C/N NE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Lat 43° 2' 42.6" Long 89° 14' 57.4"		Local Grid Location ☐ N ☐ E ☐ S ☐ W	

Facility ID 113127300	County Dane	County Code 13	Civil Town/City/ or Village Madison
---------------------------------	-----------------------	--------------------------	---

Sample				Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet						Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
				CRUSHED STONE. (FILL)										
				SILTY SAND WITH GRAVEL (SM), fine to medium grained sand, medium to large gravel, non plastic, 10YR 6/4 light yellowish brown, no odor, moist, dense. (TILL)	SM									
			1											
			2											
1 SS	24 20	11 13 19 25	3											
			4											
			5											
			6											
			7											
2 SS	24 20	10 11 13 17	8											
			9											
			10											
			11											
			12											
				As above, 10YR 6/6 brownish yellow, medium dense.										

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

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.

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 Art. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
3 SS	24 18	11 17 18 24	13 14 15 16 17	WELL GRADED SAND WITH GRAVEL (SW) , 60% fine to coarse grained sand, 20% small to large gravel, 20% fines, 10YR 7/4 very pale brown, dense. (OUTWASH)	SM SW									
4 SS	24 22	8 14 18 28	18 19 20 21 22	POORLY GRADED SAND (SP) , fine sand, 20-30% fines, non plastic, 10YR 7/4 very pale brown, no odor, moist, dense.	SP									
5 SS	24 18	4 8 9 12	23 24 25 26 27	WELL GRADED SAND WITH GRAVEL (SW) , 60% fine to coarse grained sand, 10-20% small to large gravel, 20% fines, 10YR 6/4 light yellowish brown, medium dense.	SW									
6 SS	24 20	12 20 20 20	28 29 30 31 32	SILTY SAND WITH CLAY (SM) , fine to medium grained, 10-20% fines, non plastic, 7.5YR 5/6 strong brown, light brown, no odor, wet, medium dense. (TILL)	SM									

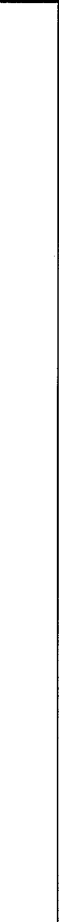
Page 3 of 3

[illegible]

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

Page 1 of 5

Facility/Project Name Dane County Landfill #2 (Rodefeld)			License/Permit/Monitoring Number 03018		Boring Number B313	
Boring Drilled By: Name of crew chief (first, last) and Firm Steve Hunger Soils and Engineering Services, Inc.			Date Drilling Started 11/6/2012		Date Drilling Completed 11/6/2012	
WI Unique Well No.		DNR Well ID No.	Common Well Name		Drilling Method hollow stem auger	
			Final Static Water Level 856.8 Feet MSL		Surface Elevation 887.8 Feet MSL	
					Borehole Diameter 8.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 381,854 N, 2,201,059 E ☒ C/N			Lat 43° 2' 42.8"		Local Grid Location	
NE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E			Long 89° 14' 52.7"		Feet ☐ N ☐ E Feet ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

Sample			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)	Blow Counts							Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	SILTY SAND (SM) , fine to medium grained sand, less than small to large gravel, non plastic, 2.5YR 4/6 red, no odor, moist, medium dense. (TILL)	SM									
			2											
1 SS	24 24	5 7 7 8	3											
			4											
			5											
			6	As above.										
			7											
2 SS	24 24	5 9 12 16	8											
			9											
			10											
			11											
			12											

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

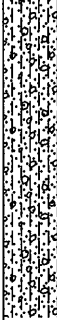
Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

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

Page 2 of 5

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
3 SS	24 20	9 13 13 14	13 14	As above, color changes to 2.5YR 5/6 red.	SM									
4 SH	5 5		15	As above, very loose.										
			16											
			17											
5 SS	24 22	7 8 10 13	18 19	As above, medium dense.										
			20											
			21											
			22											
6 SS	24 22	8 9 9 11	23 24											
			25											
			26											
			27											
7 SS	24 12	4 8 29 48	28 29	As above, dense.										
			30											
			31											
			32											

Page 3 of 5

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
8 SS	24 16	4 9 9 10	33 34 35 36 37	POORLY GRADED SAND (SP) , fine to medium grained, less than 5% gravel, non plastic, 5YR 5/6 yellowish red, no odor, wet, medium dense. (OUTWASH)	SM									
					SP									
9 SS	24 24	10 16 22 22	38 39 40 41 42	SILTY SAND WITH GRAVEL (SM) , fine to medium grained, non plastic, 5YR 5/6 yellowish red, no odor, wet, dense. (TILL)										
10 SS	24 20	8 24 35 41	43 44 45 46 47	As above, very dense.										
11 SS	24 20	12 24 34 41	48 49 50 51 52	As above, very dense.										

Page 4 of 5

[illegible]

Page 5 of 5

[illegible]

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

Page 1 of 3

Facility/Project Name Dane County Landfill #2 (Rodefeld)			License/Permit/Monitoring Number 03018		Boring Number B314	
Boring Drilled By: Name of crew chief (first, last) and Firm Steve Hunger Soils and Engineering Services, Inc.			Date Drilling Started 11/5/2012		Date Drilling Completed 11/5/2012	
WI Unique Well No.		DNR Well ID No.	Common Well Name	Final Static Water Level 854.5 Feet MSL	Surface Elevation 884.5 Feet MSL	Borehole Diameter 8.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 380,925 N, 2,200,707 E ☒ S/C/N SE 1/4 of NE 1/4 of Section 25, T 7 N, R 10 E				Local Grid Location Lat 43° 2' 33.7" Long 89° 14' 57.6" Feet ☐ N ☐ E Feet ☐ S ☐ W		

Facility ID 113127300	County Dane	County Code 13	Civil Town/City/ or Village Madison
---------------------------------	-----------------------	--------------------------	---

Sample			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)	Blow Counts							Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
				CRUSHED STONE. (FILL)											
			1	TOPSOIL , silt with sand, and organics, non plastic, 10YR 3/4 dark yellowish brown, no odor, moist. (LOESS)											
			2												
1 SS	24 20	3 4 6 7	3	SILTY CLAY (CL-ML) , plastic, 7.5YR 5/6 strong brown, brown to yellow brown, no odor, moist, medium stiff, very stiff. (LOESS)	CL-ML				2.7	24.5	45	23	94	Lab Description: LEAN CLAY (CL) - 57.8% silt, 36.2% clay.	
			4												
			5												
			6												
			7	SILTY SAND WITH GRAVEL (SM) , fine to medium sand, 20% small to large gravel, non plastic, 2.5YR 4/4 reddish brown, no odor, moist, medium dense. (TILL)	SM										
2 SS	24 19	9 10 18 15	8												
			9												
			10												
			11												
			12												

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

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

Page 2 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Art. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
3 SS	24 18	13 12 10 12	13 14 15 16 17	As above.	SM									
4 SS	24 22	7 9 9 8	18 19 20 21 22											
5 SS	24 8	5 4 4 6	23 24 25 26 27											
6 SS	24 18	3 7 10 8	28 29 30 31 32											As above, medium dense.

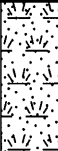
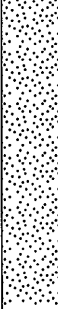
Page 3 of 3

[illegible]

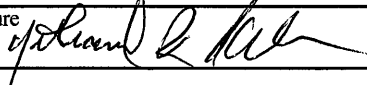
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 4

Facility/Project Name Dane County Landfill #2 (Rodefild)			License/Permit/Monitoring Number 03018		Boring Number B315	
Boring Drilled By: Name of crew chief (first, last) and Firm Steve Hunger Soils and Engineering Services, Inc.			Date Drilling Started 11/7/2012		Date Drilling Completed 11/7/2012	
WI Unique Well No.		DNR Well ID No.	Common Well Name	Final Static Water Level 859.2 Feet MSL	Surface Elevation 889.2 Feet MSL	Borehole Diameter 8.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 381,034 N, 2,201,091 E ☒ C/N NE 1/4 of NW 1/4 of Section 25, T 7 N, R 10 E			Lat 43° 2' 34.7" Long 89° 14' 52.4"		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
Facility ID 113127300		County Dane	County Code 13	Civil Town/City/ or Village Madison		

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 SS	24 22	5 4 5 5	1	TOPSOIL WITH GRAVEL , silt with sand, and organics, non plastic, 10YR 3/4 dark yellowish brown, no odor, moist. (LOESS)																		
			2																			
2 SS	24 14	7 11 15 9	3	SILTY SAND WITH GRAVEL (SM) , fine to medium grained, less than 10% small to medium gravel, non plastic, 7.5YR 5/4 brown, no odor, moist, loose. (TILL)	SM																	
			4																			
			5																			
			6																			
			7																			
			8											WELL GRADED SAND (SW) , fine to coarse grained-mostly fine, less than 10% small to medium gravel, less than 10% fines, trace gravel, on plastic, 10YR 6/6 brownish yellow, no odor, dry, medium dense. (OUTWASH)	SW							
			9																			
			10																			
			11																			
			12																			

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

Signature 	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--	--	--

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.

[illegible]

Page 4 of 4

[illegible]

Borehole and Monitoring Well Abandonments / Abandonment Information

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location	County <u>Dane</u>	Original Well Owner (If Known) <u>Dane County Public Works Department</u>	
1/4 of <u>NE</u> 1/4 of Sec. <u>25</u> ; T. <u>7</u> N.; R. <u>10</u> W.		Present Well Owner <u>Same</u>	
(If applicable) Gov't Lot _____ Grid Number _____		Street or Route <u>217 South Hamilton Street, Suite 400</u>	
Grid Location <u>38</u> <u>1470</u> ft. ☒ N. ☐ S. <u>2200960</u> ft. ☒ E. ☐ W.		City, State, Zip Code <u>Madison WI 53703</u>	
Civil Town Name <u>Blooming Grove</u>		Facility Well No. and/or Name (If Applicable) WI Unique Well No. <u>MLC (003)</u> _____	
Street Address of Well <u>7102 U.S. Hwy 12418</u>		Reason For Abandonment <u>Landfill Expansion</u>	
City, Village <u>Madison WI 53704</u>		Date of Abandonment <u>5/5/94</u>	

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) <u>8/13/82</u>		(4) Depth to Water (Feet) <u>34.1</u>	
☒ Monitoring Well ☐ Water Well ☐ Drillhole ☐ Borehole	Construction Report Available? ☒ Yes ☐ No	Pump & Piping Removed? ☐ Yes ☐ No ☒ Not Applicable Liner(s) Removed? ☐ Yes ☐ No ☒ Not Applicable Screen Removed? ☒ Yes ☐ No ☐ Not Applicable Casing Left in Place? ☐ Yes ☒ No If No, Explain <u>Drilled out entire well with augers</u>	
Construction Type: ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (Specify) _____		Was Casing Cut Off Below Surface? ☐ Yes ☒ No Did Sealing Material Rise to Surface? ☒ Yes ☐ No Did Material Settle After 24 Hours? ☒ Yes ☐ No If Yes, Was Hole Retopped? ☒ Yes ☐ No	
Formation Type: ☒ Unconsolidated Formation ☐ Bedrock		(5) Required Method of Placing Sealing Material	
Total Well Depth (ft.) <u>83.9</u> Casing Diameter (ins.) <u>2</u> (From ground surface) <u>original</u> well depth to <u>98.5'</u> <u>Grading operations</u> <u>changed elevation</u> Casing Depth (ft.) <u>83.9</u>		☒ Conductor Pipe-Gravity ☒ Conductor Pipe-Pumped ☐ Dump Bailer ☐ Other (Explain) _____	
Was Well Annular Space Grouted? ☐ Yes ☒ No ☐ Unknown If Yes, To What Depth? _____ Feet		(6) Sealing Materials	
		For monitoring wells and monitoring well boreholes only ☐ Neat Cement Grout ☐ Sand-Cement (Concrete) Grout ☐ Concrete ☐ Clay-Sand Slurry ☒ Bentonite-Sand Slurry ☐ Chipped Bentonite	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Bentonite Grout	Surface	85	280 gal.	60# Aquagel 400# Granular Bentonite 280 Gallons water from city of Madison water utility

(8) Comments: Drilled to 85'0" with 4 1/4" ID augers, backfilled with bentonite

(9) Signature of Person or Firm Doing Sealing Work	
SOILS & ENGINEERING SERVICES, INC.	
Signature of Person Doing Work <u>[Signature]</u>	Date Signed <u>5/19/94</u>
Street or Route <u>1102 STEWART STREET</u>	Telephone Number <u>(608) 274-7600</u>
City, State, Zip Code	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location NE 1/4 of NW 1/4 of Sec. 25 ; T. 7 N: R. 10 County Dane

(If applicable) Gov't Lot _____ Grid Number _____

Grid Location 38950 ft. ☒ N. ☐ S., 2200290 ft. ☒ E. ☐ W.

Civil Town Name Bloomington Grove

Street Address of Well 7102 U.S. Hwy 12+18

City, Village Madison WI 53704

(2) FACILITY NAME

Original Well Owner (If Known) Dane County Public Works Department

Present Well Owner Same

Street or Route 217 South Hamilton Street, Suite 400

City, State, Zip Code Madison WI 53703

Facility Well No. and/or Name (If Applicable) M3A (004) WI Unique Well No. _____

Reason For Abandonment Landfill Expansion

Date of Abandonment 4/29/94

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 9/9/87

- ☒ Monitoring Well
☐ Water Well
☐ Drillhole
☐ Borehole

Construction Report Available?
☒ Yes ☐ No

Construction Type:

- ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
Other (Specify) _____

Formation Type:

- ☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 44' Casing Diameter (ins.) 1 1/4"
(From ground surface)

Casing Depth (ft.) 44'

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) 37'10"

- Pump & Piping Removed? ☐ Yes ☐ No ☒ Not Applicable
Liner(s) Removed? ☐ Yes ☐ No ☒ Not Applicable
Screen Removed? ☒ Yes ☐ No ☐ Not Applicable
Casing Left in Place? ☐ Yes ☒ No
If No, Explain Drilled out entire well with augers

- Was Casing Cut Off Below Surface? ☐ Yes ☒ No
Did Sealing Material Rise to Surface? ☒ Yes ☐ No
Did Material Settle After 24 Hours? ☐ Yes ☒ No
If Yes, Was Hole Retopped? ☐ Yes ☐ No

(5) Required Method of Placing Sealing Material

- ☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain) _____

(6) Sealing Materials

- ☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
- For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☐ Granular Bentonite

Sealing Material Used

Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" Bentonite Chips</u>	<u>Surface</u>	<u>44'</u>	<u>725#</u>	

Comments: Drilled to 44' with 1 1/4" ID augers, backfilled with bentonite

Name of Person or Firm Doing Sealing Work

ENGINEERING SERVICES, INC.

Signature of Person Doing Work [Signature]

Date Signed 5/19/94

Street or Route 1102 STEWART STREET

Telephone Number (608) 274-7600

City, State, Zip Code

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected

District/County

Reviewer/Inspector

Follow-up Necessary

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location	County <u>Dane</u>	Original Well Owner (If Known) <u>Dane County Public Works Department</u>	
1/4 of <u>NE</u> 1/4 of Sec. <u>25</u> ; T. <u>7</u> N; R. <u>10</u> E W		Present Well Owner <u>Same</u>	
(If applicable) Gov't Lot _____ Grid Number _____		Street or Route <u>217 South Hamilton Street, Suite 400</u>	
Grid Location <u>382550</u> ft. ☒ N. ☐ S., <u>2201090</u> ft. ☒ E. ☐ W.		City, State, Zip Code <u>Madison WI 53703</u>	
Civil Town Name <u>Bloomington Grove</u>		Facility Well No. and/or Name (If Applicable) WI Unique Well No. <u>M 10 A (014)</u>	
Street Address of Well <u>7102 U.S. Hwy 12+18</u>		Reason For Abandonment <u>Landfill Expansion</u>	
City, Village <u>Madison WI 53704</u>		Date of Abandonment <u>5/5/94</u>	

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) <u>6/16/82</u>		(4) Depth to Water (Feet) <u>23.3</u>	
☒ Monitoring Well ☐ Water Well ☐ Drillhole ☐ Borehole		Pump & Piping Removed? ☐ Yes ☐ No ☒ Not Applicable Liner(s) Removed? ☐ Yes ☐ No ☒ Not Applicable Screen Removed? ☒ Yes ☐ No ☐ Not Applicable Casing Left in Place? ☐ Yes ☒ No If No, Explain <u>Drilled out entire well with augers</u>	
Construction Report Available? ☒ Yes ☐ No		Was Casing Cut Off Below Surface? ☐ Yes ☒ No Did Sealing Material Rise to Surface? ☒ Yes ☐ No Did Material Settle After 24 Hours? ☐ Yes ☒ No If Yes, Was Hole Retopped? ☐ Yes ☐ No	
Construction Type: ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug Other (Specify) _____		(5) Required Method of Placing Sealing Material ☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped ☐ Dump Bailer ☐ Other (Explain) _____	
Formation Type: ☒ Unconsolidated Formation ☐ Bedrock		(6) Sealing Materials ☐ Neat Cement Grout ☐ Sand-Cement (Concrete) Grout ☐ Concrete ☐ Clay-Sand Slurry ☐ Bentonite-Sand Slurry ☒ Chipped Bentonite	
Total Well Depth (ft.) <u>33.4</u> Casing Diameter (ins.) <u>2</u> (From ground surface) <u>original well depth to 45'</u>		For monitoring wells and monitoring well boreholes only ☐ Bentonite Pellets ☐ Granular Bentonite	
Casing Depth (ft.) <u>33.4</u>			
Was Well Annular Space Grouted? ☐ Yes ☒ No ☐ Unknown If Yes, To What Depth? _____ Feet			

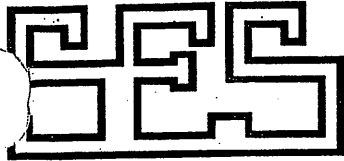
Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" Bentonite Chips</u>	<u>Surface</u>	<u>34'6"</u>	<u>800#</u>	

Comments: Drilled to 34'6" with 4 1/4" ID augers, backfilled with bentonite

Name of Person or Firm Doing Sealing Work <u>JOHN & ENGINEERING SERVICES, INC.</u>	
Signature of Person Doing Work <u>[Signature]</u>	Date Signed <u>5/19/94</u>
Street or Route <u>1102 STEWART STREET</u>	Telephone Number <u>(608) 274-7600</u>
City, State, Zip Code	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

M-13A
M-13B



SOILS & ENGINEERING SERVICES, INC.

CONSULTING CIVIL ENGINEERS

8721

1102 STEWART STREET

MADISON, WISCONSIN 53713

TELEPHONE: 608 • 274-7600

Earl H. Reichel, P.E.
Octavio Tejeda, P.E.

August 21, 1987

Dane County Public Works Department
Solid Waste Division
210 Martin Luther King Jr. Boulevard
Room 519
Madison, WI 53709

Attention: Mr. Dennis Sopcich

Subject: Dane County Landfill
Rodefild Site

Gentlemen:

In accordance with your request of July 21, 1987, we have abandoned Wells 13A and 13B. The wells to be abandoned were indicated to us in the field by Mr. Mike DiMaggio.

The wells were abandoned by drilling the well using 3 1/4-inch diameter hollow stem augers. Steel rods were used inside the well as a guide to the hollow stem augers. After removing of the well, the holes were filled with bentonite slurry consisting of a mixture of bentonite and water mixed as thick as possible. The approximate mixture consisted of about 40 gallons of water for each bag of bentonite. The bentonite slurry was pumped into the hole and deposited at the bottom of the hole with a rubber hose. The augers were withdrawn as the slurry was being pumped. Wells 13A and 13B were drilled to 68 and 83 feet respectively.

Please let us know if you have any questions regarding this submittal, or if we can be of further assistance to you.

Respectfully submitted,

SOILS & ENGINEERING SERVICES, INC.



Octavio Tejeda, P.E.

OTG:bb

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

☐ **Verification Only of Fill and Seal****Route to DNR Bureau:**☐ Drinking Water☐ Watershed/Wastewater☐ Remediation/Redevelopment☒ Waste Management☐ Other: _____**1. Well Location Information**

County Dane	WI Unique Well # of Removed Well BX891	Hicap # M-17A
-----------------------	---	-------------------------

Latitude / Longitude (see instructions)	Format Code	Method Code
N	☐ DD	☐ GPS008
W	☐ DDM	☐ SCR002
		☐ OTH001

1/4 1/4 SE	1/4 NE	Section	Township	Range	☒ E
or Gov't Lot #		25	07 N	10	☐ W

Well Street Address 7102 US-12
--

Well City, Village or Town Madison	Well ZIP Code 53718
--	-------------------------------

Subdivision Name	Lot #
------------------	-------

Reason for Removal from Service No Longer In Service	WI Unique Well # of Replacement Well NA
--	---

3. Filled & Sealed Well / Drillhole / Borehole Information

☒ Monitoring Well	Original Construction Date (mm/dd/yyyy)
☐ Water Well	06/07/1982
☐ Borehole / Drillhole	If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
28.50	2.0

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
6.0	17

Was well annular space grouted?	☐ Yes ☒ No ☐ Unknown
---------------------------------	--

If yes, to what depth (feet)?	Depth to Water (feet)
NA	9.99

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
3/8" Bentonite Chips	Surface	29	10.12 cubic feet	NA

6. Comments

Abandonment for for monitoring well M-17A. Well was overdrilled using 4.25" hollow stem augers to depth of 29 feet. PVC casing removed during drilling. Total Depth from top of well casing = 29.80'

7. Supervision of Work

Supervision of Work			DNR Use Only	
Name of Person or Firm Doing Filling & Sealing On-site Environmental Services, Inc.	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy) 03/31/2020	Date Received	Noted By
Street or Route PO Box 280	Telephone Number (608) 837-8992		Comments	
City Sun Prairie	State WI	ZIP Code 53590	Signature of Person Doing Work <i>Anthony Kapugi</i>	Date Signed 04/08/2020

EXHIBIT 6

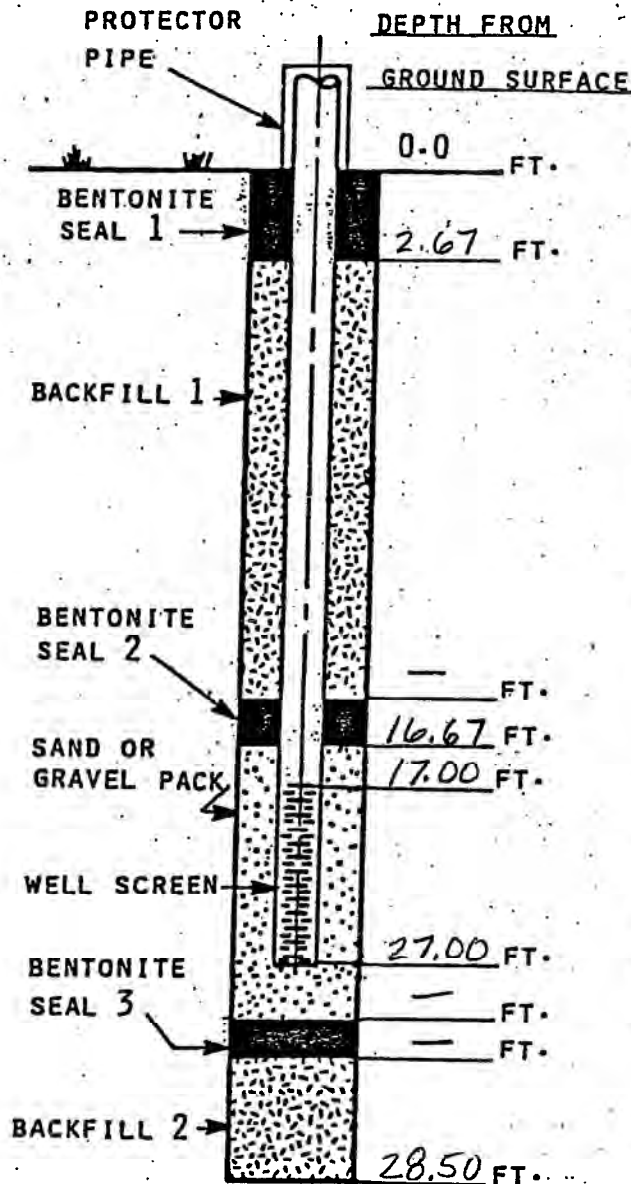
RMT, INC.
Well Diagram
F-17 (4-80)

WELL DIAGRAM

JOB RODEFELD SITE

BORING NO. M-17A

DATE INSTALLED 6-7-82



DEPTH TO BOTTOM OF BORING 28.5 FT.
DEPTH TO BOTTOM OF SEAL 3 — FT.
MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 26.66 FT.
DEPTH TO BOTTOM OF WELL POINT 27.0 FT.
DEPTH TO TOP OF WELL POINT 17.0 FT.
DEPTH TO BOTTOM OF SEAL 2 — FT.
MATERIAL —

DEPTH TO TOP OF SEAL 2 — FT.
MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.
MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 29.83 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

TYPE OF BACKFILL 2 —

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

COMMENTS: BENTONITE SEAL 1, 1 FT. THICK

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

☐ **Verification Only of Fill and Seal****Route to DNR Bureau:**☐ Drinking Water☐ Watershed/Wastewater☐ Remediation/Redevelopment☒ Waste Management☐ Other: _____**1. Well Location Information**

County Dane	WI Unique Well # of Removed Well BX892	Hicap # M-17B
-----------------------	---	-------------------------

Latitude / Longitude (see instructions) N W	Format Code ☐ DD ☐ DDM	Method Code ☐ GPS008 ☐ SCR002 ☐ OTH001
---	--	--

1/4 1/4 SE or Gov't Lot #	1/4 NE	Section 25	Township 07 N	Range 10	☒ E ☐ W
------------------------------	--------	----------------------	-------------------------	--------------------	---

Well Street Address

7102 US-12

Well City, Village or Town

Madison

Subdivision Name

Well ZIP Code

53718

Lot #

Reason for Removal from Service No Longer In Service	WI Unique Well # of Replacement Well NA
--	---

3. Filled & Sealed Well / Drillhole / Borehole Information☒ Monitoring Well☐ Water Well☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy)

06/04/1982

If a Well Construction Report is available,
please attach.

Construction Type:

☒ Drilled☐ Driven (Sandpoint)☐ Dug☐ Other (specify): _____

Formation Type:

☒ Unconsolidated Formation☐ Bedrock

Total Well Depth From Ground Surface (ft.)

50.0

Casing Diameter (in.)

2.0

Lower Drillhole Diameter (in.)

6.0

Casing Depth (ft.)

42.17

Was well annular space grouted?

☐ Yes☒ No☐ Unknown

If yes, to what depth (feet)?

NA

Depth to Water (feet)

10.16

5. Material Used to Fill Well / Drillhole

3/8" Bentonite Chips

2. Facility / Owner Information

Facility Name

Dane County Landfill Site No. 2 - Rodefild

Facility ID (FID or PWS)

License/Permit/Monitoring #

3018

Original Well Owner

Dane County Public Works - Solid Waste Division

Present Well Owner

Dane County Public Works - Solid Waste Division

Mailing Address of Present Owner

1919 Alliant Energy Center Way

City of Present Owner

Madison

State

WI

ZIP Code

53713

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

Pump and piping removed?

☒ Yes☐ No☐ N/A

Liner(s) removed?

☐ Yes☐ No☒ N/A

Liner(s) perforated?

☐ Yes☐ No☒ N/A

Screen removed?

☒ Yes☐ No☐ N/A

Casing left in place?

☐ Yes☒ No☐ N/A

Was casing cut off below surface?

☐ Yes☐ No☒ N/A

Did sealing material rise to surface?

☒ Yes☐ No☐ N/A

Did material settle after 24 hours?

☐ Yes☒ No☐ N/A

If yes, was hole retopped?

☐ Yes☐ No☒ N/AIf bentonite chips were used, were they hydrated
with water from a known safe source?☒ Yes☐ No☐ N/A

Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity☐ Conductor Pipe-Pumped☒ Screened & Poured
(Bentonite Chips)☐ Other (Explain): _____

Sealing Materials

☐ Neat Cement Grout☐ Concrete☐ Sand-Cement (Concrete) Grout☒ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:

☒ Bentonite Chips☐ Bentonite - Cement Grout☐ Granular Bentonite☐ Bentonite - Sand Slurry**6. Comments**

Abandonment form for monitoring well M-17B. Well was overdrilling using 4.25" hollow stem augers to depth of 50 feet and PVC casing was removed. Total depth from well top of casing = 45.92'. Old bailer was in bottom of well.

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing

On-site Environmental Services, Inc.

License #

Date of Filling & Sealing or Verification

(mm/dd/yyyy) 03/31/2020

DNR Use Only

Date Received

Noted By

Street or Route

PO Box 280

Telephone Number

(608)837-8992

Comments

City

Sun Prairie

State

WI

ZIP Code

53590

Signature of Person Doing Work

Anthony Kapugi

Date Signed

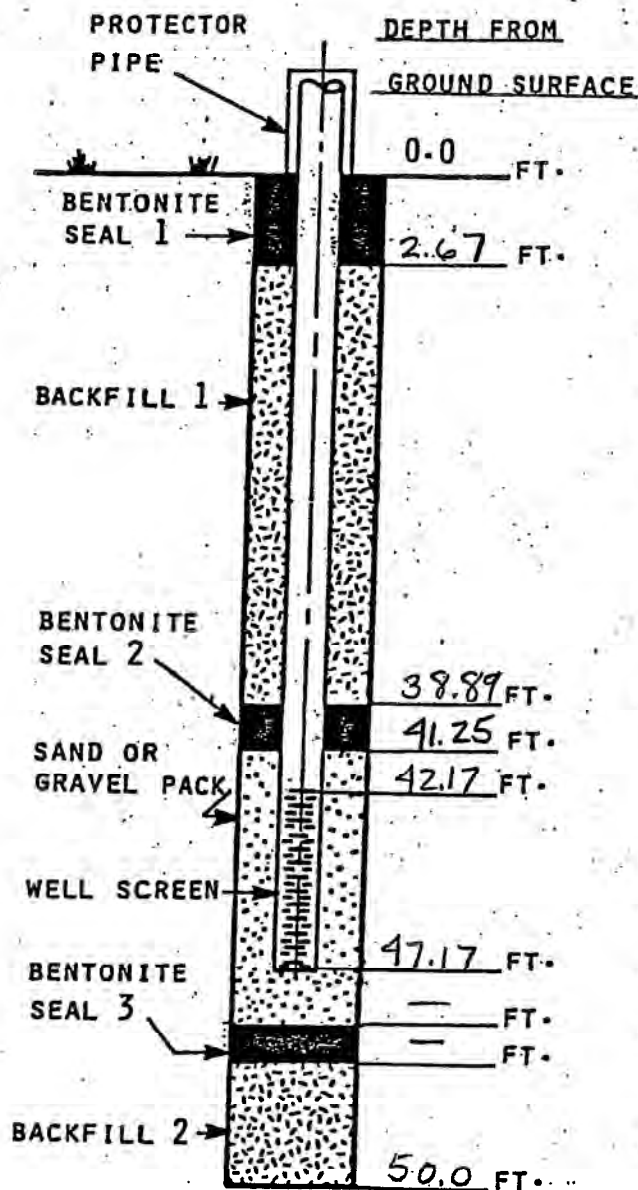
04/08/2020

WELL DIAGRAM

JOB RODEFELD SITE

BORING NO. M-17B

DATE INSTALLED 6-4-82



DEPTH TO BOTTOM OF BORING 50.0 FT.

DEPTH TO BOTTOM OF SEAL 3 — FT.

MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 48.83 FT.

DEPTH TO BOTTOM OF WELL POINT 47.17 FT.

DEPTH TO TOP OF WELL POINT 42.17 FT.

DEPTH TO BOTTOM OF SEAL 2 41.25 FT.

MATERIAL BENTONITE PELLETS

DEPTH TO TOP OF SEAL 2 38.89 FT.

MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 50.17 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

TYPE OF BACKFILL 2 —

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

COMMENTS: BENTONITE SEAL 1 IS 1 FT. THICK

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location	County <u>Dane</u>	Original Well Owner (If Known) <u>Dane County Public Works Department</u>	
<u>NE</u> 1/4 of <u>NW</u> 1/4 of Sec. <u>25</u> ; T. <u>7</u> N; R. <u>10</u> ☒ E ☐ W (If applicable)		Present Well Owner <u>Same</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>217 South Hamilton Street, Suite 400</u>	
Grid Location <u>382070</u> ft. ☒ N. ☐ S. <u>2201040</u> ft. ☒ E. ☐ W.		City, State, Zip Code <u>Madison WI 53703</u>	
Civil Town Name <u>Blooming Grove</u>		Facility Well No. and/or Name (If Applicable) WI Unique Well No. <u>M18 (021)</u> _____	
Street Address of Well <u>7102 U.S. Hwy 12 & 18</u>		Reason For Abandonment <u>Landfill Expansion</u>	
City, Village <u>Madison WI 53704</u>		Date of Abandonment <u>5/5/94</u>	

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) <u>2/18/83</u>		(4) Depth to Water (Feet) <u>43.5</u>	
☒ Monitoring Well ☐ Water Well ☐ Drillhole ☐ Borehole	Construction Report Available? ☒ Yes ☐ No	Pump & Piping Removed? ☐ Yes ☐ No ☒ Not Applicable Liner(s) Removed? ☐ Yes ☐ No ☒ Not Applicable Screen Removed? ☒ Yes ☐ No ☐ Not Applicable Casing Left in Place? ☐ Yes ☒ No If No, Explain <u>Drilled out well with augers</u>	
Construction Type: ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (Specify) _____		Was Casing Cut Off Below Surface? ☐ Yes ☒ No Did Sealing Material Rise to Surface? ☒ Yes ☐ No Did Material Settle After 24 Hours? ☐ Yes ☒ No If Yes, Was Hole Retopped? ☐ Yes ☐ No	
Formation Type: ☒ Unconsolidated Formation ☐ Bedrock		(5) Required Method of Placing Sealing Material ☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped ☐ Dump Bailer ☐ Other (Explain) _____	
Total Well Depth (ft.) <u>54.8</u> Casing Diameter (ins.) <u>2</u> (From ground surface)		(6) Sealing Materials For monitoring wells and monitoring well boreholes only ☐ Neat Cement Grout ☐ Bentonite Pellets ☐ Sand-Cement (Concrete) Grout ☐ Granular Bentonite ☐ Concrete ☐ Clay-Sand Slurry ☐ Bentonite-Sand Slurry ☒ Chipped Bentonite	
Casing Depth (ft.) <u>54.8</u>			
Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown If Yes, To What Depth? _____ Feet			

Sealing Material Used		From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
3/8" Bentonite Chips		Surface	56'	1300#	

8) Comments: Drilled to 56'0" with 4 1/4" ID augers, backfilled with bentonite

9) Name of Person or Firm Doing Sealing Work SOILS & ENGINEERING SERVICES, INC.	
Signature of Person Doing Work <u>[Signature]</u>	Date Signed <u>5/19/94</u>
Street or Route <u>1102 STEWART STREET</u>	Telephone Number <u>(608) 274-7600</u>
City, State, Zip Code	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

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

☐ **Verification Only of Fill and Seal****Route to DNR Bureau:**☐ Drinking Water☐ Watershed/Wastewater☐ Remediation/Redevelopment☒ Waste Management☐ Other: _____**1. Well Location Information**

County Dane	WI Unique Well # of Removed Well VM943	Hicap # M-303A
-----------------------	---	--------------------------

Latitude / Longitude (see instructions) N W	Format Code ☐ DD ☐ DDM	Method Code ☐ GPS008 ☐ SCR002 ☐ OTH001
---	--	--

1/4 1/4 SE or Gov't Lot #	1/4 NE	Section 25	Township 07 N	Range 10	☒ E ☐ W
------------------------------	--------	----------------------	-------------------------	--------------------	---

Well Street Address
7102 US-12Well City, Village or Town
Madison

Subdivision Name

Well ZIP Code
53718

Lot #

Reason for Removal from Service
No Longer In ServiceWI Unique Well # of Replacement Well
NA**3. Filled & Sealed Well / Drillhole / Borehole Information**☒ Monitoring Well☐ Water Well☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy)

11/08/2012If a Well Construction Report is available,
please attach.

Construction Type:

☒ Drilled☐ Driven (Sandpoint)☐ Dug☐ Other (specify): _____

Formation Type:

☒ Unconsolidated Formation☐ Bedrock

Total Well Depth From Ground Surface (ft.)

44

Casing Diameter (in.)

2.0

Lower Drillhole Diameter (in.)

8.0

Casing Depth (ft.)

19

Was well annular space grouted?

☐ Yes☒ No☐ Unknown

If yes, to what depth (feet)?

NA

Depth to Water (feet)

18.86**5. Material Used to Fill Well / Drillhole****3/8" Bentonite Chips****2. Facility / Owner Information**

Facility Name

Dane County Landfill Site No. 2 - Rodefild

Facility ID (FID or PWS)

License/Permit/Monitoring #

3018

Original Well Owner

Dane County Public Works - Solid Waste Division

Present Well Owner

Dane County Public Works - Solid Waste Division

Mailing Address of Present Owner

1919 Alliant Energy Center Way

City of Present Owner

Madison

State

WI

ZIP Code

53713**4. Pump, Liner, Screen, Casing & Sealing Material**

Pump and piping removed?

☒ Yes☐ No☐ N/A

Liner(s) removed?

☐ Yes☐ No☒ N/A

Liner(s) perforated?

☐ Yes☐ No☒ N/A

Screen removed?

☒ Yes☐ No☐ N/A

Casing left in place?

☐ Yes☒ No☐ N/A

Was casing cut off below surface?

☐ Yes☐ No☒ N/A

Did sealing material rise to surface?

☒ Yes☐ No☐ N/A

Did material settle after 24 hours?

☐ Yes☒ No☐ N/A

If yes, was hole retopped?

☐ Yes☐ No☒ N/AIf bentonite chips were used, were they hydrated
with water from a known safe source?☒ Yes☐ No☐ N/A

Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity☐ Conductor Pipe-Pumped☒ Screened & Poured
(Bentonite Chips)☐ Other (Explain): _____

Sealing Materials

☐ Neat Cement Grout☐ Concrete☐ Sand-Cement (Concrete) Grout☒ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:

☒ Bentonite Chips☐ Bentonite - Cement Grout☐ Granular Bentonite☐ Bentonite - Sand Slurry**6. Comments**

Abandonment form for monitoring well M-303A. Well was overdrilled using 4.25" hollow stem augers to depth of 44 feet and PVC casing was removed. Total depth from well top of casing = 32.45'

7. Supervision of WorkName of Person or Firm Doing Filling & Sealing
On-site Environmental Services, Inc.

License #

Date of Filling & Sealing or Verification
(mm/dd/yyyy) **04/01/2020****DNR Use Only**

Date Received

Noted By

Street or Route

PO Box 280

Telephone Number

(608)837-8992

Comments

City

Sun Prairie

State

WI

ZIP Code

53590

Signature of Person Doing Work

Anthony Kapugi

Date Signed

04/08/2020

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

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefild)	Local Grid Location of Well ft. ☐ N. ☐ E. ☐ S. ☐ W.	Well Name M303A
Facility License, Permit or Monitoring No. 03018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. " ' " Long. " ' " or	Wis. Unique Well No. VM 943 DNR Well Number 156
Facility ID 113127300	St. Plane 380,837 ft. N, 2,200,429 ft. E. ☒ C/N	Date Well Installed 11/08/2012
Type of Well Well Code 11/mw	Section Location of Waste/Source SE 1/4 of NE 1/4 of Sec. 25, T. 7 N, R. 10 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Steve Hunger
Distance from Waste/Source 75 ft. Apply ☐	Location of Well Relative to Waste/Source u ☒ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	SES, Inc.

A. Protective pipe, top elevation 887.45 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 887.23 ft. MSL	2. Protective cover pipe: a. Inside diameter: 4.0 in. b. Length: 7.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 884.9 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe:
D. Surface seal, bottom _____ ft. MSL or _____ 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 Sand ☒
13. Sieve analysis attached? ☒ Yes ☐ No	5. Annular space seal: a. Granular/Chipped 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. 4.8 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 chips ☒ 32 c. _____ Other ☐
16. Drilling additives used? ☐ Yes ☒ No	7. Fine sand material: Manufacturer, product name & mesh size a. #15 Sand b. Volume added 0.6 ft ³
Describe _____	8. Filter pack material: Manufacturer, product name & mesh size a. #40 Sand b. Volume added 3.8 ft ³
17. Source of water (attach analysis, if required): City of Madison	9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
E. Bentonite seal, top 884.6 ft. MSL or 0.3 ft.	10. Screen material: PVC a. Screen Type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
F. Fine sand, top 869.9 ft. MSL or 15.0 ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 10.0 ft.
G. Filter pack, top 867.9 ft. MSL or 17.0 ft.	11. Backfill material (below filter pack): None ☐ 14 Formation Collapse ☒
H. Screen joint, top 865.9 ft. MSL or 19.0 ft.	
I. Well bottom 855.9 ft. MSL or 29.0 ft.	
J. Filter pack, bottom 854.9 ft. MSL or 30.0 ft.	
K. Borehole, bottom 840.9 ft. MSL or 44.0 ft.	
L. Borehole, diameter 8.0 in.	
M. O.D. well casing 2.38 in.	
N. I.D. well casing 2.07 in.	

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

Signature _____ Firm TRC Environmental Corporation Tel: 608.826.360
708 Heartland Trail Madison WI 53717 Fax: 608.826.3941

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

☐ Verification Only of Fill and Seal

Route to:

☐ Drinking Water☐ Watershed/Wastewater☐ Remediation/Redevelopment☒ Waste Management☐ Other _____

1. Well Location Information				2. Facility / Owner Information			
County	WI Unique Well # of Removed Well	Hicap #		Facility Name			
Dane				Dane County Landfill #2 (Rodefild)			
Latitude / Longitude (Degrees and Minutes)		Method Code (see instructions)		Facility ID (FID or PWS)			
43 ° 2 ' 50.0"N				113127300			
89 ° 14 ' 57.4"W				License/Permit/Monitoring #			
1/4 NE		Section	Township	Range	Original Well Owner		
or Gov't Lot #		25	7	10	03018		
				☒ E ☐ W	Present Well Owner		
Well Street Address				Dane County Public Works			
7102 USH 12&18				Mailing Address of Present Owner			
Well City, Village or Town		Well ZIP Code		1919 Alliant Energy Center Way			
Madison		53718		City of Present Owner			
Subdivision Name		Lot #		Madison	State	ZIP Code	
				wi		53717	
Reason For Removal From Service				4. Pump, Liner, Screen, Casing & Sealing Material			
Soil Boring				Pump and piping removed? ☐ Yes ☐ No ☒ N/A			
3. Well / Drillhole / Borehole Information				Liner(s) removed? ☐ Yes ☐ No ☒ N/A			
☐ Monitoring Well				Screen removed? ☐ Yes ☐ No ☒ N/A			
☐ Water Well				Casing left in place? ☐ Yes ☐ No ☒ N/A			
☒ Drillhole / Borehole				Was casing cut off below surface? ☐ Yes ☐ No ☒ N/A			
Original Construction Date				Did sealing material rise to surface? ☒ Yes ☐ No ☐ N/A			
If a Well Construction Report is available, please attach.				Did material settle after 24 hours? ☒ Yes ☐ No ☐ N/A			
Construction Type:				If yes, was hole retopped? ☒ Yes ☐ No ☐ N/A			
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug				If bentonite chips were used, were they hydrated with water from a known safe source ☐ Yes ☐ No ☒ N/A			
☐ Other (Specify) _____				Required Method of Placing Sealing Material			
Formation Type:				☐ Conductor Pipe-Gravity ☒ Conductor Pipe-Pumped			
☒ Unconsolidated Formation ☐ Bedrock				☐ Screened & Poured ☒ Other (Explain) Bentonite Chips - Screened and Poured			
Total Well Depth From Ground Surface (ft)				Sealing Materials			
43.0				☐ Neat Cement Grout ☐ Clay-Sand Slurry (11 lb./gal. wt.)			
Lower Drillhole Diameter (in.)				☐ Sand-Cement (Concrete) Grout ☐ Bentonite-Sand Slurry " "			
4.3				☐ Concrete ☒ Bentonite Chips			
Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown				For Monitoring Wells and Monitoring Well Boreholes Only:			
If yes, to what depth (feet)?				☐ Bentonite Chips ☐ Bentonite - Cement Grout			
Depth to Water (feet)				☐ Granular Bentonite ☐ Bentonite - Sand Slurry			
24.0							
5. Material Used to Fill Well / Drillhole				From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips				Surface	10.0	1	
Bentonite Slurry				10.0	41.0	3.1	1.5
6. Comments							
For boring B311							
7. Supervision of Work						DNR Use Only	
Name of Person or Firm Doing Filling & Sealing		License #		Date of Filling & Sealing (mm/dd/yyyy)		Date Received	Noted By
SES, Inc.				11/5/2012			
Street or Route		Telephone Number		Comments			
1102 Stewart Street		608-274-7600					
City		State	ZIP Code	Signature of Person Doing Work		Date Signed	
Madison		WI	53713				

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

☐ Verification Only of Fill and Seal

Route to:

☐ Drinking Water☐ Watershed/Wastewater☐ Remediation/Redevelopment☒ Waste Management☐ Other

1. Well Location Information				2. Facility / Owner Information			
County	WI Unique Well # of Removed Well	Hicap #		Facility Name			
Dane				Dane County Landfill #2 (Rodefild)			
Latitude / Longitude (Degrees and Minutes)		Method Code (see instructions)		Facility ID (FID or PWS)			
43° 2' 42.6"N				113127300			
89° 14' 57.4"W				License/Permit/Monitoring #			
				03018			
1/4 1/4 NE	1/4 NE	Section	Township	Range	Original Well Owner		
		25	7	10	☒ E ☐ W		
Well Street Address				Present Well Owner			
7102 USH 12&18				Dane County Public Works			
Well City, Village or Town				Mailing Address of Present Owner			
Madison				1919 Alliant Energy Center Way			
Subdivision Name				City of Present Owner	State	ZIP Code	
				Madison	wi	53717	
Reason For Removal From Service				4. Pump, Liner, Screen, Casing & Sealing Material			
Soil Boring				Pump and piping removed?			
				☐ Yes ☐ No ☒ N/A			
				Liner(s) removed?			
				☐ Yes ☐ No ☒ N/A			
				Screen removed?			
				☐ Yes ☐ No ☒ N/A			
				Casing left in place?			
				☐ Yes ☐ No ☒ N/A			
				Was casing cut off below surface?			
				☐ Yes ☐ No ☒ N/A			
				Did sealing material rise to surface?			
				☒ Yes ☐ No ☐ N/A			
				Did material settle after 24 hours?			
				☒ Yes ☐ No ☐ N/A			
				If yes, was hole retopped?			
				☒ Yes ☐ No ☐ N/A			
				If bentonite chips were used, were they hydrated			
				☐ Yes ☐ No ☒ N/A			
				with water from a known safe source			
				☐ Yes ☐ No ☒ N/A			
WI Unique Well # of Replacement Well				Required Method of Placing Sealing Material			
				☐ Conductor Pipe-Gravity			
				☒ Conductor Pipe-Pumped			
				☐ Screened & Poured			
				☒ Other (Explain) Bentonite Chips - Screened and Poured			
Original Construction Date				Sealing Materials			
				☐ Neat Cement Grout			
				☐ Sand-Cement (Concrete) Grout			
				☐ Concrete			
				☐ Clay-Sand Slurry (11 lb./gal. wt.)			
				☐ Bentonite-Sand Slurry " "			
				☒ Bentonite Chips			
Construction Type:				For Monitoring Wells and Monitoring Well Boreholes Only:			
☒ Drilled				☐ Bentonite Chips			
☐ Driven (Sandpoint)				☐ Bentonite - Cement Grout			
☐ Dug				☐ Granular Bentonite			
☐ Other (Specify)				☐ Bentonite - Sand Slurry			
Formation Type:							
☒ Unconsolidated Formation							
☐ Bedrock							
Total Well Depth From Ground Surface (ft.)				From (ft.)			
41.0				To (ft.)			
Casing Diameter (in.)				No. Yards, Sacks Sealant or Volume (circle one)			
				Mix Ratio or Mud Weight			
Lower Drillhole Diameter (in.)							
4.3							
Casing Depth (ft.)							
Was well annular space grouted?							
☐ Yes ☒ No ☐ Unknown							
If yes, to what depth (feet)?							
Depth to Water (feet)							
25.0							
5. Material Used to Fill Well / Drillhole							
Bentonite Chips				Surface 10.0 1			
Bentonite Slurry				10.0 41.0 3.1 1.5			
6. Comments							
For boring B312							
7. Supervision of Work				DNR Use Only			
Name of Person or Firm Doing Filling & Sealing		License #		Date of Filling & Sealing (mm/dd/yyyy)		Date Received	
SES, Inc.				11/5/2012			
Street or Route		Telephone Number		Comments			
1102 Stewart Street		608-274-7600					
City		State		ZIP Code		Signature of Person Doing Work	
Madison		WI		53713		Date Signed	

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

☐ Verification Only of Fill and Seal		Route to: ☐ Drinking Water ☐ Watershed/Wastewater ☐ Remediation/Redevelopment ☒ Waste Management ☐ Other _____	
1. Well Location Information			
County Dane		WI Unique Well # of Removed Well	
Latitude / Longitude (Degrees and Minutes) 43 ° 2 ' 42.8"N 89 ° 14 ' 52.7"W		Method Code (see instructions)	
1/4 1/4 NE	1/4 NE	Section 25	Township 7
or Gov't Lot #		Range 10	☒ E ☐ W
Well Street Address 7102 USH 12&18			
Well City, Village or Town Madison		Well ZIP Code 53718	
Subdivision Name		Lot #	
Reason For Removal From Service Soil Boring		WI Unique Well # of Replacement Well	
3. Well / Drillhole / Borehole Information			
☐ Monitoring Well ☐ Water Well ☒ Drillhole / Borehole		Original Construction Date If a Well Construction Report is available, please attach.	
Construction Type: ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (Specify) _____			
Formation Type: ☒ Unconsolidated Formation ☐ Bedrock			
Total Well Depth From Ground Surface (ft) 75.0		Casing Diameter (in.)	
Lower Drillhole Diameter (in.) 4.3		Casing Depth (ft.)	
Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown			
If yes, to what depth (feet)?		Depth to Water (feet) 31.0	
5. Material Used to Fill Well / Drillhole			
Bentonite Chips		From (ft.) Surface	To (ft.) 15.0
Bentonite Slurry		15.0	75.0
6. Comments For boring B313			
7. Supervision of Work			
Name of Person or Firm Doing Filling & Sealing SES, Inc.		License #	Date of Filling & Sealing (mm/dd/yyyy) 11/5/2012
Street or Route 1102 Stewart Street		Telephone Number 608-274-7600	Comments
City Madison	State WI	ZIP Code 53713	Signature of Person Doing Work
			Date Signed
2. Facility / Owner Information			
Facility Name Dane County Landfill #2 (Rodefild)			
Facility ID (FID or PWS) 113127300			
License/Permit/Monitoring # 03018			
Original Well Owner			
Present Well Owner Dane County Public Works			
Mailing Address of Present Owner 1919 Alliant Energy Center Way			
City of Present Owner Madison		State wi	ZIP Code 53717
4. Pump, Liner, Screen, Casing & Sealing Material			
Pump and piping removed?		☐ Yes	☐ No ☒ N/A
Liner(s) removed?		☐ Yes	☐ No ☒ N/A
Screen removed?		☐ Yes	☐ No ☒ N/A
Casing left in place?		☐ Yes	☐ No ☒ N/A
Was casing cut off below surface?		☐ Yes	☐ No ☒ N/A
Did sealing material rise to surface?		☒ Yes	☐ No ☐ N/A
Did material settle after 24 hours?		☒ Yes	☐ No ☐ N/A
If yes, was hole retopped?		☒ Yes	☐ No ☐ N/A
If bentonite chips were used, were they hydrated with water from a known safe source		☐ Yes	☐ No ☒ N/A
Required Method of Placing Sealing Material			
☐ Conductor Pipe-Gravity		☒ Conductor Pipe-Pumped	
☐ Screened & Poured		☒ Other (Explain) Bentonite Chips - Screened and Poured	
Sealing Materials			
☐ Neat Cement Grout		☐ Clay-Sand Slurry (11 lb./gal. wt.)	
☐ Sand-Cement (Concrete) Grout		☐ Bentonite-Sand Slurry " "	
☐ Concrete		☒ Bentonite Chips	
For Monitoring Wells and Monitoring Well Boreholes Only:			
☐ Bentonite Chips		☐ Bentonite - Cement Grout	
☐ Granular Bentonite		☐ Bentonite - Sand Slurry	
From (ft.)		To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)
Mix Ratio or Mud Weight			

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

☐ Verification Only of Fill and Seal

Route to:

☐ Drinking Water

☐ Watershed/Wastewater

☐ Remediation/Redevelopment

☒ Waste Management

☐ Other

1. Well Location Information				2. Facility / Owner Information			
County Dane		WI Unique Well # of Removed Well		Hicap #		Facility Name Dane County Landfill #2 (Rodefild)	
Latitude / Longitude (Degrees and Minutes) 43 ° 2 ' 33.7" N 89 ° 14 ' 57.6" W		Method Code (see instructions)		Facility ID (FID or PWS) 113127300		License/Permit/Monitoring # 03018	
1/4 1/4 SE or Gov't Lot #		Section 25	Township 7	Range 10	☒ E ☐ W	Original Well Owner	
Well Street Address 7102 USH 12&18				Present Well Owner Dane County Public Works			
Well City, Village or Town Madison				Mailing Address of Present Owner 1919 Alliant Energy Center Way			
Subdivision Name				Well ZIP Code 53718		City of Present Owner Madison	State wi
Reason For Removal From Service Soil Boring				WI Unique Well # of Replacement Well		ZIP Code 53717	
3. Well / Drillhole / Borehole Information							
☐ Monitoring Well		Original Construction Date					
☐ Water Well		If a Well Construction Report is available, please attach.					
☒ Drillhole / Borehole							
Construction Type: ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (Specify) _____							
Formation Type: ☒ Unconsolidated Formation ☐ Bedrock							
Total Well Depth From Ground Surface (ft) 45.0		Casing Diameter (in.)					
Lower Drillhole Diameter (in.) 4.3		Casing Depth (ft.)					
Was well annular space grouted?		☐ Yes ☒ No ☐ Unknown					
If yes, to what depth (feet)?		Depth to Water (feet) 30.0					
5. Material Used to Fill Well / Drillhole				From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips				Surface	12.0	1.2	
Bentonite Slurry				12.0	45.0	3.2	1.5
6. Comments							
For boring B314							
7. Supervision of Work						DNR Use Only	
Name of Person or Firm Doing Filling & Sealing SES, Inc.		License #		Date of Filling & Sealing (mm/dd/yyyy) 11/5/2012		Date Received	Noted By
Street or Route 1102 Stewart Street		Telephone Number 608-274-7600		Comments			
City Madison	State WI	ZIP Code 53713	Signature of Person Doing Work			Date Signed	

4. Pump, Liner, Screen, Casing & Sealing Material			
Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☒ Yes	☐ No	☐ N/A
Did material settle after 24 hours?	☒ Yes	☐ No	☐ N/A
If yes, was hole retopped?	☒ Yes	☐ No	☐ N/A
If bentonite chips were used, were they hydrated with water from a known safe source	☐ Yes	☐ No	☒ N/A
Required Method of Placing Sealing Material			
☐ Conductor Pipe-Gravity	☒ Conductor Pipe-Pumped		
☐ Screened & Poured	☒ Other (Explain) Bentonite Chips - Screened and Poured		
Sealing Materials			
☐ Neat Cement Grout	☐ Clay-Sand Slurry (11 lb./gal. wt.)		
☐ Sand-Cement (Concrete) Grout	☐ Bentonite-Sand Slurry " "		
☐ Concrete	☒ Bentonite Chips		
For Monitoring Wells and Monitoring Well Boreholes Only:			
☐ Bentonite Chips	☐ Bentonite - Cement Grout		
☐ Granular Bentonite	☐ Bentonite - Sand Slurry		

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

☐ Verification Only of Fill and Seal

Route to:

☐ Drinking Water

☐ Watershed/Wastewater

☐ Remediation/Redevelopment

☒ Waste Management

☐ Other

1. Well Location Information

County Dane	WI Unique Well # of Removed Well	Hicap #
Latitude / Longitude (Degrees and Minutes) 43 ° 2 ' 34.7"N 89 ° 14 ' 52.4"W		Method Code (see instructions)
1/4 1/4 NE or Gov't Lot #	1/4 NW	Section 25 Township 7 Range 10 ☒ E ☐ W
Well Street Address 7102 USH 12&18		
Well City, Village or Town Madison		Well ZIP Code 53718
Subdivision Name		Lot #
Reason For Removal From Service Soil Boring	WI Unique Well # of Replacement Well	

2. Facility / Owner Information

Facility Name Dane County Landfill #2 (Rodefeld)		
Facility ID (FID or PWS) 113127300		
License/Permit/Monitoring # 03018		
Original Well Owner		
Present Well Owner Dane County Public Works		
Mailing Address of Present Owner 1919 Alliant Energy Center Way		
City of Present Owner Madison	State wi	ZIP Code 53717

3. Well / Drillhole / Borehole Information

☐ Monitoring Well	Original Construction Date
☐ Water Well	
☒ Drillhole / Borehole	If a Well Construction Report is available, please attach.
Construction Type: ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (Specify)	
Formation Type: ☒ Unconsolidated Formation ☐ Bedrock	
Total Well Depth From Ground Surface (ft) 70.0	Casing Diameter (in.)
Lower Drillhole Diameter (in.) 4.3	Casing Depth (ft.)
Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown	
If yes, to what depth (feet)?	Depth to Water (feet) 30.0

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

Pump and piping removed?	☐ Yes ☐ No ☒ N/A
Liner(s) removed?	☐ Yes ☐ No ☒ N/A
Screen removed?	☐ Yes ☐ No ☒ N/A
Casing left in place?	☐ Yes ☐ No ☒ N/A
Was casing cut off below surface?	☐ Yes ☐ No ☒ N/A
Did sealing material rise to surface?	☒ Yes ☐ No ☐ N/A
Did material settle after 24 hours?	☒ Yes ☐ No ☐ N/A
If yes, was hole retopped?	☒ Yes ☐ No ☐ N/A
If bentonite chips were used, were they hydrated with water from a known safe source	☐ Yes ☐ No ☒ N/A
Required Method of Placing Sealing Material	
☐ Conductor Pipe-Gravity	☒ Conductor Pipe-Pumped
☐ Screened & Poured	☒ Other (Explain) Bentonite Chips - Screened and Poured
Sealing Materials	
☐ Neat Cement Grout	☐ Clay-Sand Slurry (11 lb./gal. wt.)
☐ Sand-Cement (Concrete) Grout	☐ Bentonite-Sand Slurry "
☐ Concrete	☒ Bentonite Chips
For Monitoring Wells and Monitoring Well Boreholes Only:	
☐ Bentonite Chips	☐ Bentonite - Cement Grout
☐ Granular Bentonite	☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	13.0	1.3	
Bentonite Slurry	13.0	70.0	5.6	1.5

6. Comments

For boring B315

7. Supervision of Work

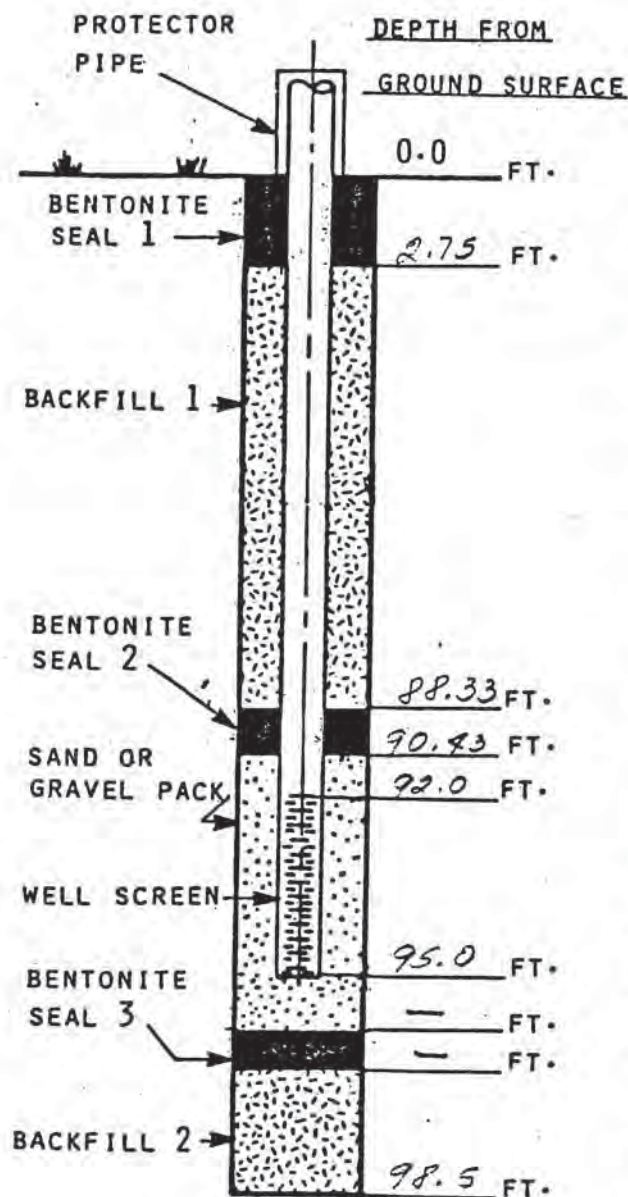
Name of Person or Firm Doing Filling & Sealing SES, Inc.	License #	Date of Filling & Sealing (mm/dd/yyyy) 11/5/2012	Date Received	Noted By
Street or Route 1102 Stewart Street		Telephone Number 608-274-7600	Comments	
City Madison	State WI	ZIP Code 53713	Signature of Person Doing Work	Date Signed

Attachment B

Monitoring Well Forms

Monitoring Well Construction and Development Forms

WELL DIAGRAM



JOB RODEFELD

BORING NO. M-1C

DATE INSTALLED 8-13-82

DEPTH TO BOTTOM OF BORING 98.5 FT.

DEPTH TO BOTTOM OF SEAL 3 — FT.

MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 97.5 FT.

DEPTH TO BOTTOM OF WELL POINT 95.0 FT.

DEPTH TO TOP OF WELL POINT 92.0 FT.

DEPTH TO BOTTOM OF SEAL 2 90.43 FT.

MATERIAL BENTONITE PELLETS

DEPTH TO TOP OF SEAL 2 88.33 FT.

MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.75 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 94.8 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

TYPE OF BACKFILL 2 —

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE 0.01 IN.

COMMENTS: SEAL 1, 1 FT. THICK
HOLE DRILLED WITH ROTARY 6" DRILL BIT AND
NW ROOS - REVERT DRILLING FLUID

WELL DETAIL INFORMATION SHEET

JOB NO. 10131

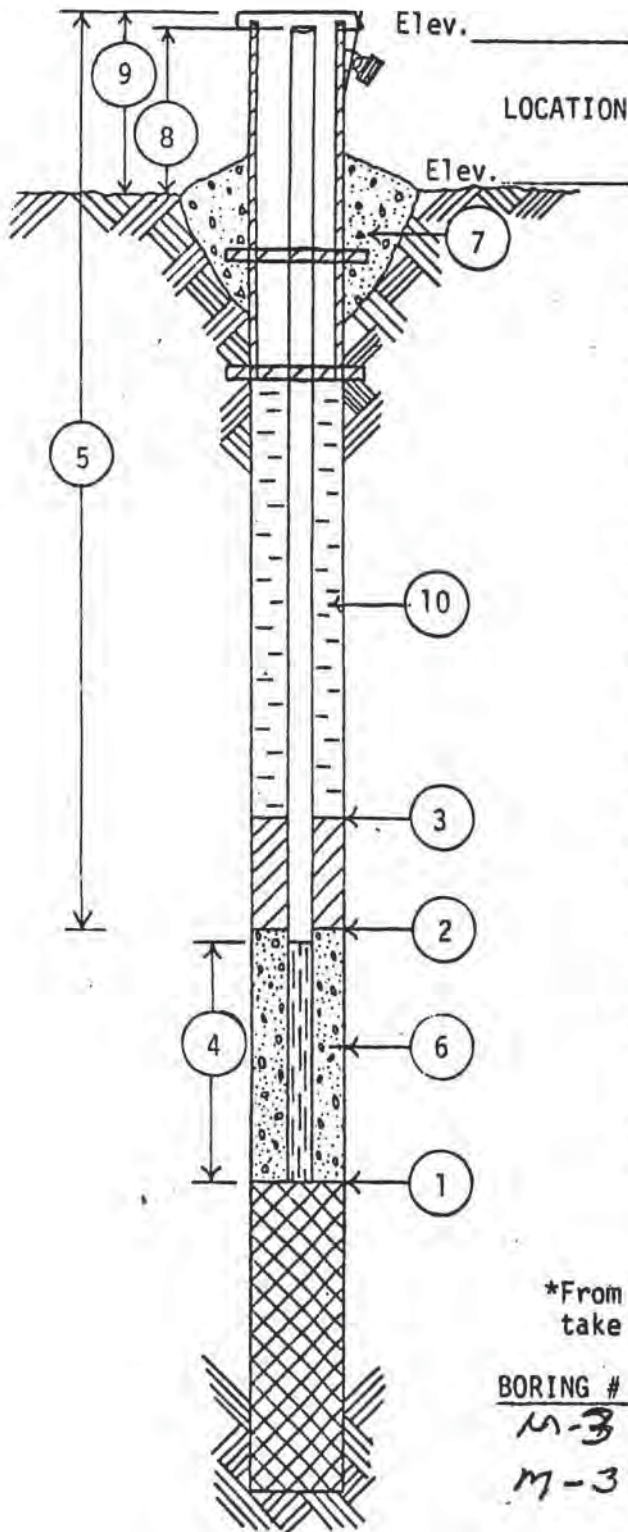
BORING NO. M-3

DATE 9-9-81

CHIEF C.B.

LOCATION CITY OF MASSACHUSETTS

All depth measurements of well detail assumed to be from ground surface unless otherwise indicated.



- 1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 43' FEET.
- 2 DEPTH OF BOTTOM OF SEAL (if installed) 27' FEET.
- 3 DEPTH TO TOP OF SEAL (if installed) 24' FEET.
- 4 LENGTH OF WELL POINT, PVC WELL SCREEN, OR SLOTTED PIPE 10' FEET. (Circle One)
- 5 TOTAL LENGTH OF PIPE 33' FEET. @ 1 1/2" IN. DIAMETER.
- 6 TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE SAND.
- 7 CONCRETE CAP, YES NO (Circle One)
- 8 HEIGHT OF WELL CASING ABOVE GROUND 3' FEET.
- 9 PROTECTIVE CASING? YES NO (Circle One)
HEIGHT ABOVE GROUND _____
LOCKING CAP? YES NO (Circle One)
- 10 TYPE OF BACKFILL: BENTONITE SPOILS

WATER LEVEL CHECKS

*From top of casing, if protective casing higher, take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS
<u>M-3</u>	<u>9-9-81</u>	<u>11:00</u>	<u>31.5'</u>	
<u>M-3</u>	<u>9/11/81</u>	<u>8:AM</u>	<u>32'10"</u>	

JOB RODEFELD SITE

BORING NO. M-6A

DATE INSTALLED 6-22-82

DEPTH TO BOTTOM OF BORING 17.25 FT.

DEPTH TO BOTTOM OF SEAL 3 FT.

MATERIAL _____

DEPTH TO BOTTOM OF GRAVEL PACK 16.25 FT.

DEPTH TO BOTTOM OF WELL POINT 16.0 FT.

DEPTH TO TOP OF WELL POINT 6.0 FT.

DEPTH TO BOTTOM OF SEAL 2 — FT.

MATERIAL _____

DEPTH TO TOP OF SEAL 2 ——— FT.

MATERIAL _____

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 20.0 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID _____ 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL

OTHER _____

TYPE OF BACKFILL 1 NATURAL SOIL

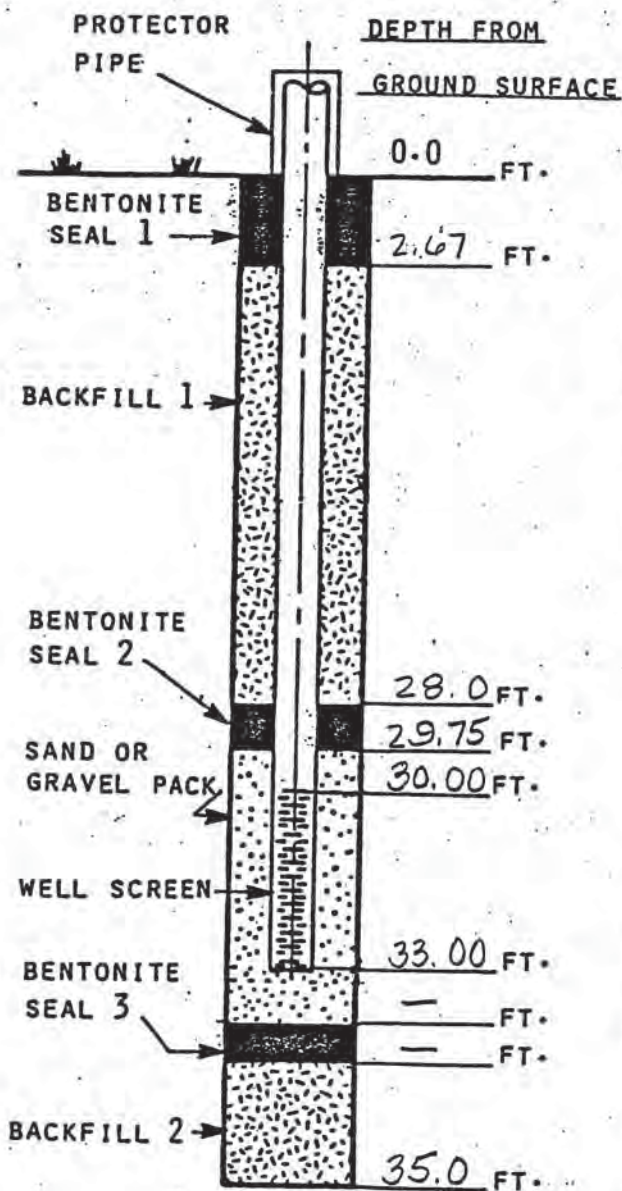
TYPE OF BACKFILL 2

TYPE OF MATERIAL AROUND WELL POINT GRAVE

WELL POINT SLOT SIZE .010 IN

COMMENTS: SEAL 1, 1 FT. THICK

WELL DIAGRAM



JOB 8721 RODEFELD

BORING NO. M-6B

DATE INSTALLED 6-22-82

DEPTH TO BOTTOM OF BORING 35.0 FT.

DEPTH TO BOTTOM OF SEAL 3 FT.

MATERIAL

DEPTH TO BOTTOM OF GRAVEL PACK 32.75 FT.

DEPTH TO BOTTOM OF WELL POINT 33.0 FT.

DEPTH TO TOP OF WELL POINT 30.0 FT.

DEPTH TO BOTTOM OF SEAL 2 29.75 FT.

MATERIAL BENTONITE PELLETS

DEPTH TO TOP OF SEAL 2 28.0 FT.

MATERIAL

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 36.0 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER

TYPE OF BACKFILL 1 NATURAL SOIL

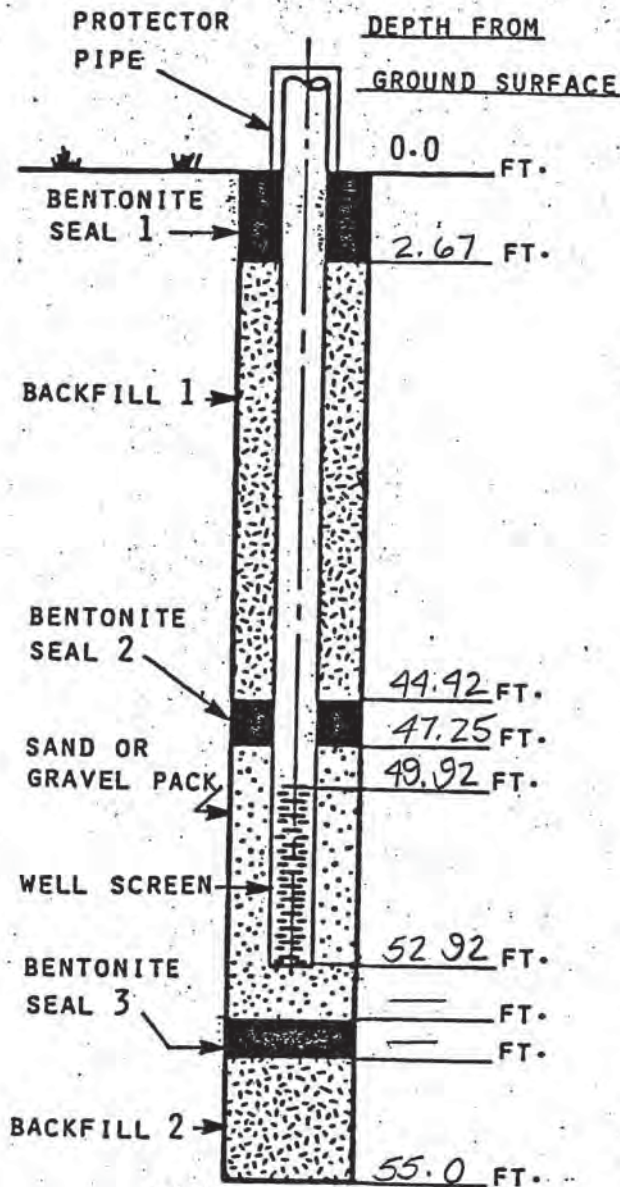
TYPE OF BACKFILL 2

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

COMMENTS: SEAL 1, 1 FT. THICK

WELL DIAGRAM



JOB RODEFELD SITE

BORING NO. M-6C

DATE INSTALLED 6-21-82

DEPTH TO BOTTOM OF BORING 55.0 FT.

DEPTH TO BOTTOM OF SEAL 3 — FT.

MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 53.75 FT.

DEPTH TO BOTTOM OF WELL POINT 52.92 FT.

DEPTH TO TOP OF WELL POINT 49.92 FT.

DEPTH TO BOTTOM OF SEAL 2 47.25 FT.

MATERIAL BENTONITE PELLETS

DEPTH TO TOP OF SEAL 2 44.42 FT.

MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 55.83 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL

OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

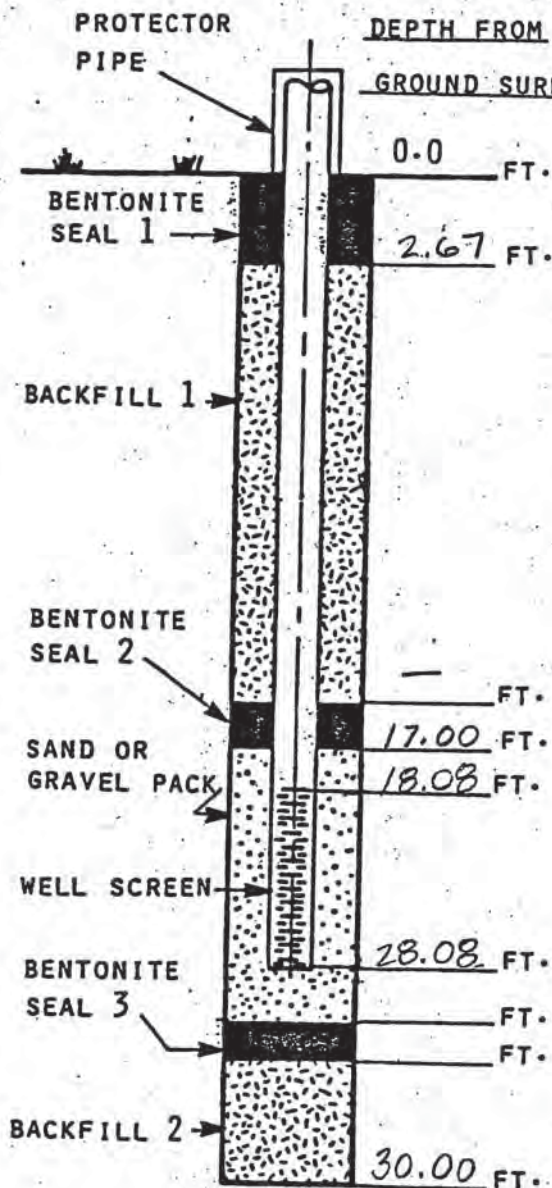
TYPE OF BACKFILL 2 —

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

COMMENTS: BENTONITE SEAL 1, 1 FT. THICK

WELL DIAGRAM



JOB RODEFELD SITE

BORING NO. M-9A

DATE INSTALLED 6-17-82

DEPTH TO BOTTOM OF BORING 30.0 FT.

DEPTH TO BOTTOM OF SEAL 3 — FT.

MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 29.83 FT.

DEPTH TO BOTTOM OF WELL POINT 28.08 FT.

DEPTH TO TOP OF WELL POINT 18.08 FT.

DEPTH TO BOTTOM OF SEAL 2 — FT.

MATERIAL —

DEPTH TO TOP OF SEAL 2 — FT.

MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 31.83 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

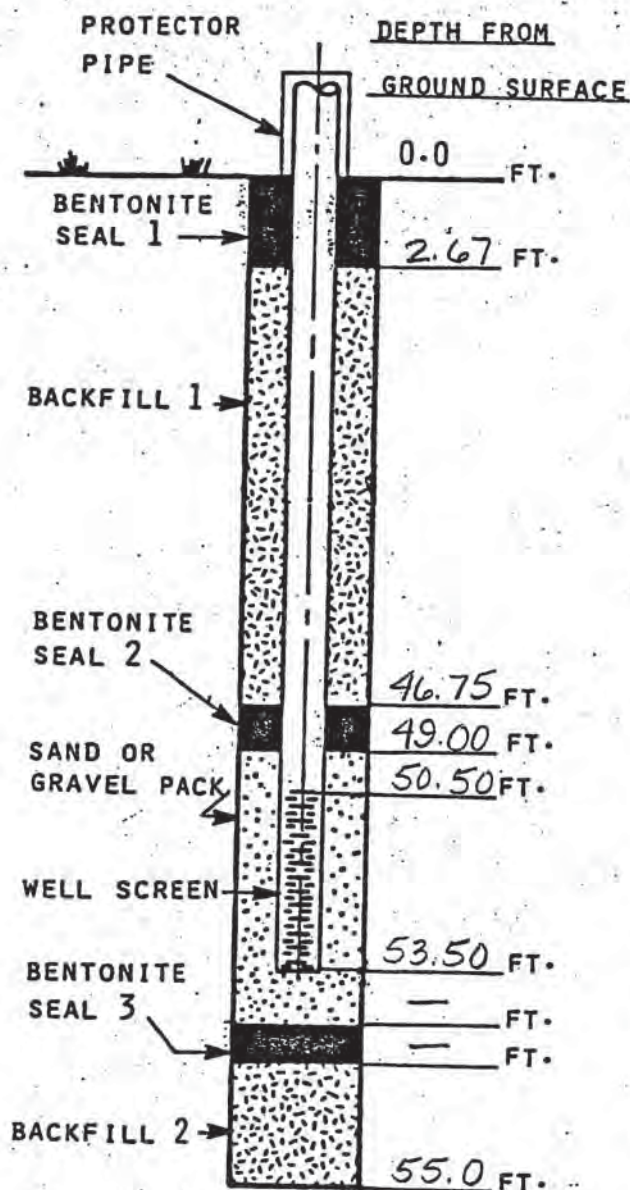
TYPE OF BACKFILL 2 —

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

COMMENTS: BENTONITE SEAL 1, 1 FT. THICK

WELL DIAGRAM



JOB RODEFELD SITE

BORING NO. M-98

DATE INSTALLED 6-17-82

DEPTH TO BOTTOM OF BORING 55.0 FT.

DEPTH TO BOTTOM OF SEAL 3 — FT.

MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 54.0 FT.

DEPTH TO BOTTOM OF WELL POINT 53.5 FT.

DEPTH TO TOP OF WELL POINT 50.5 FT.

DEPTH TO BOTTOM OF SEAL 2 49.0 FT.

MATERIAL BENTONITE PELLETS

DEPTH TO TOP OF SEAL 2 46.75 FT.

MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 56.5 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

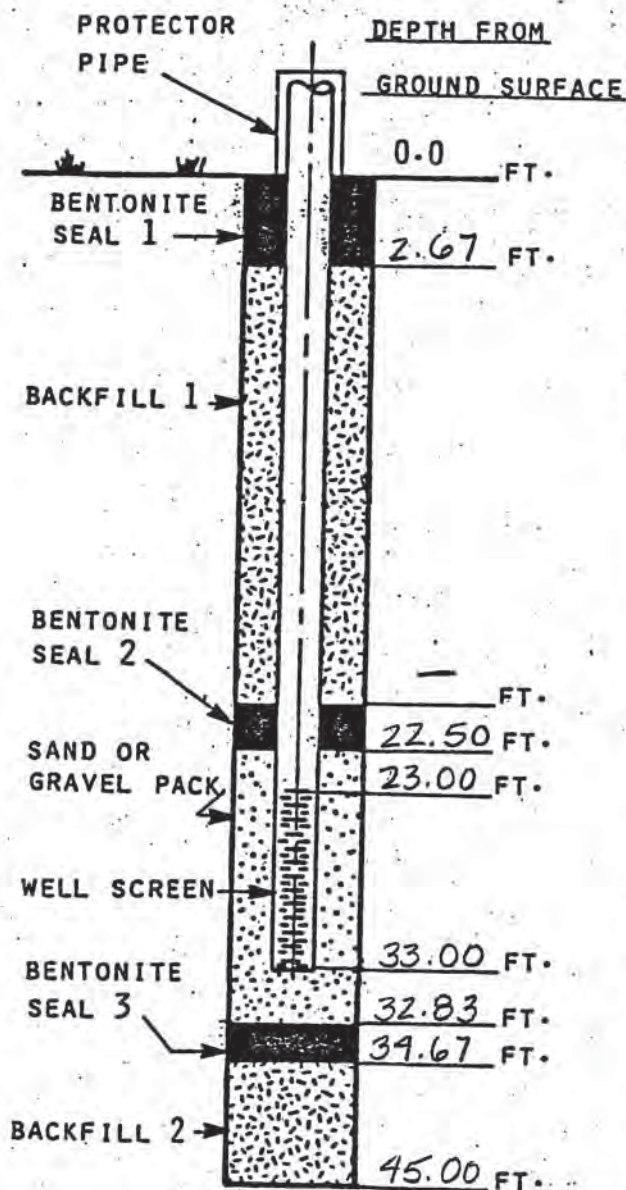
TYPE OF BACKFILL 2 —

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

COMMENTS: BENTONITE SEAL #1, 1 FT. THICK

WELL DIAGRAM



JOB RODEFELD SITE

BORING NO. M-10A

DATE INSTALLED 6-16-82

DEPTH TO BOTTOM OF BORING 45.0 FT.

DEPTH TO BOTTOM OF SEAL 3 39.67 FT.

MATERIAL BENTONITE PELLETS

DEPTH TO BOTTOM OF GRAVEL PACK 32.83 FT.

DEPTH TO BOTTOM OF WELL POINT 33.00 FT.

DEPTH TO TOP OF WELL POINT 23.00 FT.

DEPTH TO BOTTOM OF SEAL 2 — FT.

MATERIAL —

DEPTH TO TOP OF SEAL 2 — FT.

MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.27 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 36.00 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

TYPE OF BACKFILL 2 SOIL AND PEA GRAVEL

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

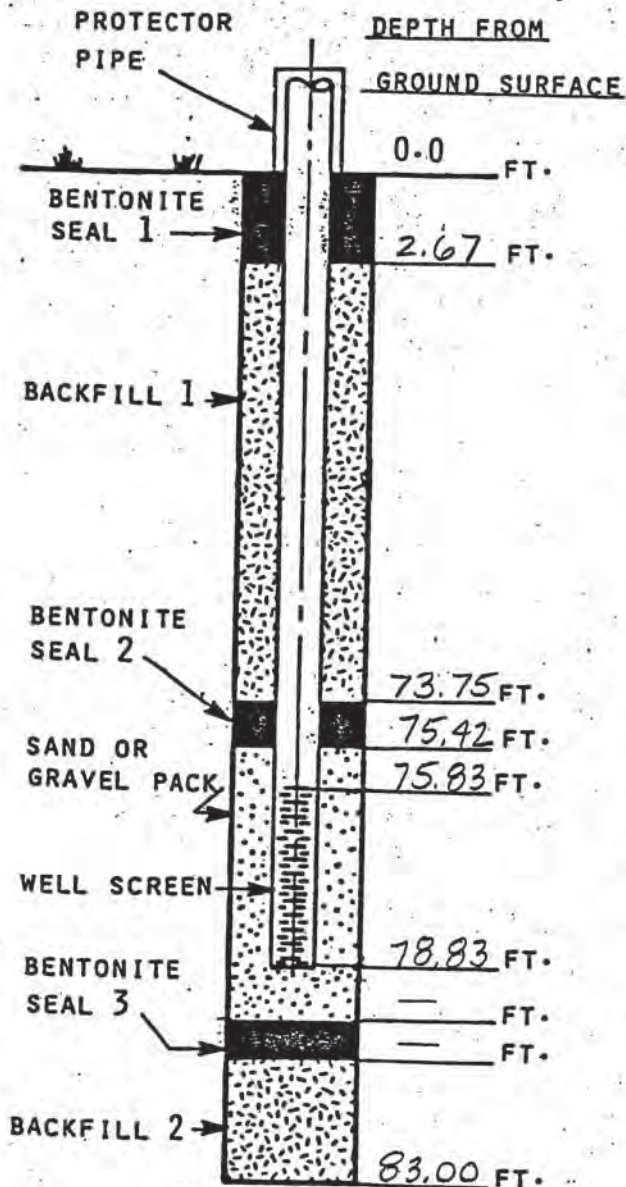
COMMENTS: BENTONITE SEAL #1, 1 FT. THICK

WELL DIAGRAM

JOB RODEFELD SITE

BORING NO. M-13B

DATE INSTALLED 6-11-82



DEPTH TO BOTTOM OF BORING 83.0 FT.

DEPTH TO BOTTOM OF SEAL 3 — FT.

MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 83.0 FT.

DEPTH TO BOTTOM OF WELL POINT 78.83 FT.

DEPTH TO TOP OF WELL POINT 75.83 FT.

DEPTH TO BOTTOM OF SEAL 2 75.42 FT.

MATERIAL BENTONITE PELLETS

DEPTH TO TOP OF SEAL 2 73.75 FT.

MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 81.83 FT.

AUGER HOLE DIAMETER 8.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL

OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

TYPE OF BACKFILL 2 —

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

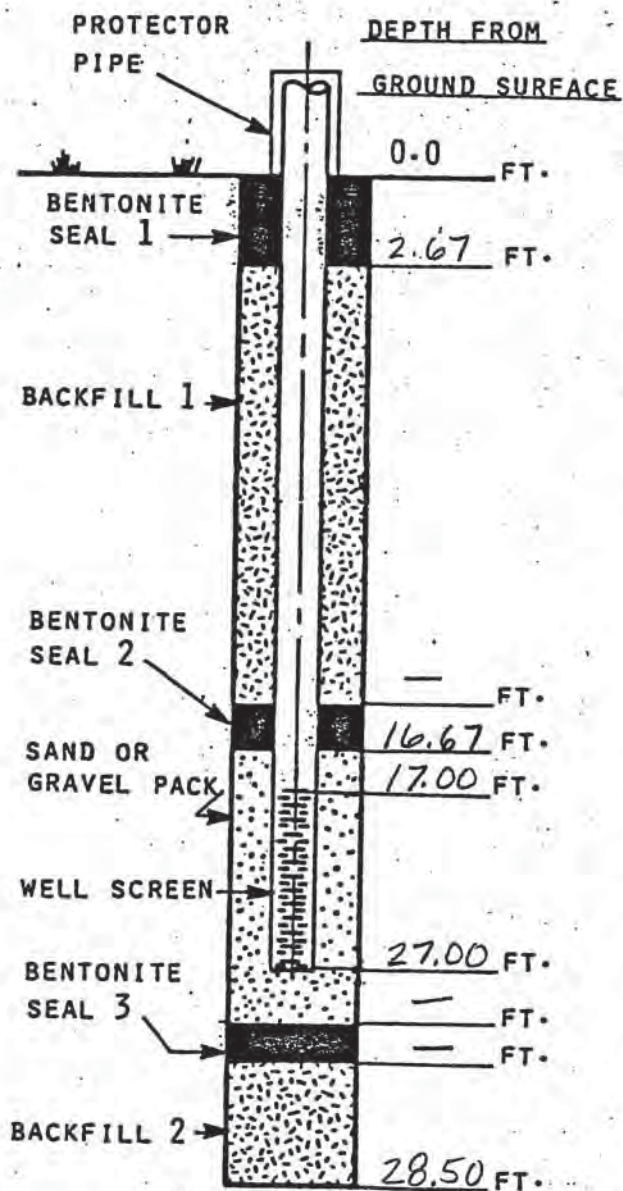
COMMENTS: BENTONITE SEAL 1, 1 FT. THICK

WELL DIAGRAM

JOB RODEFELD SITE

BORING NO. M-17A

DATE INSTALLED 6-7-82



DEPTH TO BOTTOM OF BORING 28.5 FT.

DEPTH TO BOTTOM OF SEAL 3 — FT.

MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 26.66 FT.

DEPTH TO BOTTOM OF WELL POINT 27.0 FT.

DEPTH TO TOP OF WELL POINT 17.0 FT.

DEPTH TO BOTTOM OF SEAL 2 — FT.

MATERIAL —

DEPTH TO TOP OF SEAL 2 — FT.

MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.

MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 29.83 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

TYPE OF BACKFILL 2 —

TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

COMMENTS: BENTONITE SEAL 1, 1 FT. THICK

State of Wisconsin
Department of Natural ResourcesRoute to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill Site No. 2	Local Grid Location of Well ft. ☐ N. ☐ E. ☐ S. ☐ W.	Well Name M-17AR
Facility License, Permit or Monitoring No. 3018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. " Long. " or "	Wis. Unique Well No. <u>WB260</u> DNR Well ID No. <u>166</u>
Facility ID <u>113127300</u>	St. Plane <u>380,565.00</u> ft. N. <u>2,201,316.43</u> ft. E. S/C/N	Date Well Installed <u>06</u> / <u>30</u> / <u>2020</u> m m d d y y y y
Type of Well Well Code <u>71</u> / <u>dw</u>	Section Location of Waste/Source SE <u>1/4</u> of NE <u>1/4</u> of Sec. <u>25</u> , T. <u>07</u> N, R. <u>10</u> ☒ E ☐ W	Well Installed By: Name (first, last) and Firm <u>Tony Kapugi</u>
Distance from Waste/Source <u>600</u> ft.	Location of Well Relative to Waste/Source u ☒ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	On-site Environmental Services, Inc.

A. Protective pipe, top elevation ft. MSL

B. Well casing, top elevation 888.59 ft. MSL

C. Land surface elevation 886.06 ft. MSL

D. Surface seal, bottom 886.06 ft. MSL or 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 performed? ☒ Yes ☐ No

14. Drilling method used: Rotary ☐ 5 0
Hollow Stem Auger ☒ 4 1
Other ☐

15. Drilling fluid used: Water ☐ 0 2 Air ☐ 0 1
Drilling Mud ☐ 0 3 None ☒ 9 9

16. Drilling additives used? ☐ Yes ☒ No
Describe NA

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

E. Bentonite seal, top 886.06 ft. MSL or 0 ft.

F. Fine sand, top 870.06 ft. MSL or 16 ft.

G. Filter pack, top 868.06 ft. MSL or 18 ft.

H. Screen joint, top 866.06 ft. MSL or 20 ft.

I. Well bottom 856.06 ft. MSL or 30 ft.

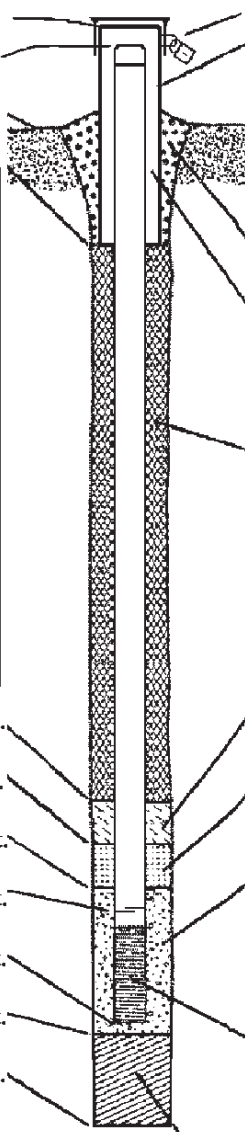
J. Filter pack, bottom 855.06 ft. MSL or 31 ft.

K. Borehole, bottom 855.06 ft. MSL or 31 ft.

L. Borehole, diameter 8.25 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.01 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 4 ft.
c. Material: Steel ☒ 0 4
Other ☐

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

3. Surface seal: Bentonite ☒ 3 0
Concrete ☐ 0 1
Other ☐

4. Material between well casing and protective pipe:
Filter Sand Bentonite ☐ 3 0
Other ☒

5. Annular space seal: a. Granular/Chipped Bentonite ☒ 3 3
b. Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5
c. Lbs/gal mud weight Bentonite slurry ☐ 3 1
d. % Bentonite Bentonite-cement grout ☐ 5 0
e. 5.46 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 0 1
Tremie pumped ☐ 0 2
Gravity ☒ 0 8

6. Bentonite seal: a. Bentonite granules ☐ 3 3
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 3 2
c. Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. Red Flint #7 ☒
b. Volume added 0.68 ft³

8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☒
b. Volume added 4.43 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 2 3
Flush threaded PVC schedule 80 ☐ 2 4
Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 1 1
Continuous slot ☐ 0 1
Other ☐

b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): None ☒ 1 4
Other ☐

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

Signature
*Jackie Rennabohm*Firm
SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐

Waste Management ☒

Remediation/Redevelopment ☐

Other ☒

Facility/Project Name Dane County Landfill Site No. 2	County Name Dane	Well Name M-17AR
Facility License, Permit or Monitoring Number 3081/113127300	County Code 13	Wis. Unique Well Number WB260
		DNR Well ID Number 166

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

2. Well development method

- surged with bailer and bailed ☐ 4 1
 surged with bailer and pumped ☒ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☐ 6 2
 surged with block, bailed and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 Other ☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 31.9 ft.

5. Inside diameter of well 2.01 in.

6. Volume of water in filter pack and well casing 6.5 gal.

7. Volume of water removed from well 22.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

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

17. Additional comments on development:

- Purged and surged for 30 min, purged ~5-gallons. Water level lowering.
- Pumped ~10-gallons, well went dry.
- Bailed ~1-gallon, well went dry.
- Waited ~15 minutes, pumped ~5-gallons, well went dry. Let recharge and collected TSS sample.

11. Depth to Water Before Development After Development

(from top of well casing) a. 14.41 ft. 31.95 ft.

Date b. 06/30/2020 06/30/2020
m m d d y y y y m m d d y y y y

Time c. 13:25 ☒ a.m. ☒ p.m. 14:24 ☒ a.m. ☒ p.m.

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

13. Water clarity Clear ☐ 1 0 Clear ☐ 2 0
Turbid ☒ 1 5 Turbid ☒ 2 5
(Describe) (Describe)

tan, sandy/silty

slightly turbid

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

14. Total suspended solids -- mg/l 870.0 mg/l

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

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

First Name: Jackie

Last Name: Rennebohm

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Name and Address of Facility Contact/Owner/Responsible Party

First Name: John Last Name: Welch

Facility/Firm: Dane County Dept. of Waste & Renewables

Street: 7102 U.S. Hwy 12/18

City/State/Zip: Madison, WI 53718

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

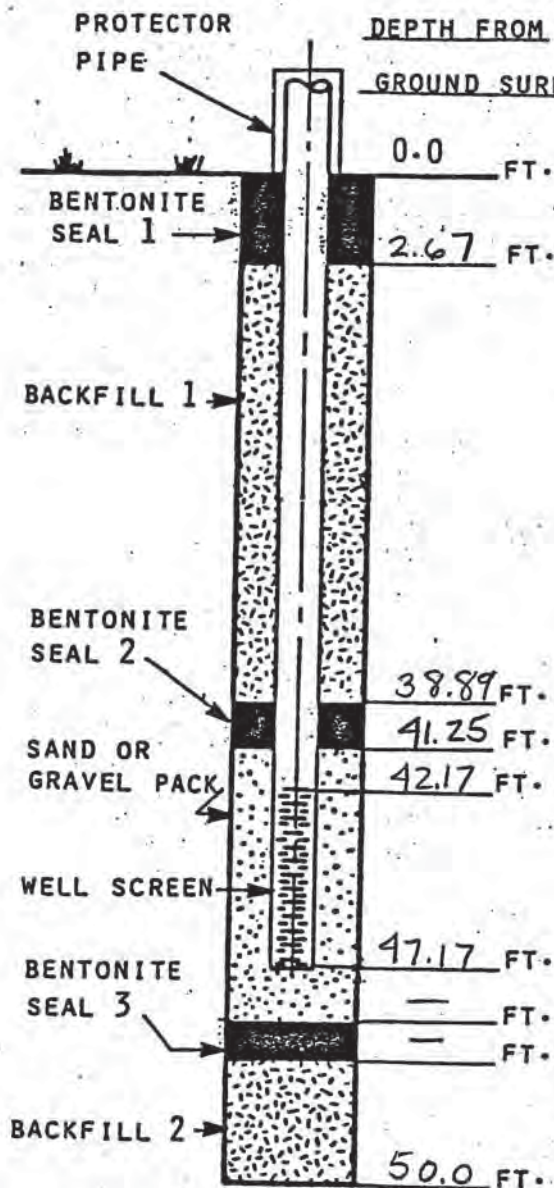
Signature: Jackie Rennebohm

Print Name: Jackie Rennebohm

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

NOTE: See instructions for more information including a list of county codes and well type codes.

WELL DIAGRAM



JOB RODEFELD SITE
BORING NO. M-17B
DATE INSTALLED 6-4-82

DEPTH TO BOTTOM OF BORING 50.0 FT.
DEPTH TO BOTTOM OF SEAL 3 — FT.
MATERIAL —

DEPTH TO BOTTOM OF GRAVEL PACK 48.83 FT.
DEPTH TO BOTTOM OF WELL POINT 47.17 FT.
DEPTH TO TOP OF WELL POINT 42.17 FT.
DEPTH TO BOTTOM OF SEAL 2 41.25 FT.
MATERIAL BENTONITE PELLETS

DEPTH TO TOP OF SEAL 2 38.89 FT.
MATERIAL —

DEPTH TO BOTTOM OF SEAL 1 2.67 FT.
MATERIAL BENTONITE POWDER

TOTAL LENGTH OF P.V.C. PIPE 50.17 FT.

AUGER HOLE DIAMETER 6.0 IN.

WELL ID 2.00 IN.

WELL OD 2.35 IN.

WELL MATERIAL: P.V.C. / IRON / STEEL
OTHER —

TYPE OF BACKFILL 1 NATURAL SOIL

TYPE OF BACKFILL 2 —

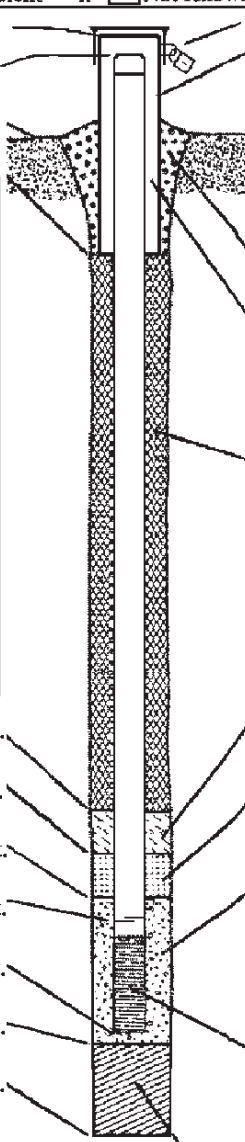
TYPE OF MATERIAL AROUND WELL POINT PEA GRAVEL

WELL POINT SLOT SIZE .010 IN.

COMMENTS: BENTONITE SEAL 1 IS 1 FT. THICK

State of Wisconsin
Department of Natural ResourcesRoute to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill Site No. 2		Local Grid Location of Well ft. ☐ N. ☐ E. ☐ S. ☐ W.		Well Name M-17BR	
Facility License, Permit or Monitoring No. 3018		Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. _____ Long. _____ or _____		Wis. Unique Well No. <u>VT575</u> DNR Well ID No. <u>168</u>	
Facility ID <u>113127300</u>		St. Plane <u>380,559.85</u> ft. N. <u>2,201,316.33</u> ft. E. S/C/N		Date Well Installed <u>06</u> / <u>30</u> / <u>2020</u> m m d d y y y y	
Type of Well Well Code <u>12</u> / <u>pz</u>		Section Location of Waste/Source SE 1/4 of NE 1/4 of Sec. <u>25</u> , T. <u>07</u> N, R. <u>10</u> E W		Well Installed By: Name (first, last) and Firm <u>Tony Kapugi</u>	
Distance from Waste/Source <u>600</u> ft.		Location of Well Relative to Waste/Source u ☒ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known		On-site Environmental Services, Inc.	
Enf. Stds. Apply ☒		Gov. Lot Number _____			

A. Protective pipe, top elevation _____ ft. MSL B. Well casing, top elevation _____ 888.55 ft. MSL C. Land surface elevation _____ 886.10 ft. MSL D. Surface seal, bottom _____ 886.10 ft. MSL or _____ 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 performed? ☒ Yes ☐ No 14. Drilling method used: Rotary ☐ 5 0 Hollow Stem Auger ☒ 4 1 Other ☐ 15. Drilling fluid used: Water ☐ 0 2 Air ☐ 0 1 Drilling Mud ☐ 0 3 None ☒ 9 9 16. Drilling additives used? ☐ Yes ☐ No Describe <u>NA</u> 17. Source of water (attach analysis, if required): <u>NA</u> E. Bentonite seal, top _____ 886.10 ft. MSL or _____ 0 ft. F. Fine sand, top _____ 846.10 ft. MSL or _____ 40 ft. G. Filter pack, top _____ 844.10 ft. MSL or _____ 42 ft. H. Screen joint, top _____ 842.10 ft. MSL or _____ 44 ft. I. Well bottom _____ 837.10 ft. MSL or _____ 49 ft. J. Filter pack, bottom _____ 835.10 ft. MSL or _____ 51 ft. K. Borehole, bottom _____ 835.10 ft. MSL or _____ 51 ft. L. Borehole, diameter _____ 8.25 in. M. O.D. well casing _____ 2.38 in. N. I.D. well casing _____ 2.01 in.	 1. Cap and lock? ☒ Yes ☐ No 2. Protective cover pipe: a. Inside diameter: _____ 6 in. b. Length: _____ 4 ft. c. Material: Steel ☒ 0 4 Other ☐ d. Additional protection? ☐ Yes ☒ No If yes, describe: _____ 3. Surface seal: Bentonite ☒ 3 0 Concrete ☐ 0 1 Other ☐ 4. Material between well casing and protective pipe: Filter Sand Bentonite ☐ 3 0 Other ☒ 5. Annular space seal: a. Granular/Chipped Bentonite ☒ 3 3 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5 c. _____ Lbs/gal mud weight Bentonite slurry ☐ 3 1 d. _____ % Bentonite Bentonite-cement grout ☐ 5 0 e. <u>13.63</u> Ft³ volume added for any of the above f. How installed: Tremie ☐ 0 1 Tremie pumped ☐ 0 2 Gravity ☒ 0 8 6. Bentonite seal: a. Bentonite granules ☐ 3 3 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 3 2 c. _____ Other ☐ 7. Fine sand material: Manufacturer, product name & mesh size a. <u>Red Flint #7</u> ☒ b. Volume added <u>0.68</u> ft³ 8. Filter pack material: Manufacturer, product name & mesh size a. <u>RW Sidley #5</u> ☒ b. Volume added <u>3.06</u> ft³ 9. Well casing: Flush threaded PVC schedule 40 ☒ 2 3 Flush threaded PVC schedule 80 ☐ 2 4 Other ☐ 10. Screen material: <u>PVC</u> a. Screen type: Factory cut ☒ 1 1 Continuous slot ☐ 0 1 Other ☐ b. Manufacturer <u>Monoflex</u> c. Slot size: <u>0.010</u> in. d. Slotted length: <u>5</u> ft. 11. Backfill material (below filter pack): None ☒ 1 4 Other ☐
--	---

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

Signature
*Jackie Rannabohm*Firm
SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 7-98

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

Facility/Project Name Dane County Landfill Site No. 2	County Name Dane	Well Name M-17BR
Facility License, Permit or Monitoring Number 3081/113127300	County Code 13	Wis. Unique Well Number VT575
		DNR Well ID Number 168

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

2. Well development method

- surged with bailer and bailed ☐ 4 1
 surged with bailer and pumped ☒ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☐ 6 2
 surged with block, bailed and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 Other ☐

3. Time spent developing well 90 min.

4. Depth of well (from top of well casing) 50.6 ft.

5. Inside diameter of well 2.01 in.

6. Volume of water in filter pack and well casing 8.2 gal.

7. Volume of water removed from well 102.5 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

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

17. Additional comments on development:

- Surged and purged for 30 minutes, removed ~5-gallons.
- Pumped starting at 1130 at 1.5-gallons/min. Continued to surge with pump every 5 minutes.
- Collected TSS sample at 1235.

11. Depth to Water Before Development After Development

(from top of well casing) a. 16.31 ft. 16.23 ft.

Date b. 06/30/2020 06/30/2020
m m d d y y y y m m d d y y y y

Time c. 11:05 ☒ a.m. 12:35 ☒ p.m.

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

13. Water clarity Clear ☐ 1 0 Clear ☒ 2 0
Turbid ☒ 1 5 Turbid ☐ 2 5
(Describe) (Describe)

light gray, slightly silty/sandy

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

14. Total suspended solids -- mg/l 162.0 mg/l

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

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

First Name: Jackie Last Name: Rennebohm

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Name and Address of Facility Contact /Owner/Responsible Party

First Name: John Last Name: Welch

Facility/Firm: Dane County Dept. of Waste & Renewables

Street: 7102 U.S. Hwy 12/18

City/State/Zip: Madison, WI 53718

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

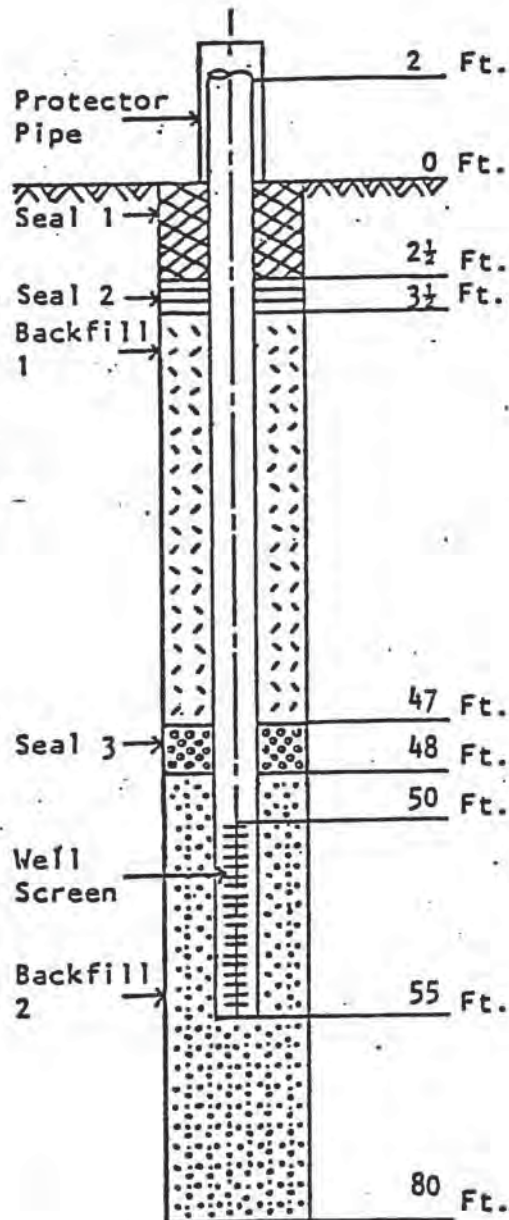
Signature: Jackie Rennebohm

Print Name: Jackie Rennebohm

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

NOTE: See instructions for more information including a list of county codes and well type codes.

WISCONSIN TESTING LABORATORIES

WELL DIAGRAMBoring No. (Well) M-18Date Installed 2/18/83

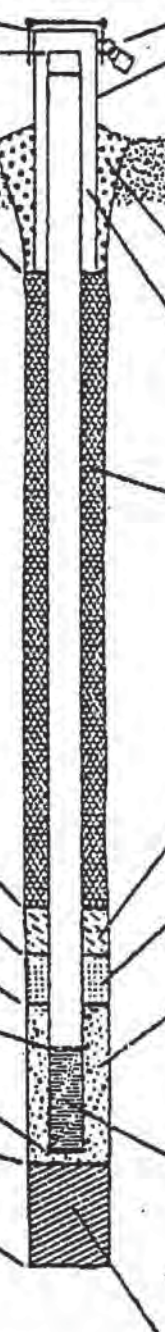
Seal Material

Seal 1 ConcreteSeal 2 Volclay No. 200Seal 3 Peltonite

Backfill Material

Backfill 1 CuttingsBackfill 2 SandAuger Hole Diameter 6-3/4 In.Well Material PVC Pipe, Threaded
Flush JointTotal Length of Well 57 Ft.Well I.D. 2 In.Well Point Slot Size 0.006 In.Comments Ground Elevation 58.17

Facility/Project Name DANE COUNTY LANDFILL SITE No. 2		Grid Location 25+00 ft. ☒ N. ☐ S. 37+25 ft. ☒ E. ☐ W.		Well Name M-28	
License, Permit or Monitoring Number 03018		Section Location SE 1/4 of NE 1/4 of Section 25		Wis. Unique Well Number _____ DNR Well Number _____	
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12		Distance Well Is From Waste/Source Boundary 600 ft.		Date Well Installed 07/21/89 m m d d y y	
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No		Location of Well Relative to Waste/Source ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known		Well Installed By: (Person's Name and Firm) GREG MARKGRAFT	
ENVIRONMENTAL & FOUNDATIONS DESIGN					

A. Protective pipe, top elevation _____ ft. MSL B. Well casing, top elevation 887.91 ft. MSL C. Land surface elevation 886.36 ft. MSL D. Surface seal, bottom _____ ft. MSL or 4.0 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 ☒ 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 _____ 17. Source of water (attach analysis): CITY OF MADISON WELL	 1. Cap and lock? ☒ Yes ☐ No 2. Protective cover pipe: a. Inside diameter: SQUARE 4.0 in. b. Length: 5.0 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 ☐ _____ FLO FLINT SAND Other ☒ _____ 5. Annular space seal: 2-50# DALS Granular Bentonite ☒ 33 1.5 Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 1.5 Lbs/gal mud weight ... Bentonite slurry ☒ 31 6.7 % Bentonite ... Bentonite-cement grout ☐ 50 6.7 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 Other ☐ _____ 7. Fine sand material: Manufacturer, product name and mesh size NATURAL SAND Volume added N/A ft³ 8. Filter pack material: Manufacturer, product name and mesh size #20 FLINT Volume added 10 - 50 # CAGES 9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐ _____ 10. Screen material: PVC Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ _____ Manufacturer NORTHERN AUL Slot size: 0.01 in. Slotted length: 14.0 ft. 11. Backfill material (below filter pack): None ☐ NATURAL SAND Other ☒ E. Bentonite seal, top _____ ft. MSL or 4.0 ft. F. Fine sand, top _____ ft. MSL or _____ ft. G. Filter pack, top _____ ft. MSL or 20.2 ft. H. Well screen, top _____ ft. MSL or 23.8 ft. I. Well screen, bottom _____ ft. MSL or 38.6 ft. J. Filter pack, bottom _____ ft. MSL or _____ ft. K. Borehole, bottom _____ ft. MSL or 44.5 ft. L. Borehole, diameter 9.25 in. M. O.D. well casing _____ in. N. well casing 2.0 in.
--	--

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

Signature Allen Czechowski Firm DANE COUNTY PUBLIC WORKS DEPT.

Please 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. 144, 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

Facility/Project Name DANE COUNTY LANDFILL Site No. 2		Well Name M-2B	
License, Permit or Monitoring Number 03018		Wis. Unique Well Number DNR Well Number	

		Before Development	After Development
1. Can this well be purged dry? ☐ Yes ☒ No			
2. Well development method			
surged with bailer and bailed	☐ 4 1		
surged with bailer and pumped	☒ 6 1		
surged with block and bailed	☐ 4 2		
surged with block and pumped	☐ 6 2		
surged with block, bailed and pumped	☐ 7 0		
compressed air	☐ 2 0		
bailed only	☐ 1 0		
pumped only	☐ 5 1		
pumped slowly	☐ 5 0		
Other	☐ 		
3. Time spent developing well	60 min.		
4. Depth of well (from top of well casing)	41.3 ft.		
5. Inside diameter of well	2.0 in.		
6. Volume of water in filter pack and well casing	_____ gal.		
7. Volume of water removed from well	48.0 gal.		
8. Volume of water added (if any)	NA gal.		
9. Source of water added	NA		
10. Analysis performed on water added? (If yes, attach results)	☐ Yes ☒ No		
Additional comments on development:			

	Before Development	After Development
11. Depth to Water (from top of well casing)	30.75 ft.	30.0 ft.
Date	07/25/89 m m d d y y	07/25/89 m m d d y y
Time	☐ a.m. ☐ p.m.	☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	_____ inches
13. Water clarity	Clear ☐ 10 Turbid ☐ 15 (Describe) BR. DR. GR. TURBID BR. TURBID	Clear ☐ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

Well developed by: Person's Name and Firm

Name: **GREG MARK GRAFT**

Firm: **ENVIRONMENTAL & FOUNDATION DRILLING INC.**

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

Signature: **Allen G. Graft**

Firm: **DANE COUNTY PUBLIC WORKS**

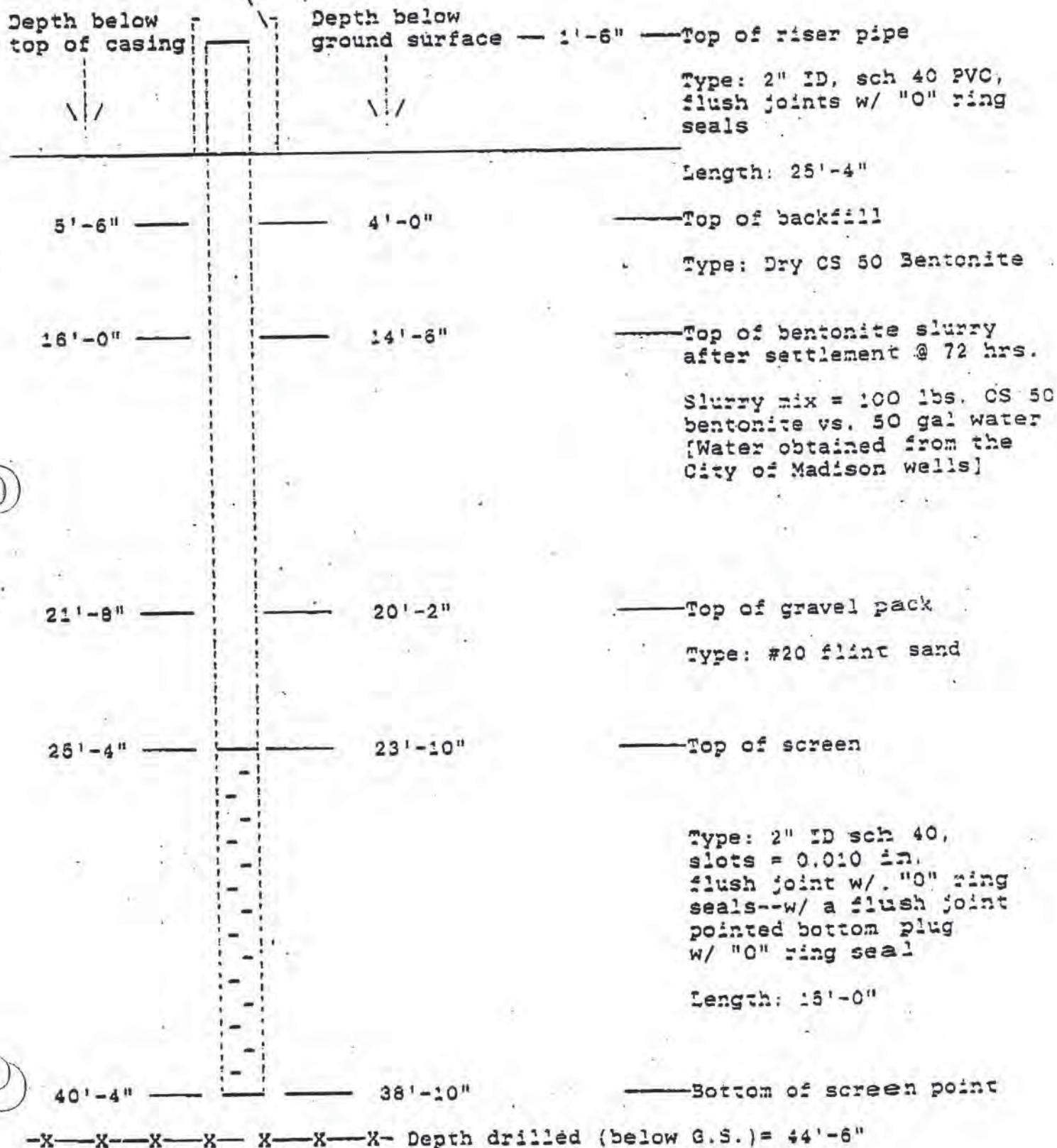
NOTE: Shaded areas are for DNR use only. See instructions for more information.

MONITORING WELL LOG

WELL # M28

PROJECT: Dane County Landfill #2
LOCATION: as per the County
ELEVATION: obtained by County

BORING METHOD: 4.25 ID auger
CORE HOLE DIAMETER: 9.25 in.
PROTECTOR PIPE: 5 foot, 4" square, w/ lock, concreted
Date Completed: 7/21/89



(not-to-scale)

ENVIRONMENTAL & FOUNDATION DRILLING INC.

Facility/Project Name <u>DANE COUNTY LANDFILL SITE No. 2</u>	Grid Location <u>18+50</u> ft. ☒ N. ☐ S. <u>37+75</u> ft. ☒ E. ☐ W.	Well Name <u>M-29</u>
Facility License, Permit or Monitoring Number <u>03018</u>	Section Location <u>SE 1/4 of NE 1/4 of Section 25</u>	Wis. Unique Well Number <u> </u> DNR Well Number <u> </u>
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Distance Well Is From Waste/Source Boundary <u>600</u> ft.	Date Well Installed <u>07/24/89</u> m m d d y y
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No	Location of Well Relative to Waste/Source ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known	Well Installed By: (Person's Name and Firm) <u>GREG MARIGRAST</u> <u>ENVIRONMENTAL & FOUNDATION DRILL</u>

A. Protective pipe, top elevation <u> </u> ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation <u>906.22</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>SQUARE</u> <u>4.0</u> in. b. Length: <u>5.0</u> ft. c. Material: Steel ☒ 04 Other ☐ <u> </u>
C. Land surface elevation <u>904.28</u> ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: <u> </u>
D. Surface seal, bottom <u> </u> ft. MSL or <u>2.6</u> ft.	3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐ <u> </u>
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 ☐ <u> </u> Other ☒ <u>#20 FLINT</u>
13. Sieve analysis attached? ☐ Yes ☒ No	5. Annular space seal: 2-50# <u>FLINT</u> Granular Bentonite ☒ 33 Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 1.5# Lbs/gal mud weight ... Bentonite slurry ☒ 31 % Bentonite ... Bentonite-cement grout <u>17.42</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 Other ☐ <u> </u>
16. Drilling additives used? ☐ Yes ☐ No	7. Fine sand material: Manufacturer, product name and mesh size <u>NA</u> Volume added <u>NA</u> Ft ³
Describe <u> </u>	8. Filter pack material: Manufacturer, product name and mesh size <u>#20 FLINT</u> Volume added <u>9-50# FLINT</u> Ft ³
17. Source of water (attach analysis): <u>CITY OF MADISON WELLS</u>	9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐ <u> </u>
E. Bentonite seal, top <u> </u> ft. MSL or <u>35.0</u> ft.	10. Screen material: <u>PVC</u> Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ <u> </u>
F. Fine sand, top <u> </u> ft. MSL or <u> </u> ft.	Manufacturer <u>NORWEL A.R.</u> Slot size: <u>0.01</u> in. Slotted length: <u>14.0</u> ft.
G. Filter pack, top <u> </u> ft. MSL or <u>37.5</u> ft.	11. Backfill material (below filter pack): None ☐ <u> </u> <u>NATURAL SAND</u> Other ☐ <u> </u>
H. Well screen, top <u> </u> ft. MSL or <u>41.5</u> ft.	
I. Well screen, bottom <u> </u> ft. MSL or <u>56.5</u> ft.	
J. Filter pack, bottom <u> </u> ft. MSL or <u> </u> ft.	
K. Borehole, bottom <u> </u> ft. MSL or <u>59.0</u> ft.	
L. Borehole, diameter <u>9.25</u> in.	
M. O.D. well casing <u> </u> in.	
N. I.D. well casing <u>2.0</u> in.	

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

Signature Allen C. Schuler Firm DANE COUNTY PUBLIC WORKS DEPT.

Please 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. 144, 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.

Facility/Project Name <u>2 County Landfill Site No. 2</u> License, Permit or Monitoring Number <u>03018</u>		Well Name <u>M-29</u> Wis. Unique Well Number DNR Well Number	
--	--	--	--

1. Can this well be purged dry? ☐ Yes ☒ No 2. Well development method surged with bailer and bailed ☐ 4 1 surged with bailer and pumped ☒ 6 1 surged with block and bailed ☐ 4 2 surged with block and pumped ☐ 6 2 surged with block, bailed and pumped ☐ 7 0 compressed air ☐ 2 0 bailed only ☐ 1 0 pumped only ☐ 5 1 pumped slowly ☐ 5 0 Other ☐ 3. Time spent developing well <u>60</u> min. 4. Depth of well (from top of well casing) <u>57.9</u> ft. 5. Inside diameter of well <u>2.0</u> in. 6. Volume of water in filter pack and well casing <u> </u> gal. 7. Volume of water removed from well <u>40.0</u> gal. 8. Volume of water added (if any) <u>NA</u> gal. 9. Source of water added <u>NA</u> 10. Analysis performed on water added? ☐ Yes ☒ No (If yes, attach results)	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:30%;"></th> <th style="width:35%;">Before Development</th> <th style="width:35%;">After Development</th> </tr> <tr> <td>11. Depth to Water (from top of well casing)</td> <td><u>47.0</u> ft.</td> <td><u>47.9</u> ft.</td> </tr> <tr> <td>Date</td> <td><u>07/25/89</u> m m d d y y</td> <td><u>07/25/89</u> m m d d y y</td> </tr> <tr> <td>Time</td> <td><u> </u> a.m. ☒ p.m.</td> <td><u> </u> a.m. ☒ p.m.</td> </tr> <tr> <td>12. Sediment in well bottom</td> <td><u>0.0</u> inches</td> <td><u>0.0</u> inches</td> </tr> <tr> <td>13. Water clarity</td> <td> Clear ☐ 10 Turbid ☐ 15 (Describe) <u>OPAQUE</u> <u>TURBID</u> </td> <td> Clear ☐ 20 Turbid ☐ 25 (Describe) </td> </tr> </table> Fill in if drilling fluids were used and well is at solid waste facility: 14. Total suspended solids <u> </u> mg/l <u> </u> mg/l 15. COD <u> </u> mg/l <u> </u> mg/l		Before Development	After Development	11. Depth to Water (from top of well casing)	<u>47.0</u> ft.	<u>47.9</u> ft.	Date	<u>07/25/89</u> m m d d y y	<u>07/25/89</u> m m d d y y	Time	<u> </u> a.m. ☒ p.m.	<u> </u> a.m. ☒ p.m.	12. Sediment in well bottom	<u>0.0</u> inches	<u>0.0</u> inches	13. Water clarity	Clear ☐ 10 Turbid ☐ 15 (Describe) <u>OPAQUE</u> <u>TURBID</u>	Clear ☐ 20 Turbid ☐ 25 (Describe)
	Before Development	After Development																	
11. Depth to Water (from top of well casing)	<u>47.0</u> ft.	<u>47.9</u> ft.																	
Date	<u>07/25/89</u> m m d d y y	<u>07/25/89</u> m m d d y y																	
Time	<u> </u> a.m. ☒ p.m.	<u> </u> a.m. ☒ p.m.																	
12. Sediment in well bottom	<u>0.0</u> inches	<u>0.0</u> inches																	
13. Water clarity	Clear ☐ 10 Turbid ☐ 15 (Describe) <u>OPAQUE</u> <u>TURBID</u>	Clear ☐ 20 Turbid ☐ 25 (Describe)																	

Additional comments on development:

Well developed by: Person's Name and Firm

Name: GREG MARGRAFT

Firm: ENVIRONMENTAL FOUNDATION DRILLING

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

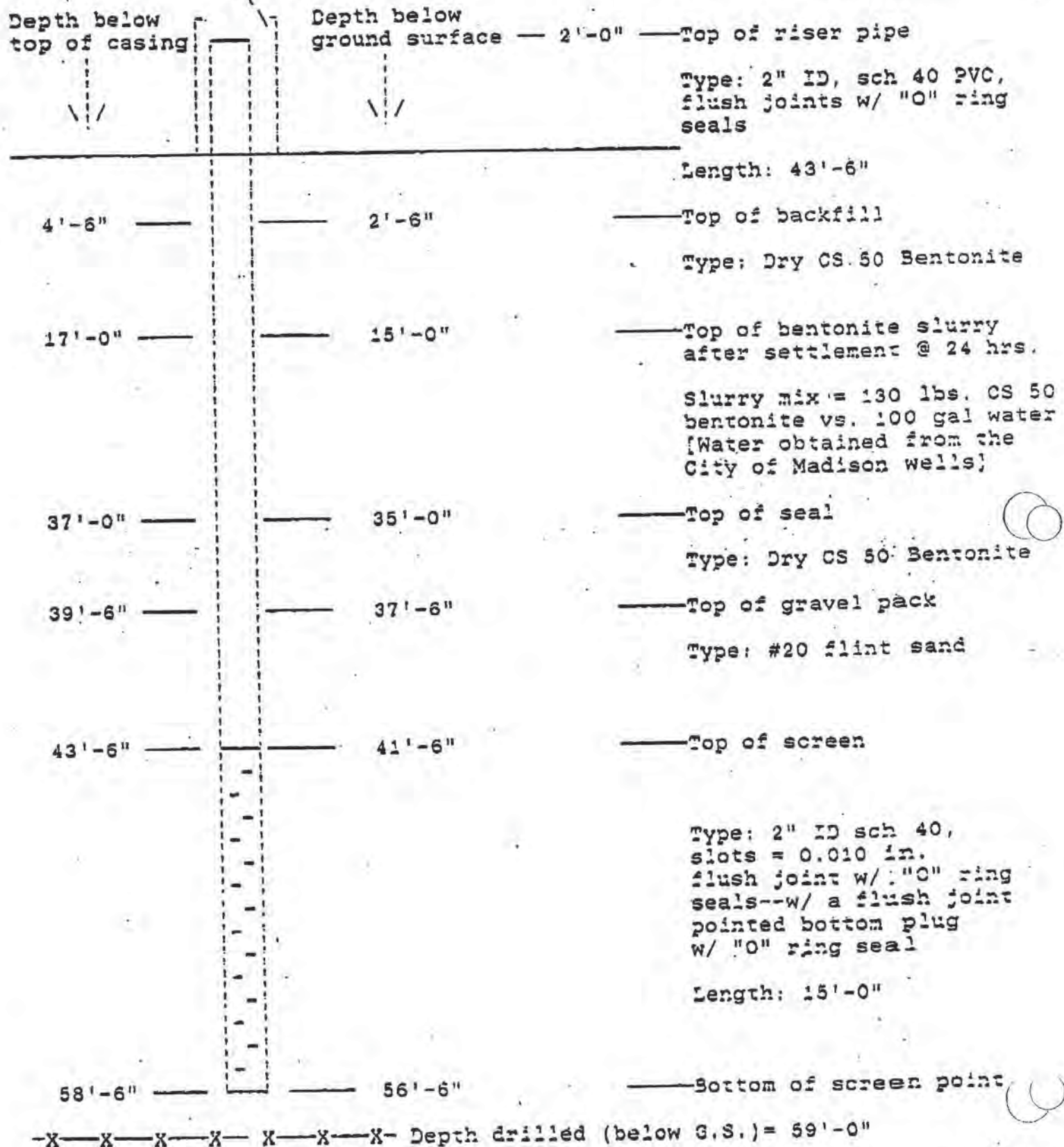
Signature: Allen Czechowski

Firm: DANE COUNTY PUBLIC WORKS

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

PROJECT: Dane County Landfill #2
 LOCATION: as per the County
 ELEVATION: obtained by County

BORING METHOD: 4.25 ID auger
 BORE HOLE DIAMETER: 9.25 in.
 PROTECTOR PIPE: 5 foot, 4" square, w/ lock, concrete
 Date Completed: 7/24/89



(not-to-scale)

ENVIRONMENTAL & FOUNDATION DRILLING INC.

WELL DEVELOPMENT

PROJECT: Dane County Landfill #2

DATE: 7/25/89

WELL #	D T W PRE-DEV	D T W. POST-DEV	D T B	VOLUME REMOVED	COLOR- TURBIDITY	ODOR- FILMY	TIME
M28	30'-9"	30'-0"	41'-4"	48 gal	Brown—> Brown Opaque—> Turbid	slight odor no film	60 min
M29	47'-0"	47'-11"	57'-11"	40 gal	Brown—> Brown Opaque—> Turbid	no odor no film	60 min

ENVIRONMENTAL & FOUNDATION DRILLING, INC.

D T W = Depth to Water

D T B = Depth to Bottom (indicates amount of sediment at well bottom)

COLOR-

TURBIDITY = Color of water, clarity before/after development

All measurements taken from top of riser pipe.

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

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefild)		Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.		Well Name M301A	
Facility License, Permit or Monitoring No. 03018		Local Grid Origin ☐ (estimated: ☐) or Well Location ☒		Wis. Unique Well No. DNR Well Number VM 942 150	
Facility ID 113127300		St. Plane 381,349 ft. N, 2,201,305 ft. E. ☒ S/C/N		Date Well Installed 11/08/2012	
Type of Well Well Code I1/mw		Section Location of Waste/Source SE 1/4 of NE 1/4 of Sec. 25, T. 7 N, R. 10 ☒ E ☐ W		Well Installed By: (Person's Name and Firm) Steve Hunger	
Distance from Waste/Source 100 ft.		Location of Well Relative to Waste/Source u ☐ Upgradient s ☒ Sidegradient d ☐ Downgradient n ☐ Not Known		Gov. Lot Number SES, Inc.	

A. Protective pipe, top elevation 894.57 ft. MSL
B. Well casing, top elevation 894.77 ft. MSL
C. Land surface elevation 892.0 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
Other ☐

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

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

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

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 7.0 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
Sand ☒

5. Annular space seal: a. Granular/Chipped 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. 7.3 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 chips ☒ 32
c. _____ Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 Sand
b. Volume added 0.6 ft³

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 Sand
b. Volume added 3.8 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 _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

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

E. Bentonite seal, top 891.7 ft. MSL or 0.3 ft.
F. Fine sand, top 869.0 ft. MSL or 23.0 ft.
G. Filter pack, top 867.0 ft. MSL or 25.0 ft.
H. Screen joint, top 865.0 ft. MSL or 27.0 ft.
I. Well bottom 855.0 ft. MSL or 37.0 ft.
J. Filter pack, bottom 855.0 ft. MSL or 37.0 ft.
K. Borehole, bottom 850.0 ft. MSL or 42.0 ft.
L. Borehole, diameter 8.0 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.07 in.

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

Signature *[Signature]* Firm TRC Environmental Corporation
708 Heartland Trail Madison WI 53717
Tel: 608.826.3600
Fax: 608.826.3941

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name Dane County Landfill #2 (Rodefild)	County Dane	Well Name M301A
Facility License, Permit or Monitoring Number 03018	County Code 13	Wis. Unique Well Number VM 942
		DNR Well Number 150

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

2. Well development method:

- surged with bailer and bailed ☒ 4 1
 surged with bailer and pumped ☐ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☐ 6 2
 surged with block, bailed, and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 other ☐ _____

3. Time spent developing well **231 min.**

4. Depth of well (from top of well casing) **40.1 ft.**

5. Inside diameter of well **2.07 in.**

6. Volume of water in filter pack and well casing **9.0 gal.**

7. Volume of water removed from well **28.0 gal.**

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

9. Source of water added _____

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 31.73 ft.	39.32 ft.
Date	b. 11/9/2012	11/9/2012
Time	c. 11:13 ☒ a.m. ☐ p.m.	03:04 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe)	Clear ☒ 2 0 Turbid ☐ 2 5 (Describe)

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

14. Total suspended solids **mg/l** **1230.0 mg/l**

15. COD **mg/l** **mg/l**

16. Well developed by: Person's Name and Firm

Steve Hunger
SES

17. Additional comments on development:

Bailed dry after 3 gallons, 4 gallons, 4 gallons, 5 gallons, 4 gallons, 4 gallons, and 4 gallons.

Facility Address or Owner/Responsible Party Address

Name: **John Welch**

Firm: **Dane County**

Street: **1919 Alliant Energy Center Way**

City/State/Zip: **Madison, WI 53717**

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

Signature:

Print Name:

Firm:

Nathaniel R Keller
Nathaniel R Keller
TRC Environmental Corporation

NOTE: See instructions for more information including a list of county codes and well type codes.

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

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefild)	Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.	Well Name M302A
Facility License, Permit or Monitoring No. 03018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. " ' " Long. " ' " or	Wis. Unique Well No. DNR Well Number VM 940 152
Facility ID 113127300	St. Plane 382,876 ft. N, 2,201,149 ft. E. ☒ C/N	Date Well Installed 11/08/2012
Type of Well Well Code 71/dw	Section Location of Waste/Source NE 1/4 of NE 1/4 of Sec. 25, T. 7 N, R. 10 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Rich Olson
Distance from Waste/Source 60 ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	SES, Inc.

A. Protective pipe, top elevation 880.47 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 880.55 ft. MSL	2. Protective cover pipe: a. Inside diameter: 4.0 in. b. Length: 7.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 878.0 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom _____ ft. MSL or _____ 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 Sand ☒
13. Sieve analysis attached? ☒ Yes ☐ No	5. Annular space seal: a. Granular/Chipped 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. 3.2 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 chips ☒ 32 c. _____ Other ☐
15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. #15 Sand b. Volume added 0.6 ft ³
16. Drilling additives used? ☐ Yes ☒ No	8. Filter pack material: Manufacturer, product name & mesh size a. #40 Sand b. Volume added 3.8 ft ³
Describe _____	9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
17. Source of water (attach analysis, if required): _____	10. Screen material: PVC a. Screen Type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
E. Bentonite seal, top 877.5 ft. MSL or 0.5 ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 10.0 ft.
F. Fine sand, top 868.0 ft. MSL or 10.0 ft.	11. Backfill material (below filter pack): None ☐ 14 Sand ☒
G. Filter pack, top 866.0 ft. MSL or 12.0 ft.	
H. Screen joint, top 864.0 ft. MSL or 14.0 ft.	
I. Well bottom 854.0 ft. MSL or 24.0 ft.	
J. Filter pack, bottom 852.0 ft. MSL or 26.0 ft.	
K. Borehole, bottom 852.0 ft. MSL or 26.0 ft.	
L. Borehole, diameter 3.0 in.	
M. O.D. well casing 2.38 in.	
N. I.D. well casing 2.07 in.	

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

Signature Michael L. Kell Firm TRC Environmental Corporation Tel: 608.826.3600
708 Heartland Trail Madison WI 53717 Fax: 608.826.3941

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name Dane County Landfill #2 (Rodefeld)		County Dane		Well Name M302A	
Facility License, Permit or Monitoring Number 03018		County Code 13		Wis. Unique Well Number VM 940	
				DNR Well Number 152	

1. Can this well be purged dry? ☒ Yes ☐ No 2. Well development method: <table style="width:100%;"> <tr><td>surged with bailer and bailed</td><td>☐ 4 1</td></tr> <tr><td>surged with bailer and pumped</td><td>☐ 6 1</td></tr> <tr><td>surged with block and bailed</td><td>☐ 4 2</td></tr> <tr><td>surged with block and pumped</td><td>☐ 6 2</td></tr> <tr><td>surged with block, bailed, and pumped</td><td>☐ 7 0</td></tr> <tr><td>compressed air</td><td>☐ 2 0</td></tr> <tr><td>bailed only</td><td>☒ 1 0</td></tr> <tr><td>pumped only</td><td>☐ 5 1</td></tr> <tr><td>pumped slowly</td><td>☐ 5 0</td></tr> <tr><td>other _____</td><td>☐ --</td></tr> </table> 3. Time spent developing well 153 min. 4. Depth of well (from top of well casing) 26.8 ft. 5. Inside diameter of well 2.07 in. 6. Volume of water in filter pack and well casing 5.3 gal. 7. Volume of water removed from well 8.0 gal. 8. Volume of water added (if any) gal. 9. Source of water added _____ 10. Analysis performed on water added? ☐ Yes ☐ No (If yes, attach results) 17. Additional comments on development: Bailed dry 3 times	surged with bailer and bailed	☐ 4 1	surged with bailer and pumped	☐ 6 1	surged with block and bailed	☐ 4 2	surged with block and pumped	☐ 6 2	surged with block, bailed, and pumped	☐ 7 0	compressed air	☐ 2 0	bailed only	☒ 1 0	pumped only	☐ 5 1	pumped slowly	☐ 5 0	other _____	☐ --	<table style="width:100%;"> <tr> <th></th> <th style="text-align: center;">Before Development</th> <th style="text-align: center;">After Development</th> </tr> <tr> <td>11. Depth to Water (from top of well casing)</td> <td style="text-align: center;">a. 21.94 ft.</td> <td style="text-align: center;">26.80 ft.</td> </tr> <tr> <td>Date</td> <td style="text-align: center;">b. 11/9/2012</td> <td style="text-align: center;">11/9/2012</td> </tr> <tr> <td>Time</td> <td style="text-align: center;">c. 10:55 ☒ a.m. ☐ p.m.</td> <td style="text-align: center;">01:28 ☐ a.m. ☒ p.m.</td> </tr> <tr> <td>12. Sediment in well bottom</td> <td style="text-align: center;">0.0 inches</td> <td style="text-align: center;">0.0 inches</td> </tr> <tr> <td>13. Water clarity</td> <td> Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) _____ </td> <td> Clear ☐ 2 0 Turbid ☒ 2 5 (Describe) _____ </td> </tr> </table> Fill in if drilling fluids were used and well is at solid waste facility: 14. Total suspended solids mg/l 1360.0 mg/l 15. COD mg/l mg/l 16. Well developed by: Person's Name and Firm Rich Olson SES		Before Development	After Development	11. Depth to Water (from top of well casing)	a. 21.94 ft.	26.80 ft.	Date	b. 11/9/2012	11/9/2012	Time	c. 10:55 ☒ a.m. ☐ p.m.	01:28 ☐ a.m. ☒ p.m.	12. Sediment in well bottom	0.0 inches	0.0 inches	13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) _____	Clear ☐ 2 0 Turbid ☒ 2 5 (Describe) _____
surged with bailer and bailed	☐ 4 1																																						
surged with bailer and pumped	☐ 6 1																																						
surged with block and bailed	☐ 4 2																																						
surged with block and pumped	☐ 6 2																																						
surged with block, bailed, and pumped	☐ 7 0																																						
compressed air	☐ 2 0																																						
bailed only	☒ 1 0																																						
pumped only	☐ 5 1																																						
pumped slowly	☐ 5 0																																						
other _____	☐ --																																						
	Before Development	After Development																																					
11. Depth to Water (from top of well casing)	a. 21.94 ft.	26.80 ft.																																					
Date	b. 11/9/2012	11/9/2012																																					
Time	c. 10:55 ☒ a.m. ☐ p.m.	01:28 ☐ a.m. ☒ p.m.																																					
12. Sediment in well bottom	0.0 inches	0.0 inches																																					
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) _____	Clear ☐ 2 0 Turbid ☒ 2 5 (Describe) _____																																					

Facility Address or Owner/Responsible Party Address Name: John Welch Firm: Dane County Street: 1919 Alliant Energy Center Way City/State/Zip: Madison, WI 53717	I hereby certify that the above information is true and correct to the best of my knowledge. Signature: <u><i>Nathaniel R Keller</i></u> Print Name: Nathaniel R Keller Firm: TRC Environmental Corporation
--	---

NOTE: See instructions for more information including a list of county codes and well type codes.

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

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefild)	Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.	Well Name M302B
Facility License, Permit or Monitoring No. 03018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ☐ ☐ ☐ Long. ☐ ☐ ☐ or	Wis. Unique Well No. DNR Well Number VM 941 154
Facility ID 113127300	St. Plane 382,879 ft. N, 2,201,142 ft. E. ☒ C/N	Date Well Installed 11/08/2012
Type of Well Well Code 12/pz	Section Location of Waste/Source NE 1/4 of NE 1/4 of Sec. 25, T. 7 N, R. 10 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Rich Olson
Distance from Waste/Source 60 ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Gov. Lot Number SES, Inc.

A. Protective pipe, top elevation 880.38 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 880.49 ft. MSL	2. Protective cover pipe: a. Inside diameter: 4.0 in. b. Length: 7.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 877.9 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom 876.9 ft. MSL or 1.0 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 Sand ☒ Other ☐
13. Sieve analysis attached? ☒ Yes ☐ No	5. Annular space seal: a. Granular/Chipped 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. 15 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 chips ☒ 32 c. Other ☐
16. Drilling additives used? ☐ Yes ☒ No	7. Fine sand material: Manufacturer, product name & mesh size a. #15 Sand b. Volume added 0.6 ft ³
Describe _____	8. Filter pack material: Manufacturer, product name & mesh size a. #40 Sand b. Volume added 2.2 ft ³
17. Source of water (attach analysis, if required):	9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
E. Bentonite seal, top 829.9 ft. MSL or 48.0 ft.	10. Screen material: PVC a. Screen Type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
F. Fine sand, top 825.9 ft. MSL or 52.0 ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 5.0 ft.
G. Filter pack, top 823.9 ft. MSL or 54.0 ft.	11. Backfill material (below filter pack): None ☐ 14 Sand ☒
H. Screen joint, top 821.9 ft. MSL or 56.0 ft.	
I. Well bottom 816.9 ft. MSL or 61.0 ft.	
J. Filter pack, bottom 816.9 ft. MSL or 61.0 ft.	
K. Borehole, bottom 814.9 ft. MSL or 63.0 ft.	
L. Borehole, diameter 8.0 in.	
M. O.D. well casing 2.38 in.	
N. I.D. well casing 2.07 in.	

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

Signature <i>Michael R. Olson</i>	Firm TRC Environmental Corporation 708 Heartland Trail Madison WI 53717	Tel: 608.826.3600 Fax: 608.826.3941
--------------------------------------	---	--

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name Dane County Landfill #2 (Rodefild)	County Dane	Well Name M302B	
Facility License, Permit or Monitoring Number 03018	County Code 13	Wis. Unique Well Number VM 941	DNR Well Number 154

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

2. Well development method:

- surged with bailer and bailed ☐ 4 1
 surged with bailer and pumped ☒ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☐ 6 2
 surged with block, bailed, and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 other _____ ☐ --

3. Time spent developing well **93 min.**

4. Depth of well (from top of well casing) **63.6 ft.**

5. Inside diameter of well **2.07 in.**

6. Volume of water in filter pack and well casing **11.6 gal.**

7. Volume of water removed from well **120.0 gal.**

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

9. Source of water added _____

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

17. Additional comments on development:
Surged pump while pumping to remove sediments.

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 22.00 ft.	22.07 ft.
Date	b. 11/9/2012	11/9/2012
Time	c. 11:55 ☒ a.m. ☐ p.m.	01:28 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.5 inches	0.0 inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe)	Clear ☒ 2 0 Turbid ☐ 2 5 (Describe)

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

14. Total suspended solids **mg/l** **1980.0 mg/l**

15. COD **mg/l** **21.3 mg/l**

16. Well developed by: Person's Name and Firm

**Rich Olson
SES**

Facility Address or Owner/Responsible Party Address

Name: **John Welch**

Firm: **Dane County**

Street: **1919 Alliant Energy Center Way**

City/State/Zip: **Madison, WI 53717**

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

Signature:

Print Name:

Firm:

Nathaniel R Keller
Nathaniel R Keller

TRC Environmental Corporation

NOTE: See instructions for more information including a list of county codes and well type codes.

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

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefeld)	Local Grid Location of Well ft. ☐ N. ☐ E. ☐ S. ☐ W.	Well Name M303A
Facility License, Permit or Monitoring No. 03018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. " ' " Long. " ' " or	Wis. Unique Well No. VM 943 DNR Well Number 156
Facility ID 113127300	St. Plane 380,837 ft. N, 2,200,429 ft. E. ☒ C/N	Date Well Installed 11/08/2012
Type of Well Well Code 11/mw	Section Location of Waste/Source SE 1/4 of NE 1/4 of Sec. 25 , T. 7 N, R. 10 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Steve Hunger
Distance from Waste/Source 75 ft.	Location of Well Relative to Waste/Source u ☒ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	SES, Inc.

A. Protective pipe, top elevation 887.45 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 887.23 ft. MSL	2. Protective cover pipe: a. Inside diameter: 4.0 in. b. Length: 7.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 884.9 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom _____ ft. MSL or _____ 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 Sand ☒ Other ☐
13. Sieve analysis attached? ☒ Yes ☐ No	5. Annular space seal: a. Granular/Chipped 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. 4.8 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 chips ☒ 32 c. _____ Other ☐
15. Drilling fluid used: Water ☒ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. #15 Sand b. Volume added 0.6 ft ³
16. Drilling additives used? ☐ Yes ☒ No	8. Filter pack material: Manufacturer, product name & mesh size a. #40 Sand b. Volume added 3.8 ft ³
Describe _____	9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
17. Source of water (attach analysis, if required): City of Madison	10. Screen material: PVC a. Screen Type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
E. Bentonite seal, top 884.6 ft. MSL or 0.3 ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 10.0 ft.
F. Fine sand, top 869.9 ft. MSL or 15.0 ft.	11. Backfill material (below filter pack): None ☐ 14 Formation Collapse ☒
G. Filter pack, top 867.9 ft. MSL or 17.0 ft.	
H. Screen joint, top 865.9 ft. MSL or 19.0 ft.	
I. Well bottom 855.9 ft. MSL or 29.0 ft.	
J. Filter pack, bottom 854.9 ft. MSL or 30.0 ft.	
K. Borehole, bottom 840.9 ft. MSL or 44.0 ft.	
L. Borehole, diameter 8.0 in.	
M. O.D. well casing 2.38 in.	
N. I.D. well casing 2.07 in.	

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

Signature *Mark R. Miller* Firm **TRC Environmental Corporation** Tel: 608.826.3600
708 Heartland Trail Madison WI 53717 Fax: 608.826.3941

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name Dane County Landfill #2 (Rodefeld)	County Dane	Well Name M303A
Facility License, Permit or Monitoring Number 03018	County Code 13	Wis. Unique Well Number VM 943
		DNR Well Number 156

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

2. Well development method:
- | | |
|---------------------------------------|---|
| surged with bailer and bailed | ☐ 4 1 |
| surged with bailer and pumped | ☒ 6 1 |
| surged with block and bailed | ☐ 4 2 |
| surged with block and pumped | ☐ 6 2 |
| surged with block, bailed, and pumped | ☐ 7 0 |
| compressed air | ☐ 2 0 |
| bailed only | ☐ 1 0 |
| pumped only | ☐ 5 1 |
| pumped slowly | ☐ 5 0 |
| other _____ | ☐ -- |

3. Time spent developing well **90 min.**

4. Depth of well (from top of well casing) **32.4 ft.**

5. Inside diameter of well **2.07 in.**

6. Volume of water in filter pack and well casing **8.6 gal.**

7. Volume of water removed from well **100.0 gal.**

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

9. Source of water added _____

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

17. Additional comments on development:
Surged pump while pumping to remove sediments.

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 24.62 ft.	24.62 ft.
Date	b. 11/9/2012	11/9/2012
Time	c. 10:24 ☒ a.m. ☐ p.m.	12:06 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) _____	Clear ☒ 2 0 Turbid ☐ 2 5 (Describe) Very Clear

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

14. Total suspended solids **mg/l** **4190.0 mg/l**

15. COD **mg/l** **23.8 mg/l**

16. Well developed by: Person's Name and Firm

Steve Hunger
SES

Facility Address or Owner/Responsible Party Address

Name: **John Welch**

Firm: **Dane County**

Street: **1919 Alliant Energy Center Way**

City/State/Zip: **Madison, WI 53717**

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

Signature: _____

Print Name: _____

Firm: _____

Nathaniel R Keller
Nathaniel R Keller
TRC Environmental Corporation

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural ResourcesRoute to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill Site No. 2	Local Grid Location of Well ft. ☐ N. ☐ E. ☐ S. ☐ W.	Well Name M-303AR
Facility License, Permit or Monitoring No. 3018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. _____ Long. _____ or _____	Wis. Unique Well No. <u>OX700</u> DNR Well ID No. <u>176</u>
Facility ID 113127300	St. Plane <u>380,779.02</u> ft. N. <u>2,200,339.01</u> ft. E. S/C/N	Date Well Installed <u>06</u> / <u>29</u> / <u>2020</u> m m d d y y y y
Type of Well Well Code <u>11</u> / mw	Section Location of Waste/Source SE 1/4 of NE 1/4 of Sec. <u>25</u> , T. <u>07</u> N, R. <u>10</u> E W	Well Installed By: Name (first, last) and Firm Tony Kapugi
Distance from Waste/Source <u>130</u> ft.	Location of Well Relative to Waste/Source u ☒ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	On-site Environmental Services, Inc.

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ 885.53 ft. MSL

C. Land surface elevation _____ 883.19 ft. MSL

D. Surface seal, bottom _____ 883.19 ft. MSL or _____ 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 performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 5 0
 Hollow Stem Auger ☒ 4 1
 Other ☐

15. Drilling fluid used: Water ☐ 0 2 Air ☐ 0 1
 Drilling Mud ☐ 0 3 None ☒ 9 9

16. Drilling additives used? ☐ Yes ☒ No
 Describe NA

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

E. Bentonite seal, top _____ 883.19 ft. MSL or _____ 0 ft.

F. Fine sand, top _____ 876.19 ft. MSL or _____ 7 ft.

G. Filter pack, top _____ 874.19 ft. MSL or _____ 9 ft.

H. Screen joint, top _____ 872.19 ft. MSL or _____ 11 ft.

I. Well bottom _____ 862.19 ft. MSL or _____ 21 ft.

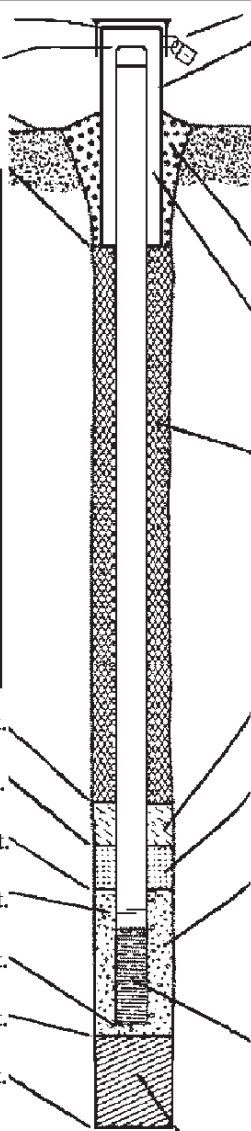
J. Filter pack, bottom _____ 861.69 ft. MSL or _____ 21.5 ft.

K. Borehole, bottom _____ 861.69 ft. MSL or _____ 21.5 ft.

L. Borehole, diameter _____ 8.25 in.

M. O.D. well casing _____ 2.38 in.

N. I.D. well casing _____ 2.01 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
 a. Inside diameter: _____ 6 in.
 b. Length: _____ 4 ft.
 c. Material: Steel ☒ 0 4
 Other ☐

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

3. Surface seal: Bentonite ☒ 3 0
 Concrete ☐ 0 1
 Other ☐

4. Material between well casing and protective pipe:
 Filter Sand Bentonite ☐ 3 0
 Other ☒

5. Annular space seal: a. Granular/Chipped Bentonite ☒ 3 3
 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5
 c. _____ Lbs/gal mud weight Bentonite slurry ☐ 3 1
 d. _____ % Bentonite Bentonite-cement grout ☐ 5 0
 e. _____ 2.38 Ft³ volume added for any of the above
 f. How installed: Tremie ☐ 0 1
 Tremie pumped ☐ 0 2
 Gravity ☒ 0 8

6. Bentonite seal: a. Bentonite granules ☐ 3 3
 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 3 2
 c. _____ Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
 a. Red Flint #7 ☒

b. Volume added _____ 0.68 ft³

8. Filter pack material: Manufacturer, product name & mesh size
 a. RW Sidley #5 ☒

b. Volume added _____ 3.52 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 2 3
 Flush threaded PVC schedule 80 ☐ 2 4
 Other ☐

10. Screen material: _____ PVC
 a. Screen type: Factory cut ☒ 1 1
 Continuous slot ☐ 0 1
 Other ☐

b. Manufacturer _____ Monoflex

c. Slot size: _____ 0.010 in.

d. Slotted length: _____ 10 ft.

11. Backfill material (below filter pack): None ☒ 1 4
 Other ☐

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

Signature
Jackie PennabehnFirm
SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 7-98

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

Facility/Project Name Dane County Landfill Site No. 2	County Name Dane	Well Name M-303AR
Facility License, Permit or Monitoring Number 3081/113127300	County Code 13	Wis. Unique Well Number OX700
		DNR Well ID Number 176

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

2. Well development method

- surged with bailer and bailed ☒ 4 1
 surged with bailer and pumped ☐ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☐ 6 2
 surged with block, bailed and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 Other ☐

3. Time spent developing well 30 min.

4. Depth of well (from top of well casing) 23.8 ft.

5. Inside diameter of well 2.01 in.

6. Volume of water in filter pack and well casing 3.4 gal.

7. Volume of water removed from well 5.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

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

17. Additional comments on development:

- Purged and surged, removed ~2-gallons, well went dry.
- Removed 1/2-gallon, well went dry.
- Removed 1/2-gallon, well went dry. Really surging bailer to see if drilling mud is cased around the well.
- Waited over 1 hour, bailed ~1-gallon, well went dry.
- Returned at 1530, removed ~1-gallon, well went dry. Let recharge and collected TSS sample.

11. Depth to Water Before Development After Development

(from top of well casing) a. 17 40 ft. 23 80 ft.

Date b. 06 / 30 / 2020 06 / 30 / 2020
m m d d y y y y m m d d y y y y

Time c. 08 : 05 ☒ a.m. 15 : 35 ☒ p.m.

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

13. Water clarity Clear ☐ 1 0 Clear ☐ 2 0
Turbid ☒ 1 5 Turbid ☒ 2 5
(Describe) (Describe)

brown, fine sandy water

slightly turbid

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

14. Total suspended solids -- mg/l 310.0 mg/l

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

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

First Name: Jackie

Last Name: Rennebohm

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Name and Address of Facility Contact /Owner/Responsible Party

First Name: John Last Name: Welch

Facility/Firm: Dane County Dept. of Waste & Renewables

Street: 7102 U.S. Hwy 12/18

City/State/Zip: Madison, WI 53718

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

Signature: Jackie Rennebohm

Print Name: Jackie Rennebohm

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

NOTE: See instructions for more information including a list of county codes and well type codes.

Route To:

Watershed/Wastewater ☐
Remediation/Redevelopment ☐

Waste Management ☒
Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefeld)	Local Grid Location of Well ft. ☐ N. ☐ E. ft. ☐ S. ☐ W.		Well Name M304A
Facility License, Permit or Monitoring No. 03018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒	Lat. ☐ ° ☐ ' ☐ " Long. ☐ ° ☐ ' ☐ " or	Wis. Unique Well No. DNR Well Number VM 947 158
Facility ID 113127300	St. Plane 382,119 ft. N. 2,200,739 ft. E. ☒ C/N	Date Well Installed 11/07/2012	
Type of Well Well Code 11/mw	Section Location of Waste/Source NE 1/4 of NE 1/4 of Sec. 25, T. 7 N, R. 10 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Rich Olson	
Distance from Waste/Source 0 ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number	SES, Inc.

A. Protective pipe, top elevation	885.13 ft. MSL	1. Cap and lock?	☒ Yes ☐ No
B. Well casing, top elevation	885.26 ft. MSL	2. Protective cover pipe:	
C. Land surface elevation	882.7 ft. MSL	a. Inside diameter:	4.0 in.
D. Surface seal, bottom	ft. MSL or ft.	b. Length:	7.0 ft.
		c. Material:	Steel ☒ 04 Other ☐
12. USCS classification of soil near screen:		d. Additional protection?	☐ Yes ☒ No
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☐		If yes, describe:	
13. Sieve analysis attached?	☒ Yes ☐ No	3. Surface seal:	Bentonite ☒ 30 Concrete ☐ 01 Other ☐
14. Drilling method used:	Rotary ☐ 50 Hollow Stem Auger ☒ 41 Other ☐	4. Material between well casing and protective pipe:	Bentonite ☐ 30 Sand ☒
15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☐ 99		5. Annular space seal:	a. Granular/Chipped Bentonite ☒ 33 b. Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35 c. Lbs/gal mud weight . . . Bentonite slurry ☐ 31 d. % Bentonite . . . Bentonite-cement grout ☐ 50 e. 4.8 Ft ³ volume added for any of the above
16. Drilling additives used?	☐ Yes ☒ No	f. How installed:	Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08
Describe		6. Bentonite seal:	a. Bentonite granules ☐ 33 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32 c. Other ☐
17. Source of water (attach analysis, if required):		7. Fine sand material: Manufacturer, product name & mesh size	a. #15 Sand b. Volume added 0.6 ft ³
E. Bentonite seal, top	882.2 ft. MSL or 0.5 ft.	8. Filter pack material: Manufacturer, product name & mesh size	a. #40 Sand b. Volume added 3.8 ft ³
F. Fine sand, top	867.5 ft. MSL or 15.3 ft.	9. Well casing:	Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
G. Filter pack, top	865.7 ft. MSL or 17.0 ft.	10. Screen material:	PVC
H. Screen joint, top	863.2 ft. MSL or 19.5 ft.	a. Screen Type:	Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
I. Well bottom	853.2 ft. MSL or 29.5 ft.	b. Manufacturer	
J. Filter pack, bottom	853.2 ft. MSL or 29.5 ft.	c. Slot size:	0.010 in.
K. Borehole, bottom	851.7 ft. MSL or 31.0 ft.	d. Slotted length:	10.0 ft.
L. Borehole, diameter	8.0 in.	11. Backfill material (below filter pack):	None ☐ 14 Sand ☒
M. O.D. well casing	2.38 in.		
N. I.D. well casing	2.07 in.		

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

Signature Michael K. Kelly Firm TRC Environmental Corporation Tel: 608.826.3600
708 Heartland Trail Madison WI 53717 Fax: 608.826.3941

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name Dane County Landfill #2 (Rodefild)	County Dane	Well Name M304A	
Facility License, Permit or Monitoring Number 03018	County Code 13	Wis. Unique Well Number VM 947	DNR Well Number 158

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

2. Well development method:

surged with bailer and bailed	☐ 4 1
surged with bailer and pumped	☒ 6 1
surged with block and bailed	☐ 4 2
surged with block and pumped	☐ 6 2
surged with block, bailed, and pumped	☐ 7 0
compressed air	☐ 2 0
bailed only	☐ 1 0
pumped only	☐ 5 1
pumped slowly	☐ 5 0
other _____	☐ _____

3. Time spent developing well **110 min.**

4. Depth of well (from top of well casing) **32.5 ft.**

5. Inside diameter of well **2.07 in.**

6. Volume of water in filter pack and well casing **8.2 gal.**

7. Volume of water removed from well **82.0 gal.**

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

9. Source of water added _____

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

17. Additional comments on development:
Surged pump while pumping to remove sediments.

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 25.14 ft.	25.25 ft.
Date	b. 11/9/2012	11/9/2012
Time	c. ☒ a.m. 08:00 ☐ p.m.	☒ a.m. 09:55 ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe)	Clear ☒ 2 0 Turbid ☐ 2 5 (Describe)

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

14. Total suspended solids **mg/l** **99.3 mg/l**

15. COD **mg/l** **mg/l**

16. Well developed by: Person's Name and Firm

Rich Olson
SES

Facility Address or Owner/Responsible Party Address

Name: **John Welch**
Firm: **Dane County**
Street: **1919 Alliant Energy Center Way**
City/State/Zip: **Madison, WI 53717**

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

Signature: 
Print Name: **Nathaniel R Keller**
Firm: **TRC Environmental Corporation**

NOTE: See instructions for more information including a list of county codes and well type codes.

Route To:

Watershed/Wastewater ☐
Remediation/Redevelopment ☐

Waste Management ☒
Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefeld)		Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.		Well Name M304B	
Facility License, Permit or Monitoring No. 03018		Local Grid Origin ☐ (estimated: ☐) or Well Location ☒		Wis. Unique Well No. DNR Well Number VM 946 160	
Facility ID 113127300		St. Plane 382,113 ft. N. 2,200,745 ft. E. ☒ S/C/N		Date Well Installed 11/07/2012	
Type of Well Well Code 12/pz		Section Location of Waste/Source NE 1/4 of NE 1/4 of Sec. 25, T. 7 N, R. 10 ☒ E ☐ W		Well Installed By: (Person's Name and Firm) Rich Olson	
Distance from Waste/Source 0 ft.		Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known		Gov. Lot Number SES, Inc.	

A. Protective pipe, top elevation 884.73 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 884.84 ft. MSL	2. Protective cover pipe: a. Inside diameter: 4.0 in. b. Length: 7.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 882.5 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom 881.5 ft. MSL or 1.0 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 Sand ☒
13. Sieve analysis attached? ☒ Yes ☐ No	5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33 b. Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35 c. 1.3 Lbs/gal mud weight . . . Bentonite slurry ☒ 31 d. % Bentonite . . . Bentonite-cement grout ☐ 50 e. 15 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 chips ☒ 32 c. Other ☐
15. Drilling fluid used: Water ☒ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. #15 Sand b. Volume added 0.6 ft ³
16. Drilling additives used? ☐ Yes ☒ No	8. Filter pack material: Manufacturer, product name & mesh size a. #40 Sand b. Volume added 2.2 ft ³
Describe _____	9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
17. Source of water (attach analysis, if required): City of Madison	10. Screen material: PVC a. Screen Type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
E. Bentonite seal, top 835.5 ft. MSL or 47.0 ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 5.0 ft.
F. Fine sand, top 831.5 ft. MSL or 51.0 ft.	11. Backfill material (below filter pack): None ☐ 14 Formation ☒
G. Filter pack, top 829.0 ft. MSL or 53.5 ft.	
H. Screen joint, top 824.5 ft. MSL or 58.0 ft.	
I. Well bottom 819.5 ft. MSL or 63.0 ft.	
J. Filter pack, bottom 819.5 ft. MSL or 63.0 ft.	
K. Borehole, bottom 818.5 ft. MSL or 64.0 ft.	
L. Borehole, diameter 8.0 in.	
M. O.D. well casing 2.38 in.	
N. I.D. well casing 2.07 in.	

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

Signature [Signature] Firm TRC Environmental Corporation Tel: 608.826.3600
708 Heartland Trail Madison WI 53717 Fax: 608.826.3941

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name Dane County Landfill #2 (Rodefild)	County Dane	Well Name M304B
Facility License, Permit or Monitoring Number 03018	County Code 13	Wis. Unique Well Number VM 946
		DNR Well Number 160

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

2. Well development method:

- | | |
|---------------------------------------|---|
| surged with bailer and bailed | ☐ 4 1 |
| surged with bailer and pumped | ☒ 6 1 |
| surged with block and bailed | ☐ 4 2 |
| surged with block and pumped | ☐ 6 2 |
| surged with block, bailed, and pumped | ☐ 7 0 |
| compressed air | ☐ 2 0 |
| bailed only | ☐ 1 0 |
| pumped only | ☐ 5 1 |
| pumped slowly | ☐ 5 0 |
| other _____ | ☐ — |

3. Time spent developing well **100 min.**

4. Depth of well (from top of well casing) **63.2 ft.**

5. Inside diameter of well **2.07 in.**

6. Volume of water in filter pack and well casing **11.2 gal.**

7. Volume of water removed from well **112.0 gal.**

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

9. Source of water added _____

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

17. Additional comments on development:
Surged pump while pumping to remove sediments.

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 24.61 ft.	24.76 ft.
Date	b. 11/9/2012	11/9/2012
Time	c. 08:00 ☒ a.m. ☐ p.m.	09:48 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) _____	Clear ☒ 2 0 Turbid ☐ 2 5 (Describe) _____

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

14. Total suspended solids **mg/l** **517.0 mg/l**

15. COD **mg/l** **27.4 mg/l**

16. Well developed by: Person's Name and Firm

Rich Olson
SES

Facility Address or Owner/Responsible Party Address

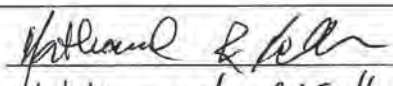
Name: **John Welch**

Firm: **Dane County**

Street: **1919 Alliant Energy Center Way**

City/State/Zip: **Madison, WI 53717**

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

Signature: 

Print Name: **Nathaniel E Keller**

Firm: **TRC Environmental Corporation**

NOTE: See instructions for more information including a list of county codes and well type codes.

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

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefeld)	Local Grid Location of Well _____ ft. ☐ N. _____ ft. ☐ E. _____ ft. ☐ S. _____ ft. ☐ W.	Well Name M305A
Facility License, Permit or Monitoring No. 03018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. _____ " Long. _____ " or	Wis. Unique Well No. VM 948 DNR Well Number 162
Facility ID 113127300	St. Plane 381,402 ft. N. 2,200,778 ft. E. ☒ C/N	Date Well Installed 11/06/2012
Type of Well Well Code 11/mw	Section Location of Waste/Source SE 1/4 of NE 1/4 of Sec. 25, T. 7 N. R. 10 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Rich Olson
Distance from Waste/Source 0 ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	SES, Inc.
Enf. Stds. Apply ☐	Gov. Lot Number	

A. Protective pipe, top elevation _____ 892.59 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation _____ 892.68 ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ 4.0 in. b. Length: _____ 7.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation _____ 890.4 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe: _____
D. Surface seal, bottom _____ ft. MSL or _____ 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: Sand ☐ 30 Other ☒
13. Sieve analysis attached? ☒ Yes ☐ No	5. Annular space seal: a. Granular/Chipped 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. 6.4 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 chips ☒ 32 c. _____ Other ☐
16. Drilling additives used? ☐ Yes ☒ No	7. Fine sand material: Manufacturer, product name & mesh size a. _____ #15 Sand b. Volume added _____ 0.6 ft ³
Describe _____	8. Filter pack material: Manufacturer, product name & mesh size a. _____ #40 Sand b. Volume added _____ 3.8 ft ³
17. Source of water (attach analysis, if required): _____	9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
E. Bentonite seal, top _____ 889.9 ft. MSL or _____ 0.5 ft.	10. Screen material: PVC a. Screen Type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
F. Fine sand, top _____ 870.4 ft. MSL or _____ 20.0 ft.	b. Manufacturer _____ c. Slot size: _____ 0.010 in. d. Slotted length: _____ 10.0 ft.
G. Filter pack, top _____ 868.4 ft. MSL or _____ 22.0 ft.	11. Backfill material (below filter pack): None ☒ 14 Other ☐
H. Screen joint, top _____ 866.4 ft. MSL or _____ 24.0 ft.	
I. Well bottom _____ 856.4 ft. MSL or _____ 34.0 ft.	
J. Filter pack, bottom _____ 856.4 ft. MSL or _____ 34.0 ft.	
K. Borehole, bottom _____ 856.4 ft. MSL or _____ 34.0 ft.	
L. Borehole, diameter _____ 8.0 in.	
M. O.D. well casing _____ 2.38 in.	
N. I.D. well casing _____ 2.07 in.	

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

Signature *Michael R. Kelly* Firm **TRC Environmental Corporation** Tel: 608.826.3600
708 Heartland Trail Madison WI 53717 Fax: 608.826.3941

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name Dane County Landfill #2 (Rodefild)	County Dane	Well Name M305A
Facility License, Permit or Monitoring Number 03018	County Code 13	Wis. Unique Well Number VM 948
		DNR Well Number 162

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

2. Well development method:

- | | |
|---------------------------------------|---|
| surged with bailer and bailed | ☐ 4 1 |
| surged with bailer and pumped | ☒ 6 1 |
| surged with block and bailed | ☐ 4 2 |
| surged with block and pumped | ☐ 6 2 |
| surged with block, bailed, and pumped | ☐ 7 0 |
| compressed air | ☐ 2 0 |
| bailed only | ☐ 1 0 |
| pumped only | ☐ 5 1 |
| pumped slowly | ☐ 5 0 |
| other _____ | ☐ -- |

3. Time spent developing well **137 min.**

4. Depth of well (from top of well casing) **36.9 ft.**

5. Inside diameter of well **2.07 in.**

6. Volume of water in filter pack and well casing **1.0 gal.**

7. Volume of water removed from well **65.0 gal.**

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

9. Source of water added _____

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

17. Additional comments on development:

Surged pump while pumping to remove sediments.

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 30.61 ft.	30.66 ft.
Date	b. 11/9/2012	11/9/2012
Time	c. 08:28 ☒ a.m. ☐ p.m.	10:45 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.1 inches	0.0 inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) _____	Clear ☒ 2 0 Turbid ☐ 2 5 (Describe) _____
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	mg/l	131.0 mg/l
15. COD	mg/l	mg/l
16. Well developed by: Person's Name and Firm Rich Olson SES		

Facility Address or Owner/Responsible Party Address

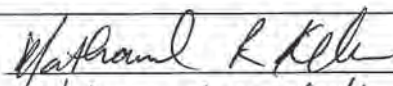
Name: **John Welch**

Firm: **Dane County**

Street: **1919 Alliant Energy Center Way**

City/State/Zip: **Madison, WI 53717**

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

Signature: 

Print Name: **Nathaniel R Keller**

Firm: **TRC Environmental Corporation**

NOTE: See instructions for more information including a list of county codes and well type codes.

Route To:

Watershed/Wastewater ☐
Remediation/Redevelopment ☐

Waste Management ☒
Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Dane County Landfill #2 (Rodefild)	Local Grid Location of Well ft. ☐ N. ☐ S. ☐ E. ☐ W.	Well Name M305B
Facility License, Permit or Monitoring No. 03018	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ☐ ☐ ☐ Long. ☐ ☐ ☐ or	Wis. Unique Well No. DNR Well Number VM 949 164
Facility ID 113127300	St. Plane 381,394 ft. N, 2,200,776 ft. E. ☒ C/N	Date Well Installed 11/06/2012
Type of Well Well Code 12/pz	Section Location of Waste/Source SE 1/4 of NE 1/4 of Sec. 25, T. 7 N, R. 10 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Rich Olson
Distance from Waste/Source 0 ft.	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	SES, Inc.

A. Protective pipe, top elevation 892.54 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 892.60 ft. MSL	2. Protective cover pipe: a. Inside diameter: 4.0 in. b. Length: 7.0 ft. c. Material: Steel ☒ 04 Other ☐
C. Land surface elevation 890.2 ft. MSL	d. Additional protection? ☐ Yes ☒ No If yes, describe:
D. Surface seal, bottom 889.2 ft. MSL or 1.0 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 Sand ☒
13. Sieve analysis attached? ☒ Yes ☐ No	5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33 b. Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35 c. 1.3 Lbs/gal mud weight . . . Bentonite slurry ☒ 31 d. % Bentonite . . . Bentonite-cement grout ☐ 50 e. 16.2 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 chips ☒ 32 c. Other ☐
15. Drilling fluid used: Water ☒ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☐ 99	7. Fine sand material: Manufacturer, product name & mesh size a. #15 Sand b. Volume added 0.6 ft ³
16. Drilling additives used? ☐ Yes ☒ No	8. Filter pack material: Manufacturer, product name & mesh size a. #40 Sand b. Volume added 2.2 ft ³
Describe _____	9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
17. Source of water (attach analysis, if required): City of Madison	10. Screen material: PVC a. Screen Type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
E. Bentonite seal, top 838.2 ft. MSL or 52.0 ft.	b. Manufacturer _____ c. Slot size: 0.010 in. d. Slotted length: 5.0 ft.
F. Fine sand, top 833.2 ft. MSL or 57.0 ft.	11. Backfill material (below filter pack): None ☐ 14 Sand ☒
G. Filter pack, top 831.2 ft. MSL or 59.0 ft.	
H. Screen joint, top 829.2 ft. MSL or 61.0 ft.	
I. Well bottom 824.2 ft. MSL or 66.0 ft.	
J. Filter pack, bottom 824.2 ft. MSL or 66.0 ft.	
K. Borehole, bottom 820.2 ft. MSL or 70.0 ft.	
L. Borehole, diameter 8.0 in.	
M. O.D. well casing 2.38 in.	
N. I.D. well casing 2.07 in.	

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

Signature Matthew J. Kelly Firm TRC Environmental Corporation Tel: 608.826.3600
708 Heartland Trail Madison WI 53717 Fax: 608.826.3941

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a 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 these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name Dane County Landfill #2 (Rodefeld)	County Dane	Well Name M305B
Facility License, Permit or Monitoring Number 03018	County Code 13	Wis. Unique Well Number VM 949
		DNR Well Number 164

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

2. Well development method:

- | | |
|---------------------------------------|---|
| surged with bailer and bailed | ☐ 4 1 |
| surged with bailer and pumped | ☒ 6 1 |
| surged with block and bailed | ☐ 4 2 |
| surged with block and pumped | ☐ 6 2 |
| surged with block, bailed, and pumped | ☐ 7 0 |
| compressed air | ☐ 2 0 |
| bailed only | ☐ 1 0 |
| pumped only | ☐ 5 1 |
| pumped slowly | ☐ 5 0 |
| other _____ | ☐ 1 1 |

3. Time spent developing well **101 min.**

4. Depth of well (from top of well casing) **68.2 ft.**

5. Inside diameter of well **2.07 in.**

6. Volume of water in filter pack and well casing **10.9 gal.**

7. Volume of water removed from well **110.0 gal.**

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

9. Source of water added _____

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 30.55 ft.	32.55 ft.
Date	b. 11/9/2012	11/9/2012
Time	c. ☒ a.m. 08:16 ☐ p.m.	☒ a.m. 09:57 ☐ p.m.
12. Sediment in well bottom	0.3 inches	0.0 inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) _____	Clear ☒ 2 0 Turbid ☐ 2 5 (Describe) _____

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

14. Total suspended solids **mg/l** **75.5 mg/l**

15. COD **mg/l** **25.0 mg/l**

16. Well developed by: Person's Name and Firm

Rich Olson
SES

17. Additional comments on development:
Surged pump while pumping to remove sediments.

Facility Address or Owner/Responsible Party Address

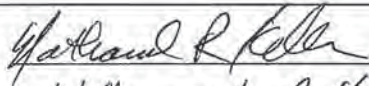
Name: **John Welch**

Firm: **Dane County**

Street: **1919 Alliant Energy Center Way**

City/State/Zip: **Madison, WI 53717**

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

Signature: 

Print Name: **Nathaniel R Keller**

Firm: **TRC Environmental Corporation**

NOTE: See instructions for more information including a list of county codes and well type codes.

Groundwater Monitoring Well Information Forms

Facility Name Dane County Landfill #2 (Rodefild)			Facility ID Number 113127300		License, Permit or Monitoring No. 03018		Date 4/9/2013		Completed By (Name and Firm) Nathaniel Keller		TRC Environmental Corporation 708 Heartland Trail Madison WI 53717									
WI Unique Well No	Well Name	DNR Well ID Number	Well Location	Dir. N E S W	Date Established	Well Casing		Elevations		References		Depths			Screen Length	Well Type	Well Status A/P/N	Enf. Stds.	Grad- ient	Distance to Waste
						Diam.	Type	Top of Well Casing	Ground Surface	MSL (X)	Site Datum (X)	Screen Top	Initial Groundwater	Well Depth						
VM 942	M301A	150	381,349	X	11/8/2012	2.07	P	894.77	892.0	X		30.1	31.7	40.1	10.0	11/mw	A		S	100
			2,201,305	X																
VM 940	M302A	152	382,876	X	11/8/2012	2.07	P	880.55	878.0	X		16.8	21.9	26.8	10.0	71/dw	A		D	60
			2,201,149	X																
VM 941	M302B	154	382,879	X	11/8/2012	2.07	P	880.49	877.9	X		58.6	22.0	63.6	5.0	12/pz	A		D	60
			2,201,142	X																
VM 943	M303A	156	380,837	X	11/8/2012	2.07	P	887.45	884.9	X		22.4	24.6	32.4	10.0	11/mw	A		U	75
			2,200,429	X																
VM 947	M304A	158	382,119	X	11/7/2012	2.07	P	885.26	882.7	X		22.5	25.1	32.5	10.0	11/mw	A		-	0
			2,200,739	X																
VM 946	M304B	160	382,113	X	11/7/2012	2.07	P	884.84	882.5	X		58.2	24.6	63.2	5.0	12/pz	A		-	0
			2,200,745	X																
VM 948	M305A	162	381,402	X	11/6/2012	2.07	P	892.68	890.4	X		26.9	30.6	36.9	10.0	11/mw	A		-	0
			2,200,778	X																
VM 949	M305B	164	381,394	X	11/6/2012	2.07	P	892.60	890.2	X		63.2	30.6	68.2	5.0	12/pz	A		-	0
			2,200,776	X																

Location Coordinates Are: ☒ State Plane Coordinate ☐ Northern ☐ Central ☒ Southern ☐ Local Grid System	Grid Origin Location (Check if estimated: ☐) Lat. ° ' " Long. ° ' " or St. Plane ft. N. ft. E. S/C/N Zone	Remarks: Survey completed November 14, 2012. Monitoring wells M304A, M304B, M305A, and M305B are located within the limits of waste.
--	---	---

Facility Name DANE CO. SANITARY LANDFILL				Facility ID Number 3018		Date 1-31-92		Completed By (Name and Firm) Eugene Kleinke SEC DONOHUE Rev. 9/15/92 cmk															
Well Name	DNR Well ID Number	Well Location	N	S	E	W	Date Established	Well Casing		Elevations		Reference		Screen Length	Well Depth	Type of Well (✓)					Gradient U, S, D or N		
								Diam.	Type	Top of Well Casing	Ground Surface	MSL (✓)	Site Datum (✓)			PIEZ	OW	PW	LYS	Other		Abandoned	Enf. Stds Apply
M-1A	001	2200960 381470				X	9-10-81	1.25	PVC	909.12	906.12	✓		10.0	48.0		X				✓	YES	U
M-1B	002	2200960 381470				X	6-03-82	2.0	PVC	909.12	906.11	✓		3.0	69.5	X				✓	YES	U	
M-1C	003	2200960 381470				X	8-13-82	2.0	PVC	908.79	905.99	✓		3.0	98.5	X				✓	YES	U	
M-3A	004	2200290 380950				X	9-09-87	1.25	PVC	897.11	894.11	✓		10.0	43.0		X			*	NO	N	
M-5A	005	2199560 383090				X	6-23-82	2.0	PVC	864.29	861.29	✓		10.0	14.5		X				YES	D	
M-5B	006	2199560 383090				X	6-23-82	2.0	PVC	864.33	861.33	✓		3.0	37.0	X					YES	D	
M-6A	007	2200760 383140				X	6-22-82	2.0	PVC	864.46	860.46	✓		10.0	17.25		X				YES	D	
M-6B	008	2200760 383140				X	6-22-82	2.0	PVC	864.59	861.59	✓		3.0	35.0	X					YES	D	
M-6C	009	2200760 383140				X	6-21-82	2.0	PVC	864.61	861.70	✓		3.0	55.0	X					NO	D	
M-7A	010	2198684 382443				X	6-16-82	2.0	PVC	865.48	862.48	✓		10.0	14.0		X			✓	YES	D	
M-7B	011	2198681 382438				X	6-14-82	2.0	PVC	865.53	862.53	✓		3.0	34.25	X				✓	YES	D	
M-9A	012	2200360 382700				X	6-17-82	2.0	PVC	876.58	872.75	✓		10.0	30.0		X				NO	D	

Location Coordinates Are:

☒ Local Grid System (preferred) ☐ State Plane Coordinate
☐ Northern ☐ Central

Remarks:

ENFORCEMENT STANDARD APPLICATIONS

RELATIVE TO EXISTING LANDFILL

* M-3A IS DAMAGED/Abandoned

Revised 5/15/13 to reflect abandoned wells - TBC

PSS Use:

File Maint. Completed: _____

Other:

Facility Name DANE CO. SANITARY LANDFILL				Facility ID Number 3018		Date 1-31-92		Completed By (Name and Firm) Eugene Kleinknecht SEC DONOHUE						Rev. 9/15/92 cmk								
Well Name	DNR Well ID Number	Well Location	N	S	E	W	Date Established	Well Casing		Elevations		Reference		Screen Length	Well Depth	Type of Well (✓)				Gradient U, S, D or N		
								Diam	Type	Top of Well Casing	Ground Surface	MSL (✓)	Site Datum (✓)			FEZ	OW	PW	LYS		Other	Abandoned
M-9B	013	2200360 382700				X	6-17-82	2.0	PVC	876.58	872.75	✓		3.0	55.0	X					NO	D
M-10A	014	2201090 382550				X	6-16-82	2.0	PVC	886.74	883.74	✓		10.0	45.0	X				✓	YES	N
M-12A		—					1982	—	PVC	—	—	—		10.0	52.5	X				✓	NO	N
M-13A	015	2200320 381800				X	6-11-82	2.0	PVC	913.97	910.97	✓		10.0	61.0	X				✓	NO	N
M-13B	016	2200320 381800				X	6-11-82	2.0	PVC	913.99	910.99	✓		3.0	83.0	X				✓	NO	N
M-14A	017	2198728 381205				X	6-10-82	2.0	PVC	865.95	863.20	✓		10.0	15.5	X					YES	N
M-14B	018	2198728 381208				X	6-09-82	2.0	PVC	866.00	863.25	✓		3.0	41.0	X					YES	N
M-17A	019	2201020 380680				X	6-07-82	2.0	PVC	882.15	879.32	✓		10.0	28.50	X					YES	U
M-17B	020	2201020 380680				X	6-04-82	2.0	PVC	882.39	879.39	✓		5.0	50.0	X					YES	U
M-18	021	2201040 382070				X	2-18-83	2.0	PVC	905.77	903.77	✓		5.0	80.0	X				✓	YES	N
M-19		—					1983	2.0	PVC	—	—	—		10.0	55.0	X				✓	NO	N
M-22	022	2198330 381020				X	2-15-83		PVC	882.44	880.44	✓		10.0	20.0	X					YES	N

Location Coordinates Are:

☒ Local System ☐ State Plane Coordinate
☐ Northern
☐ Central

Remarks:

ENFORCEMENT STANDARD APPLICATIONS
RELATIVE TO EXISTING LANDFILL

PSS Use:

File Maint. Completed: 

Other:

Facility Name DANE CO. SANITARY LANDFILL				Facility ID Number 3018		Date 1-31-92		Completed By (Name and Firm) Eugene Kleinke SEC DONOHUE Rev. 9/15/92 gnl														
Well Name	DNR Well ID Number	Well Location	N	S	E	W	Date Established	Well Casing		Elevations		Reference		Screen Length	Well Depth	Type of Well (✓)					Gradient U, S, D or N	
								Diam.	Type	Top of Well Casing	Ground Surface	MSL (✓)	Site Datum (✓)			PEZ	OW	PW	LYS	Other		Abandoned
M-23	023	2199410 380610			X		2-15-83	2.0	PVL	882.44	880.44	✓		10.0	25.0	X					YES	N
M-24	024	2201190 380170			X		2-15-83	2.0	PVL	878.39	876.39	✓		10.0	25.0	X				(i) YES	U	
M-25A (MW-25A)	025	2199201 382695			X		8-24-84	2.0	PVL	870.82	868.67	✓		10.0	22.0	X				NO	D	
M-25B (MW-25B)	026	2199200 382681			X		8-29-84	2.0	PVL	870.29*	867.32	✓		5.0	50.0	X				✓ NO	D	
M-26A (MW-26A)	027	2199820 382703			X		8-30-84	2.0	PVL	870.85	868.85	✓		10.0	22.0	X				NO	D	
M-26B (MW-26B)	028	2149823 382700			X		8-30-84	2.0	PVL	870.85	868.85	✓		5.0	50.0	X				NO	D	
M-27A (MW-27A)	029	2198801 382005			X		8-22-84	2.0	PVL	868.60	866.60	✓		10.0	18.0	X				✓ NO	D	
M-27B (MW-27B)	030	2198802 381999			X		8-22-84	2.0	PVL	868.37	866.37	✓		5.0	43.0	X				✓ NO	D	
M-28	034	2201230 382510			X		7-21-89	2.0	PVL	887.91	886.31	✓		15.0	44.5	X				YES	N	
M-29	035	2201280 381050			X		7-24-89	2.0	PVL	906.22	904.22	✓		5.0	59.0	X				YES	N	

Location Coordinates Are:

☒ Local Grid System (preferred) ☐ State Plane Coordinate
☐ Northern ☐ Central

Remarks:

"ENFORCEMENT STANDARD APPLICATIONS
 RELATIVE TO EXISTING LANDFILL"
 * (i) Abandoned by WDOT during 1997/1998

PSS Use:

File Maint. Completed: _____
 Other: No log available

Attachment C

Geotechnical Test Results

(Source: Table 6-2 and Appendix K of Eastern Expansion Feasibility Report)

Table 6-2
Soil Boring Laboratory Testing Summary
Feasibility Report
Dane County No. 2 (Rodefild) Landfill - Eastern Expansion
Madison, Wisconsin

BORING NUMBER	SAMPLE DEPTH (FEET)	USCS CLASSIFICATION	ATTERBERG LIMITS			GRAIN SIZE					LABORATORY HYDRAULIC CONDUCTIVITY (cm/s)
			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	GRAVEL (%)	SAND (%)	SILT (%)	CLAY (% <0.005 mm)	P200 (%)	
Loess and Glaciolacustrine (Silt / Clay / Meltwater Deposits)											
M-2	0-2	CH	51.0	25.0	26.0		1.0			99.0	
M303A	3-5	CL	49.0	22.0	27.0		1.9	60.0	38.1	98.1	
M305A	5-7	SC	25.0	15.0	10.0	16.3	39.2	26.9	15.3	44.5	2.00E-08
B314	3-5	CL	45.0	22.0	23.0	0.2	5.8	57.8	36.2	94	
Minimum			25.0	15.0	10.0	0.2	1.0	26.9	15.3	44.5	
Maximum			51.0	25.0	27.0	16.3	39.2	60.0	38.1	99.0	
Mean			42.5	21.0	21.5	8.3	12.0	48.2	29.9	83.9	
Standard Deviation			10.3	3.7	6.8	8.1	15.8	15.1	10.3	22.8	
Horicon Formation - Till											
M1A	29-30	SM	NP	NP	NP	7.0	62.0			31.0	
M1C	78-80	SM				29.0	50.0	10.0	11.0	21.0	
M9B	8-10	SM				7.0	66.0	17.0	10.0	27.0	
M10A	18-20	SM				3.0	72.0	16.0	9.0	25.0	2.10E-07
M16	18-20	SM				8.0	66.0	18.0	8.0	26.0	
M17	18-20	SM				6.0	61.0	23.0	10.0	33.0	
M301A	3-5	SM	NV	NP	NP	2.8	69.9	14.5	12.8	27.3	
M301A	33-35	SM	NV	NP	NP	11.2	73.8	8.5	6.5	15.0	
M302B	18-25	SM	NV	NP	NP	10.9	66.1	14.8	8.2	23.0	
M302B	53-55	SM	NV	NP	NP	6.4	74.8	5.8	13.0	18.8	
M304B	23-30	SM	NV	NP	NP	3.3	83.2	5.3	8.2	13.5	
M305B	63-65	SM	NV	NP	NP	16.4	60.9	12.7	10	22.7	
Minimum						2.8	50	5.3	6.5	13.5	
Maximum						29.0	83.2	23.0	13.0	33.0	
Mean						9.3	67.1	13.2	9.7	23.6	
Standard Deviation						7.0	8.1	5.2	1.9	5.6	

Table 6-2 (continued)
Soil Boring Laboratory Testing Summary
Feasibility Report
Dane County No. 2 (Rodefild) Landfill - Eastern Expansion
Madison, Wisconsin

BORING NUMBER	SAMPLE DEPTH (FEET)	USCS CLASSIFICATION	ATTERBERG LIMITS			GRAIN SIZE					LABORATORY HYDRAULIC CONDUCTIVITY (cm/s)
			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	GRAVEL (%)	SAND (%)	SILT (%)	CLAY (% <0.005 mm)	P200 (%)	
Horicon Formation - Outwash											
M1C	58-60	SP-SM				37.0	53.0			10.0	
M6C	43-45	SP-SM				1.0	90.0			8.0	
M13B	23-25	SP				25.0	71.0			4.0	
M16	58-60	SP				1.0	96.0			3.0	
M17	43-45	SP-SM				30.0	59.0			11.0	
M303A	23-30	SP	NV	NP	NP	42.5	53.1	3	1.4	4.4	
M305B	28-35	SP	NV	NP	NP	14.2	82.7	1.6	1.5	3.1	
Minimum						1.0	53.0	1.6	1.4	3.0	
Maximum						42.5	96.0	3.0	1.5	11.0	
Mean						21.5	72.1	2.3	1.5	6.2	
Standard Deviation						15.4	16.5	0.7	0.1	3.1	
Horicon Formation - Glaciolacustrine (Silt / Clay / Meltwater Deposits)											
M9B	18-20	ML					38.0			62.0	4.30E-06
M9B	38-40	CL	27.5	15.3	12.2			54.0	45.0	99.0	
M304B	58-60	CL	24.0	15.0	9.0	5.0	9.2	53.0	32.8	85.8	
B311	38-40	CL	35.0	17.0	18.0		1.0	38.5	60.5	99.0	
Minimum			24.0	15.0	9.0	5.0	1.0	38.5	32.8	62.0	
Maximum			35.0	17.0	18.0	5.0	38	54.0	60.5	99.0	
Mean			28.8	15.8	13.1	5.0	16.1	48.5	46.1	86.5	
Standard Deviation			4.6	0.9	3.7	0.0	15.9	7.1	11.3	15.1	

Footnotes:

- (1) Sample M17, 18-20 ft., is representative of the geologic material at the well screen of M17A.
- (2) Sample M17, 43-45 ft., is representative of the geologic material at the well screen of M17B.
- (3) Sample M9B, 18-20 ft., is representative of the geologic material at the well screen of M9A.

Notes:

1. Refer to Appendix K for Soil Test Data.
2. Blanks indicate this data was not tested or provided by laboratory during analysis.
3. NV = not viscous.
4. NP = nonplastic.
5. NA = not applicable.

Created By: N. Keller, 2/13/2013

Checked By: R. Wienkes, 2/13/2013 / J. Oswald, 3/3/13

Appendix K

Geotechnical Test Results

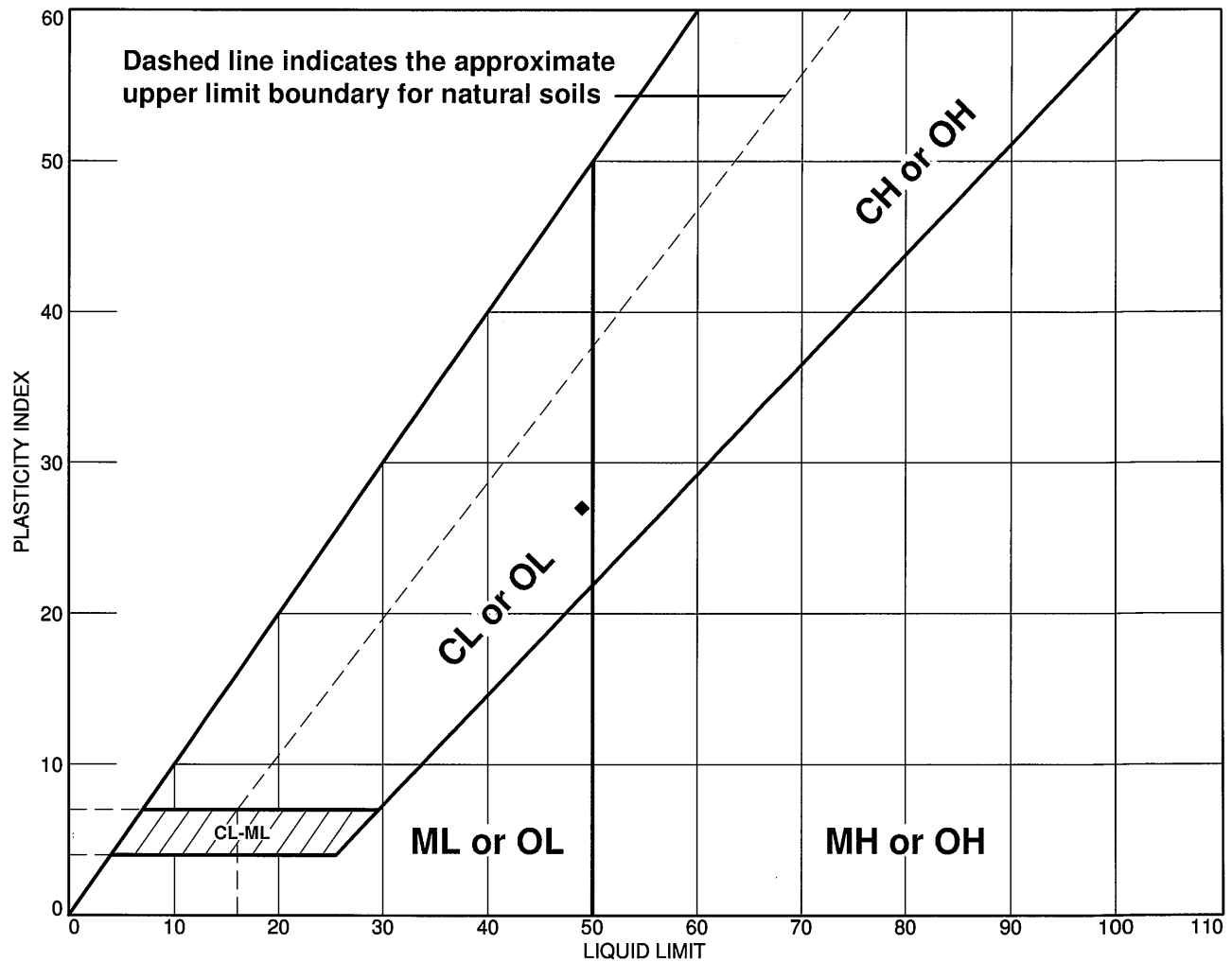
This appendix also contains soil test data for the existing site, which is used to meet the requirements of NR 507.05 and NR 512.09.

Table of Contents

- Laboratory Testing and Analyses – Moisture, Atterberg, Grain Size
- Summary of 1992 Feasibility Report Data
- Consolidation Test Results

[illegible]

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty sand	NV	NP	NP	65.6	15.0	SM
■	Silty sand	NV	NP	NP	73.5	23.0	SM
▲	Silty sand	NV	NP	NP	69.7	18.8	SM
◆	Lean clay	49	22	27	99.4	98.1	CL
▼	Poorly graded sand with gravel	NV	NP	NP	33.0	4.4	SP

Project No. 194528.0002 **Client:**

Project: Dane County

● **Source of Sample:** M301A **Sample Number:** M301A, 33-35'
 ■ **Source of Sample:** M302B **Sample Number:** M302B, 18-25'
 ▲ **Source of Sample:** M302B **Sample Number:** M302B, 53-55'
 ◆ **Source of Sample:** M303A **Sample Number:** M303A, 3-5'
 ▼ **Source of Sample:** M303A **Sample Number:** M303A, 23-30'

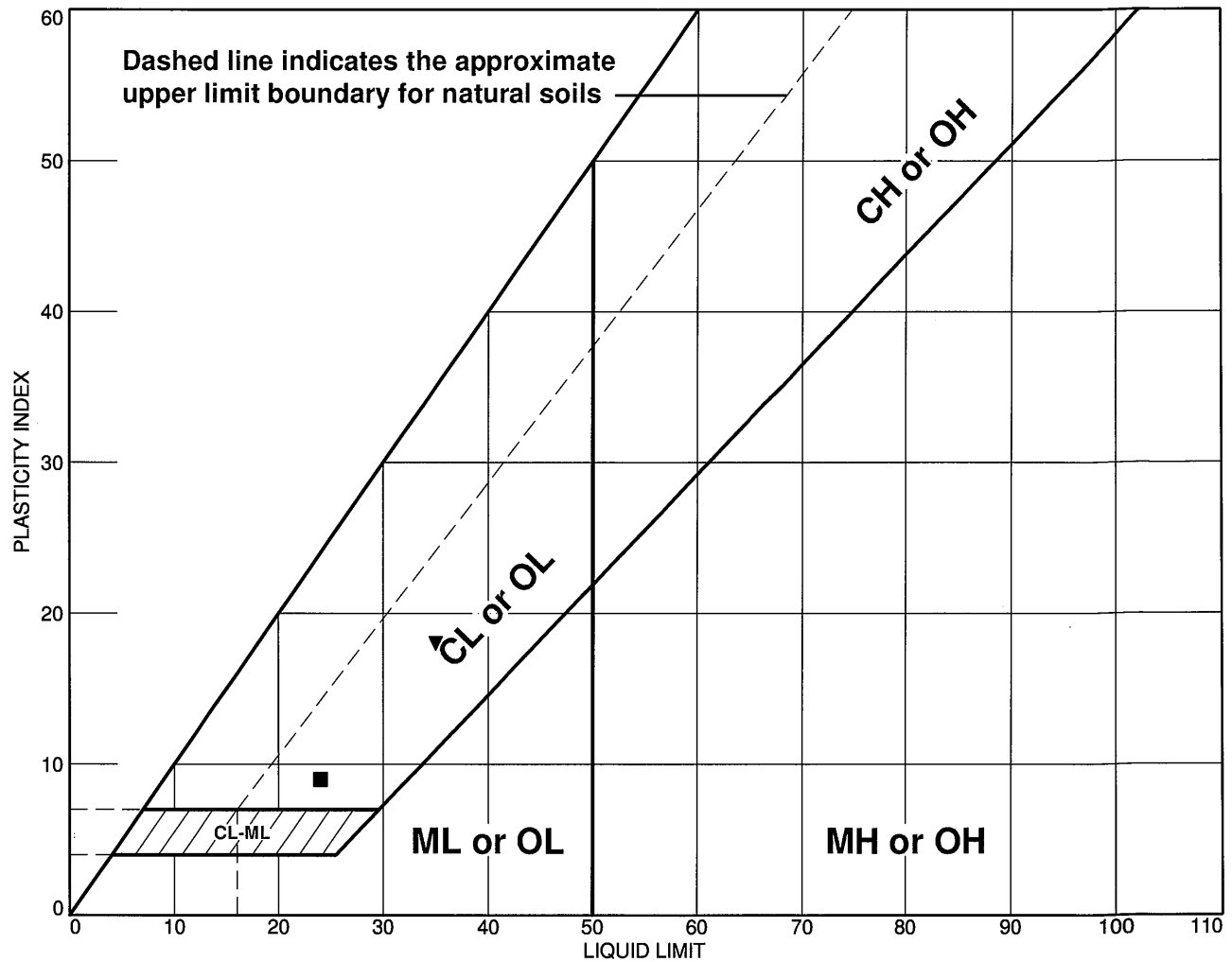
TRC Environmental Corp.

Madison, Wisconsin

Remarks:

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty sand	NV	NP	NP	78.1	13.5	SM
■	Lean clay	24	15	9	94.4	85.8	CL
▲	Poorly graded sand	NV	NP	NP	52.9	3.1	SP
◆	Silty sand with gravel	NV	NP	NP	63.8	22.7	SM
▼	Lean clay	35	17	18	99.8	99.0	CL

Project No. 194528.0002 Client:

Project: Dane County

● Source of Sample: M304B Sample Number: M304B, 23-30'
 ■ Source of Sample: M304B Sample Number: M304B, 58-60'
 ▲ Source of Sample: M305B Sample Number: M305B, 28-35'
 ◆ Source of Sample: M305B Sample Number: M305B, 63-65'
 ▼ Source of Sample: B311 Sample Number: B311, 38-40'

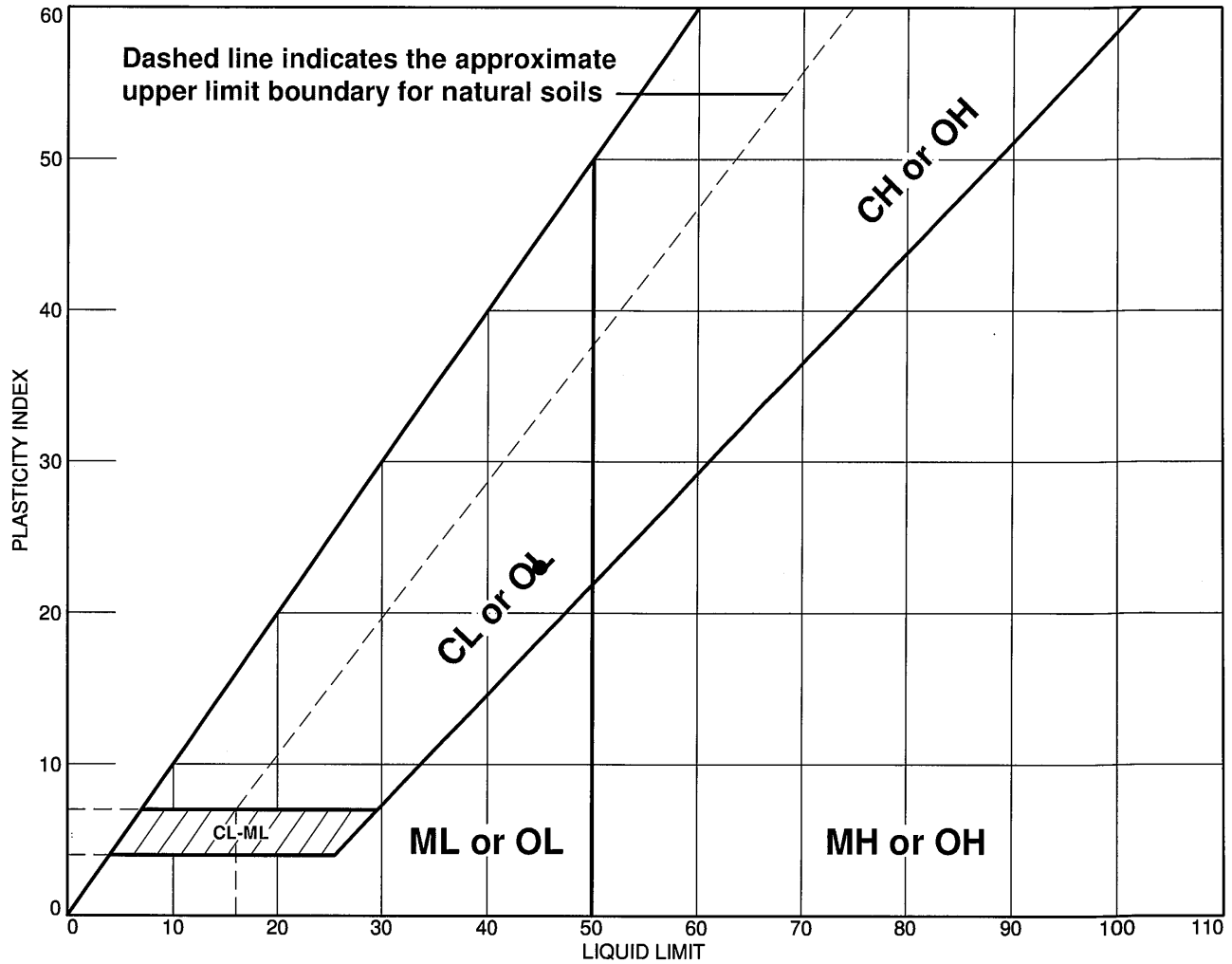
TRC Environmental Corp.

Madison, Wisconsin

Remarks:

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
•	Lean clay	45	22	23	98.7	94.0	CL

Project No. 194528.0002 Client:

Project: Dane County

• Source of Sample: B314 Sample Number: B314, 3-5'

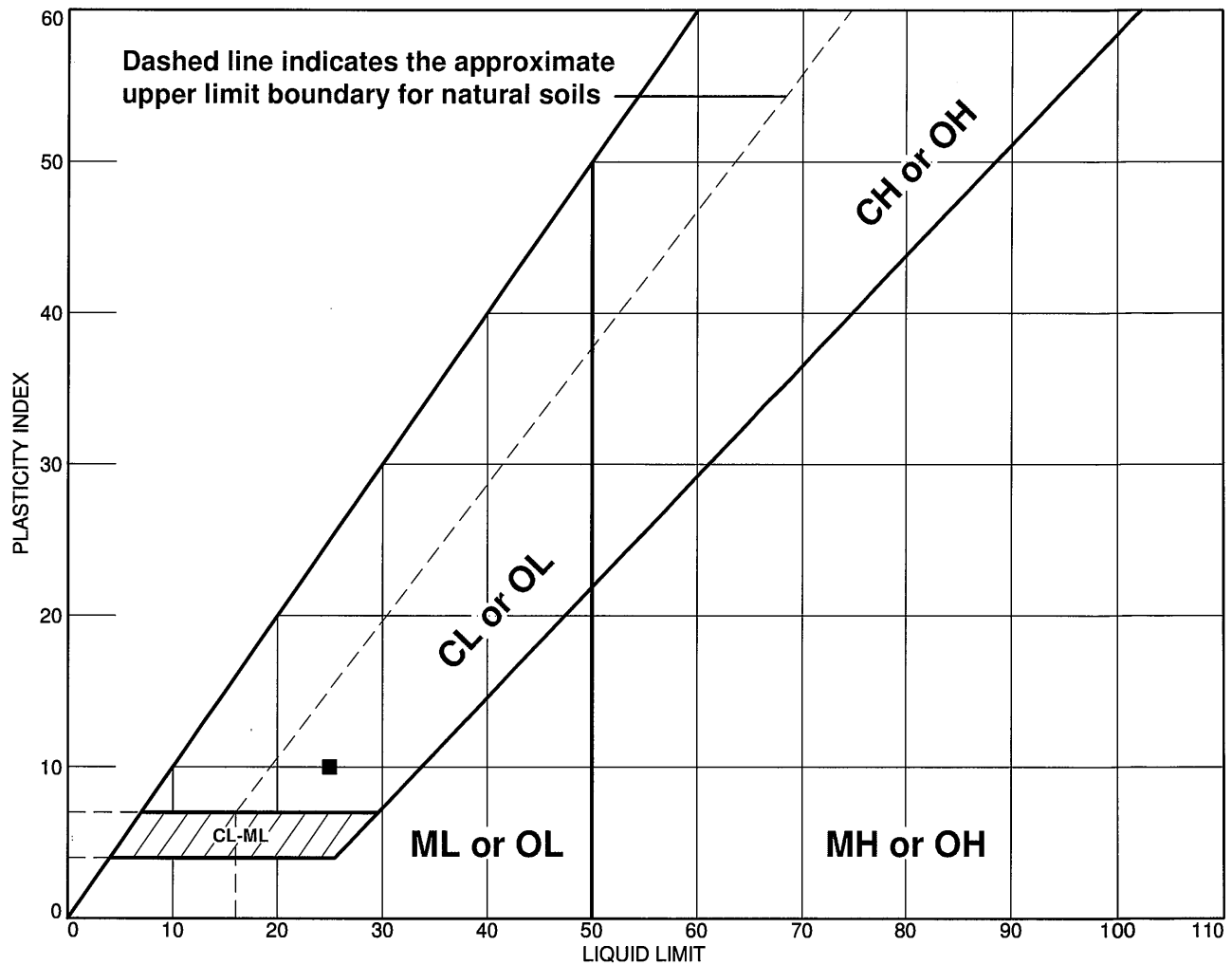
TRC Environmental Corp.

Madison, Wisconsin

Remarks:

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty sand	NV	NP	NP	83.9	27.3	SM
■	Clayey sand with gravel	25	15	10	71.4	44.5	SC

Project No. 194528.0002 Client:

Project: Dane County

● Source of Sample: M301A Sample Number: M301A, 3-5'

■ Source of Sample: M305A Sample Number: M305A, 5-7'

TRC Environmental Corp.

Madison, Wisconsin

Remarks:

Figure

RESIDUALS MANAGEMENT TECHNOLOGY

DATE: SEP-16-1981

TECHNICIAN JFS

GRAIN SIZE ANALYSIS

JOB NUMBER 2037 X 7000

SAMPLE NUMBER M1-53

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 303.38

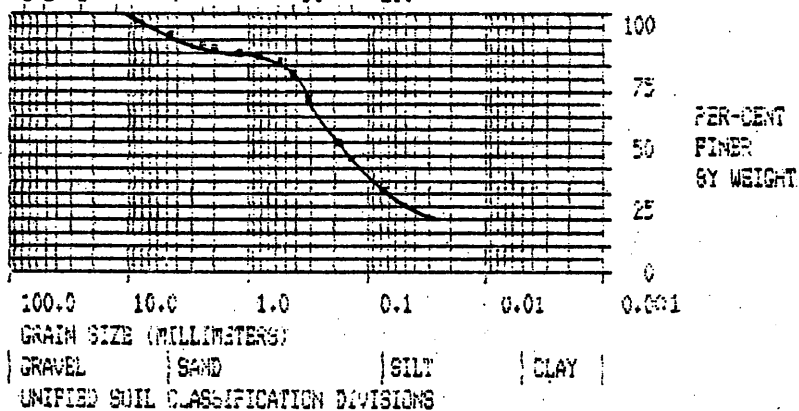
SIEVE SIZE	GRAMS RETAINED	% FINER
3/8 IN.	8.3	97.29
#4	21.87	92.79
#8	34.01	88.78
#10	36.66	87.91
#16	42.37	85.36
#20	46.81	84.57
#30	53.47	82.37
#40	66.22	77.51
#50	97.26	67.93
#80	150.72	50.31
#100	167.5	44.75
#200	208.66	31.22

GRAIN SIZE COMPOSITION SUMMARY
(PER-CENT BY WEIGHT)

PER-CENT GRAVEL	7.21
PER-CENT SAND	61.56
PER-CENT SILT/CLAY	31.22

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: SEP-16-1981
 TECHNICIAN JFS

GRAIN SIZE ANALYSIS
 JOB NUMBER 203/ X-7000
 SAMPLE NUMBER #2-S1

SIEVE ANALYSIS

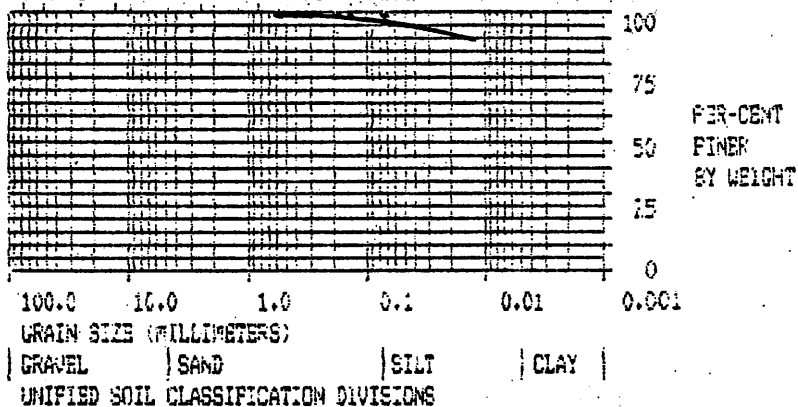
GRAMS OF SOIL SIEVED 245.67

SIEVE SIZE	GRAMS RETAINED	% FINER
#30	.02	99.99
#40	.27	99.89
#50	.67	99.72
#80	1.52	99.38
#100	1.72	99.29
#200	2.04	99.16

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)
 PER-CENT GRAVEL 0
 PER-CENT SAND .84
 PER-CENT SILT/CLAY 99.16

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M1C S-4

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 382.37

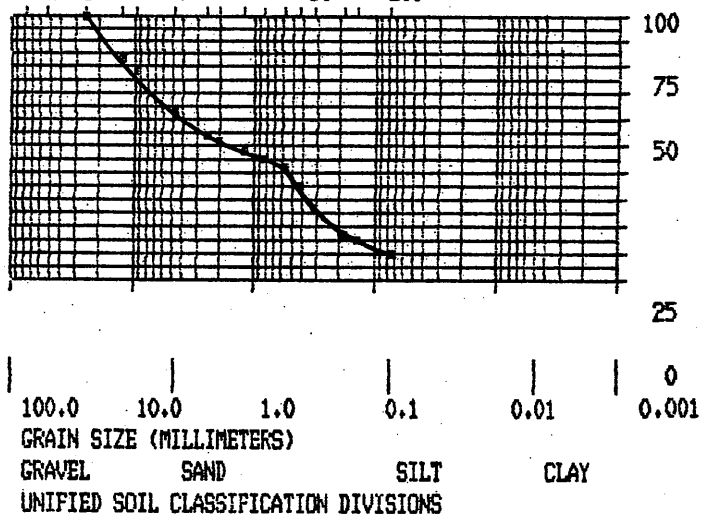
SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	0	100
1/2 IN.	63.59	83.36
3/8 IN.	82.27	78.48
#4	139.82	63.43
#8	175.07	54.21
#10	182.15	52.36
#16	198.16	48.17
#20	207.64	45.69
#30	221.27	42.13
#40	245.35	35.83
#50	277.48	27.43
#80	315.24	17.55
#100	322.49	15.66
#200	342.43	10.44

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL 36.56
 PER-CENT SAND 52.99
 PER-CENT SILT/CLAY 10.44

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



RESIDUALS MANAGEMENT TECHNOLOGY
DATE: JULY-20-1982
TECHNICIAN JPH

GRAIN SIZE ANALYSIS
JOB NUMBER 2037-7300
SAMPLE NUMBER M1C S-8

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 185.15

SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	0	100
1/2 IN.	30.59	83.47
3/8 IN.	40.65	78.04
#4	54.24	70.7
#8	64.71	65.04
#10	66.74	63.95
#16	71.59	61.33
#20	74.73	59.63
#30	80.09	56.74
#40	90.86	50.92
#50	108.12	41.6
#80	131.12	29.18
#100	135.73	26.69
#200	147.09	20.55

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65

PER-CENT PASSING #10 SIEVE 63.95

GRAMS OF SOIL TESTED 100

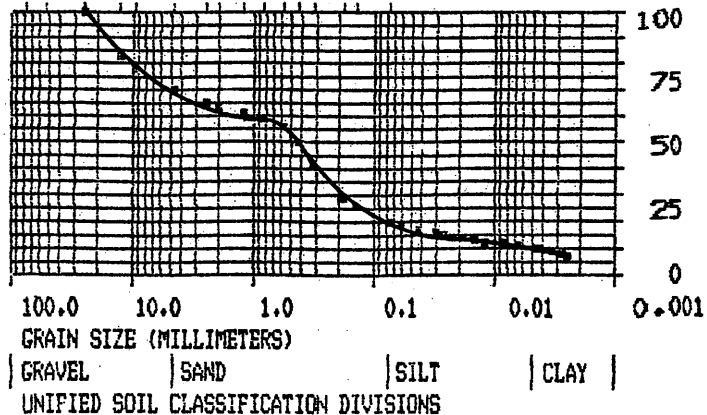
TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE (MM)	% FINER
.5	37	22	.0635	19.79
1	33.5	22	.046	17.55
2	31.5	22	.0329	16.26
3	30	22	.0272	15.3
4	29.5	22	.0236	14.98
6	28.5	22	.0194	14.34
10	27	22	.0151	13.38
15	26	22	.0124	12.73
30	25	22	8.8E-03	12.09
58	24	22	6.4E-03	11.45
126	22	22	4.4E-03	10.17
220	21	22	3.3E-03	9.53
296	20	22	2.9E-03	8.89
341	19.5	22	2.7E-03	8.56
403	18.5	22	2.5E-03	7.92

GRAIN SIZE COMPOSITION SUMMARY
(PER-CENT BY WEIGHT)
PER-CENT GRAVEL 29.3

PER-CENT SAND 50.14
PER-CENT SILT 9.99
PER-CENT CLAY 10.55

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: SEP-16-1981
 TECHNICIAN JFS

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037 X 7000
 SAMPLE NUMBER 12-86

SIEVE ANALYSIS

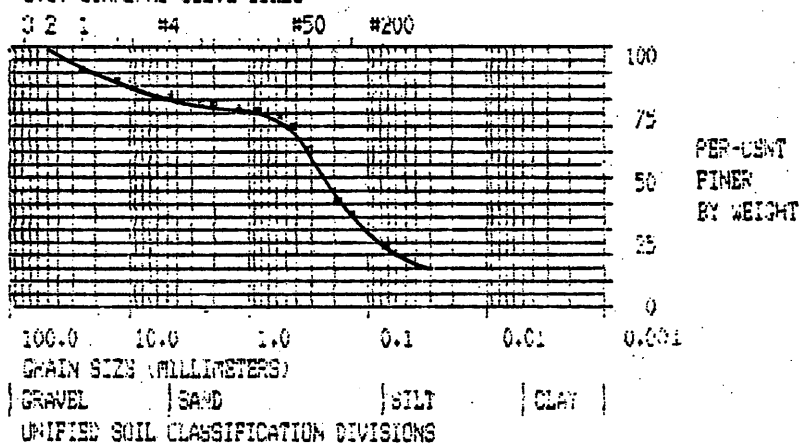
GRAMS OF SOIL SIEVED 543.5-

SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	47.83	91.22
1/2 IN.	65.84	87.92
3/8 IN.	74.57	86.28
#4	93.47	82.8
#6	110.82	79.81
#10	114.41	78.95
#16	123.17	77.33
#20	128.35	76.38
#30	137.3	74.73
#40	159.14	70.72
#50	210.2	61.32
#80	318.28	41.44
#100	344.49	36.62
#200	408.4	24.86

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)

PER-CENT GRAVEL 17.19
 PER-CENT SAND 57.94
 PER-CENT SILT/CLAY 24.86

U.S. STANDARD SIEVE SIZES



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER MSB S-4

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 312.42

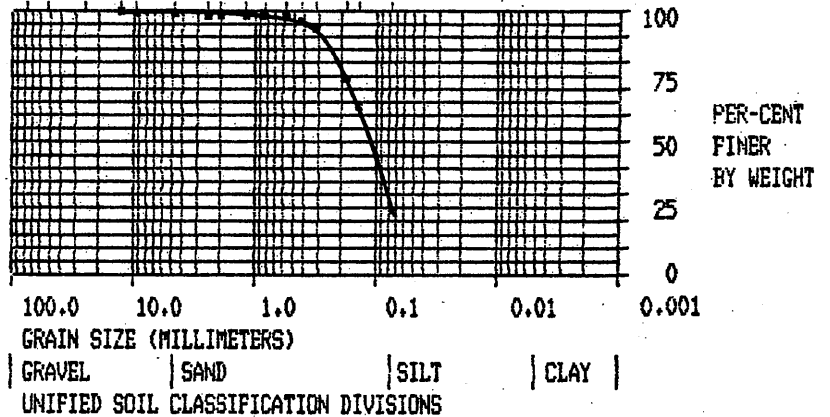
SIEVE SIZE	GRAMS RETAINED	% FINER
1/2 IN.	0	100
3/8 IN.	2.1	99.32
#4	2.88	99.07
#8	3.89	98.75
#10	4.08	98.69
#16	4.72	98.48
#20	5.12	98.36
#30	6.09	98.05
#40	9.39	96.99
#50	20.72	93.36
#80	79.91	74.42
#100	113.05	63.81
#200	237.21	24.07

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL	.93
PER-CENT SAND	74.99
PER-CENT SILT/CLAY	24.07

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER MAC S-10

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 296.96

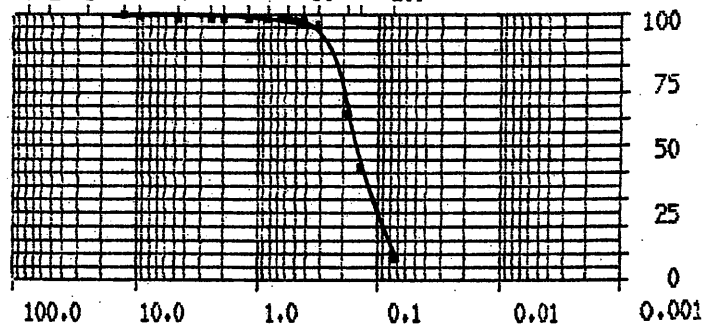
SIEVE SIZE	GRAMS RETAINED	% FINER
1/2 IN.	0	100
3/8 IN.	2.68	99.09
#4	3.45	98.83
#8	3.81	98.71
#10	3.96	98.66
#16	4.11	98.61
#20	4.18	98.59
#30	4.39	98.52
#40	4.98	98.32
#50	9.73	96.72
#80	112.14	62.23
#100	170.02	42.74
#200	271.87	8.44

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL 1.16
 PER-CENT SAND 90.39
 PER-CENT SILT/CLAY 8.44

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



GRAIN SIZE (MILLIMETERS)

GRAVEL SAND SILT CLAY
 UNIFIED SOIL CLASSIFICATION DIVISIONS

GRAIN SIZE ANALYSIS

DATE: JULY-20-1982

JOB NUMBER 2037-7300

TECHNICIAN JPH

SAMPLE NUMBER M7B S-7 S-7X

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 424.08

SIEVE SIZE	GRAMS RETAINED	ZFINER
1 IN.	0	100
1/2 IN.	12.56	97.03
3/8 IN.	19.97	95.29
#4	35.91	91.53
#8	49.97	88.21
#10	52.65	87.58
#16	59.68	85.92
#20	64.03	84.9
#30	71.89	83.04
#40	92.46	78.19
#50	141.93	66.53
#80	243.58	42.56
#100	268.64	36.65
#200	321.68	24.14

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65

PER-CENT PASSING #10 SIEVE 87.58

GRAMS OF SOIL TESTED 100

TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE(MM)	ZFINER
.5	32	22	.0657	22.71
1	28	22	.0477	19.2
2	25.5	22	.0343	17
3	23	22	.0264	14.81
4	22	22	.0248	13.93
6	21	22	.0203	13.05
10	20	22	.0158	12.17
15	19	22	.013	11.29
30	18.5	22	9.2E-03	10.85
58	17	22	6.7E-03	9.53
135	15.5	22	4.4E-03	8.22
210	15	22	3.5E-03	7.78
286	14.5	22	3E-03	7.34
331	14	22	2.8E-03	6.9
393	13.5	22	2.6E-03	6.46

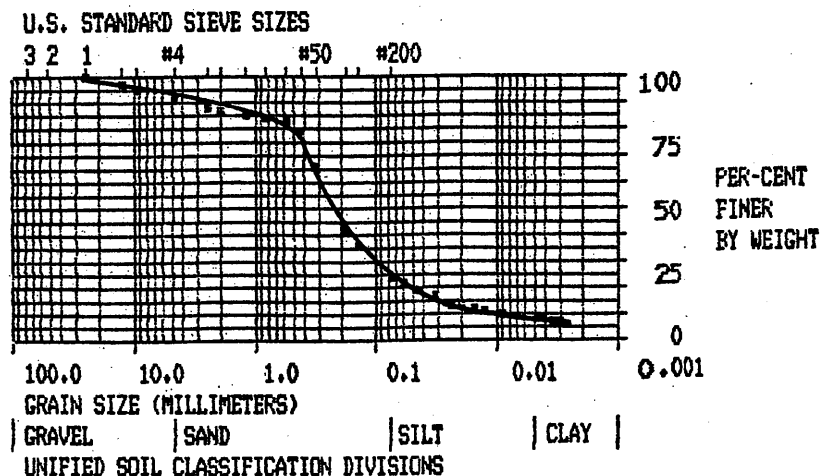
GRAIN SIZE COMPOSITION SUMMARY
(PER-CENT BY WEIGHT)

PER-CENT GRAVEL 8.46

PER-CENT SAND 67.39

PER-CENT SILT	15.57
---------------	-------

PER-CENT CLAY	8.56
---------------	------



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M8A S-7 S-7X

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 347.22

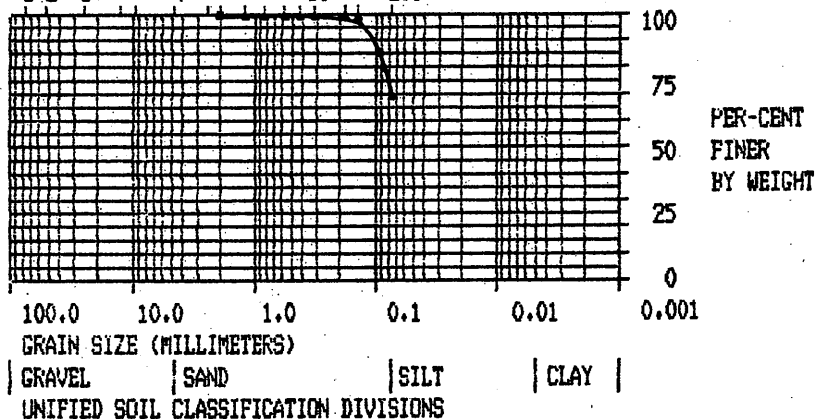
SIEVE SIZE	GRAMS RETAINED	% FINER
#10	0	100
#16	.08	99.97
#20	.16	99.95
#30	.27	99.92
#40	.56	99.83
#50	1.37	99.6
#80	3.37	99.02
#100	5.38	98.45
#200	105.54	69.6

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL	0
PER-CENT SAND	30.4
PER-CENT SILT/CLAY	69.6

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



RESIDUALS MANAGEMENT TECHNOLOGY
DATE: JULY-20-1982
TECHNICIAN JPH

GRAIN SIZE ANALYSIS
JOB NUMBER 2037-7300
SAMPLE NUMBER M9B S-3 S-3X

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 294.95

SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	0	100
1/2 IN.	7.07	97.6
3/8 IN.	9.56	96.75
#4	20.62	93
#8	31.73	89.24
#10	34.47	88.31
#16	40.33	86.32
#20	44.02	85.07
#30	50.25	82.96
#40	65.2900001	77.86
#50	97.34	66.99
#80	160.24	45.67
#100	180.96	38.64
#200	213.98	27.45

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65
PER-CENT PASSING #10 SIEVE 88.31
GRAMS OF SOIL TESTED 100

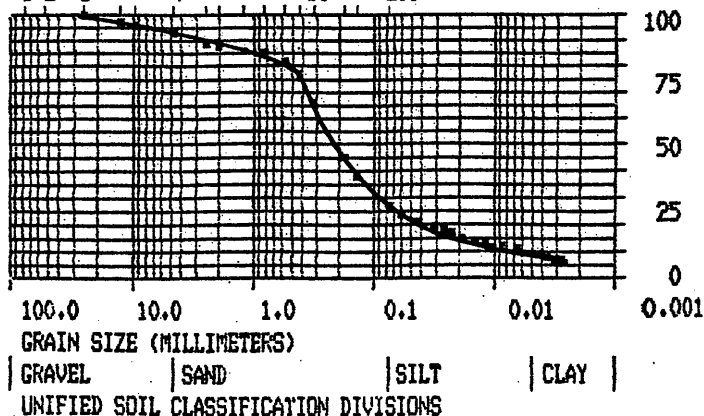
TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE (MM)	% FINER
.5	34	22	.0648	24.67
1	30.5	22	.0469	21.57
2	28	22	.0337	19.36
3	27	22	.0277	18.47
4	25.5	22	.0242	17.14
6	24	22	.02	15.82
10	22.5	22	.0156	14.49
15	21.5	22	.0128	13.6
30	20.5	22	9.1E-03	12.71
58	19	22	6.6E-03	11.39
126	17	22	4.5E-03	9.61
201	16	22	3.6E-03	8.73
277	15	22	3.1E-03	7.84
322	15	22	2.8E-03	7.84
384	14	22	2.6E-03	6.96

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL 7
PER-CENT SAND 65.54
PER-CENT SILT 17.41
PER-CENT CLAY 10.03

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200

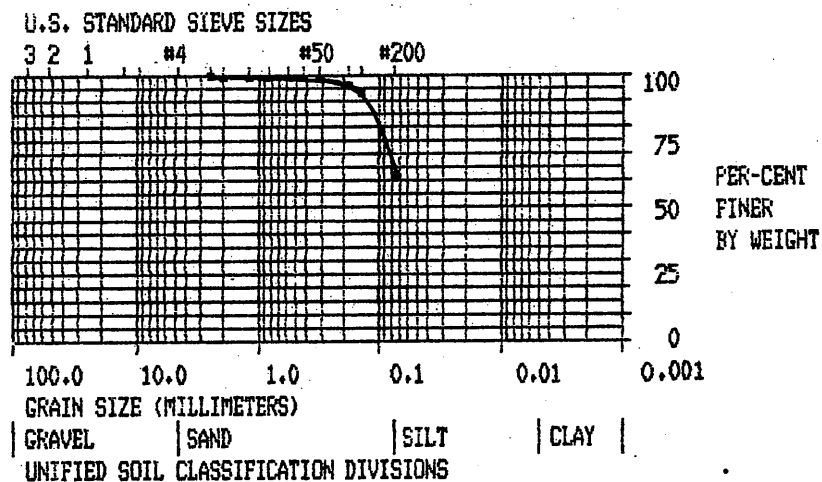


RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M9B S-5, S-5X

SIEVE ANALYSIS		
GRAMS OF SOIL SIEVED 361.02		
SIEVE SIZE	GRAMS RETAINED	% FINER
#8	0	100
#10	.07	99.98
#16	.12	99.96
#20	.17	99.95
#30	.27	99.92
#40	.57	99.84
#50	1.57	99.56
#80	11.36	96.85
#100	24.58	93.19
#200	137.04	62.04

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)
 PER-CENT GRAVEL 0
 PER-CENT SAND 37.95
 PER-CENT SILT/CLAY 62.04



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-23-1992
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER 19B S-6

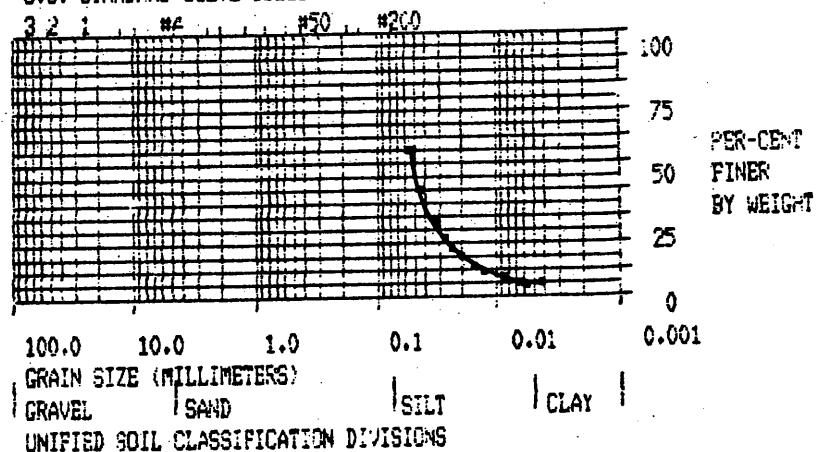
HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65
 PER-CENT PASSING #10 SIEVE 100
 GRAMS OF SOIL TESTED 75

TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE(MM)	%FINER
.5	48	21	.0593	55.45
1	36.5	21	.045	40.07
2	27.5	21	.0342	28.04
3	23.5	21	.0287	22.68
4	20.5	21	.0253	18.67
6	18	21	.021	15.33
10	15.5	21	.0165	11.98
15	14	21	.0136	9.98
34	12	21	9.1E-03	7.3
62	11	21	6.8E-03	5.97
90	10	21	5.6E-03	4.63
157	10	22	4.2E-03	5.16

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)
 PER-CENT GRAVEL/SAND 27.05
 PER-CENT SILT 68.09
 PER-CENT CLAY 4.85

U.S. STANDARD SIEVE SIZES



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-23-1982
 TECHNICIAN JPH

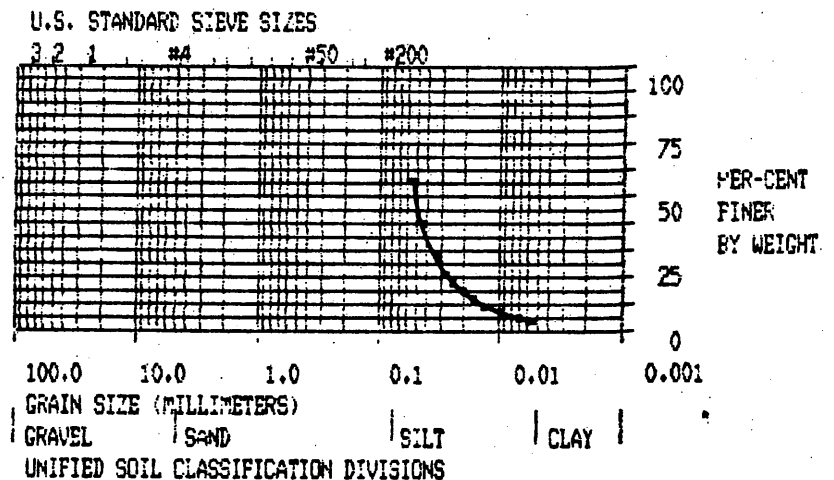
GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M9B S-6

TYPE 152-H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65
 PER-CENT PASSING #10 SIEVE 100
 GRAMS OF SOIL TESTED 75

TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE(MM)	ZFINER
.5	49	20	.0595	56.27
1	37	20	.0459	40.21
2	28	20	.0345	28.18
3	23	20	.0291	21.49
4	21	20	.0255	18.81
6	18.5	20	.0211	15.47
10	16	20	.0166	12.13
15	14	20	.0137	9.45
30	12.5	20	9.8E-03	7.45
60	11	20.5	6.9E-03	5.7
90	10	21	5.6E-03	4.63
110	10	21	5.1E-03	4.63

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)
 PER-CENT GRAVEL/SAND 25.42
 PER-CENT SILT 69.94
 PER-CENT CLAY 4.63



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M9B S-9 S-9X

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 220.55

SIEVE SIZE	GRAMS RETAINED	ZFINER
#30	0	100
#40	.04	99.98
#50	.07	99.96
#80	.13	99.94
#100	.23	99.89
#200	.46	99.79

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65

PER-CENT PASSING #10 SIEVE 100

GRAMS OF SOIL TESTED 55

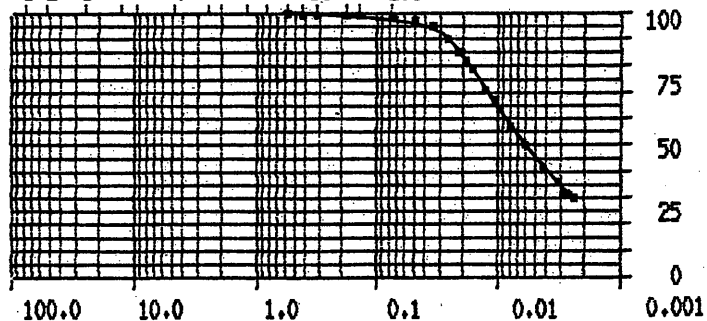
TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE (MM)	ZFINER
.5	59.5	22	.0535	97.32
1	58.5	22	.0381	95.49
2	56	22	.0275	90.93
3	53	22	.023	85.46
4	51.5	22	.0201	82.72
6	49.5	22	.0167	79.08
10	45.5	22	.0133	71.78
15	43	22	.0111	67.22
30	37.5	22	8.1E-03	57.19
58	34	22	6E-03	50.81
120	29	22	4.3E-03	41.69
228	26	22	3.2E-03	36.21
305	24	22	2.8E-03	32.57
350	23.5	22	2.6E-03	31.65
411	23	22	2.4E-03	30.74

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL	0
PER-CENT SAND	.21
PER-CENT SILT	54.34
PER-CENT CLAY	45.44

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



GRAIN SIZE (MILLIMETERS)

GRAVEL SAND SILT CLAY
 UNIFIED SOIL CLASSIFICATION DIVISIONS

RESIDUALS MANAGEMENT TECHNOLOGY
DATE: JULY-20-1982
TECHNICIAN JPH

GRAIN SIZE ANALYSIS
JOB NUMBER 2037-7300
SAMPLE NUMBER M10A S-5 S-5X

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 157.46

SIEVE SIZE	GRAMS RETAINED	%FINER
3/8 IN.	0	100
#4	4.81	96.94
#8	11.85	92.47
#10	13.66	91.32
#16	17.2	89.07
#20	19.48	87.62
#30	23.31	85.19
#40	32.36	79.44
#50	50.94	67.64
#80	85.21	45.88
#100	94.83	39.77
#200	117.34	25.47

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65

PER-CENT PASSING #10 SIEVE 91.32

GRAMS OF SOIL TESTED 100

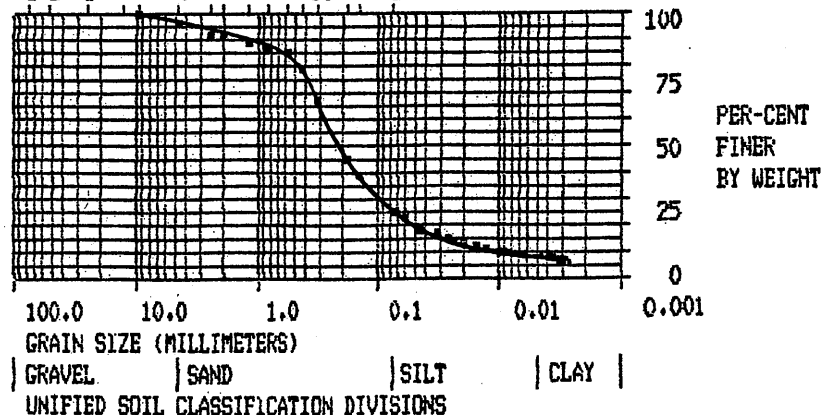
TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE (MM)	%FINER
.5	31.5	22	.0659	23.22
1	26.5	22	.0482	18.64
2	25	22	.0344	17.27
3	23	22	.0284	15.44
4	22	22	.0248	14.52
6	20.5	22	.0204	13.15
10	19.5	22	.0159	12.23
15	18.5	22	.013	11.32
30	18	22	9.2E-03	10.86
60	17	22	6.6E-03	9.94
122	16	22	4.6E-03	9.03
191	15	22	3.7E-03	8.11
267	14.5	22	3.1E-03	7.65
312	14.5	22	2.9E-03	7.65
374	13.5	22	2.7E-03	6.74

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL	3.06
PER-CENT SAND	71.46
PER-CENT SILT	16.25
PER-CENT CLAY	9.21

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



RESIDUALS MANAGEMENT TECHNOLOGY
DATE: JULY-20-1982
TECHNICIAN JPH

GRAIN SIZE ANALYSIS
JOB NUMBER 2037-7300
SAMPLE NUMBER M12 S-7 S-7X

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 402.64

SIEVE SIZE	GRAMS RETAINED	ZFINER
1 IN.	0	100
1/2 IN.	7.44	98.15
3/8 IN.	14.07	96.5
#4	32.44	91.94
#8	53.48	86.71
#10	58.14	85.56
#16	64.74	83.92
#20	72.32	82.03
#30	88.01	78.14
#40	122.53	69.56
#50	184.34	54.21
#80	268.42	33.33
#100	287.04	28.71
#200	319.88	20.55

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65
PER-CENT PASSING #10 SIEVE 85.56
GRAMS OF SOIL TESTED 100

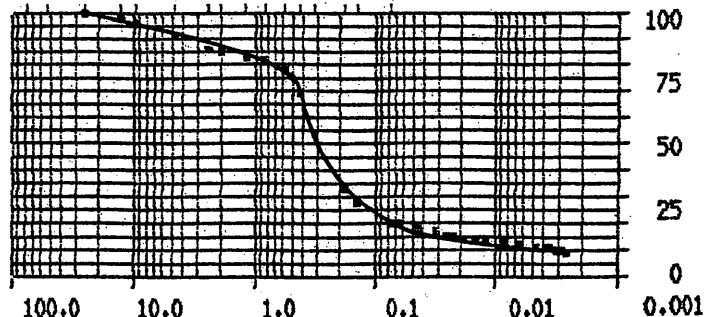
TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE (MM)	ZFINER
.5	29.5	22	.0668	20.04
1	27.5	22	.0478	18.33
2	26	22	.0342	17.04
3	24.5	22	.0281	15.75
4	24	22	.0244	15.32
6	23	22	.0201	14.46
10	22.5	22	.0156	14.03
15	22	22	.0128	13.61
30	21.5	22	9E-03	13.18
60	20.5	22	6.4E-03	12.32
120	19.5	22	4.6E-03	11.46
182	19	22	3.7E-03	11.03
258	18	22	3.1E-03	10.17
303	18	22	2.9E-03	10.17
365	17	22	2.6E-03	9.31

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL 8.06
PER-CENT SAND 71.39
PER-CENT SILT 8.89
PER-CENT CLAY 11.65

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



GRAIN SIZE (MILLIMETERS)

| GRAVEL | SAND | SILT | CLAY |

UNIFIED SOIL CLASSIFICATION DIVISIONS

RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M13B S-6X

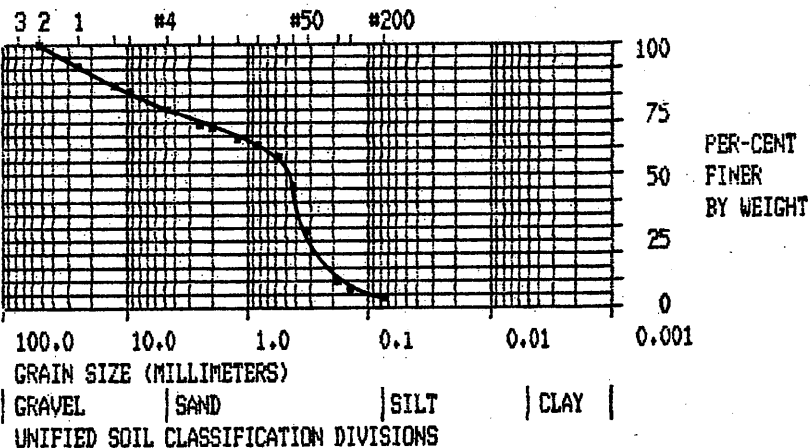
SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 379.04

SIEVE SIZE	GRAMS RETAINED	% FINER
2 IN.	0	100
1 IN.	31.47	91.69
1/2 IN.	58.85	84.47
3/8 IN.	66.83	82.36
#4	92.87	75.49
#8	115.24	69.59
#10	120.52	68.2
#16	134.43	64.53
#20	144.09	61.98
#30	162.32	57.17
#40	203.4	46.33
#50	268.17	29.25
#80	340.45	10.18
#100	351.62	7.23
#200	363.66	4.05

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)
 PER-CENT GRAVEL 24.5
 PER-CENT SAND 71.44
 PER-CENT SILT/CLAY 4.05

U.S. STANDARD SIEVE SIZES



GRAIN SIZE ANALYSIS

DATE: JULY-20-1982

JOB NUMBER 2037-7300

TECHNICIAN JPH

SAMPLE NUMBER M14B S-4

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 105.55

SIEVE SIZE	GRAMS RETAINED	ZFINER
#20	0	100
#30	.05	99.95
#40	.09	99.91
#50	.25	99.76
#80	.53	99.49
#100	.75	99.28
#200	1.59	98.49

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65

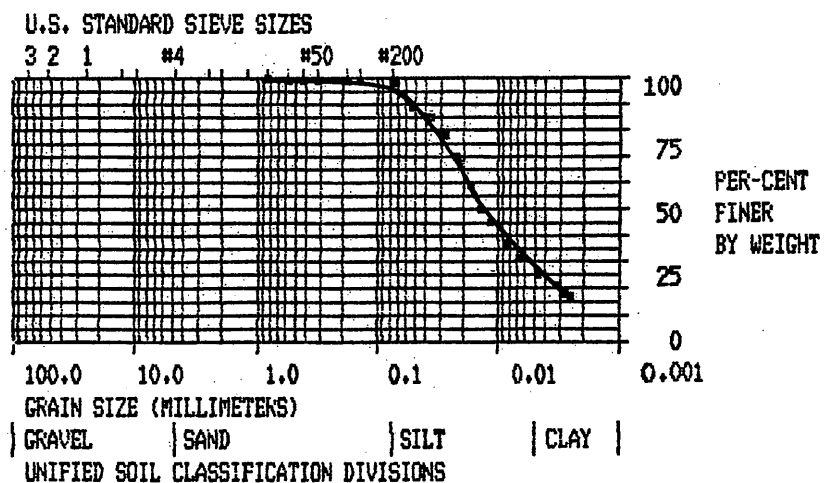
PER-CENT PASSING #10 SIEVE 100

GRAMS OF SOIL TESTED 55

TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE(MM)	ZFINER
.5	55	22	.0555	89.11
1	53	22	.0398	85.46
2	49	22	.029	78.16
3	45	22	.0244	70.87
4	43	22	.0215	67.22
6	39	22	.018	59.93
10	34	22	.0145	50.81
15	31	22	.012	45.33
30	26.5	22	8.8E-03	37.13
58	23.5	22	6.4E-03	31.65
119	20	22	4.6E-03	25.27
248	18	22	3.2E-03	21.62
315	17	22	2.8E-03	19.8
360	16.5	22	2.7E-03	18.89
421	16	22	2.5E-03	17.98

GRAIN SIZE COMPOSITION SUMMARY
(PER-CENT BY WEIGHT)

PER-CENT GRAVEL	0
PER-CENT SAND	1.5
PER-CENT SILT	71.8
PER-CENT CLAY	26.68



RESIDUALS MANAGEMENT TECHNOLOGY
DATE: JULY-20-1982
TECHNICIAN JPH

GRAIN SIZE ANALYSIS
JOB NUMBER 2037-7300
SAMPLE NUMBER M15 S-4 S-4X

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 296.58

SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	0	100
1/2 IN.	5.16	98.26
3/8 IN.	8.23	97.22
#4	17.7	94.03
#8	25.95	91.25
#10	28.07	90.53
#16	33.41	88.73
#20	37.17	87.46
#30	44.26	85.07
#40	62.39	78.96
#50	99.92	66.3
#80	163.85	44.75
#100	181.96	38.64
#200	222.52	24.97

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65

PER-CENT PASSING #10 SIEVE 90.53

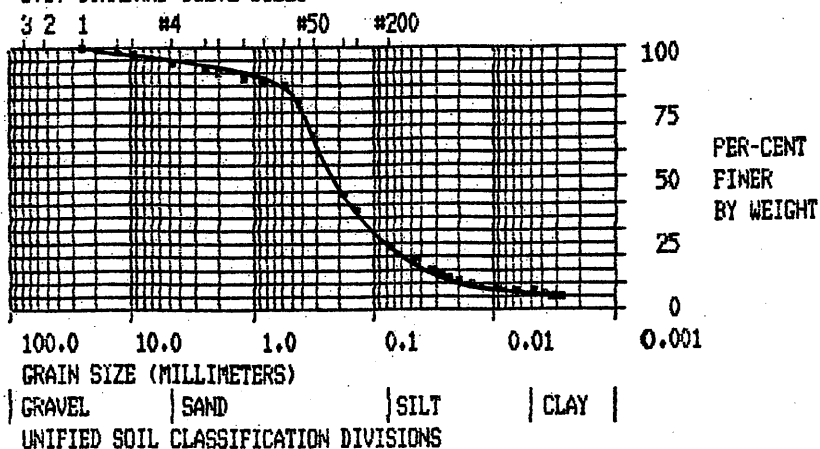
GRAMS OF SOIL TESTED 100

TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE (MM)	% FINER
.5	29.5	22	.0668	21.21
1	26	22	.0483	18.03
2	23	22	.0348	15.3
3	21.5	22	.0287	13.94
4	20	22	.0251	12.58
6	19	22	.0206	11.67
10	17.5	22	.0161	10.31
15	17	22	.0132	9.86
30	16.5	22	9.3E-03	9.4
60	14.5	22	6.7E-03	7.59
120	14	22	4.7E-03	7.13
172	13	22	3.9E-03	6.22
248	12.5	22	3.3E-03	5.77
293	12.5	22	3E-03	5.77
355	12	22	2.8E-03	5.31

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL	5.96
PER-CENT SAND	69.06
PER-CENT SILT	17.77
PER-CENT CLAY	7.19

U.S. STANDARD SIEVE SIZES



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M15 S-7X

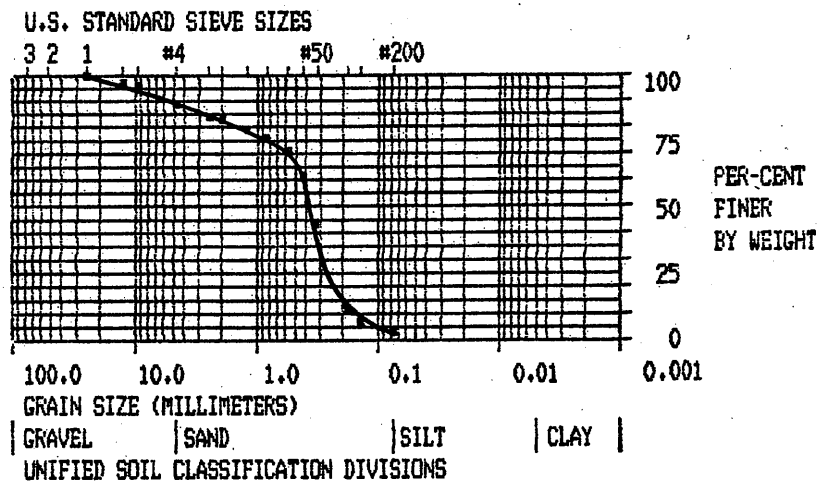
SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 339.55

SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	0	100
1/2 IN.	9.52	97.19
3/8 IN.	13.22	96.1
#4	35.86	89.43
#8	52.84	84.43
#10	57.12	83.17
#16	68.74	79.75
#20	78.4	76.91
#30	95.42	71.89
#40	128.23	62.23
#50	192.72	43.24
#80	297.52	12.37
#100	314.12	7.48
#200	328.2	3.34

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)

PER-CENT GRAVEL 10.56
 PER-CENT SAND 86.09
 PER-CENT SILT/CLAY 3.34



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M16 S-5 S-5X

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 300.17

SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	0	100
1/2 IN.	4.45	98.51
3/8 IN.	7.23	97.59
#4	22.8	92.4
#8	31.58	89.47
#10	34.41	88.53
#16	40.22	86.6
#20	44.32	85.23
#30	51.07	82.98
#40	66.9	77.71
#50	99.15	66.96
#80	157.87	47.4
#100	178.08	40.67
#200	221.82	26.1

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65

PER-CENT PASSING #10 SIEVE 88.53

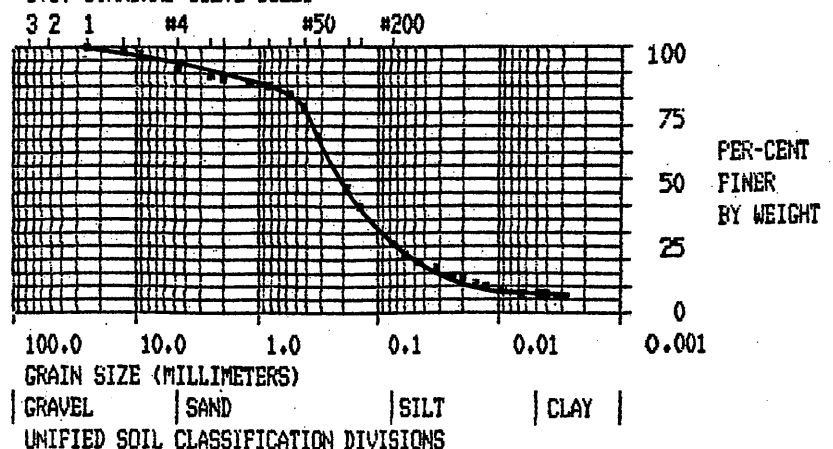
GRAMS OF SOIL TESTED 100

TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE (MM)	% FINER
.5	32	22	.0657	22.96
1	28	22	.0477	19.41
2	25.5	22	.0343	17.19
3	23	22	.0284	14.97
4	22	22	.0248	14.08
6	21	22	.0203	13.19
10	19	22	.0159	11.41
15	18.5	22	.013	10.97
30	17	22	9.3E-03	9.64
66	15	22	6.3E-03	7.86
121	15	22	4.7E-03	7.86
163	15	22	4E-03	7.86
239	14	22	3.3E-03	6.97
284	14	22	3E-03	6.97
346	13.5	22	2.8E-03	6.53

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL	7.59
PER-CENT SAND	66.3
PER-CENT SILT	18.24
PER-CENT CLAY	7.85

U.S. STANDARD SIEVE SIZES



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M16 S-13X

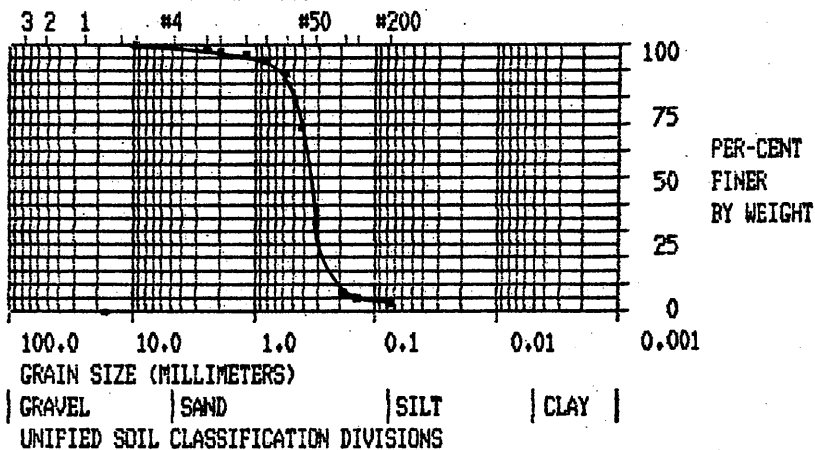
SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 331.4

SIEVE SIZE	GRAMS RETAINED	% FINER
3/8 IN.	0	100
#4	2.08	99.37
#8	6.61	98
#10	8.07	97.56
#16	12.94	96.09
#20	18.03	94.55
#30	35.56	89.26
#40	101.27	69.44
#50	218.55	34.05
#80	307.91	7.08
#100	313.87	5.28
#200	320.46	3.3

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)
 PER-CENT GRAVEL .62
 PER-CENT SAND 96.07
 PER-CENT SILT/CLAY 3.3

U.S. STANDARD SIEVE SIZES



RESIDUALS MANAGEMENT TECHNOLOGY
DATE: JULY-20-1982
TECHNICIAN JPH

GRAIN SIZE ANALYSIS
JOB NUMBER 2037-7300
SAMPLE NUMBER M17 S-5X M-17

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 184.05

SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	0	100
1/2 IN.	5.42	97.05
3/8 IN.	7.9	95.7
#4	10.76	94.15
#8	16.24	91.17
#10	17.65	90.41
#16	20.68	88.76
#20	22.49	87.78
#30	26.08	85.82
#40	34.92	81.02
#50	53.96	70.68
#80	90.04	51.07
#100	100.24	45.53
#200	123.01	33.16

TYPE 152H HYDROMETER ANALYSIS

SOIL SPECIFIC GRAVITY 2.65

PER-CENT PASSING #10 SIEVE 90.41

GRAMS OF SOIL TESTED 100

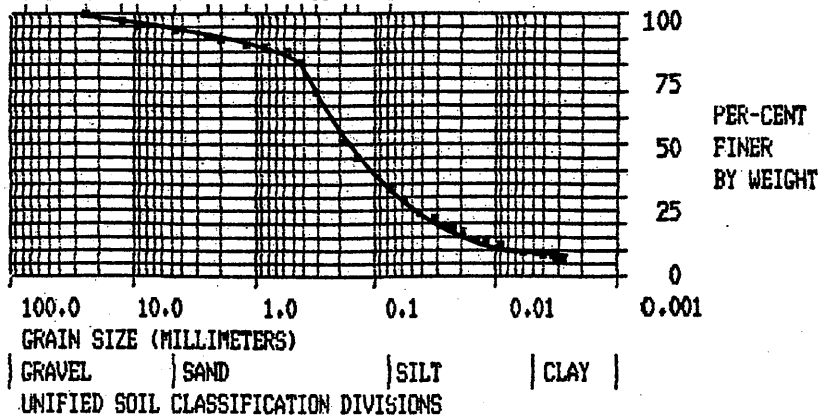
TIME (MINS)	HYDROMETER READING	TEMP (CENT)	PARTICLE SIZE (MM)	% FINER
.5	38.5	22	.0628	29.34
1	33.5	22	.046	24.81
2	30.5	22	.0332	22.09
3	28	22	.0275	19.82
4	26.5	22	.0241	18.46
6	25	22	.0198	17.1
10	22.5	22	.0156	14.83
15	21	22	.0128	13.47
30	19.5	22	9.2E-03	12.11
75	17	22	5.9E-03	9.84
117	17	22	4.7E-03	9.84
153	16	22	4.1E-03	8.94
229	15	22	3.4E-03	8.03
274	14.5	22	3.1E-03	7.58
336	14.5	22	2.8E-03	7.58

GRAIN SIZE COMPOSITION SUMMARY (PER-CENT BY WEIGHT)

PER-CENT GRAVEL	5.84
PER-CENT SAND	60.99
PER-CENT SILT	23.32
PER-CENT CLAY	9.83

U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



RESIDUALS MANAGEMENT TECHNOLOGY
 DATE: JULY-20-1982
 TECHNICIAN JPH

GRAIN SIZE ANALYSIS
 JOB NUMBER 2037-7300
 SAMPLE NUMBER M17 S-10

SIEVE ANALYSIS

GRAMS OF SOIL SIEVED 252.73

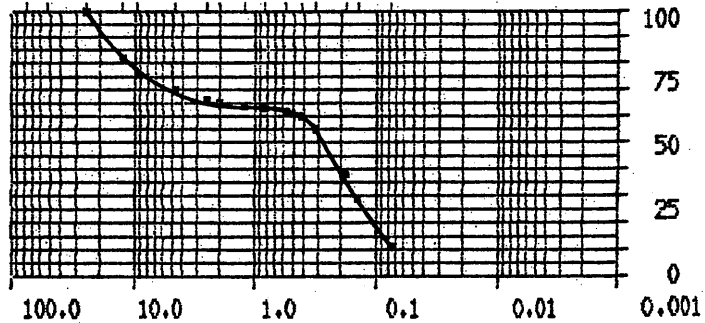
SIEVE SIZE	GRAMS RETAINED	% FINER
1 IN.	0	100
1/2 IN.	45.2	82.11
3/8 IN.	57.17	77.37
#4	75.35	70.18
#8	84.62	66.51
#10	86.31	65.84
#16	89.86	64.44
#20	91.57	63.76
#30	93.72	62.91
#40	98.71	60.94
#50	111.88	55.73
#80	156.42	38.1
#100	179.03	29.16
#200	224.54	11.15

GRAIN SIZE COMPOSITION SUMMARY
 (PER-CENT BY WEIGHT)

PER-CENT GRAVEL 29.81
 PER-CENT SAND 59.03
 PER-CENT SILT/CLAY 11.15

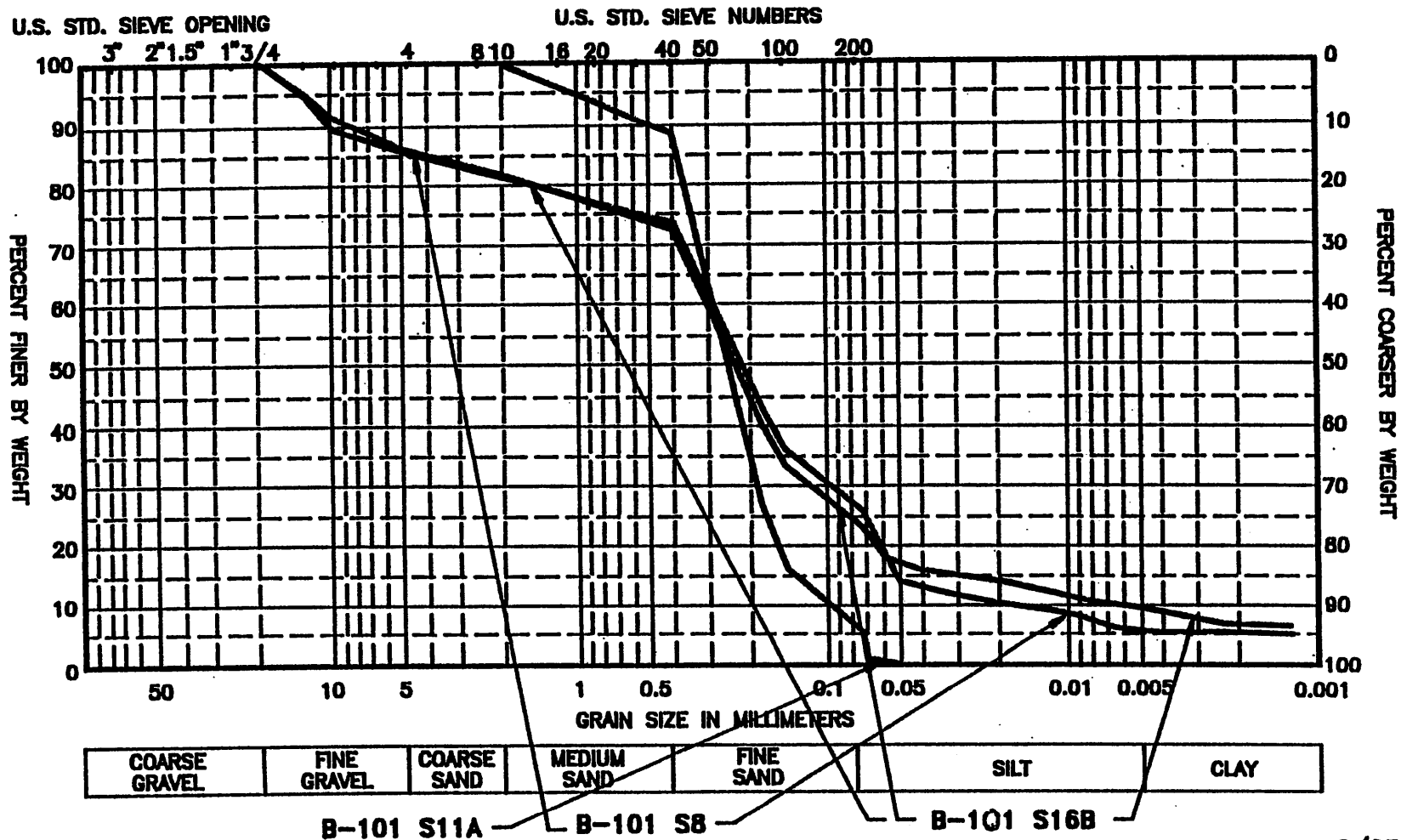
U.S. STANDARD SIEVE SIZES

3 2 1 #4 #50 #200



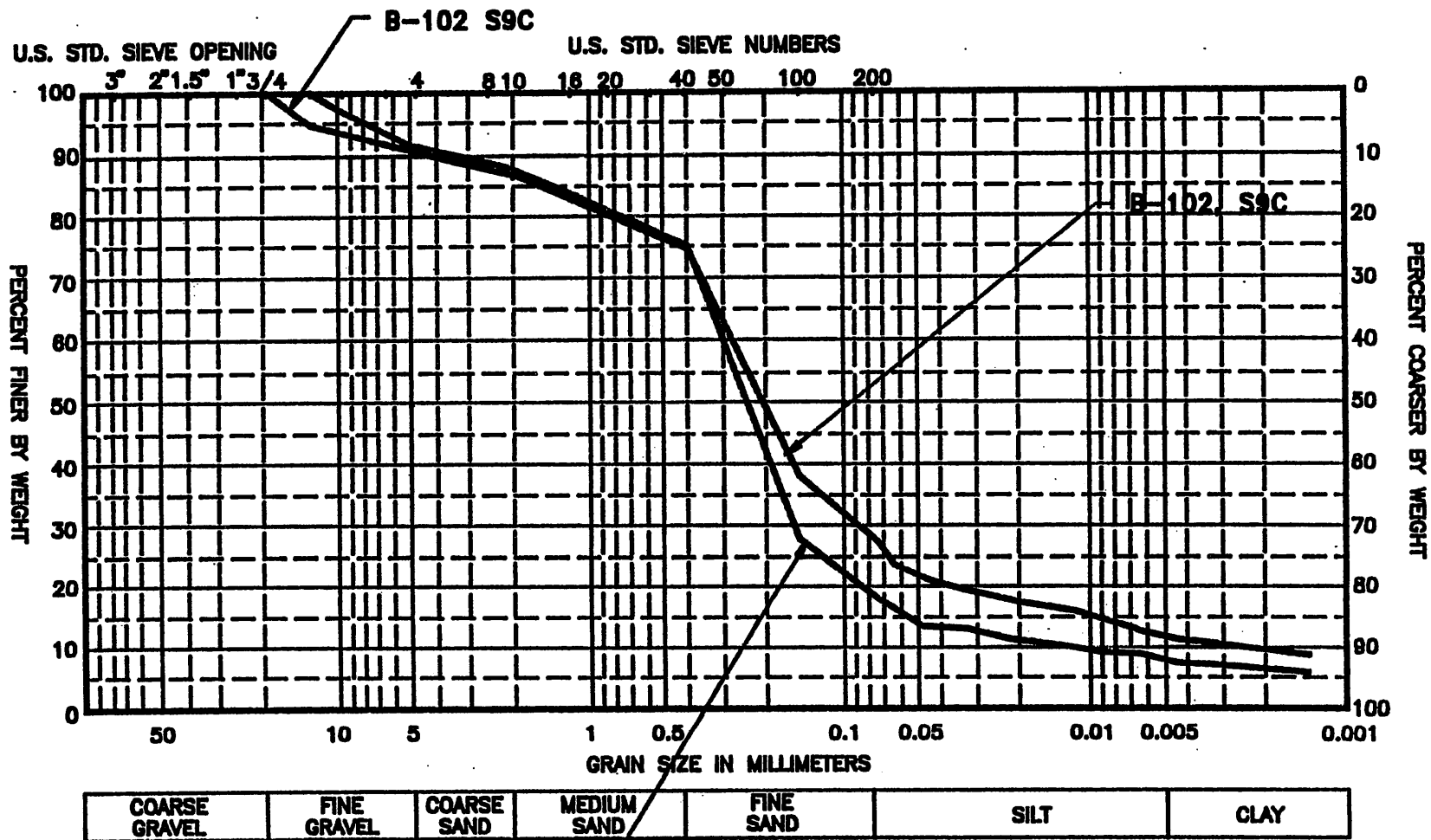
GRAIN SIZE (MILLIMETERS)

GRAVEL SAND SILT CLAY
 UNIFIED SOIL CLASSIFICATION DIVISIONS



6/25/91

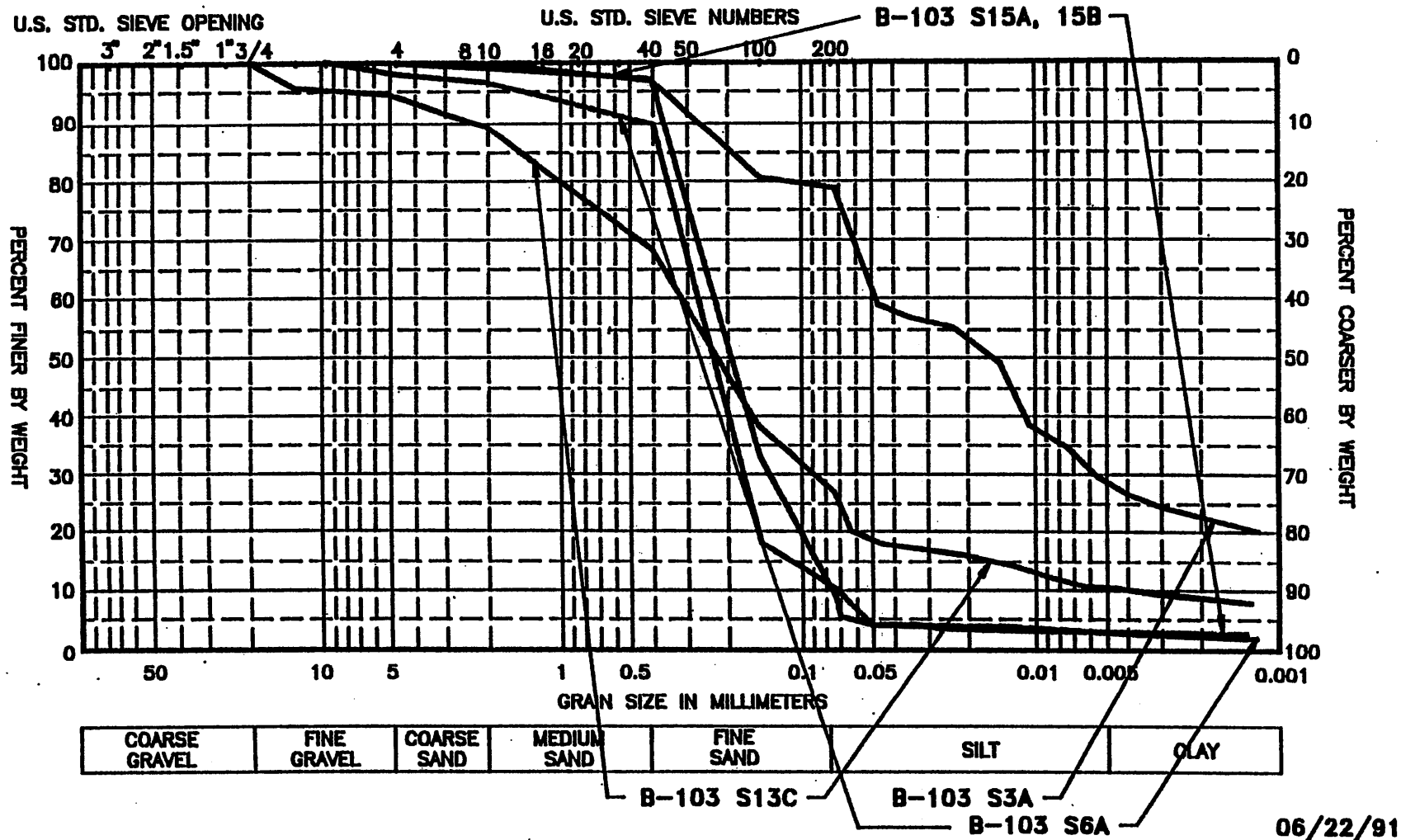
GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



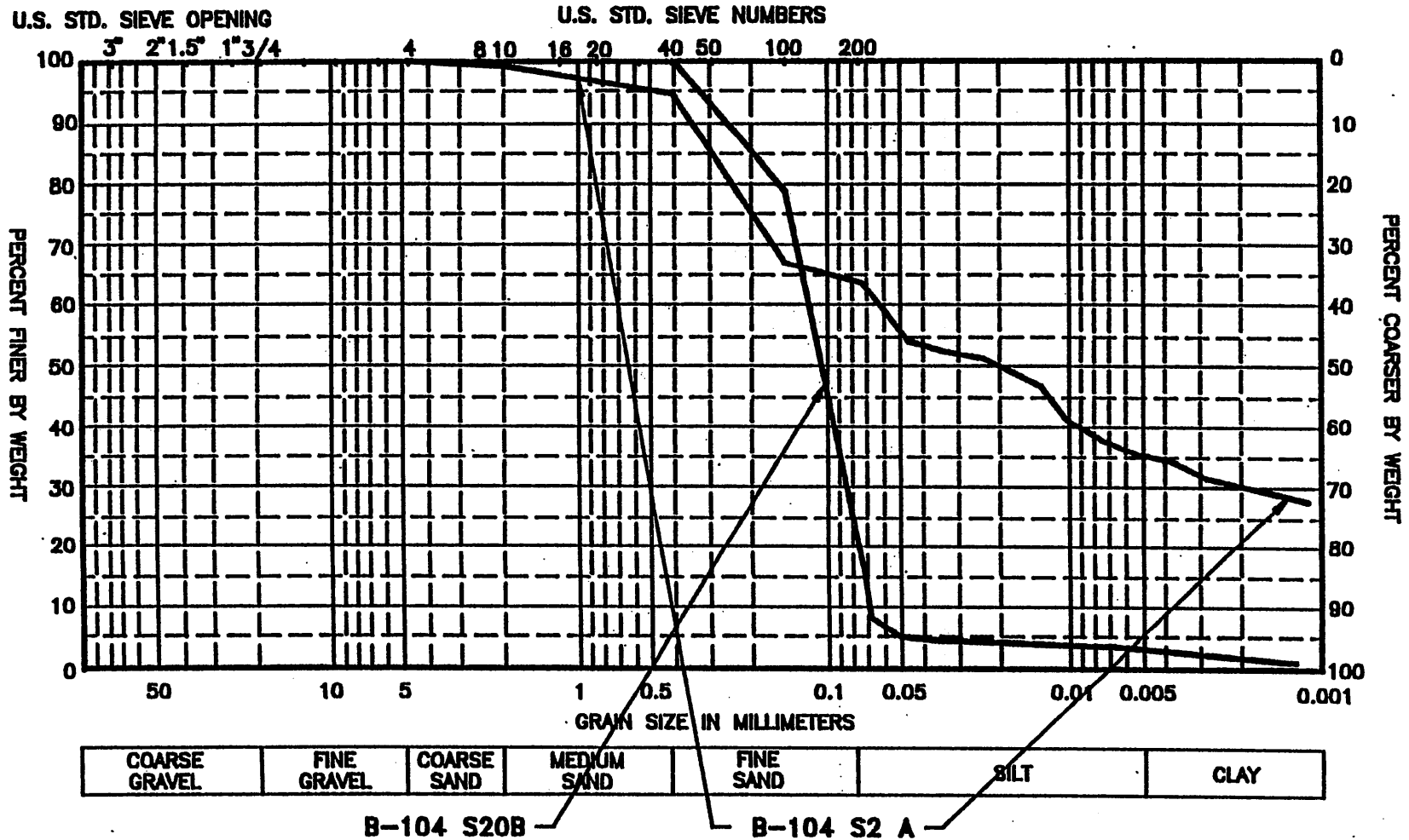
B-102 S16B

06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.

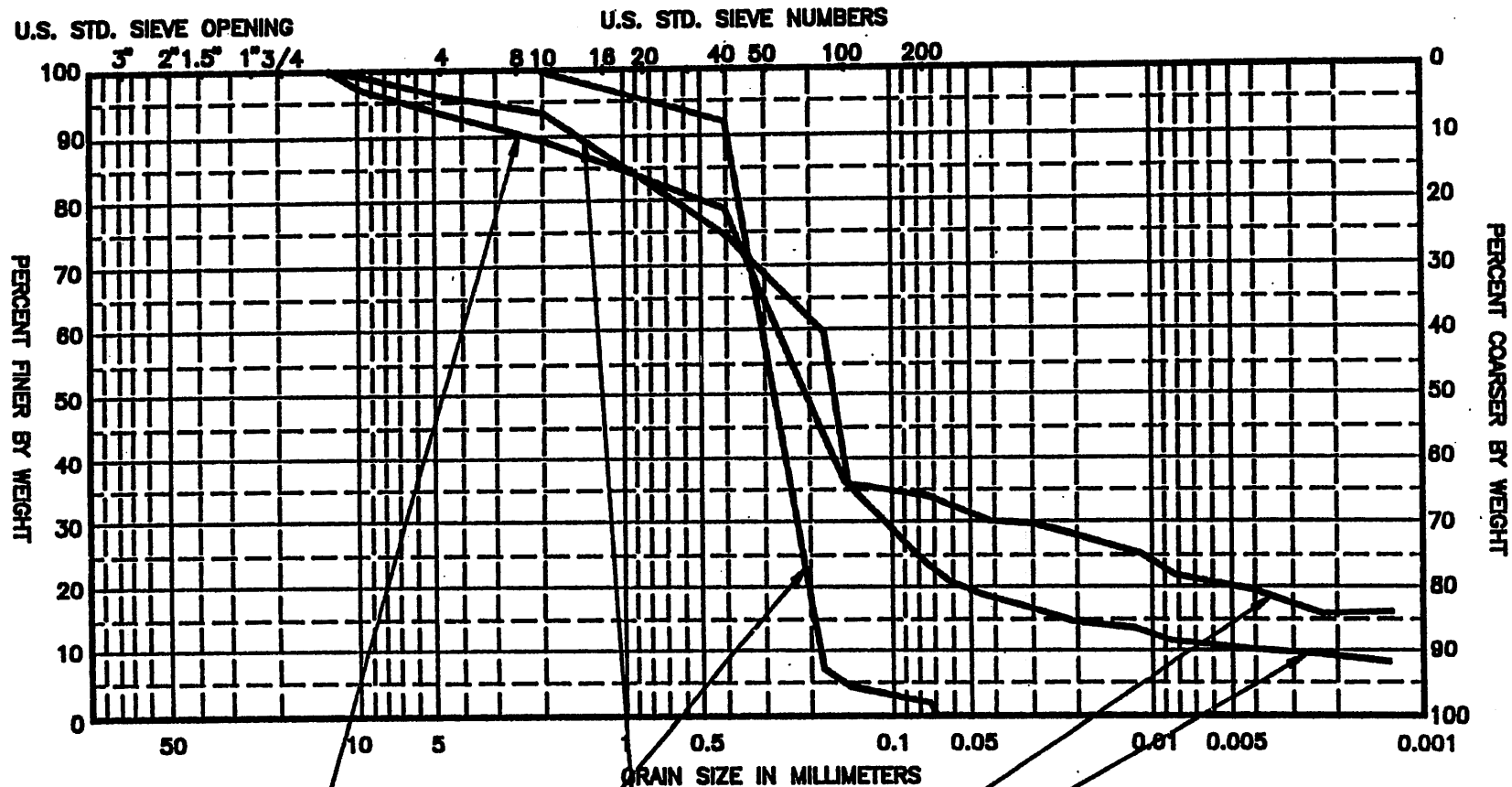


GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
 FOR
DONOHUE & ASSOCIATES, INC.
 TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



COARSE GRAVEL	FINE GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND	SILT	CLAY
---------------	-------------	-------------	-------------	-----------	------	------

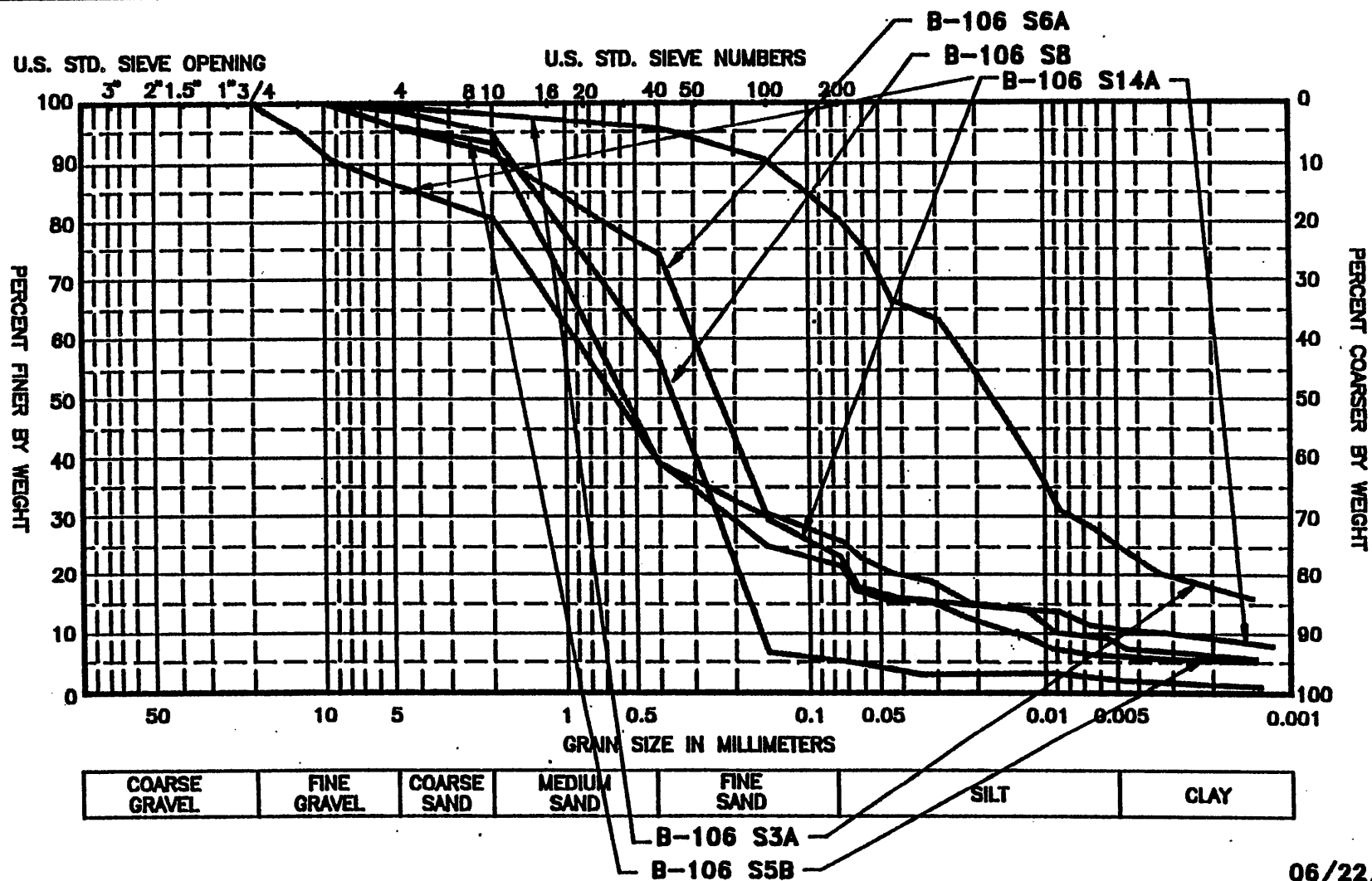
B-105 S4B

B-105 S2

B-105 S14C

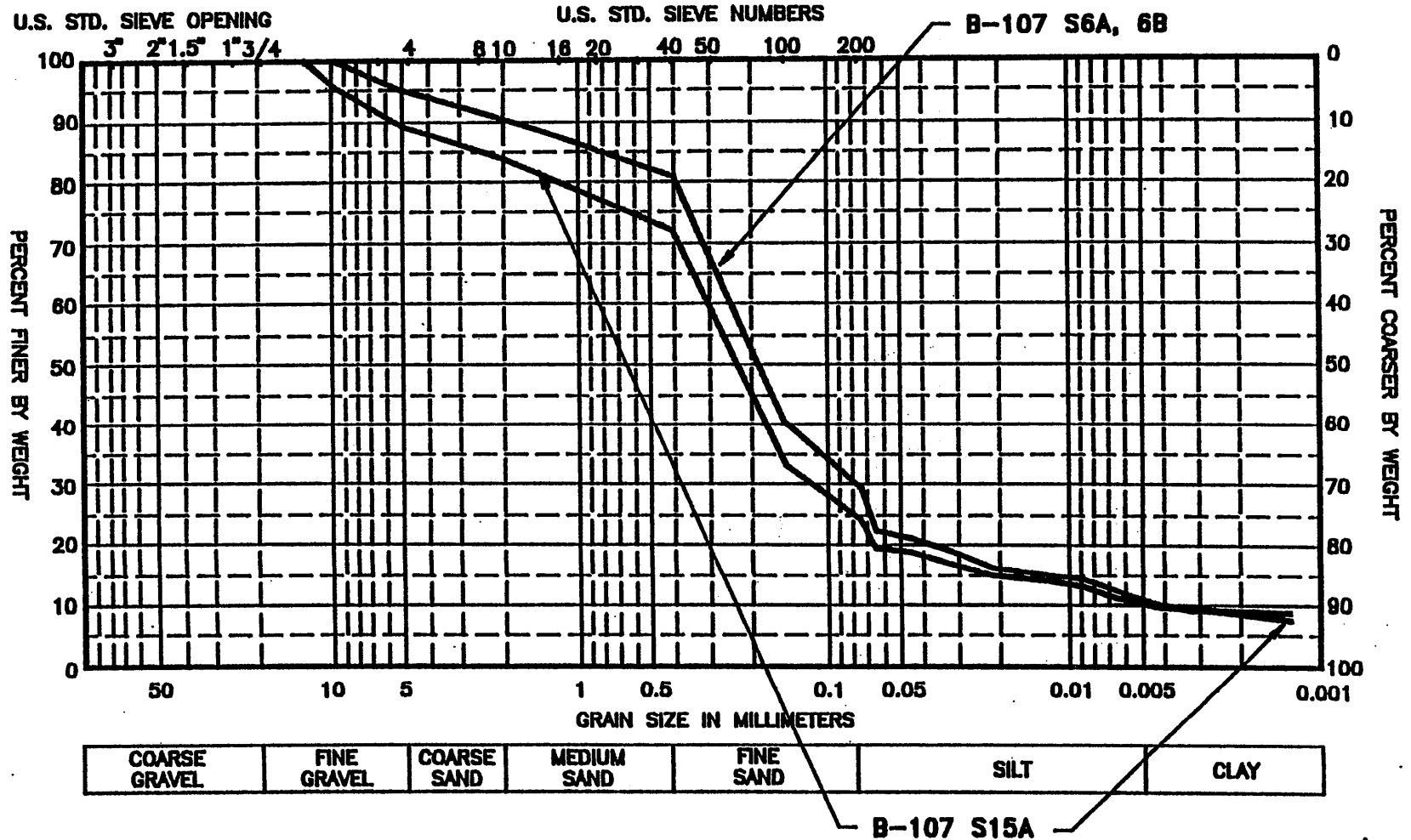
6/25/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



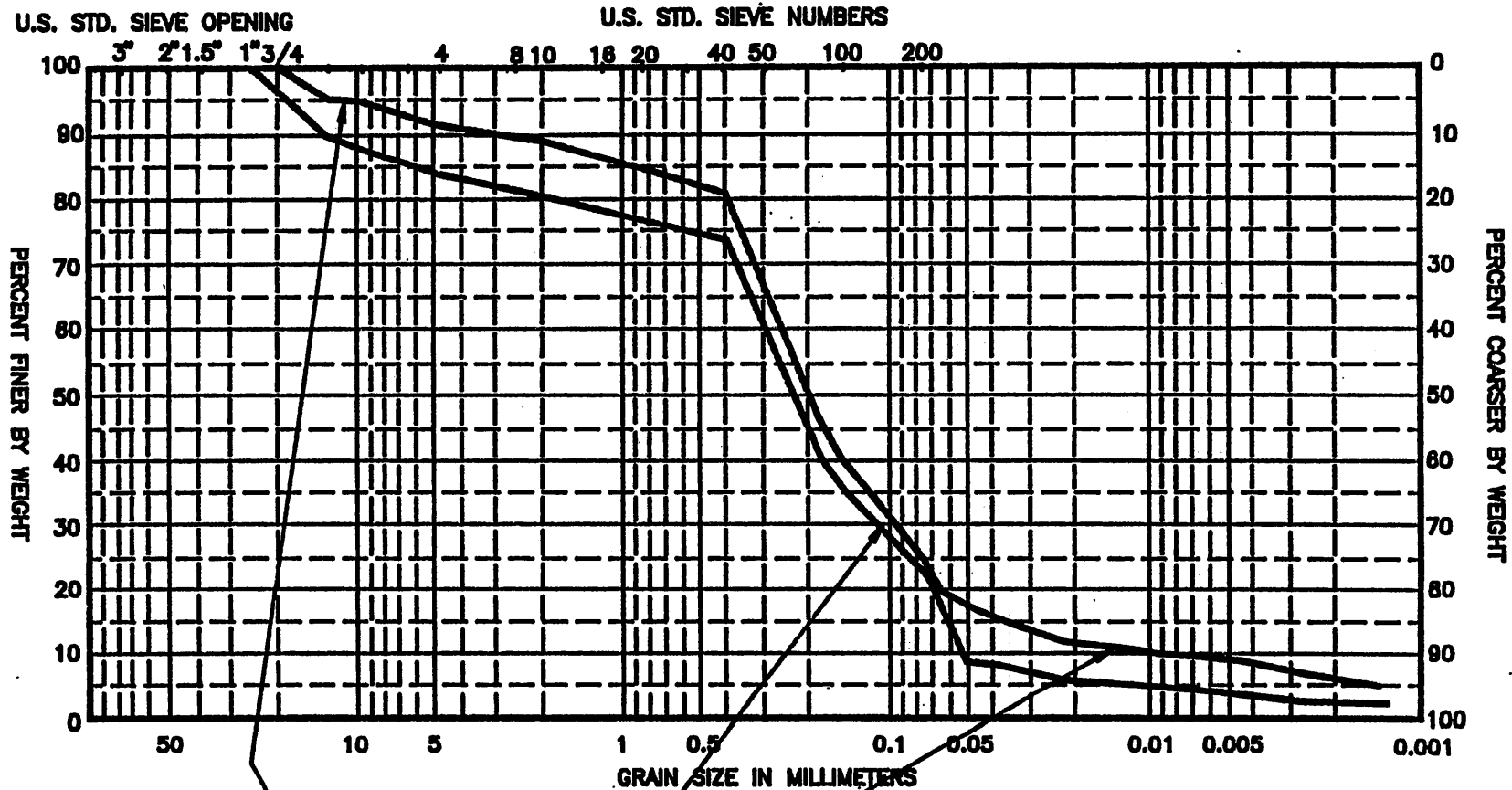
06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



06/22/91

**GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.**

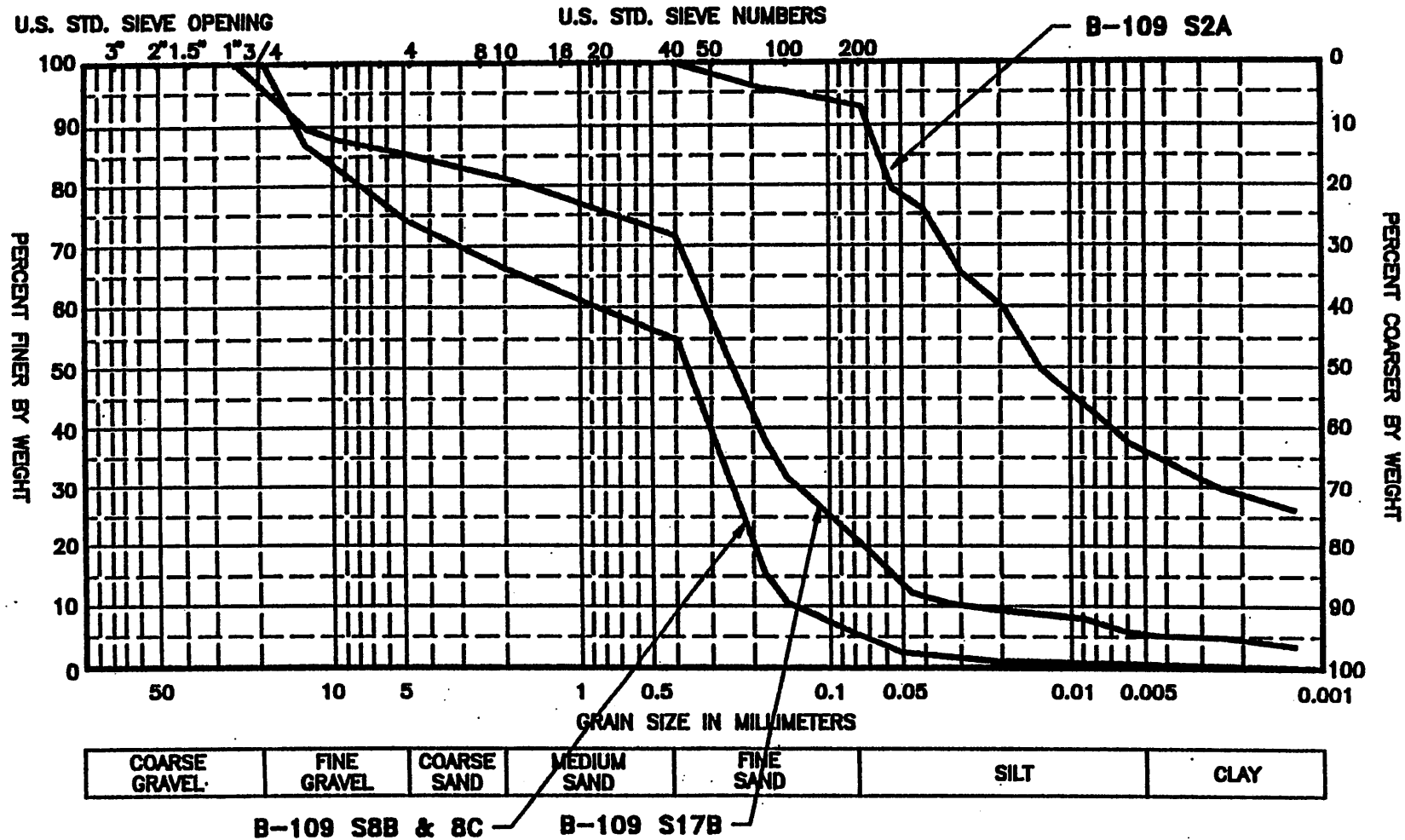


WT-108A S1

B-108 S10B

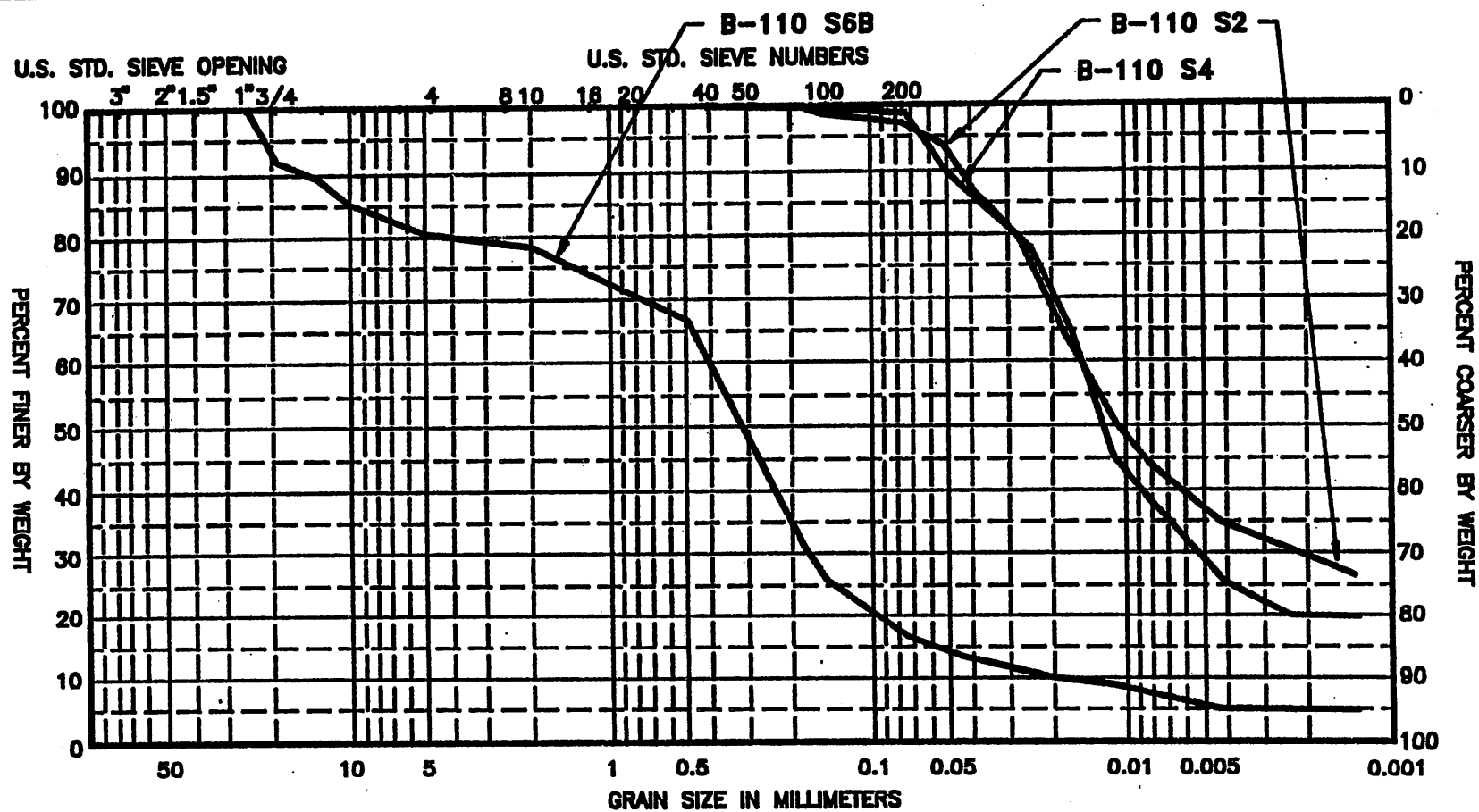
6/25/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



6/25/91

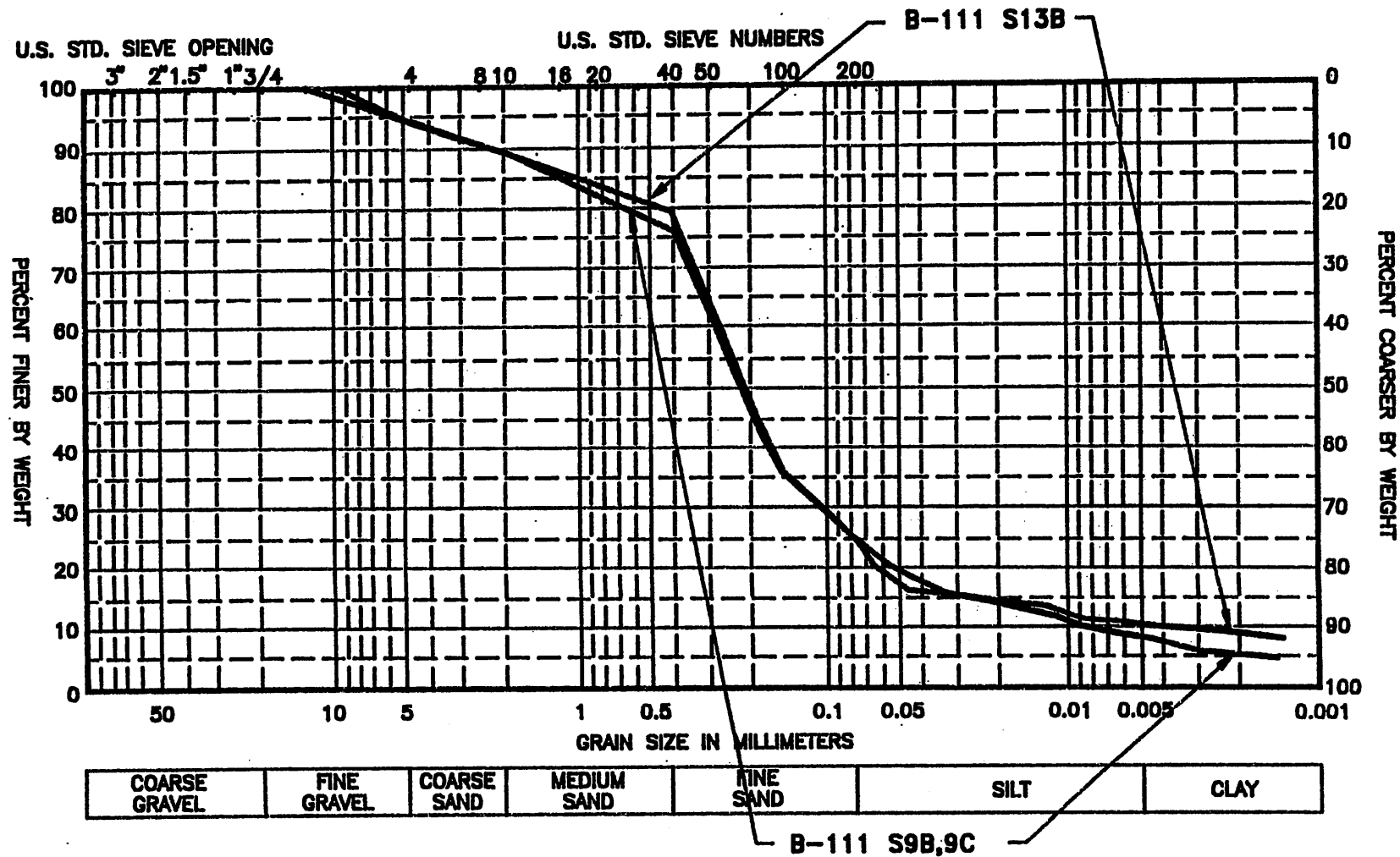
GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.

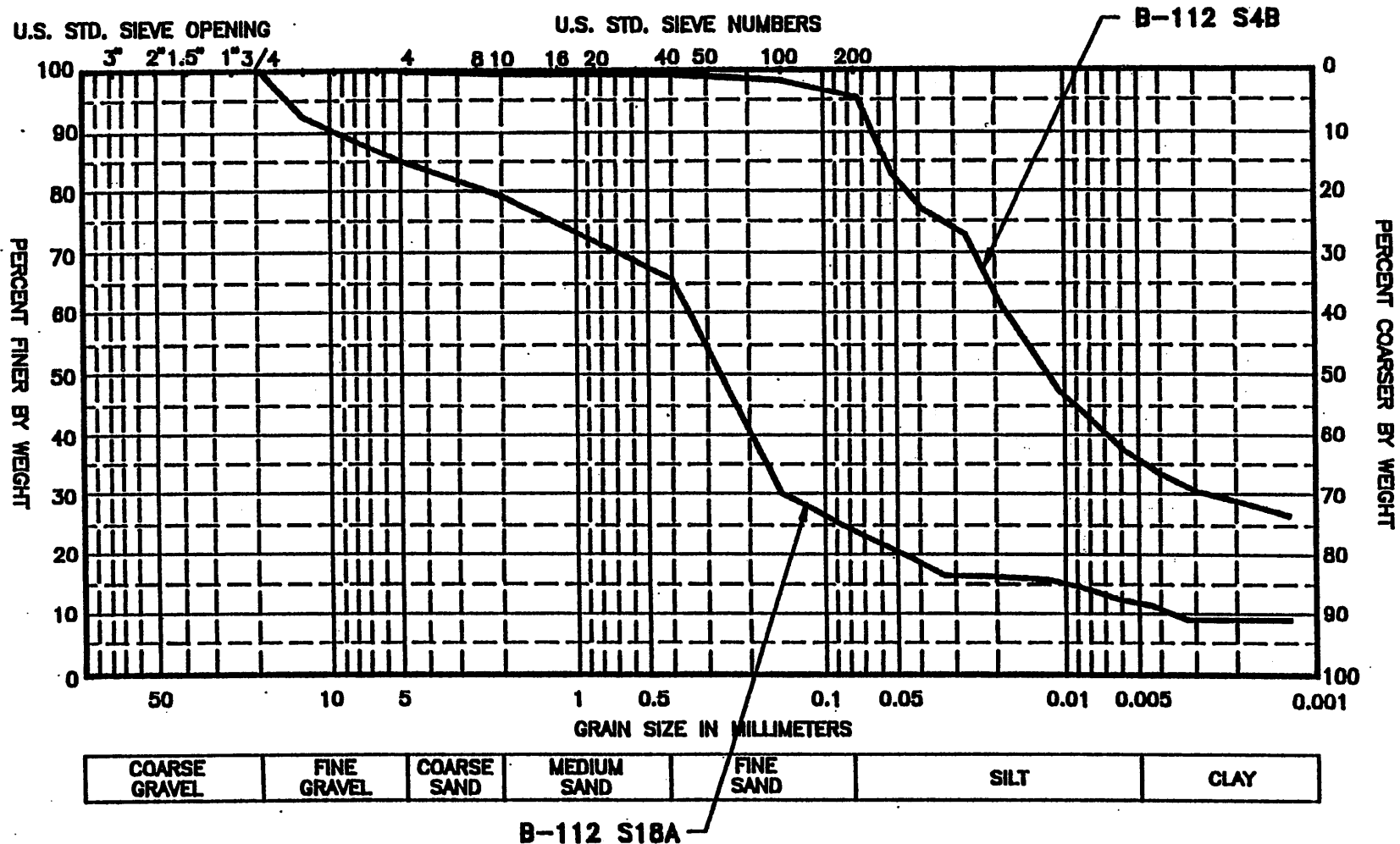


COARSE GRAVEL	FINE GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND	SILT	CLAY
---------------	-------------	-------------	-------------	-----------	------	------

6/25/91

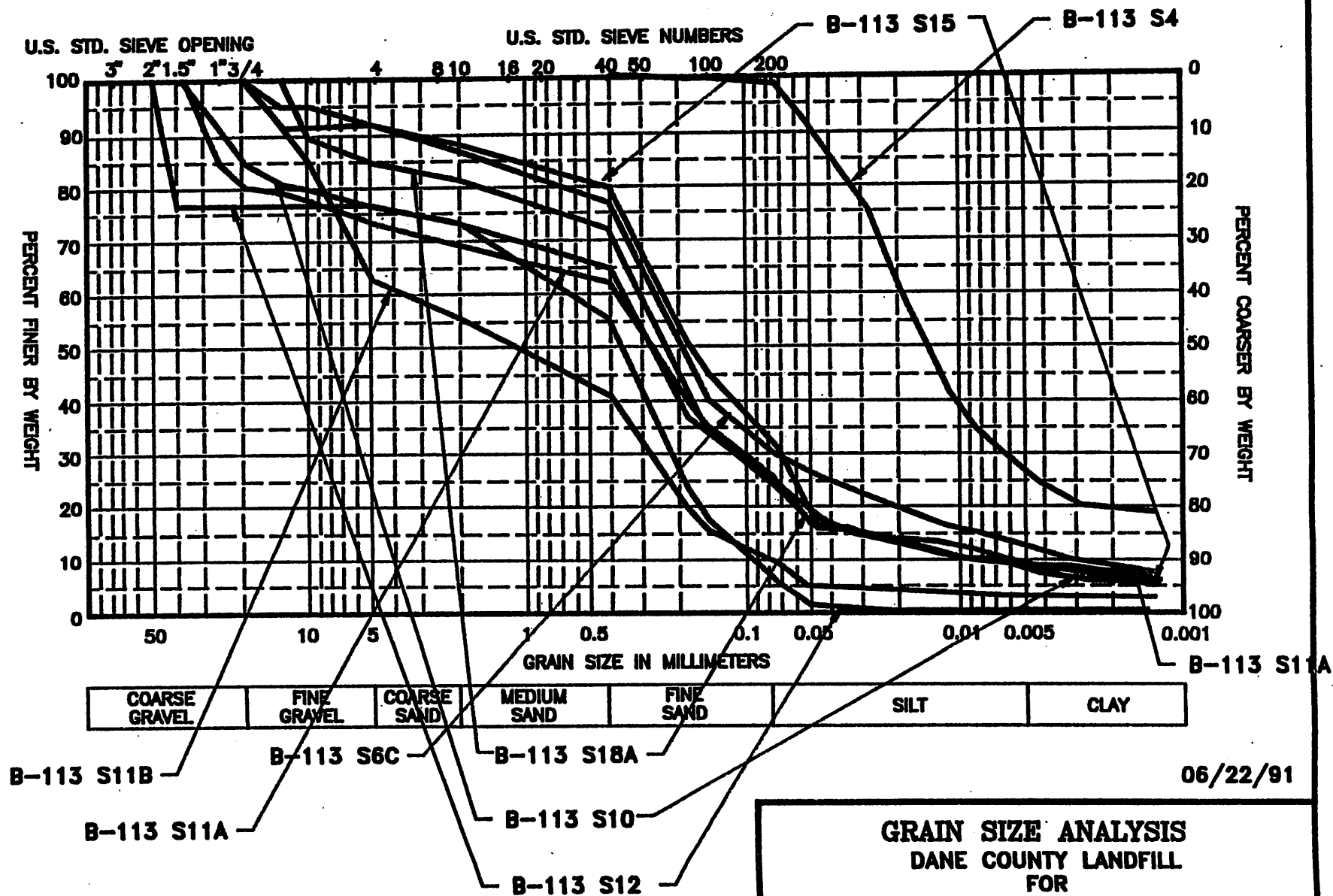
GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.





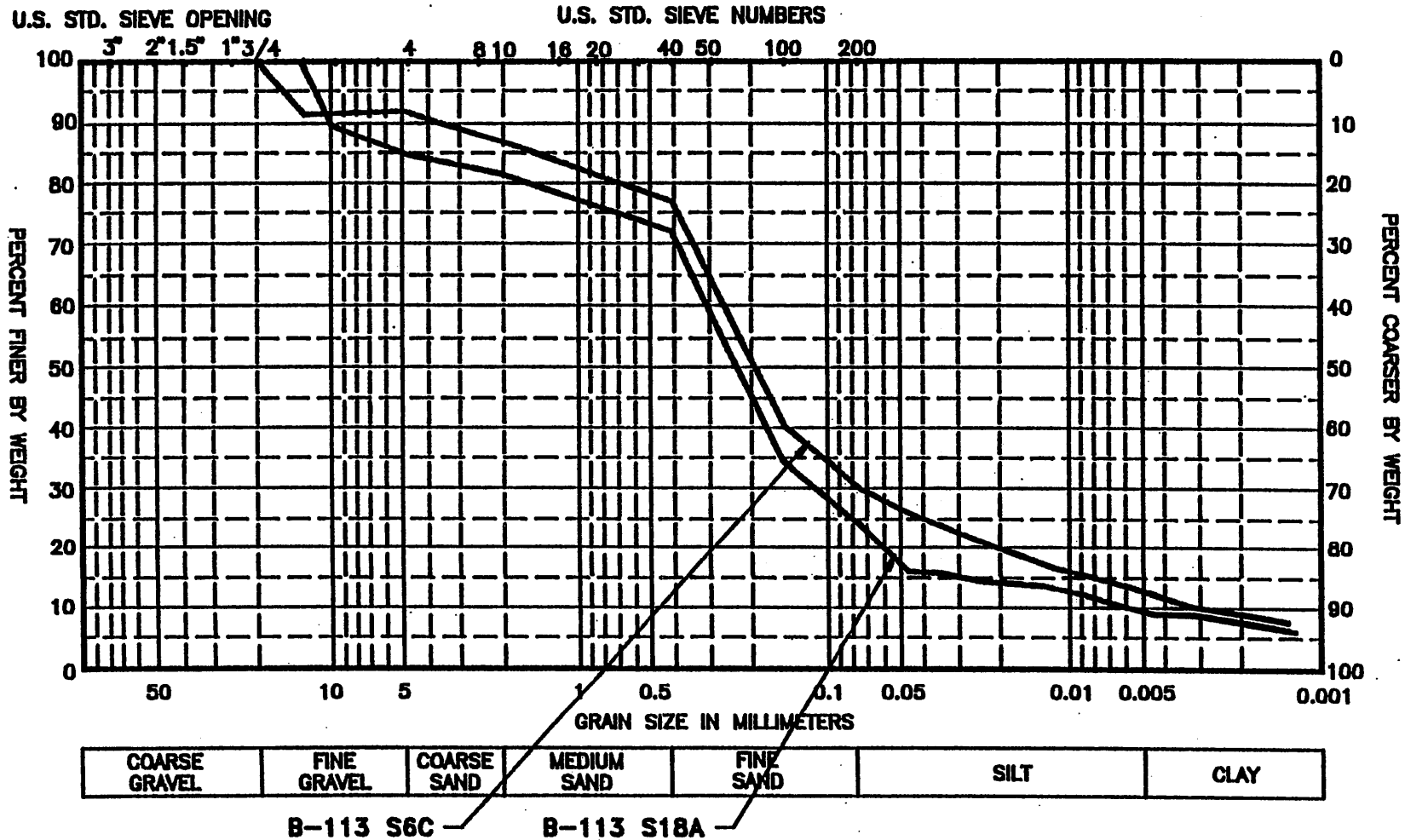
06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



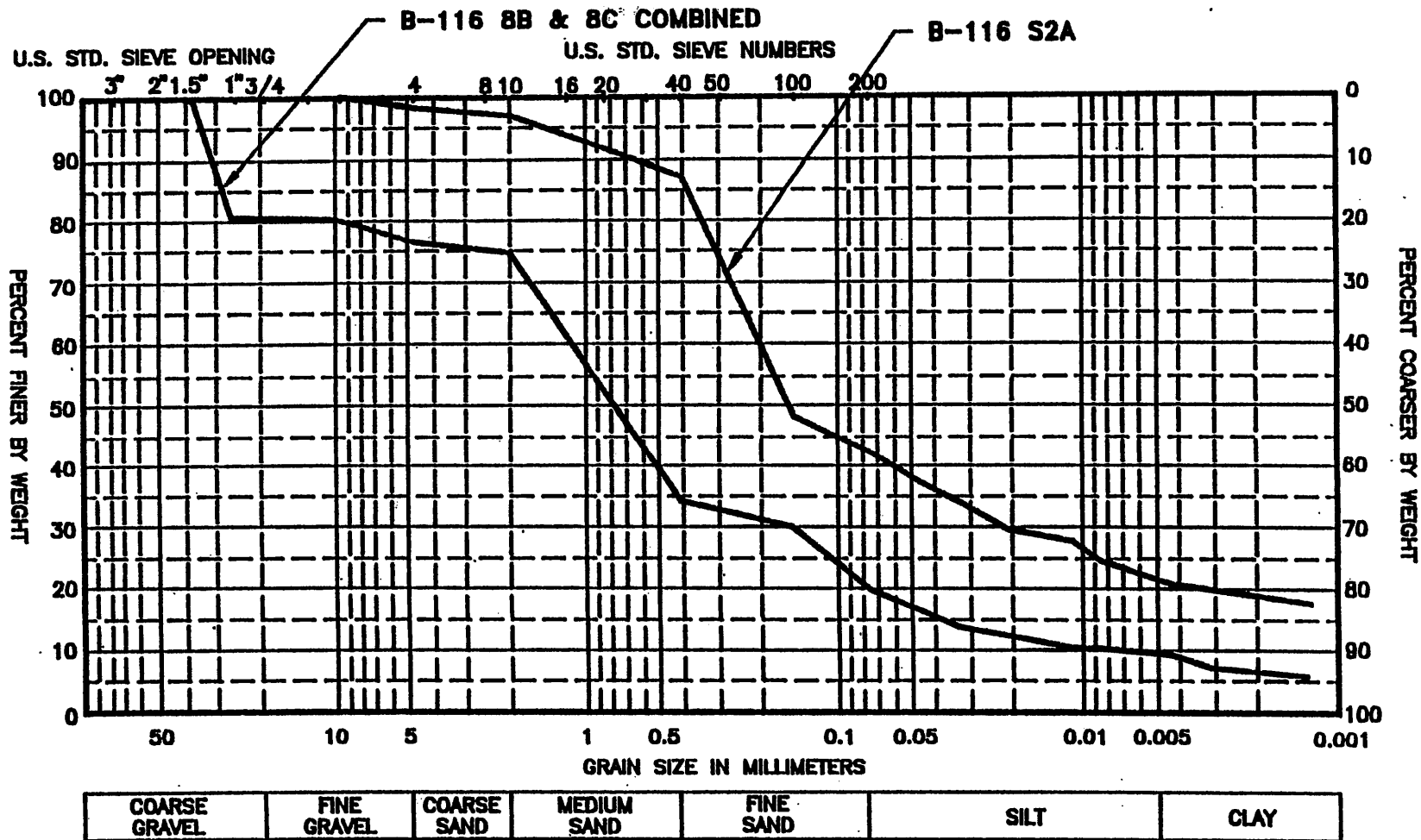
06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



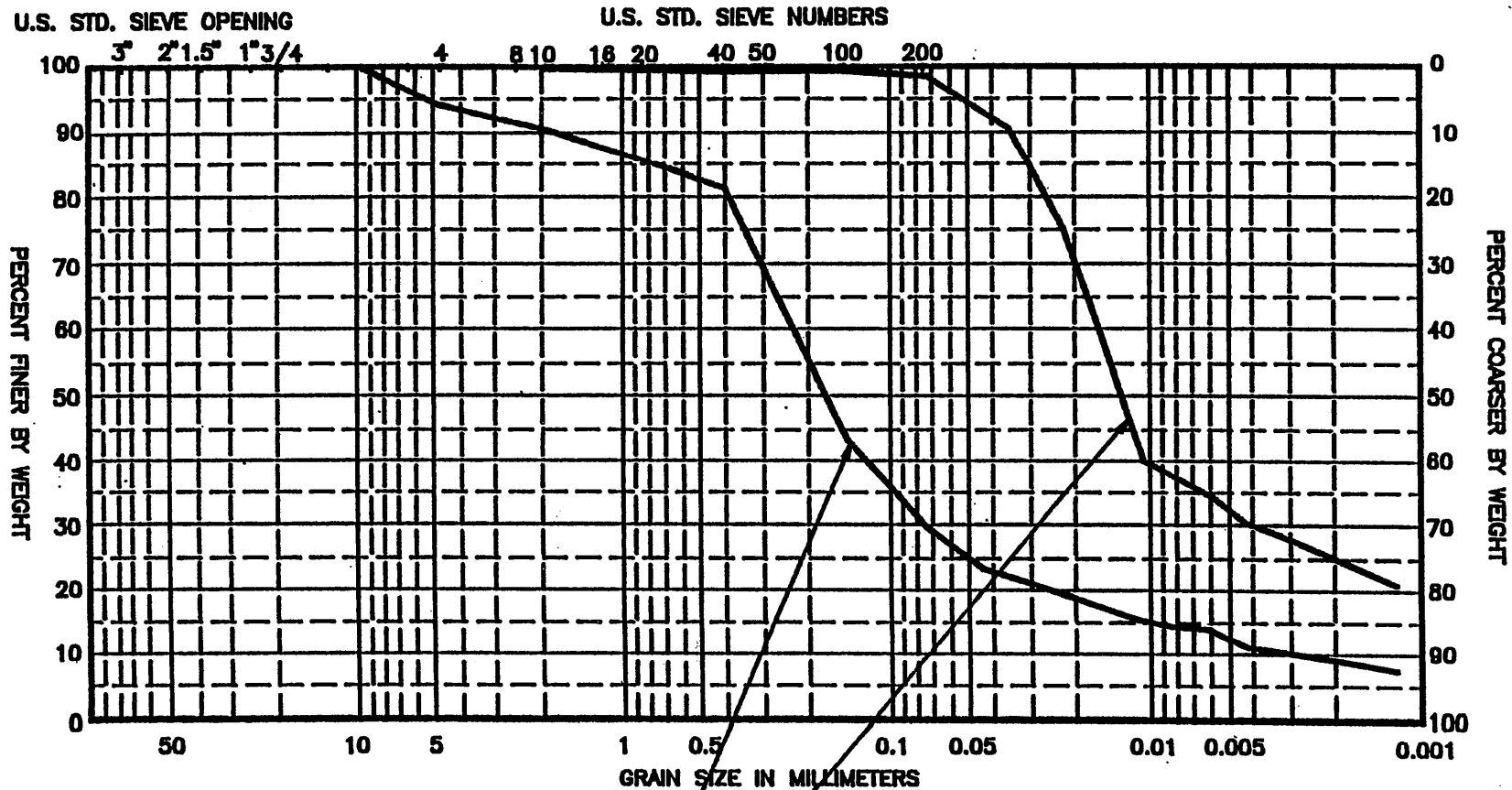
06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.

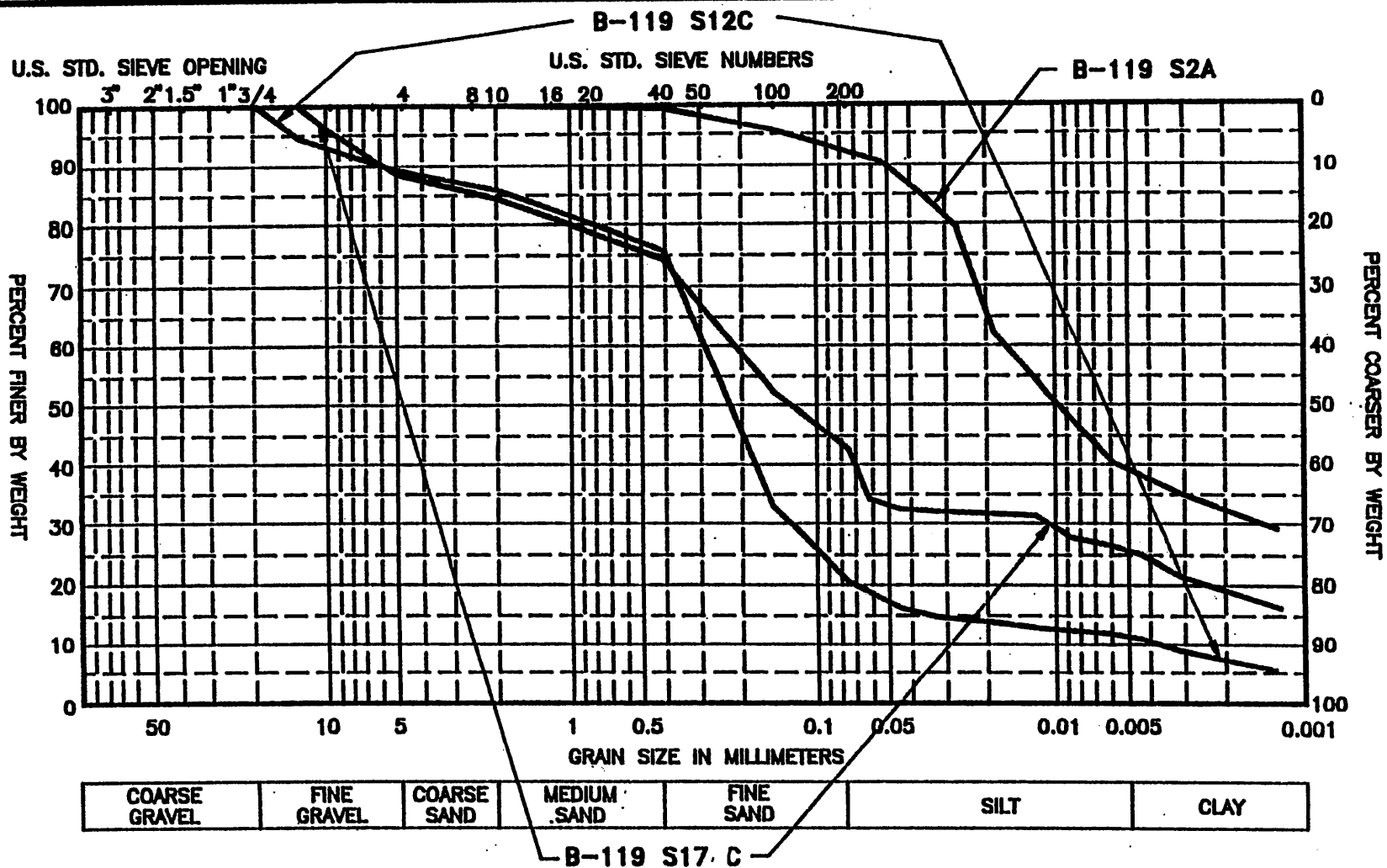


B-118 S5B

B-117 S5C

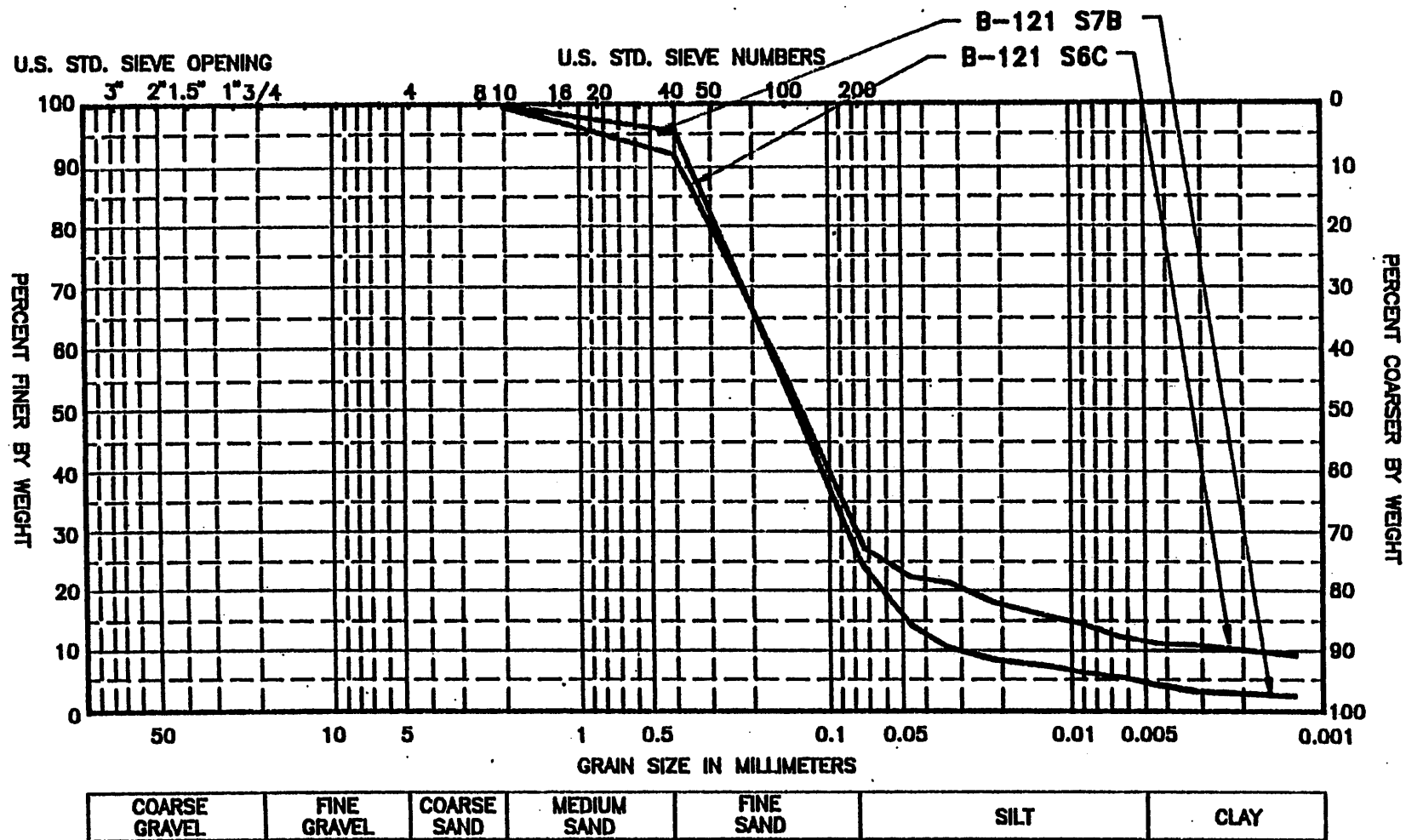
06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



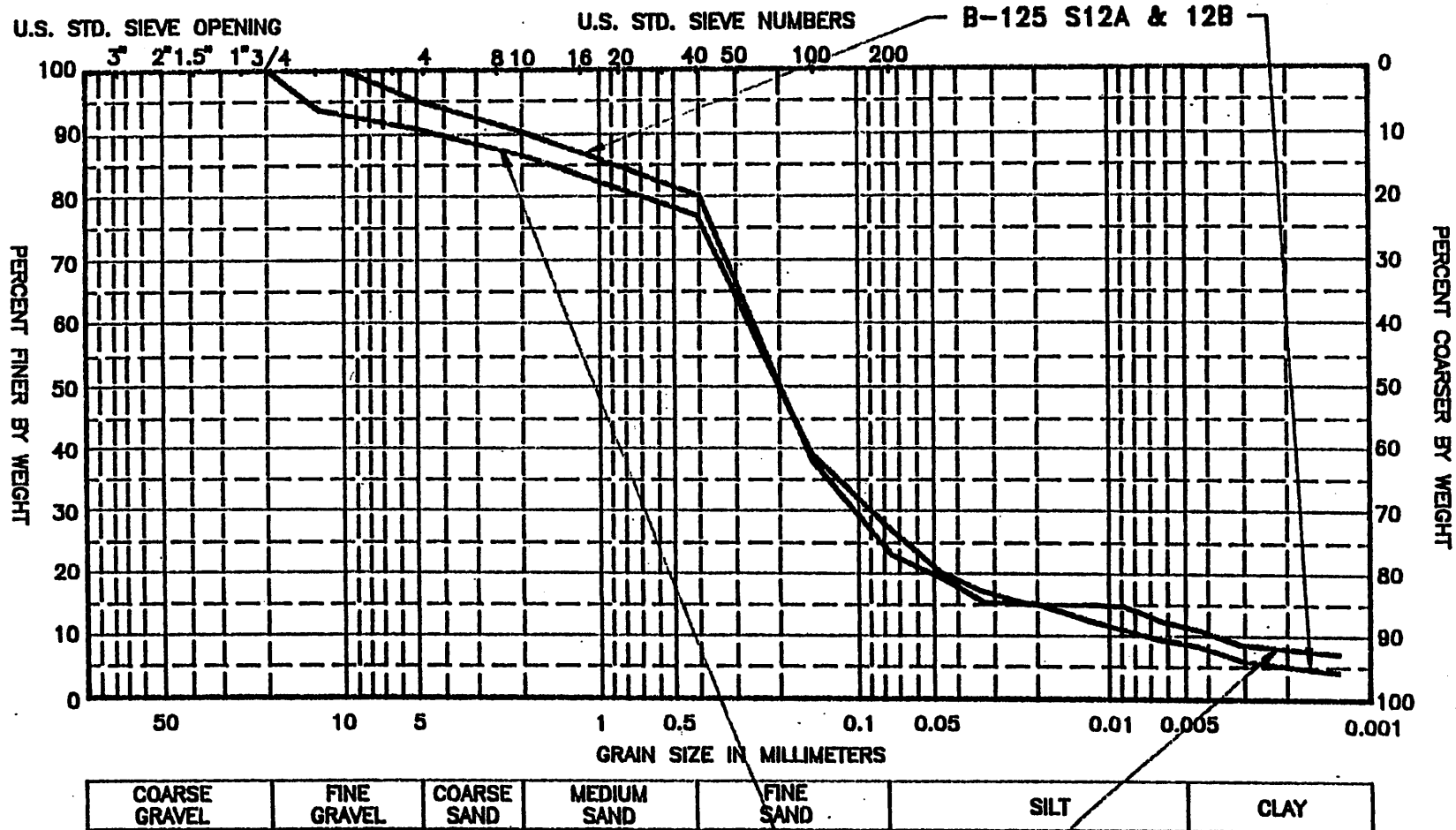
06/22/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



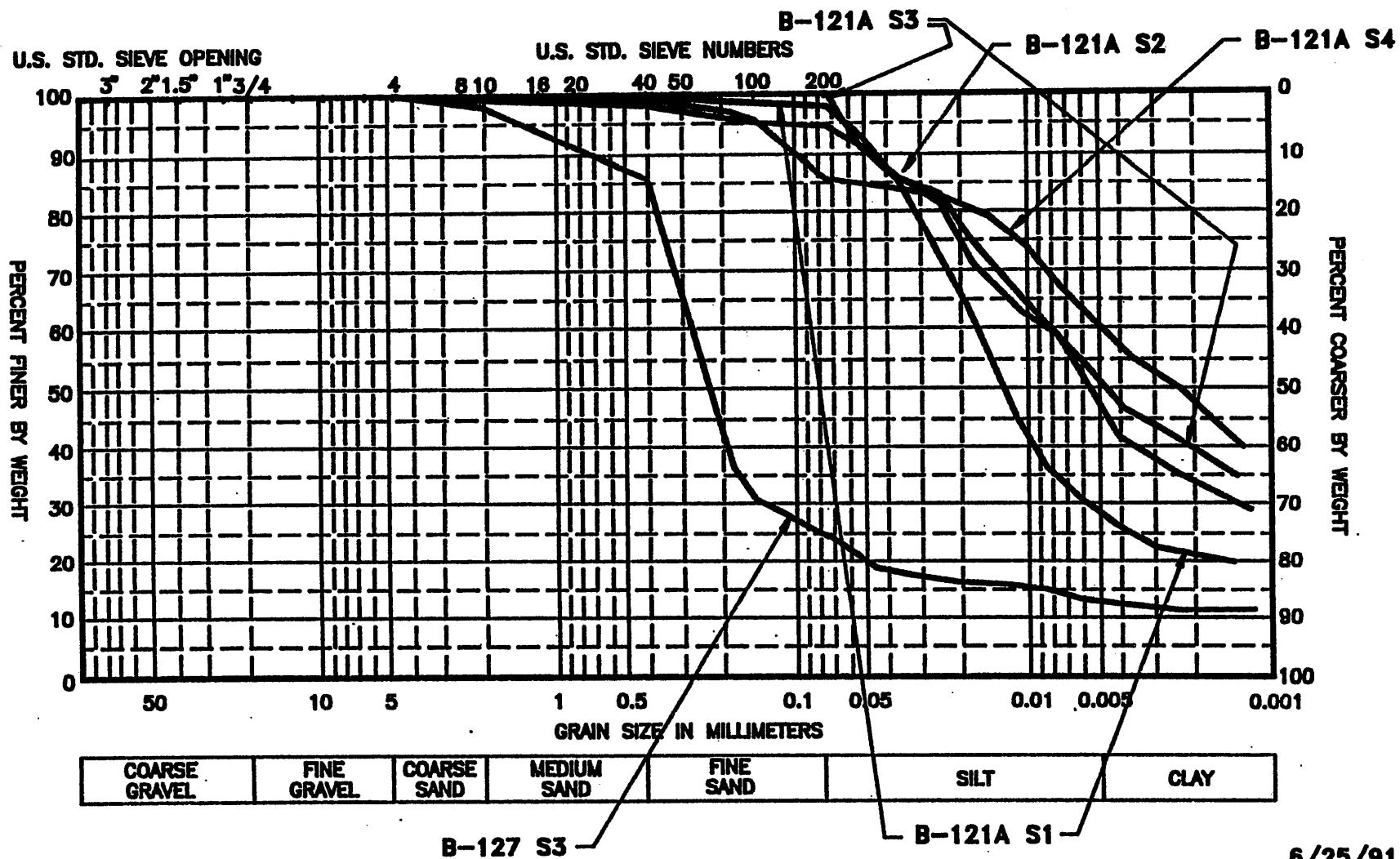
06/22/91

**GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.**



06/22/91

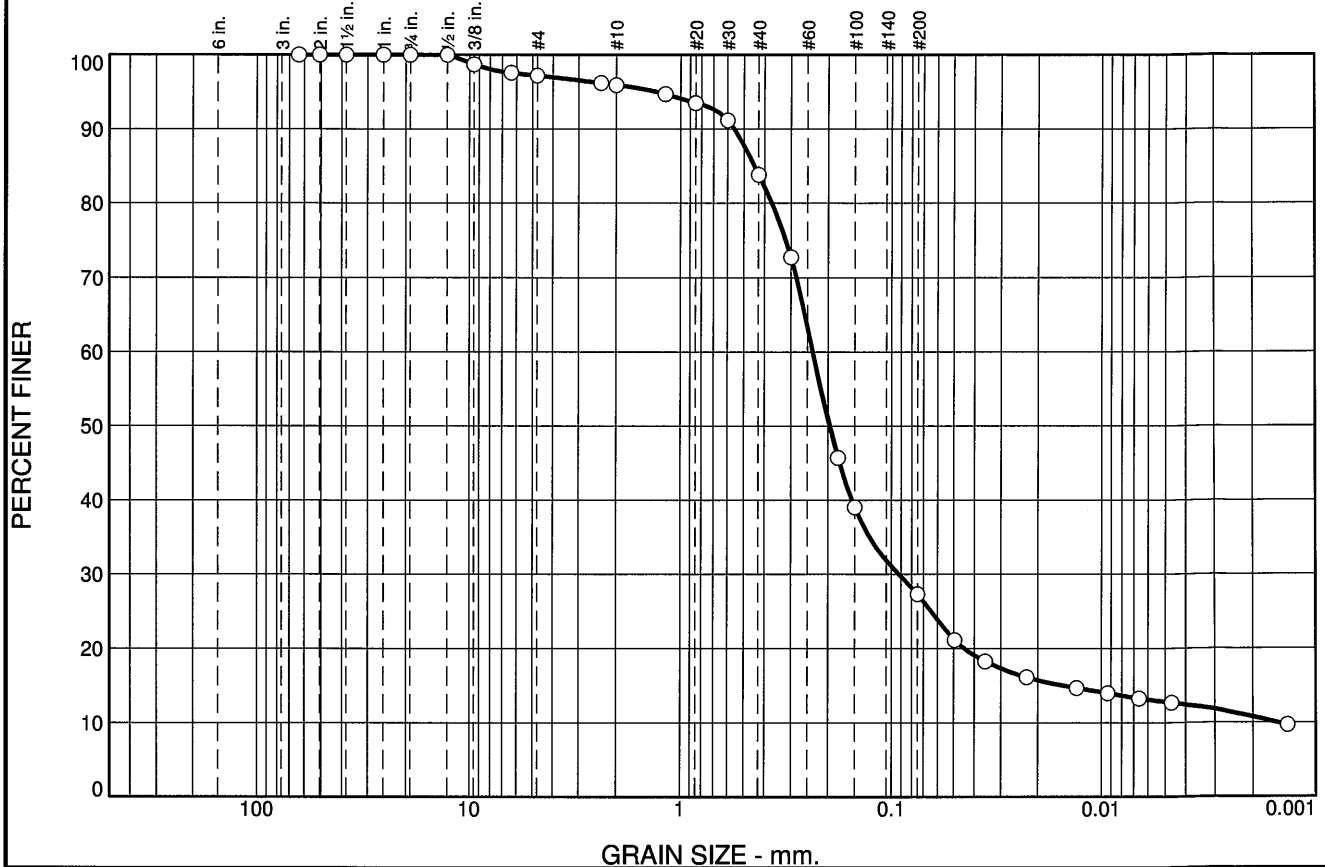
GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.



6/25/91

GRAIN SIZE ANALYSIS
DANE COUNTY LANDFILL
FOR
DONOHUE & ASSOCIATES, INC.
TESTS BY:
ENVIRONMENTAL & FD'N DRILLING INC.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.8	1.3	12.0	56.6	14.5	12.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	100.0		
.5	100.0		
.375	98.7		
.25	97.6		
#4	97.2		
#8	96.2		
#10	95.9		
#16	94.7		
#20	93.5		
#30	91.2		
#40	83.9		
#50	72.7		
#80	45.7		
#100	39.1		
#200	27.3		

* (no specification provided)

Material Description

Silty sand

PL= NP

Atterberg Limits

LL= NV

PI= NP

Coefficients

D₉₀= 0.5566

D₈₅= 0.4447

D₆₀= 0.2355

D₅₀= 0.1967

D₃₀= 0.0921

D₁₅= 0.0152

D₁₀= 0.0015

C_u= 153.44

C_c= 23.48

Classification

USCS= SM

AASHTO= A-2-4(0)

Remarks

Source of Sample: M301A
Sample Number: M301A, 3-5'

Date: 03-07-13

TRC Environmental Corp.

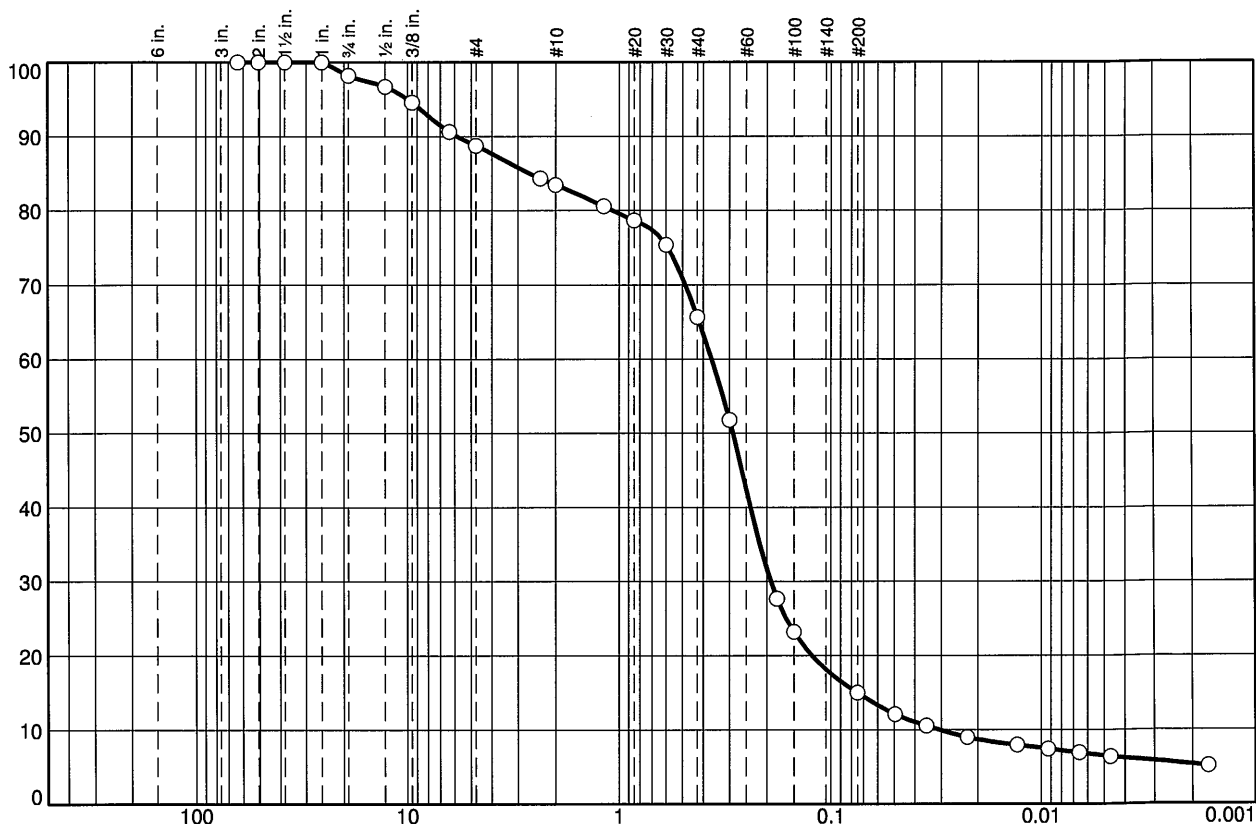
Client:
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

PERCENT FINER



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.8	9.4	5.3	17.9	50.6	8.5	6.5

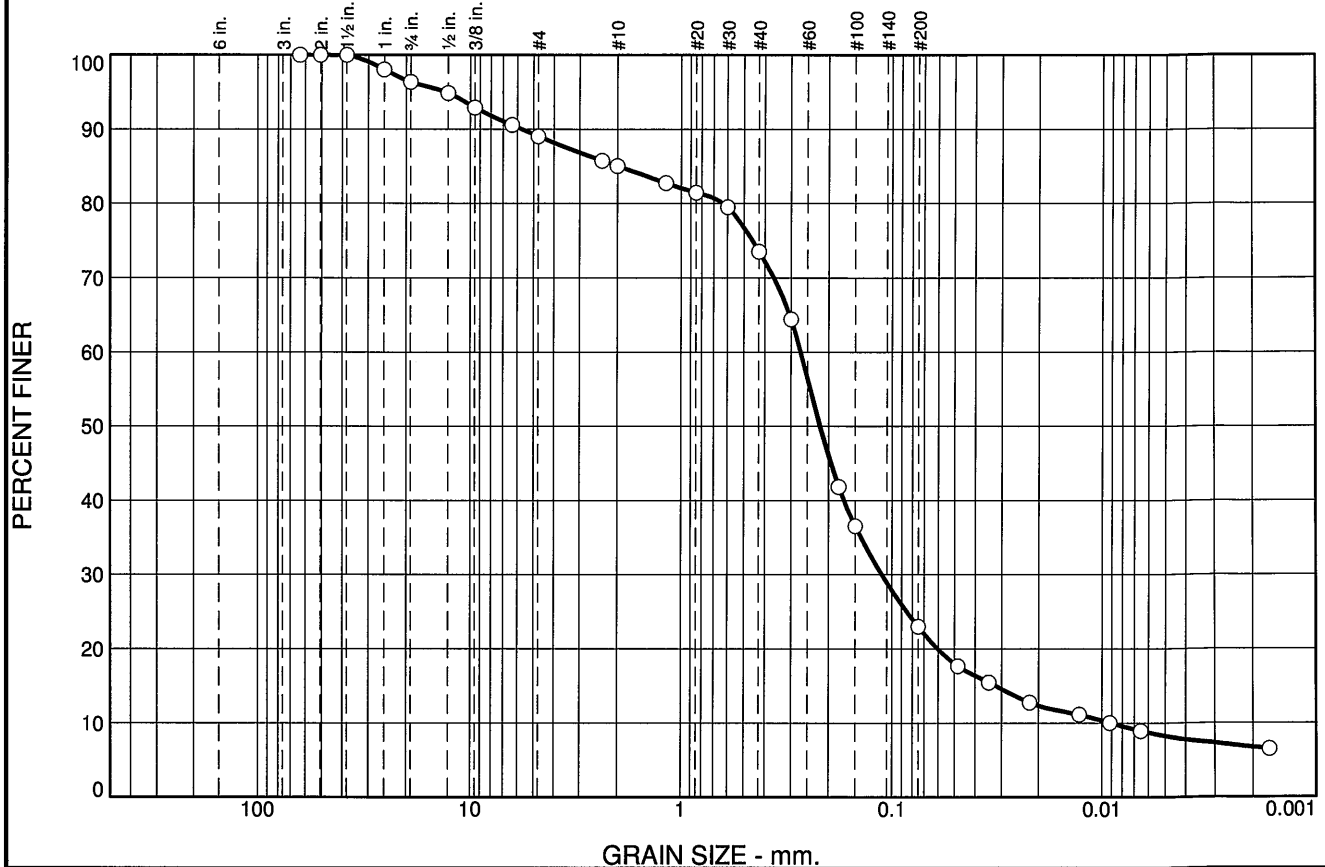
SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	98.2		
.5	96.7		
.375	94.6		
.25	90.6		
#4	88.8		
#8	84.3		
#10	83.5		
#16	80.6		
#20	78.7		
#30	75.4		
#40	65.6		
#50	51.8		
#80	27.7		
#100	23.2		
#200	15.0		

Remarks

Date: 11-21-12

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.6	7.3	4.0	11.6	50.5	14.8	8.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	98.1		
.75	96.4		
.5	94.9		
.375	92.9		
.25	90.6		
#4	89.1		
#8	85.8		
#10	85.1		
#16	82.7		
#20	81.5		
#30	79.5		
#40	73.5		
#50	64.4		
#80	41.8		
#100	36.6		
#200	23.0		

* (no specification provided)

Material Description

Silty sand

PL= NP Atterberg Limits LL= NV PI= NP

Coefficients

D₉₀= 5.6833 D₈₅= 1.9665 D₆₀= 0.2696
D₅₀= 0.2183 D₃₀= 0.1120 D₁₅= 0.0319
D₁₀= 0.0091 C_u= 29.61 C_c= 5.11

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Source of Sample: M302B
Sample Number: M302B, 18-25'

Date: 11-21-12

TRC Environmental Corp.

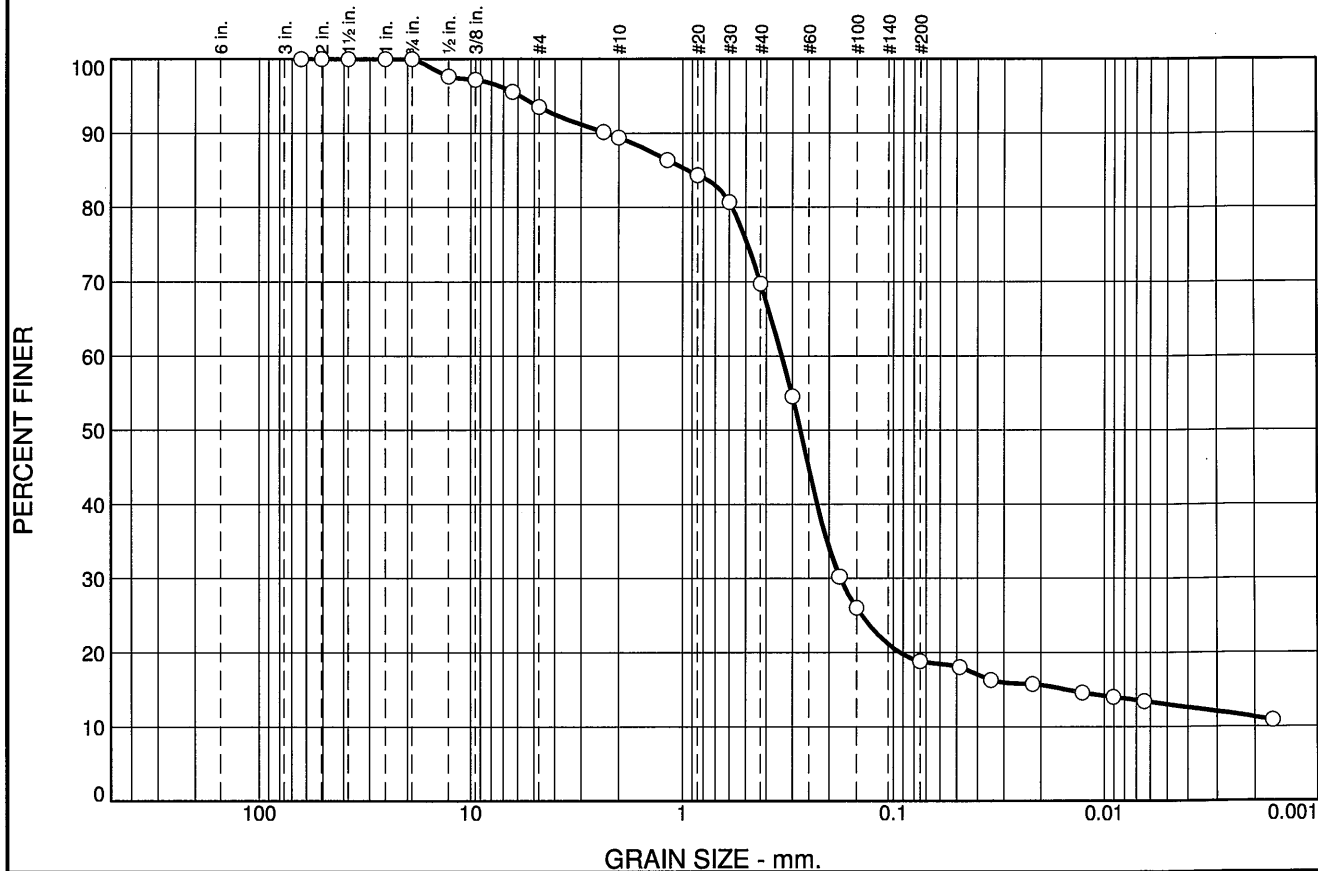
Madison, Wisconsin

Client:
Project: Dane County

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.4	4.2	19.7	50.9	5.8	13.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	100.0		
.5	97.7		
.375	97.2		
.25	95.6		
#4	93.6		
#8	90.2		
#10	89.4		
#16	86.4		
#20	84.4		
#30	80.7		
#40	69.7		
#50	54.5		
#80	30.2		
#100	26.1		
#200	18.8		

* (no specification provided)

Material Description

Silty sand

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 2.2667

D₈₅= 0.9461

D₆₀= 0.3367

D₅₀= 0.2748

D₃₀= 0.1786

D₁₅= 0.0151

D₁₀=

C_u=

C_c=

Classification

USCS= SM

AASHTO= A-2-4(0)

Remarks

Source of Sample: M302B
Sample Number: M302B, 53-55'

Date: 11-21-12

TRC Environmental Corp.

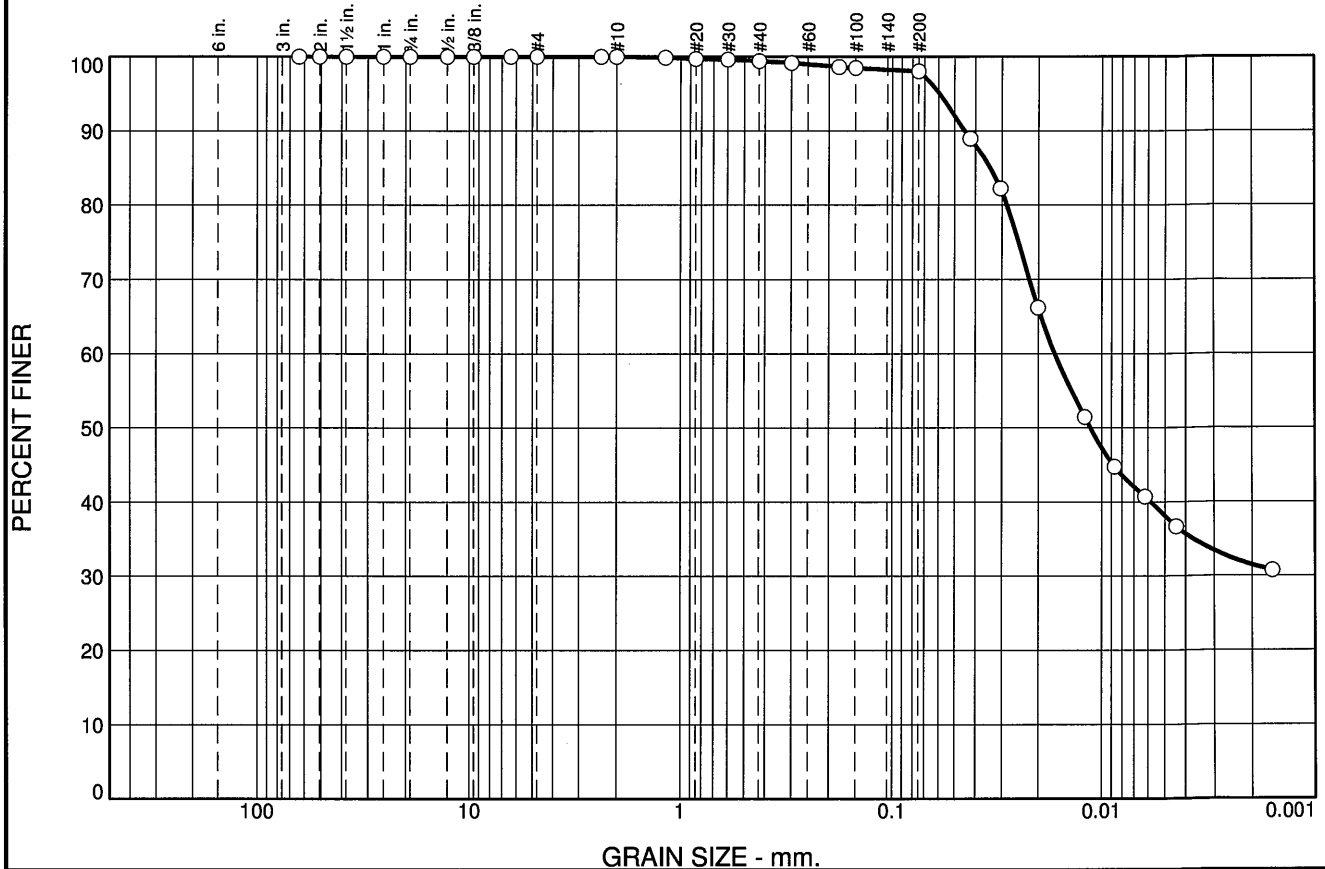
Client:
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	1.3	60.0	38.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	100.0		
.5	100.0		
.375	100.0		
.25	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.9		
#20	99.7		
#30	99.6		
#40	99.4		
#50	99.2		
#80	98.6		
#100	98.5		
#200	98.1		

* (no specification provided)

Material Description

Lean clay

Atterberg Limits

PL= 22

LL= 49

PI= 27

Coefficients

D₉₀= 0.0448

D₈₅= 0.0340

D₆₀= 0.0168

D₅₀= 0.0114

D₃₀=

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= CL

AASHTO= A-7-6(30)

Remarks

Source of Sample: M303A
Sample Number: M303A, 3-5'

Date: 11-26-12

TRC Environmental Corp.

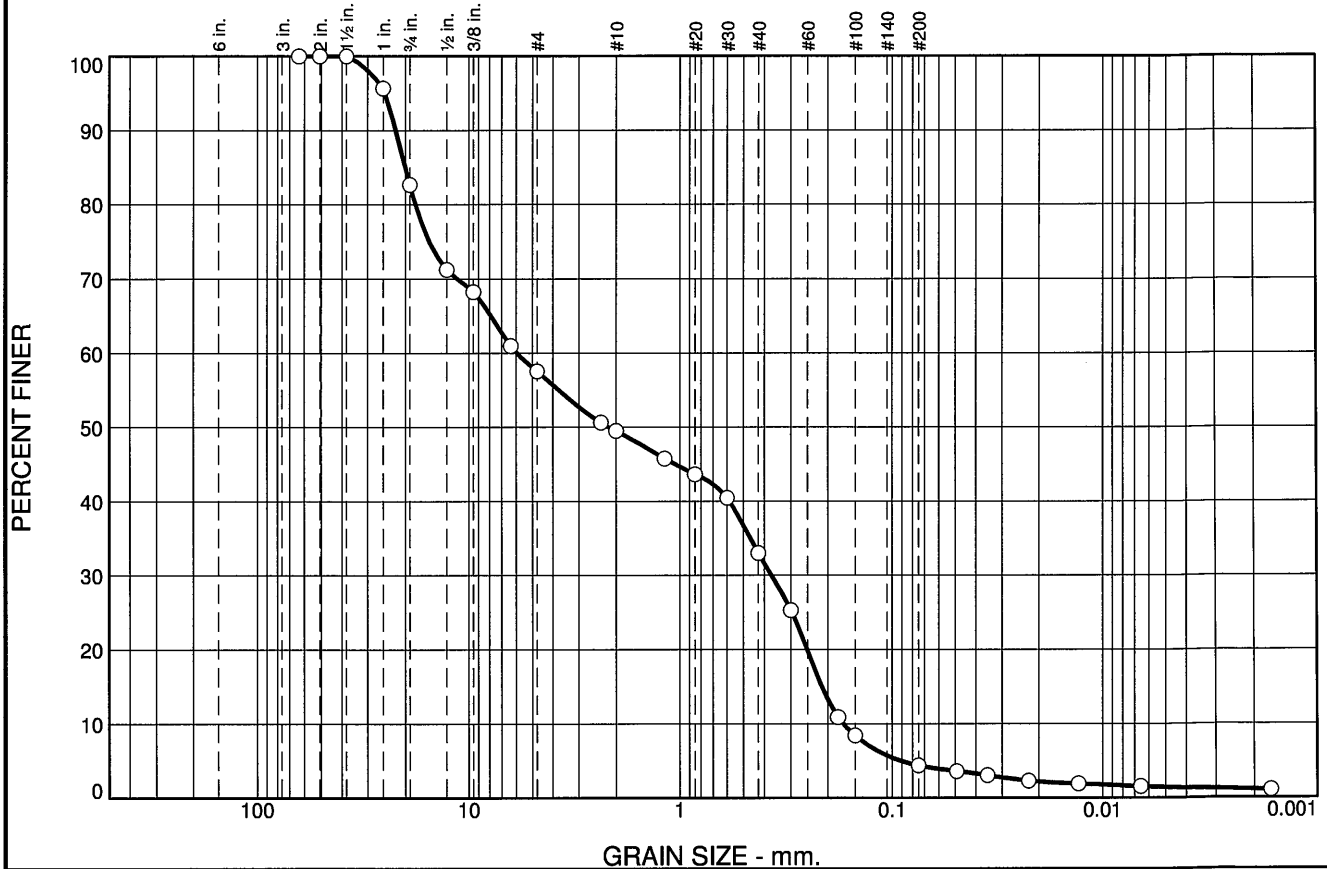
Client:
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.3	25.2	8.0	16.5	28.6	3.0	1.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	95.7		
.75	82.7		
.5	71.2		
.375	68.2		
.25	60.9		
#4	57.5		
#8	50.6		
#10	49.5		
#16	45.8		
#20	43.6		
#30	40.4		
#40	33.0		
#50	25.3		
#80	10.9		
#100	8.4		
#200	4.4		

* (no specification provided)

Material Description

Poorly graded sand with gravel

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 22.1889

D₅₀= 2.1639

D₁₀= 0.1707

D₈₅= 20.0263

D₃₀= 0.3687

C_u= 34.87

D₆₀= 5.9523

D₁₅= 0.2129

C_c= 0.13

Classification

USCS= SP

AASHTO= A-1-b

Remarks

Source of Sample: M303A
Sample Number: M303A, 23-30'

Date: 11-26-12

TRC Environmental Corp.

Client:

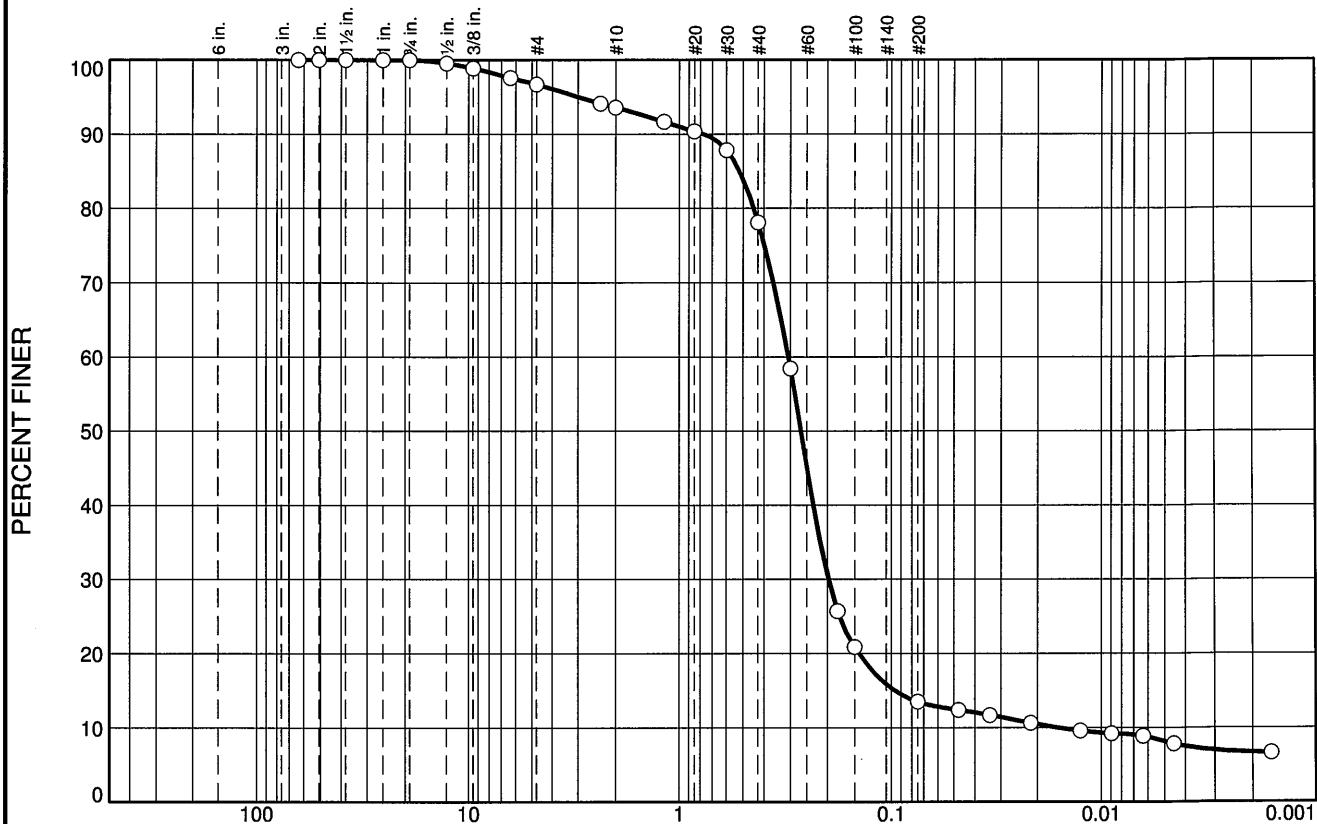
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.3	3.1	15.5	64.6	5.3	8.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	100.0		
.5	99.6		
.375	98.9		
.25	97.6		
#4	96.7		
#8	94.1		
#10	93.6		
#16	91.7		
#20	90.4		
#30	87.9		
#40	78.1		
#50	58.4		
#80	25.7		
#100	20.9		
#200	13.5		

* (no specification provided)

Material Description

Silty sand

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 0.7690

D₈₅= 0.5210

D₆₀= 0.3071

D₅₀= 0.2667

D₃₀= 0.1975

D₁₅= 0.0960

D₁₀= 0.0160

C_u= 19.18

C_c= 7.93

Classification

USCS= SM

AASHTO= A-2-4(0)

Remarks

Source of Sample: M304B
Sample Number: M304B, 23-30'

Date: 11-26-12

TRC Environmental Corp.

Client:

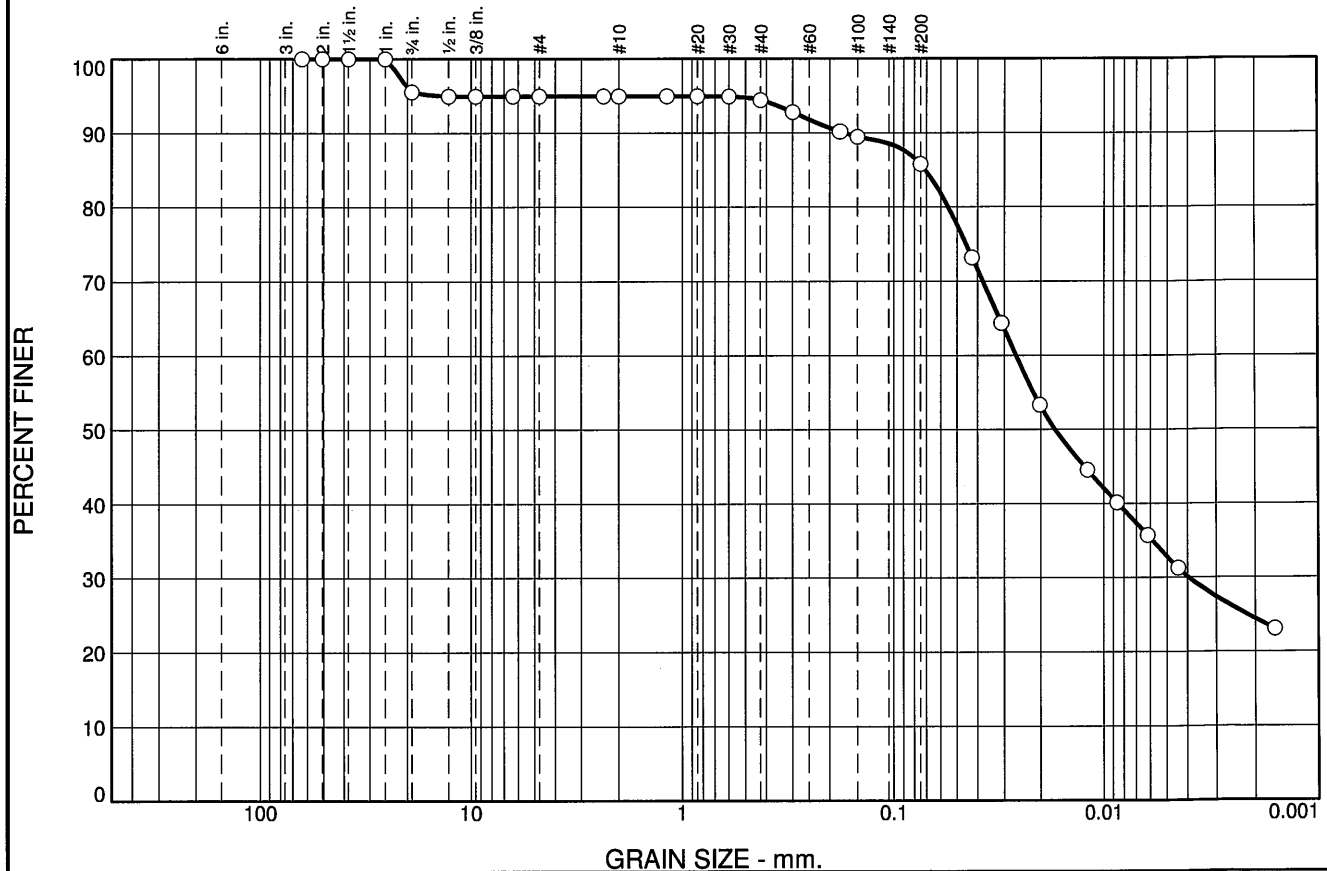
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.5	0.5	0.0	0.6	8.6	53.0	32.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	95.5		
.5	95.0		
.375	95.0		
.25	95.0		
#4	95.0		
#8	95.0		
#10	95.0		
#16	95.0		
#20	95.0		
#30	94.9		
#40	94.4		
#50	92.8		
#80	90.2		
#100	89.5		
#200	85.8		

* (no specification provided)

Material Description

Lean clay

Atterberg Limits

PL= 15

LL= 24

PI= 9

Coefficients

D₉₀= 0.1731

D₈₅= 0.0711

D₆₀= 0.0265

D₅₀= 0.0172

D₃₀= 0.0040

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= CL

AASHTO= A-4(5)

Remarks

Source of Sample: M304B
Sample Number: M304B, 58-60'

Date: 11-26-12

TRC Environmental Corp.

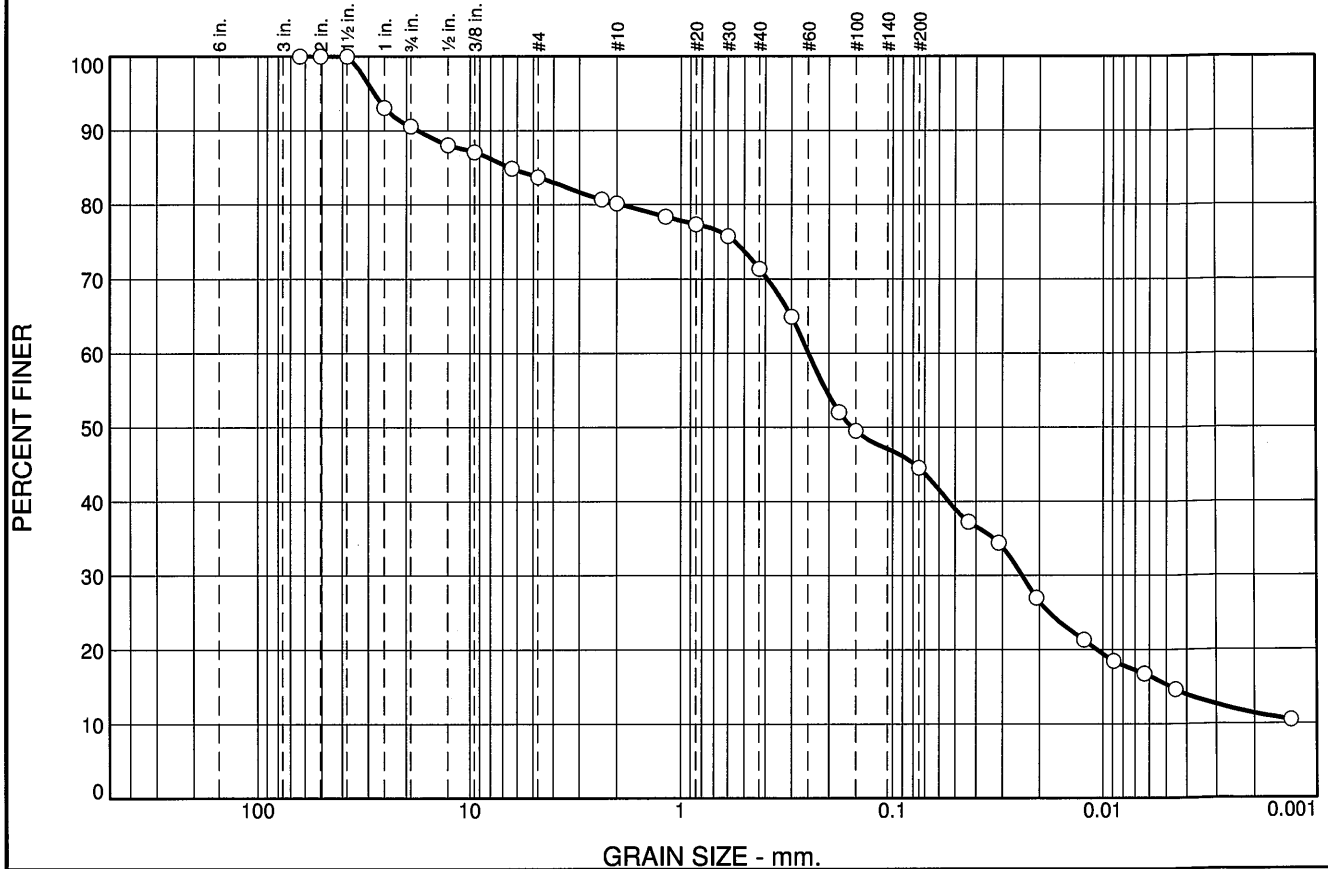
Client:
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.4	6.9	3.5	8.8	26.9	29.2	15.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	93.1		
.75	90.6		
.5	88.1		
.375	87.1		
.25	84.9		
#4	83.7		
#8	80.7		
#10	80.2		
#16	78.4		
#20	77.4		
#30	75.8		
#40	71.4		
#50	64.9		
#80	52.0		
#100	49.5		
#200	44.5		

* (no specification provided)

Material Description

Clayey sand with gravel

Atterberg Limits

PL= 15

LL= 25

PI= 10

Coefficients

D₉₀= 17.4715

D₈₅= 6.4905

D₆₀= 0.2486

D₅₀= 0.1566

D₃₀= 0.0242

D₁₅= 0.0048

D₁₀=

C_u=

C_c=

Classification

USCS= SC

AASHTO= A-4(1)

Remarks

Source of Sample: M305A
Sample Number: M305A, 5-7'

Date: 03-07-13

TRC Environmental Corp.

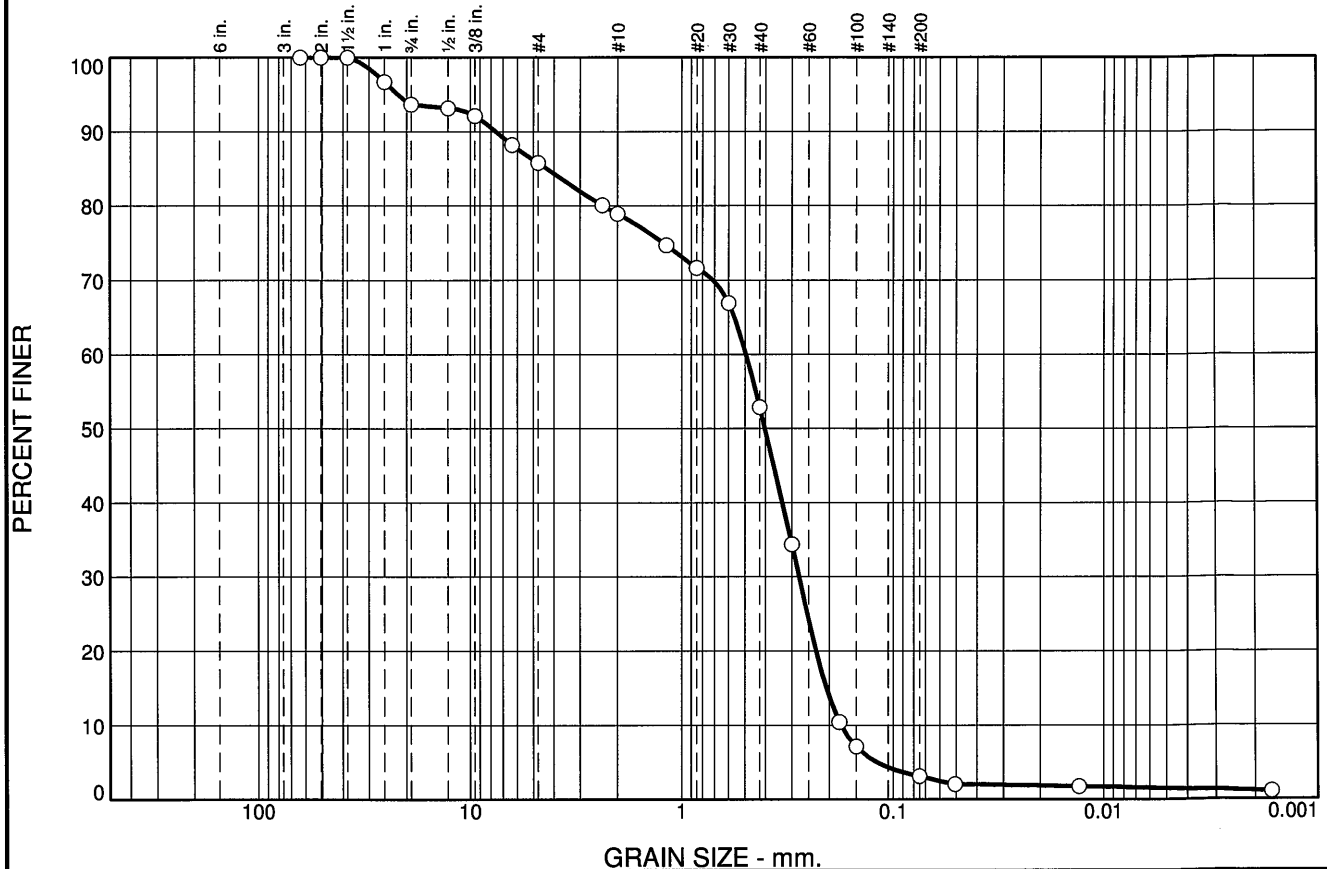
Client:
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.3	7.9	6.8	26.1	49.8	1.6	1.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	96.7		
.75	93.7		
.5	93.2		
.375	92.1		
.25	88.2		
#4	85.8		
#8	80.1		
#10	79.0		
#16	74.7		
#20	71.6		
#30	66.9		
#40	52.9		
#50	34.4		
#80	10.4		
#100	7.2		
#200	3.1		

* (no specification provided)

Material Description		
Poorly graded sand		
Atterberg Limits PL= NP LL= NV PI= NP		
Coefficients D₉₀= 7.5479 D₅₀= 0.4015 D₁₀= 0.1769		
Classification USCS= SP AASHTO= A-3		
Remarks		

Source of Sample: M305B
Sample Number: M305B, 28-35'

Date: 11-26-12

TRC Environmental Corp.

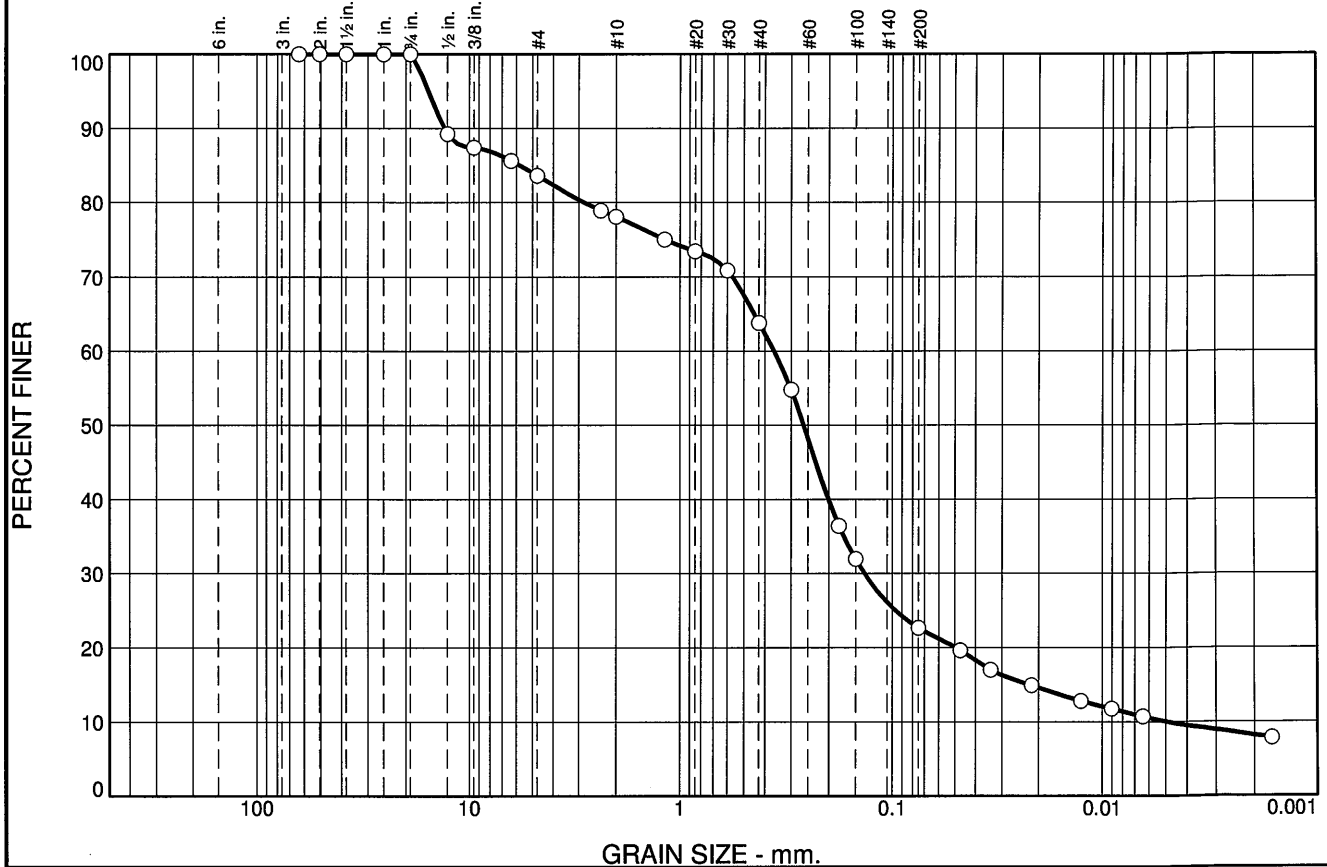
Madison, Wisconsin

Client:
Project: Dane County

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	16.4	5.5	14.3	41.1	12.7	10.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	100.0		
.5	89.3		
.375	87.4		
.25	85.7		
#4	83.6		
#8	78.9		
#10	78.1		
#16	75.0		
#20	73.4		
#30	70.8		
#40	63.8		
#50	54.8		
#80	36.4		
#100	31.9		
#200	22.7		

* (no specification provided)

Material Description

Silty sand with gravel

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 13.1491

D₈₅= 5.7537

D₆₀= 0.3618

D₅₀= 0.2619

D₃₀= 0.1358

D₁₅= 0.0222

D₁₀= 0.0050

C_u= 73.08

C_c= 10.29

Classification

USCS= SM

AASHTO= A-2-4(0)

Remarks

Source of Sample: M305B
Sample Number: M305B, 63-65'

Date: 11-26-12

TRC Environmental Corp.

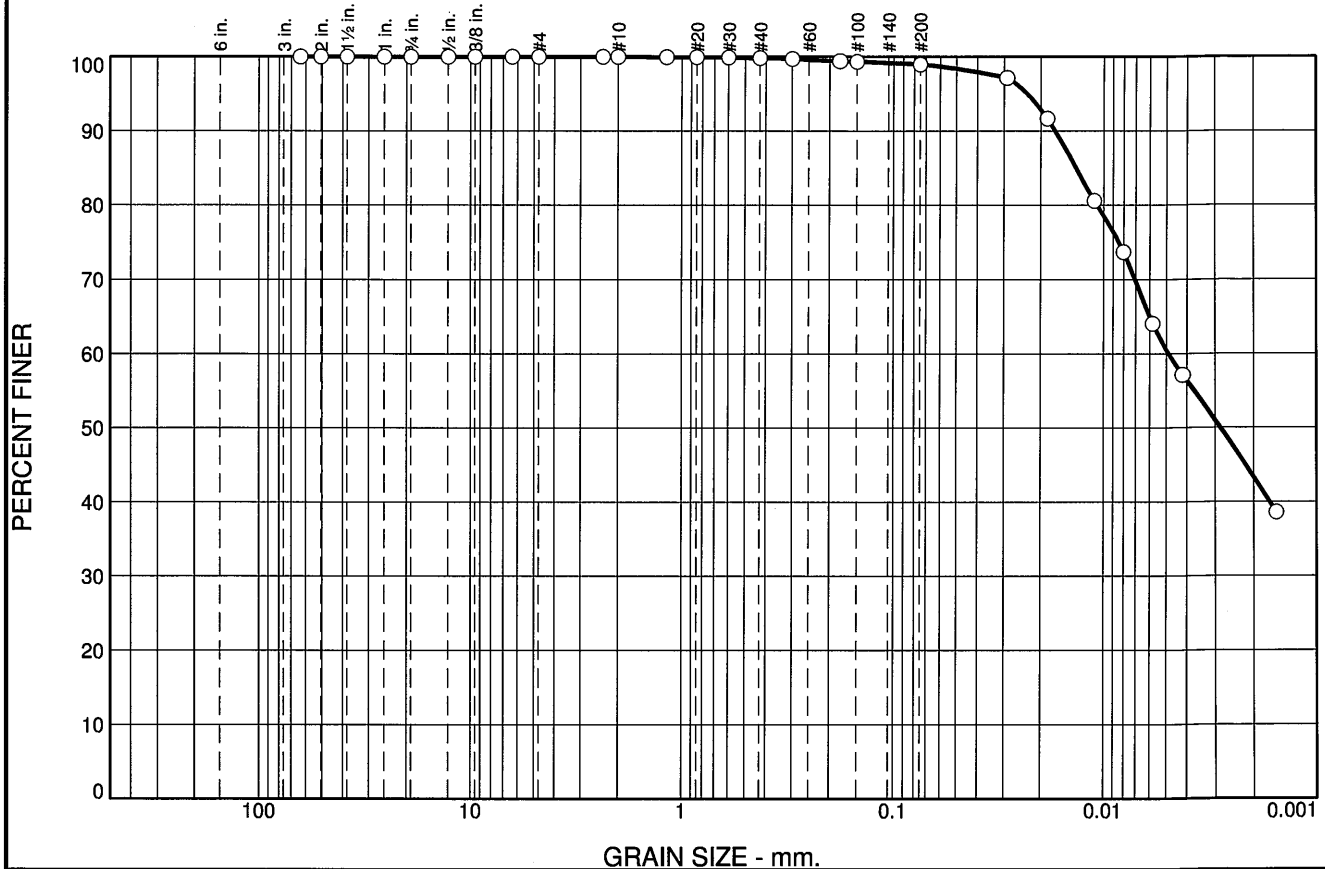
Client:
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	0.8	38.5	60.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	100.0		
.5	100.0		
.375	100.0		
.25	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#20	99.9		
#30	99.9		
#40	99.8		
#50	99.7		
#80	99.4		
#100	99.3		
#200	99.0		

* (no specification provided)

Material Description

Lean clay

Atterberg Limits

PL= 17

LL= 35

PI= 18

Coefficients

D₉₀= 0.0171

D₅₀= 0.0028

D₁₀=

D₈₅= 0.0136

D₃₀=

C_u=

D₆₀= 0.0049

D₁₅=

C_c=

Classification

USCS= CL

AASHTO= A-6(18)

Remarks

Source of Sample: B311
Sample Number: B311, 38-40'

Date: 11-26-12

TRC Environmental Corp.

Client:

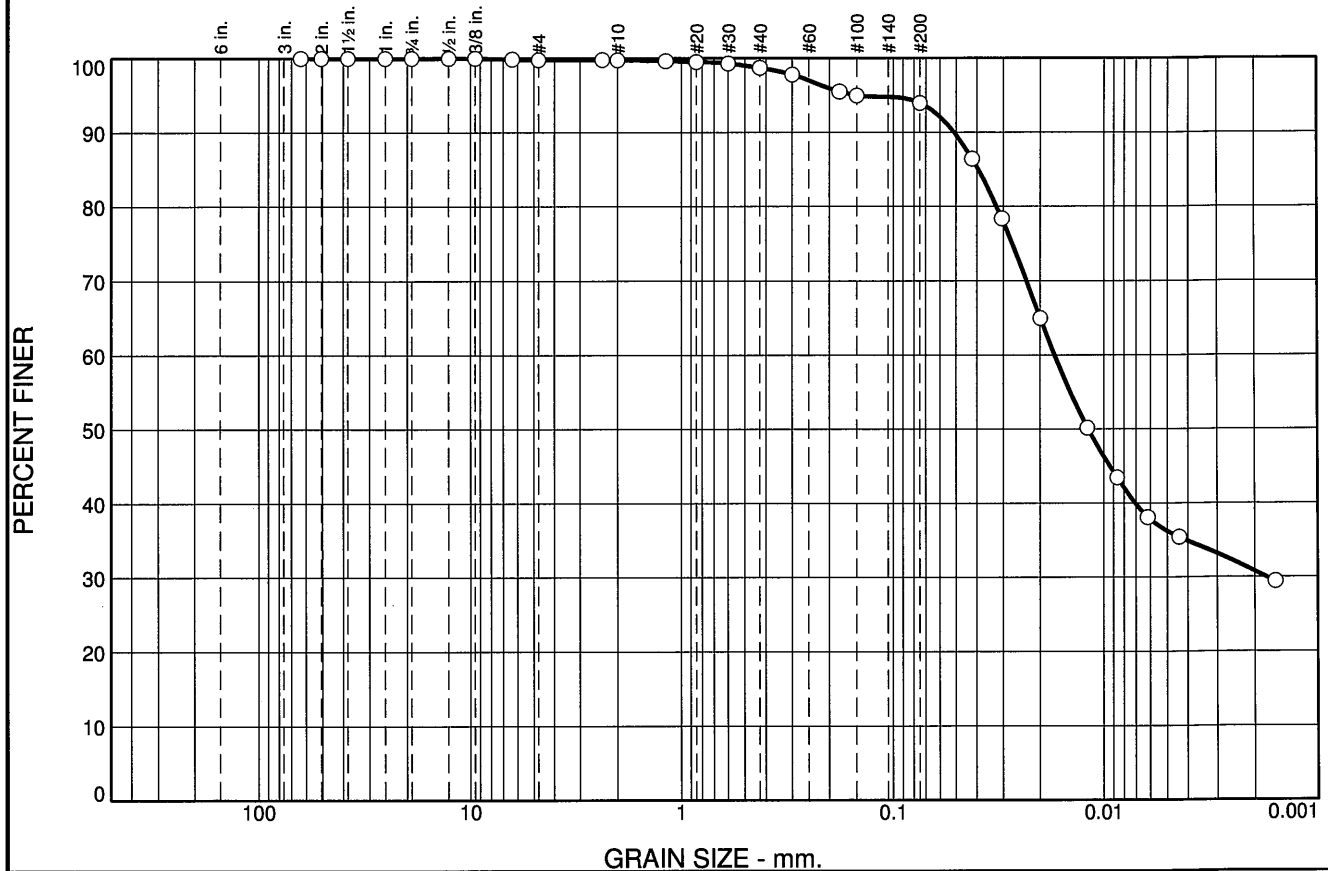
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.0	1.1	4.7	57.8	36.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	100.0		
1.5	100.0		
1.0	100.0		
.75	100.0		
.5	100.0		
.375	100.0		
.25	99.9		
#4	99.8		
#8	99.8		
#10	99.8		
#16	99.6		
#20	99.5		
#30	99.3		
#40	98.7		
#50	97.8		
#80	95.5		
#100	95.0		
#200	94.0		

* (no specification provided)

Material Description

Lean clay

PL= 22

Atterberg Limits

LL= 45

PI= 23

D₉₀= 0.0513
D₅₀= 0.0119
D₁₀=

Coefficients

D₈₅= 0.0394
D₃₀= 0.0018
C_u=

D₆₀= 0.0171
D₁₅=
C_c=

Classification

USCS= CL

AASHTO= A-7-6(24)

Remarks

Source of Sample: B314
Sample Number: B314, 3-5'

Date: 11-26-12

TRC Environmental Corp.

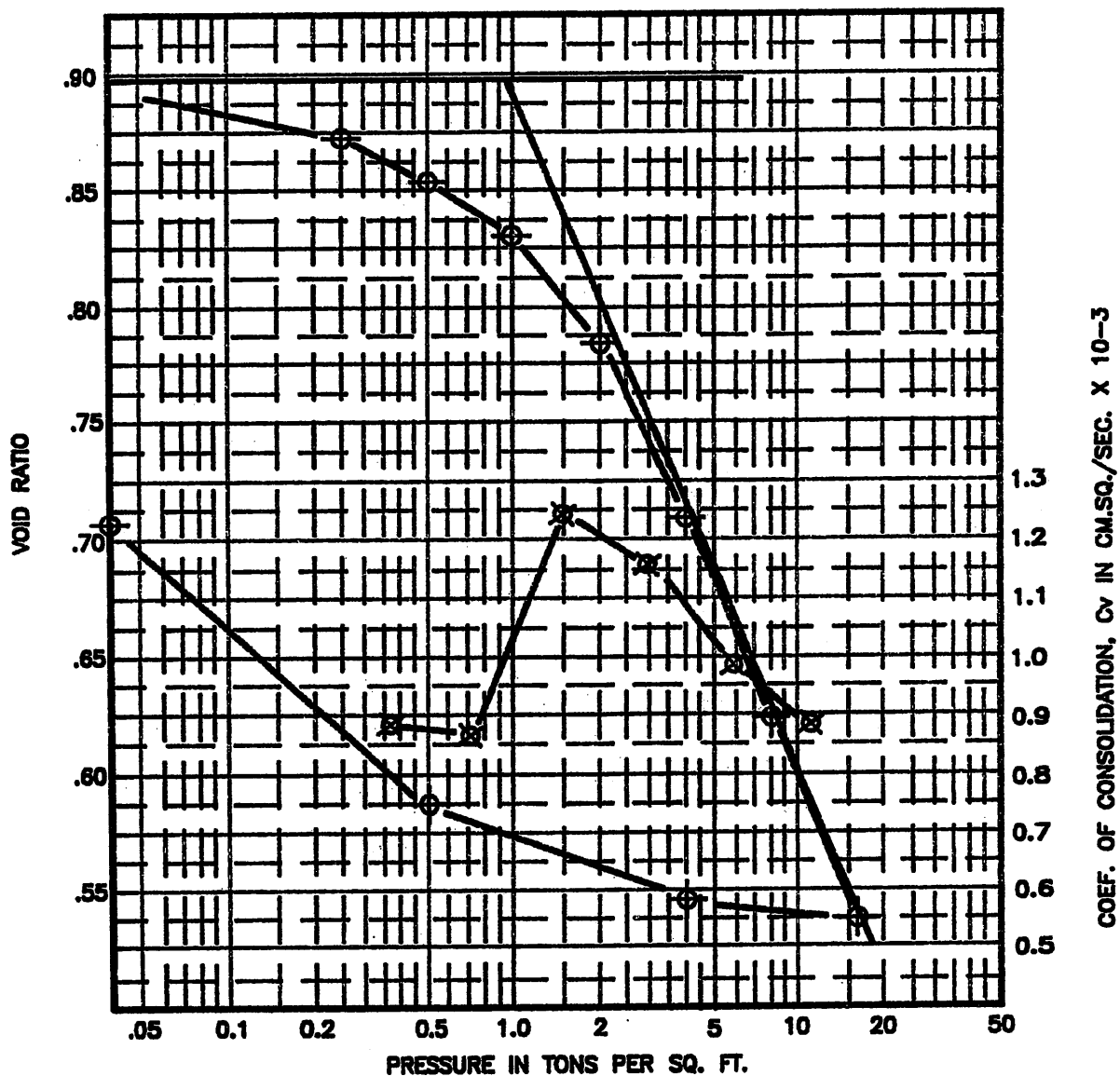
Client:
Project: Dane County

Madison, Wisconsin

Project No: 194528.0002

Figure

TRC Environmental Corporation														QC: JPH			
Falling Head Permeability Test (ASTM D5084)														QA: JPH			
Project Name: Dane County										Cell #:				1			
Project #: 194528.0002.0000										USCS Description:				Clayey sand with gravel			
Sample Name: M305A, 5-7'										USCS Classification:				SC			
Visual Descript: Clayey sand with gravel										Average Kv =				2.0E-08 cm/sec			
Sample Type: Undisturbed										Initial Values		Final Values					
Sample Dia. (in)										2.85		2.85		Permeant: Water			
Sample Ht. (in)										3.31		3.31		Permeant Specific Gravity: 1.00			
Tare & Wet (g)										767.30		1036.60		Sample Specific Gravity: 2.70 Est.			
Tare & Dry (g)										685.64		944.90		Confining Pressure (psi): 100.0			
Tare (g)										0.00		259.26		Burette Diameter (in): 0.250			
Sample Wt. (g)										767.30		777.34		Burette Zero (cm): 100.0			
Moisture (%)										11.9		13.4		Maximum Gradient: 5.1			
Wet Density (pcf)										138.5		140.3		Average Gradient: 4.6			
Dry Density (pcf)										123.8		123.8		Max. Effect. Stress (psi): 6.0			
Saturation (%)										89.0		100.0		Min. Effect. Stress (psi): 4.7			
														Ave. Effect. Stress (psi): 5.2			
Date	Time	Run	Temp	Pressure (psi)		Cham.	Bot.	Bot.		Top	Flow	Kv ***	Ave.*				
Yr.	Mo.	Day	Hr.	Min.	Time	C°**	Bot	Top	Cham	Dif.	Bot	Dif.	Top	Dif.	Dif. %	cm/sec	0.1
1	2012	11	15	7	4.00		0.0	95	95	32.30		7.75		99.65			
2	2012	11	15	8	5.00	3660	21.0	95	95	32.70	0.40	9.35	1.60	97.55	2.10	-13.5	3.5E-07
3	2012	11	15	9	6.00	3660	21.0	95	95	32.95	0.25	10.75	1.40	96.30	1.25	5.7	2.6E-07
4	2012	11	15	11	3.00	7020	21.0	95	95	33.65	0.70	12.95	2.20	94.30	2.00	4.8	2.3E-07
5	2012	11	15	12	33.00	5400	21.0	95	95	33.90	0.25	14.50	1.55	92.95	1.35	6.9	2.1E-07
6	2012	11	16	6	45.00	65520	21.0	95	95	36.05	2.15	24.10	9.60	84.60	8.35	7.0	1.3E-07
7	2012	11	16	8	11.00	5160	21.0	95	95	36.30	0.25	24.45	0.35	84.35	0.25	16.7	6.1E-08
8	2012	11	16	10	12.00	7260	21.0	95	95	36.65	0.35	24.95	0.50	83.90	0.45	5.3	6.9E-08
9	2012	11	16	13	12.00	10800	21.0	95	95	37.15	0.50	25.60	0.65	83.55	0.35	30.0	5.0E-08
10	2012	11	16	14	14.00	3720	21.0	95	95	37.25	0.10	25.80	0.20	83.55	0.00	100.0	2.9E-08
11	2012	11	16	15	40.00	5160	21.0	95	95	37.65	0.40	26.10	0.30	83.10	0.45	-20.0	8.0E-08
12	2012	11	19	6	15.00	225300	21.0	95	95	41.25	3.60	31.75	5.65	79.15	3.95	17.7	2.6E-08
13	2012	11	19	8	15.00	7200	21.0	95	95	41.40	0.15	31.85	0.10	79.05	0.10	0.0	1.9E-08
14	2012	11	19	12	9.00	14040	21.0	95	95	41.70	0.30	32.05	0.20	78.85	0.20	0.0	1.9E-08
15	2012	11	19	15	55.00	13560	22.0	95	95	42.05	0.35	32.35	0.30	78.75	0.10	50.0	2.0E-08
16	2012	11	20	6	12.00	51420	21.5	95	95	42.90	0.85	33.15	0.80	78.25	0.50	23.1	1.7E-08
17	2012	11	20	8	8.00	6960	22.0	95	95	43.25	0.35	33.25	0.10	78.15	0.10	0.0	2.0E-08
18	2012	11	20	15	8.00	25200	22.0	95	95	43.60	0.35	33.60	0.35	77.90	0.25	16.7	1.6E-08
19	2012	11	21	6	1.00	53580	21.0	95	95	43.40	-0.20	34.25	0.65	77.40	0.50	13.0	1.5E-08
20	2012	11	21	8	2.00	7260	21.0	95	95	43.65	0.25	34.40	0.15	77.35	0.05	50.0	2.0E-08
21	2012	11	21	10	3.00	7260	22.0	95	95	44.00	0.35	34.55	0.15	77.20	0.15	0.0	3.0E-08 1
22	2012	11	21	12	2.00	7140	22.0	95	95	44.30	0.30	34.65	0.10	77.10	0.10	0.0	2.0E-08 1
23	2012	11	21	14	3.00	7260	22.0	95	95	44.40	0.10	34.75	0.10	77.00	0.10	0.0	2.0E-08 1
24	2012	11	26	6	0.00	403020	21.0	95	95	45.60	1.20	39.00	4.25	74.55	2.45	26.9	1.4E-08 1
25	2012	11	26	8	40.00	9600	21.0	95	95	45.70	0.10	39.10	0.10	74.45	0.10	0.0	1.9E-08 1
26																	
**A zero in this column starts a series of measurements.										*Average Kv for those rows with a 1 in the Ave. column.				2.0E-08 cm/sec			
(Termination determined by stable Kv and low flow differential.)										***Kv adjusted for temperature.							



$C_c = 0.28$

NOTES:

$\times$ = Cv

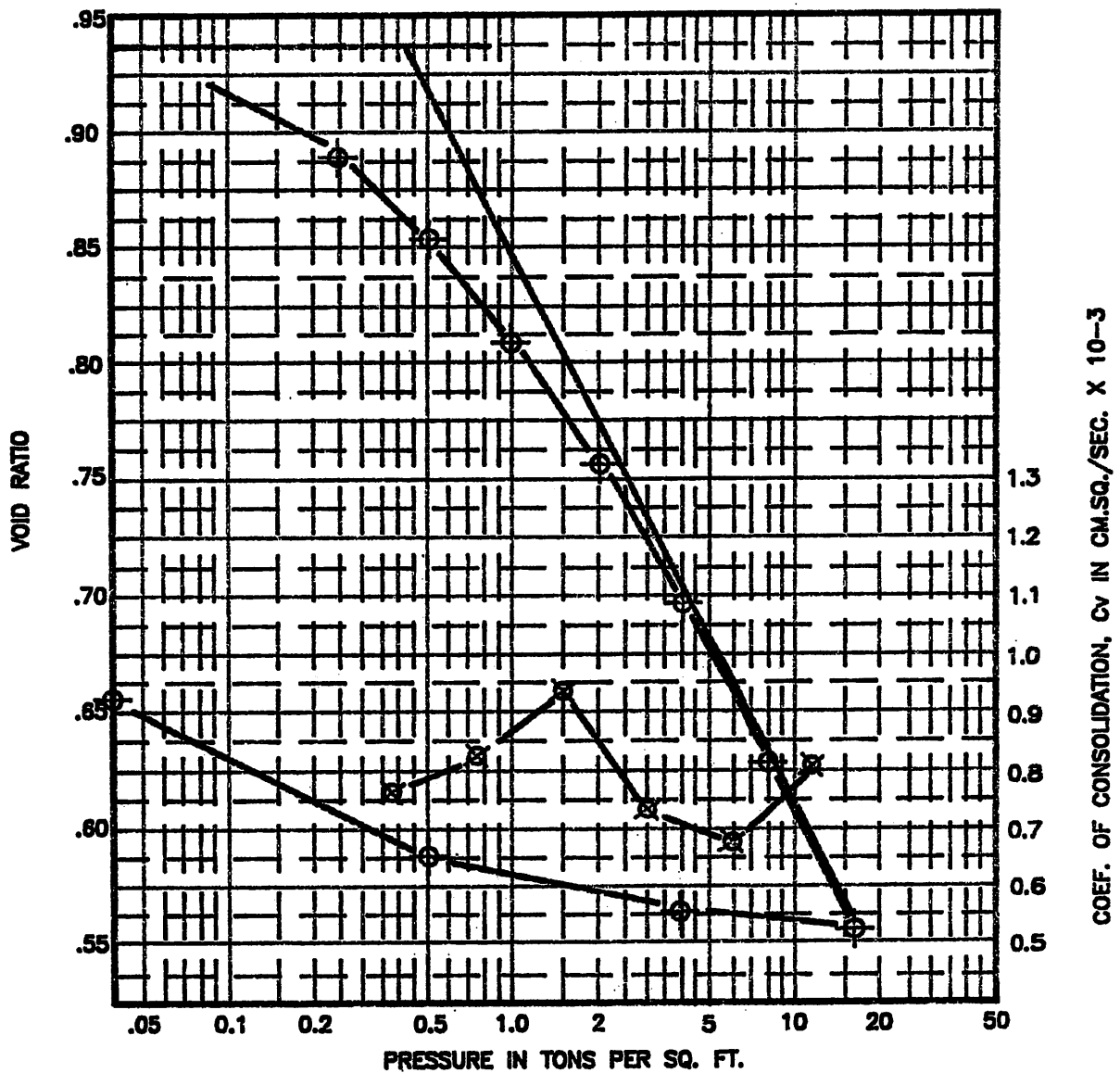
$\odot$ = Void Ratio (e)

Initial Void Ratio = 0.897

Final Void Ratio = 0.710

7/13/91

CONSOLIDATION TEST DATA
DANE CO. LANDFILL
B-110, S-4, 6'-8"
ENVIRONMENTAL AND
FOUNDATION DRILLING, INC.



$C_c = 0.24$

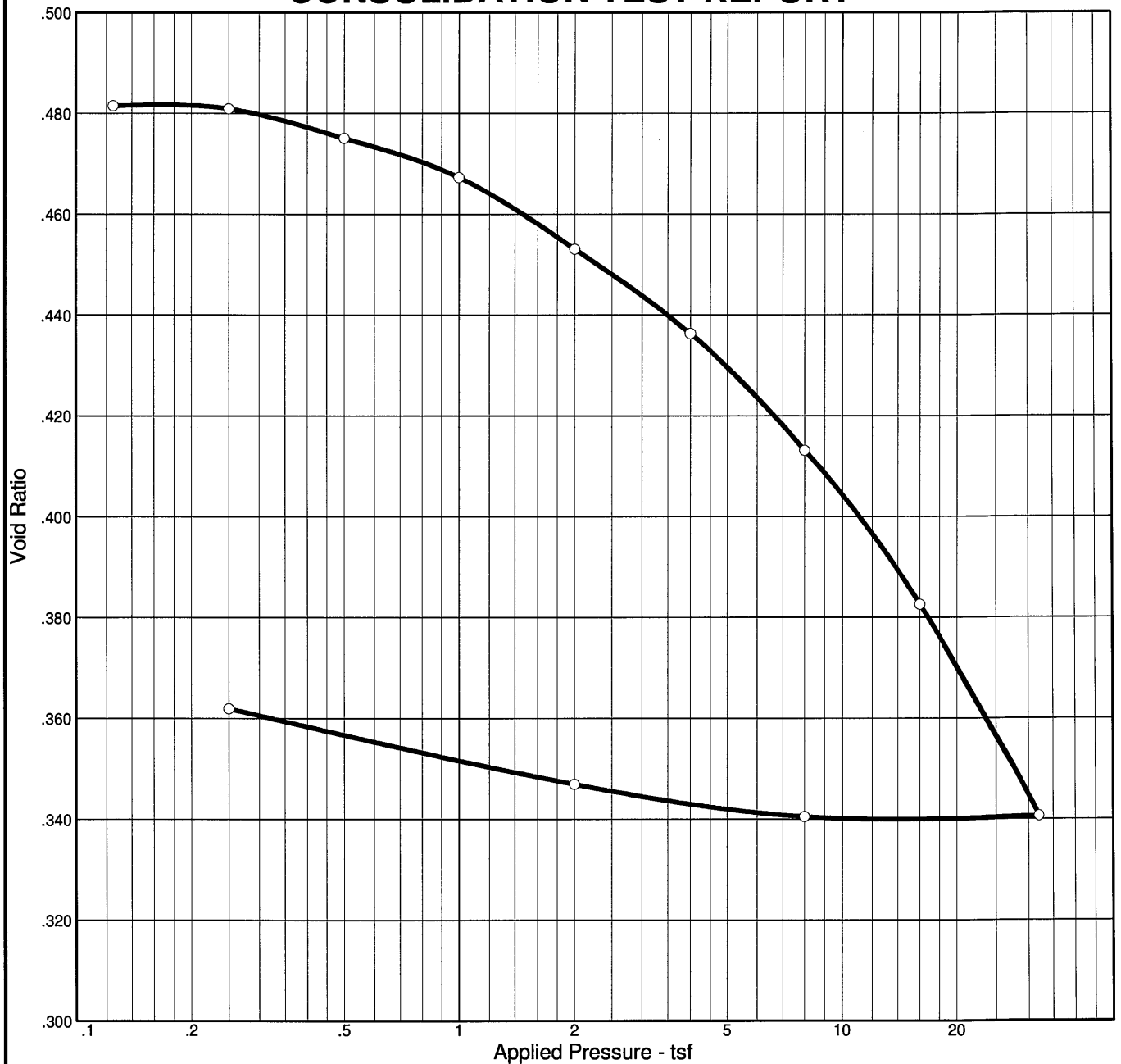
NOTES:

- $\times$ = C_v
- $\odot$ = Void Ratio (e)
- Initial Void Ratio = 0.93
- Final Void Ratio = 0.66

7/13/91

CONSOLIDATION TEST DATA
DANE CO. LANDFILL
B-121A, S-1
ENVIRONMENTAL AND
FOUNDATION DRILLING, INC.

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P _c (tsf)	C _c	C _r	Swell Press. (tsf)	Swell %	e ₀
Sat.	Moist.											
94.3 %	17.4 %	113.1			2.70		5.07	0.14				0.497

MATERIAL DESCRIPTION	USCS	AASHTO

Project No. 194528.0002 Client: Project: Dane County Source: M304B Sample No.: M304B, 60-62' TRC Environmental Corp. Madison, Wisconsin
--

Remarks: Visual Description: Light yellowish brown silty clay, some sand Figure

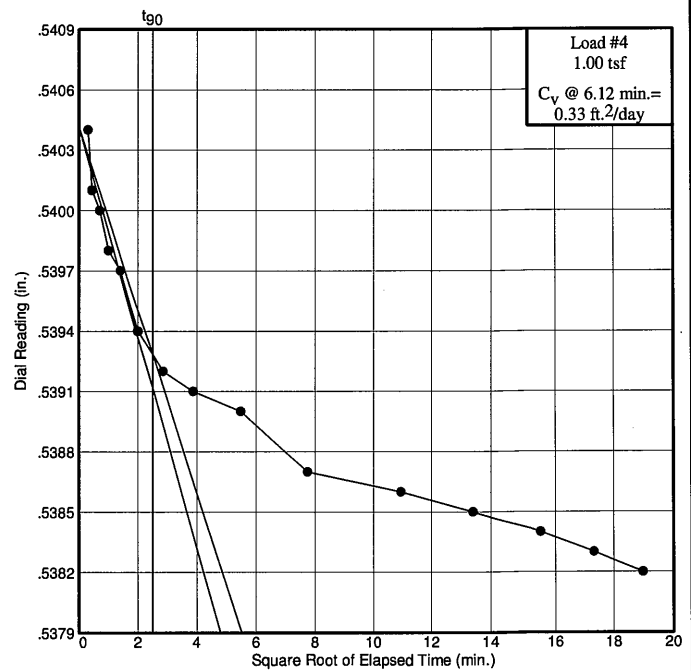
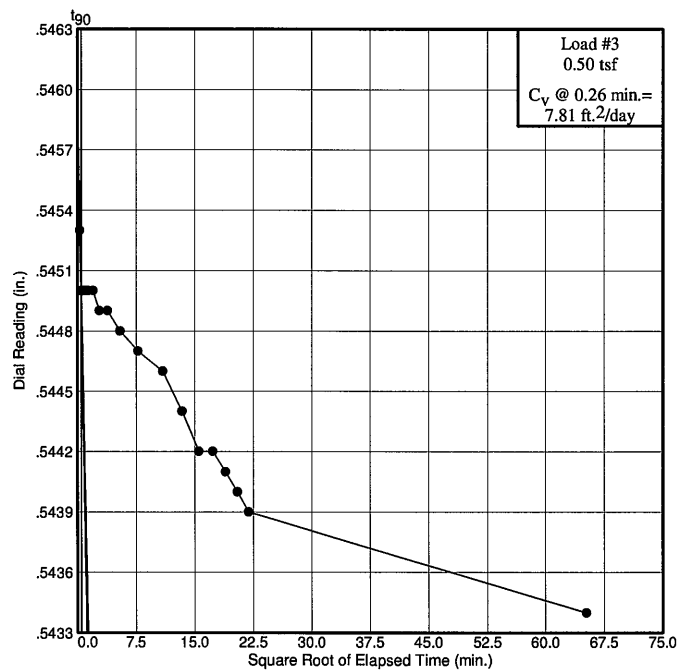
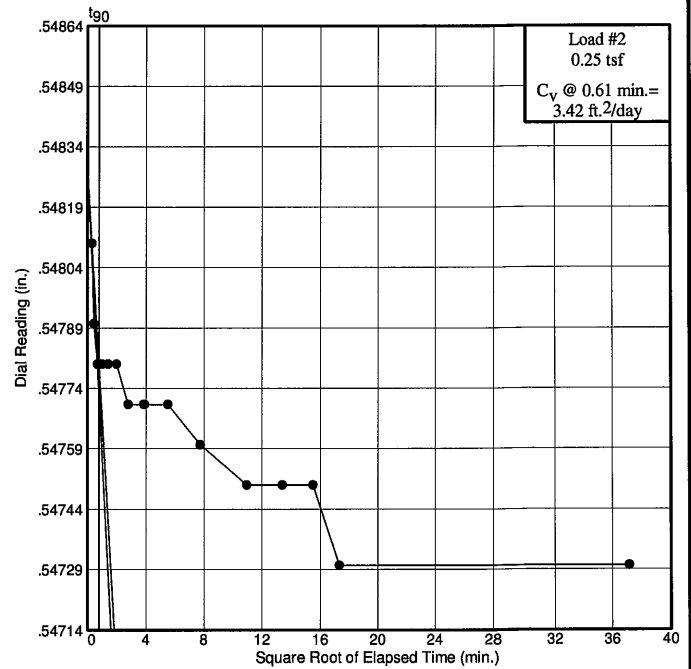
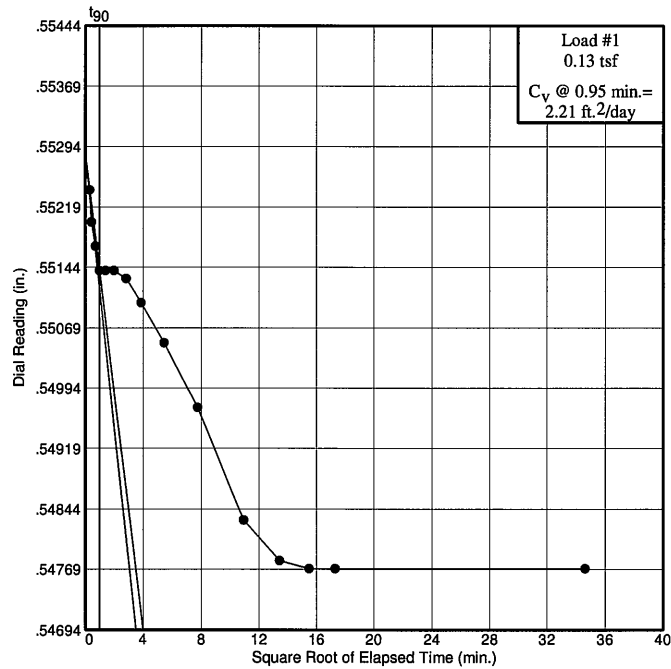
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: M304B

Sample No.: M304B, 60-62'



TRC Environmental Corp.

Madison, Wisconsin

Figure

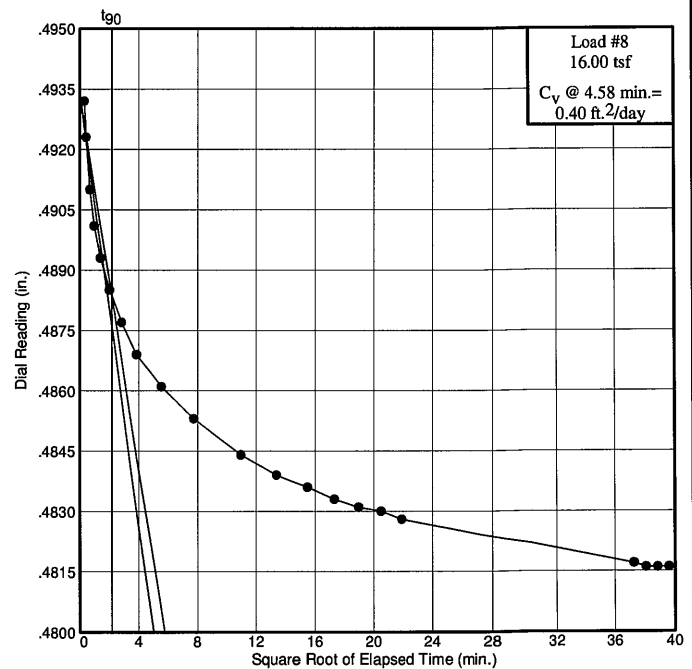
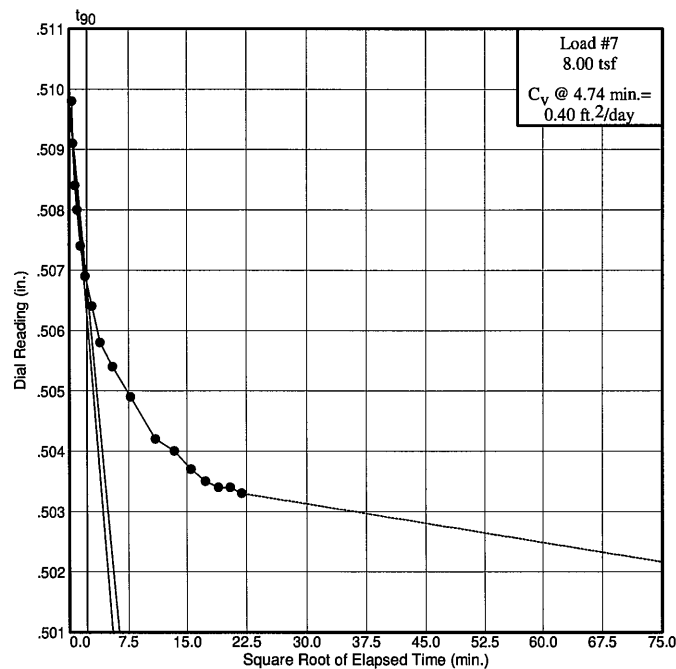
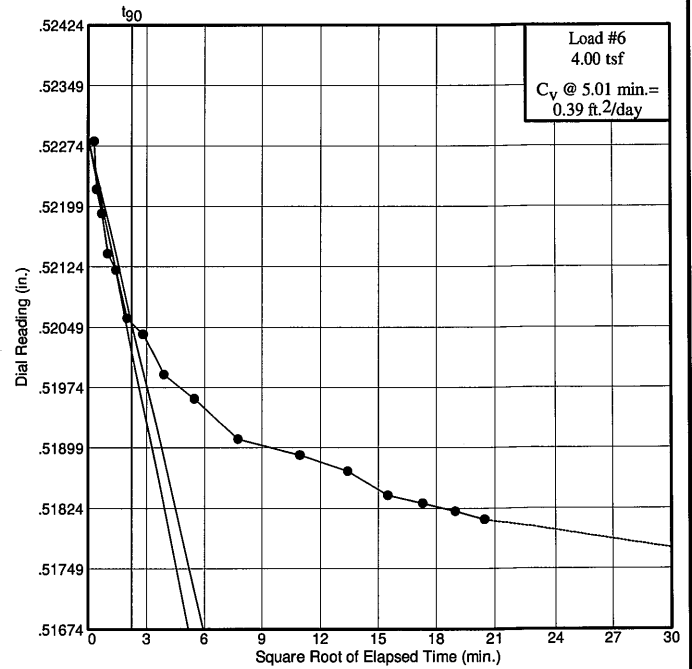
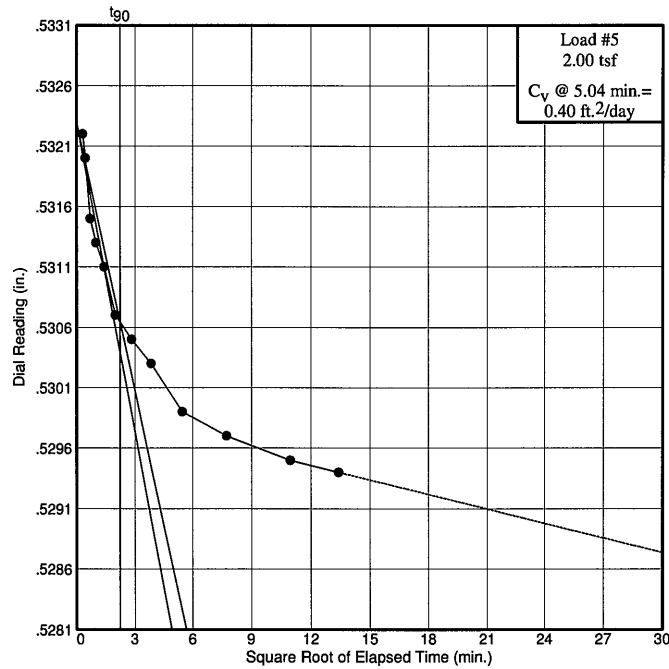
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: M304B

Sample No.: M304B, 60-62'



TRC Environmental Corp.

Madison, Wisconsin

Figure

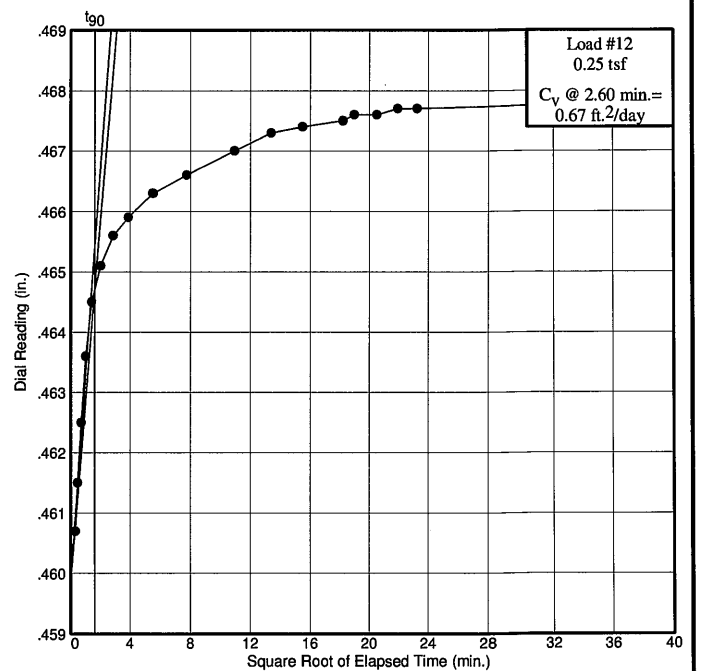
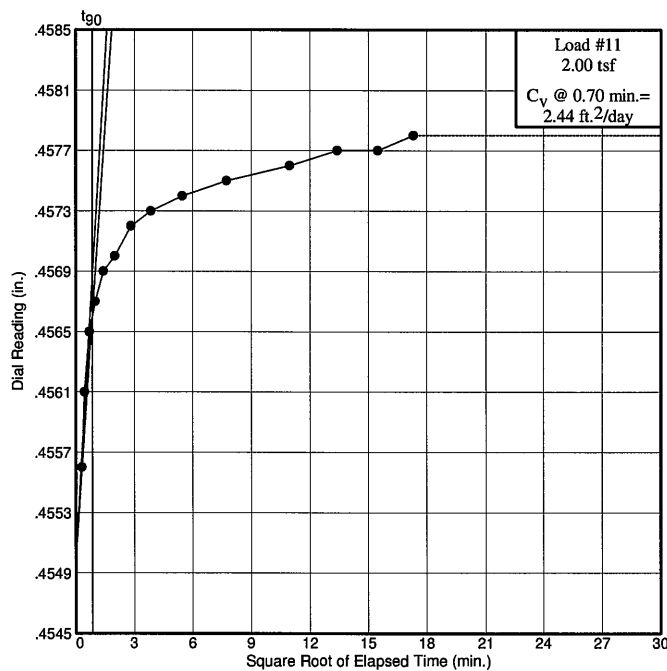
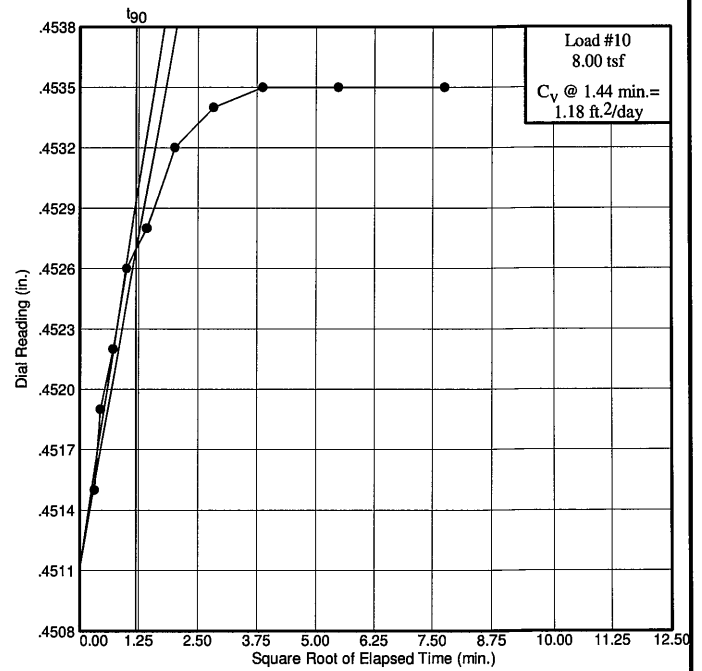
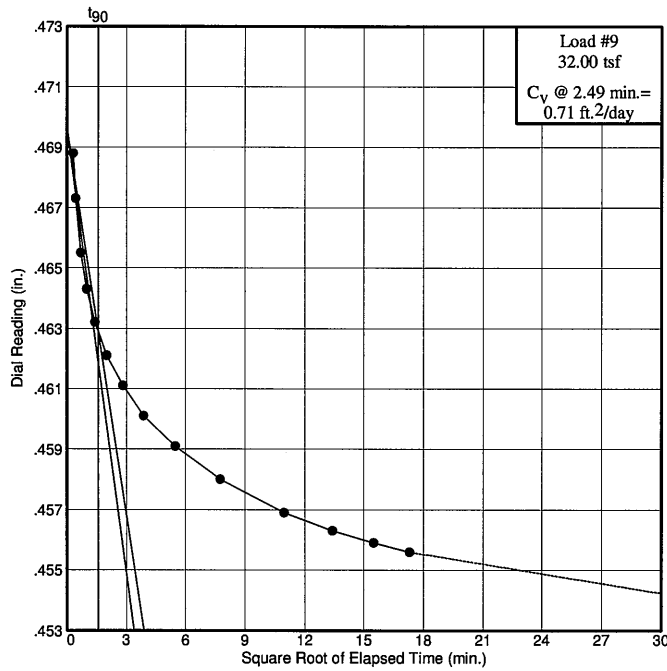
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: M304B

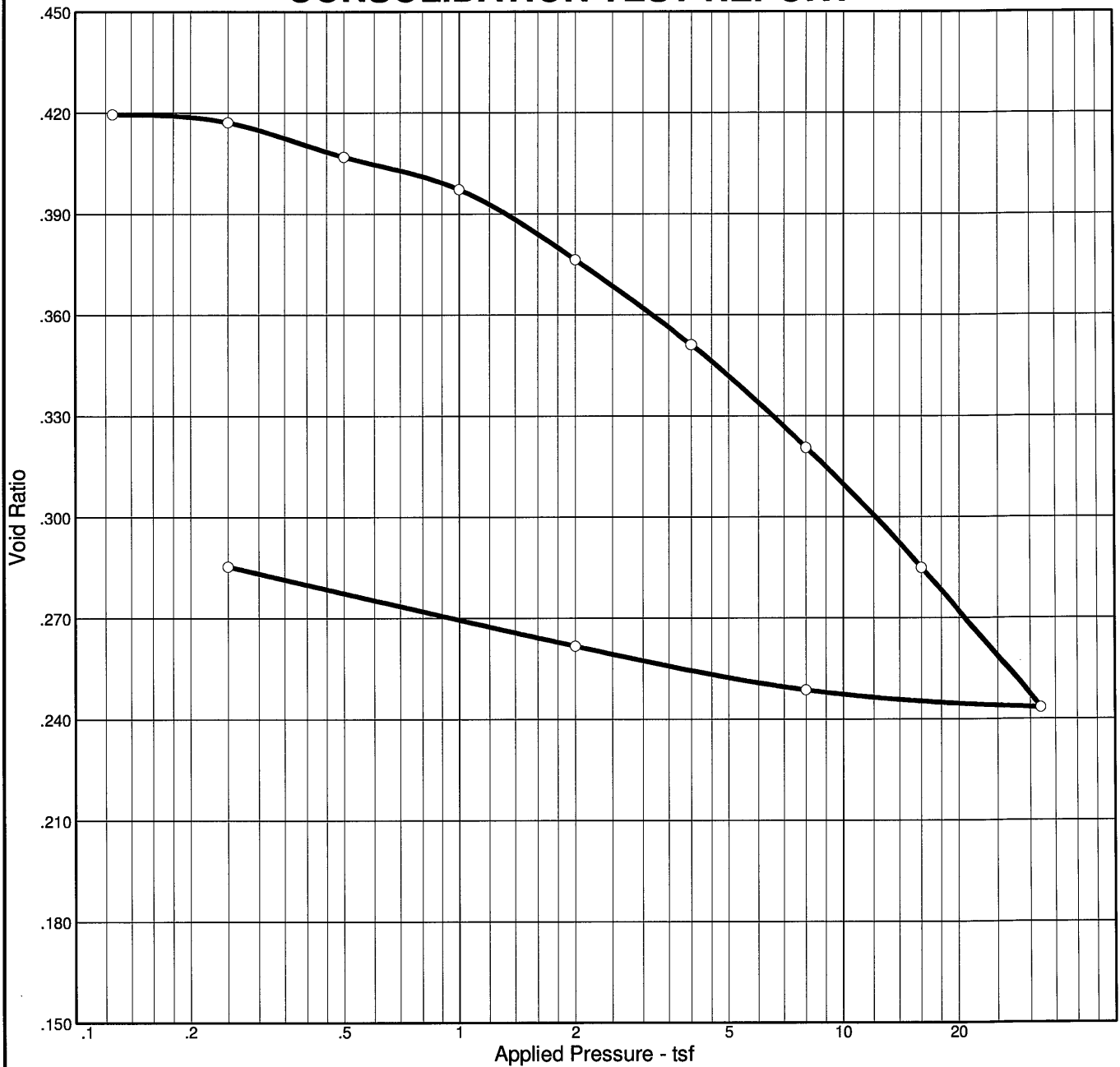
Sample No.: M304B, 60-62'



TRC Environmental Corp.
Madison, Wisconsin

Figure

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	P _c (tsf)	C _c	Initial Void Ratio
Saturation	Moisture							
86.6 %	13.5 %	119.1	25	10	2.70	3.04	0.14	0.420

MATERIAL DESCRIPTION	USCS	AASHTO
Clayey sand with gravel	SC	A-4(1)

Project No. 194528.0002 Client: Project: Dane County Source: M305A Sample No.: M305A, 5-7' TRC Environmental Corp. Madison, Wisconsin	Remarks: Figure
--	--

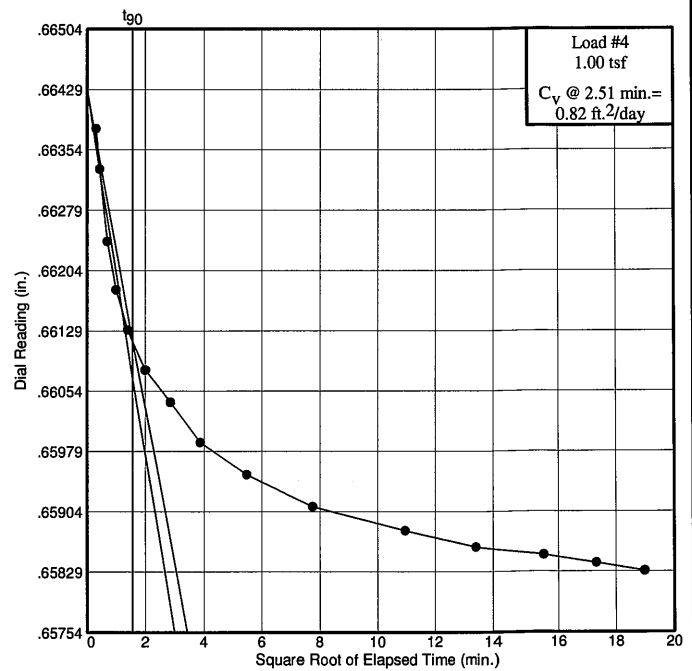
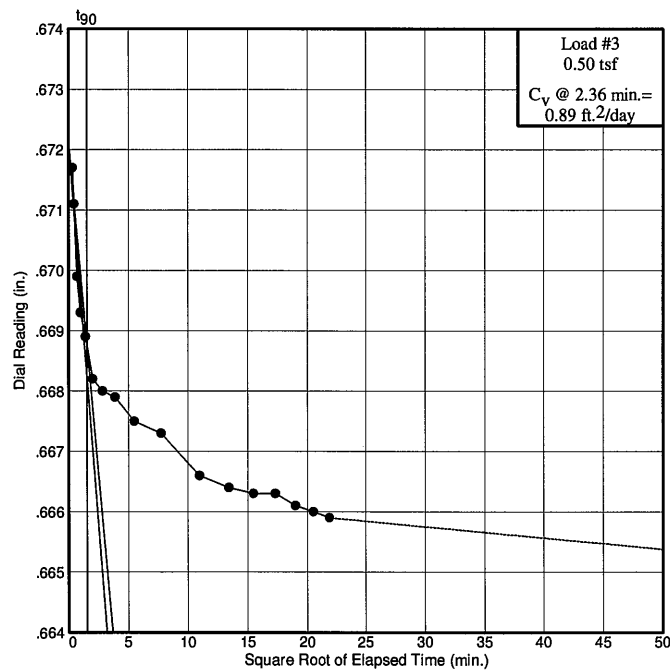
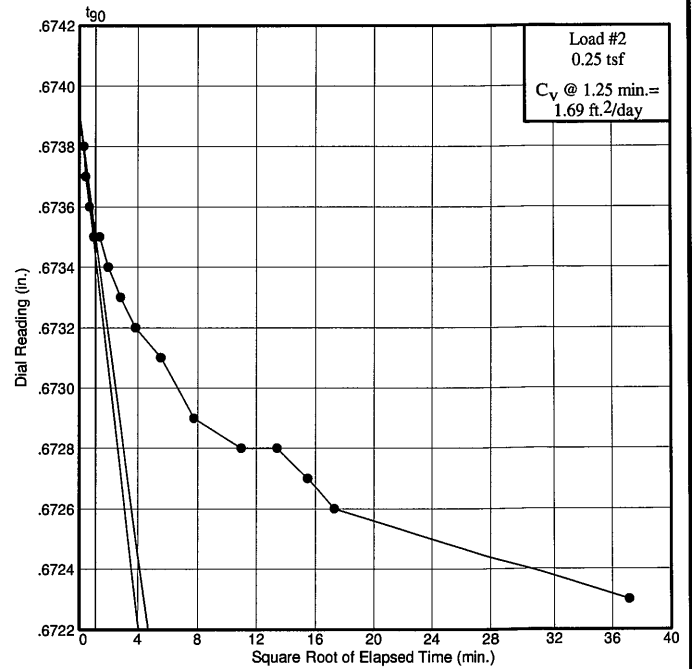
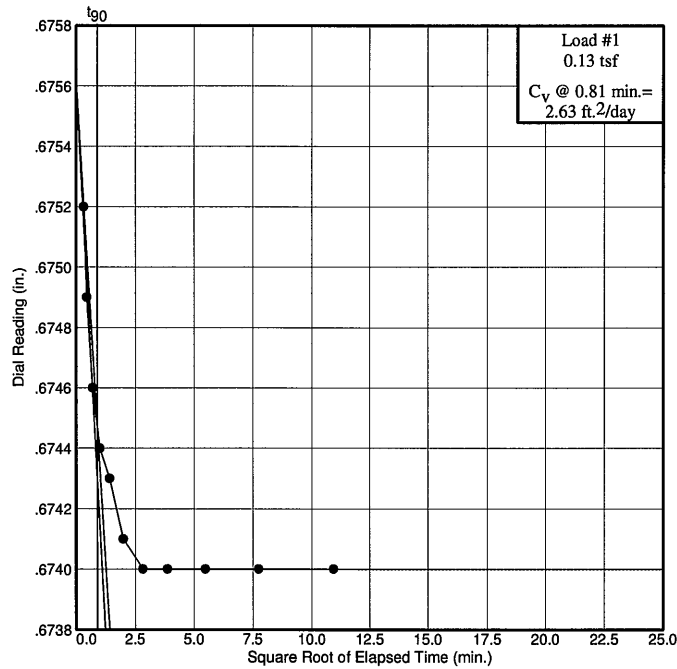
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: M305A

Sample No.: M305A, 5-7'



TRC Environmental Corp.
Madison, Wisconsin

Figure

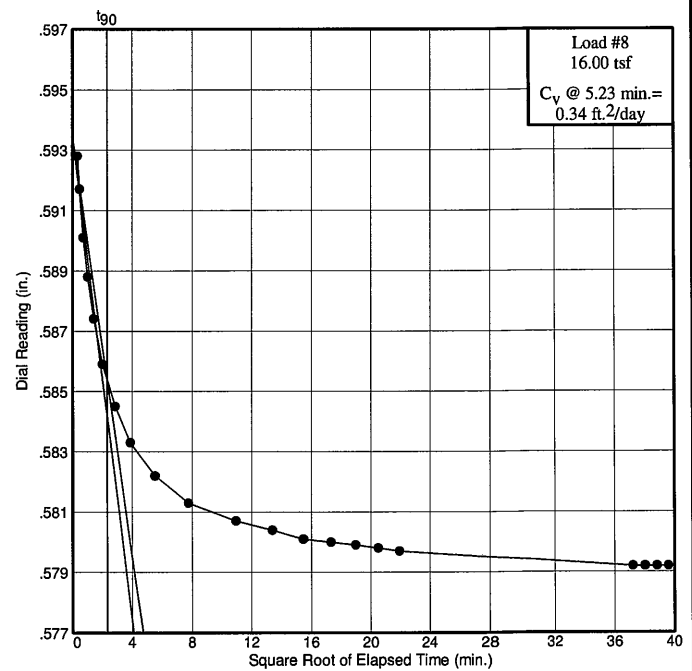
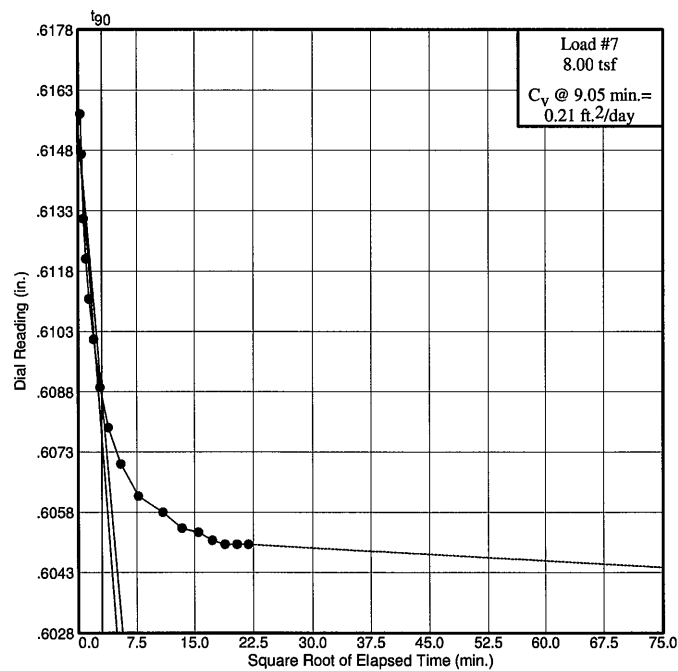
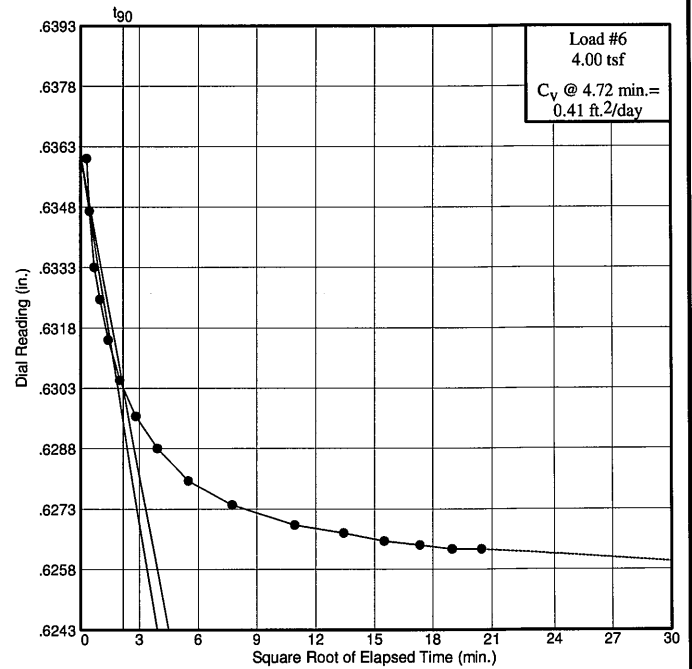
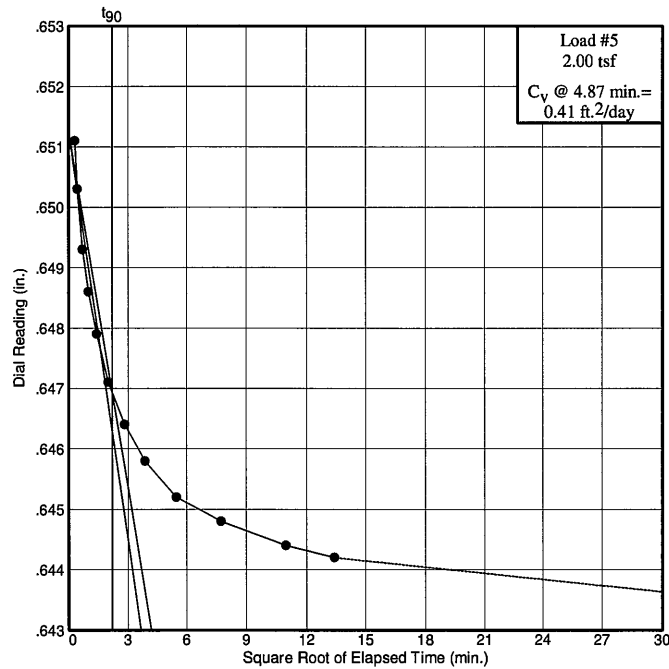
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: M305A

Sample No.: M305A, 5-7'



TRC Environmental Corp.
Madison, Wisconsin

Figure

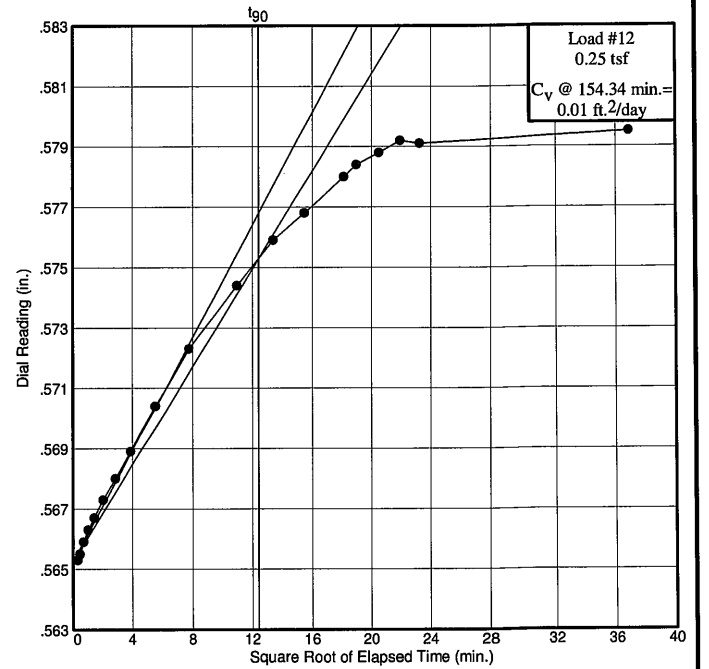
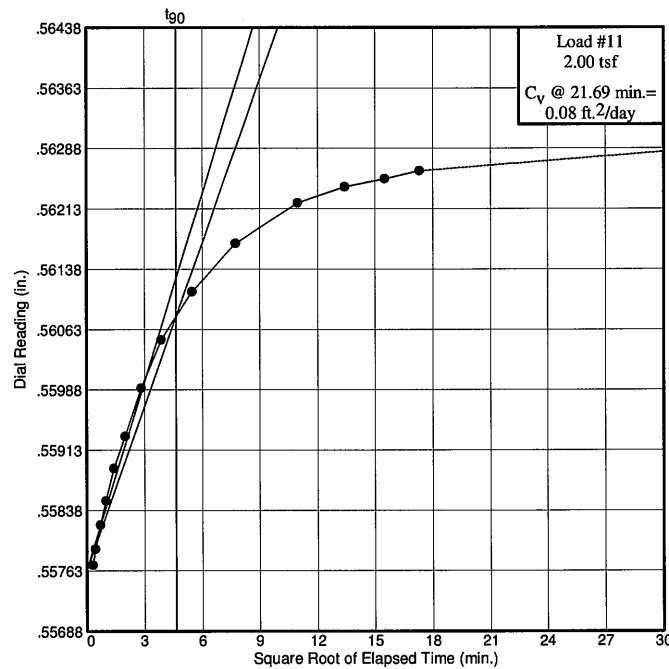
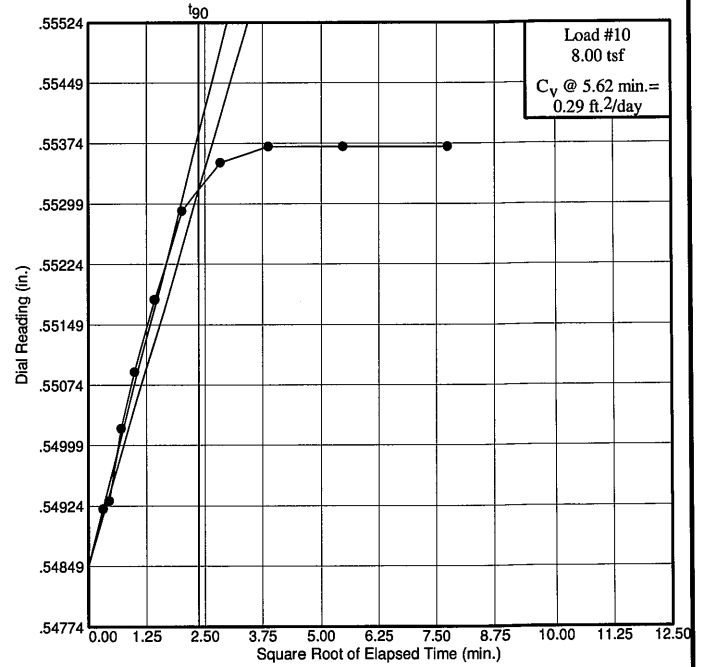
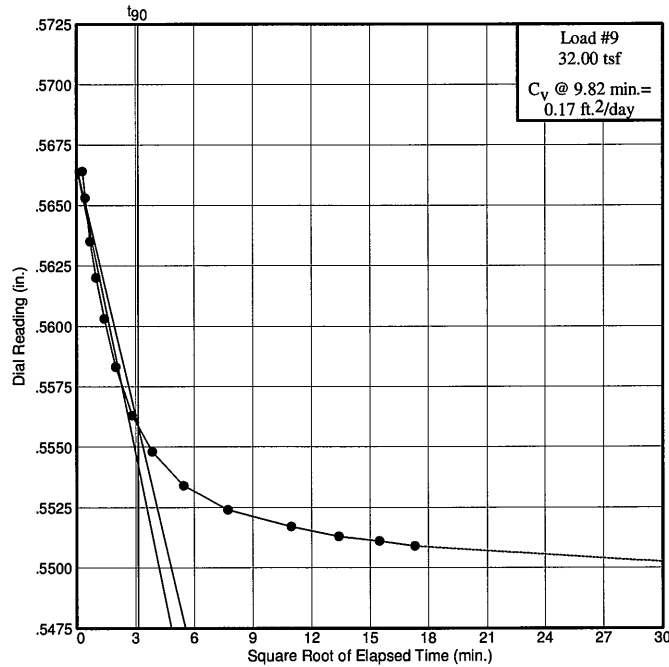
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: M305A

Sample No.: M305A, 5-7'



TRC Environmental Corp.
Madison, Wisconsin

Figure

CONSOLIDATION TEST DATA

Client:**Project:** Dane County**Project Number:** 194528.0002

Sample Data

Source: M305A**Liquid Limit:** 25**Plasticity Index:** 10**USCS:** SC**AASHTO:** A-4(1)**Figure No.:****Testing Remarks:**

Test Specimen Data

TOTAL SAMPLE
Wet w+t = 575.10 g.
Dry w+t = 536.30 g.
Tare Wt. = 248.37 g.
Height = 1.00 in.
Diameter = 2.50 in.
Weight = 174.09 g.

BEFORE TEST
Consolidometer # = 2

Spec. Gravity = 2.70
Height = 1.00 in.
Diameter = 2.50 in.
Defl. Table = 2

AFTER TEST
Wet w+t = 442.13 g.
Dry w+t = 422.13 g.
Tare Wt. = 269.22 g.

Moisture = 13.5 %
Wet Den. = 135.1 pcf
Dry Den. = 119.1 pcf

Ht. Solids = 0.7040 in.
Dry Wt. = 153.42 g.
Void Ratio = 0.420
Saturation = 86.6 %

Moisture = 13.1 %
Dry Wt. = 152.91 g.*
Void Ratio = 0.285

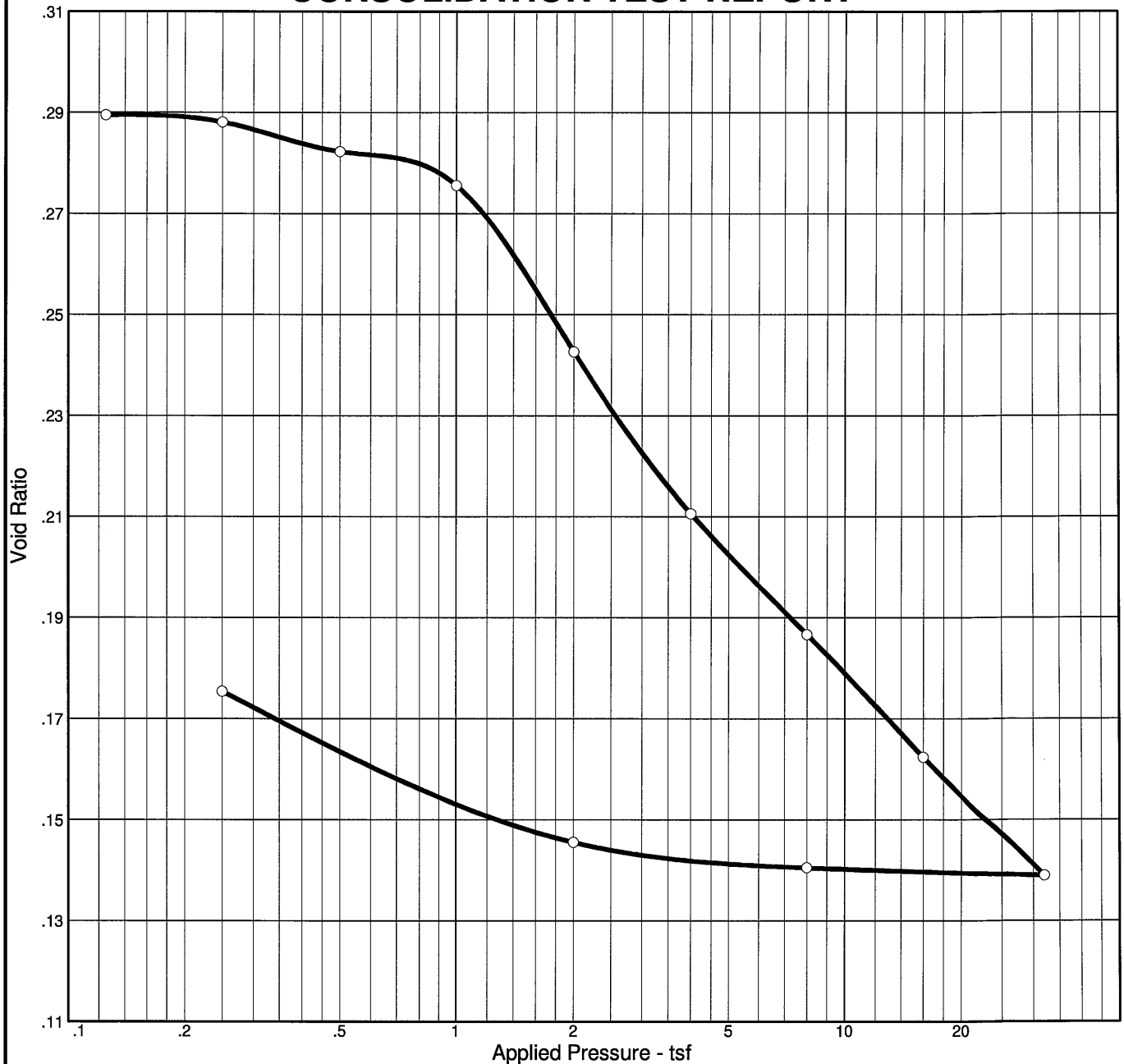
* Final dry weight used in calculations

End-of-Load Summary

Pressure (tsf)	Final Dial (in.)	Machine Defl. (in.)	C _v (ft. ² /day)	C _α	Void Ratio	% Compression /Swell
start	0.67460				0.420	
0.13	0.67250	0.00150	2.63		0.420	0.1 Compr.
0.25	0.67040	0.00190	1.69		0.417	0.2 Compr.
0.50	0.66260	0.00250	0.89		0.407	1.0 Compr.
1.00	0.65500	0.00330	0.82		0.397	1.6 Compr.
2.00	0.63830	0.00530	0.41		0.376	3.1 Compr.
4.00	0.61590	0.00990	0.41		0.351	4.9 Compr.
8.00	0.59060	0.01370	0.21		0.321	7.0 Compr.
16.00	0.56000	0.01920	0.34		0.285	9.5 Compr.
32.00	0.52040	0.02960	0.17		0.243	12.5 Compr.
8.00	0.54000	0.01370	0.29		0.249	12.1 Compr.
2.00	0.55760	0.00530	0.08		0.262	11.2 Compr.
0.25	0.57760	0.00190	0.01		0.285	9.5 Compr.

C_c = 0.14 P_c = 3.04 tsf C_r = 0.02

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P _c (tsf)	C _c	C _r	Swell Press. (tsf)	Swell %	e ₀
Sat.	Moist.											
94.4 %	10.2 %	130.8			2.70		0.35	0.08				0.292

MATERIAL DESCRIPTION										USCS	AASHTO

Project No. 194528.0002		Client:	Remarks: Visual Description: Brown silty sand with gravel
Project: Dane County			
Source: B315	Sample No.: B315, 30'-30'9"		
TRC Environmental Corp. Madison, Wisconsin			Figure

Figure

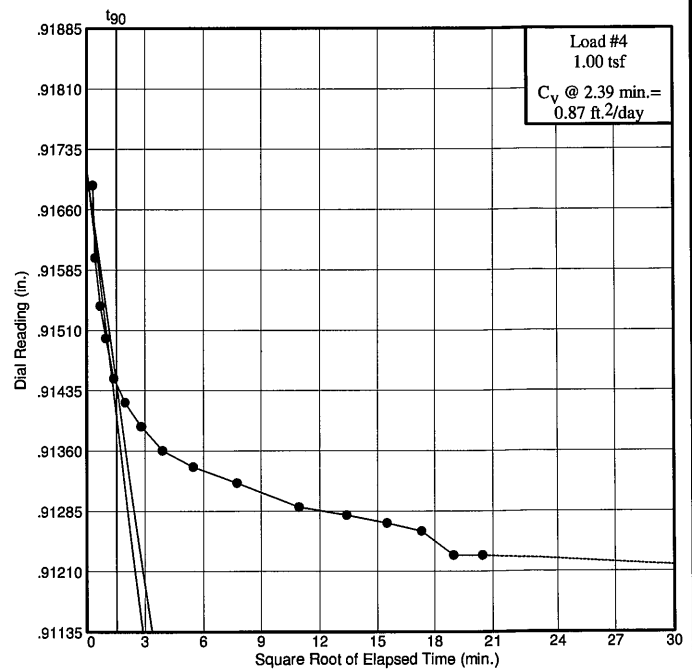
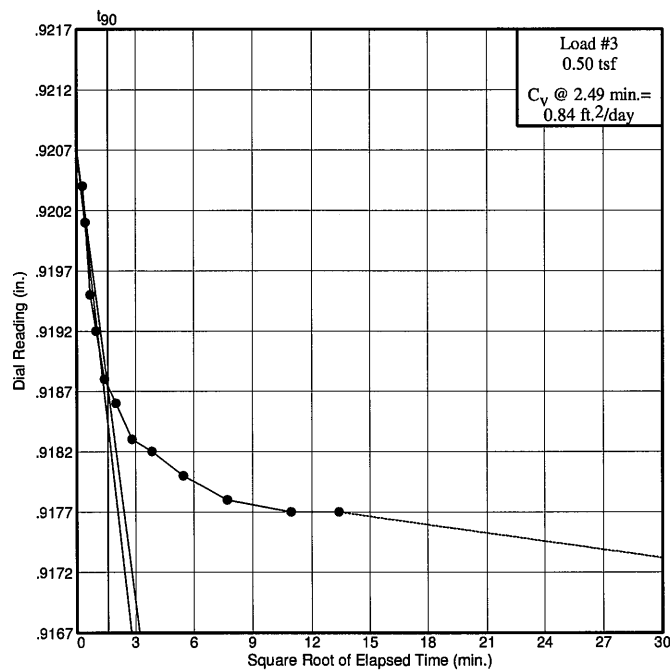
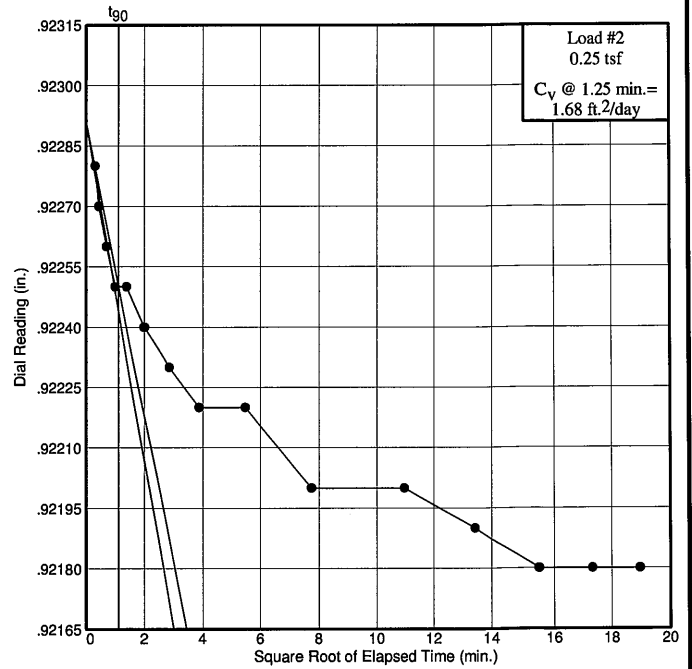
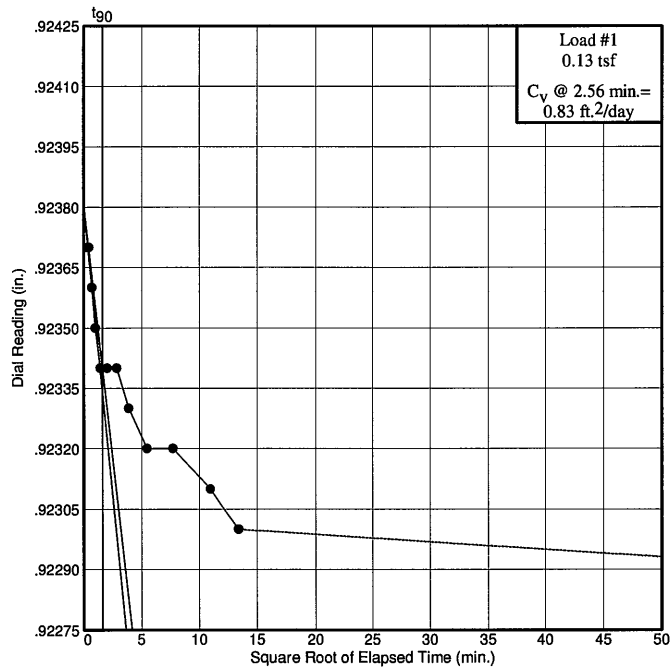
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: B315

Sample No.: B315, 30'-30'9"



TRC Environmental Corp.
Madison, Wisconsin

Figure

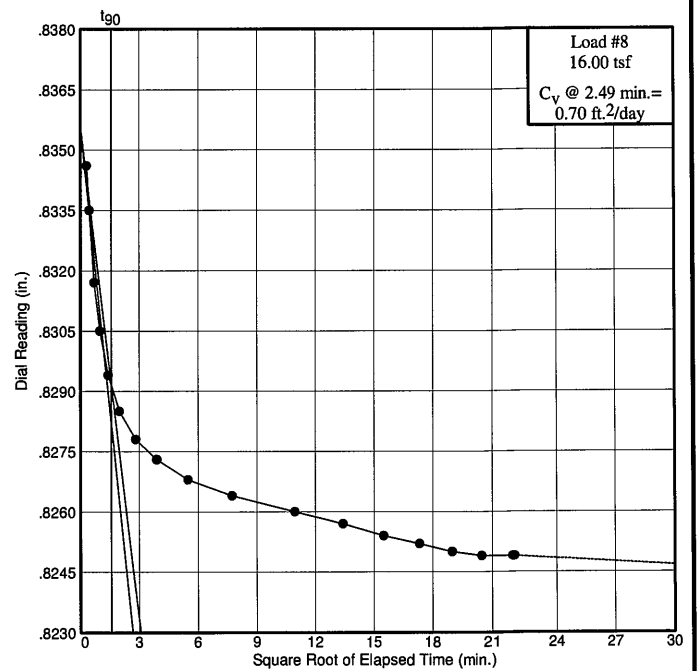
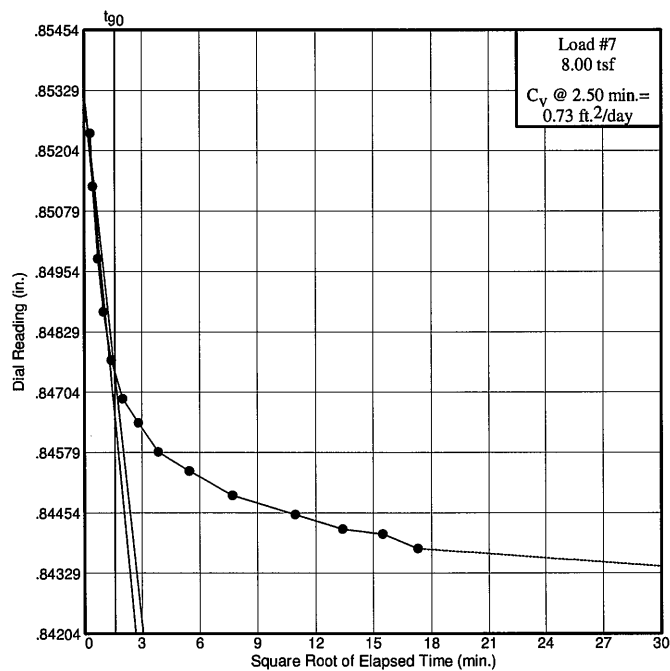
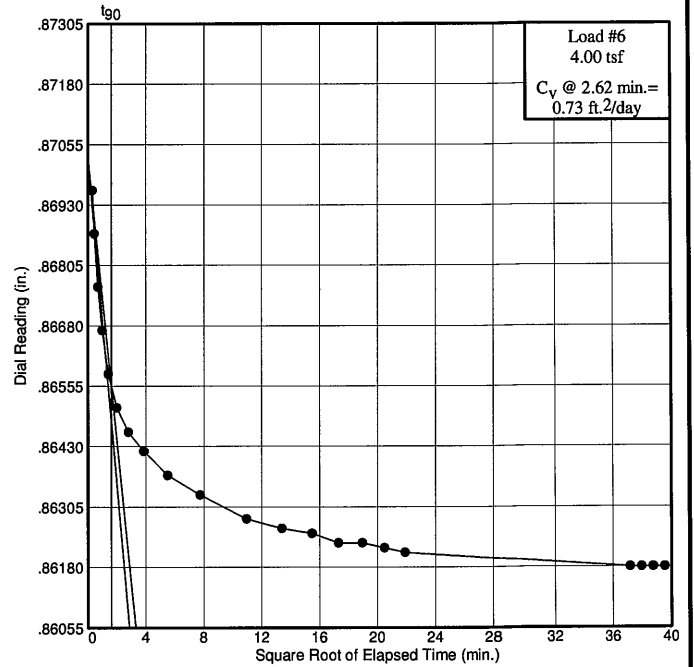
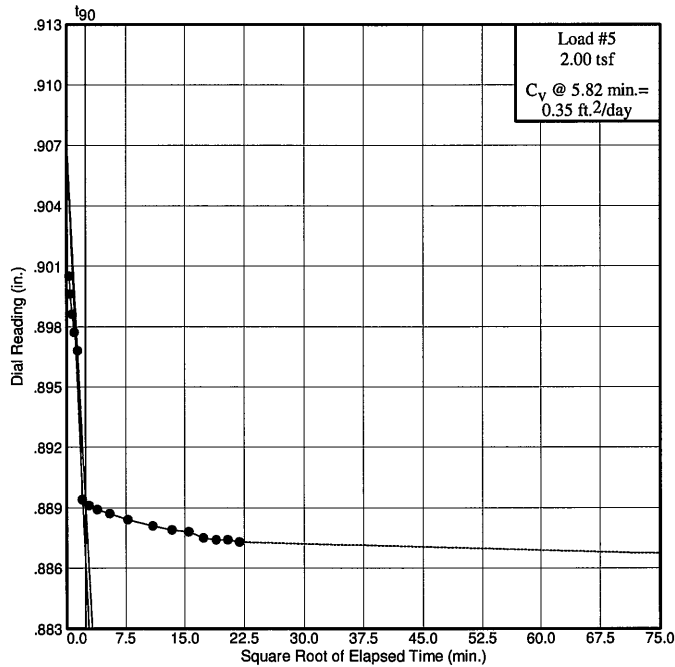
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: B315

Sample No.: B315, 30'-30'9"



TRC Environmental Corp.
Madison, Wisconsin

Figure

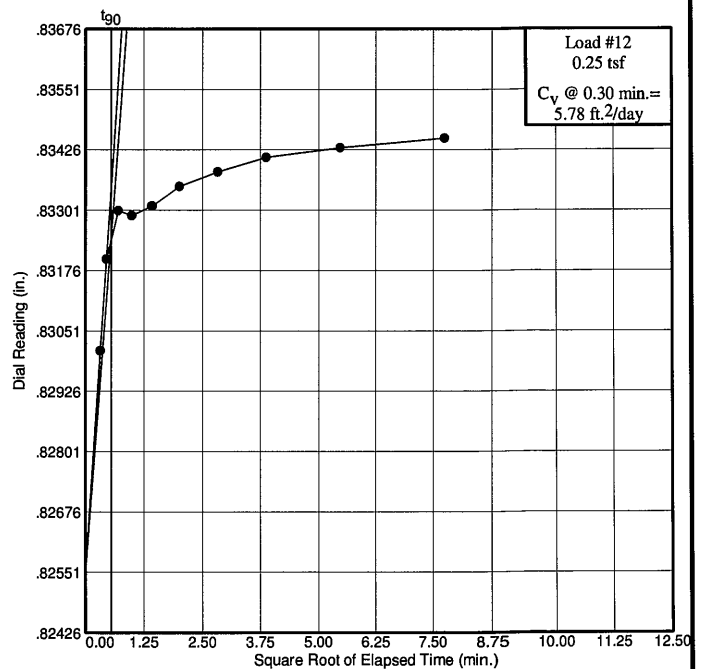
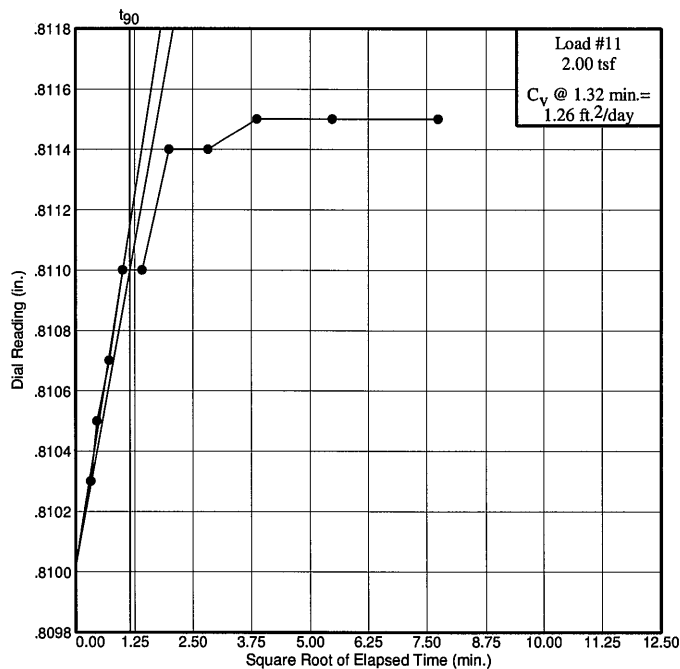
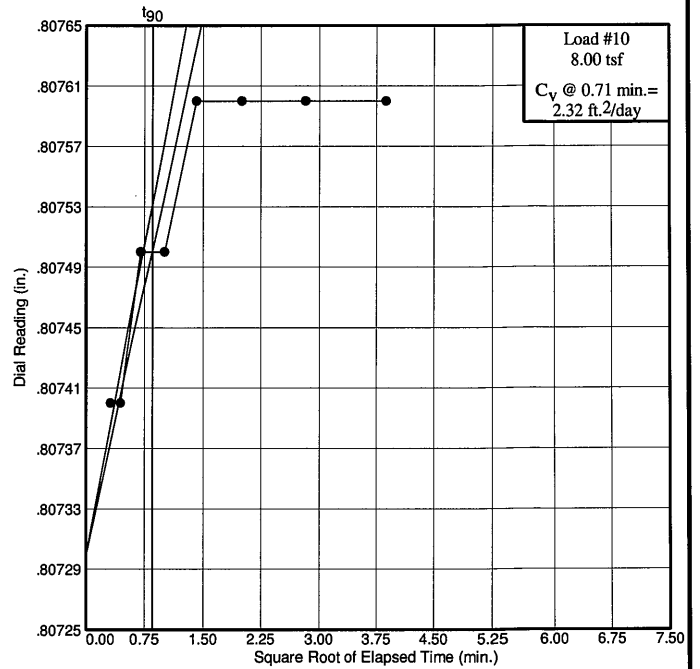
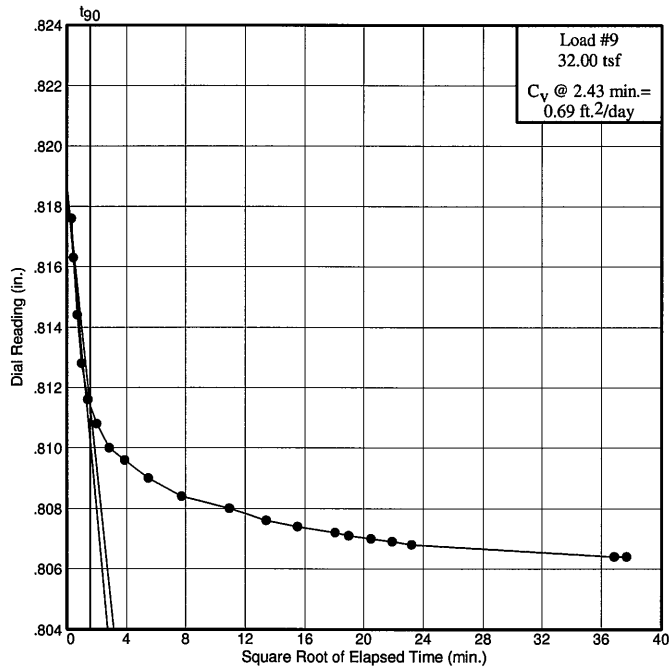
Dial Reading vs. Time

Project No.: 194528.0002

Project: Dane County

Source: B315

Sample No.: B315, 30'-30'9"



TRC Environmental Corp.
Madison, Wisconsin

Figure

TRC Environmental Corporation						QC: JPH
Tube Extrusion Form						QA: JPH
Project Name:		Dane County		Sample Name:		M304B, 15'-15'6"
Project #:		194528.0002	Length (in):	30	Diameter (in):	3.00
					Type:	Shelby Tube
In.	Analysis	Depth(El)	Pp/Tv(tsf)	Fractures or Sand Seams (X)	Visual Description	
0		Top				
1					Silty sand, some gravel, yellowish red, loose to medium	
2					dense, non-plastic, moist.	
3					"	
4					"	
5					"	
6		Bottom			"	
7					Note: Entire sample was disturbed.	
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
Analysis Codes:						
Moisture(M), Density(D), Specific Gravity(Gs), (P200), Sieve(S), Grainsize(GS), Consolidation(CON),						
Atterberg Limits(AL), Shrinkage Limit(SL), Organic Content(O), Proctor(P), Permeability(k),						
Unconfined Compressive Strength(Qu), Triaxial Compression(Tx), Direct Shear(DS)						

TRC Environmental Corporation Tube Extrusion Form						QC: JPH
						QA: JPH
Project Name:		Dane County		Sample Name:		M304B, 33-35'
Project #:		194528.0002	Length (in):	30	Diameter (in):	3.00 Type: Shelby Tube
In.	Analysis	Depth(El)	Pp/Tv(tsf)	Fractures or Sand Seams (X)	Visual Description	
0		Top				
1					Well-graded sand, some gravel, light yellowish brown, loose to	
2					medium dense, non-plastic, moist to very moist.	
3					"	
4					"	
5					"	
6					"	
7					"	
8					"	
9					"	
10					"	
11					"	
12					"	
13					"	
14					Silty sand, some gravel, reddish brown, soft to medium dense,	
15		Bottom			non-plastic, wet.	
16						
17					Note: The silty sand contained a very large rock, so no	
18					consolidation test was possible.	
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
Analysis Codes: Moisture(M), Density(D), Specific Gravity(Gs), (P200), Sieve(S), Grainsize(GS), Consolidation(CON), Atterberg Limits(AL), Shrinkage Limit(SL), Organic Content(O), Proctor(P), Permeability(k), Unconfined Compressive Strength(Qu), Triaxial Compression(Tx), Direct Shear(DS)						

TRC Environmental Corporation					QC: JPH
Tube Extrusion Form					QA: JPH
Project Name:		Dane County		Sample Name: M304B, 60-62'	
Project #:		194528.0002	Length (in): 30	Diameter (in): 3.00	Type: Shelby Tube
In.	Analysis	Depth(El)	Pp/Tv(tsf)	Fractures or Sand Seams (X)	Visual Description
0		Top			
1					Poorly graded sand, some gravel, light yellowish brown,
2					loose to medium dense, non-plastic, moist to wet.
3					"
4					"
5					Silty clay, some sand, light yellowish brown, medium stiff,
6					medium plasticity, wet.
7	CON				"
8					"
9					Poorly graded sand, some gravel, light yellowish brown,
10					medium dense, non-plastic, moist to wet.
11					Silty clay, some sand, light yellowish brown, medium stiff,
12					medium plasticity, wet.
13					Poorly graded sand, some gravel, light yellowish brown,
14					medium dense, non-plastic, moist to wet.
15					"
16					"
17		Bottom			"
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
Analysis Codes: Moisture(M), Density(D), Specific Gravity(Gs), (P200), Sieve(S), Grainsize(GS), Consolidation(CON), Atterberg Limits(AL), Shrinkage Limit(SL), Organic Content(O), Proctor(P), Permeability(k), Unconfined Compressive Strength(Qu), Triaxial Compression(Tx), Direct Shear(DS)					

TRC Environmental Corporation						QC: JPH
Tube Extrusion Form						QA: JPH
Project Name:		Dane County		Sample Name:		M305A, 5-7'
Project #:		194528.0002	Length (in):	30	Diameter (in):	3.00
					Type:	Shelby Tube
In.	Analysis	Depth(El)	Pp/Tv(tsf)	Fractures or Sand Seams (X)	Visual Description	
0		Top				
1					Clayey sand with gravel, dark grayish brown, very stiff,	
2					medium plasticity, moist.	
3					"	
4					"	
5	CON				"	
6					"	
7	k, GS, AL				"	
8					"	
9					"	
10					"	
11					"	
12					"	
13					"	
14					"	
15		Bottom			"	
16					Note: Bottom 6" of tube was damaged.	
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Analysis Codes:
 Moisture(M), Density(D), Specific Gravity(Gs), (P200), Sieve(S), Grainsize(GS), Consolidation(CON),
 Atterberg Limits(AL), Shrinkage Limit(SL), Organic Content(O), Proctor(P), Permeability(k),
 Unconfined Compressive Strength(Qu), Triaxial Compression(Tx), Direct Shear(DS)

TRC Environmental Corporation						QC: JPH
Tube Extrusion Form						QA: JPH
Project Name:		Dane County		Sample Name:		M305A, 15'-15'11"
Project #:		194528.0002	Length (in):	30	Diameter (in):	3.00 Type: Shelby Tube
In.	Analysis	Depth(El)	Pp/Tv(tsf)	Fractures or Sand Seams (X)	Visual Description	
0		Top				
1					The top 5" of material appears to be sluff, which is silt with	
2					sand and gravel, dark grayish brown, loose to medium stiff,	
3					low plasticity, and moist.	
4					"	
5					"	
6					Silty sand with gravel, red, medium dense, non-plastic, moist.	
7					"	
8					"	
9					"	
10					"	
11					"	
12					"	
13					"	
14					"	
15		Bottom			"	
16					Note: The sample contained too many rocks and not enough	
17					cohesion to perform a consolidation test.	
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
Analysis Codes: Moisture(M), Density(D), Specific Gravity(Gs), (P200), Sieve(S), Grainsize(GS), Consolidation(CON), Atterberg Limits(AL), Shrinkage Limit(SL), Organic Content(O), Proctor(P), Permeability(k), Unconfined Compressive Strength(Qu), Triaxial Compression(Tx), Direct Shear(DS)						

TRC Environmental Corporation Tube Extrusion Form					QC: JPH
					QA: JPH
Project Name:		Dane County		Sample Name: B313, 15'-15'5"	
Project #:		194528.0002	Length (in):	30	Diameter (in): 3.00 Type: Shelby Tube
In.	Analysis	Depth(El)	Pp/Tv(tsf)	Fractures or Sand Seams (X)	Visual Description
0		Top			
1					Silty sand with gravel, red, loose, non-plastic, moist.
2					"
3					"
4					"
5		Bottom			"
6					Note: Entire sample was disturbed.
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
Analysis Codes: Moisture(M), Density(D), Specific Gravity(Gs), (P200), Sieve(S), Grainsize(GS), Consolidation(CON), Atterberg Limits(AL), Shrinkage Limit(SL), Organic Content(O), Proctor(P), Permeability(k), Unconfined Compressive Strength(Qu), Triaxial Compression(Tx), Direct Shear(DS)					

TRC Environmental Corporation						QC: JPH
Tube Extrusion Form						QA: JPH
Project Name:		Dane County		Sample Name:		B315, 20'-20'9"
Project #:		194528.0002	Length (in):	30	Diameter (in):	3.00
					Type:	Shelby Tube
In.	Analysis	Depth(El)	Pp/Tv(tsf)	Fractures or Sand Seams (X)	Visual Description	
0		Top				
1					Silty sand with gravel, brown, loose to medium dense,	
2					non-plastic, moist.	
3					"	
4					"	
5					"	
6		Bottom			"	
7					Note: Entire samples was disturbed.	
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
Analysis Codes:						
Moisture(M), Density(D), Specific Gravity(Gs), (P200), Sieve(S), Grainsize(GS), Consolidation(CON),						
Atterberg Limits(AL), Shrinkage Limit(SL), Organic Content(O), Proctor(P), Permeability(k),						
Unconfined Compressive Strength(Qu), Triaxial Compression(Tx), Direct Shear(DS)						

TRC Environmental Corporation						QC: JPH
Tube Extrusion Form						QA: JPH
Project Name:		Dane County		Sample Name:		B315, 30'-30'9"
Project #:		194528.0002	Length (in):	30	Diameter (in):	3.00
					Type:	Shelby Tube
In.	Analysis	Depth(El)	Pp/Tv(tsf)	Fractures or Sand Seams (X)	Visual Description	
0		Top				
1					Silty sand with gravel, loose, non-plastic, wet.	
2					"	
3					"	
4					"	
5					Silty sand with gravel, medium dense to dense,	
6					low plasticity, moist.	
7	CON				"	
8					"	
9					"	
10					"	
11					"	
12					"	
13		Bottom			"	
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
Analysis Codes:						
Moisture(M), Density(D), Specific Gravity(Gs), (P200), Sieve(S), Grainsize(GS), Consolidation(CON),						
Atterberg Limits(AL), Shrinkage Limit(SL), Organic Content(O), Proctor(P), Permeability(k),						
Unconfined Compressive Strength(Qu), Triaxial Compression(Tx), Direct Shear(DS)						



TABLE 7-2

**SUMMARY OF GEOTECHNICAL TEST DATA BY
GEOLOGIC UNIT - HORICON FORMATION: DIAMICTITE (Qhd)
Dane County Landfill Expansion - Rodefild #2
Dane County, Wisconsin**

<u>Boring No.</u>	<u>Depth (ft.)¹</u>	<u>Soil Class²</u>	<u>Grain Size³</u>	<u>Percent Finer than 0.002 mm</u>	<u>Liquid Limit⁴</u>	<u>Plastic Limit⁴</u>	<u>Plasticity Index ⁴</u>	<u>Laboratory Permeability⁵</u>
B-101	14.0 - 16.0	SM	14/58/22/06	5.5	NP	NP	NP	--
	35.0 - 3.0	SM	14/61/16/09	6.3	NP	NP	NP	--
B-102	16.0 - 18.0	SM	09/63/15/12	9	NP	NP	NP	--
	38.0 - 40.0	SM	08/73/11/08	6	13	NP	NP	--
B-103	24.5 - 26.5	SM	05/66/18/11	8	NP	NP	NP	--
B-105	38.0 - 40.0	SM	07/69/15/11	8	NP	NP	NP	--
B-106	34.0 - 36.0	SM	14/63/12/11	8	NP	NP	NP	--
B-107	10.0 - 12.0	SM	05/65/19/11	9	9	NP	NP	--
	38.0 - 40.0	SM	14/61/14/11	8	--	--	--	--
B-108	18.0 - 20.0	SM	08/69/14/09	6	NP	NP	NP	--
WT-108A	20.0 - 22.0	SM	16/61/19/04	2.5	NP	NP	NP	2.8x10 ⁻⁷
B-109	34.0 - 36.0	SM	14/66/14/06	3.8	NP	NP	NP	--
B-111	18.0 - 20.0	SM	05/70/17/08	5	NP	NP	NP	--
	24.0 - 36.0	SM	05/70/15/10	8	NP	NP	NP	--
B-112	36.0 - 38.0	SM	15/61/12/12	9	NP	NP	NP	--
B-113	10.0 - 12.0	SM	08/62/17/13	9	--	--	--	--
	18.0 - 29.0	SM	20/55/17/08	6.3	NP	NP	NP	8.5x10 ⁻⁸
	20.0 - 20.8	SM	27/48/17/08	7.7	NP	NP	NP	--
	29.0 - 31.0	SM	08/60/23/09	6	NP	NP	NP	4.4x10 ⁻⁸
	36.0 - 38.0	SM	08/67.5/17/7.5	7.5	--	--	--	--

¹Depth describes the interval that the sample was taken

²Unified Soil Classification System

³00/00/00/00 gravel/sand/silt/clay
gravel: retained on No. 4 sieve
sand: passing No. 4 sieve, retained on No. 200 sieve
silt: passing No. 200 sieve - 0.005 mm
clay: <0.005 mm

00/00/00 gravel/sand/passing No. 200 sieve

⁴NP = nonplastic

⁵Permeability (cm/sec)

Source: 1992 SEC Donahue Feasibility Report.

TABLE 7-2
(continued)

**SUMMARY OF GEOTECHNICAL TEST DATA BY
GEOLOGIC UNIT - HORICON FORMATION: DIAMICTITE (Qhd)
Dane County Landfill Expansion - Rodefild #2
Dane County, Wisconsin**

<u>Boring No.</u>	<u>Depth (ft.)¹</u>	<u>Soil Class²</u>	<u>Grain Size³</u>	<u>Percent Finer than 0.002 mm</u>	<u>Liquid Limit</u>	<u>Plastic Limit</u>	<u>Plasticity Index</u>	<u>Laboratory Permeability⁴</u>
B-116	19.0 - 20.0	SM	23/57/11/09	6.5	NP	NP	NP	--
B-118	8.0 - 10.0	SM	06/64/18/12	9	NP	NP	NP	--
B-119	24.0	SM	11/68/09/12	7.5	NP	NP	NP	--
	46.0	SC	12/45/17/26	19	22	11	11	--
B-125	22.0 - 24.0	SM	05/68/19/08	5	NP	NP	NP	--
B-127	18.0 - 20.0	SM	09/68/10/12	7.5	--	--	--	--
M-1A(6)	30.0	SM	07/62/31	--	NP	NP	NP	--
M-1C(6)	80.0	SM	29/50/10/11	--	--	--	--	--
M-7B(6)	30.0	SM	09/67/16/09	--	--	--	--	--
M-9B(6)	10.0	SM	07/66/17/10	--	--	--	--	--
M-9B(6)	40.0	CL	00/00/54/45	--	27.5	15.3	12.2	--
M-10A(6)	20.0	SM	03/72/16/09	--	--	--	--	2.1x10 ⁻⁷
M-12A(6)	30.0	SM	08/71/09/12	--	NP	NP	NP	--
M-15(6)	15.0	SM	06/69/18/07	--	--	--	--	3.6x10 ⁻⁶
M-16(6)	20.0	SM	08/66/18/08	--	--	--	--	--
M-17(6)	20.0	SM	06/61/23/10	--	--	--	--	--
MTP-34	7	--	--	--	--	--	--	1.1x10 ⁻⁵

¹Depth describes the interval that the sample was taken

²Unified Soil Classification System

³00/00/00/00

gravel/sand/silt/clay

gravel: retained on No. 4 sieve

sand: passing No. 4 sieve, retained on No. 200 sieve

silt: passing No. 200 sieve - 0.005 mm

clay: <0.005 mm

00/00/00

gravel/sand/passing No. 200 sieve

⁴NP = nonplastic

⁵Permeability (cm/sec)

R/DANECO2/AC6

Source: 1992 SEC Donahue Feasibility Report.

TABLE 7-3

**SUMMARY OF GEOTECHNICAL TEST DATA BY
GEOLOGIC UNIT - HORICON FORMATION:
COARSE GRAINED MELTWATER DEPOSITS (Qho)
Dane County Landfill Expansion - Rodefild #2
Dane County, Wisconsin**

<u>Boring No.</u>	<u>Depth (ft.)¹</u>	<u>Soil Class²</u>	<u>Grain Size³</u>	<u>Percent Finer than 0.002 mm</u>	<u>Liquid Limit</u>	<u>Plastic Limit</u>	<u>Plasticity Index</u>	<u>Laboratory Permeability⁴</u>
B-101	20.0 - 21.0	SP	00/94/06/00	0.0	--	--	--	--
B-103	10.0 - 12.0	SP-SM	02/87/08/03	2	--	--	--	--
	36.0	SP-SM	00/90/07/03	3	--	--	--	--
B-104	38.0 - 40.0	SM	00/75/22/03	2	--	--	--	--
B-105	6.0 - 8.0	SP	00/98/02/00	0.0	--	--	--	--
B-106	14.0 - 15.0	SP	01/94/03/02	1.5	--	--	--	--
B-109	14.4 - 16.0	SP	36/69/05	0.3	--	--	--	--
B-113	20.8 - 22.0	SP-SM	37/53/07/03	2.7	--	--	--	--
	22.0 - 24.0	SP	23/70/07	1.1	--	--	--	--
M-1C(6)	60.0	SP-SM	37/53/10	--	--	--	--	--
M-2(6)	20.0	SM	17/58/25	--	NP	NP	NP	--
M-5B(6)	15.0	SM	01/75/24	--	--	--	--	--
M-6C(6)	45.0	SP-SM	01/90/08	--	--	--	--	--
M-13B(6)	25.0	SP	25/71/04	--	--	--	--	--
M-16(6)	60.0	SP	01/96/03	--	--	--	--	--
M-17(6)	45.0	SP-SM	30/59/11	--	--	--	--	--

¹Depth describes the interval that the sample was taken

²Unified Soil Classification System

³00/00/00/00 gravel/sand/silt/clay
gravel: retained on No. 4 sieve
sand: passing No. 4 sieve, retained on No. 200 sieve
silt: passing No. 200 sieve - 0.005 mm
clay: <0.005 mm

00/00/00 gravel/sand/passing No. 200 sieve

⁴NP = nonplastic

⁵Permeability (cm/sec)

R/DANECO2/AC6

Source: 1992 SEC Donahue Feasibility Report.

TABLE 7-4

**SUMMARY OF GEOTECHNICAL TEST DATA BY
GEOLOGIC UNIT - HORICON FORMATION
FINE GRAINED MELTWATER DEPOSITS (Qh1)
Dane County Landfill Expansion - Rodefild #2
Dane County, Wisconsin**

<u>Boring No.</u>	<u>Depth (ft.)¹</u>	<u>Soil Class²</u>	<u>Grain Size³</u>	<u>Percent Finer than 0.002 mm</u>	<u>Liquid Limit</u>	<u>Plastic Limit</u>	<u>Plasticity Index</u>	<u>Laboratory Permeability⁴</u>
B-103	4.0 - 5.0	CL	00/23/49/28	23	26	14	12	--
B-112	8.0 - 10.0	CH	00/04/60/36	28	56	20	36	--
B-121A	16.0 - 18.0	CL	00/05/61/47	34	29	16	13	--
	20.0 - 22.0	CL	00/05/43/52	38	32	15	17	3.1x10 ⁻⁷
	24.0 - 26.0	CL	00/15/25/60	47	37	15	22	3.0x10 ⁻⁸
M-8A(6)	30.0	ML	00/30/70	--	--	--	--	2.4x10 ⁻⁵
M-9B(6)	20.0	ML	00/38/62	--	--	--	--	4.3x10 ⁻⁶

¹Depth describes the interval that the sample was taken

²Unified Soil Classification System

³00/00/00/00 gravel/sand/silt/clay
 gravel: retained on No. 4 sieve
 sand: passing No. 4 sieve, retained on No. 200 sieve
 silt: passing No. 200 sieve - 0.005 mm
 clay: <0.005 mm

00/00/00 gravel/sand/passing No. 200 sieve

⁴NP = nonplastic

⁵Permeability (cm/sec)

R/DANECO2/ACS

Source: 1992 SEC Donahue Feasibility Report.

TABLE 7-5

**SUMMARY OF GEOTECHNICAL TEST DATA BY
GEOLOGIC UNIT - ALLUVIUM (Qa1)
Dane County Landfill Expansion - Rodefild #2
Dane County, Wisconsin**

<u>Boring No.</u>	<u>Depth (ft.)¹</u>	<u>Soil Class²</u>	<u>Grain Size³</u>	<u>Percent Finer than 0.002 mm</u>	<u>Liquid Limit</u>	<u>Plastic Limit</u>	<u>Plasticity Index</u>	<u>Laboratory Permeability⁴</u>
B-106	4.0 - 6.0	OL	00/20/55/25	18	33	22	11	--
	8.6 - 9.2	SW	05/72/14/08	6	--	--	--	--
	10.0 - 10.5	SM	05/69/20/06	6.5	--	--	--	--
B-110	6.0 - 8.0	OL	00/01/70/29	19.9	39	24	15	2.4x10 ⁻⁶
	10.6 - 12.0	SM	19/64/12/05	5	--	--	--	--
B-113	6.0 - 8.0	OL	00/11/72/27	19	34	22	12	8.8x10 ⁻⁷
B-117	8.0 - 10.0	OL	00/02/66/32	25	42	20	22	--
B-121	10.3 - 12.0	SM	00/70/18/12	10.5	--	--	--	--
	12.0 - 14.0	SM	00/75/20/05	3	--	--	--	--
B-121A	4.0 - 6.0	OL	00/02/70/28	21	36	22	14	6.0x10 ⁻⁷

¹Depth describes the interval that the sample was taken

²Unified Soil Classification System

³00/00/00/00 gravel/sand/silt/clay
 gravel: retained on No. 4 sieve
 sand: passing No. 4 sieve, retained on No. 200 sieve
 silt: passing No. 200 sieve - 0.005 mm
 clay: <0.005 mm

00/00/00 gravel/sand/passing No. 200 sieve

⁴NP = nonplastic

⁵Permeability (cm/sec)

R/DANECO2/AC6

Source: 1992 SEC Donahue Feasibility Report.

TABLE 7-6

**SUMMARY OF GEOTECHNICAL TEST DATA BY
GEOLOGIC UNIT - LOESS/B HORIZON SOIL (Q1b)
Dane County Landfill Expansion - Rodefild #2
Dane County, Wisconsin**

<u>Boring No.</u>	<u>Depth (ft.)¹</u>	<u>Soil Class²</u>	<u>Grain Size³</u>	<u>Percent Finer than 0.002 mm</u>	<u>Liquid Limit</u>	<u>Plastic Limit</u>	<u>Plasticity Index</u>	<u>Laboratory Permeability⁴</u>
B-104	2.0 - 2.8	CL	00/36/29/35	30.5	35	15	20	--
B-109	2.0 - 4.0	CL	00/07/57/36	28	48	19	29	--
B-110	2.0 - 4.0	CL-CH	00/03/62/35	29	50	20	30	9.4x10 ⁻⁸
B-116	2.0 - 2.5	CL	02/56/20/22	18.5	27	13	14	--
B-119	2.0 - 3.0	CL-CH	00/08/53/39	32.5	50	20	30	--
B-127	4.0 - 6.0	SP	00/75/13/12	11.7	NP	NP	NP	2.9x10 ⁻⁷
M-14B(6)	15.0	CL	00/02/72/27	--	41.2	26.4	14.8	--
MTP-1(6)	4.0	CL	00/02/80/18	--	33.9	22.8	14.1	2.7x10 ⁻⁸
MTP-15(6)	3.0	CL	00/00/67/33	--	37.9	19.2	18.7	2.0x10 ⁻⁸
MTP-34(6)	3.0	CL	00/04/64/32	--	45.8	22.0	23.8	1.8x10 ⁻⁸
M-2	2.0	CH	00/01/99	--	51.0	25.0	26.0	--

¹Depth describes the interval that the sample was taken

²Unified Soil Classification System

³00/00/00/00 gravel/sand/silt/clay
 gravel: retained on No. 4 sieve
 sand: passing No. 4 sieve, retained on No. 200 sieve
 silt: passing No. 200 sieve - 0.005 mm
 clay: <0.005 mm

00/00/00 gravel/sand/passing No. 200 sieve

⁴NP = nonplastic

⁵Permeability (cm/sec)

R/DANECO2/AC6

Source: 1992 SEC Donahue Feasibility Report.

Attachment D

Field Hydraulic Conductivity Test Results/Hydrogeologic Calculations

(Source: Table 6-3 and Appendix L of Eastern Expansion Feasibility Report)

Table 6-3
Field Hydraulic Conductivity Test Summary
Feasibility Report
Dane County No. 2 (Rodefild) Landfill - Eastern Expansion
Madison, Wisconsin

WELL ID	HYDRAULIC CONDUCTIVITY TEST RESULTS (cm/sec)
Horicon Formation - Till	
M1B (Abandoned)	1.0×10^{-4}
M1C (Abandoned)	1.5×10^{-3}
M6A	2.3×10^{-3}
M6B	4.2×10^{-3}
M10A (Abandoned)	2.4×10^{-5}
M17A	3.2×10^{-3}
M301A	7.06×10^{-4}
M302A	1.11×10^{-3}
M302B	4.22×10^{-3}
M304A ⁽¹⁾	9.03×10^{-4}
M305B	1.54×10^{-3}
Minimum	2.4×10^{-5}
Maximum	4.2×10^{-3}
Geometric Mean	9.41×10^{-4}
Standard Deviation	0.00143
Horicon Formation - Outwash	
M17B	4×10^{-4}
M28	2.2×10^{-2}
M29	9.4×10^{-3}
M303A	4.30×10^{-3}
M304B ⁽²⁾	3.74×10^{-2}
M305A	4.22×10^{-2}
Minimum	4×10^{-4}
Maximum	4.22×10^{-2}
Geometric Mean	9.08×10^{-3}
Standard Deviation	0.016
Horicon Formation - Glaciolacustrine (Silt / Clay - Meltwater Deposits)	
M6C	9.4×10^{-5}
M9A ⁽²⁾	1.3×10^{-5}
M9B	4.2×10^{-6}
Minimum	4.2×10^{-6}
Maximum	9.4×10^{-5}
Geometric Mean	1.72×10^{-5}
Standard Deviation	0.000040

Notes:

1. Wells M1C and M10A are abandoned.
2. cm/sec = centimeters per second.

Prepared by: J. Oswald, 3/4/13

Checked by: N. Keller, 3/19/13

Footnotes:

- ⁽¹⁾ Well screened across both outwash and till units.
- ⁽²⁾ Well screened across both coarse-grained (outwash) and fine-grained (lacustrine) units.

Appendix L

Field Hydraulic Conductivity Test Results/Hydrogeologic Calculations

This appendix also contains field hydraulic conductivity data for the existing site, which is used to meet the requirements of NR 512.09.

Table of Contents

- Field Data and Analysis
- Table L-1: Summary of Hydraulic Conductivity Data for the Existing Landfill
- Horizontal Gradient, Velocity and Discharge Calculation

TABLE 7-7

**SUMMARY OF FIELD HYDRAULIC CONDUCTIVITY
TEST DATA¹ BY GEOLOGIC UNIT**

**DANE COUNTY RODEFELD NO. 2 LANDFILL EXPANSION
DANE COUNTY, WISCONSIN**

Horicon FM: Diamictite

<u>Well No. (1)</u>	<u>Soil Class (2)</u>	<u>Kf (cm/s) (3)</u>
M1C	---	1.5×10^{-3}
M6A	---	2.3×10^{-3}
M7B	---	3.5×10^{-4}
M10A	---	2.4×10^{-5}
M17A	---	3.2×10^{-3}
M26B	---	1.4×10^{-5}
WT-101A	SM, SM/SW	1.2×10^{-5}
P-101B	SM	2.3×10^{-5}
WT-108A	SM	9.1×10^{-5}
P-113B	SM	7.0×10^{-6}
WT-116A	SM	8.9×10^{-6}
WT-119A	SM, Cobbles	7.0×10^{-5}
P-119B	SM, CL	5.7×10^{-5}
WT-127A	SM	4.3×10^{-5}
M-12A	---	$1.4 \times 10^{-5(3)}$

Horicon FM: Coarse Meltwater Deposits/Diamictite (4)

M-24	---	2.1×10^{-5}
M-28	---	2.2×10^{-2}
M-29	---	9.4×10^{-3}
WT-103A	SP, SM	2.0×10^{-4}
WT-105A	SP, SM	7.0×10^{-3}
WT-109A	SP, SM	8.4×10^{-6}
M-1B	---	1.0×10^{-4}

Horicon FM: Coarse Meltwater Deposits

P-103B	SP, CL/ML(5)	1.5×10^{-3}
M-5A	---	2.6×10^{-6}
M-6B	---	4.2×10^{-3}
M-9A	---	1.3×10^{-5}
M-14B	---	2.8×10^{-3}
M-17B	---	4.0×10^{-4}

TABLE 7-7
(Continued)

**SUMMARY OF FIELD HYDRAULIC CONDUCTIVITY
TEST DATA¹ BY GEOLOGIC UNIT**

**DANE COUNTY RODEFELD NO. 2 LANDFILL EXPANSION
DANE COUNTY, WISCONSIN**

Horicon FM: Coarse Meltwater Deposits (Continued)

M-25A	---	4.7×10^{-4}
M-26A	---	1.4×10^{-3}
M-27B	---	4.9×10^{-5}

Alluvium/Horicon FM: Diamictite⁽⁴⁾

WT-113A	OL/OH, SM, SW/SM, OL	7.0×10^{-6}
M-7A	---	2.1×10^{-5}
M-22	---	2.4×10^{-5}

Alluvium

M-14A	---	4.2×10^{-5}
-------	-----	----------------------

Horicon FM: Fine Meltwater Deposits

M-9B	---	4.2×10^{-6}
M-6C	---	9.4×10^{-5}

NOTES:

- (1) Except as noted, all hydraulic conductivity test data are from rising head tests performed in August 1992.
- (2) Unified Soil Classification System - for recently installed wells only.
- (3) Data from 1982 RMT Report, Hvorslav method used for analysis.
- (4) Well screened in both geologic units.
- (5) Well screened in fine meltwater deposits for a short distance.

R/DANECO2/ACS

Source: 1992 SEC Donahue Feasibility
Report.

Table 1
Dane County Rodefeld Sites 1 and 2
Hydraulic Conductivity Values for All Existing, Working Wells

Well	Test Type	Rising or Falling	Hydraulic Conductivity (cm/sec)		Geologic Unit
			K Value	Average K	
M 5A	Bail	Rising	2.6E-06		Qho
M 6B	Slug	Falling	4.5E-03		Qho
M 6B	Slug	Rising	4.2E-03		Qho
M 9A	Slug	Falling	8.5E-06		Qho
M 9A	Slug	Rising	1.3E-05		Qho
M 14B	Slug	Falling	2.5E-03		Qho
M 14B	Slug	Rising	2.8E-03		Qho
M 17B	Bail	Rising	4.0E-04		Qho
M 25A	Slug	Falling	4.1E-04		Qho
M 25A	Slug	Rising	4.1E-04		Qho
M 26A	Slug	Falling	1.1E-03		Qho
M 26A	Slug	Rising	1.4E-03		Qho
M 27B	Bail	Rising	4.9E-05		Qho
P 103B	Slug	Falling	1.5E-03		Qho
P 103B	Slug	Rising	1.5E-03	7.2E-04	Qho
M 1C	Slug	Falling	1.4E-03		Qhd
M 1C	Slug	Rising	1.5E-03		Qhd
M 6A	Slug	Rising	2.3E-03		Qhd
M 6A	Slug	Falling	3.3E-03		Qhd
M 7B	Slug	Rising	3.5E-04		Qhd
M 7B	Slug	Falling	2.6E-04		Qhd
M 10A	Slug	Falling	5.1E-05		Qhd
M 10A	Slug	Rising	2.4E-05		Qhd
M 17A	Slug	Falling	2.8E-03		Qhd
M 17A	Slug	Rising	3.2E-03		Qhd
M 26B	Slug	Falling	3.4E-06		Qhd
M 26B	Slug	Rising	1.4E-05		Qhd
WT 101A	Bail	Rising	1.2E-05		Qhd
P 101B	Bail	Rising	2.3E-05		Qhd
WT 108A	Bail	Rising	9.1E-05		Qhd
P 113B	Bail	Rising	7.0E-06		Qhd
WT 116A	Bail	Rising	8.9E-06		Qhd
WT 119A	Bail	Rising	7.0E-05		Qhd
P 119B	Bail	Rising	5.7E-05		Qhd
WT 127A	Bail	Rising	4.3E-05	4.5E-04	Qhd
M 1B	Bail	Rising	1.0E-04		Qho/Qhd
M 24	Bail	Rising	2.1E-05		Qho/Qhd
M 28	Slug	Falling	3.1E-02		Qho/Qhd
M 28	Slug	Rising	2.2E-02		Qho/Qhd

Table 1
Dane County Rodefild Sites 1 and 2
Hydraulic Conductivity Values for All Existing, Working Wells

Well	Test Type	Rising or Falling	Hydraulic Conductivity (cm/sec)		Geologic Unit
			K Value	Average K	
M 29	Slug	Rising	9.4E-03		Qho/Qhd
WT 103A	Bail	Rising	2.0E-04		Qho/Qhd
WT 105A	Bail	Rising	7.0E-03		Qho/Qhd
WT 109A	Bail	Rising	8.4E-06	4.8E-03	Qho/Qhd
M 7A	Bail	Rising	2.1E-05		Qal/Qhd
M 22	Bail	Rising	2.4E-05		Qal/Qhd
WT 113A	Bail	Rising	7.0E-06	1.7E-05	Qal/Qhd
M 6C	Slug	Rising	9.4E-05		Qhl
M 6C	Slug	Falling	8.8E-05		Qhl
M 9B	Bail	Rising	4.2E-06	3.3E-05	Qhl
M 14A	Bail	Rising	4.2E-05		Qal

* - Falling tests not included in average K calculations

Source: 1992 SEC Donahue Feasibility Report.

Dane Co. M1B Rising Head Slug Test

DATA SET:

m1bf.1n

08/04/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.0001014 cm/sec

Y0 = 93.34 cm

TEST DATA:

H0 = 92.96 cm

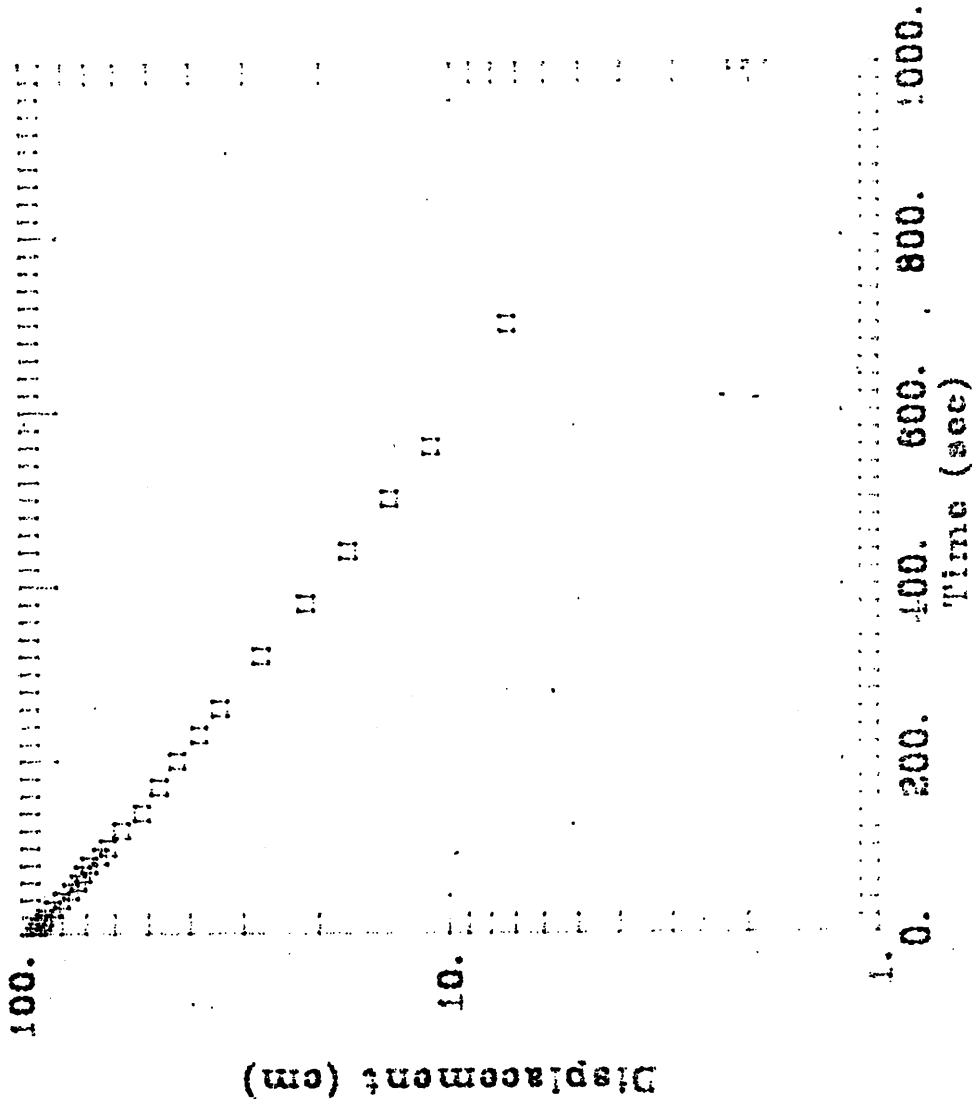
rc = 2.54 cm

rw = 7.62 cm

L = 340.2 cm

b = 2286. cm

H = 653.8 cm



mlb falling head

slugt1

92.964

2.53999

7.62

slugt2

2286

340.157

653.796

tsdata

5	91.44	1
10	90.5256	1
15	88.392	1
20	87.4776	1
30	83.82	1
40	79.8576	1
50	75.8952	1
60	72.8472	1
70	71.0184	1
80	68.58	1
90	64.6176	1
100	61.8744	1
120	57.6072	1
140	51.5112	1
170	46.9392	1
200	42.672	1
230	37.7952	1
260	33.8328	1
320	27.1272	1
380	21.336	1
440	17.0688	1
500	13.716	1
560	10.9728	1
700	7.3152	1
1000	2.1336	1

A Q T E S O L V R E S U L T S
Version 1.10

08/04/92

07:24:21

TEST DESCRIPTION

Data set..... mlbf.in
Data set title..... mlb falling head

Knowns and Constants:

No. of data points.....	25
Radius of well casing.....	2.54
Radius of well.....	7.62
Aquifer saturated thickness.....	2286
Well screen length.....	340.2
Static height of water in well.....	653.8
Log(Re/Rw).....	2.712
A, B, C.....	2.907, 0.470, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	1.0145E-004 +/-	1.0101E-006
y0 =	9.3343E+001 +/-	3.5950E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	25
Number of estimated parameters....	2
Degrees of freedom.....	23
Residual mean.....	0.1089
Residual standard deviation.....	0.8533
Residual variance.....	0.7281

bioRxiv preprint doi: <https://doi.org/10.1101/2019.05.20.256600>; this version posted May 20, 2019. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under aCC-BY-NC-ND 4.0 International license.

1000

```

      Estimate
K   =  1.0145E-004
y0  =  9.3343E+001

```

3

Dane Co. M1C Rising Head Slug Test

DATA SET:

m01cf.1n

08/03/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.001487 cm/sec

y0 = 36.65 cm

TEST DATA:

H0 = 13.72 cm

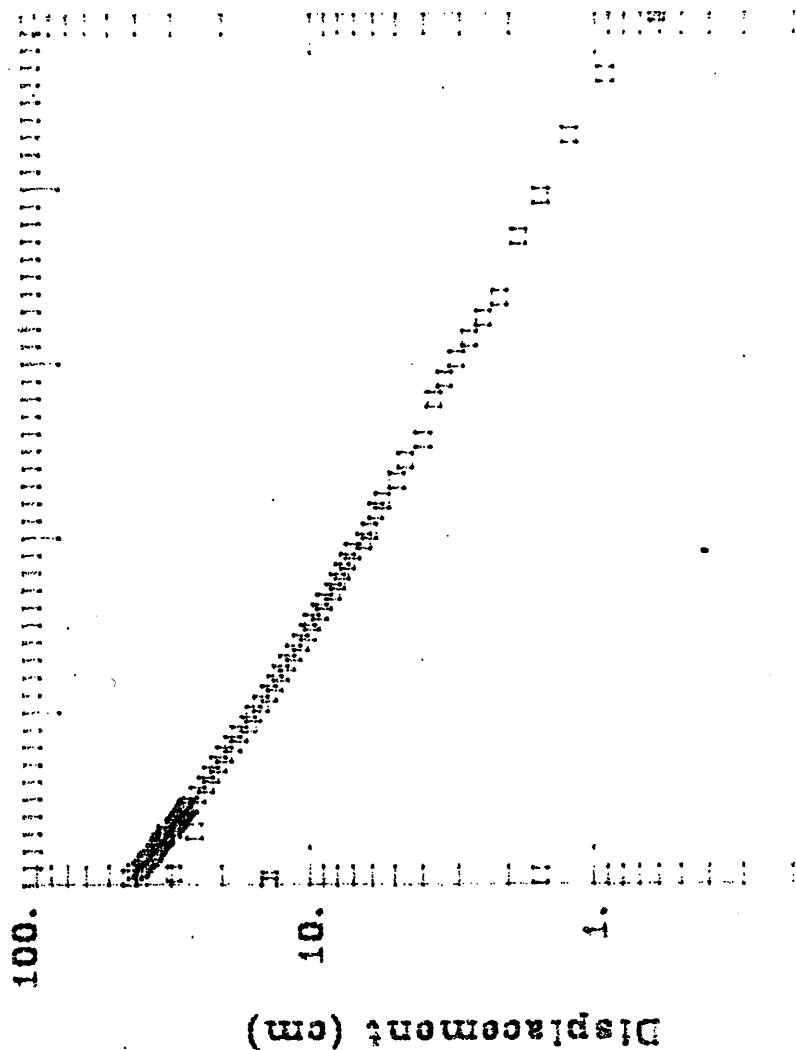
rc = 2.54 cm

rw = 7.62 cm

L = 315.2 cm

b = 2286. cm

H = 1490.2 cm



Time (sec)	Displacement (cm)
0	36.65
17.2	51.6
34.4	68.8
51.6	86

m01c falling head

slugt1

13.716

2.53999

7.62

slugt2

2286

315.163

1490.17

tsdata

0.6	13.716	1
0.8	42.0624	1
1	1.524	1
1.2	29.2608	1
1.4	40.2336	1
1.6	38.7096	1
1.8	38.1	1
2.2	37.1856	1
2.4	36.8808	1
2.6	36.2712	1
2.8	35.3568	1
3.2	34.4424	1
3.4	34.1376	1
3.8	33.528	1
4	33.2232	1
4.2	32.9184	1
4.4	32.6136	1
4.6	32.004	1
4.8	31.3944	1
5	31.0896	1
5.2	31.3944	1
5.4	24.6888	1
5.6	29.2608	1
5.8	29.5656	1
6	29.2608	1
6.2	28.6512	1
6.4	28.3464	1
6.6	28.0416	1
6.8	27.7368	1
7	27.432	1
7.2	27.1272	1
7.4	26.8224	1
7.6	26.5176	1
7.8	26.2128	1
8	25.6032	1
9	24.0792	1
10	22.5552	1
11	21.6408	1
12	20.4216	1
13	19.5072	1
14	18.288	1
15	17.3736	1
16	16.1544	1
17	15.5448	1
18	14.6304	1
19	13.716	1
20	13.1064	1

21	12.4968	1
22	11.8872	1
23	11.2776	1
24	10.668	1
25	10.0584	1
26	9.7536	1
27	9.144	1
28	8.8392	1
29	8.2296	1
30	7.9248	1
31	7.62	1
32	7.3152	1
33	7.0104	1
34	6.4008	1
35	6.096	1
37	5.7912	1
38	5.4864	1
40	4.8768	1
42	4.572	1
44	3.9624	1
48	3.6576	1
50	3.3528	1
52	3.048	1
54	2.7432	1
56	2.4384	1
58	2.1336	1
64	1.8288	1
68	1.524	1
74	1.2192	1
80	0.9144	1
86	0.6096	1

Time	Observed	Calculated	Residual	Weight
0.6	13.716	35.617	-21.901	1
0.8	42.062	35.28	6.7825	1
1	1.524	34.946	-33.422	1
1.2	29.261	34.615	-5.3542	1
1.4	40.234	34.287	5.9463	1
1.6	38.71	33.963	4.7469	1
1.8	38.1	33.641	4.4589	1
2.2	37.186	33.007	4.1784	1
2.4	36.881	32.695	4.1861	1
2.6	36.271	32.385	3.8861	1
2.8	35.357	32.079	3.2783	1
3.2	34.442	31.474	2.9684	1
3.4	34.138	31.176	2.9616	1
3.8	33.528	30.588	2.9395	1
4	33.223	30.299	2.9243	1
4.2	32.918	30.012	2.9064	1
4.4	32.614	29.728	2.8857	1
4.6	32.004	29.446	2.5576	1
4.8	31.394	29.168	2.2267	1
5	31.09	28.892	2.1981	1
5.2	31.394	28.618	2.7764	1
5.4	24.689	28.347	-3.6582	1
5.6	29.261	28.079	1.1821	1
5.8	29.566	27.813	1.7528	1
6	29.261	27.55	1.7113	1
6.2	28.651	27.289	1.3625	1
6.4	28.346	27.03	1.3161	1
6.6	28.042	26.774	1.2672	1
6.8	27.737	26.521	1.2159	1
7	27.432	26.27	1.1622	1
7.2	27.127	26.021	1.1061	1
7.4	26.822	25.775	1.0476	1
7.6	26.518	25.531	0.98685	1
7.8	26.213	25.289	0.92376	1
8	25.603	25.05	0.55359	1
9	24.079	23.886	0.19313	1
10	22.555	22.777	-0.22137	1
11	21.641	21.719	-0.0778	1
12	20.422	20.71	-0.28818	1
13	19.507	19.748	-0.24061	1
14	18.288	18.831	-0.54253	1
15	17.374	17.956	-0.58226	1
16	16.154	17.122	-0.96741	1
17	15.545	16.327	-0.78171	1
18	14.63	15.568	-0.93775	1
19	13.716	14.845	-1.129	1
20	13.106	14.155	-1.0491	1
21	12.497	13.498	-1.0011	1
22	11.887	12.871	-0.98377	1
23	11.278	12.273	-0.99552	1
24	10.668	11.703	-1.035	1
25	10.058	11.159	-1.101	1
26	9.7536	10.641	-0.88748	1
27	9.144	10.147	-1.0028	1

Dane Co. M1C Falling Head Slug Test

DATA SET:

m01cr.in

08/03/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.001398 cm/sec

Y0 = 37.59 cm

TEST DATA:

H0 = 21.34 cm

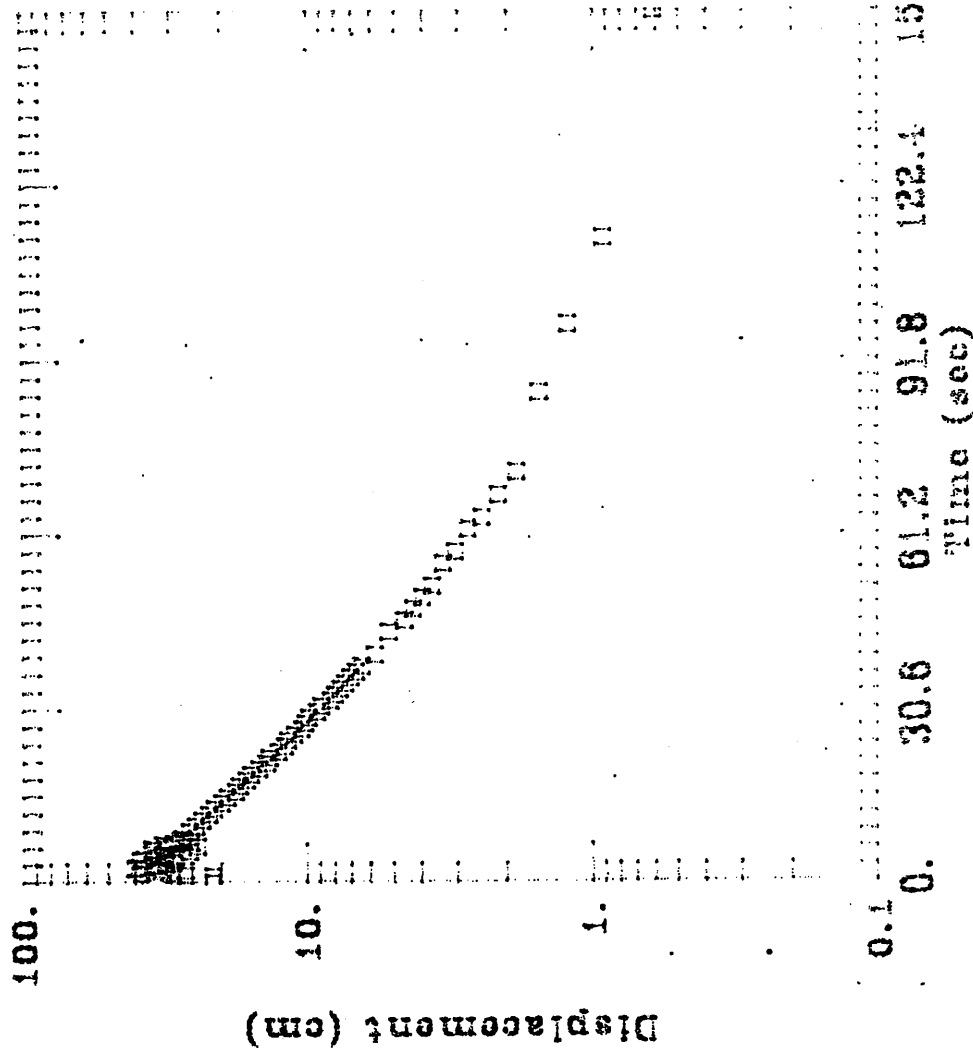
PC = 2.54 cm

rw = 7.62 cm

L = 315.2 cm

b = 2286. cm

H = 1490.2 cm



m0lc rising head

slugt1

21.336

2.53999

7.62

slugt2

2286

315.163

1490.17

tsdata

1.2	21.336	1
1.4	26.5176	1
1.6	29.2608	1
1.8	38.1	1
2	33.8328	1
2.2	26.5176	1
2.4	32.3088	1
2.6	40.2336	1
2.8	39.0144	1
3	33.2232	1
3.2	34.4424	1
3.4	31.0896	1
3.6	29.2608	1
3.8	31.0896	1
4	38.4048	1
4.2	37.1856	1
4.4	28.6512	1
4.6	33.528	1
4.8	32.004	1
5	31.6992	1
5.2	34.7472	1
5.6	25.6032	1
5.8	34.4424	1
6	34.7472	1
6.2	29.5656	1
6.4	24.0792	1
6.6	31.3944	1
6.8	32.004	1
7	29.2608	1
7.2	25.2984	1
7.4	26.8224	1
7.6	27.7368	1
7.8	27.1272	1
9	25.6032	1
10	24.384	1
11	23.1648	1
12	21.9456	1
13	21.0312	1
14	19.812	1
15	18.8976	1
16	17.6784	1
17	17.0688	1
18	16.1544	1
19	15.5448	1
20	14.6304	1
21	13.716	1
22	13.4112	1

23	12.4968	1
24	11.8872	1
25	11.5824	1
26	10.9728	1
27	10.3632	1
28	10.0584	1
29	9.7536	1
30	9.144	1
31	8.8392	1
32	8.2296	1
33	7.9248	1
34	7.62	1
35	7.3152	1
36	7.0104	1
37	6.7056	1
38	6.4008	1
40	5.7912	1
44	5.1816	1
46	4.572	1
48	4.2672	1
50	3.9624	1
52	3.6576	1
56	3.3528	1
58	3.048	1
62	2.7432	1
64	2.4384	1
68	2.1336	1
72	1.8288	1
86	1.524	1
98	1.2192	1
113	0.9144	1
153	0.6096	1

Time	Observed	Calculated	Residual	Weight
1.2	21.336	35.626	-14.29	1
1.4	26.518	35.309	-8.7914	1
1.6	29.261	34.995	-5.734	1
1.8	38.1	34.683	3.4166	1
2	33.833	34.375	-0.54196	1
2.2	26.518	34.069	-7.5513	1
2.4	32.309	33.766	-1.4569	1
2.6	40.234	33.465	6.7684	1
2.8	39.014	33.167	5.847	1
3	33.223	32.872	0.35095	1
3.2	34.442	32.58	1.8627	1
3.4	31.09	32.29	-1.2002	1
3.6	29.261	32.002	-2.7417	1
3.8	31.09	31.718	-0.62807	1
4	38.405	31.435	6.9694	1
4.2	37.186	31.156	6.0299	1
4.4	28.651	30.878	-2.2272	1
4.6	33.528	30.604	2.9244	1
4.8	32.004	30.331	1.6727	1
5	31.699	30.061	1.6378	1
5.2	34.747	29.794	4.9533	1
5.6	25.603	29.266	-3.6628	1
5.8	34.442	29.006	5.4369	1
6	34.747	28.747	5.9998	1
6.2	29.566	28.492	1.074	1
6.4	24.079	28.238	-4.1589	1
6.6	31.394	27.987	3.4076	1
6.8	32.004	27.738	4.2663	1
7	29.261	27.491	1.7699	1
7.2	25.298	27.246	-1.9478	1
7.4	26.822	27.004	-0.18139	1
7.6	27.737	26.763	0.97332	1
7.8	27.127	26.525	0.60188	1
9	25.603	25.14	0.46302	1
10	24.384	24.041	0.34269	1
11	23.165	22.99	0.17432	1
12	21.946	21.986	-0.039975	1
13	21.031	21.025	0.006046	1
14	19.812	20.106	-0.29362	1
15	18.898	19.227	-0.32921	1
16	17.678	18.386	-0.70802	1
17	17.069	17.583	-0.51396	1
18	16.154	16.814	-0.65982	1
19	15.545	16.079	-0.53448	1
20	14.63	15.376	-0.74606	1
21	13.716	14.704	-0.98836	1
22	13.411	14.062	-0.65044	1
23	12.497	13.447	-0.95021	1
24	11.887	12.859	-0.97205	1
25	11.582	12.297	-0.71478	1
26	10.973	11.76	-0.78687	1
27	10.363	11.246	-0.88246	1
28	10.058	10.754	-0.69572	1
29	9.7536	10.284	-0.53046	1

Dane Co. M6A Rising Head Slug Test

DATA SET:

m6af.in
08/04/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

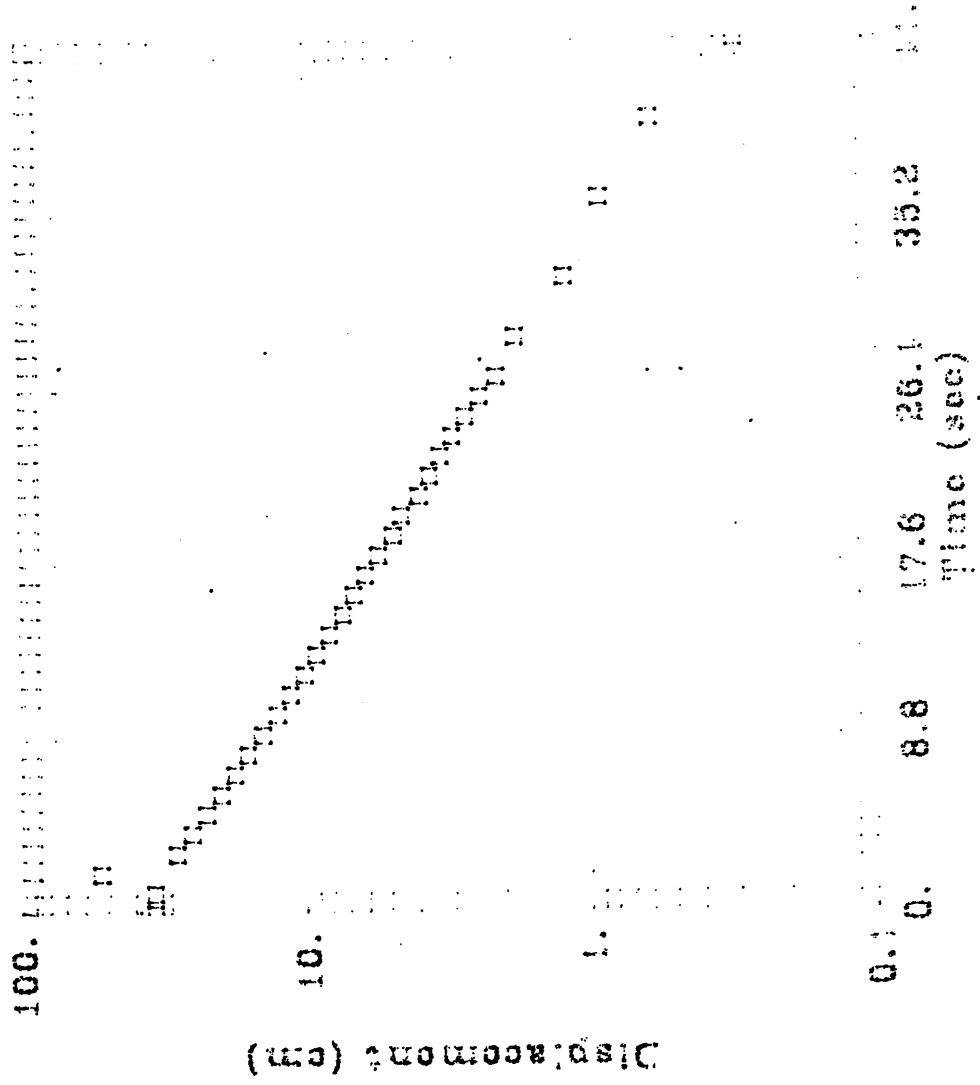
Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.002274 cm/sec
y0 = 38.53 cm

TEST DATA:

H0 = 34.14 cm
rc = 2.54 cm
rw = 7.62 cm
L = 381. cm
b = 2286. cm
H = 387.4 cm



M6A falling head

slugt1

34.1376

2.53999

7.62

slugt2

2286

381

387.401

tsdata

1	34.1376	1
2	53.0352	1
3	28.3464	1
4	24.9936	1
5	22.2504	1
6	19.812	1
7	17.6784	1
8	15.8496	1
9	14.0208	1
10	12.4968	1
11	11.2776	1
12	10.0584	1
13	9.144	1
14	8.2296	1
15	7.3152	1
16	6.7056	1
17	6.096	1
18	5.4864	1
19	4.8768	1
20	4.572	1
21	3.9624	1
22	3.6576	1
23	3.3528	1
24	3.048	1
25	2.7432	1
26	2.4384	1
27	2.1336	1
29	1.8288	1
32	1.2192	1
36	0.9144	1
40	0.6096	1
44	0.3048	1

A Q T E S O L V R E S U L T S
Version 1.10

08/04/92

13:31:03

TEST DESCRIPTION

Data set..... m6af.in
Data set title..... M6A falling head

Knowns and Constants:

No. of data points.....	32
Radius of well casing.....	2.54
Radius of well.....	7.62
Aquifer saturated thickness.....	2286
Well screen length.....	381
Static height of water in well.....	387.4
Log(Re/Rw).....	2.525
A, B, C.....	3.074, 0.494, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	2.7369E-003 +/-	2.3079E-004
y0 =	4.6792E+001 +/-	2.9279E+000

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	32
Number of estimated parameters....	2
Degrees of freedom.....	30
Residual mean.....	0.249
Residual standard deviation.....	3.542
Residual variance.....	12.55

Model Residuals:

Dane Co. M6A Falling Head Slug Test

DATA SET:

m6ar.in
08/04/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

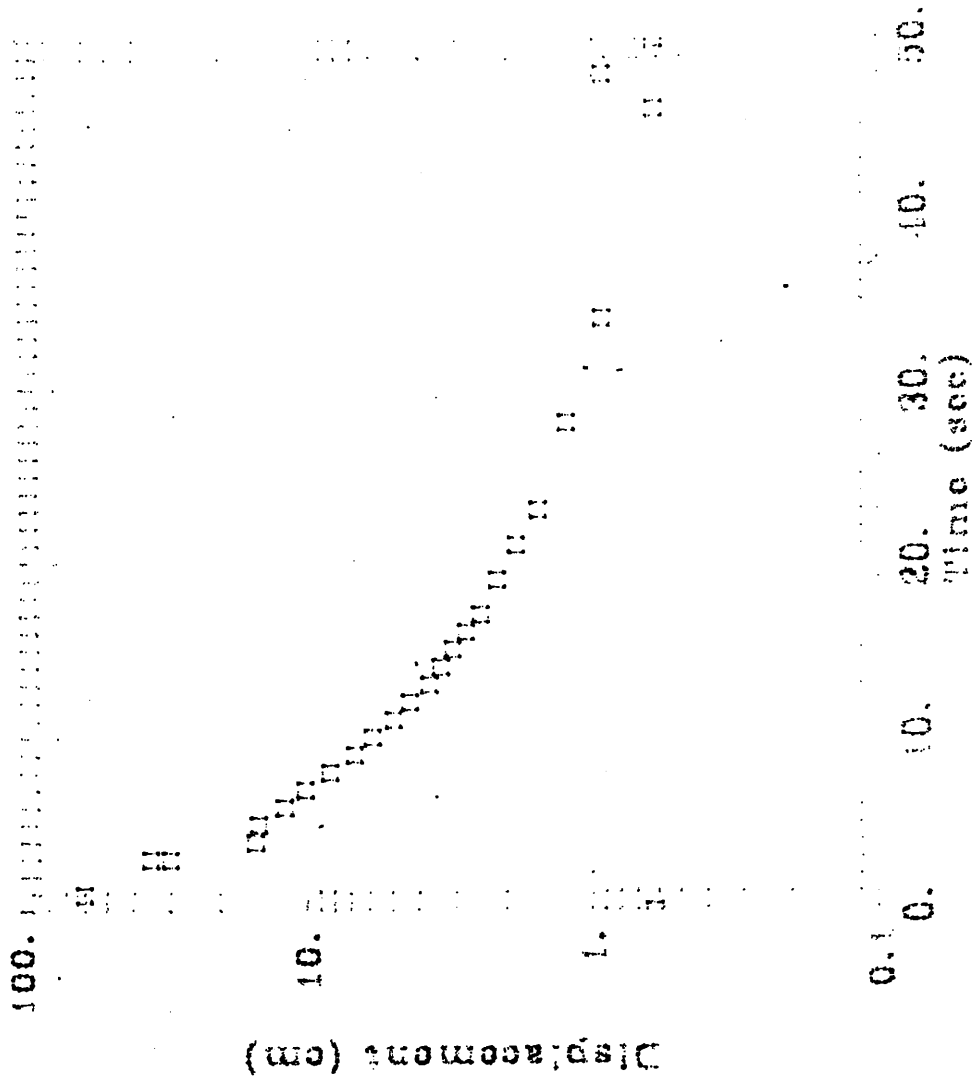
Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.00326 cm/sec
y0 = 29.6 cm

TEST DATA:

H0 = 0.6096 cm
rc = 2.54 cm
rw = 7.62 cm
L = 381. cm
b = 2286. cm
H = 387.4 cm



M6A rising head

slugt1

0.6096

2.5399

7.62

slugt2

2286

381

387.401

tsdata

1	59.7408	1
3	34.7472	1
3	29.5656	1
4	14.9352	1
5	14.6304	1
6	11.8872	1
7	10.0584	1
8	8.2296	1
9	6.7056	1
10	5.7912	1
11	4.8768	1
12	4.2672	1
13	3.6576	1
14	3.3528	1
15	3.048	1
16	2.7432	1
17	2.4384	1
19	2.1336	1
21	1.8288	1
23	1.524	1
28	1.2192	1
34	0.9144	1
46	0.6096	1
48	0.9144	1
50	0.6096	1

A Q T E S O L V R E S U L T S
Version 1.10

08/04/92

13:48:35

TEST DESCRIPTION

Data set..... m6ar.in
Data set title..... M6A rising head

Knowns and Constants:

No. of data points.....	25
Radius of well casing.....	2.54
Radius of well.....	7.62
Aquifer saturated thickness.....	2286
Well screen length.....	381
Static height of water in well.....	387.4
Log(Re/Rw).....	2.525
A, B, C.....	3.074, 0.494, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	6.7311E-003 +/-	4.0334E-004
y0 =	7.9915E+001 +/-	4.2750E+000

ANALYSIS OF MODEL RESIDUALS

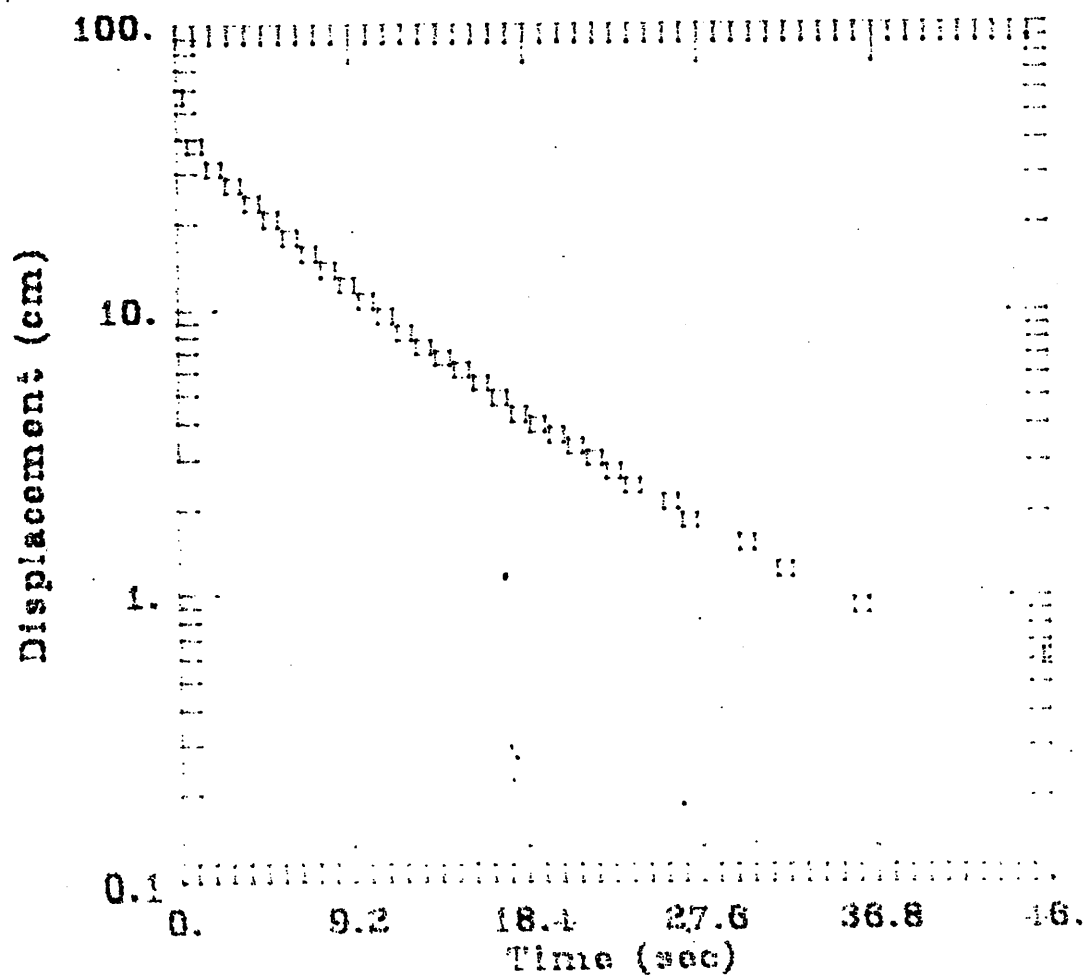
residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	25
Number of estimated parameters.....	2
Degrees of freedom.....	23
Residual mean.....	1.065
Residual standard deviation.....	2.518
Residual variance.....	6.343

Model Residuals:

Dane Co. M6B Falling Head Slug Test



DATA SET:

m6br.1n

07/31/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

$K = 0.004525$ cm/sec

$y_0 = 40.33$ cm

TEST DATA:

$H_0 = 56.39$ cm

$r_c = 2.54$ cm

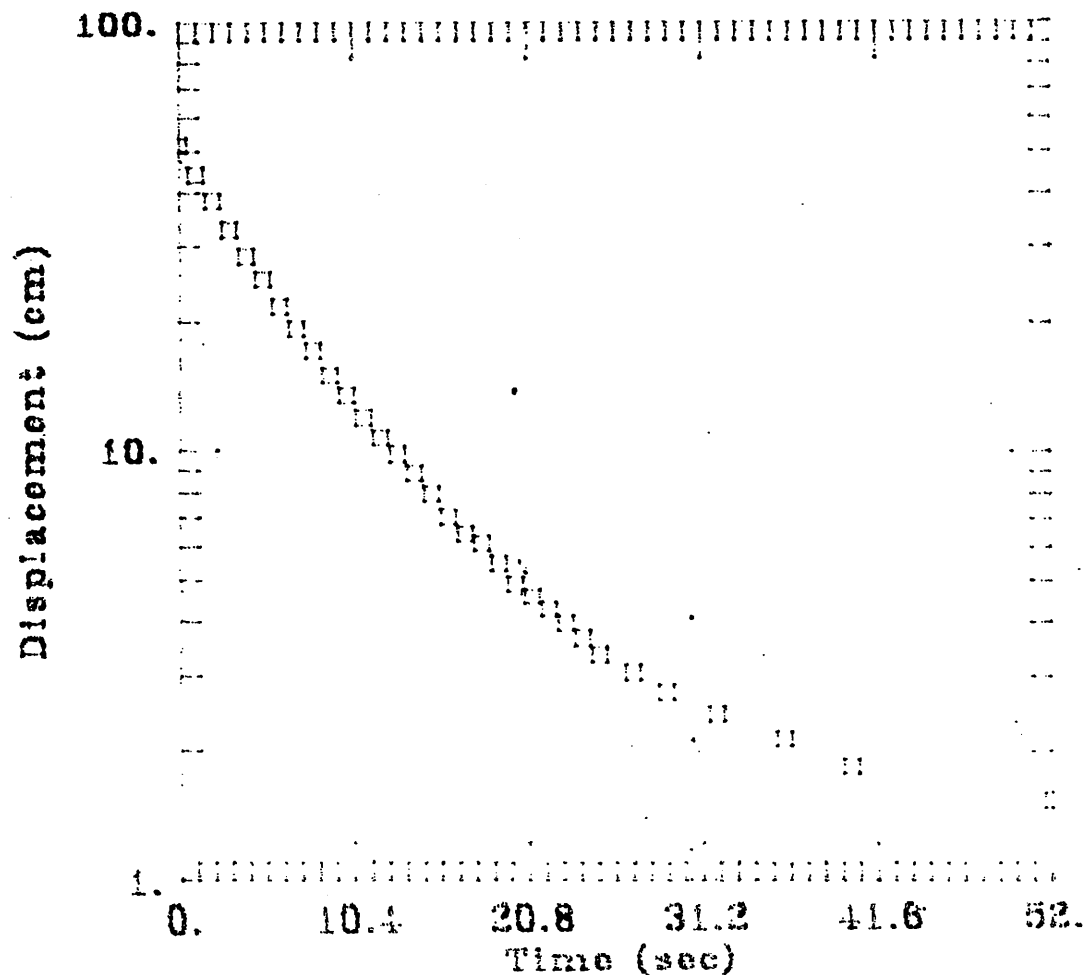
$r_w = 10.54$ cm

$L = 213.4$ cm

$b = 2286$ cm

$H = 904$ cm

Dane Co. M6B Rising Head Slug Test



DATA SET:

m6bf.1n

07/31/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

$K = 0.004221$ cm/sec

$y_0 = 47.4$ cm

TEST DATA:

$H_0 = 51.51$ cm

$r_c = 2.54$ cm

$r_w = 10.54$ cm

$L = 213.4$ cm

$b = 2256.$ cm

$H = 904.$ cm

A Q T E S O L V R E S U L T S
Version 1.10

07/31/92

10:13:06

TEST DESCRIPTION

Data set..... m6bf.in
Data set title..... m6b falling head

Knowns and Constants:

No. of data points.....	31
Radius of well casing.....	2.54
Radius of well.....	10.54
Aquifer saturated thickness.....	2286
Well screen length.....	213.4
Static height of water in well.....	904
Log(Re/Rw).....	2.298
A, B, C.....	2.157, 0.339, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	4.2211E-003 +/-	9.9883E-005
y0 =	4.7402E+001 +/-	8.2345E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	31
Number of estimated parameters....	2
Degrees of freedom.....	29
Residual mean.....	0.3931
Residual standard deviation.....	1.025
Residual variance.....	1.05

Model Residuals:

m6b falling head

slugt1

51.5112

2.53999

10.54

slugt2

2286

213.36

904.037

tsdata

1	43.8912	1
2	38.1	1
3	32.6136	1
4	28.3464	1
5	24.9936	1
6	21.6408	1
7	19.2024	1
8	17.0688	1
9	14.9352	1
10	13.4112	1
11	11.8872	1
12	10.668	1
13	9.7536	1
14	8.8392	1
15	7.9248	1
16	7.0104	1
17	6.4008	1
18	6.096	1
19	5.4864	1
20	4.8768	1
21	4.572	1
22	4.2672	1
23	3.9624	1
24	3.6576	1
25	3.3528	1
27	3.048	1
29	2.7432	1
32	2.4384	1
36	2.1336	1
40	1.8288	1
52	1.524	1

M6B rising head

slugt1

56.388

2.5399

10.54

slugt2

2286

213.36

904.037

tsdata

1	37.4904	1
2	30.7848	1
3	26.8224	1
4	23.1648	1
5	20.4216	1
6	17.6784	1
7	15.5448	1
8	13.716	1
9	12.192	1
10	10.668	1
11	9.4488	1
12	8.2296	1
13	7.3152	1
14	6.7056	1
15	6.096	1
16	5.4864	1
17	4.8768	1
18	4.2672	1
19	3.9624	1
20	3.6576	1
21	3.3528	1
22	3.048	1
23	2.7432	1
24	2.4384	1
26	2.1336	1
27	1.8288	1
30	1.524	1
32	1.2192	1
36	0.9144	1
46	0.6096	1

A Q T E S O L V R E S U L T S
Version 1.10

07/31/92

10:23:31

TEST DESCRIPTION

Data set..... m6br.in
Data set title..... M6B rising head

Knowns and Constants:

No. of data points.....	30
Radius of well casing.....	2.54
Radius of well.....	10.54
Aquifer saturated thickness.....	2286
Well screen length.....	213.4
Static height of water in well:.....	904
Log(Re/Rw).....	2.298
A, B, C.....	2.157, 0.339, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	4.5254E-003 +/-	8.7432E-005
y0 =	4.0330E+001 +/-	5.7682E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	30
Number of estimated parameters....	2
Degrees of freedom.....	28
Residual mean.....	0.2254
Residual standard deviation.....	0.6883
Residual variance.....	0.4738

Model Residuals:

Dane Co. M6C Falling Head Slug Test

DATA SET:

m6cr.in

08/04/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

$K = 8.8052E-05$ cm/sec

$y_0 = 37.29$ cm

TEST DATA:

$H_0 = 0.6096$ cm

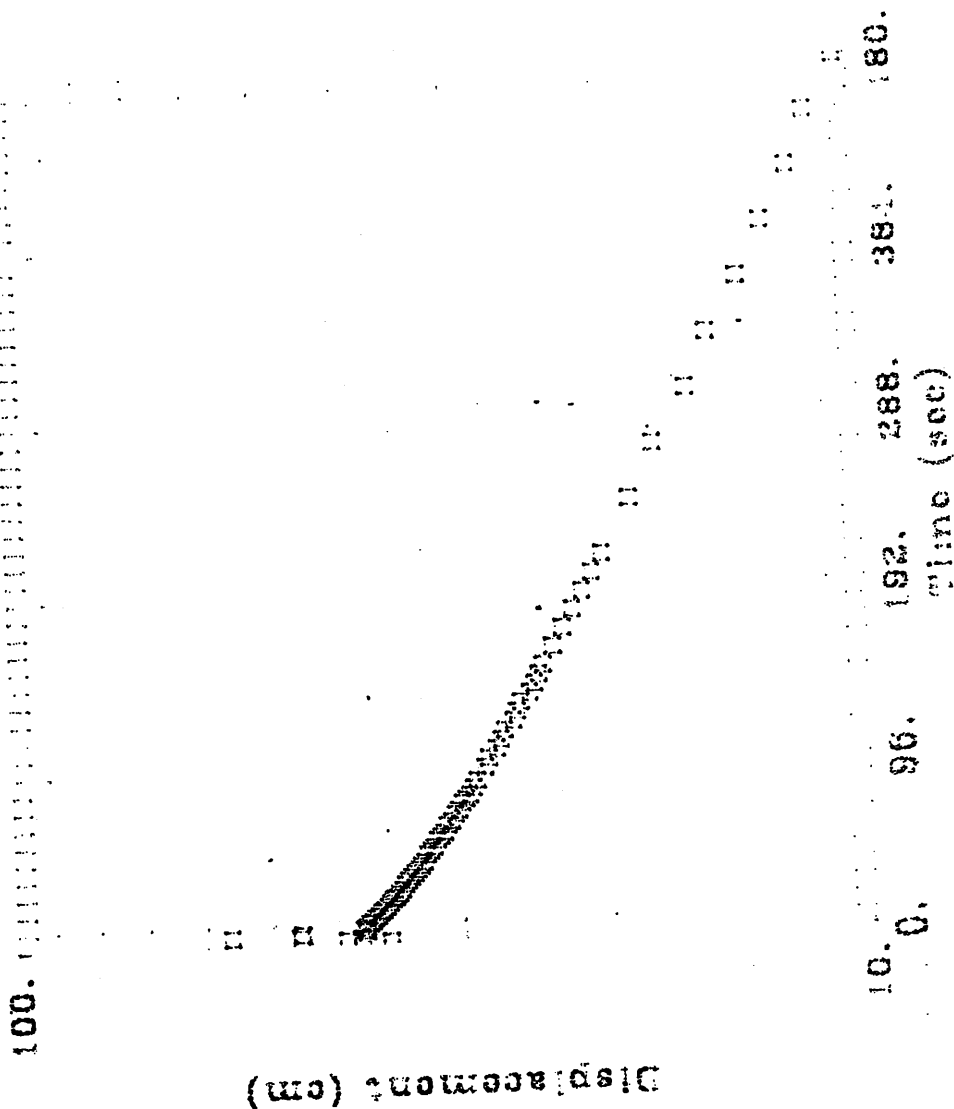
$r_c = 2.54$ cm

$r_w = 7.62$ cm

$L = 322.5$ cm

$b = 2286.$ cm

$H = 1521.6$ cm



Dane Co. M6C Rising Head Slug Test

DATA SET:

m6cf.1n

08/04/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 9.3661E-05 cm/sec

Y0 = 27.4 cm

TEST DATA:

H0 = 31.39 cm

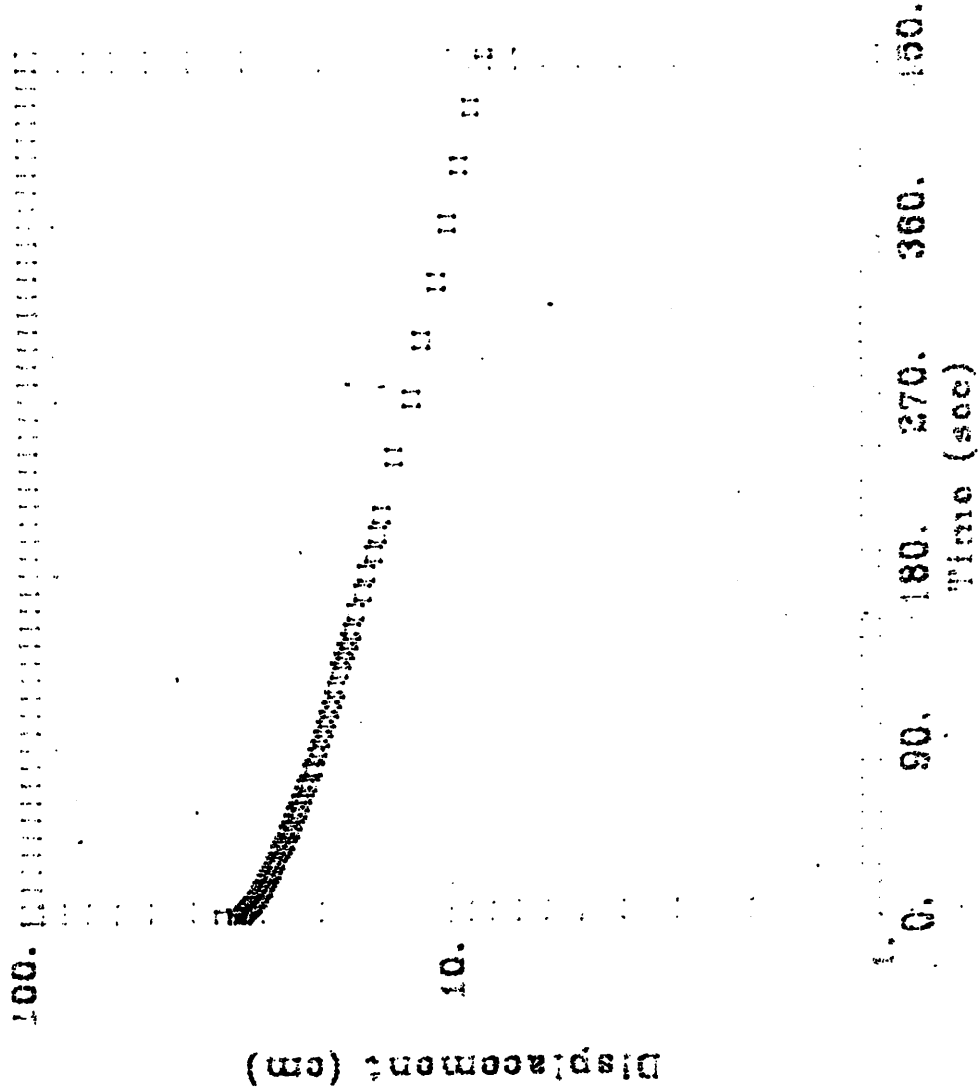
rc = 2.54 cm

rw = 7.62 cm

L = 322.5 cm

b = 2286. cm

H = 1521.6 cm



3

3

3

M6C falling head

slugt1

31.3944

2.5399

7.62

slugt2

2286

322.478

1521.56

tsdata

1	31.3944	1
2	33.8328	1
3	31.6992	1
4	30.48	1
5	30.1752	1
6	29.8704	1
7	29.5656	1
8	29.2608	1
9	28.956	1
10	28.6512	1
12	28.3464	1
13	28.0416	1
15	27.7368	1
17	27.432	1
18	27.1272	1
21	26.8224	1
23	26.5176	1
25	26.2128	1
27	25.908	1
30	25.6032	1
32	25.2984	1
36	24.9936	1
38	24.6888	1
40	24.384	1
42	24.0792	1
46	23.7744	1
48	23.4696	1
52	23.1648	1
56	22.86	1
58	22.5552	1
62	22.2504	1
66	21.9456	1
70	21.6408	1
72	21.336	1
78	21.0312	1
80	20.7264	1
86	20.4216	1
90	20.1168	1
95	19.812	1
100	19.5072	1
105	19.2024	1
110	18.8976	1
115	18.5928	1
120	18.288	1
130	17.9832	1
135	17.6784	1
140	17.3736	1

145	17.0688	1
150	16.764	1
160	16.4592	1
170	15.8496	1
180	15.5448	1
190	14.9352	1
200	14.6304	1
210	14.3256	1
240	13.4112	1
270	12.192	1
300	11.5824	1
330	10.668	1
360	10.0584	1
390	9.4488	1
420	8.8392	1
450	8.2296	1

13:01:44

TEST DESCRIPTION

```
Data set..... m6cf.in
Data set title.... M6C falling head
```

Knowns and Constants:

No. of data points.....	63		
Radius of well casing.....	2.54		
Radius of well.....	7.62		
Aquifer saturated thickness.....	2286		
Well screen length.....	322.5		
Static height of water in well.....	1522		
Log(R_e/R_w).....	3.081		
A, B, C.....	2.833,	0.459,	0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

• STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	1.0941E-004 +/-	3.6137E-006
y0 =	2.9176E+001 +/-	2.7797E-001

ANALYSIS OF MODEL RESIDUALS

```
residual = calculated - observed
weighted residual = residual * weight
```

Weighted Residual Statistics:

Number of residuals.....	63
Number of estimated parameters....	2
Degrees of freedom.....	61
Residual mean.....	0.06959
Residual standard deviation.....	1.28
Residual variance.....	1.638

Model Residuals:

Time	Observed	Calculated	Residual	Weight
1	31.394	29.072	2.322	1
2	33.833	28.969	4.8634	1
3	31.699	28.867	2.8325	1
4	30.48	28.764	1.7156	1
5	30.175	28.662	1.5127	1
6	29.87	28.561	1.3095	1
7	29.566	28.46	1.106	1
8	29.261	28.359	0.90202	1
9	28.956	28.258	0.69773	1
10	28.651	28.158	0.49308	1
12	28.346	27.959	0.38752	1
13	28.042	27.86	0.18181	1
15	27.737	27.663	0.074138	1
17	27.432	27.467	-0.034929	1
18	27.127	27.37	-0.24238	1
21	26.822	27.08	-0.25721	1
23	26.518	26.888	-0.3704	1
25	26.213	26.698	-0.48495	1
27	25.908	26.509	-0.60084	1
30	25.603	26.228	-0.62479	1
32	25.298	26.042	-0.744	1
36	24.994	25.675	-0.68157	1
38	24.689	25.493	-0.8047	1
40	24.384	25.313	-0.92911	1
42	24.079	25.134	-1.0548	1
46	23.774	24.78	-1.0052	1
48	23.47	24.604	-1.1346	1
52	23.165	24.257	-1.0925	1
56	22.86	23.915	-1.0552	1
58	22.555	23.746	-1.1908	1
62	22.25	23.411	-1.1608	1
66	21.946	23.081	-1.1354	1
70	21.641	22.756	-1.1148	1
72	21.336	22.595	-1.2585	1
78	21.031	22.118	-1.0871	1
80	20.726	21.962	-1.2354	1
86	20.422	21.499	-1.0773	1
90	20.117	21.196	-1.079	1
95	19.812	20.823	-1.0108	1
100	19.507	20.456	-0.94921	1
105	19.202	20.096	-0.89407	1
110	18.898	19.743	-0.84526	1
115	18.593	19.395	-0.80267	1
120	18.288	19.054	-0.7662	1
130	17.983	18.39	-0.40636	1
135	17.678	18.066	-0.38759	1
140	17.374	17.748	-0.37451	1
145	17.069	17.436	-0.36702	1
150	16.764	17.129	-0.36503	1
160	16.459	16.532	-0.07234	1
170	15.85	15.955	-0.1053	1
180	15.545	15.398	0.14643	1
190	14.935	14.861	0.073953	1
200	14.63	14.343	0.28754	1

M6C rising head

slugt1

0.6096

2.5399

7.62

slugt2

2286

322.478

1521.56

tsdata

1	36.576	1
2	41.148	1
3	39.624	1
4	46.6344	1
5	56.0832	1
6	46.3296	1
7	39.0144	1
8	39.3192	1
9	39.0144	1
11	38.7096	1
12	38.4048	1
14	38.1	1
15	37.7952	1
17	37.4904	1
18	37.1856	1
20	36.8808	1
22	36.576	1
24	36.2712	1
25	35.9664	1
27	35.6616	1
29	35.3568	1
32	35.052	1
34	34.7472	1
36	34.4424	1
38	34.1376	1
40	33.8328	1
42	33.528	1
44	33.2232	1
48	32.9184	1
50	32.6136	1
52	32.3088	1
56	32.004	1
58	31.6992	1
60	31.3944	1
64	31.0896	1
66	30.7848	1
70	30.48	1
72	30.1752	1
76	29.8704	1
78	29.5656	1
80	29.2608	1
84	28.956	1
88	28.6512	1
95	28.0416	1
100	27.7368	1
105	27.1272	1
110	26.8224	1

115	26.5176	1
120	25.908	1
125	25.6032	1
130	25.2984	1
135	24.6888	1
140	24.384	1
145	24.0792	1
150	23.7744	1
160	23.1648	1
170	22.5552	1
180	21.9456	1
190	21.336	1
200	20.7264	1
210	20.1168	1
240	18.5928	1
270	17.3736	1
300	15.8496	1
330	14.9352	1
360	13.716	1
390	12.8016	1
420	11.8872	1
450	11.2776	1
480	10.3632	1

Time	Observed	Calculated	Residual	Weight
1	36.576	40.023	-3.4471	1
2	41.148	39.887	1.261	1
3	39.624	39.751	-0.1274	1
4	46.634	39.616	7.0182	1
5	56.083	39.482	16.602	1
6	46.33	39.347	6.9824	1
7	39.014	39.213	-0.19904	1
8	39.319	39.08	0.23911	1
9	39.014	38.947	0.067203	1
11	38.71	38.683	0.026839	1
12	38.405	38.551	-0.14642	1
14	38.1	38.289	-0.18947	1
15	37.795	38.159	-0.36406	1
17	37.49	37.9	-0.40978	1
18	37.186	37.771	-0.58569	1
20	36.881	37.515	-0.63404	1
22	36.576	37.26	-0.68413	1
24	36.271	37.007	-0.73595	1
25	35.966	36.881	-0.9149	1
27	35.662	36.631	-0.96929	1
29	35.357	36.382	-1.0254	1
32	35.052	36.012	-0.96028	1
34	34.747	35.768	-1.0206	1
36	34.442	35.525	-1.0825	1
38	34.138	35.284	-1.1461	1
40	33.833	35.044	-1.2114	1
42	33.528	34.806	-1.2782	1
44	33.223	34.57	-1.3467	1
48	32.918	34.102	-1.1837	1
50	32.614	33.871	-1.2569	1
52	32.309	33.641	-1.3318	1
56	32.004	33.185	-1.1813	1
58	31.699	32.96	-1.2608	1
60	31.394	32.736	-1.3418	1
64	31.09	32.293	-1.2036	1
66	30.785	32.074	-1.2891	1
70	30.48	31.64	-1.1599	1
72	30.175	31.425	-1.2498	1
76	29.87	31	-1.1294	1
78	29.566	30.789	-1.2237	1
80	29.261	30.58	-1.3194	1
84	28.956	30.166	-1.2104	1
88	28.651	29.758	-1.1069	1
95	28.042	29.057	-1.0154	1
100	27.737	28.566	-0.82945	1
105	27.127	28.084	-0.95663	1
110	26.822	27.61	-0.78716	1
115	26.518	27.143	-0.6257	1
120	25.908	26.685	-0.77691	1
125	25.603	26.234	-0.63107	1
130	25.298	25.791	-0.49283	1
135	24.689	25.356	-0.66688	1
140	24.384	24.927	-0.54348	1
145	24.079	24.507	-0.42731	1

Dane Co. M9A Falling Head Slug Test

DATA SET:

m9a.1n

08/12/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 8.5178E-06 cm/sec

Y0 = 400.2 cm

TEST DATA:

H0 = 406.9 cm

rc = 2.54 cm

rw = 7.62 cm

L = 457.2 cm

b = 2286. cm

H = 359.7 cm

Displacement (cm)

1000.

100.

0.

12.

84.

126.

168.

210.

Time (sec)

Dane Co. M9a Rising Head Test .

slugt1

406.908

2.53999

7.62

slugt2

2286

457.2

359.664

tsdata

6	406.908	1
7	405.994	1
8	405.384	1
9	404.47	1
10	403.86	1
11	403.25	1
12	402.641	1
13	402.031	1
14	401.422	1
15	400.812	1
16	400.202	1
17	399.593	1
18	399.288	1
19	398.678	1
20	398.069	1
21	397.764	1
22	397.154	1
23	396.545	1
24	396.24	1
25	395.935	1
26	395.326	1
27	395.021	1
28	394.716	1
29	394.106	1
30	393.802	1
32	392.887	1
34	392.278	1
36	391.668	1
38	390.754	1
40	390.144	1
42	389.534	1
44	388.925	1
46	388.62	1
48	388.01	1
50	387.401	1
52	386.791	1
54	386.182	1
56	385.877	1
58	385.267	1
60	384.962	1
62	384.353	1
64	384.048	1
66	383.743	1
68	383.438	1
70	383.134	1
72	382.829	1
74	382.219	1

78	381.914	1
80	381.61	1
82	381.305	1
84	381	1
86	380.695	1
88	380.39	1
95	379.781	1
100	379.171	1
105	378.866	1
110	377.952	1
120	377.647	1
125	377.038	1
130	376.733	1
135	376.428	1
140	376.123	1
145	375.818	1
150	375.514	1
160	375.209	1
170	374.904	1
180	374.599	1
210	374.294	1

Model Residuals:

Time	Observed	Calculated	Residual	Weight
6	406.91	399.06	7.8491	1
7	405.99	398.87	7.1233	1
8	405.38	398.68	6.7021	1
9	404.47	398.49	5.976	1
10	403.86	398.31	5.5547	1
11	403.25	398.12	5.1333	1
12	402.64	397.93	4.7117	1
13	402.03	397.74	4.2901	1
14	401.42	397.55	3.8684	1
15	400.81	397.37	3.4466	1
16	400.2	397.18	3.0247	1
17	399.59	396.99	2.6028	1
18	399.29	396.8	2.4855	1
19	398.68	396.62	2.0634	1
20	398.07	396.43	1.6411	1
21	397.76	396.24	1.5236	1
22	397.15	396.05	1.1012	1
23	396.54	395.87	0.67869	1
24	396.24	395.68	0.5609	1
25	395.94	395.49	0.44302	1
26	395.33	395.31	0.020258	1
27	395.02	395.12	-0.097796	1
28	394.72	394.93	-0.21594	1
29	394.11	394.75	-0.63897	1
30	393.8	394.56	-0.75729	1
32	392.89	394.19	-1.299	1
34	392.28	393.81	-1.5362	1
36	391.67	393.44	-1.7738	1
38	390.75	393.07	-2.3166	1
40	390.14	392.7	-2.5549	1
42	389.53	392.33	-2.7936	1
44	388.92	391.96	-3.0326	1
46	388.62	391.59	-2.9671	1
48	388.01	391.22	-3.2068	1
50	387.4	390.85	-3.4469	1
52	386.79	390.48	-3.6873	1
54	386.18	390.11	-3.9281	1
56	385.88	389.74	-3.8644	1
58	385.27	389.37	-4.1058	1
60	384.96	389.01	-4.0428	1
62	384.35	388.64	-4.285	1
64	384.05	388.27	-4.2227	1
66	383.74	387.9	-4.1607	1
68	383.44	387.54	-4.0991	1
70	383.13	387.17	-4.0378	1
72	382.83	386.81	-3.9769	1
74	382.22	386.44	-4.2211	1
78	381.91	385.71	-3.7962	1
80	381.61	385.35	-3.7367	1
82	381.3	384.98	-3.6775	1
84	381	384.62	-3.6186	1
86	380.7	384.26	-3.5601	1
88	380.39	383.89	-3.5019	1

Dane Co. M9A Rising Head Slug Test

DATA SET:

m9af.in

08/12/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 1.2859E-05 cm/sec

Y0 = 211.2 cm

TEST DATA:

H0 = 221. cm

rc = 2.54 cm

rw = 7.62 cm

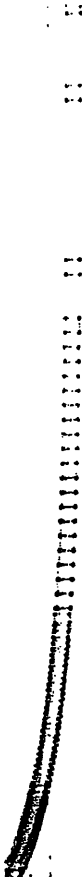
L = 457.2 cm

b = 2286. cm

H = 359.7 cm

1000.

Displacement (cm)



100. 0. 60. 120. 180. 240. 300.
time (sec)

A Q T E S O L V R E S U L T S
Version 1.10

08/12/92

09:38:02

TEST DESCRIPTION

Data set..... m9af.in
Data set title..... Dane Co. M9a Falling Head Test

Knowns and Constants:

No. of data points.....	75
Radius of well casing.....	2.54
Radius of well.....	7.62
Aquifer saturated thickness.....	2286
Well screen length.....	457.2
Static height of water in well.....	359.7
Log(Re/Rw).....	2.555
A, B, C.....	3.377, 0.539, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	1.2859E-005 +/-	8.9369E-007
y0 =	2.1115E+002 +/-	8.8030E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	75
Number of estimated parameters....	2
Degrees of freedom.....	73
Residual mean.....	0.006076
Residual standard deviation.....	4.938
Residual variance.....	24.38

Model Residuals:

Time	Observed	Calculated	Residual	Weight
3	220.98	210.7	10.279	1
4	220.07	210.55	9.5152	1
5	219.15	210.4	8.7509	1
6	217.93	210.25	7.6817	1
7	217.63	210.1	7.5269	1
8	217.02	209.95	7.0671	1
9	216.1	209.8	6.3024	1
10	215.49	209.65	5.8424	1
11	214.88	209.5	5.3823	1
12	214.27	209.35	4.9221	1
13	213.66	209.2	4.4618	1
14	213.06	209.05	4.0014	1
15	212.75	208.9	3.8457	1
16	212.14	208.76	3.3851	1
17	211.53	208.61	2.9243	1
18	211.23	208.46	2.7683	1
19	210.62	208.31	2.3073	1
20	210.01	208.16	1.8463	1
21	209.7	208.01	1.6899	1
22	209.09	207.86	1.2287	1
23	208.79	207.72	1.0721	1
24	208.48	207.57	0.91543	1
25	207.87	207.42	0.45385	1
26	207.57	207.27	0.29696	1
27	207.26	207.12	0.13997	1
28	206.65	206.98	-0.32192	1
29	206.35	206.83	-0.47913	1
30	206.04	206.68	-0.63643	1
32	205.13	206.39	-1.2562	1
34	204.52	206.09	-1.5715	1
36	203.91	205.8	-1.8873	1
38	203.3	205.51	-2.2035	1
40	202.69	205.21	-2.5201	1
42	202.08	204.92	-2.8371	1
44	201.47	204.63	-3.1545	1
46	201.17	204.34	-3.1676	1
48	200.56	204.04	-3.4859	1
50	199.95	203.75	-3.8046	1
52	199.64	203.46	-3.8189	1
54	199.03	203.17	-4.1384	1
56	198.73	202.88	-4.1535	1
58	198.12	202.59	-4.4739	1
60	197.82	202.31	-4.4898	1
62	197.51	202.02	-4.5062	1
64	196.9	201.73	-4.8278	1
66	196.6	201.44	-4.845	1
68	196.29	201.15	-4.8626	1
70	195.99	200.87	-4.8806	1
72	195.68	200.58	-4.899	1
74	195.38	200.29	-4.9178	1
76	195.07	200.01	-4.9371	1
78	194.77	199.72	-4.9567	1
80	194.46	199.44	-4.9768	1

Dane Co. M9a Falling Head Test

slugt1

220.98

2.53999

7.62

slugt2

2286

457.2

359.664

tsdata

3	220.98	1
4	220.066	1
5	219.151	1
6	217.932	1
7	217.627	1
8	217.018	1
9	216.103	1
10	215.494	1
11	214.884	1
12	214.274	1
13	213.665	1
14	213.055	1
15	212.75	1
16	212.141	1
17	211.531	1
18	211.226	1
19	210.617	1
20	210.007	1
21	209.702	1
22	209.093	1
23	208.788	1
24	208.483	1
25	207.874	1
26	207.569	1
27	207.264	1
28	206.654	1
29	206.35	1
30	206.045	1
32	205.13	1
34	204.521	1
36	203.911	1
38	203.302	1
40	202.692	1
42	202.082	1
44	201.473	1
46	201.168	1
48	200.558	1
50	199.949	1
52	199.644	1
54	199.034	1
56	198.73	1
58	198.12	1
60	197.815	1
62	197.51	1
64	196.901	1
66	196.596	1
68	196.291	1

70	195.986	1
72	195.682	1
74	195.377	1
76	195.072	1
78	194.767	1
80	194.462	1
82	194.158	1
84	193.853	1
88	193.548	1
90	193.243	1
95	192.634	1
100	192.329	1
105	191.719	1
110	191.414	1
115	191.11	1
120	190.805	1
125	190.5	1
130	190.195	1
135	189.89	1
140	189.586	1
150	189.281	1
160	188.976	1
170	188.671	1
180	188.366	1
190	188.062	1
210	187.757	1
270	187.452	1
300	187.147	1

Dane Co. M9B Rising Head Slug Test

DATA SET:

m9bf.1n

08/03/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 4.2048E-06 cm/sec

y0 = 139. cm

TEST DATA:

H0 = 139.9 cm

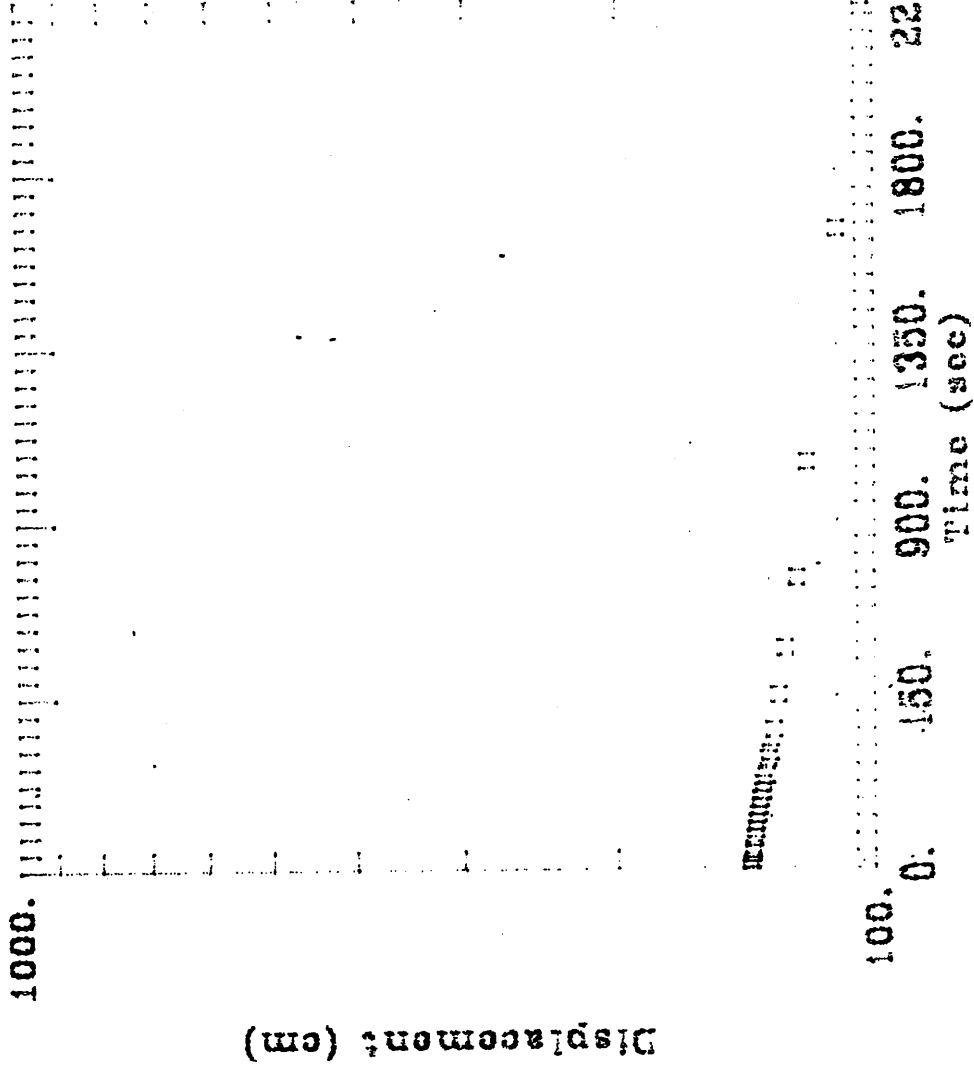
rc = 2.54 cm

rw = 7.62 cm

L = 320. cm

b = 2286. cm

H = 1206.1 cm



m9b falling head

slugt1

139.903

2.53999

7.62

slugt2

2286

320.04

1206.09

tsdata

10	139.598	1
20	138.989	1
40	138.684	1
50	138.684	1
80	138.074	1
100	137.77	1
120	137.465	1
140	136.855	1
160	136.246	1
180	135.941	1
200	135.026	1
220	135.026	1
240	133.807	1
285	133.198	1
300	132.283	1
360	131.064	1
450	129.54	1
570	127.102	1
750	123.139	1
1050	119.786	1
1650	110.033	1
2250	103.022	1

A Q T E S O L V R E S U L T S
Version 1.10

08/03/92

14:35:53

TEST DESCRIPTION

Data set..... m9bf.in
Data set title..... m9b falling head

Knowns and Constants:

No. of data points.....	22
Radius of well casing.....	2.54
Radius of well.....	7.62
Aquifer saturated thickness.....	2286
Well screen length.....	320
Static height of water in well.....	1206
Log(Re/Rw).....	2.955
A, B, C.....	2.823, 0.457, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	4.2048E-006 +/-	9.0784E-008
y0 =	1.3904E+002 +/-	2.4540E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	22
Number of estimated parameters....	2
Degrees of freedom.....	20
Residual mean.....	0.002429
Residual standard deviation.....	0.8741
Residual variance.....	0.764

Model Residuals:

Dane Co. M10A Rising Head Slug Test

DATA SET:

m10af.in
08/04/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

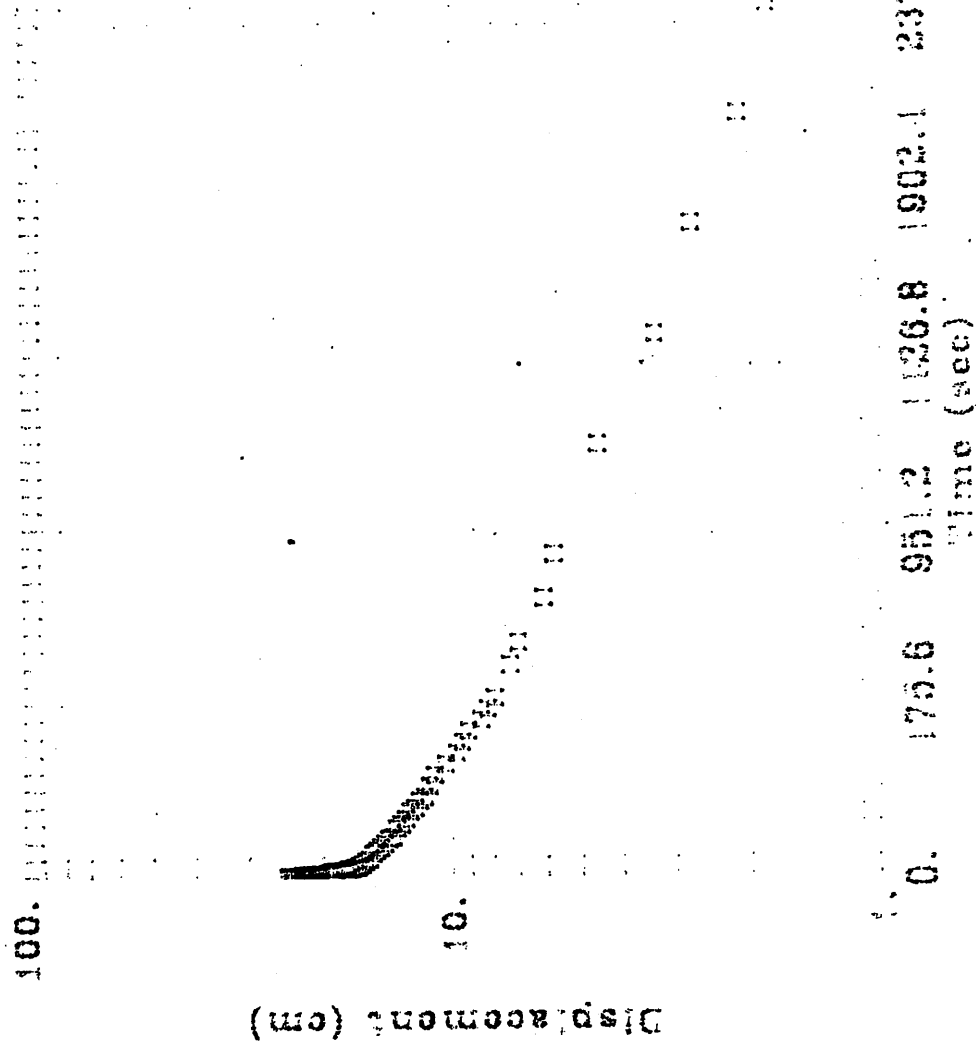
Bouwer-Rice

ESTIMATED PARAMETERS:

K = 2.3514E-05 cm/sec
Y0 = 15.94 cm

TEST DATA:

H0 = 24.08 cm
rc = 2.54 cm
rw = 7.62 cm
L = 426.7 cm
b = 2286. cm
H = 288. cm



ml0a falling head

slugt1

24.0792

2.53999

7.62

slugt2

2286

426.72

288.036

tsdata

0.4	23.7744	1
0.8	23.4696	1
1	23.1648	1
1.4	22.86	1
1.8	22.5552	1
2.2	22.2504	1
2.6	21.9456	1
3	21.6408	1
3.4	21.336	1
3.6	21.6408	1
3.8	21.336	1
4	22.2504	1
4.2	21.336	1
4.6	20.4216	1
4.8	21.0312	1
5.8	20.7264	1
6.8	20.4216	1
7.6	20.1168	1
9	19.5072	1
12	19.2024	1
14	18.8976	1
15	18.5928	1
16	18.288	1
17	17.9832	1
18	17.6784	1
21	17.3736	1
23	17.0688	1
26	16.764	1
30	16.4592	1
35	16.1544	1
42	15.8496	1
48	15.5448	1
64	15.24	1
72	14.9352	1
80	14.6304	1
90	14.3256	1
103	14.0208	1
108	13.716	1
133	13.4112	1
143	13.1064	1
158	12.8016	1
178	12.4968	1
188	12.192	1
208	11.8872	1
218	11.5824	1
248	11.2776	1
278	10.9728	1

308	10.3632	1
338	9.7536	1
368	9.4488	1
398	9.144	1
428	8.5344	1
458	8.2296	1
488	7.9248	1
578	7.3152	1
638	7.0104	1
758	6.096	1
878	5.7912	1
1178	4.572	1
1478	3.3528	1
1778	2.7432	1
2078	2.1336	1
2378	1.8288	1

Time	Observed	Calculated	Residual	Weight
2	0.3048	34.003	-33.699	1
2.8	0.3048	33.864	-33.559	1
3.2	0.3048	33.795	-33.49	1
4.8	43.282	33.519	9.763	1
5	40.538	33.484	7.0542	1
5.2	53.645	33.45	20.195	1
5.4	32.614	33.416	-0.802	1
5.6	46.33	33.381	12.948	1
5.8	31.394	33.347	-1.9527	1
6	57.912	33.313	24.599	1
6.2	50.902	33.279	17.623	1
6.4	52.73	33.245	19.486	1
6.6	40.234	33.211	7.023	1
6.8	50.292	33.176	17.116	1
7	31.699	33.142	-1.4433	1
7.2	56.693	33.108	23.584	1
7.4	24.994	33.075	-8.081	1
7.6	32.918	33.041	-0.12224	1
7.8	38.405	33.007	5.398	1
8	35.966	32.973	2.9935	1
9	34.442	32.804	1.6382	1
10	52.121	32.636	19.484	1
11	35.357	32.469	2.8874	1
12	32.614	32.303	0.3103	1
13	31.394	32.138	-0.74364	1
14	28.651	31.974	-3.3224	1
15	30.48	31.81	-1.33	1
17	29.87	31.485	-1.615	1
18	28.651	31.324	-2.6731	1
19	29.261	31.164	-1.9032	1
20	28.956	31.005	-2.0486	1
21	28.651	30.846	-2.1948	1
22	28.346	30.688	-2.3418	1
23	28.042	30.531	-2.4896	1
25	27.737	30.22	-2.4827	1
26	27.432	30.065	-2.6329	1
28	27.127	29.758	-2.6309	1
29	26.822	29.606	-2.7834	1
31	26.518	29.304	-2.7861	1
32	26.213	29.154	-2.941	1
33	25.908	29.005	-3.0966	1
35	25.603	28.709	-3.1054	1
36	25.298	28.562	-3.2633	1
40	24.994	27.982	-2.9881	1
42	24.689	27.696	-3.0073	1
44	24.079	27.413	-3.3342	1
46	23.774	27.134	-3.3592	1
48	23.47	26.857	-3.3871	1
52	23.165	26.311	-3.1465	1
56	22.86	25.777	-2.917	1
58	22.555	25.514	-2.9587	1
60	22.25	25.253	-3.0031	1
62	21.946	24.996	-3.0502	1
64	21.641	24.741	-3.0998	1

Dane Co. M10A Falling Head Slug Test

DATA SET:

m10ar.in
08/04/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

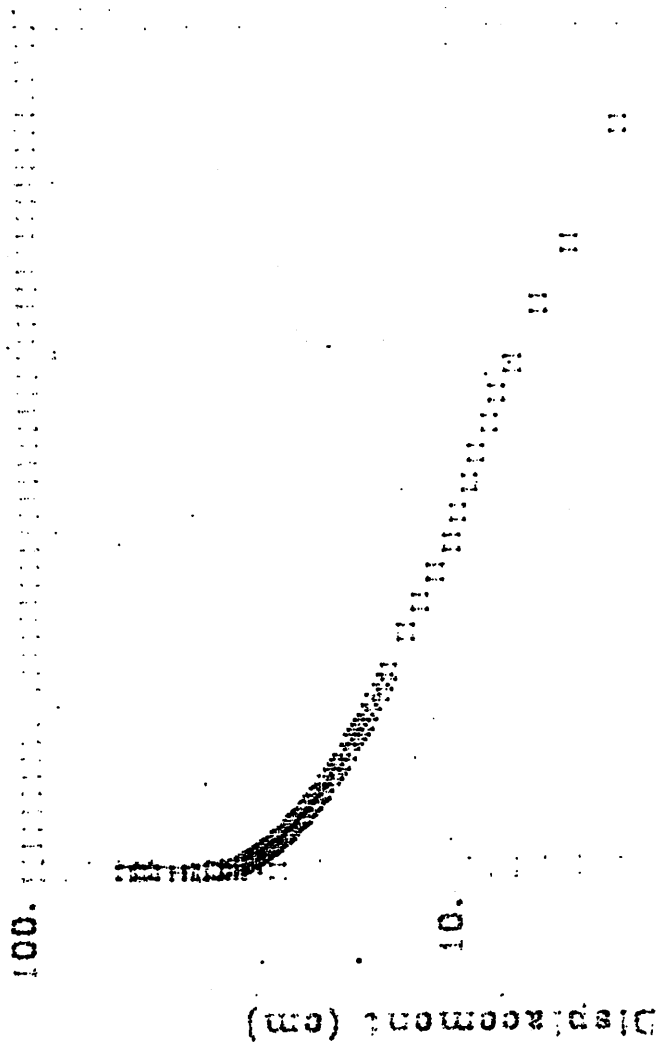
Bouwer-Hise

ESTIMATED PARAMETERS:

K = 5.1922E-05 cm/sec
y0 = 25.81 cm

TEST DATA:

H0 = 43.28 cm
rc = 2.54 cm
rw = 7.62 cm
L = 426.7 cm
b = 2286. cm
H = 288. cm



0. 173.6 351.2 528.8 702.1 878.
Time (sec)

m10a rising head

slugt1

43.2816

2.53999

7.62

slugt2

2286

426.72

288.036

tsdata

2	0.3048	1
2.8	0.3048	1
3.2	0.3048	1
4.8	43.2816	1
5	40.5384	1
5.2	53.6448	1
5.4	32.6136	1
5.6	46.3296	1
5.8	31.3944	1
6	57.912	1
6.2	50.9016	1
6.4	52.7304	1
6.6	40.2336	1
6.8	50.292	1
7	31.6992	1
7.2	56.6928	1
7.4	24.9936	1
7.6	32.9184	1
7.8	38.4048	1
8	35.9664	1
9	34.4424	1
10	52.1208	1
11	35.3568	1
12	32.6136	1
13	31.3944	1
14	28.6512	1
15	30.48	1
17	29.8704	1
18	28.6512	1
19	29.2608	1
20	28.956	1
21	28.6512	1
22	28.3464	1
23	28.0416	1
25	27.7368	1
26	27.432	1
28	27.1272	1
29	26.8224	1
31	26.5176	1
32	26.2128	1
33	25.908	1
35	25.6032	1
36	25.2984	1
40	24.9936	1
42	24.6888	1
44	24.0792	1
46	23.7744	1

48	23.4696	1
52	23.1648	1
56	22.86	1
58	22.5552	1
60	22.2504	1
62	21.9456	1
64	21.6408	1
70	21.336	1
72	21.0312	1
76	20.7264	1
78	20.4216	1
84	20.1168	1
86	19.812	1
88	19.5072	1
96	19.2024	1
103	18.5928	1
108	18.288	1
113	17.9832	1
118	17.6784	1
128	17.0688	1
138	16.764	1
143	16.4592	1
148	16.1544	1
153	15.8496	1
158	15.5448	1
168	15.24	1
178	14.9352	1
188	14.3256	1
198	14.0208	1
208	13.716	1
248	12.4968	1
278	11.5824	1
308	10.668	1
338	9.7536	1
368	9.4488	1
398	8.8392	1
428	8.5344	1
458	7.9248	1
488	7.62	1
518	7.0104	1
578	6.096	1
638	5.1816	1
758	3.9624	1
878	2.4384	1

A Q T E S O L V R E S U L T S

Version 1.10

08/04/92

14:02:15

TEST DESCRIPTION

Data set..... ml0af.in
Data set title..... ml0a falling head

Knowns and Constants:

No. of data points.....	63
Radius of well casing.....	2.54
Radius of well.....	7.62
Aquifer saturated thickness.....	2286
Well screen length.....	426.7
Static height of water in well.....	288
Log(Re/Rw).....	2.422
A, B, C.....	3.258, 0.521, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	3.9776E-005 +/-	2.8044E-006
y0 =	2.0057E+001 +/-	3.3531E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	63
Number of estimated parameters....	2
Degrees of freedom.....	61
Residual mean.....	0.2235
Residual standard deviation.....	1.868
Residual variance.....	3.488

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.4	23.774	20.04	3.7348	1
0.8	23.47	20.022	3.4474	1
1	23.165	20.014	3.1513	1
1.4	22.86	19.996	2.8638	1
1.8	22.555	19.979	2.5764	1
2.2	22.25	19.961	2.289	1
2.6	21.946	19.944	2.0015	1
3	21.641	19.927	1.714	1
3.4	21.336	19.909	1.4265	1
3.6	21.641	19.901	1.74	1
3.8	21.336	19.892	1.4438	1
4	22.25	19.884	2.3669	1
4.2	21.336	19.875	1.4611	1
4.6	20.422	19.858	0.56397	1
4.8	21.031	19.849	1.1822	1
5.8	20.726	19.806	0.92047	1
6.8	20.422	19.763	0.65865	1
7.6	20.117	19.729	0.38816	1
9	19.507	19.669	-0.16153	1
12	19.202	19.541	-0.33856	1
14	18.898	19.456	-0.55865	1
15	18.593	19.414	-0.82123	1
16	18.288	19.372	-1.0839	1
17	17.983	19.33	-1.3467	1
18	17.678	19.288	-1.6095	1
21	17.374	19.163	-1.789	1
23	17.069	19.08	-2.0107	1
26	16.764	18.956	-2.1916	1
30	16.459	18.792	-2.3324	1
35	16.154	18.589	-2.4342	1
42	15.85	18.308	-2.4585	1
48	15.545	18.071	-2.5262	1
64	15.24	17.454	-2.2137	1
72	14.935	17.153	-2.2178	1
80	14.63	16.857	-2.227	1
90	14.326	16.495	-2.1696	1
103	14.021	16.036	-2.0151	1
108	13.716	15.863	-2.1466	1
133	13.411	15.024	-1.6129	1
143	13.106	14.701	-1.5949	1
158	12.802	14.23	-1.4283	1
178	12.497	13.625	-1.1281	1
188	12.192	13.332	-1.1401	1
208	11.887	12.765	-0.8781	1
218	11.582	12.491	-0.90859	1
248	11.278	11.703	-0.4253	1
278	10.973	10.965	0.0082659	1
308	10.363	10.273	0.090446	1
338	9.7536	9.6246	0.12898	1
368	9.4488	9.0174	0.43142	1
398	9.144	8.4485	0.69555	1
428	8.5344	7.9154	0.61898	1
458	8.2296	7.416	0.81359	1
488	7.9248	6.9481	0.97668	1

m29 rising head

slugt1

22.86

2.5399

11.747

slugt2

2286

731.52

364.541

tsdata

2	22.86	1
3	5.7912	1
4	2.1336	1
5	1.8288	1
6	1.524	1
7	1.8288	1
8	1.2192	1
9	0.9144	1
12	0.6096	1
17	0.3048	1

A Q T E S O L V R E S U L T S
Version 1.10

08/04/92

15:07:11

TEST DESCRIPTION

Data set..... m29r.in
Data set title..... m29 rising head

Knowns and Constants:

No. of data points.....	10
Radius of well casing.....	2.54
Radius of well.....	11.75
Aquifer saturated thickness.....	2286
Well screen length.....	731.5
Static height of water in well.....	364.5
Log(Re/Rw).....	2.378
A, B, C.....	3.444, 0.549, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	1.3181E-002 +/-	1.6596E-003
y0 =	2.8088E+002 +/-	9.2553E+001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	10
Number of estimated parameters....	2
Degrees of freedom.....	8
Residual mean.....	0.7242
Residual standard deviation.....	1.123
Residual variance.....	1.262

Model Residuals:

RESULTS FROM VISUAL CURVE MATCHING

```

      Estimate
K   =  4.3681E-003
y0  =  2.2954E+001

```

[illegible]

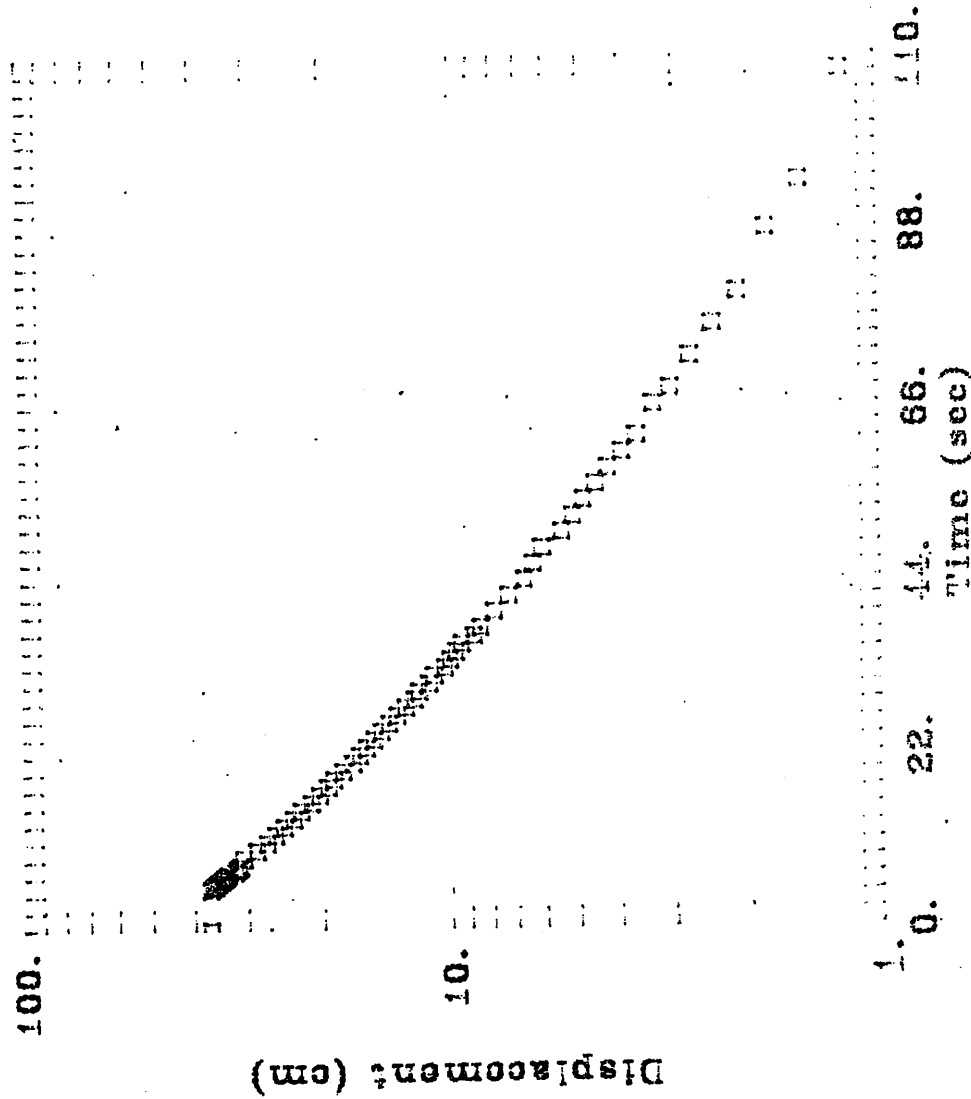
Danc Co. M-17 A Falling Head Slug Test

DATA SET:
m17af.dat
08/20/92

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

ESTIMATED PARAMETERS:
K = 0.002795 cm/sec
Y0 = 26.76 cm

TEST DATA:
H0 = 36.88 cm
rc = 4.45 cm
rw = 22.86 cm
L = 152.4 cm
b = 424.3 cm
H = 338. cm



Model Residuals:

Time	Observed	Calculated	Residual	Weight
5.2	36.881	35.924	0.95676	1
5.4	36.271	35.606	0.66558	1
5.6	35.966	35.29	0.67637	1
5.8	35.662	34.977	0.68437	1
6	35.357	34.667	0.68959	1
6.2	34.747	34.36	0.38727	1
6.4	34.442	34.055	0.38702	1
6.6	34.138	33.754	0.38407	1
6.8	33.833	33.454	0.37845	1
7	33.528	33.158	0.37018	1
7.4	32.309	32.573	-0.26383	1
7.6	32.004	32.284	-0.27992	1
7.8	31.699	31.998	-0.29857	1
8	31.394	31.714	-0.31975	1
9	30.785	30.333	0.45146	1
10	28.651	29.013	-0.36145	1
11	27.127	27.749	-0.62226	1
12	25.908	26.541	-0.63327	1
13	24.689	25.386	-0.69688	1
14	23.47	24.28	-0.81081	1
15	22.555	23.223	-0.66806	1
16	21.336	22.212	-0.87613	1
17	20.422	21.245	-0.82343	1
18	19.507	20.32	-0.81284	1
19	18.898	19.435	-0.53772	1
20	17.983	18.589	-0.60592	1
21	17.069	17.78	-0.71096	1
22	16.459	17.006	-0.54645	1
23	15.85	16.265	-0.41563	1
24	15.24	15.557	-0.31706	1
25	14.63	14.88	-0.24931	1
26	14.021	14.232	-0.21106	1
27	13.411	13.612	-0.20102	1
28	12.802	13.02	-0.21795	1
29	12.192	12.453	-0.26069	1
30	11.887	11.911	-0.023307	1
31	11.278	11.392	-0.11433	1
32	10.973	10.896	0.076864	1
33	10.363	10.422	-0.058335	1
34	10.058	9.9678	0.090611	1
35	9.7536	9.5338	0.2198	1
36	9.4488	9.1187	0.3301	1
37	8.8392	8.7217	0.11752	1
38	8.5344	8.3419	0.19245	1
40	7.9248	7.6314	0.29344	1
42	7.3152	6.9813	0.33391	1
44	6.7056	6.3866	0.31899	1
46	6.4008	5.8426	0.55822	1
48	6.096	5.3449	0.75111	1
50	5.4864	4.8896	0.5968	1
52	5.1816	4.4731	0.70851	1
54	4.8768	4.0921	0.78474	1
56	4.572	3.7435	0.82852	1
58	4.2672	3.4246	0.8426	1
60	3.9624	3.1329	0.82951	1
62	3.6576	2.866	0.79158	1

Danc Co. M-17 A Rising Head Slug Test

DATA SET:

m17ar.dat

08/21/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.003225 cm/sec

Y0 = 34.26 cm

TEST DATA:

H0 = 47.24 cm

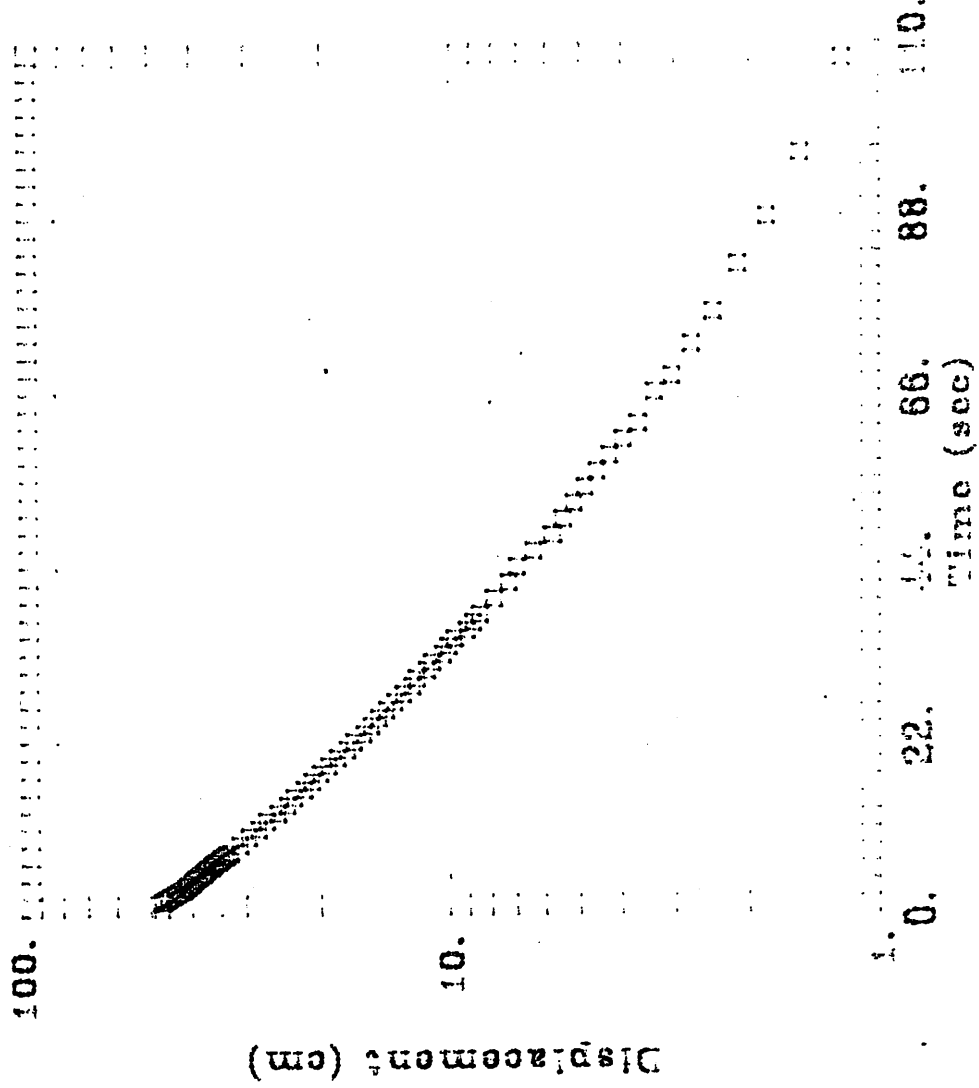
PC = 4.45 cm

rw = 22.86 cm

L = 152.4 cm

b = 424.3 cm

H = 338. cm



Model Residuals:

Time	Observed	Calculated	Residual	Weight
1.8	47.244	45.332	1.9118	1
2	46.634	44.897	1.7377	1
2.2	46.025	44.465	1.5594	1
2.4	45.415	44.038	1.377	1
2.6	44.501	43.615	0.88572	1
2.8	43.891	43.196	0.69514	1
3	43.282	42.781	0.50053	1
3.2	42.672	42.37	0.30194	1
3.4	42.062	41.963	0.099394	1
3.6	41.758	41.56	0.19774	1
3.8	41.148	41.161	-0.012585	1
4	40.843	40.765	0.078052	1
4.2	40.234	40.374	-0.13991	1
4.4	39.929	39.986	-0.056832	1
4.6	39.624	39.601	0.022517	1
4.8	39.319	39.221	0.098177	1
5	38.71	38.844	-0.13462	1
5.2	38.405	38.471	-0.066235	1
5.4	37.795	38.101	-0.30624	1
5.6	37.49	37.735	-0.24499	1
5.8	37.186	37.373	-0.18726	1
6	36.881	37.014	-0.13301	1
6.2	36.271	36.658	-0.38701	1
6.4	35.966	36.306	-0.33963	1
6.6	35.662	35.957	-0.29563	1
6.8	35.357	35.612	-0.25498	1
7	34.747	35.27	-0.52245	1
7.2	34.442	34.931	-0.48841	1
7.4	34.138	34.595	-0.45762	1
7.6	33.528	34.263	-0.73486	1
7.8	33.223	33.934	-0.71049	1
8	32.614	33.608	-0.99408	1
9	31.09	32.024	-0.93442	1
10	29.566	30.515	-0.94939	1
11	28.042	29.077	-1.0355	1
12	26.822	27.707	-0.88451	1
13	25.298	26.401	-1.1029	1
14	24.079	25.157	-1.078	1
15	23.165	23.972	-0.80697	1
16	21.946	22.842	-0.89658	1
17	21.031	21.766	-0.73461	1
18	20.117	20.74	-0.62337	1
19	19.202	19.763	-0.56045	1
20	18.288	18.832	-0.54359	1
21	17.374	17.944	-0.57061	1
22	16.764	17.099	-0.33465	1
23	15.85	16.293	-0.44333	1
24	15.24	15.525	-0.28518	1
25	14.63	14.794	-0.1632	1
26	14.021	14.097	-0.075701	1
27	13.411	13.432	-0.021048	1
28	12.802	12.799	0.0023041	1
29	12.192	12.196	-0.0041697	1
30	11.887	11.621	0.26574	1
31	11.278	11.074	0.20376	1
32	10.973	10.552	0.42078	1

Dane Co. M17B Rising Head Slug Test

DATA SET:

m17bf.in

08/04/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.0003966 cm/sec

y0 = 65.53 cm

TEST DATA:

H0 = 67.67 cm

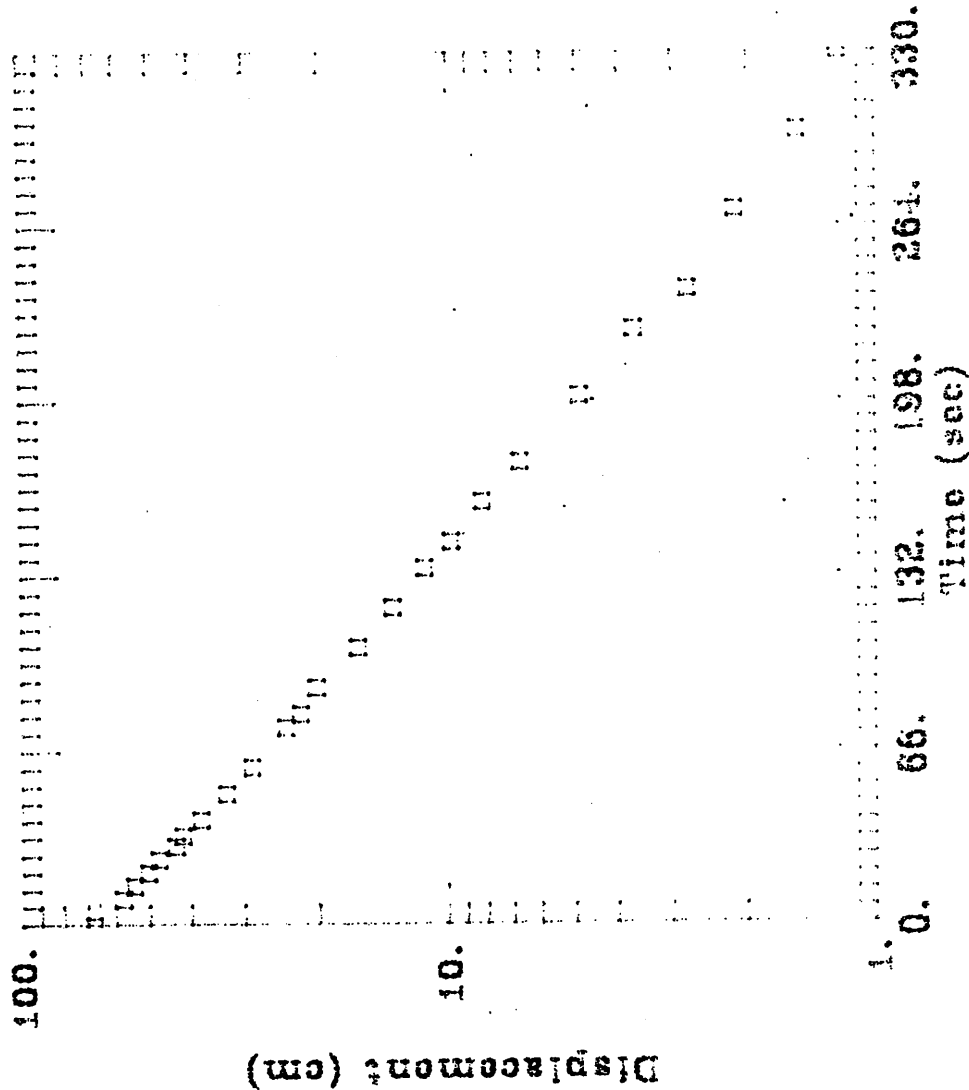
rc = 2.54 cm

rw = 7.62 cm

L = 301.8 cm

b = 2286. cm

H = 878.1 cm



m17b falling head
slugt1
67.6656
2.53999
7.62
slugt2
2286
301.752
878.129
tsdata
10 57.6072 1
15 54.2544 1
20 50.292 1
25 47.5488 1
30 43.2816 1
34 41.7576 1
40 37.7952 1
50 32.9184 1
60 28.6512 1
75 23.7744 1
80 21.9456 1
90 20.1168 1
105 16.1544 1
120 13.4112 1
135 11.2776 1
145 9.7536 1
160 8.2296 1
175 6.7056 1
200 4.8768 1
225 3.6576 1
240 2.7432 1
270 2.1336 1
300 1.524 1
330 1.2192 1

A Q T E S O L V R E S U L T S
Version 1.10

08/04/92

07:00:48

TEST DESCRIPTION

Data set..... ml7bf.in
Data set title..... ml7b falling head

Knowns and Constants:

No. of data points.....	24
Radius of well casing.....	2.54
Radius of well.....	7.62
Aquifer saturated thickness.....	2286
Well screen length.....	301.8
Static height of water in well.....	878.1
Log(Re/Rw).....	2.779
A, B, C.....	2.747, 0.446, 0.000

ANALYTICAL METHOD

Bouwer and Rice (unconfined aquifer slug test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	3.9657E-004 +/-	3.4646E-006
y0 =	6.5533E+001 +/-	3.3492E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals.....	24
Number of estimated parameters....	2
Degrees of freedom.....	22
Residual mean.....	0.09728
Residual standard deviation.....	0.4632
Residual variance.....	0.2145

Model Residuals:

Danc Co. M-28 Rising Head Slug Test

DATA SET:

m28r.dat

08/21/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.02296 cm/sec

Y0 = 14.48 cm

TEST DATA:

H0 = 15.24 cm

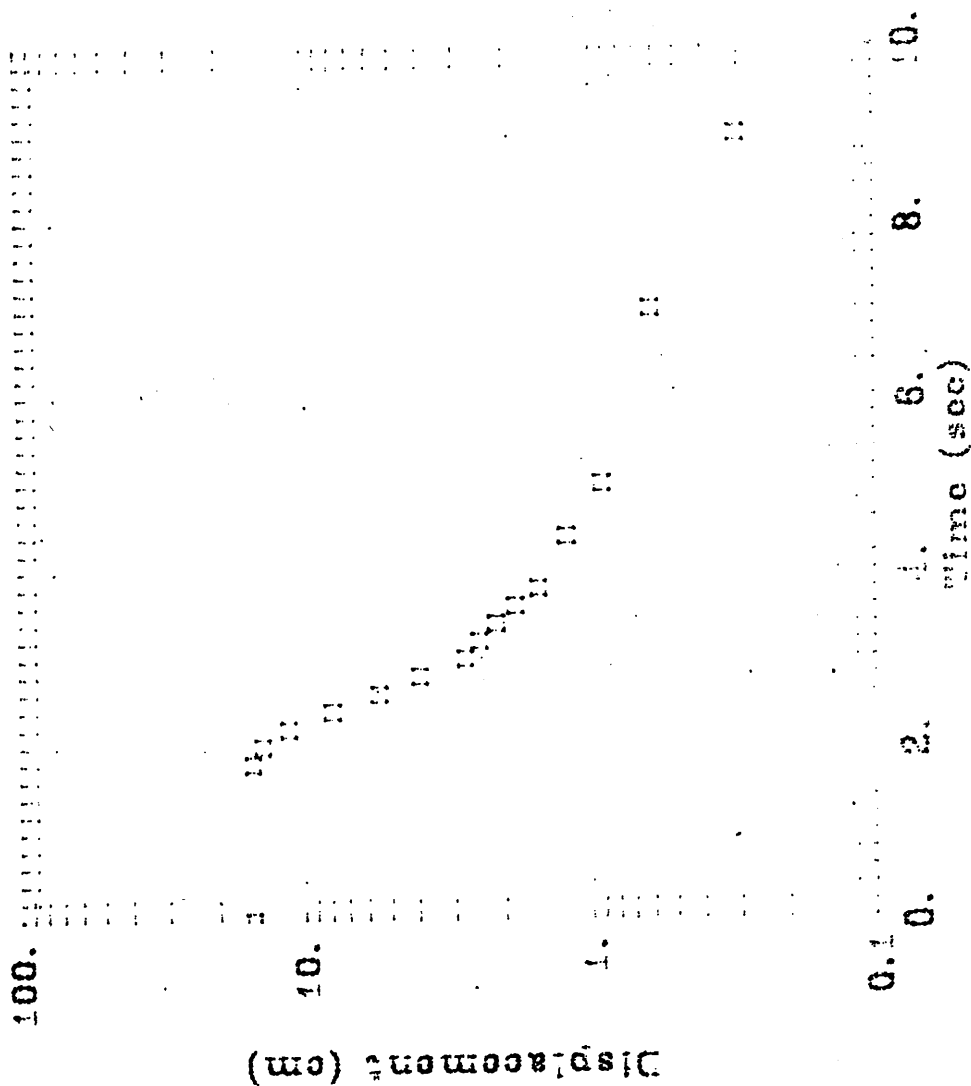
rc = 4.45 cm

rw = 22.66 cm

L = 457.2 cm

b = 582.2 cm

H = 399.3 cm



Version 1.10

14:12:02

```

Data set..... m28r.dat
Data set title.... Dane Co. M-28 Rising Head Slug Test

```

No. of data points.....	15
Radius of well casing.....	4.45
Radius of well.....	22.86
Aquifer saturated thickness.....	582.2
Well screen length.....	457.2
Static height of water in well.....	399.3
Log(R_e/R_w).....	1.897
A, B, C.....	2.150, 0.337, 0.000

3ouwer and Rice (unconfined aquifer slug test)

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	5.1617E-002	+/- 3.3466E-003
y0 =	1.5793E+002	+/- 2.7046E+001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 15
Number of estimated parameters.... 2
Degrees of freedom..... 13
Residual mean..... 0.0855
Residual standard deviation..... 0.7721
Residual variance..... 0.5962

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.8	15.24	16.456	-1.2165	1
2	14.021	12.8	1.2207	1
2.2	11.278	9.9561	1.3215	1
2.4	7.9248	7.7439	0.18085	1
2.6	5.4864	6.0233	-0.53694	1
2.8	3.9624	4.685	-0.72263	1
3	2.7432	3.6441	-0.90088	1
3.2	2.4384	2.8344	-0.39601	1
3.4	2.1336	2.2046	-0.071043	1
3.6	1.8288	1.7148	0.114	1
3.8	1.524	1.3338	0.19021	1
4.4	1.2192	0.62765	0.59155	1
5	0.9144	0.29535	0.61905	1
7	0.6096	0.023938	0.58566	1
9	0.3048	0.0019402	0.30286	1

RESULTS FROM VISUAL CURVE MATCHING

USUAL MATCH PARAMETER ESTIMATES

Estimate

K = 5.1617E-002

1.5793E+002

Frequency	Percentage
Never	0%
Rarely	0%
Sometimes	0%
Often	0%
Every day	85%

Danc Co. M-28 Falling Head Slug Test

DATA SET:

m28f.dat

08/21/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

Bouwer-Rice

ESTIMATED PARAMETERS:

K = 0.03105 cm/sec

Y0 = 19.44 cm

TEST DATA:

H0 = 11.89 cm

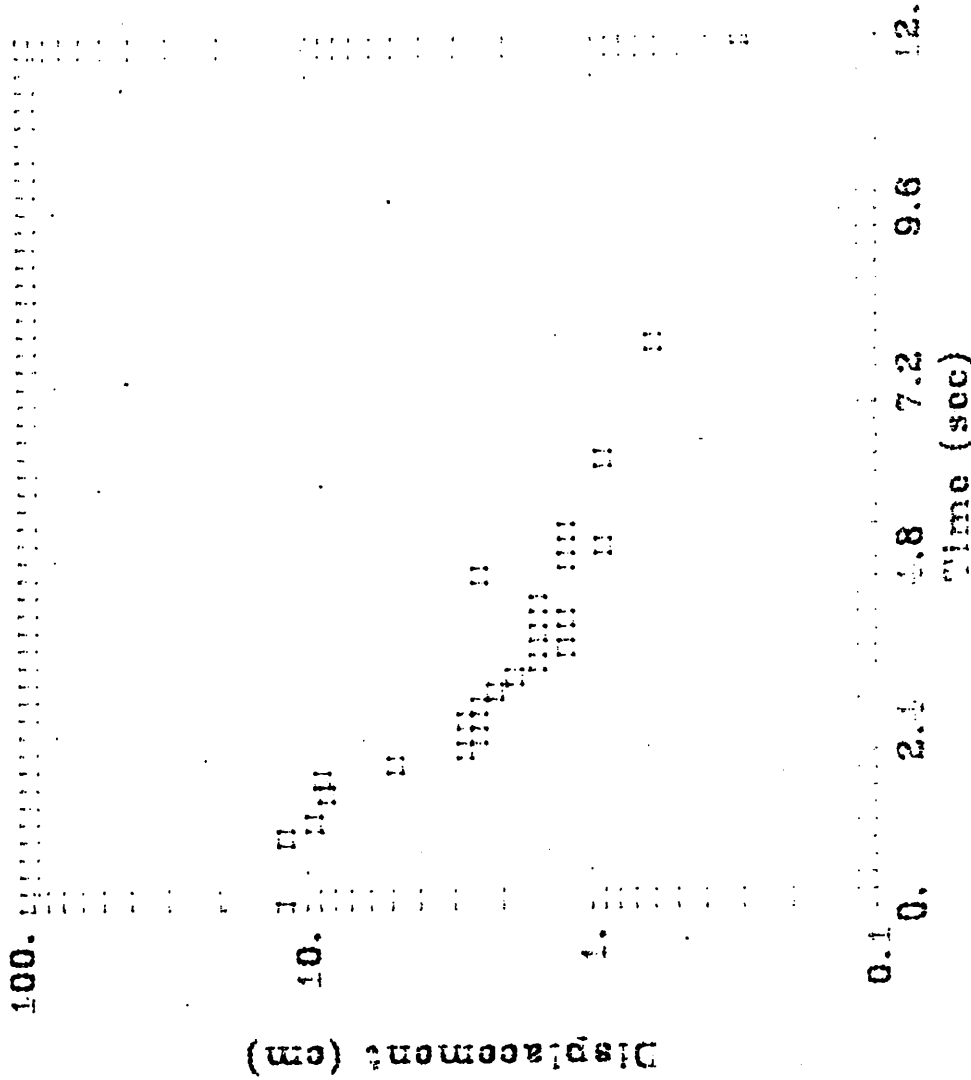
PC = 4.45 cm

rw = 22.86 cm

L = 457.2 cm

b = 582.2 cm

H = 399.3 cm



14:22:23

=====

Data set..... m28f.dat
Data set title..... Dane Co. M-28 Falling Head Slug Test

Knowns and Constants:

No. of data points.....	23
Radius of well casing.....	4.45
Radius of well.....	22.86
Aquifer saturated thickness.....	582.2
Well screen length.....	457.2
Static height of water in well.....	399.3
Log(R_e/R_w).....	1.897
A, B, C.....	2.150, 0.337, 0.000

P

— — — — —

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	3.3042E-002	+/- 3.0437E-003
y0 =	2.6635E+001	+/- 3.2681E+000

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 23
Number of estimated parameters.... 2
Degrees of freedom..... 21
Residual mean..... 0.167
Residual standard deviation..... 0.988
Residual variance..... 0.9761

Resi

Model Residuals:

Time	Observed	Calculated	Residual	Weight
1	11.887	11.917	-0.030225	1
1.2	9.4488	10.147	-0.69797	1
1.6	8.5344	7.3556	1.1788	1
1.8	8.8392	6.2627	2.5765	1
2	4.8768	5.3322	-0.45544	1
2.2	2.7432	4.54	-1.7968	1
2.4	2.4384	3.8655	-1.4271	1
2.6	2.7432	3.2911	-0.54794	1
2.8	2.4384	2.8022	-0.36375	1
3	2.1336	2.3858	-0.25222	1
3.2	1.8288	2.0313	-0.20254	1
3.4	1.524	1.7295	-0.20553	1
3.6	1.2192	1.4726	-0.25336	1
3.8	1.524	1.2538	0.27023	1
4	1.2192	1.0675	0.15171	1
4.2	1.524	0.90889	0.61511	1
4.6	2.4384	0.65887	1.7795	1
4.8	1.2192	0.56098	0.65822	1
5	0.9144	0.47763	0.43677	1
5.2	1.2192	0.40667	0.81253	1
6.2	0.9144	0.18196	0.73244	1
7.8	0.6096	0.050249	0.55935	1
12	0.3048	0.0017147	0.30309	1

RESULTS FROM VISUAL CURVE MATCHING

USUAL MATCH PARAMETER ESTIMATES

Estimate

K = 3.1047E-002

y0 = 1.9439E+001

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>

Dane Co. M-29 Rising Head Slug Test

DATA SET:

m29r.dat
08/21/92

AQUIFER TYPE:

Unconfined

SOLUTION METHOD:

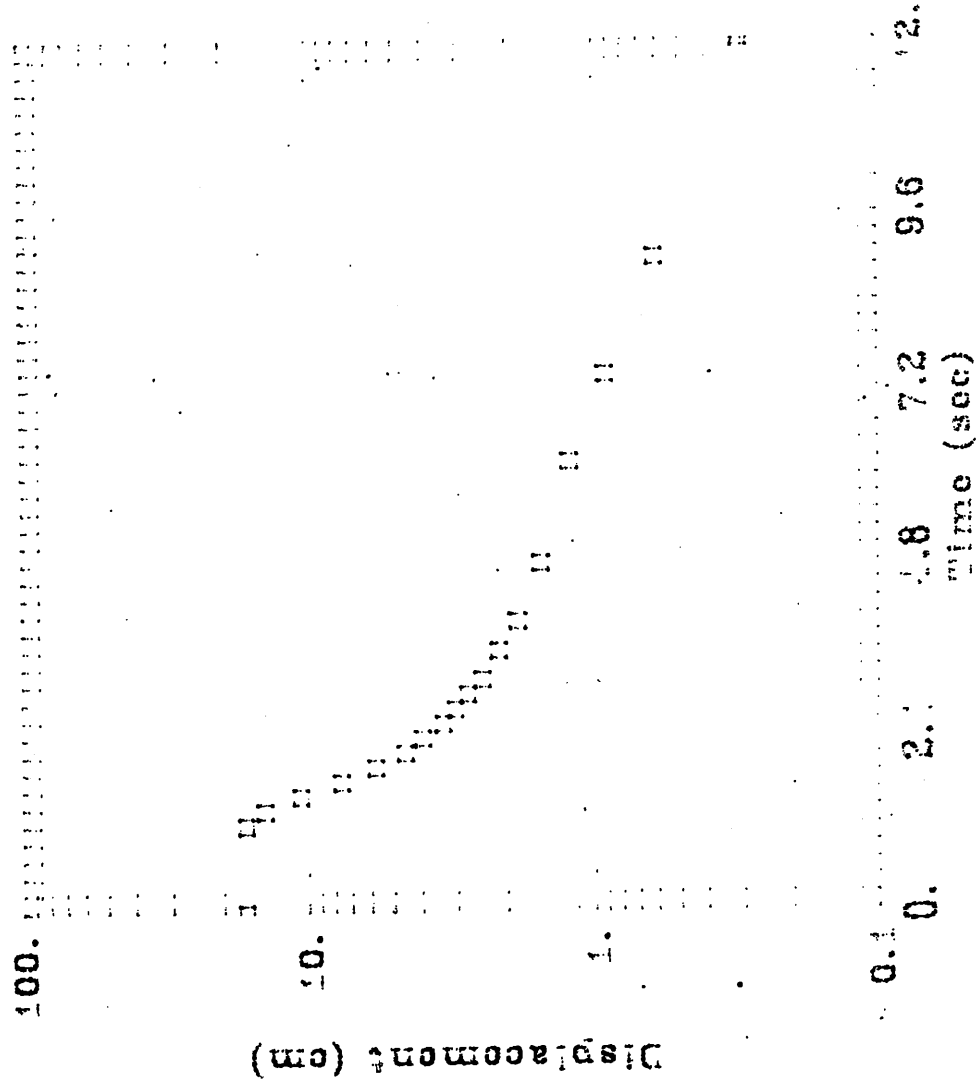
Bouwer-Hise

ESTIMATED PARAMETERS:

K = 0.009436 cm/sec
y0 = 5.085 cm

TEST DATA:

H0 = 16.76 cm
rc = 4.45 cm
rw = 22.86 cm
L = 457.2 cm
b = 431.9 cm
H = 355.7 cm



Model Residuals:

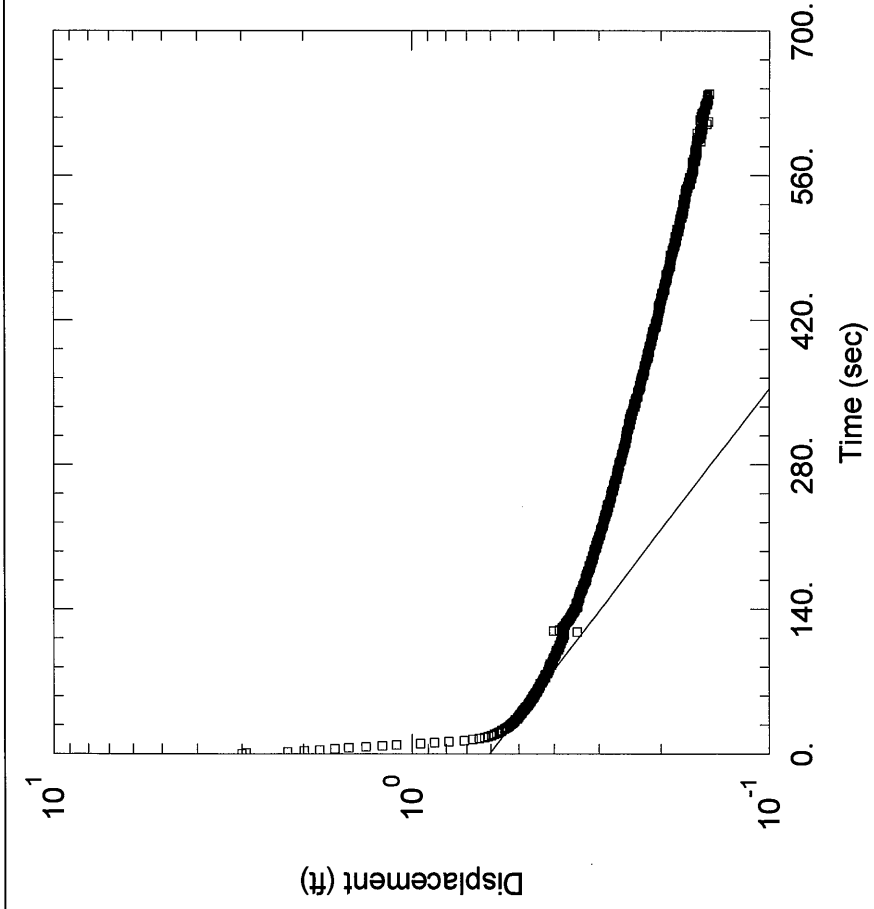
Time	Observed	Calculated	Residual	Weight
1.2	16.764	16.756	0.0082805	1
1.4	14.326	13.345	0.98062	1
1.6	10.668	10.629	0.039474	1
1.8	7.62	8.465	-0.84502	1
2	5.7912	6.7419	-0.95071	1
2.2	4.572	5.3696	-0.79755	1
2.4	3.9624	4.2765	-0.31414	1
2.6	3.3528	3.406	-0.053226	1
2.8	3.048	2.7127	0.33529	1
3	2.7432	2.1605	0.58268	1
3.2	2.4384	1.7207	0.71767	1
3.6	2.1336	1.0915	1.0421	1
4	1.8288	0.69236	1.1364	1
4.8	1.524	0.27858	1.2454	1
6.2	1.2192	0.056629	1.1626	1
7.4	0.9144	0.014453	0.89995	1
9	0.6096	0.00234	0.60726	1
12	0.3048	7.7007E-005	0.30472	1

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

Estimate
K = 9.4362E-003
y0 = 5.0845E+000

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>



WELL TEST ANALYSIS

Data Set: C:\Users\NKeller\Desktop\DC K tests\m301A.aqt
Date: 02/27/13 Time: 13:48:49

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Well: MW301A
Test Date: 1/4/12

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
 $K = 0.0007061$ cm/sec
 $y_0 = 0.605$ ft

AQUIFER DATA

Saturated Thickness: 9.4 ft Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (M301A)

Initial Displacement: 3. ft Static Water Column Height: 7.4 ft
Total Well Penetration Depth: 7.4 ft Screen Length: 7.4 ft
Casing Radius: 0.083 ft Well Radius: 0.33 ft
Gravel Pack Porosity: 0.25

AQTESOLV for Windows

Data Set: C:\Users\NKeller\Desktop\DC K tests\m301A.aqt
Date: 04/12/13
Time: 21:14:19

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Date: 1/4/12
Test Well: MW301A

AQUIFER DATA

Saturated Thickness: 9.4 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: M301A

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 3. ft
Static Water Column Height: 7.4 ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft
Well Skin Radius: 1. ft
Screen Length: 7.4 ft
Total Well Penetration Depth: 7.4 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.18 ft
Gravel Pack Porosity: 0.25

No. of Observations: 639

		<u>Observation Data</u>			
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
04/12/13			1		21:14:19

AQTESOLV for Windows

1.	2.912	214.	0.2966	427.	0.2034
2.	2.218	215.	0.2968	428.	0.2033
3.	1.99	216.	0.296	429.	0.2025
4.	1.805	217.	0.2963	430.	0.2023
5.	1.636	218.	0.2947	431.	0.2021
6.	1.497	219.	0.2943	432.	0.2017
7.	1.341	220.	0.2929	433.	0.2032
8.	1.209	221.	0.2919	434.	0.2028
9.	1.104	222.	0.2914	435.	0.2007
10.	0.9477	223.	0.2918	436.	0.2017
11.	0.8644	224.	0.2912	437.	0.2008
12.	0.7867	225.	0.291	438.	0.2003
13.	0.7109	226.	0.2909	439.	0.2
14.	0.6725	227.	0.2895	440.	0.1997
15.	0.6458	228.	0.2888	441.	0.1991
16.	0.6236	229.	0.2889	442.	0.1998
17.	0.6101	230.	0.2871	443.	0.199
18.	0.5978	231.	0.2883	444.	0.1978
19.	0.5872	232.	0.2871	445.	0.1976
20.	0.5774	233.	0.2861	446.	0.1989
21.	0.57	234.	0.2846	447.	0.1972
22.	0.5622	235.	0.2845	448.	0.1969
23.	0.5584	236.	0.284	449.	0.1958
24.	0.5494	237.	0.2854	450.	0.1949
25.	0.5444	238.	0.2832	451.	0.1963
26.	0.5387	239.	0.2821	452.	0.1958
27.	0.533	240.	0.2831	453.	0.1955
28.	0.5302	241.	0.2836	454.	0.1952
29.	0.5253	242.	0.282	455.	0.1951
30.	0.5214	243.	0.2793	456.	0.1947
31.	0.5166	244.	0.2796	457.	0.1939
32.	0.5139	245.	0.2793	458.	0.1938
33.	0.5123	246.	0.2792	459.	0.1927
34.	0.5057	247.	0.2781	460.	0.1935
35.	0.5044	248.	0.2774	461.	0.1922
36.	0.5013	249.	0.2769	462.	0.1927
37.	0.5006	250.	0.2772	463.	0.1927
38.	0.4972	251.	0.2771	464.	0.1934
39.	0.4927	252.	0.2768	465.	0.1915

04/12/13

2

21:14:19

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
40.	0.4913	253.	0.2754	466.	0.1913
41.	0.4897	254.	0.2765	467.	0.1913
42.	0.4874	255.	0.2737	468.	0.1905
43.	0.4836	256.	0.2741	469.	0.1905
44.	0.4813	257.	0.273	470.	0.19
45.	0.4804	258.	0.2727	471.	0.1896
46.	0.4762	259.	0.2721	472.	0.1885
47.	0.4726	260.	0.2712	473.	0.1894
48.	0.4717	261.	0.2721	474.	0.1892
49.	0.4693	262.	0.2708	475.	0.1882
50.	0.4677	263.	0.2704	476.	0.189
51.	0.4642	264.	0.2703	477.	0.1887
52.	0.464	265.	0.27	478.	0.1875
53.	0.4622	266.	0.2676	479.	0.1879
54.	0.4591	267.	0.2681	480.	0.1875
55.	0.4566	268.	0.2679	481.	0.1873
56.	0.4567	269.	0.2682	482.	0.187
57.	0.4535	270.	0.266	483.	0.1879
58.	0.4521	271.	0.2659	484.	0.186
59.	0.4504	272.	0.267	485.	0.1861
60.	0.4477	273.	0.2653	486.	0.1853
61.	0.4464	274.	0.2646	487.	0.1862
62.	0.4452	275.	0.2656	488.	0.1858
63.	0.4439	276.	0.2642	489.	0.1847
64.	0.4408	277.	0.2636	490.	0.1847
65.	0.4406	278.	0.2632	491.	0.1839
66.	0.4378	279.	0.2626	492.	0.1836
67.	0.4379	280.	0.2636	493.	0.1828
68.	0.4375	281.	0.2623	494.	0.1833
69.	0.4332	282.	0.2624	495.	0.1835
70.	0.4314	283.	0.2608	496.	0.1821
71.	0.4295	284.	0.2605	497.	0.1817
72.	0.4294	285.	0.2588	498.	0.1825
73.	0.4273	286.	0.2587	499.	0.1817
74.	0.4231	287.	0.2595	500.	0.1812
75.	0.4232	288.	0.2588	501.	0.1823
76.	0.4246	289.	0.2578	502.	0.1805
77.	0.4226	290.	0.2581	503.	0.1805

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
78.	0.4173	291.	0.2574	504.	0.1809
79.	0.4167	292.	0.256	505.	0.1802
80.	0.4167	293.	0.2563	506.	0.1788
81.	0.4132	294.	0.2558	507.	0.18
82.	0.414	295.	0.2549	508.	0.1805
83.	0.4118	296.	0.2557	509.	0.1784
84.	0.4112	297.	0.2539	510.	0.1784
85.	0.4122	298.	0.2543	511.	0.1782
86.	0.4067	299.	0.2537	512.	0.1781
87.	0.4106	300.	0.2529	513.	0.1771
88.	0.4043	301.	0.2514	514.	0.1776
89.	0.4048	302.	0.2527	515.	0.1768
90.	0.4016	303.	0.2515	516.	0.1769
91.	0.4035	304.	0.2518	517.	0.1769
92.	0.4027	305.	0.2519	518.	0.1767
93.	0.4017	306.	0.25	519.	0.1759
94.	0.3984	307.	0.2515	520.	0.1752
95.	0.398	308.	0.2515	521.	0.1757
96.	0.3958	309.	0.2495	522.	0.1753
97.	0.3951	310.	0.2493	523.	0.1736
98.	0.3952	311.	0.2494	524.	0.1742
99.	0.3933	312.	0.2505	525.	0.1747
100.	0.3943	313.	0.2491	526.	0.1732
101.	0.3892	314.	0.2478	527.	0.1738
102.	0.3896	315.	0.2474	528.	0.1737
103.	0.3861	316.	0.2471	529.	0.1734
104.	0.3873	317.	0.2472	530.	0.1729
105.	0.3874	318.	0.2462	531.	0.1737
106.	0.3848	319.	0.2441	532.	0.1735
107.	0.3831	320.	0.2473	533.	0.1716
108.	0.3829	321.	0.2458	534.	0.1716
109.	0.3829	322.	0.2448	535.	0.1721
110.	0.3804	323.	0.2444	536.	0.1718
111.	0.3802	324.	0.243	537.	0.1726
112.	0.3768	325.	0.2452	538.	0.1713
113.	0.3761	326.	0.2433	539.	0.1709
114.	0.3779	327.	0.2436	540.	0.1705
115.	0.3745	328.	0.2416	541.	0.1704

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
116.	0.3741	329.	0.2435	542.	0.1703
117.	-0.04656	330.	0.2419	543.	0.171
118.	0.3443	331.	0.2414	544.	0.1702
119.	0.4016	332.	0.24	545.	0.1693
120.	0.3863	333.	0.2404	546.	0.1703
121.	0.3813	334.	0.2394	547.	0.1696
122.	0.3795	335.	0.2396	548.	0.1687
123.	0.3767	336.	0.2363	549.	0.1684
124.	0.3745	337.	0.2382	550.	0.1689
125.	0.372	338.	0.2381	551.	0.1672
126.	0.3715	339.	0.2387	552.	0.1659
127.	0.3698	340.	0.2351	553.	0.1673
128.	0.3669	341.	0.2351	554.	0.1674
129.	0.3657	342.	0.2367	555.	0.1659
130.	0.3632	343.	0.2354	556.	0.166
131.	0.3615	344.	0.2361	557.	0.1645
132.	0.3607	345.	0.2339	558.	0.1662
133.	0.3587	346.	0.2323	559.	0.1644
134.	0.3575	347.	0.2331	560.	0.1645
135.	0.357	348.	0.2328	561.	0.1646
136.	0.3554	349.	0.2322	562.	0.1638
137.	0.353	350.	0.2328	563.	0.1641
138.	0.3516	351.	0.2322	564.	0.1628
139.	0.3496	352.	0.231	565.	0.1624
140.	0.3511	353.	0.2307	566.	0.1629
141.	0.3482	354.	0.2294	567.	0.1636
142.	0.3444	355.	0.2287	568.	0.1628
143.	0.3435	356.	0.228	569.	0.1633
144.	0.3457	357.	0.2297	570.	0.1621
145.	0.347	358.	0.2283	571.	0.1636
146.	0.3456	359.	0.2284	572.	0.1624
147.	0.3434	360.	0.2282	573.	0.1636
148.	0.3427	361.	0.2276	574.	0.1606
149.	0.3409	362.	0.2281	575.	0.1606
150.	0.3421	363.	0.2264	576.	0.1619
151.	0.339	364.	0.2269	577.	0.1604
152.	0.3406	365.	0.2261	578.	0.1603
153.	0.3394	366.	0.2256	579.	0.1598

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
154.	0.3387	367.	0.2237	580.	0.1595
155.	0.3382	368.	0.2252	581.	0.1598
156.	0.3371	369.	0.2231	582.	0.159
157.	0.3367	370.	0.2235	583.	0.1608
158.	0.3349	371.	0.2223	584.	0.1606
159.	0.3345	372.	0.2233	585.	0.1601
160.	0.3332	373.	0.2227	586.	0.1591
161.	0.3318	374.	0.2228	587.	0.1596
162.	0.3324	375.	0.2226	588.	0.1598
163.	0.3322	376.	0.2222	589.	0.1596
164.	0.3302	377.	0.221	590.	0.1589
165.	0.3295	378.	0.2206	591.	0.1587
166.	0.3282	379.	0.2206	592.	0.1588
167.	0.3269	380.	0.2203	593.	0.1549
168.	0.3249	381.	0.2199	594.	0.1591
169.	0.3262	382.	0.2202	595.	0.1574
170.	0.3264	383.	0.2181	596.	0.156
171.	0.3241	384.	0.2185	597.	0.1575
172.	0.325	385.	0.217	598.	0.1553
173.	0.3245	386.	0.2187	599.	0.1559
174.	0.3233	387.	0.2183	600.	0.1537
175.	0.3229	388.	0.2178	601.	0.1585
176.	0.3216	389.	0.2159	602.	0.1556
177.	0.3221	390.	0.2166	603.	0.156
178.	0.3197	391.	0.2167	604.	0.1538
179.	0.319	392.	0.215	605.	0.1529
180.	0.3173	393.	0.2158	606.	0.1535
181.	0.3177	394.	0.2158	607.	0.1532
182.	0.3189	395.	0.2152	608.	0.1551
183.	0.3162	396.	0.214	609.	0.1528
184.	0.3165	397.	0.2136	610.	0.149
185.	0.3151	398.	0.2136	611.	0.1528
186.	0.3141	399.	0.2129	612.	0.1473
187.	0.315	400.	0.2121	613.	0.1547
188.	0.3126	401.	0.2128	614.	0.1556
189.	0.312	402.	0.2129	615.	0.1529
190.	0.3109	403.	0.2117	616.	0.1537
191.	0.3121	404.	0.2114	617.	0.1546

AQTESOLV for Windows

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
192.	0.3109	405.	0.2118	618.	0.1538
193.	0.3094	406.	0.2102	619.	0.1515
194.	0.3091	407.	0.2099	620.	0.154
195.	0.3091	408.	0.2107	621.	0.1526
196.	0.3091	409.	0.2107	622.	0.1516
197.	0.3077	410.	0.2094	623.	0.1513
198.	0.3083	411.	0.2092	624.	0.1502
199.	0.3061	412.	0.2091	625.	0.1503
200.	0.3047	413.	0.2074	626.	0.15
201.	0.3057	414.	0.2067	627.	0.1506
202.	0.3053	415.	0.2068	628.	0.1504
203.	0.3038	416.	0.2064	629.	0.1486
204.	0.303	417.	0.2072	630.	0.1495
205.	0.3035	418.	0.2057	631.	0.1483
206.	0.3021	419.	0.2061	632.	0.148
207.	0.3015	420.	0.2046	633.	0.1478
208.	0.3005	421.	0.2051	634.	0.1484
209.	0.3001	422.	0.2048	635.	0.148
210.	0.2996	423.	0.2039	636.	0.1482
211.	0.2986	424.	0.2035	637.	0.1484
212.	0.2975	425.	0.2039	638.	0.1479
213.	0.2971	426.	0.2037	639.	0.1464

SOLUTION

Slug Test

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

ln(Re/rw): 2.079

VISUAL ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.0007061	cm/sec
y0	0.605	ft

04/12/13

7

21:14:19

$T = K \cdot b = 0.2023 \text{ cm}^2/\text{sec}$ AUTOMATIC ESTIMATION RESULTSEstimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.0004557	2.018E-5	+/- 3.964E-5	22.57	cm/sec
y0	0.681	0.01903	+/- 0.03737	35.8	ft

C.I. is approximate 95% confidence interval for parameter

t-ratio = estimate/std. error

No estimation window

 $T = K \cdot b = 0.1306 \text{ cm}^2/\text{sec}$ Parameter Correlations

	K	y0
K	1.00	0.74
y0	0.74	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 15.51 ft²
Variance 0.02435 ft²
Std. Deviation 0.156 ft
Mean 0.008805 ft
No. of Residuals... 639
No. of Estimates... 2

<u>WELL TEST ANALYSIS</u> Data Set: <u>C:\Users\NKeller\Desktop\DC K tests\m302A.aqt</u> Date: <u>02/27/13</u> Time: <u>13:48:44</u>	<u>PROJECT INFORMATION</u> Company: <u>TRC</u> Client: <u>Dane County Landfill</u> Project: <u>194528.0002.0000</u> Location: <u>Madison, WI</u> Test Well: <u>MW302A</u> Test Date: <u>1/4/12</u> <u>SOLUTION</u> Aquifer Model: <u>Unconfined</u> Solution Method: <u>Bouwer-Rice</u> $K = 0.001114$ cm/sec $y_0 = 0.386$ ft
<u>AQUIFER DATA</u> Saturated Thickness: <u>33.3</u> ft Anisotropy Ratio (K_z/K_r): <u>1.</u>	<u>WELL DATA (M302A)</u> Initial Displacement: <u>2.5</u> ft Total Well Penetration Depth: <u>4.3</u> ft Casing Radius: <u>0.083</u> ft Static Water Column Height: <u>4.3</u> ft Screen Length: <u>4.3</u> ft Well Radius: <u>0.33</u> ft Gravel Pack Porosity: <u>0.25</u>

AQTESOLV for Windows

Data Set: C:\Users\NKeller\Desktop\DC K tests\m302A.aqt
Date: 04/12/13
Time: 21:30:48

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Date: 1/4/12
Test Well: MW302A

AQUIFER DATA

Saturated Thickness: 33.3 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: M302A

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.5 ft
Static Water Column Height: 4.3 ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft
Well Skin Radius: 1. ft
Screen Length: 4.3 ft
Total Well Penetration Depth: 4.3 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.18 ft
Gravel Pack Porosity: 0.25

No. of Observations: 407

<u>Observation Data</u>					
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
04/12/13		1			21:30:48

AQTESOLV for Windows

1.	2.	137.	0.2466	273.	0.2256
2.	1.795	138.	0.2462	274.	0.2268
3.	1.497	139.	0.2459	275.	0.224
4.	1.224	140.	0.2455	276.	0.2233
5.	0.9567	141.	0.2455	277.	0.2254
6.	0.7499	142.	0.2446	278.	0.2237
7.	0.6048	143.	0.2455	279.	0.2237
8.	0.5221	144.	0.247	280.	0.2235
9.	0.4715	145.	0.2453	281.	0.2226
10.	0.4371	146.	0.2452	282.	0.2233
11.	0.4108	147.	0.2449	283.	0.2234
12.	0.3916	148.	0.2459	284.	0.2245
13.	0.3774	149.	0.2452	285.	0.224
14.	0.3675	150.	0.2466	286.	0.2215
15.	0.3628	151.	0.2447	287.	0.2222
16.	0.3541	152.	0.243	288.	0.2215
17.	0.3501	153.	0.2429	289.	0.2232
18.	0.3456	154.	0.2434	290.	0.2231
19.	0.3424	155.	0.2427	291.	0.2219
20.	0.338	156.	0.2409	292.	0.2211
21.	0.3352	157.	0.2409	293.	0.2208
22.	0.3319	158.	0.2426	294.	0.2219
23.	0.33	159.	0.2415	295.	0.221
24.	0.3262	160.	0.2409	296.	0.2218
25.	0.324	161.	0.244	297.	0.2211
26.	0.3241	162.	0.2409	298.	0.2204
27.	0.3194	163.	0.2388	299.	0.2213
28.	0.3173	164.	0.2386	300.	0.2205
29.	0.3161	165.	0.2385	301.	0.2191
30.	0.3134	166.	0.2395	302.	0.2198
31.	0.3124	167.	0.2384	303.	0.2213
32.	0.311	168.	0.2379	304.	0.2219
33.	0.3105	169.	0.2385	305.	0.2199
34.	0.3092	170.	0.2385	306.	0.2218
35.	0.3067	171.	0.2387	307.	0.2217
36.	0.3058	172.	0.2382	308.	0.2196
37.	0.3027	173.	0.2407	309.	0.2209
38.	0.3028	174.	0.2392	310.	0.2199
39.	0.3003	175.	0.2391	311.	0.2182

04/12/13

2

21:30:48

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
40.	0.2995	176.	0.237	312.	0.2203
41.	0.2992	177.	0.2382	313.	0.2215
42.	0.2987	178.	0.2376	314.	0.2186
43.	0.2983	179.	0.2407	315.	0.2193
44.	0.297	180.	0.2396	316.	0.2188
45.	0.2942	181.	0.2373	317.	0.2213
46.	0.2887	182.	0.2374	318.	0.219
47.	0.2951	183.	0.2368	319.	0.2182
48.	0.2909	184.	0.2361	320.	0.2182
49.	0.2919	185.	0.2353	321.	0.2192
50.	0.2892	186.	0.2367	322.	0.2182
51.	0.2877	187.	0.2353	323.	0.2182
52.	0.2887	188.	0.2351	324.	0.2183
53.	0.2875	189.	0.2342	325.	0.2168
54.	0.2841	190.	0.2355	326.	0.2179
55.	0.2685	191.	0.2347	327.	0.2178
56.	0.2481	192.	0.235	328.	0.2166
57.	0.288	193.	0.2342	329.	0.2153
58.	0.301	194.	0.2347	330.	0.2175
59.	0.2928	195.	0.2362	331.	0.2163
60.	0.2904	196.	0.2354	332.	0.2173
61.	0.2898	197.	0.2346	333.	0.2175
62.	0.285	198.	0.2349	334.	0.217
63.	0.2854	199.	0.2336	335.	0.2166
64.	0.2854	200.	0.234	336.	0.2175
65.	0.2855	201.	0.2344	337.	0.2189
66.	0.2855	202.	0.2344	338.	0.2185
67.	0.2813	203.	0.2336	339.	0.2157
68.	0.28	204.	0.2344	340.	0.216
69.	0.2803	205.	0.2322	341.	0.2149
70.	0.2815	206.	0.2339	342.	0.2157
71.	0.2784	207.	0.2326	343.	0.2156
72.	0.2792	208.	0.2326	344.	0.2176
73.	0.2766	209.	0.233	345.	0.2185
74.	0.2734	210.	0.2308	346.	0.216
75.	0.2754	211.	0.2319	347.	0.2132
76.	0.2734	212.	0.2356	348.	0.215
77.	0.2714	213.	0.2323	349.	0.2168

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
78.	0.2728	214.	0.2306	350.	0.2165
79.	0.271	215.	0.2305	351.	0.216
80.	0.2715	216.	0.2301	352.	0.2144
81.	0.2693	217.	0.2315	353.	0.2143
82.	0.269	218.	0.2311	354.	0.2142
83.	0.268	219.	0.2307	355.	0.2138
84.	0.266	220.	0.231	356.	0.2143
85.	0.2667	221.	0.2334	357.	0.2152
86.	0.2667	222.	0.2312	358.	0.2079
87.	0.2671	223.	0.23	359.	0.2166
88.	0.2654	224.	0.2294	360.	0.2144
89.	0.2632	225.	0.2283	361.	0.2141
90.	0.2645	226.	0.2292	362.	0.2129
91.	0.264	227.	0.2287	363.	0.2122
92.	0.2625	228.	0.2299	364.	0.2121
93.	0.262	229.	0.23	365.	0.2151
94.	0.2625	230.	0.2288	366.	0.2152
95.	0.2648	231.	0.2297	367.	0.2133
96.	0.2605	232.	0.2292	368.	0.2144
97.	0.2624	233.	0.2315	369.	0.2151
98.	0.2614	234.	0.2302	370.	0.2109
99.	0.2605	235.	0.2293	371.	0.2173
100.	0.26	236.	0.2294	372.	0.218
101.	0.2577	237.	0.2282	373.	0.2119
102.	0.2554	238.	0.2291	374.	0.2112
103.	0.259	239.	0.2297	375.	0.2131
104.	0.2563	240.	0.228	376.	0.2137
105.	0.2576	241.	0.2294	377.	0.2138
106.	0.2569	242.	0.229	378.	0.2118
107.	0.2591	243.	0.2291	379.	0.2109
108.	0.2575	244.	0.2275	380.	0.2119
109.	0.2552	245.	0.2285	381.	0.2117
110.	0.2548	246.	0.2284	382.	0.209
111.	0.2544	247.	0.2246	383.	0.2115
112.	0.2551	248.	0.2289	384.	0.212
113.	0.256	249.	0.2283	385.	0.2104
114.	0.2541	250.	0.2271	386.	0.2115
115.	0.2544	251.	0.2263	387.	0.2133

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
116.	0.2524	252.	0.2269	388.	0.212
117.	0.2536	253.	0.2277	389.	0.2159
118.	0.2535	254.	0.2248	390.	0.1988
119.	0.2532	255.	0.2267	391.	0.2155
120.	0.2524	256.	0.2257	392.	0.2238
121.	0.2516	257.	0.2273	393.	0.212
122.	0.2524	258.	0.2269	394.	0.2184
123.	0.2506	259.	0.2281	395.	0.2195
124.	0.2511	260.	0.2246	396.	0.2153
125.	0.2515	261.	0.2241	397.	0.2136
126.	0.25	262.	0.2263	398.	0.2128
127.	0.2499	263.	0.2255	399.	0.2143
128.	0.2486	264.	0.2251	400.	0.2101
129.	0.249	265.	0.224	401.	0.2116
130.	0.2486	266.	0.225	402.	0.212
131.	0.2501	267.	0.225	403.	0.2105
132.	0.2468	268.	0.2268	404.	0.2107
133.	0.2472	269.	0.2313	405.	0.2064
134.	0.2477	270.	0.2261	406.	0.2138
135.	0.2498	271.	0.2275	407.	0.1958
136.	0.2472	272.	0.2242		

SOLUTION

Slug Test

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

ln(Re/rw): 1.475

VISUAL ESTIMATION RESULTSEstimated Parameters

Parameter	Estimate	
K	0.001114	cm/sec
y0	0.386	ft

$$T = K \cdot b = 1.131 \text{ cm}^2/\text{sec}$$

04/12/13

5

21:30:48

AUTOMATIC ESTIMATION RESULTSEstimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.0004082	3.959E-5	+/- 7.783E-5	10.31	cm/sec
y0	0.4106	0.01698	+/- 0.03338	24.18	ft

C.I. is approximate 95% confidence interval for parameter

t-ratio = estimate/std. error

No estimation window

$T = K \cdot b = 0.4143 \text{ cm}^2/\text{sec}$

Parameter Correlations

	K	y0
K	1.00	0.80
y0	0.80	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 7.571 ft²
Variance 0.01869 ft²
Std. Deviation 0.1367 ft
Mean 0.001793 ft
No. of Residuals... 407
No. of Estimates... 2

WELL TEST ANALYSIS

Data Set: C:\Users\NKeller\Desktop\DC K tests\m302B.aqt

Date: 02/27/13

Time: 13:48:39

PROJECT INFORMATION

Company: TRC

Client: Dane County Landfill

Project: 194528.0002.0000

Location: Madison, WI

Test Well: MW302B

Test Date: 1/4/12

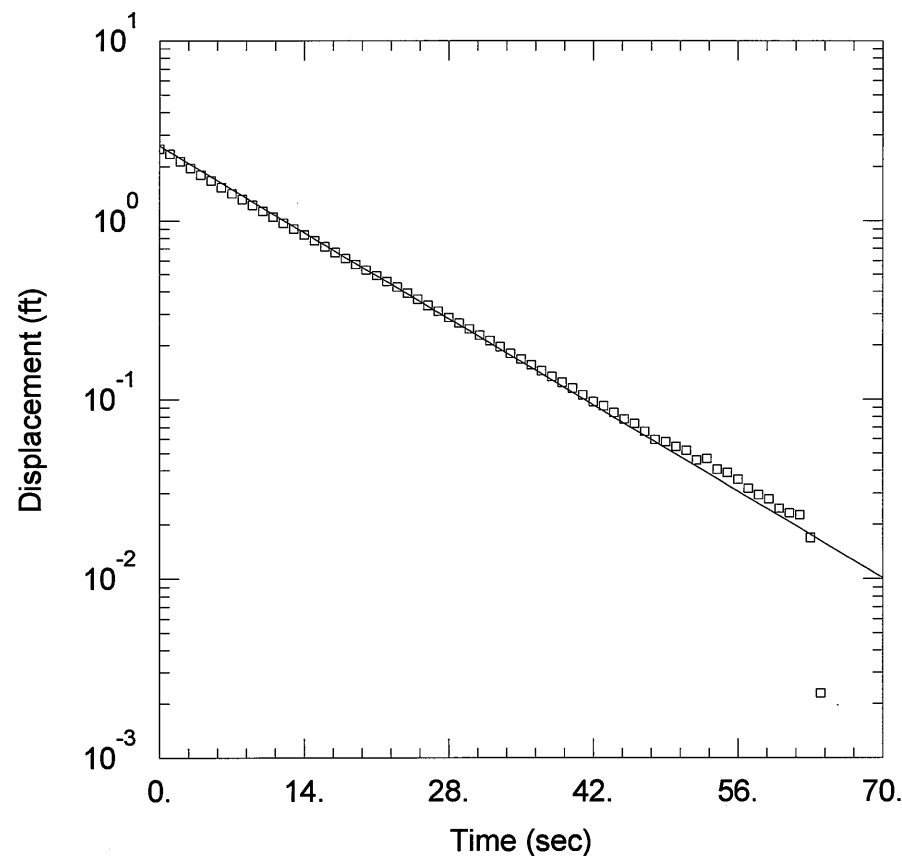
SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 0.004221 cm/sec

y0 = 2.603 ft



AQUIFER DATA

Saturated Thickness: 43.25 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (M302B)

Initial Displacement: 2.5 ft

Total Well Penetration Depth: 41.25 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 41.25 ft

Screen Length: 5. ft

Well Radius: 0.33 ft

AQTESOLV for Windows

Data Set: C:\Users\NKeller\Desktop\DC K tests\m302B.aqt
Date: 04/12/13
Time: 21:30:16

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Date: 1/4/12
Test Well: MW302B

AQUIFER DATA

Saturated Thickness: 43.25 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: M302B

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.5 ft
Static Water Column Height: 41.25 ft
Casing Radius: 0.0833 ft
Well Radius: 0.33 ft
Well Skin Radius: 1. ft
Screen Length: 5. ft
Total Well Penetration Depth: 41.25 ft

No. of Observations: 64

<u>Observation Data</u>					
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
1.	2.34	23.	0.4229	45.	0.0777
2.	2.135	24.	0.3912	46.	0.0735

04/12/13

1

21:30:16

AQTESOLV for Windows

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
3.	1.956	25.	0.3623	47.	0.0664
4.	1.797	26.	0.3351	48.	0.0596
5.	1.667	27.	0.311	49.	0.0579
6.	1.533	28.	0.2872	50.	0.0544
7.	1.419	29.	0.2664	51.	0.0518
8.	1.315	30.	0.2461	52.	0.0457
9.	1.222	31.	0.2276	53.	0.0466
10.	1.132	32.	0.2117	54.	0.0405
11.	1.049	33.	0.1964	55.	0.039
12.	0.971	34.	0.1803	56.	0.0357
13.	0.9018	35.	0.1673	57.	0.0319
14.	0.8362	36.	0.1552	58.	0.0294
15.	0.7745	37.	0.1434	59.	0.0278
16.	0.7181	38.	0.1337	60.	0.0246
17.	0.666	39.	0.124	61.	0.0231
18.	0.6174	40.	0.1151	62.	0.0226
19.	0.5715	41.	0.1055	63.	0.0169
20.	0.5307	42.	0.0971	64.	0.0023
21.	0.4929	43.	0.092		
22.	0.4551	44.	0.0845		

SOLUTION

Slug Test

Aquifer Model: Confined

Solution Method: Bouwer-Rice

ln(Re/rw): 2.517

VISUAL ESTIMATION RESULTS

Estimated Parameters

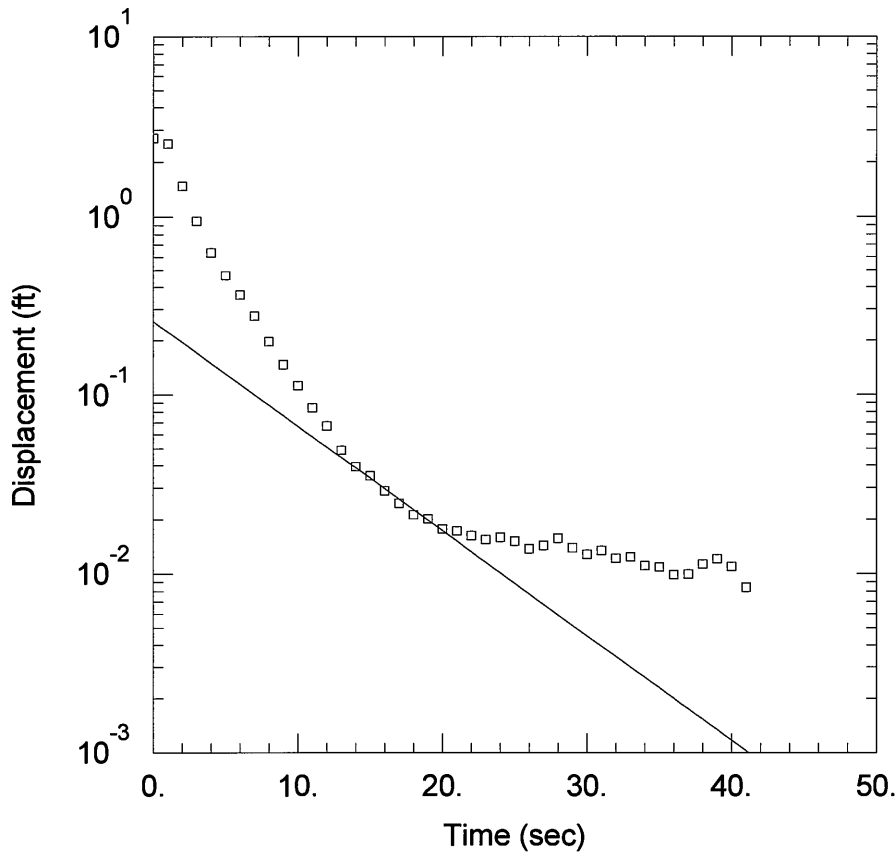
Parameter	Estimate	
K	0.004221	cm/sec
y0	2.603	ft

$T = K \cdot b = 5.564 \text{ cm}^2/\text{sec}$

04/12/13

2

21:30:17



WELL TEST ANALYSIS

Data Set: C:\Users\NKeller\Desktop\DC K tests\m303A.aqt

Date: 02/27/13

Time: 13:48:34

PROJECT INFORMATION

Company: TRC

Client: Dane County Landfill

Project: 194528.0002.0000

Location: Madison, WI

Test Well: MW303A

Test Date: 1/4/12

SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 0.004298 cm/sec

y0 = 0.2568 ft

AQUIFER DATA

Saturated Thickness: 9.3 ft

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (M303A)

Initial Displacement: 2.7 ft

Total Well Penetration Depth: 6.3 ft

Casing Radius: 0.083 ft

Static Water Column Height: 6.3 ft

Screen Length: 6.3 ft

Well Radius: 0.33 ft

Gravel Pack Porosity: 0.25

AQTESOLV for Windows

Data Set: C:\Users\NKeller\Desktop\DC K tests\m303A.aqt
Date: 04/12/13
Time: 21:28:57

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Date: 1/4/12
Test Well: MW303A

AQUIFER DATA

Saturated Thickness: 9.3 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: M303A

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.7 ft
Static Water Column Height: 6.3 ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft
Well Skin Radius: 1. ft
Screen Length: 6.3 ft
Total Well Penetration Depth: 6.3 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.083 ft
Gravel Pack Porosity: 0.25

No. of Observations: 41

<u>Observation Data</u>					
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
04/12/13		1			21:28:57

AQTESOLV for Windows

1.	2.521	15.	0.03498	29.	0.01396
2.	1.481	16.	0.02892	30.	0.01283
3.	0.9477	17.	0.02463	31.	0.01346
4.	0.6353	18.	0.02121	32.	0.01219
5.	0.4664	19.	0.02015	33.	0.01243
6.	0.3617	20.	0.01765	34.	0.0111
7.	0.2752	21.	0.01726	35.	0.01091
8.	0.1976	22.	0.01623	36.	0.00989
9.	0.1474	23.	0.01545	37.	0.00996
10.	0.1122	24.	0.01587	38.	0.01129
11.	0.08488	25.	0.0151	39.	0.01214
12.	0.06699	26.	0.01369	40.	0.01097
13.	0.04903	27.	0.01432	41.	0.0084
14.	0.03938	28.	0.01569		

SOLUTION

Slug Test

Aquifer Model: Confined

Solution Method: Bouwer-Rice

ln(Re/rw): 1.914

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.004298	cm/sec
y0	0.2568	ft

$$T = K \cdot b = 1.218 \text{ cm}^2/\text{sec}$$

04/12/13

2

21:28:57

WELL TEST ANALYSIS

Data Set: C:\Users\NKeller\Desktop\DC K tests\m304A.aqt

Date: 02/27/13

Time: 13:48:26

PROJECT INFORMATION

Company: TRC

Client: Dane County Landfill

Project: 194528.0002.0000

Location: Madison, WI

Test Well: MW304A

Test Date: 1/4/12

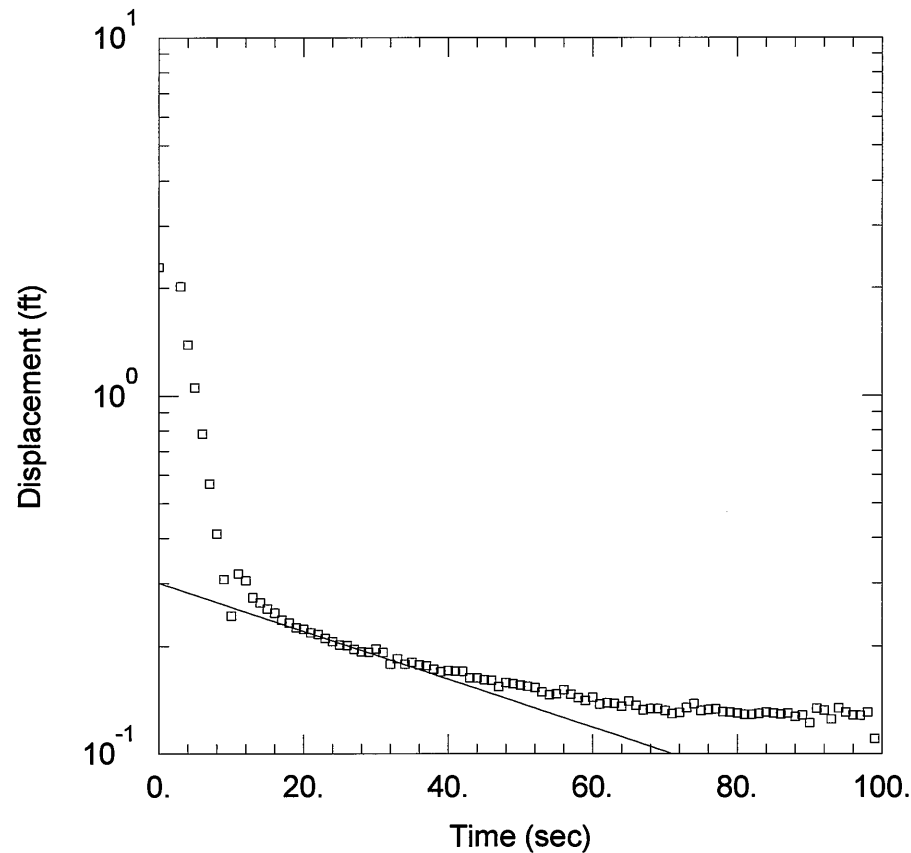
SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 0.0009031 cm/sec

y0 = 0.3003 ft



AQUIFER DATA

Saturated Thickness: 3.5 ft

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (M304A)

Initial Displacement: 2.3 ft

Total Well Penetration Depth: 1.5 ft

Casing Radius: 0.083 ft

Static Water Column Height: 1.5 ft

Screen Length: 1.5 ft

Well Radius: 0.33 ft

Gravel Pack Porosity: 0.25

AQTESOLV for Windows

Data Set: C:\Users\NKeller\Desktop\DC K tests\m304A.aqt
Date: 04/12/13
Time: 21:26:10

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Date: 1/4/12
Test Well: MW304A

AQUIFER DATA

Saturated Thickness: 3.5 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: M304A

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.3 ft
Static Water Column Height: 1.5 ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft
Well Skin Radius: 1. ft
Screen Length: 1.5 ft
Total Well Penetration Depth: 1.5 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.083 ft
Gravel Pack Porosity: 0.25

No. of Observations: 97

Observation Data					
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
04/12/13		1			21:26:10

AQTESOLV for Windows

3.	2.018	36.	0.177	69.	0.1336
4.	1.388	37.	0.1761	70.	0.1318
5.	1.054	38.	0.1723	71.	0.1292
6.	0.7814	39.	0.1694	72.	0.1303
7.	0.5669	40.	0.1707	73.	0.1343
8.	0.4118	41.	0.1702	74.	0.1378
9.	0.3082	42.	0.1699	75.	0.1319
10.	0.2431	43.	0.163	76.	0.1327
11.	0.3194	44.	0.1625	77.	0.1334
12.	0.3052	45.	0.1609	78.	0.1308
13.	0.2736	46.	0.1603	79.	0.1307
14.	0.2648	47.	0.1539	80.	0.1298
15.	0.2546	48.	0.1579	81.	0.1288
16.	0.2481	49.	0.1568	82.	0.1288
17.	0.237	50.	0.1555	83.	0.1296
18.	0.2327	51.	0.1543	84.	0.1306
19.	0.2258	52.	0.1528	85.	0.1297
20.	0.2232	53.	0.1487	86.	0.129
21.	0.2181	54.	0.146	87.	0.1299
22.	0.2161	55.	0.1467	88.	0.127
23.	0.2106	56.	0.1508	89.	0.1282
24.	0.206	57.	0.1466	90.	0.1219
25.	0.2014	58.	0.1434	91.	0.1338
26.	0.2007	59.	0.1405	92.	0.1322
27.	0.1958	60.	0.1436	93.	0.125
28.	0.1928	61.	0.1374	94.	0.1342
29.	0.1923	62.	0.1386	95.	0.1306
30.	0.1964	63.	0.138	96.	0.1283
31.	0.1919	64.	0.1356	97.	0.1281
32.	0.178	65.	0.1399	98.	0.1305
33.	0.1844	66.	0.1365	99.	0.1099
34.	0.1778	67.	0.1324		
35.	0.1802	68.	0.1336		

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice

04/12/13

2

21:26:10

AQTESOLV for Windows

ln(Re/rw): 0.8324

VISUAL ESTIMATION RESULTS

Estimated Parameters

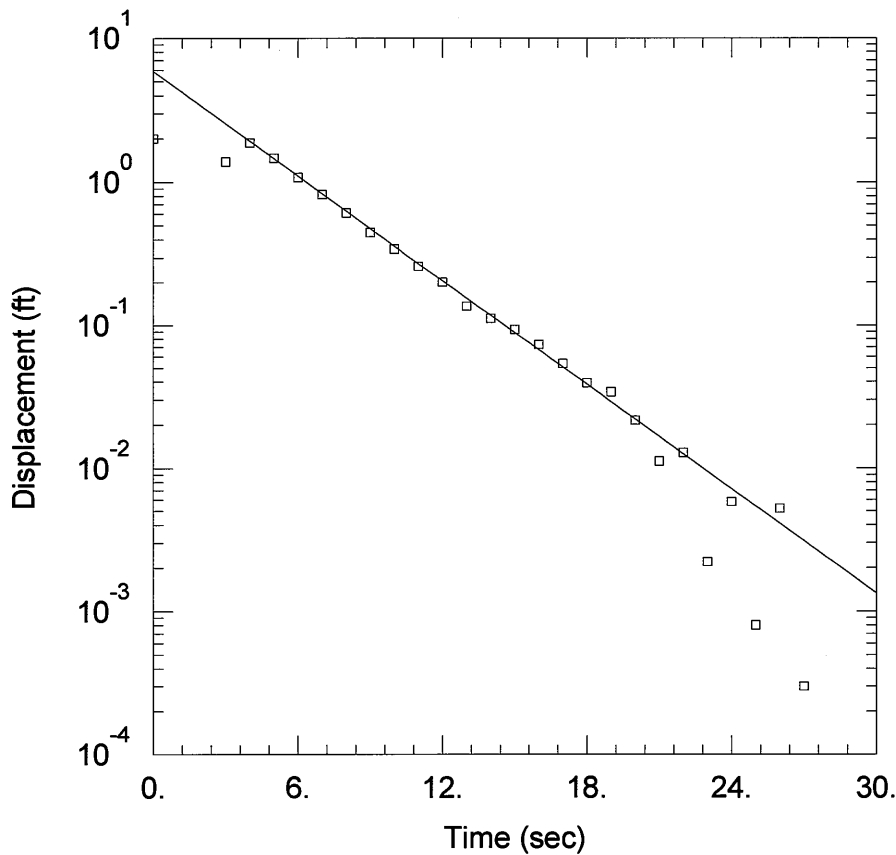
<u>Parameter</u>	<u>Estimate</u>	
K	0.0009031	cm/sec
y0	0.3003	ft

$T = K \cdot b = 0.09634 \text{ cm}^2/\text{sec}$

04/12/13

3

21:26:10



WELL TEST ANALYSIS

Data Set: C:\Users\NKeller\Desktop\DC K tests\m304B.aqt

Date: 02/27/13

Time: 13:48:20

PROJECT INFORMATION

Company: TRC

Client: Dane County Landfill

Project: 194528.0002.0000

Location: Madison, WI

Test Well: MW304B

Test Date: 1/4/12

SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 0.03735 cm/sec

y0 = 5.895 ft

AQUIFER DATA

Saturated Thickness: 35 ft

Anisotropy Ratio (Kz/Kr): 1

WELL DATA (M304B)

Initial Displacement: 2 ft

Total Well Penetration Depth: 39.38 ft

Casing Radius: 0.083 ft

Static Water Column Height: 35 ft

Screen Length: 2 ft

Well Radius: 0.33 ft

AQTESOLV for Windows

Data Set: C:\Users\NKeller\Desktop\DC K tests\m304B.aqt
Date: 04/12/13
Time: 21:25:17

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Date: 1/4/12
Test Well: MW304B

AQUIFER DATA

Saturated Thickness: 35. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: M304B

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2. ft
Static Water Column Height: 35. ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft
Well Skin Radius: 1. ft
Screen Length: 2. ft
Total Well Penetration Depth: 39.38 ft

No. of Observations: 25

Observation Data					
Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
3.	1.384	12.	0.2009	21.	0.0112
4.	1.871	13.	0.1366	22.	0.0128

04/12/13

1

21:25:17

AQTESOLV for Windows

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
5.	1.467	14.	0.1118	23.	0.0022
6.	1.08	15.	0.0935	24.	0.0058
7.	0.8194	16.	0.0731	25.	0.0008
8.	0.6103	17.	0.0537	26.	0.0052
9.	0.4463	18.	0.0391	27.	0.0003
10.	0.3445	19.	0.0339		
11.	0.2613	20.	0.0215		

SOLUTION

Slug Test

Aquifer Model: Confined

Solution Method: Bouwer-Rice

ln(Re/rw): 2.544

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.03735	cm/sec
y0	5.895	ft

$$T = K \cdot b = 39.84 \text{ cm}^2/\text{sec}$$

04/12/13

2

21:25:17

WELL TEST ANALYSIS

Data Set: C:\Users\NKeller\Desktop\DC K tests\m305A.aqt

Date: 02/27/13

Time: 13:48:15

PROJECT INFORMATION

Company: TRC

Client: Dane County Landfill

Project: 194528.0002.0000

Location: Madison, WI

Test Well: MW305A

Test Date: 1/4/12

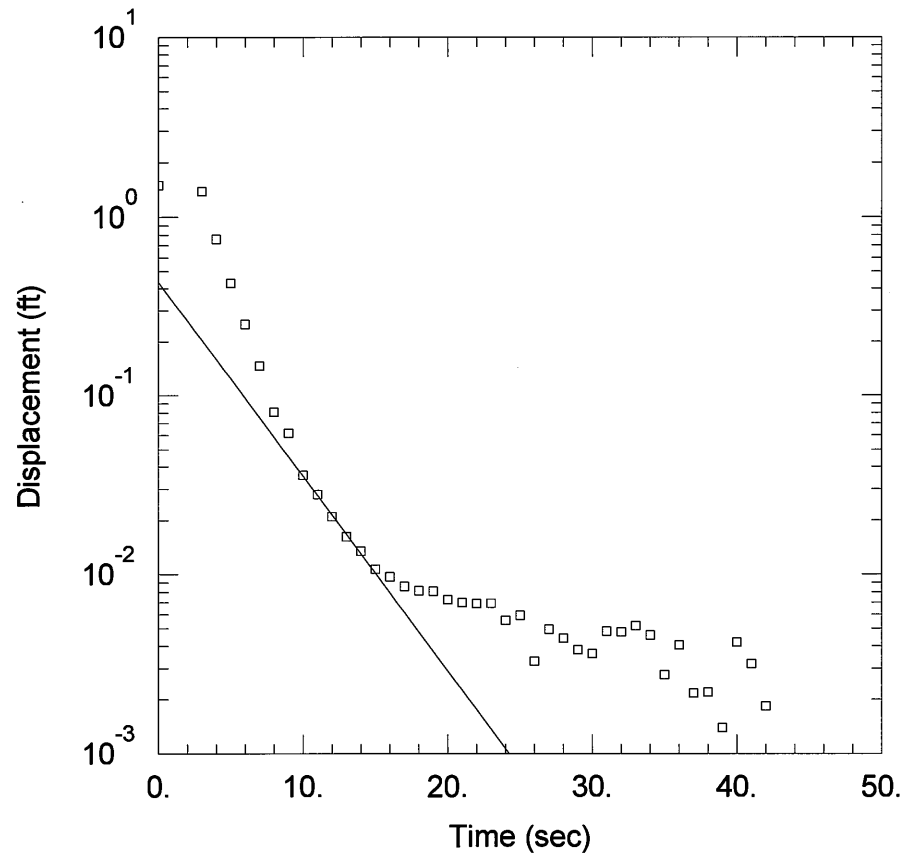
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.04219 cm/sec

y0 = 0.4345 ft



AQUIFER DATA

Saturated Thickness: 7.2 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (M305A)

Initial Displacement: 1.5 ft

Total Well Penetration Depth: 5.2 ft

Casing Radius: 0.083 ft

Static Water Column Height: 5.2 ft

Screen Length: 5.2 ft

Well Radius: 0.33 ft

Gravel Pack Porosity: 0.25

AQTESOLV for Windows

Data Set: C:\Users\NKeller\Desktop\DC K tests\m305A.aqt
Date: 04/12/13
Time: 21:24:42

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Date: 1/4/12
Test Well: MW305A

AQUIFER DATA

Saturated Thickness: 7.2 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: M305A

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 1.5 ft
Static Water Column Height: 5.2 ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft
Well Skin Radius: 1. ft
Screen Length: 5.2 ft
Total Well Penetration Depth: 5.2 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.18 ft
Gravel Pack Porosity: 0.25

No. of Observations: 40

Observation Data					
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
04/12/13		1			21:24:42

AQTESOLV for Windows

3.	1.388	17.	0.00856	31.	0.00482
4.	0.7565	18.	0.0081	32.	0.00478
5.	0.4291	19.	0.00806	33.	0.00517
6.	0.2511	20.	0.00725	34.	0.0046
7.	0.1457	21.	0.007	35.	0.00277
8.	0.08075	22.	0.00693	36.	0.00404
9.	0.06159	23.	0.00692	37.	0.00217
10.	0.03581	24.	0.00555	38.	0.0022
11.	0.02791	25.	0.00593	39.	0.00139
12.	0.02097	26.	0.00329	40.	0.0042
13.	0.01622	27.	0.00494	41.	0.00318
14.	0.01347	28.	0.00441	42.	0.00184
15.	0.01068	29.	0.00381		
16.	0.00966	30.	0.00363		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 1.775

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.04219	cm/sec
y0	0.4345	ft

$T = K \cdot b = 9.258 \text{ cm}^2/\text{sec}$

WELL TEST ANALYSIS

Data Set: C:\Users\NKeller\Desktop\DC K tests\m305B.aqt

Date: 02/27/13

Time: 13:47:54

PROJECT INFORMATION

Company: TRC

Client: Dane County Landfill

Project: 194528.0002.0000

Location: Madison, WI

Test Well: MW305B

Test Date: 1/4/12

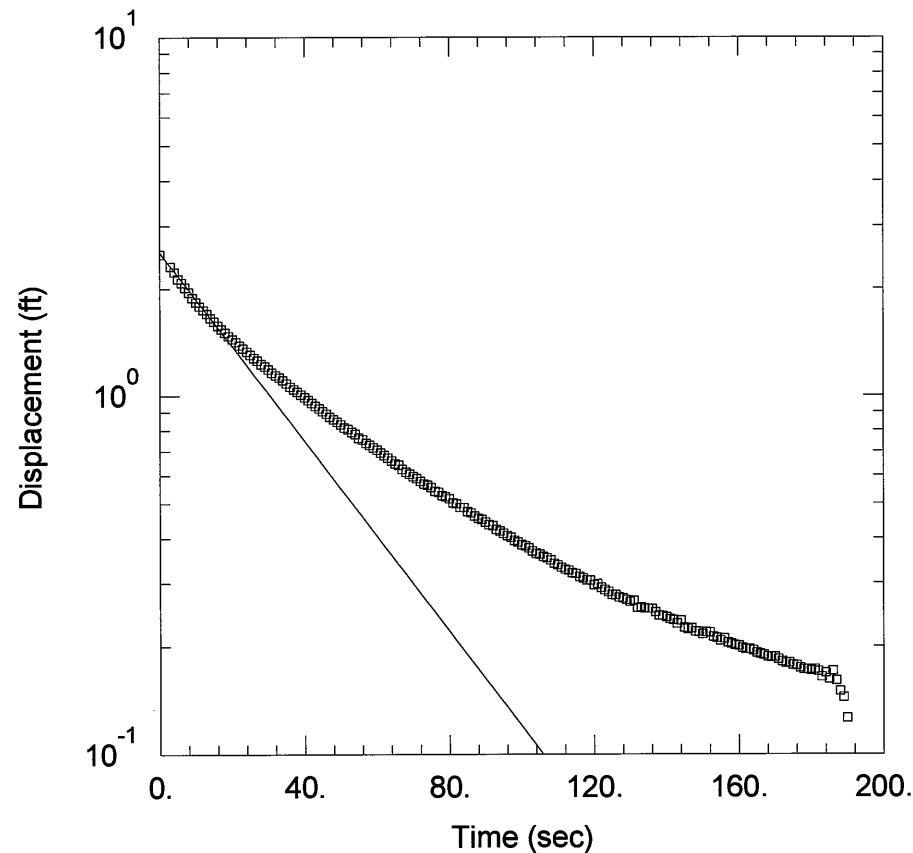
SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 0.001541 cm/sec

y0 = 2.534 ft



AQUIFER DATA

Saturated Thickness: 41.5 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (M305B)

Initial Displacement: 2.5 ft

Total Well Penetration Depth: 37.5 ft

Casing Radius: 0.083 ft

Static Water Column Height: 37.5 ft

Screen Length: 5. ft

Well Radius: 0.33 ft

AQTESOLV for Windows

Data Set: C:\Users\NKeller\Desktop\DC K tests\m305B.aqt
Date: 04/12/13
Time: 21:23:41

PROJECT INFORMATION

Company: TRC
Client: Dane County Landfill
Project: 194528.0002.0000
Location: Madison, WI
Test Date: 1/4/12
Test Well: MW305B

AQUIFER DATA

Saturated Thickness: 41.5 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: M305B

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.5 ft
Static Water Column Height: 37.5 ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft
Well Skin Radius: 1. ft
Screen Length: 5. ft
Total Well Penetration Depth: 37.5 ft

No. of Observations: 188

<u>Observation Data</u>					
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
3.	2.313	66.	0.6402	129.	0.2694
4.	2.228	67.	0.6237	130.	0.2664

04/12/13

1

21:23:41

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
5.	2.13	68.	0.6129	131.	0.2684
6.	2.08	69.	0.6055	132.	0.2557
7.	2.015	70.	0.5951	133.	0.2571
8.	1.953	71.	0.5881	134.	0.2552
9.	1.887	72.	0.5772	135.	0.2546
10.	1.836	73.	0.5674	136.	0.2543
11.	1.788	74.	0.5634	137.	0.2487
12.	1.742	75.	0.5555	138.	0.2434
13.	1.701	76.	0.5422	139.	0.2426
14.	1.654	77.	0.5386	140.	0.2407
15.	1.614	78.	0.5269	141.	0.2381
16.	1.573	79.	0.5217	142.	0.2365
17.	1.539	80.	0.5155	143.	0.2313
18.	1.505	81.	0.502	144.	0.2355
19.	1.47	82.	0.4989	145.	0.2251
20.	1.441	83.	0.4869	146.	0.2235
21.	1.413	84.	0.4868	147.	0.2241
22.	1.384	85.	0.4738	148.	0.2197
23.	1.355	86.	0.4703	149.	0.2192
24.	1.327	87.	0.4604	150.	0.2161
25.	1.3	88.	0.454	151.	0.219
26.	1.276	89.	0.4509	152.	0.2182
27.	1.253	90.	0.4429	153.	0.2127
28.	1.226	91.	0.436	154.	0.2109
29.	1.208	92.	0.4333	155.	0.2073
30.	1.187	93.	0.4225	156.	0.2099
31.	1.159	94.	0.4184	157.	0.2048
32.	1.14	95.	0.4123	158.	0.2032
33.	1.125	96.	0.4065	159.	0.2014
34.	1.104	97.	0.4025	160.	0.2009
35.	1.083	98.	0.3945	161.	0.1977
36.	1.057	99.	0.3905	162.	0.1963
37.	1.041	100.	0.3839	163.	0.1962
38.	1.023	101.	0.381	164.	0.1947
39.	1.004	102.	0.376	165.	0.1918
40.	0.9881	103.	0.3687	166.	0.1903
41.	0.9705	104.	0.3638	167.	0.1892
42.	0.954	105.	0.3615	168.	0.1874

AQTESOLV for Windows

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
43.	0.935	106.	0.3558	169.	0.1866
44.	0.9213	107.	0.3534	170.	0.1869
45.	0.9039	108.	0.3483	171.	0.1842
46.	0.889	109.	0.3407	172.	0.1817
47.	0.8717	110.	0.337	173.	0.1798
48.	0.8575	111.	0.3312	174.	0.1803
49.	0.8436	112.	0.3276	175.	0.1774
50.	0.8291	113.	0.3257	176.	0.1769
51.	0.8123	114.	0.3201	177.	0.1744
52.	0.8038	115.	0.3182	178.	0.1726
53.	0.7899	116.	0.3124	179.	0.1724
54.	0.7798	117.	0.309	180.	0.1713
55.	0.7604	118.	0.3057	181.	0.1726
56.	0.7524	119.	0.3048	182.	0.1704
57.	0.7362	120.	0.2962	183.	0.1642
58.	0.7272	121.	0.2983	184.	0.1686
59.	0.7163	122.	0.2915	185.	0.1618
60.	0.7047	123.	0.2874	186.	0.1707
61.	0.6922	124.	0.2839	187.	0.1604
62.	0.6817	125.	0.2787	188.	0.1498
63.	0.6703	126.	0.2779	189.	0.1437
64.	0.6577	127.	0.2742	190.	0.1259
65.	0.6455	128.	0.2721		

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.405

VISUAL ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.001541	cm/sec
y0	2.534	ft

04/12/13

3

21:23:41

$T = K \cdot b = 1.949 \text{ cm}^2/\text{sec}$



PROJECT/PROPOSAL/LOCATION NAME: <u>Dane County LF Expansion</u>		PROJECT/PROPOSAL NUMBER
SUBJECT: <u>Horizontal Gradient Calculation</u>		
PREPARED BY: <u>N. Keller</u>	DATE: <u>4/16/13</u>	FINAL ☐
CHECKED BY: <u>A. Sellwood</u>	DATE: <u>4/16/13</u>	REVISION ☐

Calculate Horizontal Gradients at High and Low Water Levels:

1. High Water Table (June 2008) ✓

$$\frac{\Delta h}{\Delta d} = \frac{865.68 \text{ ft (M-9A)} - 859.39 \text{ ft (M-5A)}}{869 \text{ ft}} \quad \text{M-9A} \rightarrow \text{M-5A}$$

$$= 0.007 \quad \checkmark$$

$$\frac{\Delta h}{\Delta d} = \frac{874 \text{ ft (M-17A)} - 866.19 \text{ ft (M-29)}}{1109 \text{ ft}} \quad \text{M-17A} \rightarrow \text{M-29}$$

$$= 0.007 \quad \checkmark$$

$$\frac{\Delta h}{\Delta d} = \frac{866.19 \text{ ft (M-29)} - 865.95 \text{ ft (M-28)}}{723 \text{ ft}} \quad \text{M-29} \rightarrow \text{M-28}$$

$$= 0.0003 \quad \checkmark$$

2. Low Water Table (December 2012) ✓

$$\frac{\Delta h}{\Delta d} = \frac{859.08 \text{ ft (M-9A)} - 858.01 \text{ ft (M-5A)}}{869} \quad \text{M-9A} \rightarrow \text{M-5A}$$
$$= 0.001 \quad \checkmark$$

$$\frac{\Delta h}{\Delta d} = \frac{863.35 \text{ ft (M-17A)} - 859.42 \text{ ft (M-29)}}{1109} \quad \text{M-17A} \rightarrow \text{M-29}$$
$$= 0.004 \quad \checkmark$$

$$\frac{\Delta h}{\Delta d} = \frac{859.42 \text{ ft (M-29)} - 858.96 \text{ ft (M-28)}}{723 \text{ ft}} \quad \text{M-29} \rightarrow \text{M-28}$$
$$= 0.0006 \quad \checkmark$$

$$\frac{\Delta h}{\Delta d} = \frac{858.28 \text{ ft (M-302A)} - 857.89 \text{ ft (M-6A)}}{986} \quad \text{M-302A} \rightarrow \text{M-6A}$$
$$= 0.0004 \quad \checkmark$$

PROJECT/PROPOSAL/LOCATION NAME: Dane County LF		PROJECT/PROPOSAL NUMBER
SUBJECT: Advection Velocity		
PREPARED BY: N. Keller	DATE: 4/16/13	FINAL ☐
CHECKED BY: A. Sellwood	DATE: 4/16/13	REVISION ☐

Darcy's Law to Calculate Advection Velocity

$$Q = v_x A \text{ where;}$$

Q = flux (ft³/day or gal/day)

v_x = velocity in x direction (ft/day, cm/sec)

A = cross sectional area (ft²) or (ft² × n_e for porous media)

$$v_x = \frac{Q}{A} \text{ where } Q = KI A$$

$$v_x = \frac{KI A}{A \cdot n_e} \text{ where;}$$

K = Hydraulic Conductivity (cm/sec)
 I = Horizontal Hydraulic Gradient

or

$$v_x = \frac{KI}{n_e} \text{ where;}$$

n_e = effective porosity assume (0.25)

Q Eastern Expansion

- Average K for Harcon Till = 9.41×10^{-4} (where water table occurs)
- Horizontal Gradient across Site 0.007 (use Maximum)
- Assume Porosity 0.25 (see Previous)

$$v_x = \frac{9.41 \times 10^{-4} \text{ cm/sec} \times 0.007}{0.25}$$

$$v_x = 0.00003 \text{ cm/sec}$$

$$= \frac{0.00003 \text{ cm}}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{24 \text{ hr}}{\text{day}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in}}$$

$$= 0.09 \text{ ft/day} \times 365 \text{ day/yr}$$

$$= 30 \text{ ft/yr} \leftarrow (\text{use } 30 \text{ ft/yr})$$



PROJECT/PROPOSAL/LOCATION NAME: Dane County Landfill		PROJECT/PROPOSAL NUMBER
SUBJECT: Darcy Flux, Discharge from Eastern Exposure		
PREPARED BY: W. J. Keller	DATE: 4/16/13	FINAL ☐
CHECKED BY: A. Sellwood	DATE: 4/16/13	REVISION ☐

Darcy Flux = $Q = v_x A$ where;

$$v_x = 30 \text{ ft/yr} \quad \text{from previous Eqn.}$$

A = cross-sectional area of Horicon Till Formation at Northern Edge of LF
assume thickness is 30 ft (M302B) +
and length along Northern edge of waste
is 650 ft

$$A = 650 \text{ ft} \times 30 \text{ ft} = 19,500 \text{ ft}^2$$

$$Q = 30 \text{ ft/yr} \times 19,500 \text{ ft}^2 = 600,000 \text{ ft}^3/\text{yr}$$

$$Q = 600,000 \text{ ft}^3/\text{yr} \times \frac{7.48 \text{ gal}}{\text{ft}^3}$$

$$= 4,000,000 \text{ gal/yr} \quad \text{or} \quad 10,000 \text{ gal/day}$$

Flux = $Q = KIA$ or $v_x A n_e$ (see Previous)

$$Q = 4,000,000 \text{ gal/yr} \times 0.25$$
$$= 1,000,000 \text{ gal/yr} \quad \text{or} \quad 2,700 \text{ gal/day}$$



Attachment E

Regional and Site-specific Geotechnical Information

(Source: Section 6 of Eastern Expansion Feasibility Report)

Section 6

Regional and Site-Specific Geotechnical Information

Regional and site-specific geotechnical information has been collected and reported on for various phases of landfill activity in the vicinity of the Eastern Expansion since 1982 (RMT, 1982, 1984, and Donohue 1992, 1993, and 1994). These investigations, reports, and the results of routine groundwater, surface water, leachate, and gas monitoring performed at the landfill have resulted in a comprehensive body of subsurface, hydrologic, and chemical data for the area and for the facility. The sections that follow present the methods (Subsection 6.1) and results (Subsection 6.2) of the current subsurface investigation for the Eastern Expansion, and incorporate the results and gathered information/data into the body of available historical data to meet the requirements of NR 512.

6.1 Site Field Investigation

An Alternative Geotechnical Investigation Program (AGIP) request was submitted to the WDNR on October 12, 2012, (TRC, 2012c). In an e-mail response on October 22, 2012, the WDNR requested that additional information be provided (see Appendix B) and consequently, the County submitted an Addendum No. 1 to the AGIP on October 25, 2012 (TRC, 2012d). An opinion indicating that the information adequately addressed requirements of an AGIP was provided by the WDNR in a letter dated October 26, 2012 (Appendix B). The WDNR also indicated in their letter that formal approval of the AGIP will be made in the Department's feasibility determination. The AGIP allows for several existing borings and wells to be utilized to fulfill a portion of the hydrogeologic investigation requirements under NR 512.09(1) and (2). The AGIP is based on the availability of regional geological information, the abundance of site-specific geological information, and the consistency of the existing subsurface geologic material (silty sand glacial till, sand outwash, and silty clay till). The AGIP consisted of utilizing information from 11 existing soil borings, 5 existing water table wells, and 3 existing piezometers, combined with information from 10 new soil borings, five new water table wells, and three new piezometers.

Fieldwork for the AGIP and this FR was performed during November 2012. Drilling and well installation activities were performed by SES Consultants, of Madison, Wisconsin, under the direction of a TRC professional geologist. The initial round of comprehensive groundwater level measurements and background groundwater quality monitoring was obtained in

November 2012. Groundwater sampling was conducted by TRC. This subsection contains a discussion of the field investigation activities.

6.1.1 Soil Borings

The subsurface investigation was designed to fulfill the requirements for submittal of an FR as specified in NR 512. The Eastern Expansion will encompass approximately 46 acres consisting of a 28.6-acre Horizontal Expansion and a 17-acre overlap of the existing landfill. Based on the 29-acre horizontal Expansion area in a coarse-grained geologic environment, NR 512.09(1)(b) requires that 20 soil borings be drilled and sampled to a depth of at least 25 feet below the proposed subgrade or to bedrock, whichever is less. Prior to the FR, numerous borings had been completed at the site, 11 of which were recommended for use in the current AGIP. Of the 11 borings recommended in the AGIP, one boring (M-6C) was greater than the 300-foot distance requirement of NR 512.09. However, the boring is within approximately 315 feet of the Expansion limits of waste. An exemption has been requested to utilize this boring and the WDNR approved the use of this boring in their approval of the AGIP. In addition to reasons specified in Subsection 6.1, the use of the 11 existing borings was recommended in part because 17 acres of the Expansion area overlays the existing, approved landfill.

To supplement the existing soil boring program, an additional 10 soil borings were installed, bringing the total number of boring locations to 21. The 21 new and previously existing soil borings, which were listed in the AGIP, their installation dates, their approximate distances from the proposed limits of fill, their installation depths, their surface and bottom elevations, and their proposed subbase grade elevations are listed in Table 6-1. The locations of the 21 borings (11 existing and 10 new) are shown on Plan Sheet 3 and Figure 1-2.

The 10 new soil borings were completed using hollow stem augers and split spoon sampling techniques, including standard penetration tests. All soil samples collected during the November 2012 hydrogeologic field investigation of the proposed Eastern Expansion have been retained. The soil samples will be stored at TRC until a feasibility determination is obtained. Upon receipt of the feasibility determination, Dane County will be notified to determine the subsequent disposition of the soil samples.

Water used in drilling and decontamination was obtained from the City of Madison. Samples of the drilling water source was tested for the parameters required by NR 507.18. Analytical results are included in Appendix M.

Samples of unconsolidated soil were collected using split-barrel (split-spoon) samplers. Samples of the soil were obtained on a five-foot interval to a depth of at least 25 feet below the proposed subbase grades at a minimum and to at least 50 feet below the subbase grade at one boring in each proposed phase. Soil samples collected during drilling were visually classified in the field by a TRC professional geologist in accordance with the Unified Soil Classification System (USCS). Upon completion, each soil boring not converted to a monitoring well was abandoned using chipped bentonite or a bentonite slurry in accordance with NR 141.25. Soil boring logs and the borehole abandonment forms from the November 2012 investigation as well as previous investigations are included in Appendix J.

The WDNR AGIP opinion letter issued October 26, 2012 (Appendix B), stated that the WDNR did not anticipate granting an exemption from required consolidation testing. Therefore, several attempts were made to collect samples from the major geologic units for consolidation testing as described in NR 512.09(6). As indicated in the letter, these samples are to be used to demonstrate that the relevant material properties of the soil samples collected from borings for the proposed Eastern Expansion are representative of the stratigraphy and properties from previously collected samples in each cell. Several attempts were made to collect thin-walled samples (Shelby tubes) within the glacial units. Attempts were made at 10 locations in the major units present onsite. Two locations did not recover any sample, and of the eight locations that had recovery (>6-inches), only three had sufficient undisturbed sample to perform consolidation testing. The two attempts with no recovery resulted in a collapsed Shelby tube, likely due to the density and composition of the soils. Photographic documentation of one of the collapsed Shelby tubes and laboratory documentation of disturbed samples is included in Appendix K.

6.1.2 Monitoring Wells

To adequately characterize a 29-acre expansion, NR 512.09 (2) requires the installation of 10 water table monitoring wells and five piezometers. The November 2012 drilling program included the installation of five water table monitoring wells (M-301A, M-302A, M-303A, M-304A, and M-305A) and three piezometers (M-301B, M-304B, and M-305B). To comply with the requirement of NR 512.09(2), soil boring information and background groundwater quality data from 5 existing water table wells (M-6A, M-9A, M-17A, M-28, and M-29) and three existing piezometers (M-6C, M-9B, and M-17B) have been utilized as approved by the WDNR in a letter dated October 26, 2012 (Appendix B). The five existing water table wells combined with the five new water table wells meet the NR 512.09(2) requirement of 10 water table wells for a 29-acre site. The three existing

piezometers combined with the three new piezometers satisfy the NR 512.09 requirement of five piezometers for a 29-acre site.

The list of wells is summarized in Table 6-1. Well locations are shown on Plan Sheet 3. Groundwater monitoring well construction forms, well development forms, and Groundwater Monitoring Well Information Forms (WIFs) are included in Appendix J.

Nine water table monitoring wells and five piezometers are located within 300 feet of the proposed limits of fill, with the exception of water table well M-6A and piezometer M-6C which is located 315 feet from the limits of waste. The WDNR concurred with the use of these wells in their approval of the AGIP. Eight of ten water table wells and four of six piezometers are located within 150 feet of the proposed limits of fill, although NR 512.09(2)(d) requires only half of the wells to be within 150 feet of the proposed limits of fill. Additional monitoring wells at the site are located further than 300 feet from the proposed limits of fill and are used for supplemental water level and water quality information.

The monitoring wells were constructed in substantial conformance with NR 141 and consist of 2-inch-inner diameter (I.D.) Schedule 40 threaded flush-joint PVC. The well screens consist of 2-inch-I.D. Schedule 40 PVC with 0.010-inch factory-cut slots. The water table wells were constructed with 10-foot-long screened sections and were installed in substantial accordance with NR 141. The piezometers were constructed with 5-foot-long screened sections. The screened sections of the new wells were backfilled with clean, coarse silica-based sand to a level at least 2 feet above the top of the screen. Clean silica sand was installed approximately 2 feet above the filter pack in each well. The annulus above the fine sand was backfilled with a chipped bentonite seal and then grouted with a bentonite slurry (piezometers) or chipped bentonite (water table wells).

A steel protective encasement pipe and lock were installed over the aboveground portion of each well. A mixture of hydrated bentonite granules and on-site soil was mounded around the base of each protector pipe. Monitoring well diagrams for the new wells are included in Appendix J.

Following installation, wells were developed in substantial conformance with NR 141.21 and NR 507.07. Each well was surged and purged with a bailer, and/or submersible pump. Monitoring well development forms are included in Appendix J. Post-development water samples were collected and analyzed for total suspended solids and COD (where applicable) in accordance with NR 507. The analytical results for the post-

development water samples are included in Appendix M and on the well development forms included in Appendix J.

The observation and documentation of well installation and well development activities and the completion of in-field hydraulic conductivity tests were performed by a registered professional geologist and under the direction of a registered professional geologist.

6.1.3 Soil Data Classification and Analysis

During drilling, soil samples collected from the borings were examined to determine the color, degree of saturation, and geologic origin, and to observe for the presence of conspicuous structures, mottling, voids, layering, lenses, and seams. Samples were also classified in the field according to the Unified Soil Classification System (USCS). The soil descriptions and classifications are included on the boring logs in Appendix J and are also summarized in Table 6-2. The capitalized symbol on the boring logs is the appropriate group symbol according to the USCS. Note that the strata contact lines on the boring logs represent approximate soil boundaries between soil types. Changes in soil type may be gradual in both the horizontal and vertical directions, and no actual sharp contact may exist. In addition, variations may exist in both the horizontal and vertical direction between borings.

Soil samples from the screened zone of each newly completed monitoring well and representative samples of the major soil units encountered were analyzed in the laboratory for grain-size distribution (sieve and hydrometer) in accordance with ASTM Specification D-4318, and for Atterberg limits, where appropriate, in accordance with ASTM Specification D-423. Test results are noted on the soil boring logs contained in Appendix J, and on the appropriate geologic cross sections (Plan Sheets 6 through 19). Soil gradation curves and Atterberg limits results are included in Appendix K. Table 6-2 summarizes the results for soil samples tested from the newly installed borings and from the previously existing borings (Table 6-1) used to meet NR 512.09(1) requirements. Table K-1 in Appendix K summarizes physical soil test results for the borings installed for the original landfill and Western Expansion Feasibility Study as prepared by Donohue & Associates in 1992.

Laboratory hydraulic conductivity tests were performed on one sample from the upper fine-grained soil unit. The results of these tests as well as tests performed during previous subsurface investigations are also included in Table 6-2, on the soil boring logs contained in Appendix J and on the appropriate geologic cross sections. Laboratory data sheets are included in Appendix K.

6.1.4 In-Field Hydraulic Conductivity Testing

In situ hydraulic conductivity was determined for each new well by completing single-well aquifer response tests (baildown tests). The general procedure for the testing involved measuring the initial static water level in a well and then causing an instantaneous change in the water level in the wells. Rising-head tests were performed by lowering the water level in the well and measuring and recording incremental water levels while the water level stabilized. Recovering water levels were measured at recorded intervals using an electronic water level logging device. Results of the testing are discussed in Subsection 6.2. The test results are summarized in Table 6-3 and are included in Appendix L. The hydraulic conductivity tests for the existing wells utilized to meet NR 512.09 requirements are also included on Table 6-3. Hydraulic conductivity tests for the Existing Landfill wells installed for the previous Feasibility Studies, including those used as supplemental data for the FR, are provided on Table L-1 in Appendix L, as summarized by Donohue and Associates in the 1992 FR.

6.1.5 Staff Gauges

In addition to monitoring wells, the County installed four staff gauges (Staff Gauge 1-4) in surface water bodies near the Eastern Expansion site at locations shown on Plan Sheet 3 and Figure 1-2. These stations and an existing staff gauge (Park Gauge) in a drainage ditch located in Hope Park were included in the monthly background groundwater elevation measurements. Water elevation data from the staff gauges were utilized in the preparation of the low water table contour map.

6.1.6 Surveying

A horizontal and vertical survey was performed by Exeter Design to determine the location, the ground surface elevation, and the top of the well elevation at each new boring and well. The County hired AECOM to survey the five staff gauge locations. Aerial photographs were taken of the site, and a topographic map was prepared by KBM, Inc. Plan Sheet 3 and Figure 1-2 shows the topography and site features of the proposed site and references the site datum to the Wisconsin State Plane Coordinate System. Elevations are referenced to U.S. Geological Survey (USGS) mean sea level (M.S.L.) datum. Elevations and local grid locations are listed on the Boring Logs, Well Construction Details and the WIF in Appendix J.

6.2 Subsurface Data Analysis

This subsection presents the findings of the site investigation and includes a discussion of the site geology, the site hydrogeology, and the groundwater quality per NR 512.10. The appendices, tables, and plan sheets referenced in this subsection contain the information required by NR 512.11. In general, the AGIP confirmed the findings of previous investigations conducted at the site (i.e., RMT, 1982; and Donohue 1992), and added to the significant data set provided by those studies. The sections that follow include a summary of regional and local geology and relate that information to site-specific data from the AGIP and relevant previous studies.

6.2.1 Site Soil and Geology

Regional and Site-specific Soil Types

Surficial soils in the vicinity of the site have been mapped by the United States Department of Agriculture (USDA), National Resource Conservation Service and are shown on Figure 6-1. Specific surficial soils in the vicinity of the site range from well drained silt-loam to poorly drained muck and consist primarily of the following: Dodge silt loam, Ringwood silt loam, Sable silty clay loam, Houghton muck, and St. Charles silt loam. A brief description of the soils is as follows:

- Dodge silt loam, 2-6% slopes, not hydric, well drained, and prime farmland. Most commonly found on moraines and is formed from loess overlying sandy loam glacial till.
- Ringwood silt loam, 2-6% slopes, not hydric, well drained, and prime farmland. Most commonly found on moraines and is formed from loess overlying sandy loam glacial till.
- Sable silty clay loam, 0-3% slopes, all hydric, poorly drained, and prime farmland if drained. Most commonly found in depressions of stream terraces and is formed from silty alluvium.
- Houghton muck, all hydric, poorly drained, and prime farmland statewide. Most commonly found in depressions of stream terraces and is formed from organic deposits.
- St. Charles silt loam, 0-2% slopes, not hydric, well drained, and prime farmland. Most commonly found on till plains and is formed from deep loess overlying glacial till.

Regional Glacial Geology

The proposed Eastern Expansion is located in an area underlain by a thick sequence of unconsolidated glacial drift of the Horicon Formation deposited over dolomite bedrock of Ordovician age. The Horicon Formation generally consists of brown sandy till, but also includes sand and gravel deposited by glacial meltwater and clay, silt and sand deposited in glacial lakes. This till was deposited by the Wisconsin Valley Lobe during the Wisconsin Stage of continental glaciations. Subsurface investigations performed in the area of the proposed Eastern Expansion encountered glacial sediments that extended down to at least 95 feet below the land surface. The sediments encountered in these investigations consist of silty clay (glacial lacustrine deposits), silty sand glacial till with scattered pebbles, cobbles, boulders (poorly sorted ice contact deposits), and sand and gravel (outwash and lacustrine sand deposits).

Site-specific Glacial Geology

The geotechnical data compiled for this section comply with the requirements of NR 512.09(1) and NR 512.09(4). The laboratory soil testing results for the Eastern Expansion borings and for the existing borings used to meet NR 512 requirements are summarized in Table 6-1. The laboratory soil testing results for the Existing Landfill Feasibility Study borings are summarized in Table K-1 (in Appendix K). The laboratory data sheets are included in Appendix K. The boring logs were completed in accordance with NR 512.09(1), and are contained in Appendix J, along with WDNR borehole abandonment forms.

For this study, 14 geologic cross sections meeting the requirements of NR 512.11(2) were prepared (Plan Sheets 6 through 19). The cross section locations are depicted on each plan sheet. Plan Sheet 2 provides descriptions of the unconsolidated glacial deposits illustrated graphically on the cross sections. As noted in the AGIP and as discussed with the WDNR, the original geologic cross sections prepared for the Existing Landfill have been included in Appendix J of this report. These cross sections also include geologic information for borings Y-1 through Y-5 that were drilled during the 1970's. The logs for these borings could not be located for the 1992 Feasibility Report or the Eastern Expansion Feasibility Report. The original cross sections are included to satisfy the requirements of NR 512.11(2).

The glacial deposits encountered in the borings advanced during the Eastern Expansion geotechnical investigation can be divided into four major geologic

units. The four major units from the surface downward consist of surficial fine-grained loess and glaciolacustrine deposits, silty sand till, sand outwash, and an isolated fine-grained clay and silt lower lacustrine deposit. The till, outwash, and isolated lower lacustrine deposit are overlapping in some areas of the site and are derived from the Horicon Formation.

The horizontal and vertical extent, and the physical properties of the unconsolidated deposits were defined as part of the geotechnical field investigation by preparing Geologic Cross Sections A-A' through L-L' presented as Plan Sheets 6 through 19.

The surficial lean clay (CL) soil encountered beneath portions of the site is consistent with the presence of loess deposits and fine-grained lake deposits and correlates well with previous investigations. For purposes of definition on the cross sections, this unit is labeled as a loess deposit. Due to landfill activities (grading, sedimentation pond, etc.) and normal heterogeneity in the area of the Eastern Expansion, this layer is not present in all of the recently installed borings. Where it is present, it will be removed during the construction of the project. This formation was also identified as a major soil unit during 1982, and 1992 FR investigation at the Dane County Landfill (RMT, 1982, and Donohue, 1992). This unit was commonly described as a silty clay or lean clay with little to moderate plasticity. Color of the clay ranged from brown to yellow brown, with thicknesses up to 6.5 feet, and the density ranged from medium stiff to hard. The distribution of grain size is similar to the results of the grain-size analysis for samples collected as part of the Existing Landfill geotechnical investigations. Donohue & Associates (1992) also combined near-surface deposits of silt and clay (loess) with associated glaciolacustrine and meltwater deposits for the purposes of soil grain-size analysis. The average grain-size distribution reported for loess and glaciolacustrine and meltwater deposits collected at the Eastern Expansion site, and as reported in the Eastern Expansion Feasibility Report, is as follows: 8.3 percent gravel, 12.0 percent sand, 48.2 percent silt, and 29.9 percent clay. A laboratory hydraulic conductivity test of this unit yielded a value of 2.0×10^{-8} cm/sec. The soil properties are summarized in Table 6-2.

A second major geologic unit was encountered in all borings at varying depths depending on thicknesses of the upper clay and surficial soils. This unit was commonly identified as a silty sand (SM) with gravel (till) that varies in thickness from a few feet where it is interbedded with outwash up to greater

than 61 feet at boring M-302B. This unit is generally brown to red in color and ranges in density from loose to very dense, particularly at depth. The water table generally occurs with the till unit under the Expansion.

Six soil samples of the till member were selected from the November 2012 geotechnical borings for laboratory analysis of grain-size distribution. The results of these analyses were combined with the results of six previous grain-size analysis of till to provide geotechnical data for this major geologic unit.

The results of grain-size analysis of the till samples within the Eastern Expansion area contain an average of 9.3 percent gravel, 67.1 percent sand, 13.2 percent silt, and 9.7 percent clay. These data are similar to data collected during the geotechnical investigation of the Existing Landfill as summarized on the table from the 1992 Feasibility Report included in Appendix K.

The third major unit encountered consists of a poorly graded sand (SP), poorly graded sand with gravel, or sand with silt (SP-SM). The outwash unit is present with highly varying thickness and density in most areas underlying the expansion. The greatest thickness was encountered at borings across the center of the Eastern Expansion area. Thicknesses ranged from 35 to 70 feet. The outwash unit was not observed at boring M-302B.

Samples from two soil boring locations were selected for grain-size analysis. The results of the analysis of these samples were combined with the results of the analysis performed on five samples collected during the Existing Landfill geotechnical investigations. Based on the results of the grain-size analysis of these seven samples, each within the Eastern Expansion area, the outwash member contains an average grain-size distribution as follows: 21.5 percent gravel, 72.1 percent sand, 2.3 percent silt, and 1.5 percent clay. (Note that the average P200 content of the outwash is 6.2 percent. Several preexisting samples were only analyzed for P200 content and not silt and clay individually, thus the average clay and silt percentage may be skewed slightly.) These results are similar to data collected during the previous site investigations (see Appendix K).

In the northwestern portion of the Eastern Expansion area (e.g., M-6C, M-9B, B311, and B-304B) a fourth unit of glaciolacustrine origin, consisting of lean clay/ silty clay (CL) and silt (ML), was present at depths up to 60 feet bgs (M-304B) and thicknesses up to 28 feet (M-9B, located outside the Expansion

footprint). The unit thinned to 3 feet at M-304B. This unit was grayish brown to brown in color and was generally stiff. Soil samples of glaciolacustrine silt and clay were selected from two soil borings advanced as part of the November 2012 geotechnical investigation. The results of these analyses were combined with the results of the grain-size tests performed on two samples of glaciolacustrine clay taken from existing soil borings. The average grain-size distribution for the glaciolacustrine silt and clay in the Eastern Expansion area is as follows: 5.0 percent gravel (only at one boring), 16.1 percent sand, 48.5 percent silt, and 46.1 percent clay. Overall, this unit is most predominant in this area of the entire landfill site as defined by these four borings and is considered to be an isolated deposit.

Regional Bedrock Geology

Regional information suggests that bedrock in the vicinity of the site consists of dolomite of the Prairie du Chien group, and in the eastern most portion of the site, sandstone of the Trempealeau, Tunnel City, and Elk Mound groups, however, subsequent subsurface investigations/well logs indicate the bedrock in the immediate vicinity of the Expansion consists of the Galena-Platteville dolomite of the Sinnipee Group.

Logs from local water wells along CTH AB immediately east and north of the Expansion indicate that Galena-Platteville dolomite bedrock of the Sinnipee Group ranges in depth from 70 feet below ground surface (bgs) near the USH 12 & 18 intersection with CTH AB (PW-37) to 153 feet bgs just to the east of the Expansion footprint to 110 feet bgs in the park to the north of the footprint (PW-48). To the west of the Expansion logs from previously abandoned onsite water supply wells indicate dolomitic or shale bedrock ranges in depth from 194 feet bgs to 90 feet bgs. Thus, the surface of the bedrock beneath the Expansion is expected to be greater than 50 feet below the lowest subbase grade elevation. The regional bedrock topography is depicted on figures in the ISR (TRC, 2012a).

In the area of the site there is also a fault complex, informally called the “Yahara Hills Complex” (Donohue, 1991), where the disturbed area is subdivided into discrete blocks separated by normal faults. The faults are not part of any currently active geologic process and are therefore considered inactive.

Site-specific Bedrock

Bedrock (dolomite) was not encountered while drilling new borings for the Eastern Expansion. Depth to bedrock information is available from private well logs for existing wells PW-37, PW-48, Community Well, Hope Park, and Niebuhr well, and abandoned wells PW-36, and PW-47. Based on data shown on these private well logs and existing borings performed at the site, the depth to bedrock is greater than 50 feet below the proposed subbase grades for the Eastern Expansion and is at least 95 feet below ground surface under the center of the Eastern Expansion, based on boring log M-1C.

6.2.2 Site Hydrogeology

Regional Hydrogeology

Three major aquifers and one aquitard exist in Dane County (Bradbury et al, 1999). The aquifers consist of the Mount Simon (Cambrian sandstone), the Upper Paleozoic and the unlithified aquifers, while the aquitard is the Eau Claire Formation. The unlithified aquifers are further divided into three types, the proposed and existing landfill is underlain by Types 2 and 3. Type 2 – Unconfined Poorly sorted sand, gravel and silt deposited as diamicton or well sorted offshore glacial lake sediment and Type 3 – Confined or partially confined well to moderately well sorted sand and gravel overlain by silty or clayey lake sediments. The unlithified sand and gravel aquifers can yield economically useful quantities of water in some areas of the county. However, the Cambrian sandstone units are considered to be the principal aquifer in the County.

The elevation of the regional water table in this area is approximately 870 feet M.S.L., based on actual measurements taken at the site. In the area of the proposed Eastern Expansion, the groundwater system consists of two distinct hydrostratigraphic units, a bedrock aquifer, and the surficial glacial deposits. According to regional sources, the flow direction in the bedrock aquifer is generally to the southwest (Figure 6-2). The uppermost hydrostratigraphic unit in the vicinity of the Eastern Expansion generally occurs within the till and outwash glacial deposits.

Site-Specific Hydrogeology

Horizontal Flow

The hydrogeologic data for this section meets the requirements of NR 512.09(2), NR 512.09(4), 512.11(3), and 512.11(5). Water levels measured at the on-site monitoring wells and off-site staff gauges are summarized in Table 6-5. High water table elevation and low water table elevation contour maps are presented on Plan Sheets 4 and Plan Sheet 5, respectively.

Water levels in the new and existing wells across the entire landfill were measured on six occasions during 2012 (November, and December) and in 2013 (January, February, March, April) at a minimum of 30-day intervals, as required by NR 512.09(4). Generally, groundwater was encountered in the unconsolidated glacial sediment at depths of less than 4 feet to approximately 47 feet below ground surface (most often within the silty sand till). June 2008 water level data was used to construct the high water table map (Plan Sheet 4). The June 2008 data was selected because it represents the high round of data across the entire site during the past 26 years. The low water table was prepared with the data measured in December 2012 (Plan Sheet 5). Water elevations ranged from 874.00 feet M.S.L. at M-17A to 861.91 feet M.S.L. at M-6A, from south to north or upgradient to downgradient across the Eastern Expansion during June 2008. The overall gradient flattened during the low water period compared to the high water table period. Water elevations were 863.35 feet M.S.L. at upgradient well M-17A, while they were 857.89 feet M.S.L. at downgradient well M-6A during December 2012.

The direction of groundwater flow during both of these periods was generally to the north under the Eastern Expansion area. Flow trends toward the northwest under the Existing Landfill. The direction of flow is consistent with configurations observed during the previous landfill expansion (see figures included in the AGIP; TRC, 2012c). No perched water was encountered during drilling activities in November 2012.

Horizontal hydraulic gradients for the water table were calculated across the Eastern Expansion area using water table elevation data and the corresponding water table contour maps. During the water table high,

observed in June 2008, the horizontal hydraulic gradient across the Eastern Expansion area was steeper over the south half of the Expansion area, flatter over the north half of the site, and approximately 0.003 ft/ft. The horizontal gradient flattened to 0.002 ft/ft during low water table conditions in December 2012. Calculations of horizontal hydraulic gradients by segmented areas of the site are included with Appendix L.

The variability in flow is expected given the somewhat lower conductivity of the till material. Additionally, a drainage ditch acts to minimize the overall fluctuations to the immediate north of the Expansion area near well M-6A. Lastly, the underlying outwash unit acts to somewhat mitigate fluctuations.

Vertical Flow

Water level data from December 2012 and June 2008 were used to calculate the vertical gradients between water table wells and the piezometers. The gradients between the wells were calculated by subtracting the head in the piezometer from the head in the water table well and then dividing by the distance between the water table and the midpoint of the piezometer screen. Vertical gradients for previously existing well nests were also calculated by using the screen midpoints to compare heads between the two piezometers. The calculated vertical groundwater gradients are provided in Table 6-6. Vertical gradients between the water table and the piezometric surface in December 2012 ranged from -0.014 ft/ft to 0.004 ft/ft in wells near the Eastern Expansion. Gradients were variable at the well nests with a slightly higher number of wells exhibiting upward gradients. In June 2008, vertical gradients ranged from -0.026 to 0.006 at wells in the Eastern Expansion area. In general, vertical gradients are downward during periods of high groundwater elevations with the exception of those well nests nearest the northern wetland/drainage ditch (M-5 and M-6). Cross Section I-I' (Plan Sheet 16) shows the vertical component of groundwater flow during high water conditions.

Hydraulic Conductivity, Flow Velocity, and Discharge

In-field hydraulic conductivity tests were performed on each new well installed as part of the Eastern Expansion November 2012 geotechnical drilling program. The tests provide estimates of hydraulic conductivity for the till deposit, the

sand and gravel outwash deposit, and the glaciolacustrine deposit. Calculated hydraulic conductivity values for each well within 300 feet of the Eastern Expansion footprint are shown in Table 6-3, and the raw test data and analyses are provided in Appendix L. Hydraulic conductivity values for existing wells across the entire contiguous Existing Landfill are summarized in Table L-1 in Appendix L.

The geometric mean hydraulic conductivity of the till deposit is 9.4×10^{-4} cm/sec. The geometric mean of the underlying sand outwash is 9.1×10^{-3} cm/sec. The lacustrine deposit in the northwest portion of the Expansion area exhibits a geometric mean of 1.7×10^{-5} cm/sec.

The Eastern Expansion site is hydraulically located primarily sidegradient, but slightly upgradient of the Existing Landfill. As indicated by generally flat vertical hydraulic gradients, horizontal flow conditions generally control the shallow groundwater flow system beneath the Eastern Expansion area until reaching the drainage ditch north of the site. The average linear velocity for groundwater flowing within the Horicon silty sand till aquifer is estimated to be on the order of 30 feet per year or 0.08-foot per day. This estimate of average linear velocity was calculated using the mean hydraulic conductivity values listed above, the highest observed horizontal hydraulic gradient across the Eastern Expansion between selected wells, and an estimate (0.25 percent) of effective porosity. The resulting average linear velocity represents the average rate at which groundwater moves between two points within the aquifer.

To estimate the daily volume of groundwater flowing beneath the Eastern Expansion within the unconfined silty sand till, the average linear velocity is multiplied by the cross-sectional area of the aquifer. The unconfined portion of the sand and gravel aquifer is assumed to have, at a minimum, at least 30 feet of saturated thickness beneath the Eastern Expansion, and the Eastern Expansion is approximately 650 feet in length perpendicular to flow at the northern edge of the proposed limits of waste. Based on these assumptions, a minimum of approximately 4 million gallons/per year or 10,000 gallons per day of water discharge from the till formation beneath the Eastern Expansion to portions of the aquifer and wetland located immediately north of the site.

Calculations of average linear velocity and discharge are included in Appendix L.

6.2.3 Background Water Quality Monitoring

Four monthly rounds of background groundwater analytical data were collected from newly installed wells (M-301A, M-302A, M-302B, and M-303A). New wells located within the Eastern Expansion's proposed limits of waste (M-304A, M-304B, MN-305A, and M-305B) do not require background groundwater monitoring. However, groundwater elevations were measured at each Eastern Expansion well and each groundwater monitoring well at the Existing Landfill (see Table 6-5) for a 6-month period from November 2012 through April 2013.

Groundwater samples collected from M-301A, M-302A, M-302B, and M-303A were analyzed per NR 507.17 and NR 507.18 requirements for the baseline and detection monitoring parameters (summarized in NR 507 Appendix I, Table 1 and Table 2) for landfills accepting municipal solid wastes, combustible residues, fly or bottom ash, and demolition wastes. Each well listed above was also sampled monthly for the analysis of parameters not listed as detection monitoring parameters, but for Public Health and Public Welfare parameters as summarized in NR 507 Appendix I, Table 3. Two consecutive rounds of sampling (November 2012 and December 2012) were performed at each well for analysis of volatile organic compounds (VOCs). In addition, water table monitoring well M-302A was sampled monthly for the analysis of Subtitle D metals (antimony, beryllium, cobalt, nickel, thallium, and vanadium). A list of the parameters is provided in Table 6-7.

The laboratory analytical results of the background groundwater quality monitoring results at the Eastern Expansion site are provided in Appendix M. The November 2012, December 2012, January 2013, and February 2013 analytical results are being electronically transmitted to the WDNR with this report. A summary and discussion of the groundwater quality analytical results and the current NR 140 exceedences at the active and closed landfill facilities are provided as part of the Existing Site Performance Evaluation, found in Appendix P.

Table 6-8 provides a summary of the NR 140 Groundwater Quality Standard exceedences for the Eastern Expansion background groundwater quality samples collected and analyzed between November 2012 and February 2013. Additional background groundwater quality sampling events are ongoing at the Eastern Expansion. The remaining four rounds of background monitoring are being conducted in accordance with NR 507 prior to landfill construction. The analytical results for these monitoring events will be submitted with the Plan of Operation Report. The associated parameters and monitoring wells are summarized in Table 6-9. Well-specific standards will be developed as part of the Plan of Operation report.

As shown in Table 6-8, concentrations of nitrate plus nitrite (as nitrogen) exceeded their respective NR 140 Groundwater Quality Public Health Standards in groundwater samples collected at two Eastern Expansion well locations. Manganese was also reported at concentrations greater than its NR 140 Groundwater Quality Public Welfare Standards in groundwater samples collected at four wells. A discussion of the exceedences reported between November 2012 through February 2013 at the Eastern Expansion site is provided in the following text.

Manganese

Background water quality at each of the four new wells sampled exceeded either the NR 140 Preventive Action Limit (PAL) of 25 µg/L or Enforcement Standard (ES) of 50 µg/L for manganese during one or more rounds (Table 6-8). Most of the wells exhibiting manganese exceedences are screened in the till deposits and are hydraulically upgradient from the Existing Landfill. Manganese is known to be naturally occurring at elevated levels in groundwater in this region (TRC, 2012a). The manganese results are within the range of naturally occurring manganese (0.0 µg/L to 570 µg/L) reported in the sand and gravel aquifer in Dane County (Kammerer, 1981). As a result, the concentrations reported in the wells likely reflect the natural variability of the groundwater in this area. Similar manganese concentrations have been reported across the site. For these reasons, an exemption to NR 140.28(3)(a) and NR 140.28 (4)(a) is requested and warranted for manganese at the four wells listed on Table 6-8.

Nitrate + Nitrite as Nitrogen

Nitrate + nitrite as nitrogen was reported above the NR 140 PAL during two of the four background monitoring events in samples collected from wells M-302B and during one round at well M-302A. These wells are located along the northern limits of waste of the Eastern Expansion. The reported nitrate + nitrite concentrations in samples collected from these wells likely reflect the background variability of the groundwater owing to agricultural practices in this area of the site. Additionally, samples collected from other existing adjacent wells have exhibited more elevated nitrogen concentrations than those reported in the samples collected from wells M-302A and M-302B. An exemption to NR 140.28 (3)(b) is warranted for wells M-302A and M-302B based on the preceding rationale.

Volatile Organic Compounds

Two consecutive monthly rounds of groundwater samples were collected at each of the four new wells for analysis of VOCs. No VOCs were detected during the two rounds at each of the four wells.

6.3 Private Water Supply Wells

There are a total of six private wells located within 1,200 feet of the existing landfill and the proposed Expansion (Plan Sheet 3 and Table 6-4).

Dane County has controlling interest in one of the wells (Hope Park Well). The second well (Community Well) is located approximately 920 feet from the Eastern Expansion and serves four residences along County Highway AB. A third well (Crossroads Tavern) is located 350 feet to the southeast of the Eastern Expansion (Dane County has a signed offer to purchase this property and will have controlling interest of the well prior to construction). The fourth well, a private residence (Niebuhr), is located 1170 feet to the east of the Expansion. The fifth well, a private residence (Acker), is located 1090 feet to the northeast of the Expansion. The sixth well (Hope Lutheran Church) is located approximately 1,020 feet northeast of the Expansion. Each of these wells (where logs are available) have steel casing installed to the bedrock and withdraw water from the bedrock. The well construction logs are included in Appendix E for each well, with the exception of the Acker residence and the Church.

Groundwater flow within the bedrock near the site and in the localized area is generally to the southwest toward the Yahara River Valley. Shallow groundwater flow within the unconsolidated unit is toward the north/northwest in the vicinity of the Eastern Expansion and generally discharges to the large wetland complex north of the site. Since these water supply wells withdraw water from the bedrock unit and the bedrock groundwater flow direction is toward the southwest (see Figure 6-2), these wells generally lie upgradient from the proposed Eastern Expansion. Additionally, the existing landfill has had limited to no impact on the surrounding groundwater quality beyond its management boundary. A minimum of 50 feet of separation distance has been maintained between the proposed subbase grades and bedrock. Thus, there is minimal risk for impacts from the proposed Eastern Expansion.

Dane County intends to abandon the Hope Park well (PW-48) upon construction of the landfill Expansion and is therefore only requesting a variance for this well on a temporary basis. A variance was previously granted for the Crossroads Tavern well during the previous landfill expansion. Dane County intends to abandon the Acker well and the Church well and replace them outside the 1,200 foot setback boundary prior to construction of the Eastern Expansion. Dane County has notified the affected property owners for each of the six wells of the WDNR

setback and exemption requirements. For informational purposes, acknowledgement of receipt of the certified mail are included in Appendix F. Based on the above information, a variance to the private well setback requirement is justified for these six wells.

Upon concurrence from the WDNR Solid Waste Division, Dane County will forward the variance forms to the WDNR Water Supply Division requesting an exemption to NR 812 for the location of these six wells.

The justification for variance is as follows:

- Regional groundwater in the bedrock has been shown to flow to the southwest.
- Wells are located side to upgradient of the Eastern Expansion based on the bedrock groundwater flow direction.
- Wells are cased to the bedrock surface and at 50 feet of separation between the landfill liner and bedrock.
- There have been no significant impacts to groundwater based on 26 years of landfill monitoring.

Based on these factors, there is minimal risk for impacts from the proposed Eastern Expansion.