WARZYN

Volume 2
Appendix A
13076.80

Remedial Investigation
Wausau Water Supply NPL Site
a.k.a. Wausau Groundwater Contamination NPL Site
Wausau, Wisconsin

Prepared for:
U.S. Environmental Protection Agency
Region V
Chicago, Illinois

Prepared by:
Warzyn Engineering Inc.
Madison, Wisconsin

previous reports + correspondence
F+VD 6/86
RMT & G+M 6/87
CH_2MHill 2/86
+others

July 1989

APPENDIX A

PREVIOUSLY RELEASED REPORTS AND CORRESPONDENCE

APPENDIX A.1

INFIELD CONDITIONS REPORT, WAUSAU ENERGY CORPORATION,
FOTH & VAN DYKE, 1986

Foth & Van Dyke

Waste/Energy Division

Infield Conditions Report

IMPACT OF

INCIDENTAL PETROLEUM SPILLAGE

AT THE

WAUSAU ENERGY CORPORATION SITE

PREPARED FOR:

WAUSAU ENERGY CORPORATION

PROJECT #: 86.W.18

June 1986

Foth & Van Dyke and Associates Inc.
2737 S. Ridge Road
P. O. Box 11997
Green Bay, Wisconsin 54307-1997
414/497-0902

IN-FIELD CONDITIONS REPORT

IMPACT OF INCIDENTAL PETROLEUM SPILLAGE AT THE WAUSAU ENERGY CORPORATION SITE

Prepared for:

WAUSAU ENERGY CORPORATION

Prepared by:

FOTH & VAN DYKE and Associates Inc.
2737 S. Ridge Road
P.O. Box 11997
Green Bay, Wisconsin 54307-1997

JUNE 1986

Foth & Van Dyke
Waste/Energy Division
2737 S. Ridge Road
P. O. Box 11997
Green Bay, WI 54307-1997
414/497-0902

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1986

June 27, 1986 86W18-2

Mr. Dave O'Malley
Wisconsin Department of Natural Resources
North Central District
Box 818
Rhinelander, WI 54501

Dear Mr. O'Malley:

RE: Wausau Energy In-Field Conditions Report

On behalf of the Wausau Energy Corporation we are enclosing two copies of the report titled In-Field Conditions Report: Impact of Incidental Petroleum Spillage at the Wausau Energy Corporation Site.

If you have any comments or questions on this report, please contact us.

Sincerely,

FOTH & VAN DYKE

Fred J. Doran
Staff Hydrogeological Engineer

Boyd N. Possin
Manager, Environmental
Investigations Section

FJD:BNP:lmv

Enclosure

cc: Gary Kulibert, WDNR - NCD
Mark Giesfeldt, WDNR - Madison
Arlen Rusch - Wausau Energy
David E. Stewart - DeWitt Sundby
Dennis Beckmann, Amoco

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1.0 INTRODUCTION

The Wausau Energy Corporation property is located on the southwest corner of the intersection of Wausau Avenue and Second Street on the east side of the Wisconsin River in Wausau, Wisconsin. The site has been used as a petroleum bulk storage and distribution center, but is currently inactive. The site, previously owned by Amoco, is currently owned by the Wausau Energy Corporation. Storage tanks used on the property were dismantled and removed during the summer of 1984. A plan view of the Wausau Energy property, as it existed in 1974, is illustrated in Figure No. 1-1. The content of each storage tank is indicated.

Over this period of petroleum handling, small incidental spillages of petroleum products may have occurred possibly affecting the subsurface soil and groundwater south of the Wausau Energy building. The Wisconsin Department of Natural Resources (WDNR) has requested that this In-Field Conditions Report be prepared to quantify the extent of petroleum contamination, if any.

In order to develop this report, the following four tasks were performed:

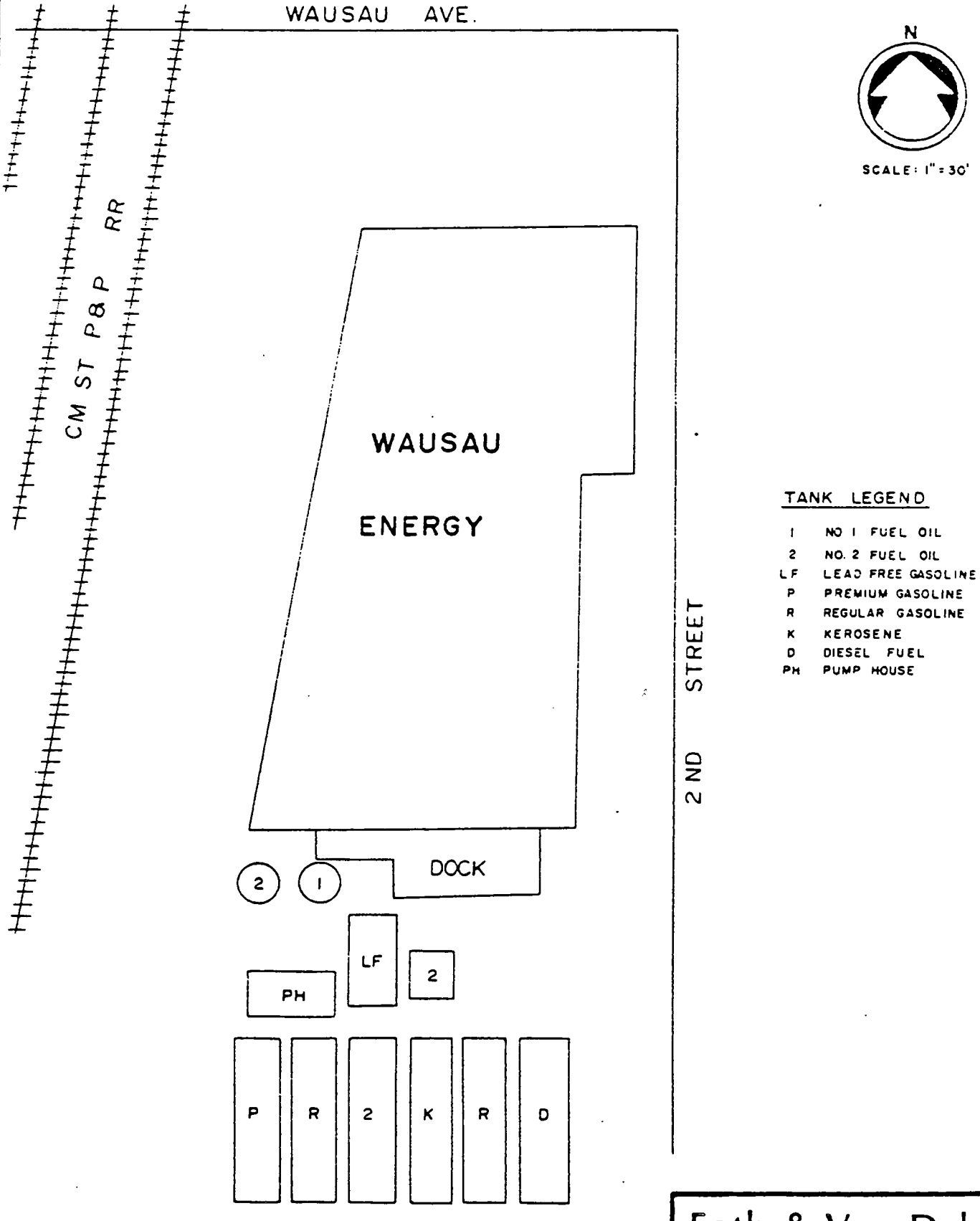
1. Review of previous soil borings, soil chemical analysis, and monitoring well installations conducted at the Wausau Energy property.

2. Measurement of depth to groundwater in on-site and off-site wells and determination of groundwater flow direction and gradient.

3. Measurement of the thickness of petroleum product on top of the water table, and

FIGURE 1-1

WAUSAU ENERGY PROPERTY - APRIL 26, 1974



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Waste/Energy Division

4. Collection of groundwater samples from the four on-site wells and two downgradient off-site wells and analysis for Priority Pollutant volatile organic compounds (VOCs).

2.0 RESULTS OF FIELD WORK

2.1 Summary of Previous Work at Wausau Energy

Eight soil borings were conducted at Wausau Energy by Exploration Technology, Inc. on February 18, 1986. Four of these borings were converted into water table monitoring wells. Selected split spoon samples were analyzed by Zimpro, Inc. of Rothschild, Wisconsin for VOCs. Boring logs, monitoring well details, and analytical results are presented in Appendix A. Boring locations are shown in Figure No. 2-1.

Samples from the borings indicated that soils beneath the Wausau Energy property are principally fine to course sand with zones of silt and gravel. Some of the soil samples from TB1 to TB4 were described as having a strong fuel odor.

Soil chemical analysis revealed that petroleum contamination was confined to the area south of the existing building. Concentrations of ethylbenzene and toluene were detected in samples TB1-3, TB2-1, TB3-1, TB3-3 and TB4-3, but could not be quantified due to interference. Xylenes were present in samples TB1-3, TB2-1, TB2-2, TB3-1, TB3-3 and TB4-3. Benzene was present in sample TB4-3. These sample locations span the entire soil profile south of the building. The analytical method used is described briefly in Appendix A.

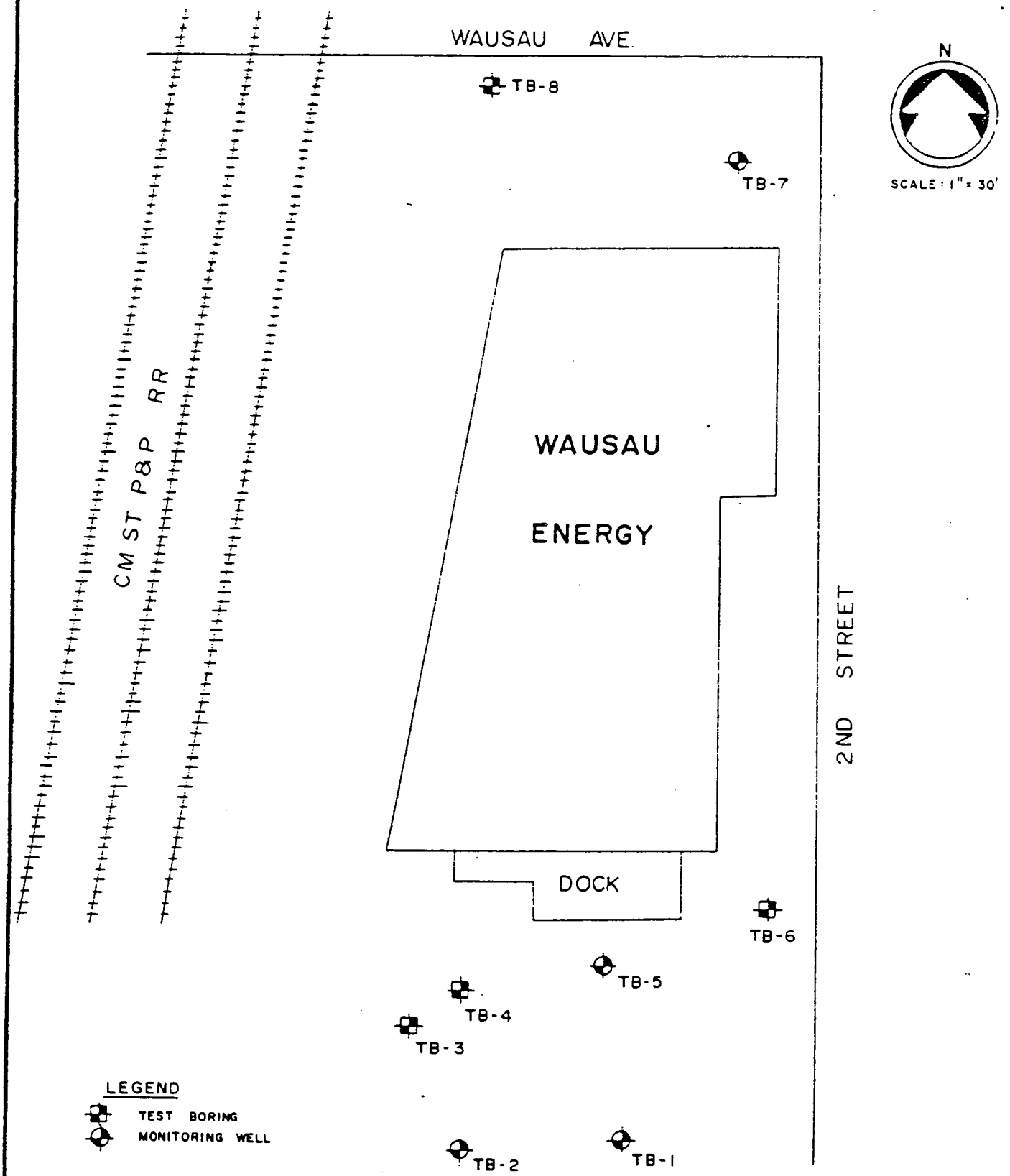
2.2 Groundwater Flow Direction

Monitoring wells were surveyed for vertical control on April 21, 1986 and for horizontal control on May 1, 1986, in order to determine groundwater flow direction and gradient. Top of PVC elevations (MSL) are given on the monitoring well details in Appendix A.

FIGURE 2-1

SOIL BORING & MONITORING WELL LOCATIONS

WAUSAU ENERGY - FEBRUARY 18, 1986



Foth & Van Dyke
Waste/Energy Division

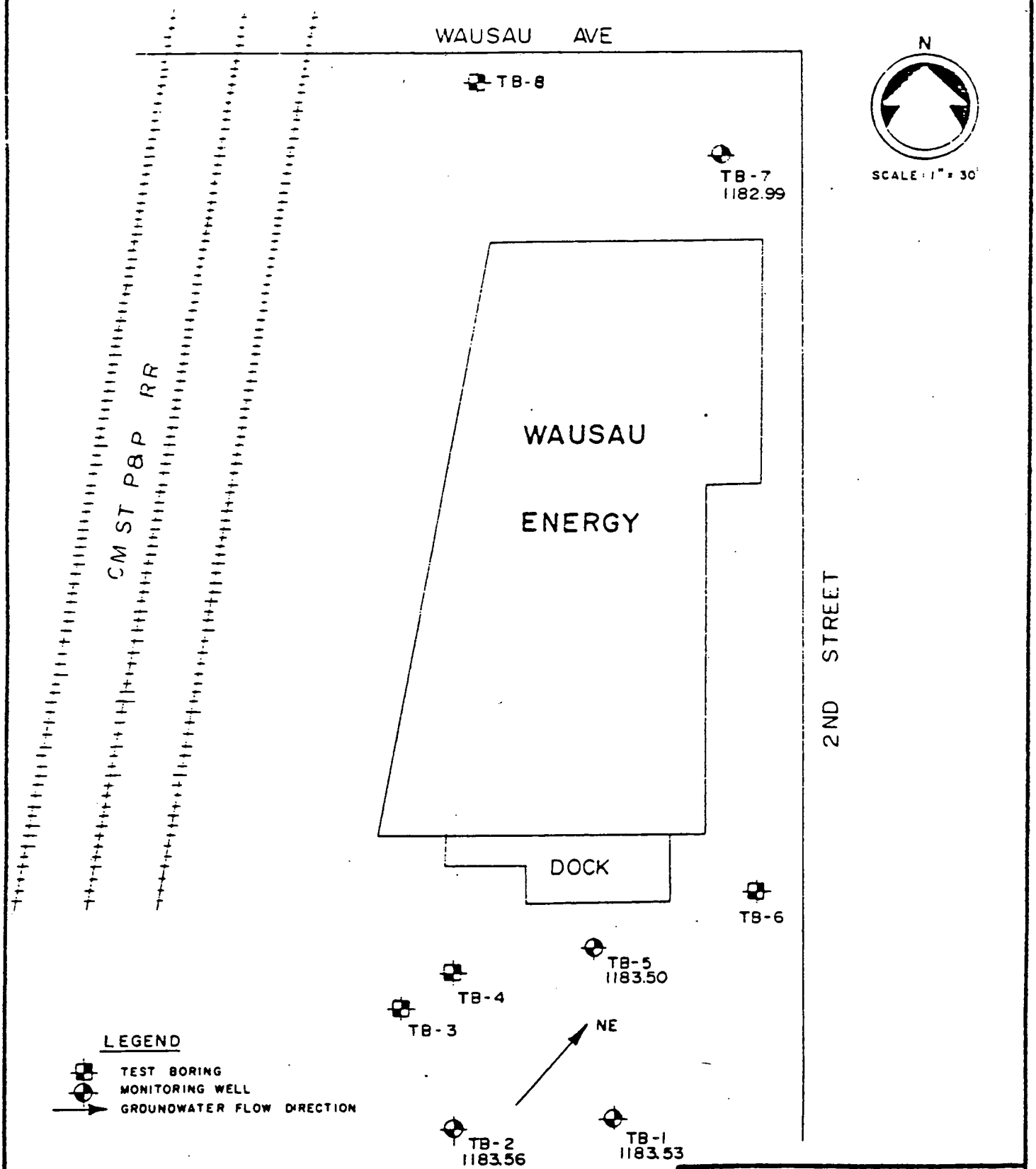
Static water level measurements in the wells were taken on April 21, May 1, and May 13, 1986. Groundwater was approximately 13 feet below the ground surface. Figure No. 2-2 illustrates the water table elevations in the Wausau Energy wells on May 1, 1986. Based on these values, groundwater flow direction in the area south of the building is to the northeast with a hydraulic gradient of 0.001 feet/feet.

Groundwater elevations for a majority of the other monitoring wells in the vicinity of the Wausau Energy property were measured on April 21, 1986 by the WDNR. These elevations were incorporated with the Wausau Energy values and the resulting approximate water table contours are illustrated in Figure No. 2-3. More water table elevations would be necessary to completely define groundwater contours; the data, however, can be used for general discussion of groundwater flow.

Even though the Wisconsin River is immediately west of the study area, the groundwater flow pattern is governed by two City of Wausau water supply wells (Nos. 3 and 4), and a supply well operated by Wergin Construction. Groundwater in the northern section of the study area is drawn toward City Well No. 3 and the Wergin Well, while groundwater in the southern section is drawn toward City Well No. 4. The approximate location of the groundwater divide separating the two cones of depression is shown in Figure No. 2-3. The combined effect of the Wergin Well and City Well No. 3 is responsible for the northeasterly groundwater flow at the Wausau Energy site.

FIGURE 2-2

WATER TABLE ELEVATIONS AND GROUNDWATER FLOW DIRECTION - MAY 1, 1986

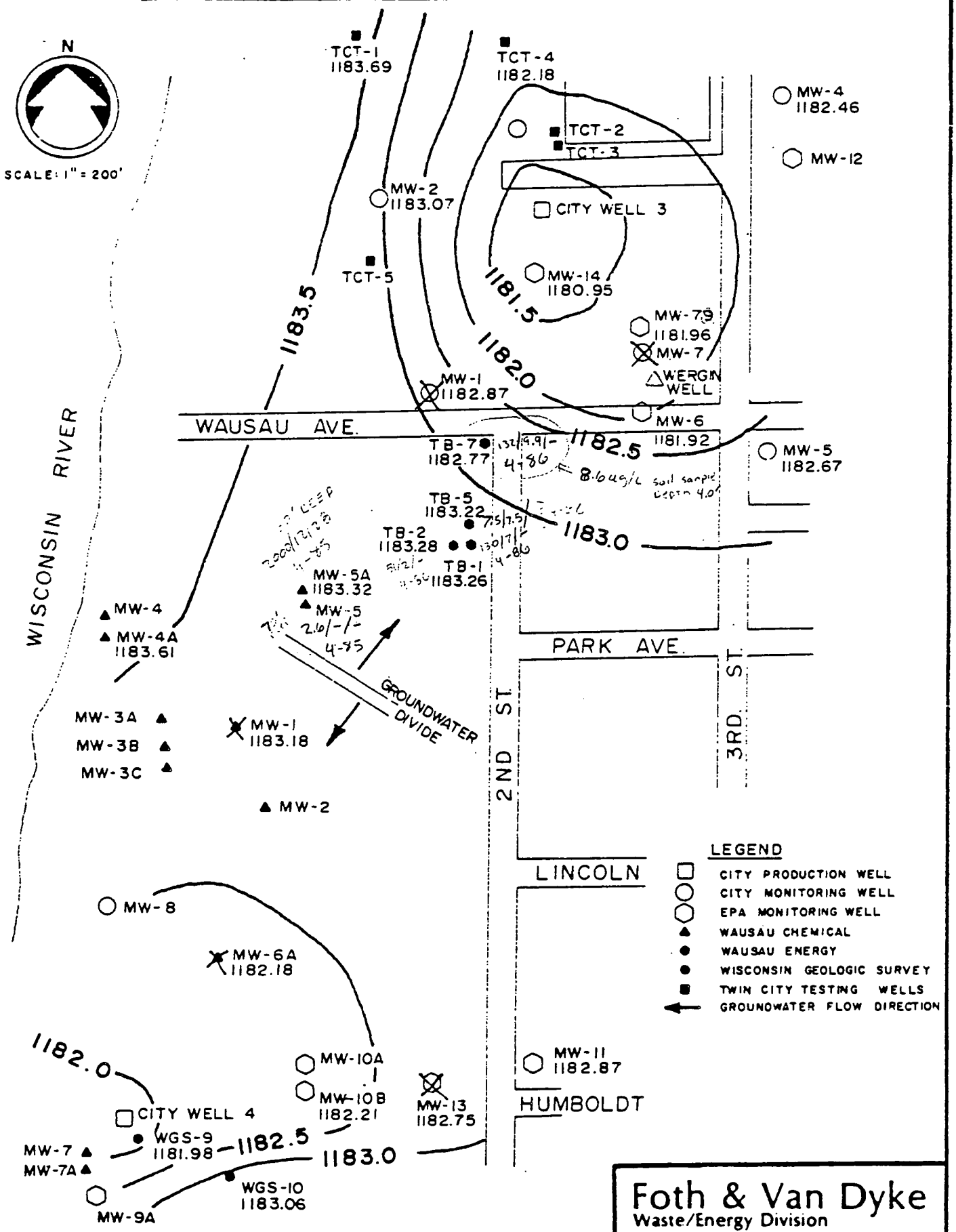


Foth & Van Dyke
Waste/Energy Division

FIGURE 2-3

WATER TABLE CONTOURS

VICINITY OF WAUSAU ENERGY - APRIL 21, 1986



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Waste/Energy Division

2.3 Petroleum Product Measurements

All four monitoring wells at Wausau Energy were monitored for petroleum product floating on the water table. Measurements were taken on April 21, May 1, and May 13, 1986. A transparent Teflon bailer was utilized on May 13; water indicating paste applied to a steel tape was used on the two earlier measurements. In all cases, no floating petroleum product was measured or otherwise noted on the water table.

2.4 Groundwater Chemical Analysis

On April 21, 1986, groundwater samples were collected from all four Wausau Energy monitoring wells, as well as City of Wausau monitoring well MW-1 and EPA monitoring well MW-14. Both wells are between Municipal Well No. 3 and Wausau Energy (see Figure No. 2-3). A Teflon bailer was employed for sample collection and care was taken to neither agitate nor cross contaminate the samples. Analysis for VOCs was performed by Zimpro, Inc. These results are provided in Appendix A.

Results indicate that the aromatic hydrocarbons benzene, ethylbenzene, toluene, and xylenes were present in TB-1, TB-2, and TB-5. This evaluation is presented in Table 2-1. No aromatic hydrocarbons were detected in City MW-1 or EPA MW-14.

Since benzene, ethylbenzene, toluene, and xylenes were found in the unsaturated soils samples at Wausau Energy, the Corporation may have contributed to the detection of these parameters in the groundwater. The source(s) of aromatic hydrocarbons in the

TABLE 2-1

Wausau Energy Groundwater Quality Summary
April 21, 1986

	Well					
	- Wausau Energy -				City Well	EPA Well
Parameter	TB-1	TB-2	TB-5	TB-7	No. 1	No. 14
Benzene	5.0	243	1048	x	x	x
Ethylbenzene	x	38	1150	x	x	x
Toluene	x	23	2150	x	x	x
Total Xylene	7.0	486	4273	x	x	x

Units = ug/l; X = Not Detected.

groundwater will not positively be determined, however, unless groundwater analysis is performed on monitoring wells upgradient of the Wausau Energy property. As of the date of this report, the upgradient sampling has not been done because permission could not be obtained from the Wausau Chemical Company to sample their existing monitoring wells. It is necessary to do this because past sampling of the Wausau Chemical wells has shown aromatic hydrocarbons to be present in significant concentrations.

3.0 DISCUSSION - THE FATE OF PETROLEUM CONTAMINATED GROUNDWATER AT WAUSAU ENERGY

As discussed in Section 2.2, groundwater beneath the Wausau Energy property is drawn northeasterly by City Well No. 3 and the Wergin Construction well. Available analytical data from these two wells indicate minimal contribution from aromatic hydrocarbons through June 1985. These data are summarized in Tables 3-1 and 3-2.

Toluene has been detected in both wells. Benzene was detected in the Wergin well two times. Ethylbenzene was also detected in this well. Benzene and ethylbenzene have not been detected in City Well No. 3 and xylenes have not been detected in either of the two wells.

Available data also indicate that concentrations of toluene, benzene, and xylenes have been detected in City monitoring wells MW-1, MW-6, and MW-7 and EPA MW-14 (see Figure No. 2-3 for location).

TABLE 3-1

City Well #3 - Groundwater Quality

Date	Toluene	Benzene	Ethylbenzene
07/13/82	ND	ND	ND
09/07/82	ND	ND	ND
11/30/83	ND	ND	ND
09/17/84	3.5	ND	ND
10/01/84	ND	ND	ND
10/17/84	ND	ND	ND
11/08/84	ND	ND	ND
12/11/84	ND	ND	ND
06/19/85	ND	ND	ND

NOTE: Units = ug/l; ND = Not Detected; Xylene was not detected

TABLE 3-2

Wergin Construction Well
Groundwater Quality

Date	Toluene	Benzene	Ethylbenzene
09/07/82	ND	ND	ND
08/23/84	0.3	0.2	0.4
09/17/84	2.4	ND	ND
10/01/84	2.5	ND	ND
10/17/84	1.5	ND	ND
11/08/84	3.0	1.6	ND

NOTE: Units = ug/l; ND = Not Detected; Xylene was not detected

In order to compute the rate VOC compounds would move toward City Well No. 3 from the vicinity of the Wausau Energy site, Darcy's Law (V=Ki/n) was applied using the following inputs:

K = hydraulic conductivity = 267 feet/day
(See Appendix B)

i = hydraulic gradient = 0.005 (from Figure No. 2-3)

n = porosity = 0.2 (from visual estimates)

V = flow velocity = 267 (0.005)/(0.2) = 6.7 feet/day

The approximate distance from the Wausau Energy site to City Well No. 3 is 500 feet. At 6.7 ft/day, the travel time would be approximately 75 days.

4.0 CONCLUSIONS

At the time of this report, the petroleum products detected in the soils at the Wausau Energy Corporation have not significantly impacted the groundwater quality in City Well No. 3 or the Wergin Construction Well. Because of the age of the Wausau Energy site and the rapid travel times involved, the maximum impact of the Wausau Energy site on the two wells, if any, is already being felt. Therefore, it is not likely that the impact will ever be significant.

Since petroleum product is not present on the water table, product extraction is not possible.

On-site soil removal, property capping, groundwater containment, nor groundwater pumping and treatment is necessary at Wausau Energy. Aromatic hydrocarbons held in the unsaturated soil will continue to be naturally flushed by precipitation recharge. For reasons stated above, this flushing process will not significantly impact City Well No. 3 or the Wergin Construction Well.

APPENDIX A

LABORATORY DATA

EXPLORATION TECHNOLOGY INC.

Exploration Drilling and Sampling — Diamond Rock Coring — Off Shore Drilling

1402 Emil Street P.O. Box 9404 Madison, WI 53715
Madison, WI (608) 258-9550 Milwaukee, WI (414) 224-6177

February 27, 1986

Ronald J. Ganim
Amoco Oil Company
P.O. Box 5910-A
Chicago, IL 60680

David E. Stewart
DeWitt-Sundby, Attorneys
Suite 120 Teton Wood
6515 Grand Teton Plaza
Madison, WI 53719

Re: Soil Sampling and Monitoring Well Installation
at Wausau Energy Property on Second Street
in Wausau, Wisconsin

Gentlemen:

We have completed soil borings, sampling and well installation for the referenced site in Wausau, Wisconsin. The work was performed under the direction of Mr. Dennis Beckmann of Amoco Oil.

If you have any questions or require furtner assistance, please feel free to call.

Sincerely,

EXPLORATION TECHNOLOGY INC.

Thomas F. Bendorf
Director of Marketing

RECEIVED
MAR 05 1986
DeWITT, SUNDBY...

TFB/mem

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No.: TB-1
Surface Elevation:
Job No.: 811078
Sheet: 1 of 1

1402 EARL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

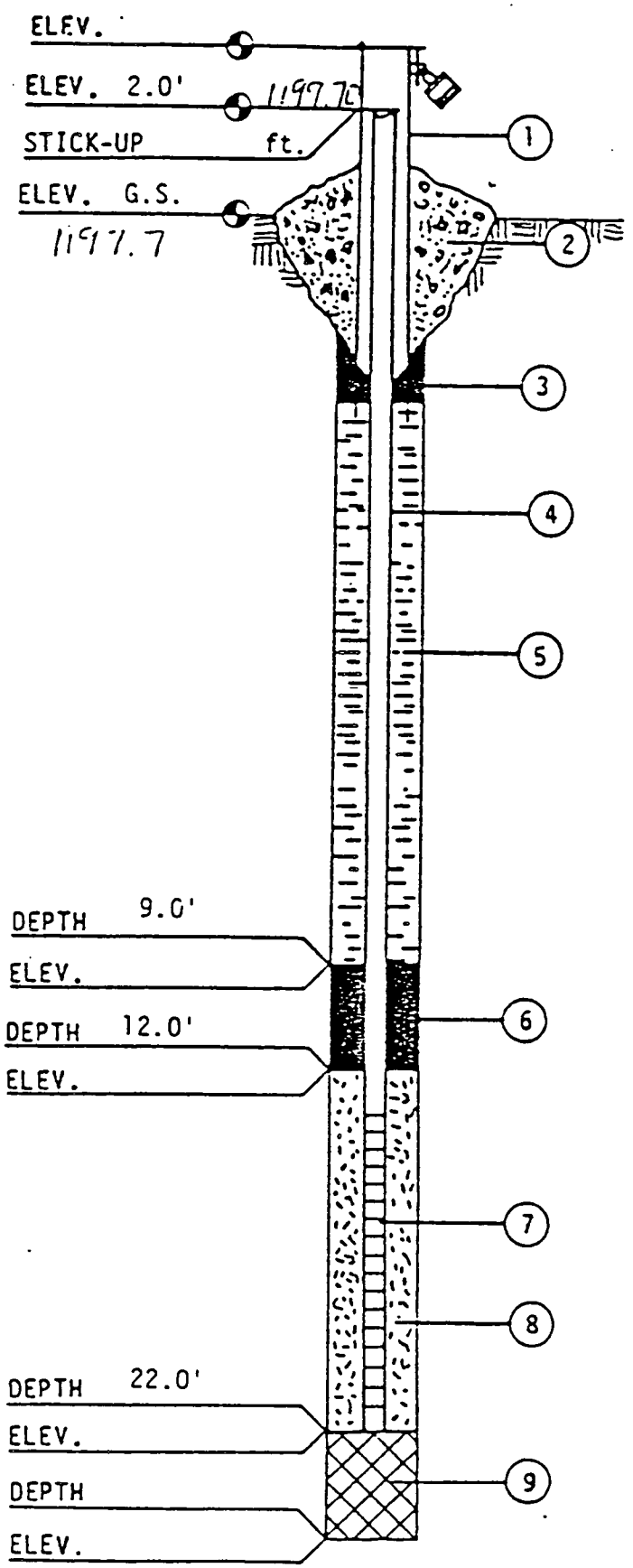
SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		Wn	W	LL	PL	D
1	SS	.5'	D	9		Red to Brown Very Coarse to Fine SAND with Gravel					
2	SS	.9'	D	46	5	Brown Very Coarse to Fine SAND with Gravel & Silt					
					10	Red to Brown Very Coarse to Fine SAND with Gravel					
3	SS	.7'	W	46	15	Gray to Brown Coarse to Fine SAND					
					20	End Boring at 22'					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling: 1/4 hour
Depth to Water: 17.0'
Depth to Cave In: 8.0'

GENERAL NOTES

Start: 2/18/86 Complete: 2/18/86
Crew Chief: LE Rig: 750
Drilling Method:



EXPLORATION TECHNOLOGY INC.

MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. 811078

BORING/WELL NO. TB-1

DATE 2/18/86

CHIEF/UNIT Larry/750

1. PROTECTIVE CASING (YES) NO
   LOCKING (YES) NO
2. CONCRETE SEAL (YES) NO
3. TYPE OF SURFACE SEAL (IF INSTALLED)
   Bentonite
4. SOLID PIPE TYPE PVC
   SOLID PIPE LENGTH 12.0 ft.
   JOINT TYPE SLIP/GLUED (THREADED)
5. TYPE OF BACKFILL Sand
   HOW INSTALLED - TREMIE (FROM SURFACE)
6. TYPE OF LOWER SEAL (IF INSTALLED)
   Bentonite
7. SCREEN TYPE PVC
   SCREEN LENGTH
   SLOT-SIZE 0.010" LENGTH 10.0 ft.
   SCREEN DIAMETER 2.0 in.
8. TYPE OF BACKFILL AROUND SCREEN
   Sand
9. TYPE OF BACKFILL -
10. DRILLING METHOD Hollow Stem Auger
11. ADDITIVES USED (IF ANY)
    -

WATER LEVEL 14.5' DATE 2/18/86

*ALL DEPTHS MEASURED FROM GROUND SURFACE.

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No. TB-2
Surface Elevation
Job No. 811078
Sheet 1 of 1

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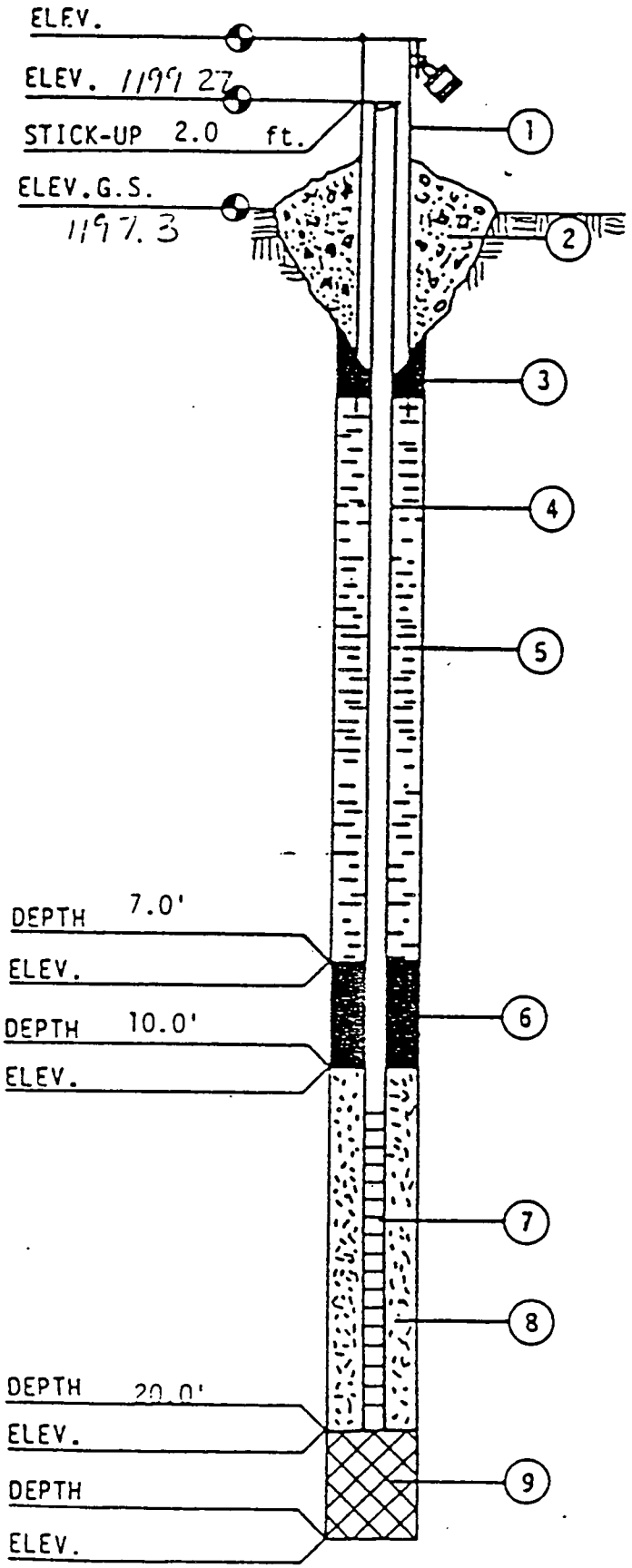
SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu	W	LL	PL	D
1	SS	.7'	M	34	5	Red to Brown Medium to Fine SAND with Gravel and Silt					
2	SS	12'	M	54	10	Red to Brown Very Coarse to Fine SAND with Gravel					
3	SS	.8'	W	100	15	Gray to Brown Coarse to Fine SAND					
					20	End Boring at 20' Well set at 20.0'					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling 1/4 hour
Depth to Water 15.0'
Depth to Cave In 10.0'

GENERAL NOTES

Start 2/18/86 Complete 2/18/86
Crew Chief L.E. Rig 750
Drilling Method



EXPLORATION TECHNOLOGY INC.

MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. 811078

BORING/WELL NO. TB-2

DATE 2/18/86

CHIEF/UNIT LE/750

1. PROTECTIVE CASING (YES) NO
   LOCKING (YES) NO
2. CONCRETE SEAL (YES) NO
3. TYPE OF SURFACE SEAL (IF INSTALLED)
   Bentonite
4. SOLID PIPE TYPE PVC
   SOLID PIPE LENGTH 10.0 ft.
   JOINT TYPE SLIP/GLUED (THREADED)
5. TYPE OF BACKFILL Sand
   HOW INSTALLED - TREMIE (FROM SURFACE)
6. TYPE OF LOWER SEAL (IF INSTALLED)
   Bentonite
7. SCREEN TYPE PVC
   SCREEN LENGTH
   SLOT-SIZE 0.010" LENGTH 10.0 ft.
   SCREEN DIAMETER in.
8. TYPE OF BACKFILL AROUND SCREEN
   Sand
9. TYPE OF BACKFILL -
10. DRILLING METHOD Hollow Stem Auger
11. ADDITIVES USED (IF ANY)
    -

WATER LEVEL 14.5' DATE 2/18/86

*ALL DEPTHS MEASURED FROM GROUND SURFACE.

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No.: TB-3
Surface Elevation:
Job No.: 811078
Sheet: 1 of 1

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SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu	W	LL	PL	D
1	SS	.9'	M	5		Red to Brown Very Coarse to Fine SAND with Silt and Gravel					
2	SS	12"	M	38	5	Red to Brown Very Coarse to Fine SAND with Gravel					
3	SS	1.1'	W	30	10	Gray to Brown Coarse to Fine SAND					
					15	End Boring at 16.5'					
					20						
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling: 1/4 hour
Depth to Water: 15.0'
Depth to Cave In: 7.0'

GENERAL NOTES

Start: 2/18/86 Complete: 2/18/86
Crew Chief: L.E. Rig: 750
Drilling Method:

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No. T8-4
Surface Elevation
Job No. 811078
Sheet 1 of 1

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SAMPLE No.	Type	Recovery ↓	Moisture ↓	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu	W	LL	PL	D
1	SS	1.1'	M	17		Red to Brown Coarse to Fine SAND with Gravel and Silt					
					5						
2	SS	1.0'	M	39		Red to Brown Very Coarse to Fine SAND with Gravel					
					10						
					15	Gray to Brown Coarse to Fine SAND					
3	SS	.8'	W	26		End Boring at 16.5'					
					20						
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling 1/4 hour
Depth to Water 15.0'
Depth to Cave In 9.3'

GENERAL NOTES

Start 2/18/86 Complete 2/18/86
Crew Chief LE Rig 750
Drilling Method

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No.: TB-5
Surface Elevation:
Job No.: 811078
Sheet: 1 of 1

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SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
1	SS	.4'	M	8		Red to Brown Very Coarse to Fine SAND with Gravel, Some Silt
2	SS	.1'	M	41	5	Red to Brown Very Coarse to Fine SAND with Gravel
3	SS	1.0'	W	29	10	Gray to Brown Very Coarse to Fine SAND
					15	End Boring at 20.5'
					20	Well set at 20.5'
					25	
					30	
					35	
					40	

SOIL PROPERTIES

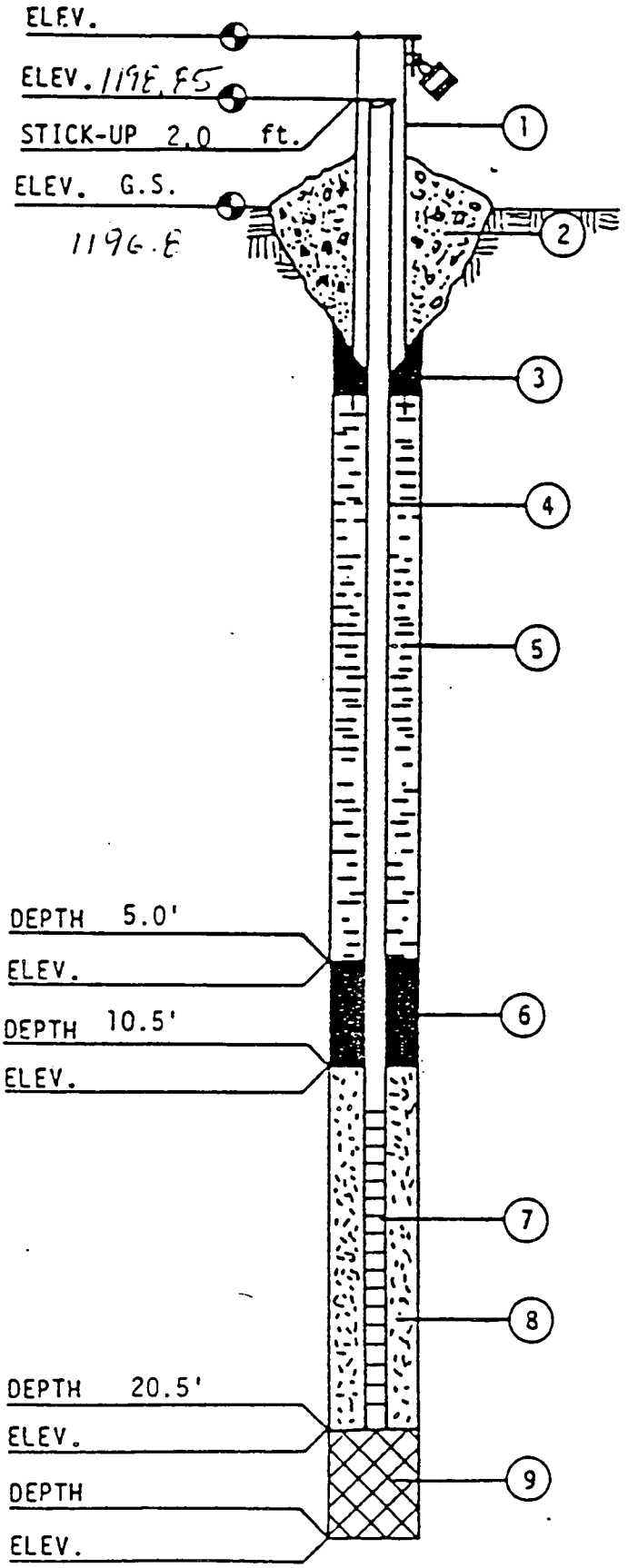
qp	W	LL	PL	D

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling: 1/4 hour
Depth to Water: 14.0'
Depth to Cave In: 8.0'

GENERAL NOTES

Start: 2/18/86 Complete: 2/18/86
Crew Chief: LE Rig: 750
Drilling Method:



EXPLORATION TECHNOLOGY INC.

MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. 811078

BORING/WELL NO. TB-5

DATE 2/18/86

CHIEF/UNIT LE/750

1. PROTECTIVE CASING (YES) NO

   LOCKING (YES) NO

2. CONCRETE SEAL (YES) NO

3. TYPE OF SURFACE SEAL (IF INSTALLED)
   Bentonite

4. SOLID PIPE TYPE PVC

   SOLID PIPE LENGTH 10.0 ft.

   JOINT TYPE SLIP/GLUED (THREADED)

5. TYPE OF BACKFILL Sand

   HOW INSTALLED - TREMIE (FROM SURFACE)

6. TYPE OF LOWER SEAL (IF INSTALLED)
   Bentonite

7. SCREEN TYPE PVC

   SCREEN LENGTH

   SLOT-SIZE 0.010" LENGTH 10.0 ft.

   SCREEN DIAMETER 2.0 in.

8. TYPE OF BACKFILL AROUND SCREEN
   Sand

9. TYPE OF BACKFILL -

10. DRILLING METHOD Hollow Stem Auger

11. ADDITIVES USED (IF ANY)
    -

WATER LEVEL 14.0' DATE 2/18/86

*ALL DEPTHS MEASURED FROM GROUND SURFACE.

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Streets
Location: Wausau, Wisconsin

Boring No.: TB-6
Surface Elevation:
Job No.: 811078
Sheet: 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL (608) 258-9550

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES
						.2' ASPHALT	
1	SS	1.3'	D	27		Red-Brown Coarse to Fine SAND with Gravel, Occasional Cobbles	
2	SS	1.0'	D	100	5		
					10		
3	SS	1.4'	W	35	15	Gray Coarse to Fine SAND with Gravel (Tip of Spoon)	
						End Boring at 17.0'	
					20		
					25		
					30		
					35		
					40		

SOIL PROPERTIES: q_u | W | LL | PL | D

WATER LEVEL OBSERVATIONS

While Drilling: 15.5'
Upon Completion of Drilling:
Time After Drilling: 1/4 hour
Depth to Water: 15.2'
Depth to Cave In: 7.3'

GENERAL NOTES

Start: 2/18/86 Complete: 2/18/86
Crew Chief: MP Rig: 45-C
Drilling Method:

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No. TB-7
Surface Elevation
Job No. 811078
Sheet 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

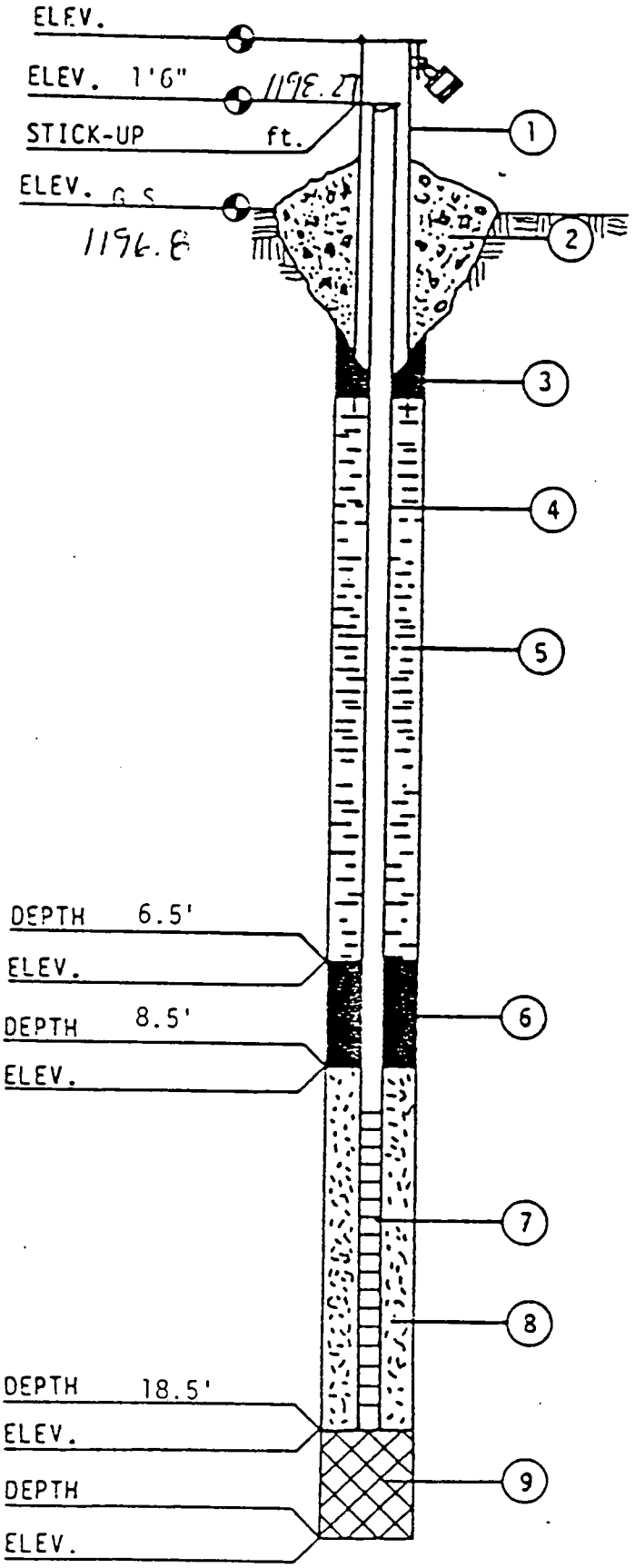
SAMPLE No.	Type	Recovery ↓	Moisture ↓	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu	W	LL	PL	D
						.3' Granite					
1	SS	.2'	D	100		Red-Brown Coarse to Fine SAND with Gravel, Occasional Cobble					
2	SS	1.7'	M	37	5	Pounding on Rock Dark Brown Coarse to Fine SAND with Some Silt, Trace Organics 4.0-4.5'					
3	SS	.5'	M	79	10						
4	SS	1.5'	W	22	15	Brown Coarse to Fine SAND, Trace Gravel					
					20	End Boring at 18.5' Well at 18.5'					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling 13.5'
Upon Completion of Drilling
Time After Drilling 1/4 hour
Depth to Water 13.5'
Depth to Cave In

GENERAL NOTES

Start 2/18/86 Complete 2/18/86
Crew Chief MP Rig 45-C
Drilling Method



EXPLORATION TECHNOLOGY INC.

MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. 811078

BORING/WELL NO. TB-7

DATE 2/18/86

CHIEF/UNIT MP/750

1. PROTECTIVE CASING (YES) NO

   LOCKING (YES) NO

2. CONCRETE SEAL (YES) NO

3. TYPE OF SURFACE SEAL (IF INSTALLED)
   Bentonite

4. SOLID PIPE TYPE PVC

   SOLID PIPE LENGTH 10.0 ft.

   JOINT TYPE SLIP/GLUED (THREADED)

5. TYPE OF BACKFILL Sand

   HOW INSTALLED - TREMIE (FROM SURFACE)

6. TYPE OF LOWER SEAL (IF INSTALLED)
   Bentonite

7. SCREEN TYPE PVC

   SCREEN LENGTH

   SLOT-SIZE 0.010" LENGTH 10.0 ft.

   SCREEN DIAMETER 2.0 in.

8. TYPE OF BACKFILL AROUND SCREEN
   Sand

9. TYPE OF BACKFILL -

10. DRILLING METHOD Hollow Stem Auger

11. ADDITIVES USED (IF ANY)
    -

WATER LEVEL 13.5' DATE 2/18/86

*ALL DEPTHS MEASURED FROM GROUND SURFACE.

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No.: TB-8
Surface Elevation:
Job No.: 311078
Sheet: 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES
						.3' GRANITE	
1	SS	.5'	D	27	5	Red Brown Coarse to Fine SAND with Gravel, Occasional Cobble	
2	SS	.4'	M	100		Black Medium to Fine Silty SAND with Some Gravel 3.0-3.5'	
3	SS	1.1'	W	29	15		
					20	End Boring at 17.0'	
					25	*Brown Coarse to Fine SAND, Trace Gravel	
					30		
					35		
					40		

SOIL PROPERTIES: No. | W | LL | PL | D

WATER LEVEL OBSERVATIONS

While Drilling: 14.5'
Upon Completion of Drilling:
Time After Drilling: 1/4 hour
Depth to Water: 14.2'
Depth to Cave In:

GENERAL NOTES

Start: 2/18/86 Complete: 2/18/86
Crew Chief: MP Rig: 45-C
Drilling Method:

ZIMPRO INC
ENVIRONMENTAL & ENERGY SYSTEMS

March 7, 1986

DeWitt, Sundby, Huggett, Schumacher & Morgan, S.C.
Attorneys at Law
Suite 120 Teton Wood
6515 Grand Teton Plaza
Madison, WI 53719

Attn: David Stewart

Re: Wausau Energy/Amoco VOC Analysis

Attached are the analytical results for samples submitted February 18 & 19, 1986 for volatile organics (VOC) analysis under the above mentioned project.

The soil samples were extracted with methanol. An aliquot of the extract was then added to a specific amount of reagent water and analyzed according to EPA Method 601, modified to use PID (9.5 eV) and Hall detectors in series. The results for the soil samples are expressed in ug/g (ppm) based on the dry weight of sample used. The results for the water samples are expressed in ug/l (ppb).

Samples TB1-3, TB2-1, TB3-1, TB3-3, and TB4-3 exhibited an interference problem. The samples had a strong fuel oil type odor. As previously discussed, the compounds contained in fuel oil can not be identified by this analytical method, but can interfere with it if they are at a high enough level. The problem occurred around toluene and ethylbenzene. The extract of sample TB4-3 was, at your request, also analyzed by EPA Method 624, a gas chromatographic/mass spectrometer (GC/MS) method, to confirm presence or absence of toluene and ethylbenzene. A qualitative identification is given on benzene, m-xylene and o & p-xylene. Quantitative results are given on toluene and ethylbenzene (Table 6). Further GC/MS work would have to be done to accurately identify the remaining contaminants present.

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474
TELEPHONE (715) 359-7211 TELEX 29-0495

The chain of custody record is also enclosed. If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie Heuser /ls
Mary C. Christie Heuser
Instrumentation Chemist

MCCH/ls

cc: Ronald J. Ganim

RECEIVED
MAR 10 1986
DeWITT, SUNDBY...

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Table 1
Wausau Energy/Amoco
VOC Analysis (ug/g)

	Detection Limit	TB1-1	TB1-2	TB1-3	TB2-1	TB2-2	TB2-3
Benzene	0.6	X	X	X	X	X	X
Bromoform	1.5	X	X	X	X	X	X
Bromomethane	3.0	X	X	X	X	X	X
Carbon Tetrachloride	0.3	X	X	X	X	X	X
Chlorobenzene	0.3	X	X	X	X	X	X
Chloroethane	3.0	X	X	X	X	X	X
2-Chloroethylvinyl Ether	6.0	X	X	X	X	X	X
Chloroform	0.3	X	X	X	X	X	X
Chloromethane	18.0	X	X	X	X	X	X
Dibromochloromethane	0.3	X	X	X	X	X	X
1,2-Dichlorobenzene	0.9	X	X	X	X	X	X
1,3-Dichlorobenzene	0.9	X	X	X	X	X	X
1,4-Dichlorobenzene	0.9	X	X	X	X	X	X
Dichlorobromomethane	0.3	X	X	X	X	X	X
1,1-Dichloroethane	0.3	X	X	X	X	X	X
1,2-Dichloroethane	0.9	X	X	X	X	X	X
1,1-Dichloroethylene	1.5	X	X	X	X	X	X
1,2-Dichloroethylene	0.9	X	X	X	X	X	X
Dichloromethane	0.6	X	X	X	X	X	X
1,2-Dichloropropane	1.5	X	X	X	X	X	X
cis-1,3-Dichloropropene	0.9	X	X	X	X	X	X
trans-1,3-Dichloropropene	3.0	X	X	X	X	X	X
Ethylbenzene	0.6	X	X	Intf.	Intf.	X	X
1,1,2,2-Tetrachloroethane	0.3	X	X	X	X	X	X
Tetrachloroethylene	0.3	X	X	X	X	X	X
Toluene	0.3	X	X	Intf.	Intf.	X	X
1,1,1-Trichloroethane	0.3	X	X	X	X	X	X
1,1,2-Trichloroethane	0.3	X	X	X	X	X	X
Trichloroethylene	0.3	X	X	X	X	X	X
Vinyl Chloride	1.5	X	X	X	X	X	X
m-Xylene	1.5	X	X	34.8	11.6	X	X
o- & p-Xylene (as o-Xylene)	1.5	X	X	86.1	37.8	2.3	X
Zimpro Analytical No.		16518	16519	16520	16521	16522	16523

X = Analyzed but not detected

Intf. = Interference

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 2
Wausau Energy/Amoco
VOC Analysis (ug/g)

	Detection Limit	TB4-1	TB5-1	TB5-3	TB6-1	TB6-3
Benzene	0.6	X	X	X	X	X
Bromoform	1.5	X	X	X	X	X
Bromomethane	3.0	X	X	X	X	X
Carbon Tetrachloride	0.3	X	X	X	X	X
Chlorobenzene	0.3	X	X	X	X	X
Chloroethane	3.0	X	X	X	X	X
2-Chloroethylvinyl Ether	6.0	X	X	X	X	X
Chloroform	0.3	X	X	X	X	X
Chloromethane	18.0	X	X	X	X	X
Dibromochloromethane	0.3	X	X	X	X	X
1,2-Dichlorobenzene	0.9	X	X	X	X	X
1,3-Dichlorobenzene	0.9	X	X	X	X	X
1,4-Dichlorobenzene	0.9	X	X	X	X	X
Dichlorobromomethane	0.3	X	X	X	X	X
1,1-Dichloroethane	0.3	X	X	X	X	X
1,2-Dichloroethane	0.9	X	X	X	X	X
1,1-Dichloroethylene	1.5	X	X	X	X	X
1,2-Dichloroethylene	0.9	X	X	X	X	X
Dichloromethane	0.6	X	X	X	X	X
1,2-Dichloropropane	1.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.9	X	X	X	X	X
trans-1,3-Dichloropropene	3.0	X	X	X	X	X
Ethylbenzene	0.6	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.3	X	X	X	X	X
Tetrachloroethylene	0.3	X	X	X	X	X
Toluene	0.3	X	X	X	X	X
1,1,1-Trichloroethane	0.3	X	X	X	X	X
1,1,2-Trichloroethane	0.3	X	X	X	X	X
Trichloroethylene	0.3	X	X	X	X	X
Vinyl Chloride	1.5	X	X	X	X	X
m-Xylene	1.5	X	X	X	X	X
o & p-Xylene (as o-Xylene)	1.5	X	X	X	X	X
Zimpro Analytical No.		16574	16577	16579	16580	16582

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 3
Wausau Energy/Amoco
VOC Analysis (ug/g)

	Detection Limit	TB7-2	TB7-3	TB7-4	TB8-1	TB8-3
Benzene	0.6	X	X	X	X	X
Bromoform	1.5	X	X	X	X	X
Bromomethane	3.0	X	X	X	X	X
Carbon Tetrachloride	0.3	X	X	X	X	X
Chlorobenzene	0.3	X	X	X	X	X
Chloroethane	3.0	X	X	X	X	X
2-Chloroethylvinyl Ether	6.0	X	X	X	X	X
Chloroform	0.3	X	X	X	X	X
Chloromethane	18.0	X	X	X	X	X
Dibromochloromethane	0.3	X	X	X	X	X
1,2-Dichlorobenzene	0.9	X	X	X	X	X
1,3-Dichlorobenzene	0.9	X	X	X	X	X
1,4-Dichlorobenzene	0.9	X	X	X	X	X
Dichlorobromomethane	0.3	X	X	X	X	X
1,1-Dichloroethane	0.3	X	X	X	X	X
1,2-Dichloroethane	0.9	X	X	X	X	X
1,1-Dichloroethylene	1.5	X	X	X	X	X
1,2-Dichloroethylene	0.9	X	X	X	X	X
Dichloromethane	0.6	X	X	X	X	X
1,2-Dichloropropane	1.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.9	X	X	X	X	X
trans-1,3-Dichloropropene	3.0	X	X	X	X	X
Ethylbenzene	0.6	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.3	X	X	X	X	X
Tetrachloroethylene	0.3	8.6	X	X	X	X
Toluene	0.3	X	X	X	X	X
1,1,1-Trichloroethane	0.3	X	X	X	X	X
1,1,2-Trichloroethane	0.3	X	X	X	X	X
Trichloroethylene	0.3	X	X	X	X	X
Vinyl Chloride	1.5	X	X	X	X	X
m-Xylene	1.5	X	X	X	X	X
o & p-Xylene (as o-Xylene)	1.5	X	X	X	X	X
Zimpro Analytical No.		16524	16525	16526	16583	16585

X = Analyzed but not detected

APPENDIX L

GROUNDWATER FLOW MODEL

Foth & Van Dyke
Green Bay, Wisconsin

CLIENT: Wausau Energy DATE: 6-23-86
PROJECT: BY: BNP
PROJECT NO.: PAGE NO.: 1 OF 2
COMPUTED BY: DATE: REVIEWED BY: DATE:
CHECKED BY: DATE: APPROVED BY: DATE:

Travel Time Calculation

$t = \frac{D}{V}$, and $V = \frac{Ki}{n}$, so $t = \frac{Dn}{Ki}$, where

t = travel time = ?
D = travel distance = 500 feet (from Figure No. 2-3)
V = flow velocity = ?
K = hydraulic conductivity = ?
i = hydraulic gradient = ±0.005 (from Figure No. 2-3)
n = porosity = 0.2 (visual estimate)

In order to calculate t, V must first be determined. Figure No. 2-3 is a water table configuration measured on April 21, 1986. According to City of Wausau personnel, the rates at which City Well 3 and City Well 4 were pumping at that time were 2.246 mgd and 2.016 mgd, respectively.

Using PLASM a 20×20 grid was set up with City Well 3 assigned to Node 7,4 and Well 4 to Node 3,18. The Wisconsin River was set into nodes 1,1 through 1,20. Default values were assigned as follows: T = 200,000gpd, S = 1×10^{-5}, head = 1185.5 (W.S. River elevation), Q = 0. Wisconsin River nodes were assigned S values of 1×10^{21} to fix the head, and the

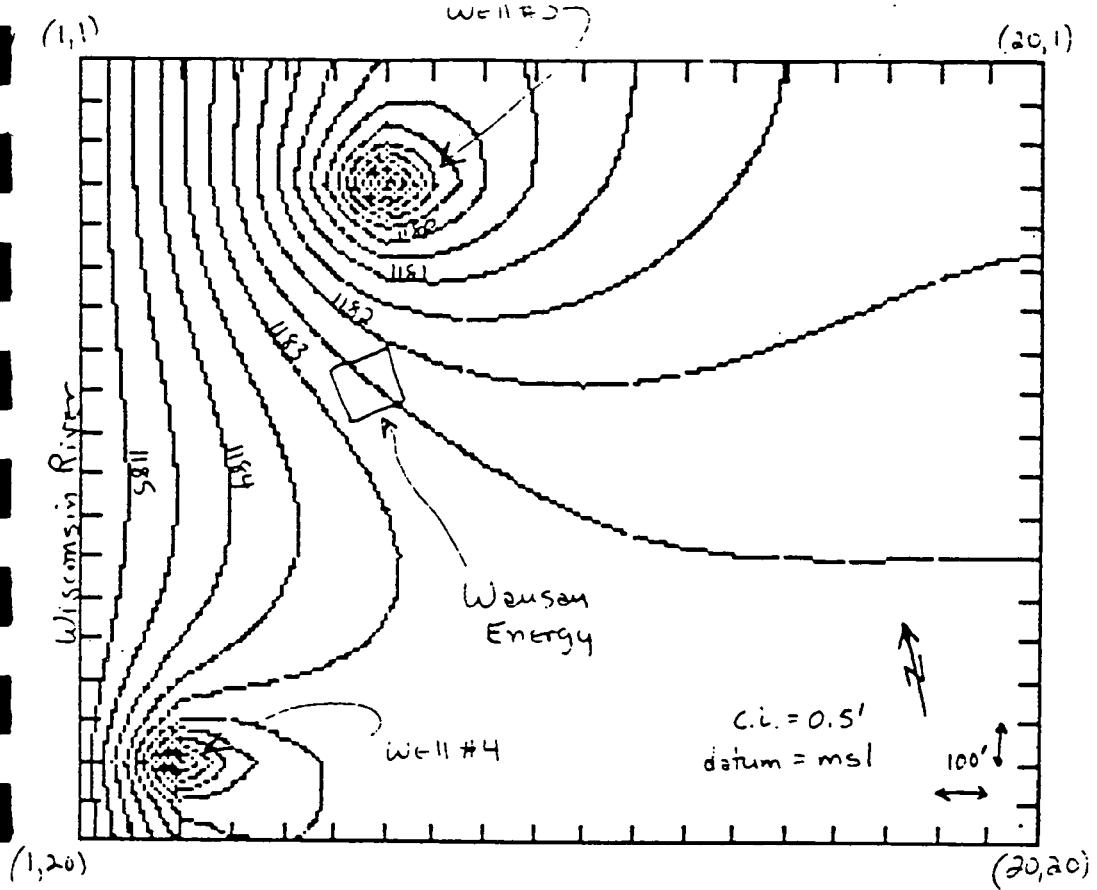
Q's at the Well 3 and 4 nodes were changed to represent their respective rates. One time step with a length of 1×10^{10} days was selected, which, in combination with the default S of 1×10^{-5} lead to the steady-state solution.

Several runs were made with T values ranging from 100,000 gpd/ft to 1,000,000 gpd/ft. With T = 200,000 gpd/ft the match with Figure No. 2-3 was quite good. Thus, dividing 200,000 gpd/ft by the assumed aquifer thickness, 100 feet*, a hydraulic conductivity, K, of 2000 gpd/ft^2 = 9.4×10^{-2} cm/sec = 267 ft/day was calculated.

Thus to compute travel time, t:

$$t = \frac{(500 \text{ feet})(0.2)}{(267 \text{ feet/day})(0.005)} = 75 \text{ days}$$

* Based on bedrock topography information (Weston, 1985)



PLASM computer run simulating water table conditions shown in Figure No. 2-3. See attached notes for input parameters.

Final Head Values

Wausau Energy Flow Modeling

June 23, 1986

(1,1)

1185.5	1184.5	1183.6	1182.6	1181.7	1181.0	1180.4	1180.3	1180.4	1180.6	1180.8	1181.0	1181.2	1181.4	1181.5	1181.6	1181.7	1181.8	1181.8	1181.8
1185.5	1184.5	1183.6	1182.6	1181.6	1180.7	1180.1	1180.0	1180.2	1180.5	1180.8	1181.0	1181.2	1181.4	1181.5	1181.6	1181.7	1181.8	1181.8	1181.8
1185.5	1184.5	1183.6	1182.5	1181.4	1180.2	1179.1	1179.5	1180.1	1180.5	1180.8	1181.1	1181.3	1181.4	1181.6	1181.7	1181.8	1181.8	1181.9	1181.9
1185.5	1184.6	1183.6	1182.5	1181.3	1179.6	1176.5	1179.0	1180.0	1180.5	1180.9	1181.1	1181.3	1181.5	1181.6	1181.7	1181.8	1181.9	1181.9	1181.9
1185.5	1184.6	1183.7	1182.7	1181.7	1180.5	1179.4	1179.9	1180.4	1180.8	1181.1	1181.3	1181.5	1181.6	1181.7	1181.8	1181.9	1181.9	1182.0	1182.0
1185.5	1184.7	1183.9	1183.0	1182.2	1181.4	1180.8	1180.7	1180.9	1181.1	1181.3	1181.5	1181.6	1181.7	1181.8	1181.9	1181.9	1182.0	1182.0	1182.0
1185.5	1184.8	1184.0	1183.3	1182.6	1182.0	1181.6	1181.4	1181.4	1181.5	1181.6	1181.7	1181.8	1181.8	1181.9	1182.0	1182.0	1182.1	1182.1	1182.1
1185.5	1184.8	1184.2	1183.5	1183.0	1182.5	1182.1	1181.9	1181.8	1181.8	1181.8	1181.9	1181.9	1182.0	1182.0	1182.1	1182.1	1182.1	1182.2	1182.2
1185.5	1184.9	1184.3	1183.7	1183.2	1182.8	1182.5	1182.2	1182.1	1182.1	1182.0	1182.0	1182.1	1182.1	1182.1	1182.2	1182.2	1182.2	1182.2	1182.2
1185.5	1184.9	1184.4	1183.9	1183.4	1183.0	1182.7	1182.5	1182.4	1182.3	1182.2	1182.2	1182.2	1182.2	1182.2	1182.3	1182.3	1182.3	1182.3	1182.3
1185.5	1185.0	1184.4	1184.0	1183.5	1183.2	1182.9	1182.7	1182.5	1182.4	1182.4	1182.3	1182.3	1182.3	1182.3	1182.3	1182.4	1182.4	1182.4	1182.4
1185.5	1185.0	1184.4	1184.0	1183.6	1183.3	1183.0	1182.8	1182.7	1182.6	1182.5	1182.5	1182.4	1182.4	1182.4	1182.4	1182.4	1182.4	1182.4	1182.4
1185.5	1184.9	1184.4	1183.9	1183.6	1183.3	1183.1	1182.9	1182.7	1182.7	1182.6	1182.5	1182.5	1182.5	1182.5	1182.5	1182.5	1182.5	1182.5	1182.5
1185.5	1184.8	1184.3	1183.8	1183.5	1183.2	1183.0	1182.9	1182.8	1182.7	1182.7	1182.6	1182.6	1182.6	1182.6	1182.6	1182.6	1182.6	1182.6	1182.6
1185.5	1184.7	1184.0	1183.6	1183.3	1183.1	1183.0	1182.9	1182.8	1182.7	1182.7	1182.7	1182.6	1182.6	1182.6	1182.6	1182.6	1182.6	1182.6	1182.6
1185.5	1184.4	1183.5	1183.1	1183.0	1182.9	1182.9	1182.8	1182.8	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.6	1182.6	1182.6	1182.6	1182.6
1185.5	1183.9	1182.4	1182.5	1182.6	1182.7	1182.7	1182.8	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7
1185.5	1183.3	1179.9	1181.7	1182.3	1182.6	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7
1185.5	1183.8	1182.2	1182.2	1182.4	1182.5	1182.6	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7
1185.5	1184.1	1182.9	1182.6	1182.5	1182.5	1182.6	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7	1182.7

(1,20)

(20,1

(20,2

T = 200,000 gpd/ft; S = 0.2; Well #3 Q = 2.246mgd; Well #4 Q = 2.016mgd;
Initial Head = 1185.5 msl

1185.5 1184.5 1183.6 1182.6 1181.6 1180.7 1180.1 1180.0 1180.2 1180.5 1180.8 11
81.0 1181.2 1181.4 1181.5 1181.6 1181.7 1181.8 1181.8 1181.8
1185.5 1184.5 1183.6 1182.5 1181.4 1180.2 1179.1 1179.5 1180.1 1180.5 1180.8 11
81.1 1181.3 1181.4 1181.6 1181.7 1181.8 1181.8 1181.9 1181.9
1185.5 1184.6 1183.6 1182.5 1181.3 1179.6 1176.5 1179.0 1180.0 1180.5 1180.9 11
81.1 1181.3 1181.5 1181.6 1181.7 1181.8 1181.9 1181.9 1181.9
1185.5 1184.6 1183.7 1182.7 1181.7 1180.5 1179.4 1179.9 1180.4 1180.8 1181.1 11
81.3 1181.5 1181.6 1181.7 1181.8 1181.9 1181.9 1181.9 1182.0
1185.5 1184.7 1183.9 1183.0 1182.2 1181.4 1180.8 1180.7 1180.9 1181.1 1181.3 11
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INTERACTIVE MICROCOMPUTER PLASM

0 INPUT DATA PRINTOUT

System of units ;used = ENGLISH (gal-day-ft)
umber of time steps= 1
Initial time step= 1E+10 days
umber of rows and columns= 20 20
istance between rows= 100
Distance between columns= 100
llowed error in head between iteration= 4

INITIAL HEAD

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STORAGE FACTOR

0.7E+26	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00
0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00
0.7E+26	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00
0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00
0.7E+26	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00
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0.7E+26	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00
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0.7E+26	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00	0.7E+00
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ITER - 54 ERROR - 8.901367 TIME - 1E+10
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11[redacted].5 1184.8 1184.2 1183.5 1183.0 1182.5 1182.1 1181.9 1181.8 1181.8 1181.8 11
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1[redacted]5.5 1184.9 1184.4 1183.9 1183.4 1183.0 1182.7 1182.5 1182.4 1182.3 1182.2 11
[redacted] 1182.2 1182.2 1182.2 1182.3 1182.3 1182.3 1182.3 1182.3
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[redacted] 1182.3 1182.3 1182.3 1182.3 1182.4 1182.4 1182.4 1182.4
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[redacted] 1182.4 1182.4 1182.4 1182.4 1182.4 1182.4 1182.4 1182.4
118[redacted].5 1184.9 1184.4 1183.9 1183.6 1183.3 1183.1 1182.9 1182.7 1182.7 1182.6 11
[redacted] 1182.5 1182.5 1182.5 1182.5 1182.5 1182.5 1182.5 1182.5
1 [redacted].5 1184.8 1184.3 1183.8 1183.5 1183.2 1183.0 1182.9 1182.8 1182.7 1182.7 11
[redacted] 1182.6 1182.6 1182.6 1182.6 1182.6 1182.6 1182.6 1182.6
1185.5 1184.7 1184.0 1183.6 1183.3 1183.1 1183.0 1182.9 1182.8 1182.7 1182.7 11
[redacted] 1182.6 1182.6 1182.6 1182.6 1182.6 1182.6 1182.6 1182.6
1[redacted].5 1184.4 1183.5 1183.1 1183.0 1182.9 1182.9 1182.8 1182.8 1182.7 1182.7 11
[redacted] 1182.7 1182.7 1182.7 1182.6 1182.6 1182.6 1182.6 1182.6
1 [redacted]5.5 1183.9 1182.4 1182.5 1182.6 1182.7 1182.7 1182.8 1182.7 1182.7 1182.7 11
[redacted] 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7
118[redacted].5 1183.3 1179.9 1181.7 1182.3 1182.6 1182.7 1182.7 1182.7 1182.7 1182.7 11
[redacted] 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7
[redacted]5.5 1183.8 1182.2 1182.2 1182.4 1182.5 1182.6 1182.7 1182.7 1182.7 1182.7 11
[redacted] 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7 1182.7
1185.5 1184.1 1182.9 1182.6 1182.5 1182.5 1182.6 1182.7 1182.7 1182.7 1182.7 11
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[redacted] [redacted] ratio for output device is 1.2

[redacted] [redacted] ratio for output device is 1.2

L[redacted]BEING CONTOURED IS:headd1.dat

[redacted] y Mean is: 1182.527
[redacted] Maximum is: 1185.5 At Coordinates I= 0 J= 0
ray Minimum is: 1176.463 At Coordinates I= 7 J= 4
ray NC= 20 And NR= 20

Dave Wausau 8/4 NRG

1. NR 140 standards must be met unless they are proven Tech. + economically unfeasable (Benzene 0.68 ppb)

2. They must determine their impact on wells 3 + 4. Well 4 has been used with well 3 off.

3. Have you sent Margret G. a copy?

Bill D.

5.0 RECOMMENDATIONS

As a result of this preliminary investigation, no remedial action is suggested at this time. The following recommendations are, however, presented:

1. A well upgradient of the Wausau Energy property, such as Wausau Chemical's MW-5A, should be sampled for Priority Pollutant VOCs.

2. Aromatic hydrocarbon monitoring should be included in the VOC monitoring of City Well No. 3, the Wergin Well, City monitoring well MW-6, and EPA MW-14.

3. If aromatic hydrocarbon concentrations show a rising trend toward significant levels, an additional monitoring well(s) should be installed in order to ascertain the source of the contamination.

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 4
Wausau Energy/Amoco
VOC Analysis (ug/g)

	Detection Limit	TB3-1	TB3-3	TB4-3
Benzene	1.8	X	X	11.5
Bromoform	4.5	X	X	X
Bromomethane	9.0	X	X	X
Carbon Tetrachloride	0.9	X	X	X
Chlorobenzene	0.9	X	X	X
Chloroethane	9.0	X	X	X
2-Chloroethylvinyl Ether	18.0	X	X	X
Chloroform	0.9	X	X	X
Chloromethane	54.0	X	X	X
Dibromochloromethane	0.9	X	X	X
1,2-Dichlorobenzene	2.7	X	X	X
1,3-Dichlorobenzene	2.7	X	X	X
1,4-Dichlorobenzene	2.7	X	X	X
Dichlorobromomethane	0.9	X	X	X
1,1-Dichloroethane	0.9	X	X	X
1,2-Dichloroethane	2.7	X	X	X
1,1-Dichloroethylene	4.5	X	X	X
1,2-Dichloroethylene	2.7	X	X	X
Dichloromethane	1.8	X	X	X
1,2-Dichloropropane	4.5	X	X	X
cis-1,3-Dichloropropene	2.7	X	X	X
trans-1,3-Dichloropropene	9.0	X	X	X
Ethylbenzene	1.8	Intf.	Intf.	Intf.
1,1,2,2-Tetrachloroethane	0.9	X	X	X
Tetrachloroethylene	0.9	X	X	X
Toluene	0.9	Intf.	Intf.	Intf.
1,1,1-Trichloroethane	0.9	X	X	X
1,1,2-Trichloroethane	0.9	X	X	X
Trichloroethylene	0.9	X	X	X
Vinyl Chloride	4.5	X	X	X
m-Xylene	4.5	55.0	115.	163.
o & p-Xylene (as o-Xylene)	4.5	250.	175.	294.
Zimpro Analytical No.		16571	16573	16576

X = Analyzed but not detected

Intf. = Interference

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 5
Wausau Energy/Amoco
VOC Analysis (ug/l)

	Detection Limit	Distilled Water	Tap Water	Trip Blank
Benzene	Ø.2	X	X	X
Bromoform	Ø.5	X	X	X
Bromomethane	1.Ø	X	X	X
Carbon Tetrachloride	Ø.1	X	X	X
Chlorobenzene	Ø.1	X	X	X
Chloroethane	1.Ø	X	X	X
2-Chloroethylvinyl Ether	2.Ø	X	X	X
Chloroform	Ø.1	X	X	X
Chloromethane	6.Ø	X	X	X
Dibromochloromethane	Ø.1	X	X	X
1,2-Dichlorobenzene	Ø.3	X	X	X
1,3-Dichlorobenzene	Ø.3	X	X	X
1,4-Dichlorobenzene	Ø.3	X	X	X
Dichlorobromomethane	Ø.1	X	X	X
1,1-Dichloroethane	Ø.1	X	X	X
1,2-Dichloroethane	Ø.3	X	X	X
1,1-Dichloroethylene	Ø.5	X	X	X
1,2-Dichloroethylene	Ø.3	X	X	X
Dichloromethane	Ø.2	Ø.9	X	X
1,2-Dichloropropane	Ø.5	X	X	X
cis-1,3-Dichloropropene	Ø.3	X	X	X
trans-1,3-Dichloropropene	1.Ø	X	X	X
Ethylbenzene	Ø.2	X	X	X
1,1,2,2-Tetrachloroethane	Ø.1	X	X	X
Tetrachloroethylene	Ø.1	Ø.2	X	X
Toluene	Ø.1	X	Ø.4	X
1,1,1-Trichloroethane	Ø.1	Ø.3	Ø.3	Ø.3
1,1,2-Trichloroethane	Ø.1	X	X	X
Trichloroethylene	Ø.1	X	X	X
Vinyl Chloride	Ø.5	X	X	X
m-Xylene	Ø.5	X	X	X
o & p-Xylene (as o-Xylene)	Ø.5	X	2.Ø	X
Zimpro Analytical No.		16586	16587	16588

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 6

Wausau Energy/Amoco
GC/MS VOC Analysis (ug/g)

	TB4-3	Detection Limit
Benzene	Positive	-
Ethylbenzene	35.2	7.6
Toluene	X	7.6
m-Xylene	Positive	-
o & p-Xylene	Positive	-
Analytical No.	16576	

CHAIN OF CUSTODY RECORD

PROJECT NO | PROJECT NAME: Wausau Energy

SAMPLERS (Signature)

STA. NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	REMARKS - Empro Analytical No.
	2/18				TB8 Sample 1		~~Empro~~ 16583
					" " 2		16584
					" " 3		16585
					TB5 " 1		16577
					" " 2		16578
					TB6 " 3		16582
					4 " 3		16576
					6 " 1		16580
					6 " 2		16581
					4 " 2		16575
					4 " 1		16574
					3 " 2		16572
					3 " 1		16571
					3 " 3		16573
					5 " 3		16579

Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	2/19/86 1330	Mary C. Christe Heiser			
Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

CHAIN OF CUSTODY RECORD

PROJ NO | PROJECT NAME: Wausau Energy

SAMPLERS (Signature)

STA. NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	REMARKS
	1/28				Water Sample Top		Empro Analytical No. 16588
					Top		16587
					Distilled		16586

Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	2-19-86 1320	Mary C Christie Hess			
Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

CHAIN OF CUSTODY RECORD

PROJ NO: | PROJECT NAME: Wausau Energy

SAMPLERS (Signature): Thomas Bankroff

STA. NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	VOC's	REMARKS: Zimpro Analytical No.
	2/18				TB 1 Sample 1			16518
	"				TB #1 " 2			16519
	"				TB #1 " 3			16520
	"				TB 1 Sample 2			16524
	"				TB 1 " 3			16525
	"				TB 1 " 4			16526
	"				TB 2 " 1			16521
	"				TB 2 " 2			16522
	"				TB 2 " 3			16523

Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Thomas Bankroff	2/18 1:00 pm	Mary C. Christie Heron			
Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

April 30, 1986

Fred Doran
Foth & VanDyke Engineers, Inc.
2737 S. Ridge Rd.
P.O. Box 11997
Green Bay, WI 54307-1997

Dear Mr. Doran:

Attached are the VOC results for samples taken April 21, 1986 at the Wausau Energy site. The analysis was done by EPA Method 601 with PID (9.5 eV) and Hall detectors in series. The soil samples were extracted with methanol prior to analysis via EPA Method 601. The results for the soil samples are expressed in ug/g or ppm based on the dry weight of the sample.

If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie Heuser

Mary C. Christie Heuser
Instrumentation Chemist

MCCH/ls

cc: J.W. Barr
J.R. Salkowski

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

	Detection Limit	TB-1 4-21-86	TB-2 4-21-86
Benzene	2.0	5.0	243.
Bromoform	5.0	X	X
Bromomethane	10.0	X	X
Carbon Tetrachloride	1.0	X	X
Chlorobenzene	1.0	X	X
Chloroethane	10.0	X	X
2-Chloroethylvinyl Ether	20.0	X	X
Chloroform	1.0	X	X
Chloromethane	60.0	X	X
Dibromochloromethane	1.0	X	X
1,2-Dichlorobenzene	3.0	X	X
1,3-Dichlorobenzene	3.0	X	X
1,4-Dichlorobenzene	3.0	X	X
Dichlorobromomethane	1.0	X	X
1,1-Dichloroethane	1.0	X	X
1,2-Dichloroethane	3.0	6.0	X
1,1-Dichloroethylene	5.0	X	X
1,2-Dichloroethylene	3.0	X	X
Dichloromethane	2.0	X	X
1,2-Dichloropropane	5.0	X	X
cis-1,3-Dichloropropene	3.0	X	X
trans-1,3-Dichloropropene	10.0	X	X
Ethylbenzene	2.0	X	38.
1,1,2,2-Tetrachloroethane	1.0	X	X
Tetrachloroethylene	1.0	130.	51.
Toluene	1.0	X	23.
1,1,1-Trichloroethane	1.0	X	X
1,1,2-Trichloroethane	1.0	X	X
Trichloroethylene	1.0	7.0	2.0
Vinyl Chloride	5.0	X	X
Trichlorofluoromethane	2.0	X	X
Dichlorodifluoromethane	20.0	X	X
m-Xylene	5.0	X	29.
o & p-Xylene (as o-Xylene)	5.0	7.0	457.
Zimpro Analytical No.		17757	17758

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

TB 5

	Detection Limit	4-21-86
Benzene	5.0	1,048.
Bromoform	12.5	X
Bromomethane	25.0	X
Carbon Tetrachloride	2.5	X
Chlorobenzene	2.5	X
Chloroethane	25.0	X
2-Chloroethylvinyl Ether	50.0	X
Chloroform	2.5	X
Chloromethane	150.0	X
Dibromochloromethane	2.5	X
1,2-Dichlorobenzene	7.5	X
1,3-Dichlorobenzene	7.5	X
1,4-Dichlorobenzene	7.5	X
Dichlorobromomethane	2.5	X
1,1-Dichloroethane	2.5	X
1,2-Dichloroethane	7.5	X
1,1-Dichloroethylene	12.5	X
1,2-Dichloroethylene	7.5	X
Dichloromethane	5.0	X
1,2-Dichloropropane	12.5	X
cis-1,3-Dichloropropene	7.5	X
trans-1,3-Dichloropropene	25.0	X
Ethylbenzene	5.0	1,150.
1,1,2,2-Tetrachloroethane	2.5	X
Tetrachloroethylene	2.5	7.5
Toluene	2.5	2,150.
1,1,1-Trichloroethane	2.5	X
1,1,2-Trichloroethane	2.5	X
Trichloroethylene	2.5	7.5
Vinyl Chloride	12.5	X
Trichlorofluoromethane	5.0	X
Dichlorodifluoromethane	50.0	X
m-Xylene	12.5	1,298.
o & p-Xylene (as o-Xylene)	12.5	2,975.

Zimpro Analytical No. 17759

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

TB 7

	Detection Limit	4-21-86
Benzene	1.0	X
Bromoform	2.5	X
Bromomethane	5.0	X
Carbon Tetrachloride	0.5	X
Chlorobenzene	0.5	X
Chloroethane	5.0	X
2-Chloroethylvinyl Ether	10.0	X
Chloroform	0.5	X
Chloromethane	30.0	X
Dibromochloromethane	0.5	X
1,2-Dichlorobenzene	1.5	X
1,3-Dichlorobenzene	1.5	X
1,4-Dichlorobenzene	1.5	X
Dichlorobromomethane	0.5	X
1,1-Dichloroethane	0.5	X
1,2-Dichloroethane	1.5	X
1,1-Dichloroethylene	2.5	X
1,2-Dichloroethylene	1.5	X
Dichloromethane	1.0	X
1,2-Dichloropropane	2.5	X
cis-1,3-Dichloropropene	1.5	X
trans-1,3-Dichloropropene	5.0	X
Ethylbenzene	1.0	X
1,1,2,2-Tetrachloroethane	0.5	X
Tetrachloroethylene	0.5	132.
Toluene	0.5	X
1,1,1-Trichloroethane	0.5	2.4
1,1,2-Trichloroethane	0.5	X
Trichloroethylene	0.5	9.9
Vinyl Chloride	2.5	X
Trichlorofluoromethane	1.0	X
Dichlorodifluoromethane	10.0	X
Zimpro Analytical No.		17760

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

	Detection Limit	City MW-1 4-21-86	EPA-14 4-21-86
Benzene	0.2	X	X
Bromoform	0.5	X	X
Bromomethane	1.0	X	X
Carbon Tetrachloride	0.1	X	X
Chlorobenzene	0.1	X	X
Chloroethane	1.0	X	X
2-Chloroethylvinyl Ether	2.0	X	X
Chloroform	0.1	X	X
Chloromethane	6.0	X	X
Dibromochloromethane	0.1	X	X
1,2-Dichlorobenzene	0.3	X	X
1,3-Dichlorobenzene	0.3	X	X
1,4-Dichlorobenzene	0.3	X	X
Dichlorobromomethane	0.1	X	X
1,1-Dichloroethane	0.1	X	X
1,2-Dichloroethane	0.3	X	X
1,1-Dichloroethylene	0.5	X	X
1,2-Dichloroethylene	0.3	X	X
Dichloromethane	0.2	X	X
1,2-Dichloropropane	0.5	X	X
cis-1,3-Dichloropropene	0.3	X	X
trans-1,3-Dichloropropene	1.0	X	X
Ethylbenzene	0.2	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X
Tetrachloroethylene	0.1	X	X
Toluene	0.1	X	X
1,1,1-Trichloroethane	0.1	X	X
1,1,2-Trichloroethane	0.1	X	X
Trichloroethylene	0.1	X	X
Vinyl Chloride	0.5	X	X
Trichlorofluoromethane	0.2	X	X
Dichlorofluoromethane	2.0	X	X
m-Xylene	0.5	X	X
o & p-Xylene (as o-Xylene)	0.5	X	X
Zimpro Analytical No.		17761	17762

X = Analyzed but not detected

APPENDIX A.2

VOC GROUNDWATER INVESTIGATION AT THE FORMER WAUSAU ENERGY FACILITY IN WAUSAU, WISCONSIN, FOTH & VAN DYKE, 1986

VOC GROUNDWATER INVESTIGATION

AT THE

FORMER WAUSAU ENERGY FACILITY

IN

WAUSAU, WISCONSIN

Prepared for:

WAUSAU ENERGY CORPORATION

Prepared by:

FOTH & VAN DYKE and Associates, Inc.

December, 1986

FOTH & VAN DYKE

Waste/Energy Division
2737 S. Ridge Road
P. O. Box 11997
Green Bay, WI 54307-1997
414/497-0902

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1986

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4.0	DISCUSSION OF VOC CONTAMINATION	9
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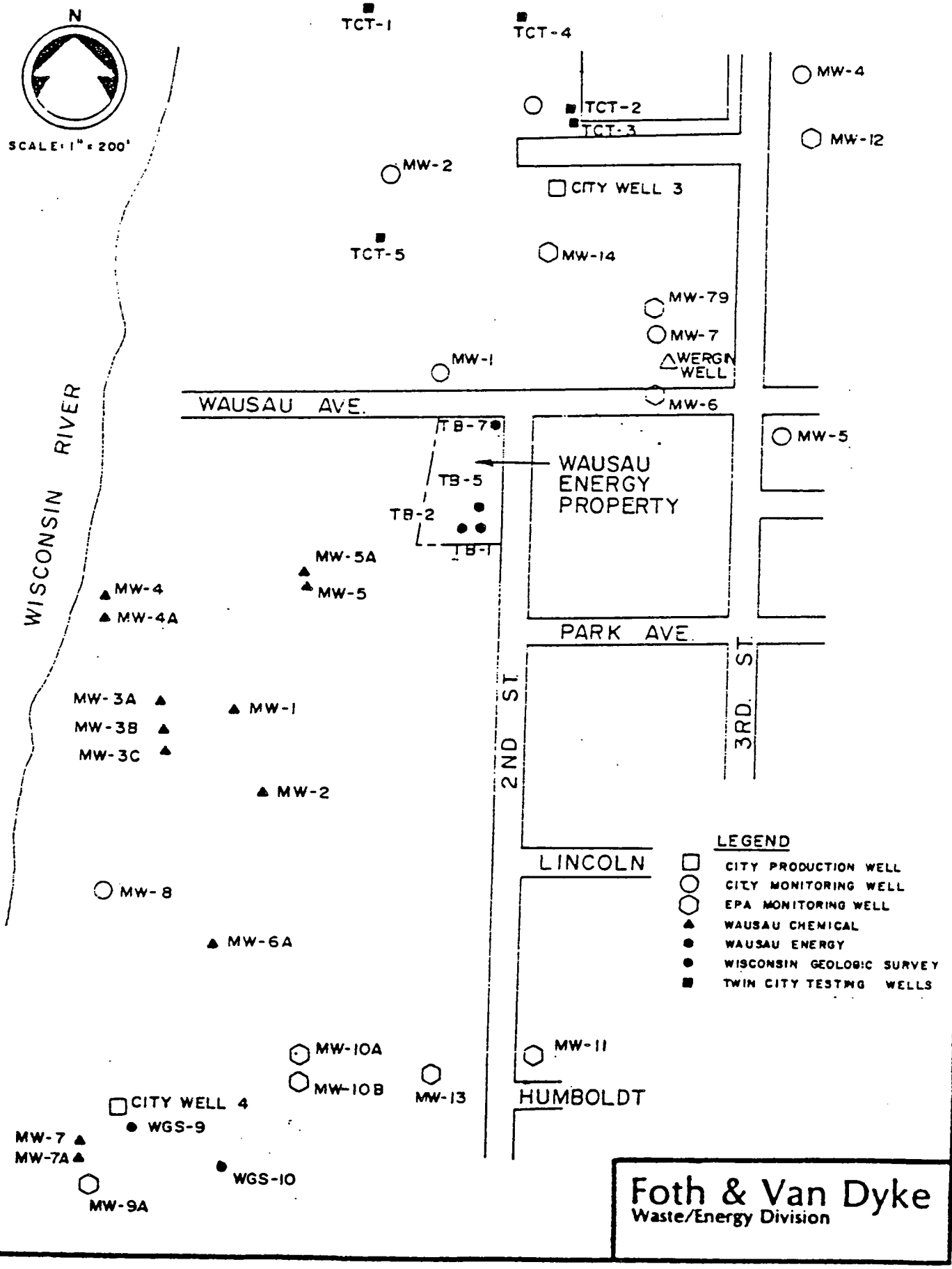
APPENDIX A	Boring Logs and Analytical Results, Field Activity of February 18, 1986
APPENDIX B	Analytical Results, Field Activity of April 21, 1986
APPENDIX C	Analytical Results, Field Activity of May 1, 1986

1.0 INTRODUCTION

This report summarizes the volatile organic compound (VOC) investigation that Foth & Van Dyke has conducted for the Wausau Energy Corporation in Wausau, Wisconsin. The U. S. Environmental Protection Agency (USEPA) has named Wausau Energy a Potentially Responsible Party (PRP) in the Wausau Groundwater Superfund case, presumably as a contributor to the VOC contamination of City of Wausau Wells No. 3 and 4 (see Figure No. 1-1). The goal of this study was to determine the responsibility of Wausau Energy, if any, for this VOC contamination.

FIGURE NO. 1-1

MONITORING WELL LOCATIONS IN THE VICINITY OF WAUSAU ENERGY



Foth & Van Dyke
Waste/Energy Division

2.0 BACKGROUND INFORMATION

The Wausau Energy property was used in the past as a petroleum bulk storage and distribution center. Tanks were located to the south of the building (see Figure No. 2-1), and a trailer, used for the licensed collection of drummed waste oils, was occasionally parked on the north side of the building. The tanks and piping were drained, dismantled, and removed off-site during the summer of 1984 and the site is currently inactive.

During the early 1980's, VOC contamination was discovered in City Well No. 3 and a non-potable supply well owned by the Wergin Construction Company (see Figure No. 1-1 for location). According to available data, dichloroethylene (DCE) values ranged from 3 to 110 ug/l, trichloroethylene (TCE) values from 2 to 210 ug/l, and tetrachloroethylene (PCE) values from 0.6 to 100 ug/l in samples collected from Well No. 3. These concentrations are above groundwater quality Enforcement Standards (State of Wisconsin NR-140). As of November 1984, however, PCE and DCE that previously occurred at high concentrations, had diminished to trace levels, while TCE concentrations have generally remained in the 100-200 ug/l range. In the Wergin Construction Company Well, DCE values ranged from 7 to 2090 ug/l, TCE values ranged from 4 to 230 ug/l, and PCE values ranged from 45 to 800 ug/l. As of November 1984, concentrations have also been declining in this well. Previous studies in the region (Weston, 1985 and Foth & Van Dyke, 1986) have determined that City Well No. 3 and the Wergin Well are downgradient from the Wausau Energy property.

The Wisconsin Department of Natural Resources (WDNR) collected a surface soil sample in the fall of 1985 from the point indicated on Figure No. 2-1. VOC analytical results indicated the presence of PCE which the USEPA considered to be sufficient evidence to include Wausau Energy on its PRP list for the Wausau groundwater CERCLA case.

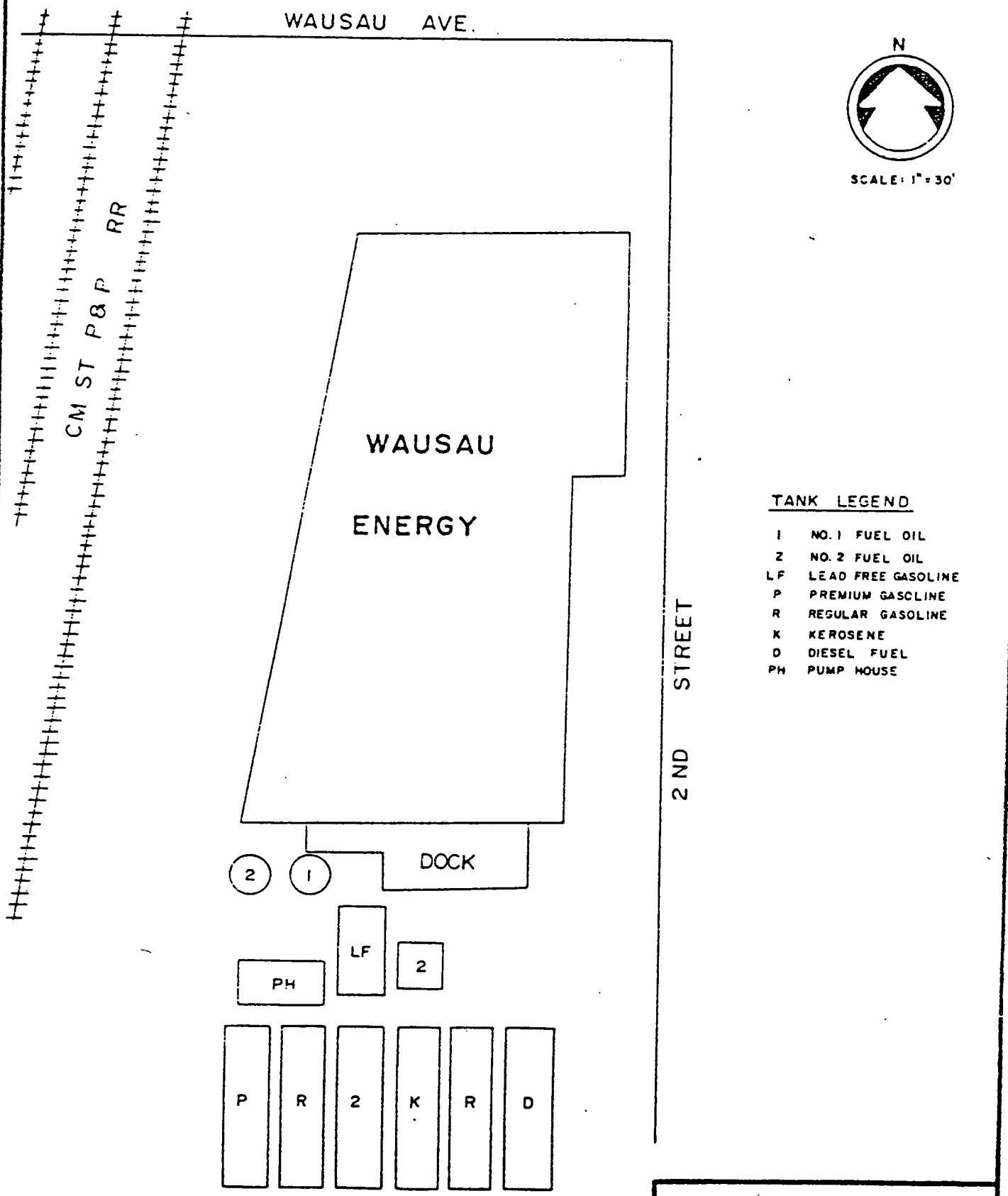
Wausau Energy, in an effort to further confirm the extent of contamination, conducted eight soil borings, four of which were converted into monitoring wells. This work was done on February 18, 1986 and boring locations are given on Figure No. 2-2 (labeled TB-1 through TB-8). Soil boring logs, monitoring well construction details, and soil sample analytical results are provided in Appendix A.

Soil VOC results indicated the presence of toluene, benzene, xylene, and ethylbenzene in TB-1, TB-2, TB-3, and TB-4. These components are, among other things, constituents of fuels once contained on the site. When present in this combination, they usually indicate the presence of gasoline. PCE (8.6 ug/g) was found only in TB-7 at the four foot depth. No other VOCs were detected in the other samples analyzed.

Foth & Van Dyke was subsequently retained to determine the extent of VOC contamination on the Wausau Energy property. The occasional parking of the trailer containing drummed waste oils on the north side of the building was a concern as a possible past source of VOC contamination.

FIGURE NO. 2-1

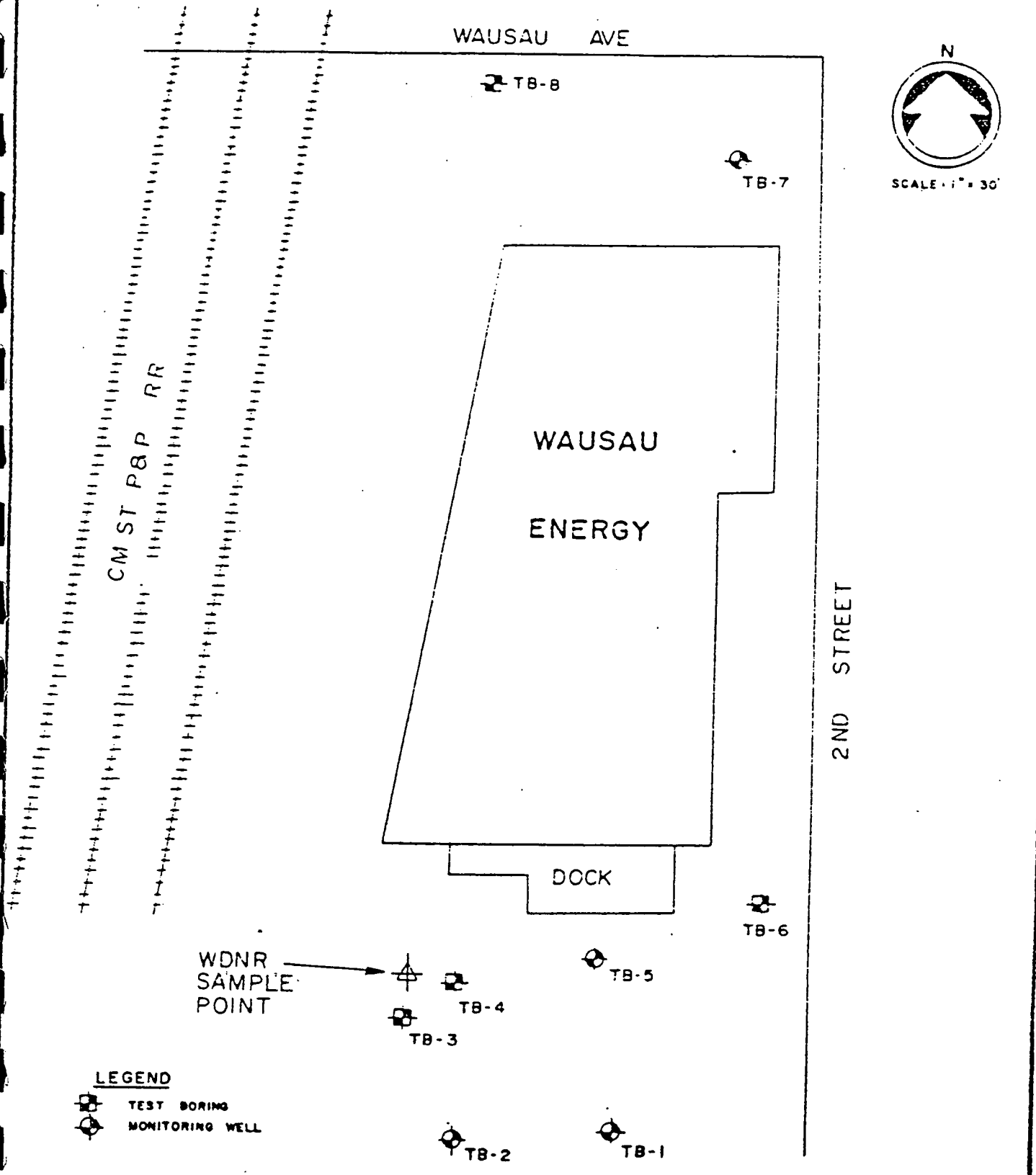
WAUSAU ENERGY PROPERTY - APRIL 26, 1974



Foth & Van Dyke
Waste/Energy Division

FIGURE NO. 2-2

SOIL BORING AND MONITORING WELL LOCATIONS AT WAUSAU ENERGY — FEBRUARY, 1986



Foth & Van Dyke
Waste/Energy Division

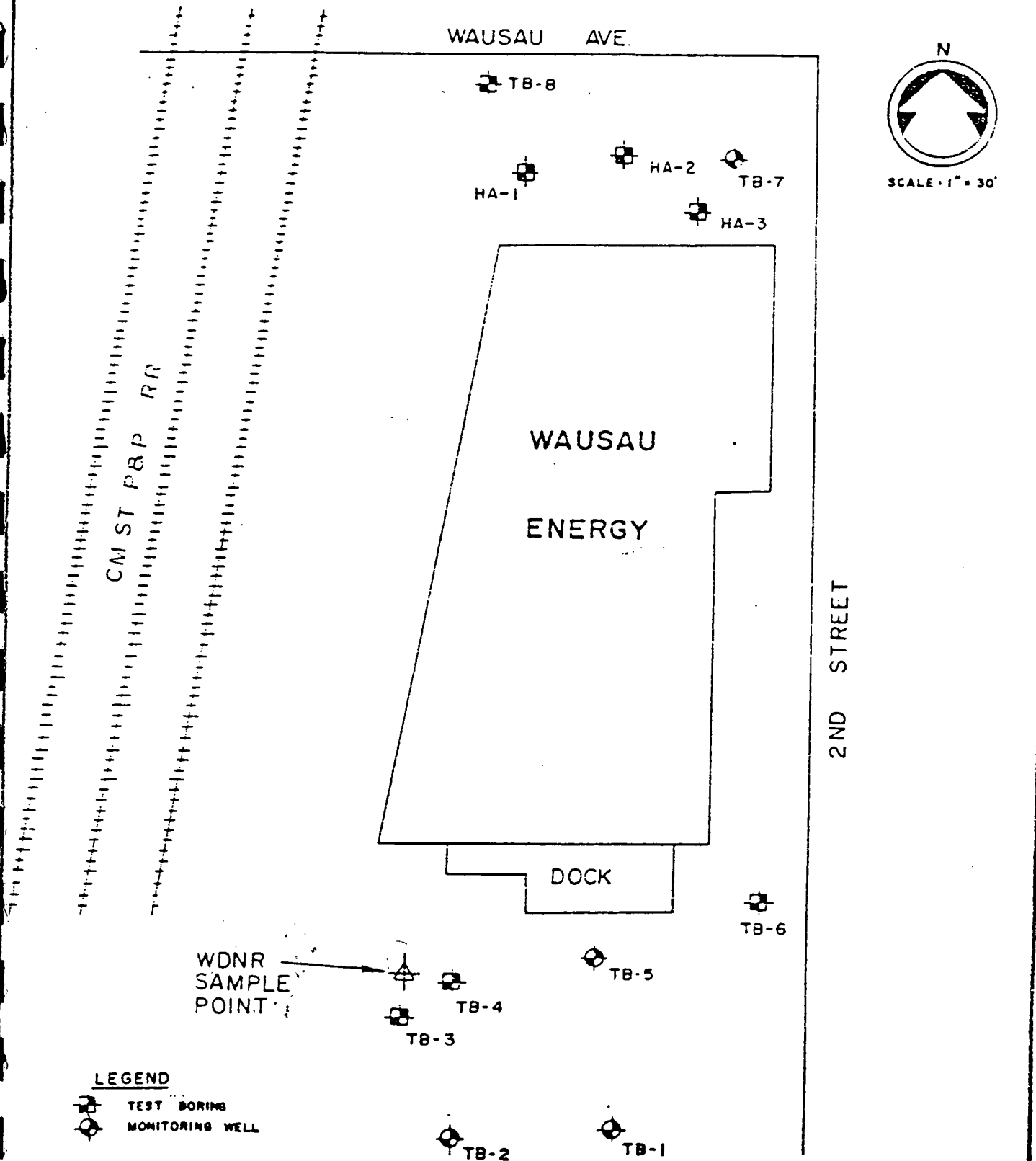
3.0 ADDITIONAL SOIL AND GROUNDWATER ANALYSIS

On April 21, 1986, groundwater samples were collected from Wausau Energy's monitoring wells, City of Wausau MW-1, and USEPA MW-14 (see Figure No. 1-1 for location). Groundwater was approximately 13 feet below the ground surface. Using a hand auger rinsed with deionized water, hexane, and again with deionized water, soil samples were collected from HA-1, HA-2, and HA-3 (see Figure No. 3-1) and analyzed for Priority Pollutant VOCs. Samples were taken at the surface and four foot depth. The results are provided in Appendix B.

On May 1, 1986, five more soil borings were conducted on site. These borings were labeled TB-101 to TB-105 and are indicated on Figure No. 3-2. TB-101 and TB-102 were positioned near the WDNR sampling point. Samples were taken at the depth intervals of 0-2 feet, 4-6 feet, 8-10 feet, and 12-14 feet in these two borings. TB-103, TB-104, and TB-105 were drilled close to HA-3, HA-2, and HA-1, respectively. Samples were taken at the depth intervals of 7-9 feet, 9-11 feet, and 12-13.5 feet in these three borings. Samples were analyzed for Priority Pollutant VOCs; in addition, samples from TB-103, TB-104, and TB-105 were analyzed for Total Organic Carbon (TOC). Results are provided in Appendix C.

FIGURE NO. 3-1

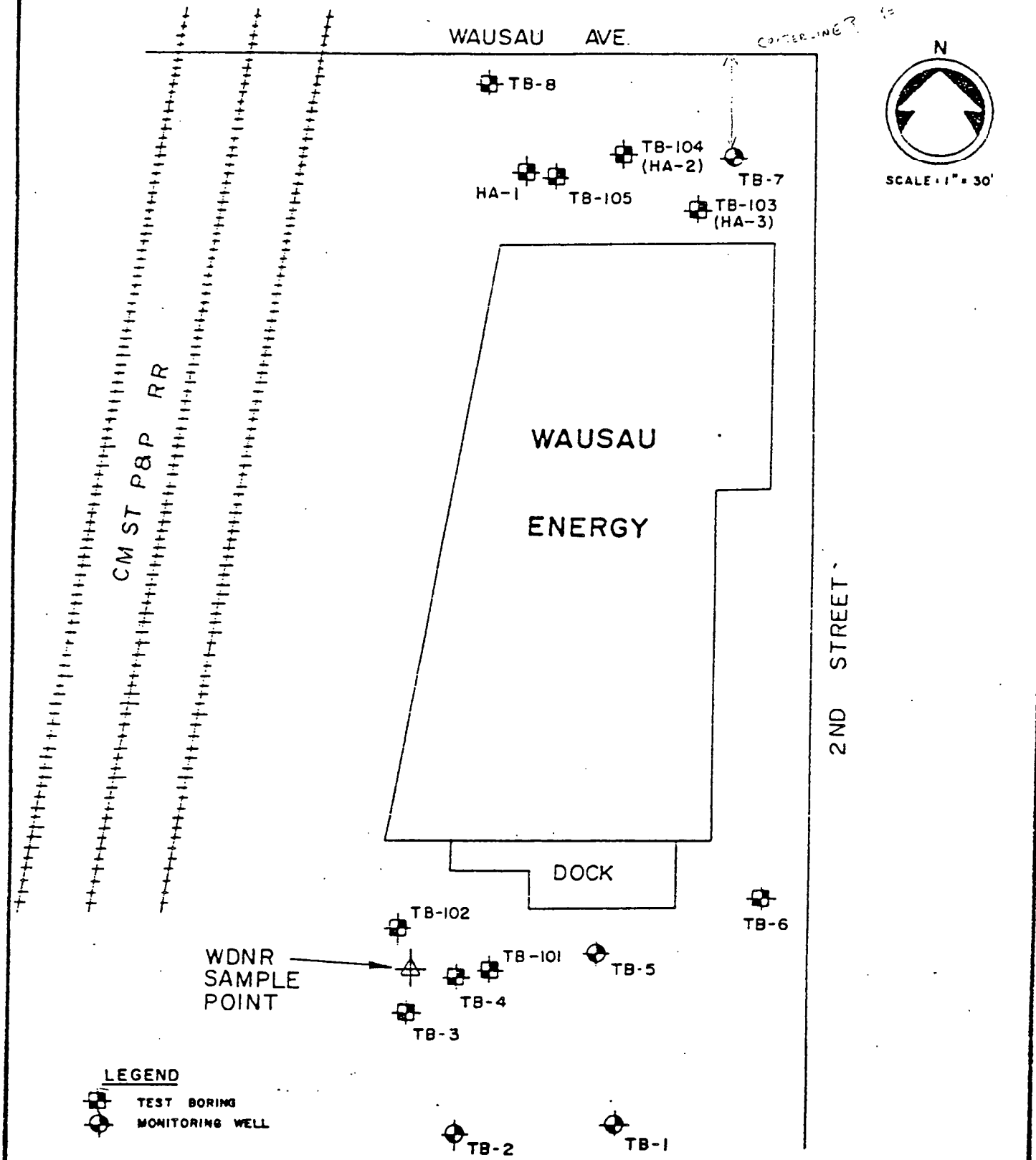
SOIL BORING AND MONITORING WELL LOCATIONS AT WAUSAU ENERGY — APRIL 21, 1986



Foth & Van Dyke
Waste/Energy Division

FIGURE NO. 3-2

SOIL BORING AND MONITORING WELL LOCATIONS AT WAUSAU ENERGY — MAY 1, 1986



Foth & Van Dyke
Waste/Energy Division

4.0 DISCUSSION OF VOC CONTAMINATION

Besides the petroleum constituents (i.e.. toluene, benzene, ethylbenzene,. and xylene) which were detected in TB-101 and TB-102, PCE was the only other VOC detected in the soil samples. Its presence was limited to the borings north of the Wausau Energy building. Its presence south of the main building, as found in the WDNR sample, was not confirmed by this investigation. PCE was the only chlorinated VOC contaminant which was detected in the unsaturated soils at Wausau Energy which was also detected in City Well No. 3. The major and long term contaminant at City Well No. 3, TCE, was not found in any of the Wausau Energy soil samples.

Figure No. 4-1 summarizes the analytical results for PCE and TOC for samples collected on the north side of the Wausau Energy building. It is seen that PCE is not detectable in a layer of soil 9 to 11 feet deep. One hypothesis which can be made from these data is that the PCE contaminated oil, originating from the ground surface on the north side of the building, did not percolate below a depth of nine feet. The PCE contained in the deeper samples just above the water table in the 12 to 13.5 foot soil layer may have originated from groundwater passing through these soils at times past when the water table was somewhat higher (at the time of sampling, the water table occurred at approximately 13 feet below the land surface during a relatively dry spring season).

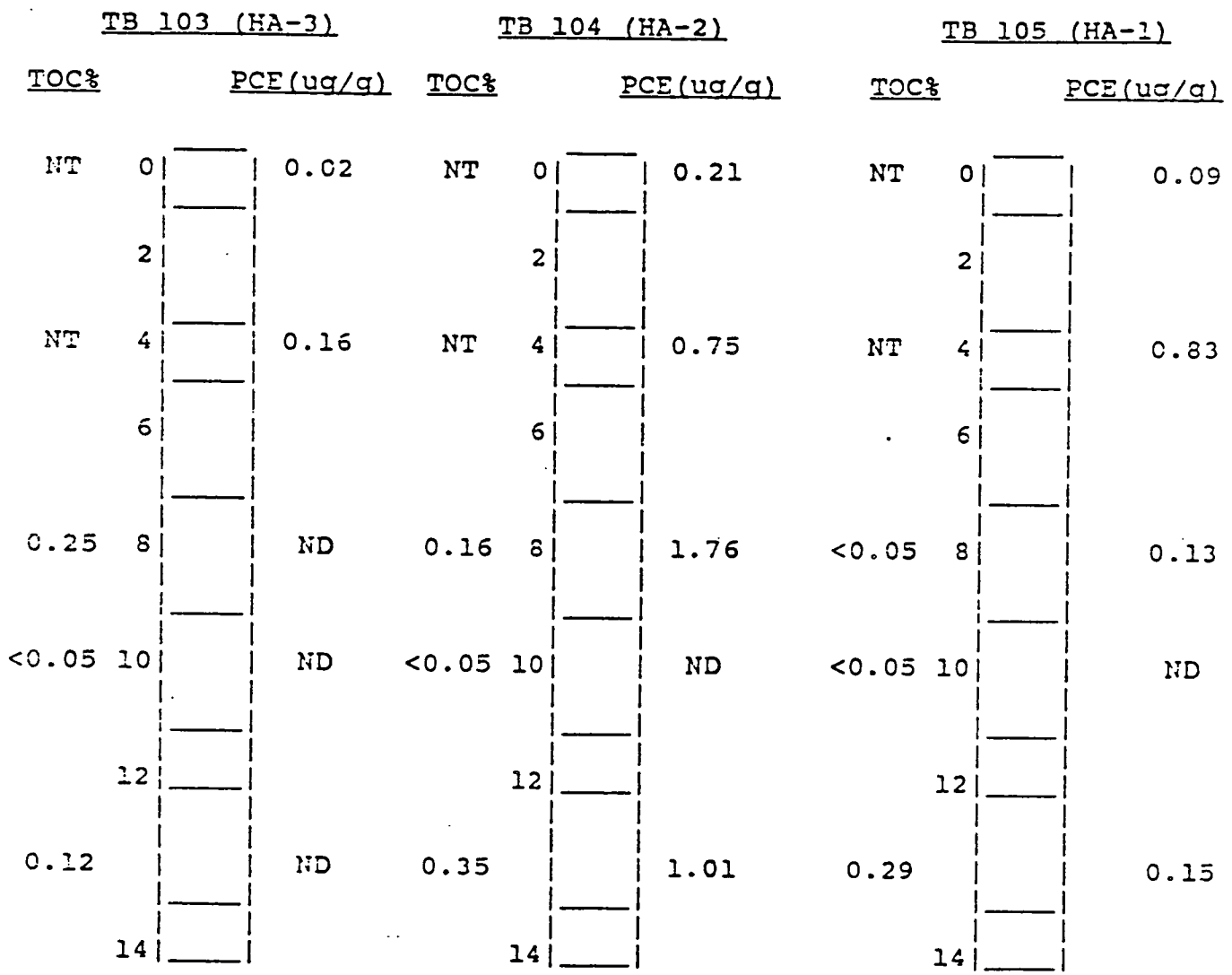
Research indicates that VOCs tend to adsorb and become concentrated in a soil's organic matter, the amount of which in a soil is measured by the parameter, total organic carbon (TOC). The hypothesis, that the absence of VOCs in the 9-11 foot soil layer means that no VOCs passed through the layer, can neither be confirmed nor denied since no TOC was detected in the layer either. An alternative hypothesis would be that the VOC front may have passed through the 9-11 foot soil layer with minimal, non-detectable adsorption taking place, entered the underlying soils, and possibly contributed a minor amount of PCE to the groundwater beneath the site.

Dr. Robert Griffin, a VOC adsorption and transport expert with the Illinois State Geologic Survey, concurred with the inability to select between the two above hypotheses. Dr. Griffin did state, however, that even though evidence does not exist to make such a choice, the Wausau Energy soil contamination is relatively small. Something on the order of one pint of PCE solvent is apparently responsible for the on-site PCE soil concentrations.

In our opinion, there are VOC sources yet to be found in the area. This must be done if Wausau Energy's interests are to be protected in this matter. Chief among these is the TCE source at City Well No. 3 which has contributed concentrations of 100-200 ug/l for at least four years, while the concentrations of PCE have fallen to the barely detectable range. Such consistent TCE readings cannot possibly be the result of a one time slug flow of contaminant, as seems to have been the case with the PCE. Somewhere, probably within a 1000 feet of City Well No. 3, there is a continuing source of TCE contamination.

FIGURE 4-1

SOIL PCE AND TOC SUMMARY



NT = Not Tested

ND = Not Detected

5.0 CONCLUSIONS

The lack of organic matter (i.e., TOC) in the 9-11 foot soil layer makes it impossible to select between the two plausible hypotheses. One hypothesis holds that no PCE migrated downward from the surface any deeper than 9 feet. Under this hypothesis, PCE found in the soil sample taken at 13 feet got there by being contaminated from the contaminated water table which fluctuates up and down through that zone. The alternative hypothesis holds that PCE did migrate from the surface to the water table. The explanation as to why it was not detected in the 9-11 foot soil sample would be that the sample did not contain any detectable TOC, which would be the medium that would have adsorbed most of the PCE.

Notwithstanding this uncertainty, however, there is little doubt that the amount of PCE spilled on site was quite small, probably the equivalent of one pint. Therefore, the contribution of PCE to the groundwater beneath the Wausau Energy property is a *de minimis* contribution, at most, to the Wausau Groundwater Superfund site.

APPENDIX A

Boring Logs and Analytical Results

Field Activity of February 18, 1986

EXPLORATION TECHNOLOGY INC.

Exploration Drilling and Sampling — Diamond Rock Coring — Off Shore Drilling

1402 Emil Street P.O. Box 9404 Madison, WI 53715
Madison, WI (608) 258-9550 Milwaukee, WI (414) 224-6177

February 27, 1986

Ronald J. Ganim
Amoco Oil Company
P.O. Box 5910-A
Chicago, IL 60680

David E. Stewart
DeWitt-Sundby, Attorneys
Suite 120 Teton Wood
6515 Grand Teton Plaza
Madison, WI 53719

Re: Soil Sampling and Monitoring Well Installation
at Wausau Energy Property on Second Street
in Wausau, Wisconsin

Gentlemen:

We have completed soil borings, sampling and well installation for the referenced site in Wausau, Wisconsin. The work was performed under the direction of Mr. Dennis Beckmann of Amoco Oil.

If you have any questions or require furtner assistance, please feel free to call.

Sincerely,

EXPLORATION TECHNOLOGY INC.

Thomas F. Bendorf
Director of Marketing

TFB/mem

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MAR 05 1986

DeWITT, SUNDBY...

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No. TB-1
Surface Elevation
Job No. 811078
Sheet 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

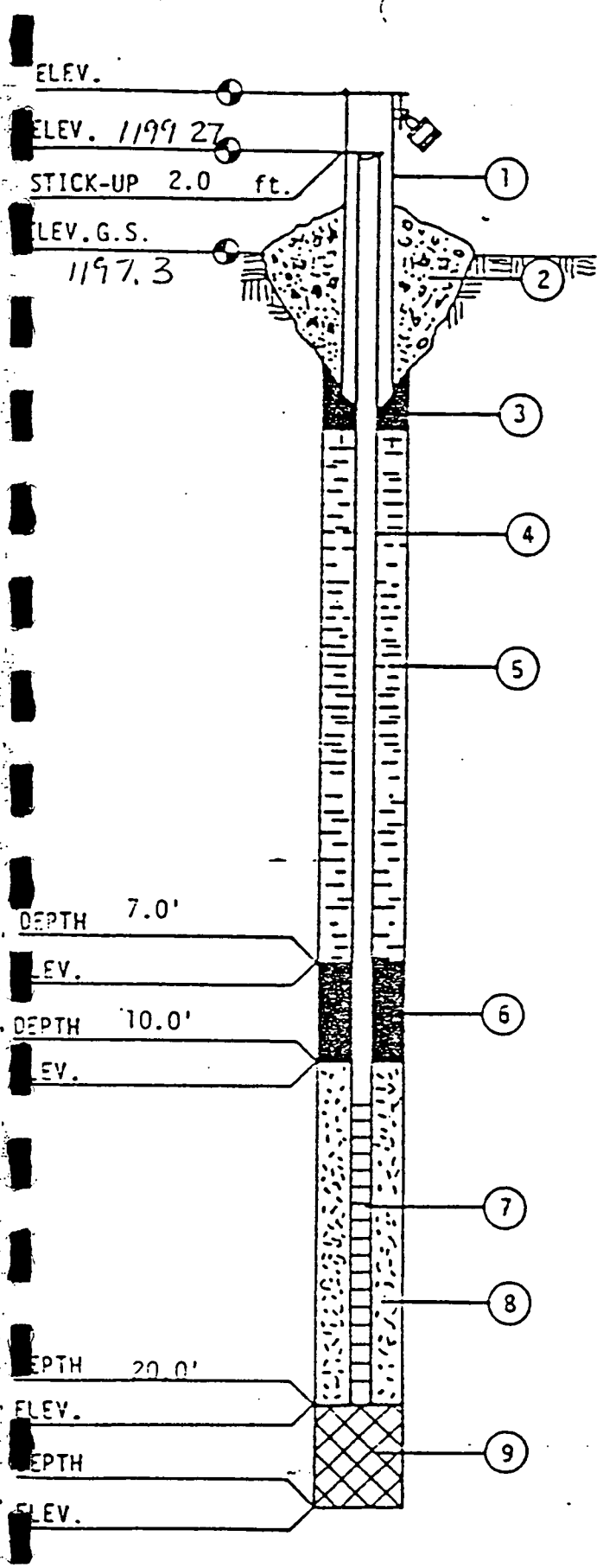
SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu	W	LL	PL	D
1	SS	.5'	D	9		Red to Brown Very Coarse to Fine SAND with Gravel					
2	SS	.9'	D	46	5	Brown Very Coarse to Fine SAND with Gravel & Silt					
					10	Red to Brown Very Coarse to Fine SAND with Gravel					
3	SS	.7'	W	46	15	Gray to Brown Coarse to Fine SAND					
					20	End Boring at 22'					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling 1/4 hour
Depth to Water 17.0'
Depth to Cave In 8.0'

GENERAL NOTES

Start 2/18/86 Complete 2/18/86
Crew Chief LE Rig 750
Drilling Method



KPLORATION TECHNOLOGY INC.

MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. 811078

BORING/WELL NO. TB-2

DATE 2/18/86

CHIEF/UNIT LE/750

1. PROTECTIVE CASING (YES) NO
   LOCKING (YES) NO
2. CONCRETE SEAL (YES) NO
3. TYPE OF SURFACE SEAL (IF INSTALLED)
   Bentonite
4. SOLID PIPE TYPE PVC
   SOLID PIPE LENGTH 10.0 ft.
   JOINT TYPE SLIP/GLUED (THREADED)
5. TYPE OF BACKFILL Sand
   HOW INSTALLED - TREMIE (FROM SURFACE)
6. TYPE OF LOWER SEAL (IF INSTALLED)
   Bentonite
7. SCREEN TYPE PVC
   SCREEN LENGTH
   SLOT-SIZE 0.010" LENGTH 10.0 ft.
   SCREEN DIAMETER in.
8. TYPE OF BACKFILL AROUND SCREEN
   Sand
9. TYPE OF BACKFILL -
10. DRILLING METHOD Hollow Stem Auger
11. ADDITIVES USED (IF ANY)
    -

WATER LEVEL 14.5' DATE 2/18/86

*ALL DEPTHS MEASURED FROM GROUND SURFACE.

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No. TB-3
Surface Elevation
Job No. 811078
Sheet 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type			N	Depth		qu	W	LL	PL	D
1	SS	.9'	M	5		Red to Brown Very Coarse to Fine SAND with Silt and Gravel					
2	SS	12"	M	38	5	Red to Brown Very Coarse to Fine SAND with Gravel					
3	SS	11'	W	30	10	Gray to Brown Coarse to Fine SAND					
					15	End Boring at 16.5'					
					20						
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling 1/4 hour
Depth to Water 15.0'
Depth to Cave In 7.0'

GENERAL NOTES

Start 2/18/86 Complete 2/18/86
Crew Chief LE Rig 750
Drilling Method

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No. TB-4
Surface Elevation
Job No. 811078
Sheet 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		qp	W	LL	PL	D
1	SS	1.1'	M	17		Red to Brown Coarse to Fine SAND with Gravel and Silt					
					5						
	SS	1.0'	M	30		Red to Brown Very Coarse to Fine SAND with Gravel					
					10						
					15						
2	SS	.8'	W	26		Gray to Brown Coarse to Fine SAND					
						End Boring at 16.5'					
					20						
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling 1/4 hour
Depth to Water 15.0'
Depth to Cave In 9.3'

GENERAL NOTES

Start 2/18/86 Complete 2/18/86
Crew Chief LE Rig 750
Drilling Method

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No.: TB-5
Surface Elevation:
Job No.: 811078
Sheet: 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

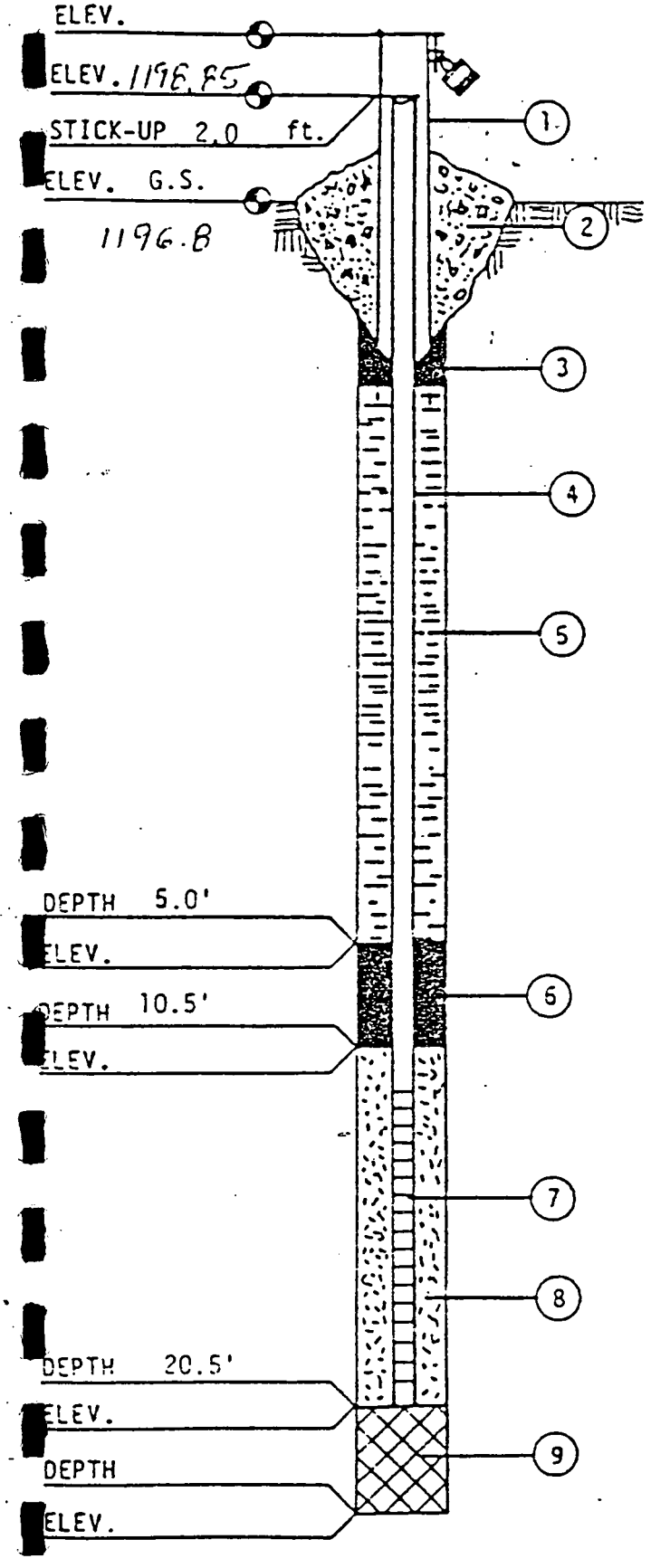
SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qp	W	LL	PL	D
1	SS	.4'	M	8		Red to Brown Very Coarse to Fine SAND with Gravel, Some Silt					
2	SS	1'	M	41	5	Red to Brown Very Coarse to Fine SAND with Gravel					
3	SS	1.0'	W	29	10	Gray to Brown Very Coarse to Fine SAND					
					15	End Boring at 20.5'					
					20	Well set at 20.5'					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling: 1/4 hour
Depth to Water: 14.0'
Depth to Cave In: 8.0'

GENERAL NOTES

Start: 2/18/86 Complete: 2/18/86
Crew Chief: LE Rig: 750
Drilling Method:



EXPLORATION TECHNOLOGY INC.

MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. 811078

BORING/WELL NO. TB-5

DATE 2/18/86

CHIEF/UNIT LE/750

1. PROTECTIVE CASING (YES) NO

   LOCKING (YES) NO

2. CONCRETE SEAL (YES) NO

3. TYPE OF SURFACE SEAL (IF INSTALLED)
   Bentonite

4. SOLID PIPE TYPE PVC

   SOLID PIPE LENGTH 10.0 ft.

   JOINT TYPE SLIP/GLUED (THREADED)

5. TYPE OF BACKFILL Sand

   HOW INSTALLED - ~~TREMIE~~ (FROM SURFACE)

6. TYPE OF LOWER SEAL (IF INSTALLED)
   Bentonite

7. SCREEN TYPE PVC

   SCREEN LENGTH

   SLOT-SIZE 0.010" LENGTH 10.0 ft.

   SCREEN DIAMETER 2.0 in.

8. TYPE OF BACKFILL AROUND SCREEN
   Sand

9. TYPE OF BACKFILL -

10. DRILLING METHOD Hollow Stem Auger

11. ADDITIVES USED (IF ANY)
    -

WATER LEVEL 14.0' DATE 2/18/86

*ALL DEPTHS MEASURED FROM GROUND SURFACE.

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd. & Bridge Streets
Location: Wausau, Wisconsin

Boring No.: TB-6
Surface Elevation:
Job No.: 811078
Sheet: 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type			N	Depth		Wp	W	LL	PL	D
						.2' ASPHALT					
1	SS	1.3'	D	27		Red-Brown Coarse to Fine SAND with Gravel, Occasional Cobbles					
2	SS	1.0'	D	100							
3	SS	1.4'	W	35		Gray Coarse to Fine SAND with Gravel (Tip of Spoon)					
						End Boring at 17.0'					

WATER LEVEL OBSERVATIONS

While Drilling: 15.5'
Upon Completion of Drilling:
Time After Drilling: 1/4 hour
Depth to Water: 15.2'
Depth to Cave In: 7.3'

GENERAL NOTES

Start: 2/18/86 Complete: 2/18/86
Crew Chief: MP Rig: 45-C
Drilling Method:

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No. TB-7
Surface Elevation
Job No. 811078
Sheet 1 of 1

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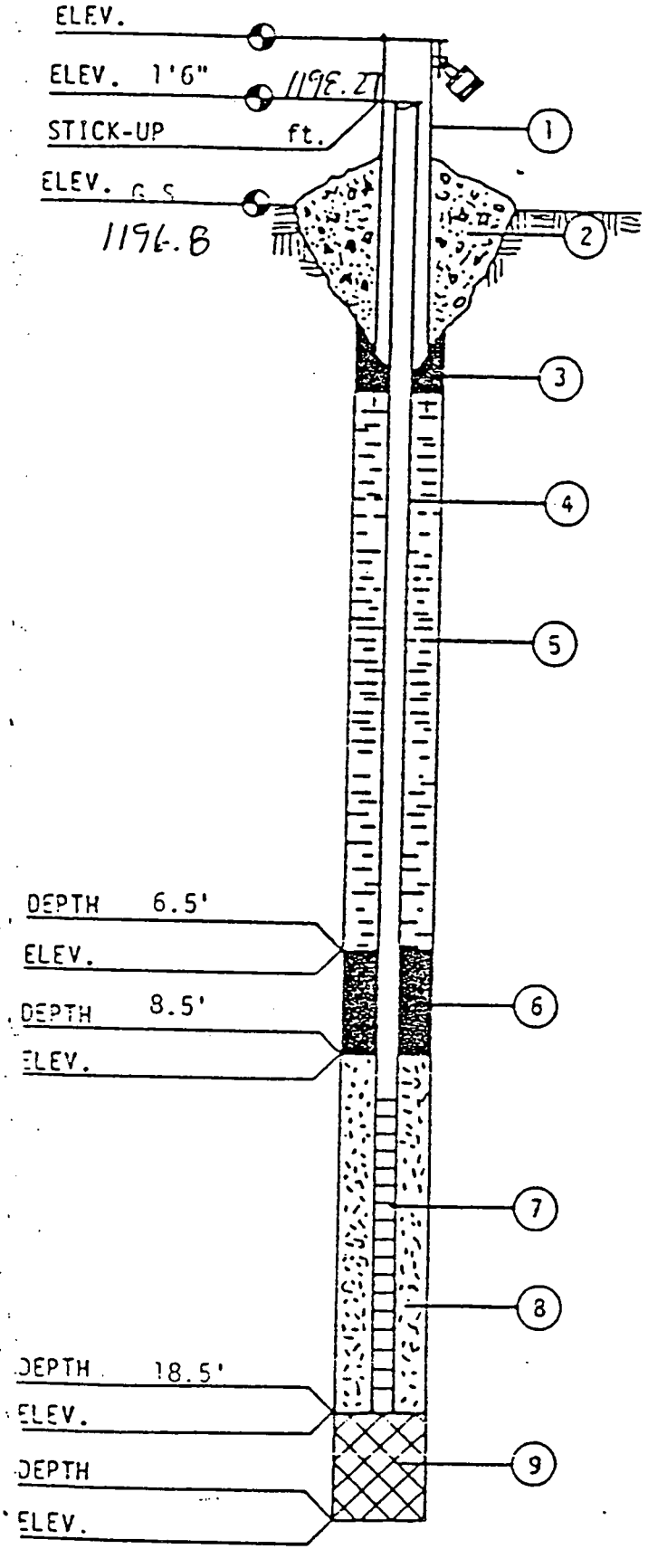
SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu	W	LL	PL	D
						.3' Granite					
1	SS	.2'	D	100		Red-Brown Coarse to Fine SAND with Gravel, Occasional Cobble					
2	SS	1.7'	M	37	5	Pounding on Rock					
3	SS	.5'	M	79	10	Dark Brown Coarse to Fine SAND with Some Silt, Trace Organics 4.0-4.5'					
4	SS	1.5'	W	22	15	Brown Coarse to Fine SAND, Trace Gravel					
					20	End Boring at 18.5'					
						Well at 18.5'					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling 13.5'
Upon Completion of Drilling
Time After Drilling 1/4 hour
Depth to Water 13.5'
Depth to Cave In

GENERAL NOTES

Start 2/18/86 Complete 2/18/86
Crew Chief MP Rig 45-C
Drilling Method



EXPLORATION TECHNOLOGY INC.

MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. 811078

BORING/WELL NO. TB-7

DATE 2/18/86

CHIEF/UNIT MP/750

1. PROTECTIVE CASING (YES) NO

   LOCKING (YES) NO

2. CONCRETE SEAL (YES) NO

3. TYPE OF SURFACE SEAL (IF INSTALLED)
   Bentonite

4. SOLID PIPE TYPE PVC

   SOLID PIPE LENGTH 10.0- ft.

   JOINT TYPE SLIP/GLUED (THREADED)

5. TYPE OF BACKFILL Sand

   HOW INSTALLED - TREMIE (FROM SURFACE)

6. TYPE OF LOWER SEAL (IF INSTALLED)
   Bentonite

7. SCREEN TYPE PVC

   SCREEN LENGTH

   SLOT-SIZE 0.010" LENGTH 10.0 ft.

   SCREEN DIAMETER 2.0 in.

8. TYPE OF BACKFILL AROUND SCREEN
   Sand

9. TYPE OF BACKFILL -

10. DRILLING METHOD Hollow Stem Auger

11. ADDITIVES USED (IF ANY)
    -

WATER LEVEL 13.5' DATE 2/18/86

*ALL DEPTHS MEASURED FROM GROUND SURFACE.

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Wausau Energy & Amoco Oil
2nd & Bridge Street
Location: Wausau, Wisconsin

Boring No.: TB-8
Surface Elevation:
Job No.: 311078
Sheet: 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Recovery	Moisture	N	Depth		Wn	W	LL	PL	D
						.3' GRANITE					
						Red Brown Coarse to Fine SAND with Gravel, Occasional Cobble					
1	SS	.5'	D	27	5						
2	SS	.4'	M	100		Black Medium to Fine Silty SAND with Some Gravel 3.0-3.5'					
					10						
3	SS	1.1'	W	29	15						
						End Boring at 17.0'					
					20	*Brown Coarse to Fine SAND, Trace Gravel					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling: 14.5'
Upon Completion of Drilling:
Time After Drilling: 1/4 hour
Depth to Water: 14.2'
Depth to Cave In:

GENERAL NOTES

Start: 2/18/86 Complete: 2/18/86
Crew Chief: MP Rig: 45-C
Drilling Method:

ZIMPRO INC
ENVIRONMENTAL & ENERGY SYSTEMS

March 7, 1986

DeWitt, Sundby, Huggett, Schumacher & Morgan, S.C.
Attorneys at Law
Suite 120 Teton Wood
6515 Grand Teton Plaza
Madison, WI 53719

Attn: David Stewart

Re: Wausau Energy/Amoco VOC Analysis

Attached are the analytical results for samples submitted February 18 & 19, 1986 for volatile organics (VOC) analysis under the above mentioned project.

The soil samples were extracted with methanol. An aliquot of the extract was then added to a specific amount of reagent water and analyzed according to EPA Method 601, modified to use PID (9.5 eV) and Hall detectors in series. The results for the soil samples are expressed in ug/g (ppm) based on the dry weight of sample used. The results for the water samples are expressed in ug/l (ppb).

Samples TB1-3, TB2-1, TB3-1, TB3-3, and TB4-3 exhibited an interference problem. The samples had a strong fuel oil type odor. As previously discussed, the compounds contained in fuel oil can not be identified by this analytical method, but can interfere with it if they are at a high enough level. The problem occurred around toluene and ethylbenzene. The extract of sample TB4-3 was, at your request, also analyzed by EPA Method 624, a gas chromatographic/mass spectrometer (GC/MS) method, to confirm presence or absence of toluene and ethylbenzene. A qualitative identification is given on benzene, m-xylene and o & p-xylene. Quantitative results are given on toluene and ethylbenzene (Table 6). Further GC/MS work would have to be done to accurately identify the remaining contaminants present.

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474
TELEPHONE (715) 359-7211 TELEX 29-0495

The chain of custody record is also enclosed. If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie Heuser /ls

Mary C. Christie Heuser
Instrumentation Chemist

MCCH/ls

cc: Ronald J. Ganim

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MAR 10 1986
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ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 1
Wausau Energy/Amoco
VOC Analysis (ug/g)

	Detection Limit	TB1-1	TB1-2	TB1-3	TB2-1	TB2-2	TB2-3
nzene	0.6	X	X	X	X	X	X
omoform	1.5	X	X	X	X	X	X
romomethane	3.0	X	X	X	X	X	X
rbon Tetrachloride	0.3	X	X	X	X	X	X
lorobenzene	0.3	X	X	X	X	X	X
Chloroethane	3.0	X	X	X	X	X	X
Chloroethylvinyl Ether	6.0	X	X	X	X	X	X
loroform	0.3	X	X	X	X	X	X
Chloromethane	18.0	X	X	X	X	X	X
bromochloromethane	0.3	X	X	X	X	X	X
2-Dichlorobenzene	0.9	X	X	X	X	X	X
,3-Dichlorobenzene	0.9	X	X	X	X	X	X
,4-Dichlorobenzene	0.9	X	X	X	X	X	X
chlorobromomethane	0.3	X	X	X	X	X	X
l-Dichloroethane	0.3	X	X	X	X	X	X
1,2-Dichloroethane	0.9	X	X	X	X	X	X
l-Dichloroethylene	1.5	X	X	X	X	X	X
2-Dichloroethylene	0.9	X	X	X	X	X	X
Dichloromethane	0.6	X	X	X	X	X	X
2-Dichloropropane	1.5	X	X	X	X	X	X
s-1,3-Dichloropropene	0.9	X	X	X	X	X	X
ans-1,3-Dichloropropene	3.0	X	X	X	X	X	X
Ethylbenzene	0.6	X	X	Intf.	Intf.	X	X
l,2,2-Tetrachloroethane	0.3	X	X	X	X	X	X
trachloroethylene	0.3	X	X	X	X	X	X
Toluene	0.3	X	X	Intf.	Intf.	X	X
l,1-Trichloroethane	0.3	X	X	X	X	X	X
l,2-Trichloroethane	0.3	X	X	X	X	X	X
richloroethylene	0.3	X	X	X	X	X	X
Vinyl Chloride	1.5	X	X	X	X	X	X
Xylene	1.5	X	X	34.8	11.6	X	X
+ p-Xylene (as o-Xylene)	1.5	X	X	86.1	37.8	2.3	X
mpro Analytical No.		16518	16519	16520	16521	16522	16523

X = Analyzed but not detected

tf. = Interference

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 2
Wausau Energy/Amoco
VOC Analysis (ug/g)

	Detection Limit	TB4-1	TB5-1	TB5-3	TB6-1	TB6-3
Benzene	0.6	X	X	X	X	X
Bromoform	1.5	X	X	X	X	X
Bromomethane	3.0	X	X	X	X	X
Carbon Tetrachloride	0.3	X	X	X	X	X
Chlorobenzene	0.3	X	X	X	X	X
Chloroethane	3.0	X	X	X	X	X
2-Chloroethylvinyl Ether	6.0	X	X	X	X	X
Chloroform	0.3	X	X	X	X	X
Chloromethane	18.0	X	X	X	X	X
Dibromochloromethane	0.3	X	X	X	X	X
1,2-Dichlorobenzene	0.9	X	X	X	X	X
1,3-Dichlorobenzene	0.9	X	X	X	X	X
1,4-Dichlorobenzene	0.9	X	X	X	X	X
Dichlorobromomethane	0.3	X	X	X	X	X
1,1-Dichloroethane	0.3	X	X	X	X	X
1,2-Dichloroethane	0.9	X	X	X	X	X
1,1-Dichloroethylene	1.5	X	X	X	X	X
1,2-Dichloroethylene	0.9	X	X	X	X	X
Dichloromethane	0.6	X	X	X	X	X
1,2-Dichloropropane	1.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.9	X	X	X	X	X
trans-1,3-Dichloropropene	3.0	X	X	X	X	X
Ethylbenzene	0.6	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.3	X	X	X	X	X
Tetrachloroethylene	0.3	X	X	X	X	X
Toluene	0.3	X	X	X	X	X
1,1,1-Trichloroethane	0.3	X	X	X	X	X
1,1,2-Trichloroethane	0.3	X	X	X	X	X
Trichloroethylene	0.3	X	X	X	X	X
Vinyl Chloride	1.5	X	X	X	X	X
m-Xylene	1.5	X	X	X	X	X
o & p-Xylene (as o-Xylene)	1.5	X	X	X	X	X
Zimpro Analytical No.		16574	16577	16579	16580	16582

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 3
Wausau Energy/Amoco
VOC Analysis (ug/g)

	Detection Limit	TB7-2	TB7-3	TB7-4	TB8-1	TB8-3
Benzene	0.6	X	X	X	X	X
Bromoform	1.5	X	X	X	X	X
Bromomethane	3.0	X	X	X	X	X
Carbon Tetrachloride	0.3	X	X	X	X	X
Chlorobenzene	0.3	X	X	X	X	X
Chloroethane	3.0	X	X	X	X	X
2-Chloroethylvinyl Ether	6.0	X	X	X	X	X
Chloroform	0.3	X	X	X	X	X
Chloromethane	18.0	X	X	X	X	X
Dibromochloromethane	0.3	X	X	X	X	X
1,2-Dichlorobenzene	0.9	X	X	X	X	X
1,3-Dichlorobenzene	0.9	X	X	X	X	X
1,4-Dichlorobenzene	0.9	X	X	X	X	X
Dichlorobromomethane	0.3	X	X	X	X	X
1,1-Dichloroethane	0.3	X	X	X	X	X
1,2-Dichloroethane	0.9	X	X	X	X	X
1,1-Dichloroethylene	1.5	X	X	X	X	X
1,2-Dichloroethylene	0.9	X	X	X	X	X
Dichloromethane	0.6	X	X	X	X	X
1,2-Dichloropropane	1.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.9	X	X	X	X	X
trans-1,3-Dichloropropene	3.0	X	X	X	X	X
Ethylbenzene	0.6	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.3	X	X	X	X	X
Tetrachloroethylene	0.3	8.6	X	X	X	X
Toluene	0.3	X	X	X	X	X
1,1,1-Trichloroethane	0.3	X	X	X	X	X
1,1,2-Trichloroethane	0.3	X	X	X	X	X
Trichloroethylene	0.3	X	X	X	X	X
Vinyl Chloride	1.5	X	X	X	X	X
m-Xylene	1.5	X	X	X	X	X
o & p-Xylene (as o-Xylene)	1.5	X	X	X	X	X
Zimpro Analytical No.		16524	16525	16526	16583	16585

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 4
Wausau Energy/Amoco
VOC Analysis (ug/g)

	Detection Limit	TB3-1	TB3-3	TB4-3
Benzene	1.8	X	X	11.5
Bromoform	4.5	X	X	X
Bromomethane	9.0	X	X	X
Carbon Tetrachloride	0.9	X	X	X
Chlorobenzene	0.9	X	X	X
Chloroethane	9.0	X	X	X
2-Chloroethylvinyl Ether	18.0	X	X	X
Chloroform	0.9	X	X	X
Chloromethane	54.0	X	X	X
Dibromochloromethane	0.9	X	X	X
1,2-Dichlorobenzene	2.7	X	X	X
1,3-Dichlorobenzene	2.7	X	X	X
1,4-Dichlorobenzene	2.7	X	X	X
Dichlorobromomethane	0.9	X	X	X
1,1-Dichloroethane	0.9	X	X	X
1,2-Dichloroethane	2.7	X	X	X
1,1-Dichloroethylene	4.5	X	X	X
1,2-Dichloroethylene	2.7	X	X	X
Dichloromethane	1.8	X	X	X
1,2-Dichloropropane	4.5	X	X	X
cis-1,3-Dichloropropene	2.7	X	X	X
trans-1,3-Dichloropropene	9.0	X	X	X
Ethylbenzene	1.8	Intf.	Intf.	Intf.
1,1,2,2-Tetrachloroethane	0.9	X	X	X
Tetrachloroethylene	0.9	X	X	X
Toluene	0.9	Intf.	Intf.	Intf.
1,1,1-Trichloroethane	0.9	X	X	X
1,1,2-Trichloroethane	0.9	X	X	X
Trichloroethylene	0.9	X	X	X
Vinyl Chloride	4.5	X	X	X
m-Xylene	4.5	55.0	115.	163.
o & p-Xylene (as o-Xylene)	4.5	250.	175.	294.
Zimpro Analytical No.		16571	16573	16576

X = Analyzed but not detected

Intf. = Interference

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 5
Wausau Energy/Amoco
VOC Analysis (ug/l)

	Detection Limit	Distilled Water	Tap Water	Trip Blank
Benzene	0.2	X	X	X
Bromoform	0.5	X	X	X
Bromomethane	1.0	X	X	X
Carbon Tetrachloride	0.1	X	X	X
Chlorobenzene	0.1	X	X	X
Chloroethane	1.0	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X
Chloroform	0.1	X	X	X
Chloromethane	6.0	X	X	X
Dibromochloromethane	0.1	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X
Dichlorobromomethane	0.1	X	X	X
1,1-Dichloroethane	0.1	X	X	X
1,2-Dichloroethane	0.3	X	X	X
1,1-Dichloroethylene	0.5	X	X	X
1,2-Dichloroethylene	0.3	X	X	X
Dichloromethane	0.2	0.9	X	X
1,2-Dichloropropane	0.5	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X
Ethylbenzene	0.2	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X
Tetrachloroethylene	0.1	0.2	X	X
Toluene	0.1	X	0.4	X
1,1,1-Trichloroethane	0.1	0.3	0.3	0.3
1,1,2-Trichloroethane	0.1	X	X	X
Trichloroethylene	0.1	X	X	X
Vinyl Chloride	0.5	X	X	X
m-Xylene	0.5	X	X	X
o & p-Xylene (as o-Xylene)	0.5	X	2.0	X
Zimpro Analytical No.		16586	16587	16588

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 6

Wausau Energy/Amoco
GC/MS VOC Analysis (ug/g)

	TB4-3	Detection Limit
Benzene	Positive	-
Ethylbenzene	35.2	7.6
Toluene	X	7.6
m-Xylene	Positive	-
o & p-Xylene	Positive	-
Analytical No.	16576	

CHAIN OF CUSTODY RECORD

PROJ. NO | PROJECT NAME: Wausau Energy

SAMPLERS: (Signature)

STA. NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	REMARKS: Empro Analytical No.
	2/18				TB8 Comp 1		~~Wausau~~ 16583
					" " 2		16584
					" " 3		16585
					TB5 " 1		16577
					" " 2		16578
					TB6 " 3		16582
					4 " 3		16576
					6 " 1		16580
					6 " 2		16581
					4 " 2		16575
					4 " 1		16574
					3 " 2		16572
					3 " 1		16571
					3 " 3		16573
					5 " 3		16579

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	2/18/86 1330	Mary C. Christensen			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

CHAIN OF CUSTODY RECORD

PROJ NO | PROJECT NAME: Wausau Energy

SAMPLERS. (Signature)

STA. NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	REMARKS
	2/18				Water Sample Tap		Empro Analytical No.
					Top		16588
					Distilled		16587
							16586

Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	2-19-86 1320	Mary C Christie Hunt			
Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

CHAIN OF CUSTODY RECORD

PROJECT NO | PROJECT NAME: Wausau Energy

SAMPLERS. (Signature): Thomas Benkoff

STA. NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	VOC's	REMARKS: Zimpro Analytical No.
	2/18				TB 1 Sample 1			16518
	"				TB 1 " 2			16519
	"				TB 1 " 3			16520
	"				TB 1 Sample 2			16524
	"				TB 1 " 3			16525
	"				TB 1 " 4			16526
	"				TB 2 " 1			16521
	"				TB 2 " 2			16522
	"				TB 2 " 3			16523

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Thomas Benkoff	2/18 1:00 pm	Mary C Christie Hewes			
Relinquished by (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

APPENDIX B

Analytical Results

Field Activity of April 21, 1986

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

April 30, 1986

Fred Doran
Foth & VanDyke Engineers, Inc.
2737 S. Ridge Rd.
P.O. Box 11997
Green Bay, WI 54307-1997

Dear Mr. Doran:

Attached are the VOC results for samples taken April 21, 1986 at the Wausau Energy site. The analysis was done by EPA Method 601 with PID (9.5 eV) and Hall detectors in series. The soil samples were extracted with methanol prior to analysis via EPA Method 601. The results for the soil samples are expressed in ug/g or ppm based on the dry weight of the sample.

If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie Heuser

Mary C. Christie Heuser
Instrumentation Chemist

MCCH/ls

cc: J.W. Barr
J.R. Salkowski

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

	Detection Limit	TB-1 4-21-86	TB-2 4-21-86
Benzene	2.0	5.0	243.
Bromoform	5.0	X	X
Bromomethane	10.0	X	X
Carbon Tetrachloride	1.0	X	X
Chlorobenzene	1.0	X	X
Chloroethane	10.0	X	X
2-Chloroethylvinyl Ether	20.0	X	X
Chloroform	1.0	X	X
Chloromethane	60.0	X	X
Dibromochloromethane	1.0	X	X
1,2-Dichlorobenzene	3.0	X	X
1,3-Dichlorobenzene	3.0	X	X
1,4-Dichlorobenzene	3.0	X	X
Dichlorobromomethane	1.0	X	X
1,1-Dichloroethane	1.0	X	X
1,2-Dichloroethane	3.0	6.0	X
1,1-Dichloroethylene	5.0	X	X
1,2-Dichloroethylene	3.0	X	X
Dichloromethane	2.0	X	X
1,2-Dichloropropane	5.0	X	X
cis-1,3-Dichloropropene	3.0	X	X
trans-1,3-Dichloropropene	10.0	X	X
Ethylbenzene	2.0	X	38.
1,1,2,2-Tetrachloroethane	1.0	X	X
Tetrachloroethylene	1.0	130.	51.
Toluene	1.0	X	23.
1,1,1-Trichloroethane	1.0	X	X
1,1,2-Trichloroethane	1.0	X	X
Trichloroethylene	1.0	7.0	2.0
Vinyl Chloride	5.0	X	X
Trichloroflucromethane	2.0	X	X
Dichlorodifluoromethane	20.0	X	X
m-Xylene	5.0	X	29.
o & p-Xylene (as o-Xylene)	5.0	7.0	457.
Zimpro Analytical No.		17757	17758

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

TB 5

	Detection Limit	4-21-36
Benzene	5.0	1,048.
Bromoform	12.5	X
Bromomethane	25.0	X
Carbon Tetrachloride	2.5	X
Chlorobenzene	2.5	X
Chloroethane	25.0	X
2-Chloroethylvinyl Ether	50.0	X
Chloroform	2.5	X
Chloromethane	150.0	X
Dibromochloromethane	2.5	X
1,2-Dichlorobenzene	7.5	X
1,3-Dichlorobenzene	7.5	X
1,4-Dichlorobenzene	7.5	X
Dichlorobromomethane	2.5	X
1,1-Dichloroethane	2.5	X
1,2-Dichloroethane	7.5	X
1,1-Dichloroethylene	12.5	X
1,2-Dichloroethylene	7.5	X
Dichloromethane	5.0	X
1,2-Dichloropropane	12.5	X
cis-1,3-Dichloropropene	7.5	X
trans-1,3-Dichloropropene	25.0	X
Ethylbenzene	5.0	1,150.
1,1,2,2-Tetrachloroethane	2.5	X
Tetrachloroethylene	2.5	7.5
Toluene	2.5	2,150.
1,1,1-Trichloroethane	2.5	X
1,1,2-Trichloroethane	2.5	X
Trichloroethylene	2.5	7.5
Vinyl Chloride	12.5	X
Trichlorofluoromethane	5.0	X
Dichlorodifluoromethane	50.0	X
m-Xylene	12.5	1,298.
o & p-Xylene (as o-Xylene)	12.5	2,975.
Zimpro Analytical No.		17759

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

TB-7

	Detection Limit	4-21-86
Benzene	1.0	X
Bromoform	2.5	X
Bromomethane	5.0	X
Carbon Tetrachloride	0.5	X
Chlorobenzene	0.5	X
Chloroethane	5.0	X
2-Chloroethylvinyl Ether	10.0	X
Chloroform	0.5	X
Chloromethane	30.0	X
Dibromochloromethane	0.5	X
1,2-Dichlorobenzene	1.5	X
1,3-Dichlorobenzene	1.5	X
1,4-Dichlorobenzene	1.5	X
Dichlorobromomethane	0.5	X
1,1-Dichloroethane	0.5	X
1,2-Dichloroethane	1.5	X
1,1-Dichloroethylene	2.5	X
1,2-Dichloroethylene	1.5	X
Dichloromethane	1.0	X
1,2-Dichloropropane	2.5	X
cis-1,3-Dichloropropene	1.5	X
trans-1,3-Dichloropropene	5.0	X
Ethylbenzene	1.0	X
1,1,2,2-Tetrachloroethane	0.5	X
Tetrachloroethylene	0.5	132.
Toluene	0.5	X
1,1,1-Trichloroethane	0.5	2.4
1,1,2-Trichloroethane	0.5	X
Trichloroethylene	0.5	9.9
Vinyl Chloride	2.5	X
Trichlorofluoromethane	1.0	X
Dichlorodifluoromethane	10.0	X
Zimpro Analytical No.		17760

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

	Detection Limit	City MW-1 4-21-86	EPA-14 4-21-86
Benzene	0.2	X	X
Bromoform	0.5	X	X
Bromomethane	1.0	X	X
Carbon Tetrachloride	0.1	X	X
Chlorobenzene	0.1	X	X
Chloroethane	1.0	X	X
2-Chloroethylvinyl Ether	2.0	X	X
Chloroform	0.1	X	X
Chloromethane	6.0	X	X
Dibromochloromethane	0.1	X	X
1,2-Dichlorobenzene	0.3	X	X
1,3-Dichlorobenzene	0.3	X	X
1,4-Dichlorobenzene	0.3	X	X
Dichlorobromomethane	0.1	X	X
1,1-Dichloroethane	0.1	X	X
1,2-Dichloroethane	0.3	X	X
1,1-Dichloroethylene	0.5	X	X
1,2-Dichloroethylene	0.3	X	X
Dichloromethane	0.2	X	X
1,2-Dichloropropane	0.5	X	X
cis-1,3-Dichloropropene	0.3	X	X
trans-1,3-Dichloropropene	1.0	X	X
Ethylbenzene	0.2	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X
Tetrachloroethylene	0.1	X	X
Toluene	0.1	X	X
1,1,1-Trichloroethane	0.1	X	X
1,1,2-Trichloroethane	0.1	X	X
Trichloroethylene	0.1	X	X
Vinyl Chloride	0.5	X	X
Trichlorofluoromethane	0.2	X	X
Dichlorofluoromethane	2.0	X	X
m-Xylene	0.5	X	X
o & p-Xylene (as o-Xylene)	0.5	X	X
Zimpro Analytical No.		17761	17762

X = Analyzed but not detected

APPENDIX C

Analytical Results

Field Activity of May 1, 1986

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

May 16, 1986

Fred Doran
Foth & VanDyke Engineers, Inc.
2737 S. Ridge Rd.
P.O. Box 11997
Green Bay, WI 54307-1997

Dear Mr. Doran:

Attached are the results for the soil samples taken May 1, 1986 at the Wausau Energy site. The analysis was done in the same manner described in my April 30, 1986 report to you. Also included are results for duplicate analyses and a spike analysis. The compounds used for the spike were added to the methanol extract of sample TB-104-A.

If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie Heuser

Mary C. Christie Heuser
Instrumentation Chemist

MCCH/ls

cc: J.W. Barr
J.R. Salkowski

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
Wausau Energy
VOC Analysis (ug/l)

	Detection Limit	F & VD Trip Blank	WTD Rinse Water
Benzene	0.2	X	X
Bromoform	0.5	X	X
Bromomethane	1.0	X	X
Carbon Tetrachloride	0.1	X	X
Chlorobenzene	0.1	X	X
Chloroethane	1.0	X	X
2-Chloroethylvinyl Ether	2.0	X	X
Chloroform	0.1	X	X
Chloromethane	6.0	X	X
Dibromochloromethane	0.1	X	X
1,2-Dichlorobenzene	0.3	X	X
1,3-Dichlorobenzene	0.3	X	X
1,4-Dichlorobenzene	0.3	X	X
Dichlorobromomethane	0.1	X	X
1,1-Dichloroethane	0.1	X	X
1,2-Dichloroethane	0.3	X	X
1,1-Dichloroethylene	0.5	X	X
1,2-Dichloroethylene	0.3	X	X
Dichloromethane	0.2	0.8	X
1,2-Dichloropropane	0.5	X	X
cis-1,3-Dichloropropene	0.3	X	X
trans-1,3-Dichloropropene	1.0	X	X
Ethylbenzene	0.2	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X
Tetrachloroethylene	0.1	X	X
Toluene	0.1	0.5	X
1,1,1-Trichloroethane	0.1	X	X
1,1,2-Trichloroethane	0.1	X	X
Trichloroethylene	0.1	X	X
Vinyl Chloride	0.5	X	X
Trichlorofluoromethane	0.2	X	X
Dichlorofluoromethane	2.0	X	X
m-Xylene	0.5	X	X
o & p-Xylene (as o-Xylene)	0.5	X	X
Zimpro Analytical No.		18107	18108

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & VanDyke
Wausau Energy
VOC Analysis (ug/g)

	Detection Limit	SURFACE TB-101-A	4' TB-101-B	8' TB-101-C	SURFACE TB-102-A	7-9' TB-103-A
Benzene	0.10	X	X	X	X	X
Bromoform	0.10	X	X	X	X	X
Bromomethane	0.30	X	X	X	X	X
Carbon Tetrachloride	0.03	X	X	X	X	X
Chlorobenzene	0.03	X	X	X	X	X
Chloroethane	0.30	X	X	X	X	X
2-Chloroethylvinyl Ether	0.60	X	X	X	X	X
Chloroform	0.03	X	X	X	X	X
Chloromethane	1.5	X	X	X	X	X
Dibromochloromethane	0.03	X	X	X	X	X
1,2-Dichlorobenzene	0.08	X	X	X	X	X
1,3-Dichlorobenzene	0.08	X	X	X	X	X
1,4-Dichlorobenzene	0.08	X	X	X	X	X
Dichlorobromomethane	0.03	X	X	X	X	X
1,1-Dichloroethane	0.03	X	X	X	X	X
1,2-Dichloroethane	0.20	X	X	X	X	X
1,1-Dichloroethylene	0.80	X	X	X	X	X
1,2-Dichloroethylene	0.08	X	X	X	X	X
Dichloromethane	0.40	X	X	X	X	X
1,2-Dichloropropane	0.10	X	X	X	X	X
cis-1,3-Dichloropropene	0.03	X	X	X	X	X
trans-1,3-Dichloropropene	0.30	X	X	X	X	X
Ethylbenzene	0.05	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.03	X	X	X	X	X
Tetrachloroethylene	0.03	X	X	X	X	X
Toluene	0.05	0.1	X	X	X	X
1,1,1-Trichloroethane	0.10	X	X	X	X	X
1,1,2-Trichloroethane	0.05	X	X	X	X	X
Trichloroethylene	0.05	X	X	X	X	X
Vinyl Chloride	0.30	X	X	X	X	X
Trichlorofluoromethane	0.05	X	X	X	X	X
Dichlorodifluoromethane	0.60	X	X	X	X	X
o-Xylene	0.20	X	X	X	X	X
m & p-Xylene (as o-Xylene)	0.20	0.2	X	X	X	X
TOC (%)	0.05	NT	NT	NT	NT	0.25
Zimpro Analytical No.		18109	18110	18111	18113	18117

X = Analyzed but not detected

NT = NOT TESTED

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & VanDyke
Wausau Energy
VOC Analysis (ug/g)

	Detection Limit	9-11' TB-103-B	12-13.5' TB-103-C	7-9' TB-104-A	9-11' TB-104-B	12-13.5' TB-104-C
[illegible]nzene	0.10	X	X	X	X	X
Bromoform	0.10	X	X	X	X	X
Bromomethane	0.30	X	X	X	X	X
[illegible]bon Tetrachloride	0.03	X	X	X	X	X
[illegible]lorobenzene	0.03	X	X	X	X	X
Chloroethane	0.30	X	X	X	X	X
[illegible]Chloroethylvinyl Ether	0.60	X	X	X	X	X
[illegible]oroform	0.03	X	X	X	X	X
Chloromethane	1.5	X	X	X	X	X
[illegible]ibromochloromethane	0.03	X	X	X	X	X
[illegible]2-Dichlorobenzene	0.08	X	X	X	X	X
1,3-Dichlorobenzene	0.08	X	X	X	X	X
1,4-Dichlorobenzene	0.08	X	X	X	X	X
[illegible]chlorobromomethane	0.03	X	X	X	X	X
[illegible],1-Dichloroethane	0.03	X	X	X	X	X
1,2-Dichloroethane	0.20	X	X	X	X	X
[illegible]1-Dichloroethylene	0.80	X	X	X	X	X
[illegible]2-Dichloroethylene	0.08	X	X	X	X	X
Dichloromethane	0.40	X	X	X	X	X
[illegible]2-Dichloropropane	0.10	X	X	X	X	X
[illegible]s-1,3-Dichloropropene	0.08	X	X	X	X	X
trans-1,3-Dichloropropene	0.30	X	X	X	X	X
Ethylbenzene	0.05	X	X	X	X	X
[illegible],2,2-Tetrachloroethane	0.03	X	X	X	X	X
[illegible]etrachloroethylene	0.03	X	X	1.76	X	1.01
Toluene	0.05	X	X	X	0.06	X
[illegible],1-Trichloroethane	0.10	X	X	X	X	X
[illegible],2-Trichloroethane	0.05	X	X	X	X	X
Trichloroethylene	0.05	X	X	X	X	X
[illegible]nyl Chloride	0.30	X	X	X	X	X
[illegible]chlorofluoromethane	0.05	X	X	X	X	X
Dichlorodifluoromethane	0.60	X	X	X	X	X
m-Xylene	0.20	X	X	X	X	X
[illegible] p-Xylene (as o-Xylene)	0.20	X	X	X	X	X
TOC (%)	0.05	X	0.12	0.16	X	0.35
Zimpro Analytical No.		18118	18119	18120	18121	18122

[illegible] = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & VanDyke
Wausau Energy
VOC Analysis (ug/g)

	Detection Limit	7-9' TB-105-A	7-9' TB-105-A Duplicate	9-11' TB-105-B	12-13.5' TB-105-C
Benzene	0.10	X	X	X	X
Bromoform	0.10	X	X	X	X
:omomethane	0.30	X	X	X	X
.rbon Tetrachloride	0.03	X	X	X	X
Chlorobenzene	0.03	X	X	X	X
loroethane	0.30	X	X	X	X
.-Chloroethylvinyl Ether	0.60	X	X	X	X
Chloroform	0.03	X	X	X	X
Chloromethane	1.5	X	X	X	X
.bromochloromethane	0.03	X	X	X	X
1,2-Dichlorobenzene	0.08	X	X	X	X
1,3-Dichlorobenzene	0.08	X	X	X	X
.4-Dichlorobenzene	0.08	X	X	X	X
.chlorobromomethane	0.03	X	X	X	X
1,1-Dichloroethane	0.03	X	X	X	X
.2-Dichloroethane	0.20	X	X	X	X
.1-Dichloroethylene	0.80	X	X	X	X
1,2-Dichloroethylene	0.08	X	X	X	X
Dichloromethane	0.40	X	X	X	X
.2-Dichloropropane	0.10	X	X	X	X
cis-1,3-Dichloropropene	0.08	X	X	X	X
trans-1,3-Dichloropropene	0.30	X	X	X	X
thylbenzene	0.05	X	X	X	X
,1,2,2-Tetrachloroethane	0.03	X	X	X	X
Tetrachloroethylene	0.03	0.13	0.11	X	0.15
Toluene	0.05	X	X	X	X
,1,1-Trichloroethane	0.10	X	X	X	X
1,1,2-Trichloroethane	0.05	X	X	X	X
Trichloroethylene	0.05	X	X	X	X
inyl Chloride	0.30	X	X	X	X
.richlorofluoromethane	0.05	X	X	X	X
Dichlorodifluoromethane	0.60	X	X	X	X
-Xylene	0.20	X	X	X	X
& p-Xylene (as o-Xylene)	0.20	X	X	X	X
TOC (%)	0.05	X	NT	X	0.29
Zimpro Analytical No.		18123	18123	18124	18125

X = Analyzed but not detected

NT = Not Tested

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & VanDyke
Wausau Energy
VOC Analysis (ug/g)

	Detection Limit	12' TB-101-D	4' TB-102-B	4' TB-102-B Duplicate	6' TB-102-C	12' TB-102-D
ne	0.4	X	X	X	X	X
form	1.0	X	X	X	X	X
romomethane	2.0	X	X	X	X	X
on Tetrachloride	0.2	X	X	X	X	X
obenzene	0.2	X	X	X	X	X
loroethane	2.0	X	X	X	X	X
Chloroethylvinyl Ether	4.0	X	X	X	X	X
oform	0.6	X	X	X	X	X
omethane	12.0	X	X	X	X	X
ibromochloromethane	0.2	X	X	X	X	X
ichlorobenzene	0.6	X	X	X	X	X
ichlorobenzene	0.6	X	X	X	X	X
,4-Dichlorobenzene	0.6	X	X	X	X	X
lorobromomethane	0.2	X	X	X	X	X
ichloroethane	0.2	X	X	X	X	X
,2-Dichloroethane	0.6	X	X	X	X	X
1-Dichloroethylene	3.5	X	X	X	X	X
ichloroethylene	0.6	X	X	X	X	X
oromethane	0.4	X	X	X	X	X
,2-Dichloropropane	1.0	X	X	X	X	X
,3-Dichloropropene	0.6	X	X	X	X	X
-1,3-Dichloropropene	2.0	X	X	X	X	X
thylbenzene	0.4	Intf.	Intf.	Intf.	Intf.	Intf.
2,2-Tetrachloroethane	0.2	X	X	X	X	X
chloroethylene	0.2	X	X	X	X	X
luene	0.2	Intf.	Intf.	Intf.	Intf.	Intf.
1,1-Trichloroethane	0.4	X	X	X	X	X
-Trichloroethane	0.2	X	X	X	X	X
loroethylene	0.2	X	X	X	X	X
inyl Chloride	2.0	X	X	X	X	X
lorofluoromethane	0.4	X	X	X	X	X
orodifluoromethane	4.0	X	X	X	X	X
-Xylene	1.0	Intf.	Intf.	Intf.	Intf.	Intf.
-Xylene (as o-Xylene)	1.0	Intf.	Intf.	Intf.	Intf.	Intf.
mpro Analytical No.		18112	18114	18114	18115	18116

nalyzed but not detected

ntf. = Interference

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & Van Dyke
VOC Analysis (ug/l)

	Amount Spiked (ug/l)	% Recovery
Carbon Tetrachloride	40.	129.
Chlorobenzene	40.	116.
Chloroform	40.	123.
1,1-Dichloroethane	40.	120.
Dichloromethane	40.	117.
1,2-Dichloropropane	40.	116.
Tetrachloroethylene	40.	118.
Trichloroethylene	40.	130.

Sample used for spike TB-104-A
Analytical No. 18120

Foth & Van Dyke
Green Bay, Wisconsin

CLIENT: Wausau Energy DATE: 5-1-86
PROJECT: BY: B. Possin
PROJECT NO.: PAGE NO.: OF

COMPUTED BY: DATE: REVIEWED BY: DATE:
CHECKED BY: DATE: APPROVED BY: DATE:

Chain of Custody Log

Samples Taken 5-1-86 by Foth+Van Dyke (B. Possin, F. Doran).

Sample I.D.	Container	Analytical Parameters	Sample Type	Lab #
TB-101-A1 } one sample TB-101-A2 }	40 ml VOC	Priority Pollutant VOCs	soil	18109
TB-101-B1 } one sample TB-101-B2 }			soil	18110
TB-101-C1 } one sample TB-101-C2 }			soil	18111
TB-101-D1 } one sample TB-101-D2 }			soil	18112
Trip Blank #1 } one sample Trip Blank #2 }			water	18107
WTD Rinse Water #1 } one sample WTD Rinse Water #2 }			water	18108
TB-102-A1 } " " -A2 }			soil	18113
TB-102-B1 } " " -B2 }			soil	18114
TB-102-C1 } " " -C2 }			soil	18115
TB-102-D1 } " " D2 }			soil	18116
TB-103-A1 } " " A2 }			soil	18117
TB-103 B1 } " " B2 }			soil	18118

24 total

Relinquished by: FoVD Date: 5-1-86 Time: 3:53PM
Received by: Date: 5-1-86 Time: 3:54PM
Relinquished by: Date: Time:
Received by: Date: Time:

Foth & Van Dyke

Green Bay, Wisconsin

CLIENT: Wausau Energy DATE: 5-1-86

PROJECT: BY: B. Possin

PROJECT NO.: PAGE NO.: OF

COMPUTED BY: DATE: REVIEWED BY: DATE:

CHECKED BY: DATE: APPROVED BY: DATE:

Chain of Custody Log

Samples Taken 5-1-86 by Foth & Van Dyke (B. Possin & F. Baran)

Sample I.D.	Container	Analytical Parameters	Sample Type	# Containers
TB-103-C2 } one sample	40 ml VOA	Priority Pollutant VOCs	Soil	1
TB-103-C2 }				
TB-104-A1 } one sample			Soil	1
" " A2 }				
" " B1 } one sample			Soil	1
" " B2 }				
" " C1 } one sample			Soil	1
" " C2 }				
TB-105-A1 } one sample			Soil	1
" " A2 }				
" " B1 } one sample			Soil	1
" " B2 }				
" " C1 } one sample			Soil	1
" " C2 }				

Relinquished by: Date: 5-1-86 Time: 3:53pm

Received by: Date: 5-1-86 Time: 3:54pm

Relinquished by: Date: Time:

Received by: Date: Time:

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

June 3, 1986

Mr. Fred Dorn
Foth & VanDyke Engineers, Inc.
P.O. Box 11997
2737 Ridge Road
Green Bay, WI 54303-1997

Re: Wausau Energy Project

Attached are the analytical results for for TOC of the select soil samples collected May 1, 1986. Analysis of TOC was by a gasometric procedure. Results are reported as percent of dry solids.

If you have any questions about the results, please call.

Sincerely,

ZIMPRO INC.

James R. Salkowski
Analytical Laboratory Supervisor

JRS/ls

cc: J.W. Barr

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Foth & VanDyke Engineers Inc.

Sample	Total Organic Carbon, % of Dry Weight	Analytical No.
103-A	0.26	18117
103-B	<0.05	18118
103-C	0.12	18119
104-A	0.17	18120
104-B	<0.05	18121
104-C	0.36	18122
105-A	<0.05	18123
105-B	<0.05	18124
105-C	0.30	18125

APPENDIX A.3

HYDROGEOLOGICAL INVESTIGATION OF THE ALLUVIAL AQUIFER BENEATH CITY WELL 6, RMT INC./GERAGHTY & MILLER, INC. 1987

— DK2

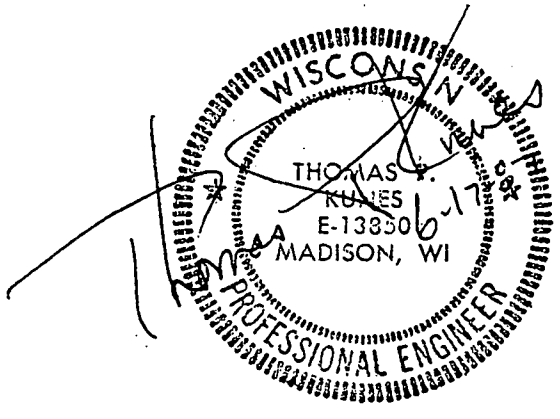
WARZYN ENGINEERING INC.
RECEIVED
JUL 10 1987
MADISON

C13076-M-4

OF THE ALLUVIAL AQUIFER
BENEATH CITY WELL 6

WAUSAU, WISCONSIN

JUNE 1987



RMT, Inc.

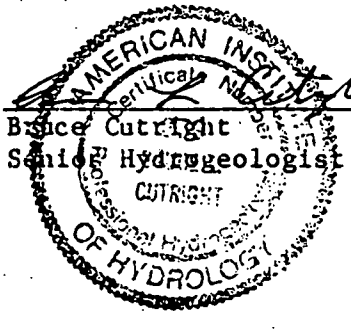
Thomas R. Stolzenburg
Water Chemist

Stephen D. Johannsen
Manager, Hydrogeologic Services

Thomas P. Kunes, P.E.
President, Northern Region

Geraghty & Miller, Inc

Lori Huntoon
Hydrogeologist



Bruce Cutright
Senior Hydrogeologist

222.04 906:RPT:fol0617

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1. INTRODUCTION

In March of 1982, the City of Wausau discovered the presence of trichloroethylene in one of its water supply wells. Subsequent investigations conducted by the U.S. Environmental Protection Agency, the Wisconsin Department of Natural Resources, and the Wisconsin Geological and Natural History Survey extended the known area of ground water contamination but did not definitively locate a source of contamination. The USEPA under the authority provided in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or "Superfund") has continued to seek potential sources. In early 1986 the City of Wausau, Marathon Electric Corporation, Wausau Chemical Corporation, AMOCO Corporation, and Wausau Energy Corporation were named as potentially responsible parties for the ground water contamination in the Wausau area by the USEPA. This group of 5 named PRPs were not able to reach an agreement with the USEPA to conduct a Remedial Investigation/Feasibility Study. When it became apparent that the 5 PRPs would not be able to cooperate with the USEPA, Marathon Electric Corporation and the City of Wausau agreed to work together outside of the normal Superfund process to address ground water contamination identified on the west side of the Wisconsin River.

Marathon Electric Corporation retained RMT, Inc., as their technical consultant. The City of Wausau retained Geraghty & Miller, Inc., as their technical consultant. RMT and Geraghty & Miller conducted investigations on the west side of the Wisconsin River beginning in August of 1986 and continuing to February of 1987. This report presents the findings and conclusions of that study.

1.1 Background

The City of Wausau municipal water supply is derived from six high-yield water supply wells located on both the east and west sides of the Wisconsin River. These production wells are responsible for the daily supply of (approximately) 4.3 million gallons of water required for the city residents and industries. Wells located on the west side of the Wisconsin River are City Wells 6, 7 and 9.

In March of 1982, trichloroethylene (TCE) was discovered in City Well 6, the southern most well of the 3 west side wells. Initially, the concentration of TCE was less than 100 ug/L. Concentrations gradually increased over time until February, 1984 when 200 ug/L was exceeded. The measured concentrations have remained in the range of 150 to 250 ug/L to the present. TCE has been the only compound conclusively detected in the well 6 water. Trace or unquantifiable detects of tetrachloroethylene (PCE) and dichloroethylene (DCE) have been reported in well 6, but not in any consistent pattern.

City Well 6 was taken off the city water supply line and has been pumped to waste at a rate of 1100 gpm since April 1986. Prior to April, well 6 was used periodically to mix with the other wells when supply demands required. Pumping of City Well 6 apparently limits contaminant movement toward City Wells 7 and 9, providing a hydraulic barrier between the source and the remaining west side water supply wells.

Several investigations have been conducted by the USEPA and the Wisconsin DNR in the vicinity of City Well 6 to determine the source of the TCE. As of the date of this report, they have not identified a specific source.

1.2 Purpose

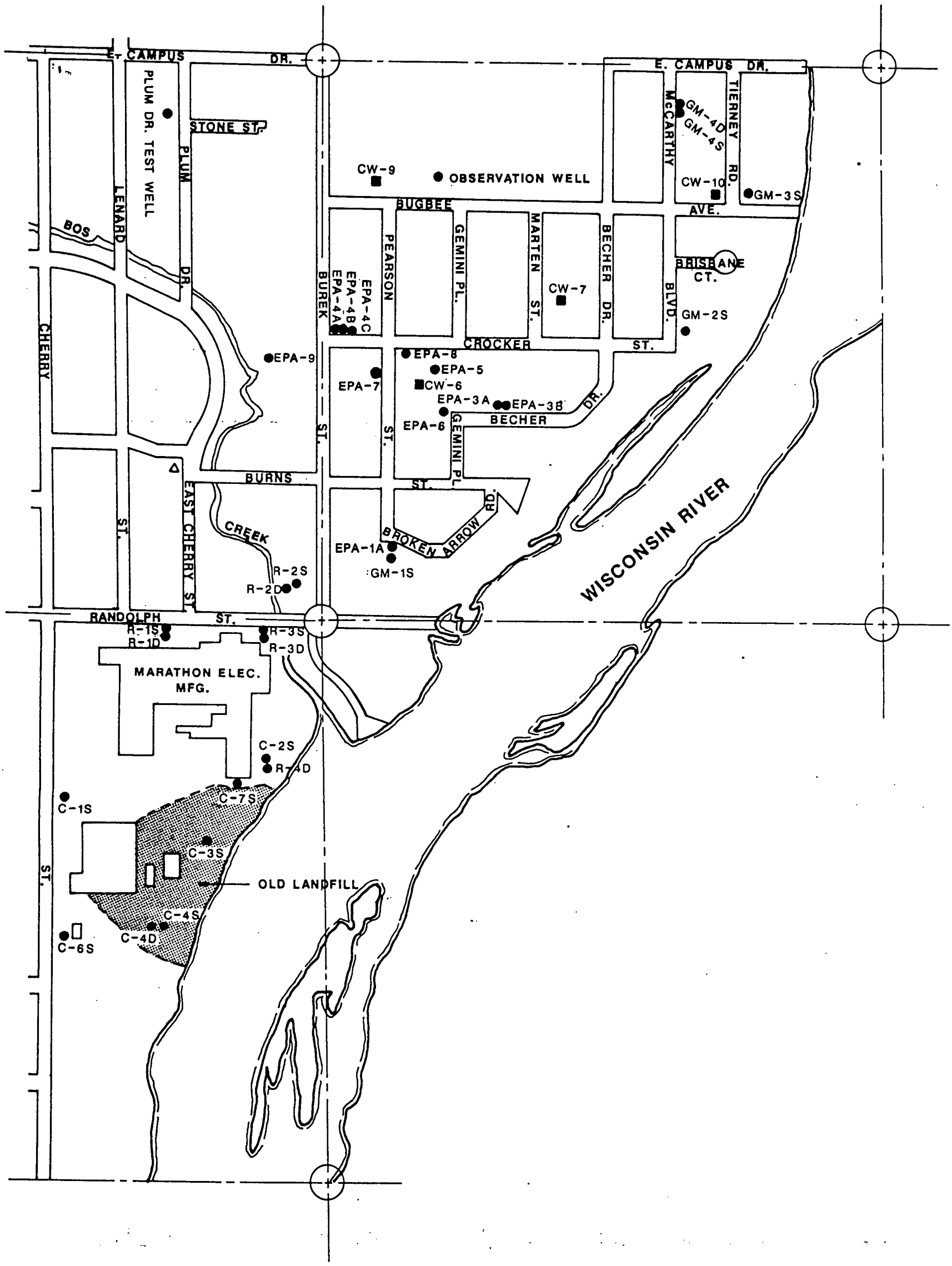
The goals of this investigation, jointly conducted on behalf of Marathon Electric and the City of Wausau by RMT, Inc., and Geraghty & Miller, Inc., were to define the ground water flow directions on the west side of the Wisconsin River to determine if the Marathon Electric/Old City Landfill property could be contributing contaminants to City Well 6. Secondly, the investigation was intended to add to the ground-water chemical data base by sampling of new wells and resampling of previously installed wells. This sampling provided consistent sampling methods for all wells in addition to the data collected in conjunction with hydraulic measurements to provide better evaluation of the distribution of contaminants and potential TCE migration pathways.

1.3 Scope

The tasks required to accomplish the above goals are listed below:

Objective 1 - Ground Water Flow Direction

Task 1 - Install deep and shallow wells on the Marathon Electric Property and around City Well 6. The new wells are designated by R- and GM- prefixes (Figure 1).



LEGEND

- ● EPA-1A EPA MONITORING WELL
- ● GM-1S GERAGHTY & MILLER MONITORING WELL
- ● R-1S RMT, INC. MONITORING WELL
- ■ CW-6 CITY OF WAUSAU WATER SUPPLY WELL
- ● C-4S CH_2M HILL MONITORING WELL

NORTH

0' 250' 500'

LOCATIONS OF WEST SIDE MONITORNG WELLS

RMT INC

Dwn. by:	JM
Date:	5/14/87
Proj.#	222.04

FIGURE 1

Task 2 - Collect ground-water level data from new and existing wells on the west side of the river which are screened at both shallow and deep depths. These water levels were recorded biweekly for six months.

Task 3 - Contour shallow and deep water level data to evaluate ground-water flow directions.

Task 4 - Conduct a pumping test on City Well 6 to determine aquifer properties and radius of influence of the pumping well.

Objective 2 - Additional Ground Water Chemical Data

Task 1 - Collect ground-water samples from City Well 6, in addition to monitoring wells in the well 6 vicinity and on the Marathon Electric Property.

Task 2 - Analyze the ground-water samples for the volatile organic compounds which have been previously detected in City Well 6, wells in the Old City Landfill, and wells on the Marathon Electric Property.

Task 3 - Analyze the ground-water samples from selected wells for major ions to verify flow directions by general water quality characteristics.

2. FINDINGS AND CONCLUSIONS

Geology

1. The study area is located in the Wisconsin River Valley. The near-river geology is dominated by thick sand and gravel deposits overlying Precambrian igneous and metamorphic bedrock.

2. The bedrock surface slopes sharply toward the river locally and toward the south regionally. Previous investigations suggest the presence of a bedrock ridge south of City Well 6, which may influence deep ground-water flow.

Hydrogeology

4. The sand and gravel of the aquifer are highly permeable and heterogeneous. The aquifer is unconfined with a saturated thickness of almost 120 feet near the Wisconsin River.

5. Ground water generally flows from the bedrock hills which border the valley toward the Wisconsin River. Locally, ground water flow is affected by river level fluctuations, bedrock topography, and pumping of the city wells.

6. Ground water under the southern part of the Marathon Electric/Old City Landfill property flows toward the Wisconsin River. Shallow ground-water flow discharges into the river.

7. Ground water under the northern part of the Marathon Electric/Old City Landfill property flows northeastward, toward the Wisconsin River, and under some conditions may flow to the north.

8. The radius of influence of City Well 6 extends at least as far south as Bos Creek. The shallow ground-water flow system appears to be influenced by Bos Creek, which may act as a recharge area during high creek levels and a discharge area during low levels.

9. The bedrock ridge south of City Well 6 may divert the flow of deep ground-water from the south toward the Wisconsin River. It is unknown to what extent deep ground water may flow over or around the ridge.

10. Pumping test results indicate that the aquifer responded as an unconfined aquifer with delayed yield. The following aquifer characteristics were computed:

Average Transmissivity - 315,000 gpd/ft to 370,000 gpd/ft

Storage Coefficient - 0.34 (Late), 0.05 (Early)

Average Hydraulic Conductivity - 2625 gpd/ft^2 to 3083 gpd/ft^2

WATER QUALITY

1. Trichloroethylene (TCE) is a common industrial solvent and waste product. TCE has been found in City Well 6 at concentrations ranging from approximately 100 ug/L to 200 ug/L.

2. Samples collected from monitoring wells EPA 4C and EPA 7, located northwest of City Well 6, detected 20 to 60 ug/L TCE, indicating there may be a source of TCE to the west of City Well 6.

3. Samples collected from monitoring wells R-4D and R-2D found concentrations of TCE ranging from 3,190 ug/L to 1,140 ug/L, indicating a possible source of TCE to the south of City Well 6.

4. Drinking water currently supplied to the City of Wausau residents is within applicable federal and state health-related standards and is tested on a regular basis so that adequate quality is maintained.

3. SUBSURFACE INVESTIGATION

3.1 Methods of Investigation

The subsurface investigation for the west side aquifer was prepared by RMT and Geraghty & Miller following a review of regional information and previous hydrogeologic studies. Directly related to the RMT/Geraghty & Miller investigation are two studies which were conducted by Roy F. Weston, Inc., and CH_2M Hill.

In 1985, Roy F. Weston, Inc., issued a report on behalf of the EPA which presented the results of their initial studies to locate the source of VOC's in City Wells 3 and 4 on the east side of the Wisconsin River and City Well 6 on the west side. Figure 1 illustrates the network of city wells and monitoring wells which are currently in place on the west side.

In 1986, CH2M Hill, Inc., completed an investigation of the Old City of Wausau Landfill located on the Marathon Electric Property for the Wisconsin DNR.

Based on these previous studies, the locations of new borings and wells were planned to further delineate ground-water flow directions, specifically near the Old City Landfill and Marathon Electric Property. Nine monitoring wells were installed under the supervision of RMT and Geraghty & Miller during August and September, 1986. Following completion of well installation, water level measurements continued to be collected from these wells in addition to the existing wells on a semi-monthly basis. An aquifer test was conducted by pumping City Well 6 at a constant rate for seven days to provide site-specific values for aquifer properties. One round of water quality samples was collected from the new monitoring wells in addition to selected existing monitoring wells, and analyzed for volatile organic compounds. Selected samples were also analyzed for inorganics and Hazardous Substances List parameters.

3.2 Site Setting

The Study Area is located in the northern portion of the City of Wausau, Marathon County, Wisconsin (Figure 1). Land use in the area is mostly residential near City Well 6, and mixed residential/industrial south of City Well 6.

The study area is bordered on the east by the Wisconsin River, and is bisected from northwest to southeast by Bos Creek. Land surface elevations range from approximately 1,225 feet (msl) near the western edge of the study area to 1,190 feet (msl) near the Wisconsin River. Wisconsin River water elevations are maintained by a dam at a fairly constant elevation of 1,187 to 1,188 feet (msl) operated by the Wisconsin Valley Improvement Corporation (S. Morgan Dec. 1986 personal communication).

3.3 Regional Hydrogeology

The major regional source of ground water for both private and municipal use is the Wausau Aquifer (Kendy, 1986). The Wausau Aquifer consists of glacio-fluvial sand and gravel outwash deposits which have filled buried bedrock valleys along the Wisconsin River, including the study area. These sand and gravel deposits are typically less than 1/2 mile wide. In some areas, the outwash deposits are over 150 feet thick. Wells in the unconfined Wausau Aquifer typically yield from 500 to 1,000 gpm, although the west side wells have been tested at greater than 3,000 gpm.

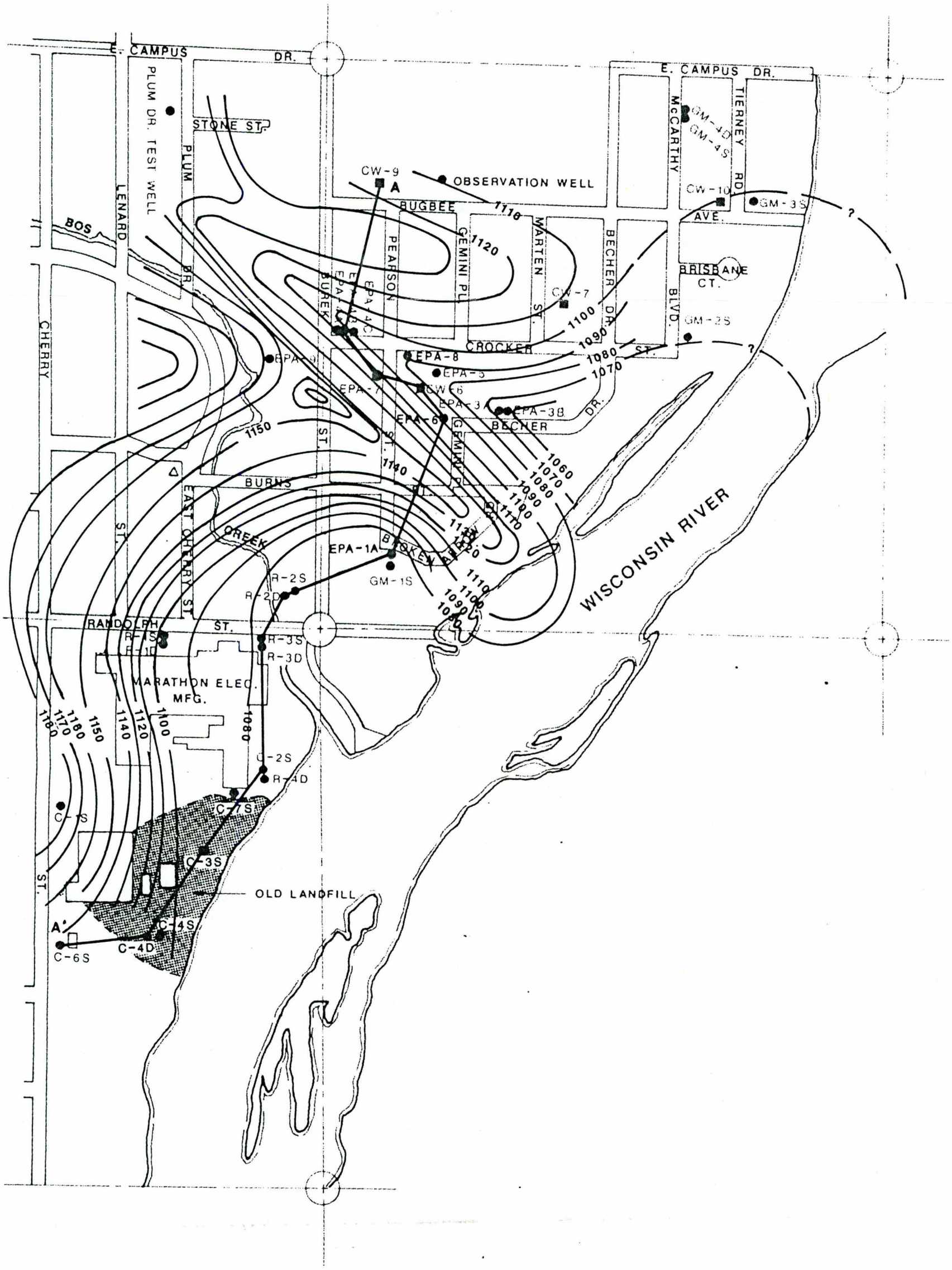
In upland areas away from the productive Wausau Aquifer, the crystalline bedrock yields a limited amount of water for domestic use. Although relatively impermeable, numerous near-surface fractures and weathered bedrock zones provide sufficient quantities of water for individual residential use. Generally, yields are less than 20 gpm in the bedrock aquifer, with yields in some areas less than 5 gpm (Kendy, 1986).

3.4 Site Geology

3.4.1 Bedrock

Bedrock in the study area has been extensively investigated by LaBerge and Myers (1983) to determine the potential for mineral exploration of the Precambrian rock. Two major lithologic units that are igneous in origin dominate the regional bedrock geology. Syenite, an igneous plutonic rock similar to granite but lighter in color, underlies the study area on the west side of the Wisconsin River. Bedrock on the east side of the river is predominantly rhyolite. The contact between these two lithologic bodies in the Wausau area is believed to be located beneath the Wisconsin River.

A seismic refraction study to determine the top of the bedrock surface was conducted by Roy F. Weston, Inc., in 1985. The Weston bedrock surface map has been combined with subsequent boring information to produce the bedrock surface map included as Figure 2. There is an apparent northwest to southeast-trending bedrock ridge located south of City Well 6 and north of Bos Creek.



LEGEND

- EPA-1A EPA MONITORING WELL
- GM-1S GERAGHTY & MILLER MONITORING WELL
- R-1S RMT, INC. MONITORING WELL
- CW-6 CITY OF WAUSAU WATER SUPPLY WELL
- C-4S CH_2M HILL MONITORING WELL

A A' GEOLOGIC CROSS SECTION

APPROXIMATE BEDROCK SURFACE (COMBINES WESTON 1985 & UNPUB. DATA)

RMT INC.

Dwn. by:	JM
Date:	5/7/87
Proj. #:	222.04

FIGURE 2

3.4.2 Unconsolidated Deposits

The study area is situated in an area of complex glacial outwash sand and gravel deposits. Figure 3 provides a north-to-south geologic cross-section through the study area. The location of the cross-section is shown on Figure 2. On the bedrock surface map, the bedrock has been defined as a lower boundary wherever boring information was available.

3.5 Site Hydrogeology

3.5.1 West Side Municipal Well Field

Water Supply Wells. City Well 6, located in the West Side Well Field on the corner of Pearson and Crocker Streets, was installed in 1951 by Layne-Northwest. The well was tested at 3,600 gpm, yielding a specific capacity of 130 gpm/ft. The well is 100 feet deep with a 24-inch bronze screen installed from 60-100 feet below land surface. The well, screened in sands, is considered the best producer of the city water supply wells, having both a high yield and a low iron and manganese content.

City Well 6 was taken off the city water supply line and has been pumped to waste at a rate of 1,100 gpm since April 1986. Prior to April, water from well 6 was periodically mixed with water from the other wells when demand required. Pumping of City Well 6 limits contaminant movement toward City Wells 7 and 9, and may provide an hydraulic barrier between the source of TCE and the remaining west side city water supply wells. Figure 4 shows the average monthly pumping for well 6 from 1977 to the present.

PUMPING HISTORY OF CITY WELL 6

1977 to 1986

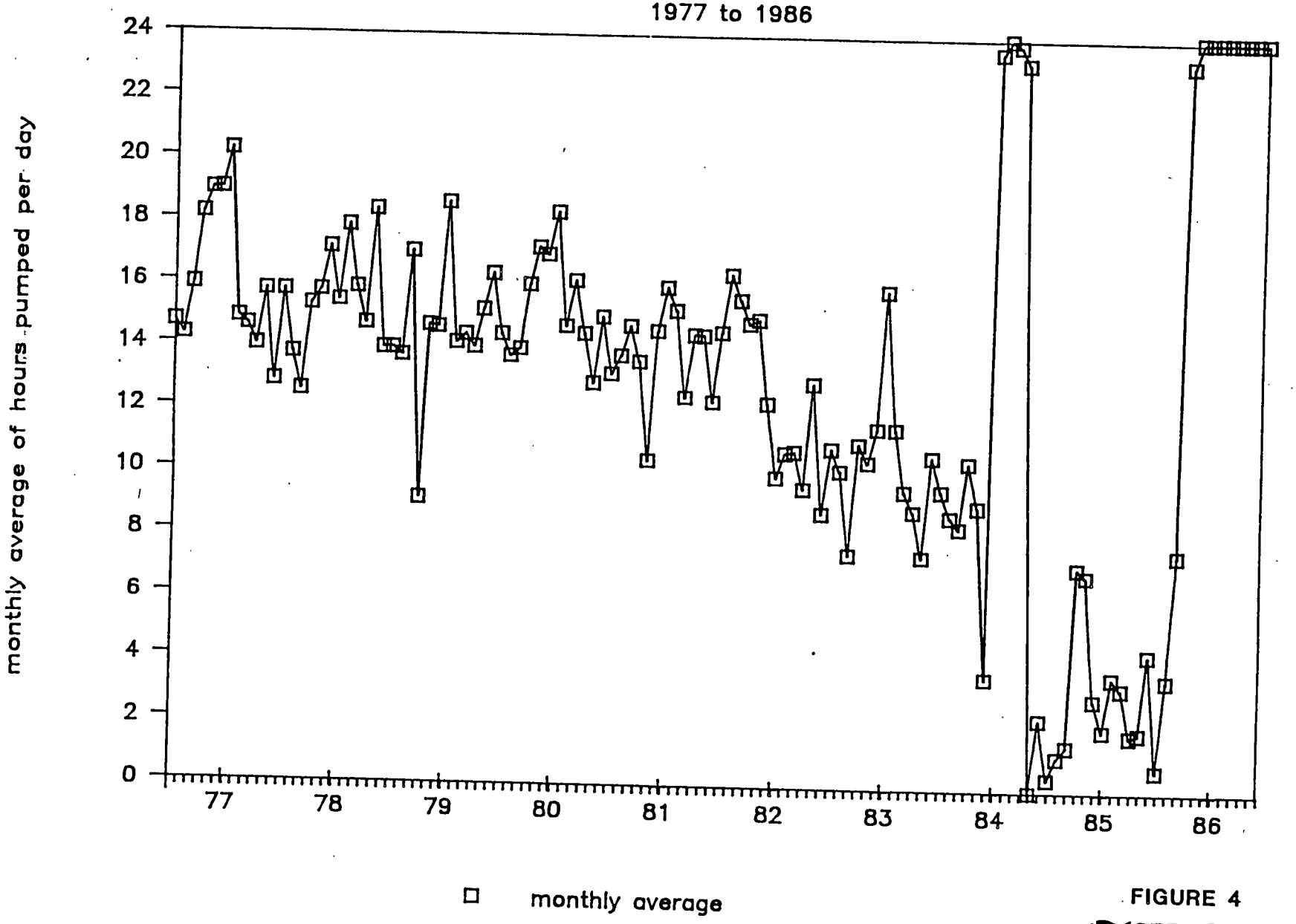


FIGURE 4

GERAGHTY & MILLER, INC.
Ground-Water Consultants

City Well 7, located between Bugbee Avenue and Crocker Street, was installed in 1951 by Layne-Northwest. The well was originally tested at 3,180 gpm, yielding a specific capacity of 127.5 gpm/ft. The total depth of the well is 100 feet below land surface with a 24-inch diameter bronze screen from 60 to 100 feet below land surface. The well is screened in sand, and presently pumps an average of 1,700 gpm when pumping alone (1,600 gpm when pumping in conjunction with well 9). No contamination has been detected in City Well 7. Figure 5 shows the average monthly pumping for well 7 from 1977 to the present.

City Well 9, located on the corner of Burek and Bugbee Avenue, was installed in 1963 by Miller Well and Pump Company. The well was tested at 1,200 gpm, and no specific capacity was reported. Information gathered during this investigation indicates that City Well 9 has a specific capacity of approximately 71 gpm/ft. The lower specific capacity at this well is a result of the higher bedrock surface and resultant thinner alluvial aquifer at this location. Total depth of the well is 100 feet below land surface with a 20-inch diameter stainless steel screen from 60 to 100 feet. The well is screened in medium to fine sand, and presently pumps an average of 850 gpm when pumping alone (750 gpm when pumping in conjunction with Well 7). No contamination has been detected in City Well 9. Average monthly use of well 9 from 1977 to the present is shown in Figure 6.

Pumping History. Historically, pumping schedules of the city wells are highly variable. The city wells are turned on and off according to changes in demand and to shift the pumping load from well to well. The recent

PUMPING HISTORY OF CITY WELL 7

1977 to 1986

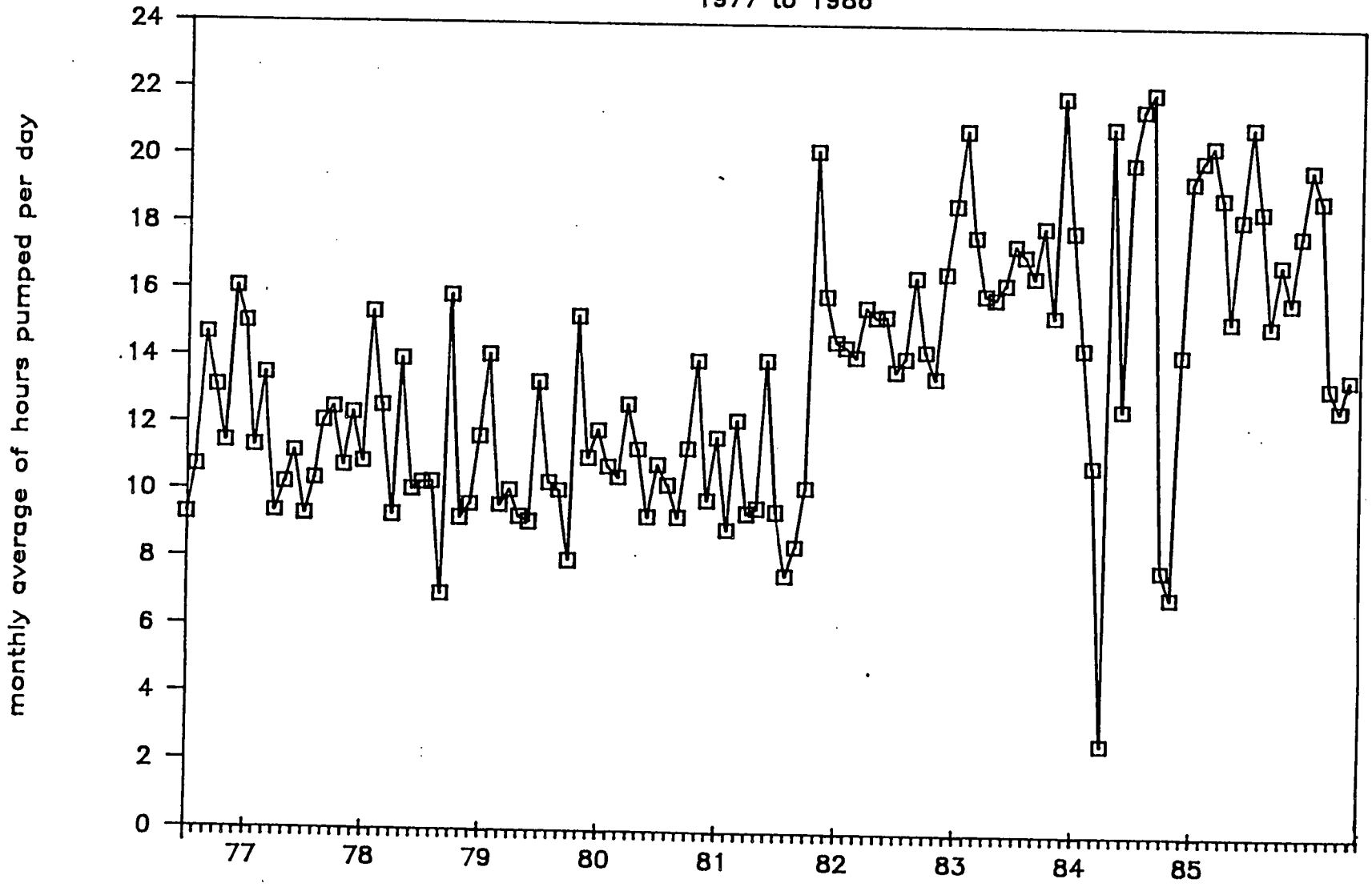


FIGURE 5

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PUMPING HISTORY OF CITY WELL 9

1977 to 1986

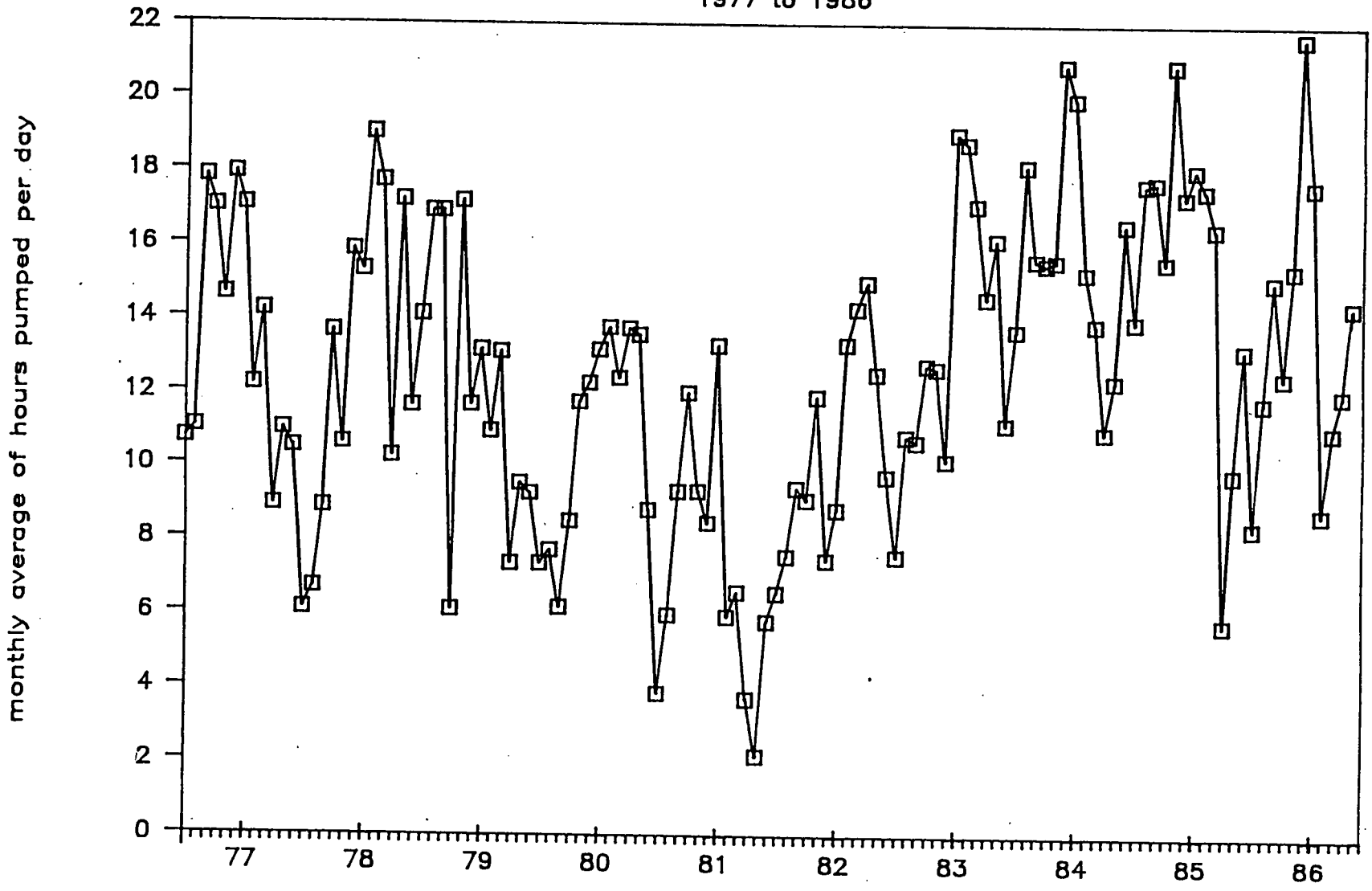


FIGURE 6

GERAGHTY & MILLER, INC.
Ground-Water Consultants

pumping history is summarized in Figures 4, 5, and 6, and is further defined below:

- During the winter months, wells 3 and 4 in the East Side Well Field commonly pump continuously, while wells 7 and 9 in the West Side Well Field run alternately. Well 8, on the east side near the Wausau Municipal Airport, is used only during times of high demand or periods when other wells must be shut down.

- During the summer months, pumping is heavier due to increased water demand, and all City wells are required to run almost continuously.

- The pumping rate of City Well 3 has had to be reduced over the last several years, from 1,250 gpm to the present pumping rate of 1,175 gpm. Wells 7 and 9 on the west side of the river have taken over the load well 3 is unable to carry. Well 6 was only used to meet maximum demands when necessary by mixing with clean water from the other wells.

3.5.2 Ground-Water Elevations and Flow Directions

Ground-water elevations and subsequently derived flow directions were evaluated on the west side of the Wisconsin River by collecting water level measurements semi-monthly over a 6-month period of time (May 1986 to January 1987) from all the monitoring wells on the west side. A summary of the available well construction information for the monitoring wells on the west

side can be found in Table 3-1. Table 3-2 provides the water level measurements recorded from May 1986 through January 1987.

Water level conditions from two dates during the study program are presented in Figures 7 and 8 (May 22, 1987 and November 26, 1986, respectively). On the west side of the study area, natural ground-water gradients are somewhat steeper than the rest of the area, as ground-water levels are controlled by higher bedrock levels in addition to the nearby well field. As ground water reaches the deep alluvial deposits of the Wisconsin River Valley, natural gradients become somewhat flatter and more strongly affected by the level of the Wisconsin River, which is the natural discharge area for the regional ground-water flow system. This stretch of the Wisconsin River directly east of the study area is a reservoir and the elevation is usually maintained at 1,188 $\pm$ 0.5 feet msl by a dam south of the study area controlled by the Wisconsin Valley Improvement Corporation.

Pumping from the city well field affects ground-water flow directions in this area. The radius of influence and distribution of the cone of depression of the well field varies, depending upon the rate and duration of pumping in each water supply well.

No strong vertical gradients were observed in the aquifer during the study period. For this reason, it appears that ground-water flow is predominantly horizontal in this area.

In general, water levels measured from the wells, in addition to results from the pumping test, indicate that Bos Creek is a general transition zone

TABLE 3-1
SUMMARY OF WEST SIDE WELL DATA, CITY OF WAUSAU, WI

Well Designation	Top of Casing Elevation	Ground Surface Elevation	Depth of Well	Bottom of Screen Elevation	Screen Length	Top of Screen Elevation
C-1S	1,223.69	1,220.98	29.9	1,191.08	15.0	1,206.08
C-2S	1,219.20	1,216.24	37.9	1,178.34	15.0	1,193.34
C-3S	1,220.17	1,217.41	38.9	1,178.51	15.0	1,193.51
C-4S	1,216.80	1,214.26	32.2	1,182.06	15.0	1,197.06
C-4D	1,216.30	1,214.04	104.2	1,109.84	5.0	1,114.84
C-6S	1,221.69	1,219.32	39.5	1,179.82	15.0	1,194.82
C-7S	1,220.96	1,218.26	36.0	1,182.26	15.0	1,197.26
EPA1A	1,215.81	1,214.21	130.0	1,084.21	8.0	1,092.21
EPA3A	1,223.26	1,221.11	140.0	1,081.11	10.0	1,091.11
EPA3B	1,223.53	1,221.17	74.9	1,146.27	10.0	1,156.27
EPA4A	1,215.24	1,215.59	100.0	1,115.59	10.0	1,125.59
EPA4B	1,215.62	1,215.68	60.5	1,155.18	10.0	1,165.18
EPA4C	1,215.34	1,215.69	40.0	1,175.69	10.0	1,185.69
EPA5	1,219.22	1,219.28	45.0	1,174.28	10.0	1,184.28
EPA6	--	1,218.93	45.0	1,174.00	10.0	1,184.00
EPA7	1,219.00	1,219.06	45.0	1,174.06	10.0	1,184.06
EPA9	1,201.92	1,201.99	--	--	--	--
PLUM	1,215.85	1,213.73	--	--	--	--
CW6	1,220.02	1,220.02	100.0	1,120.02	38.5	1,158.52
CW7	1,223.63	1,223.63	100.0	1,123.63	39.0	1,162.63
CW9	1,224.56	1,224.56	100.0	1,124.56	60.0	1,184.56
CW90BS	1,224.25	1,222.12	--	--	--	--
R1S	1,222.08	1,220.01	40.5	1,179.51	10.0	1,189.51
R1D	1,222.34	1,220.16	121.0	1,099.16	10.0	1,109.16
R2S	1,209.84	1,208.05	28.0	1,180.05	10.0	1,190.05
R2D	1,209.54	1,207.69	135.0	1,072.69	10.0	1,082.69
R3S	1,215.27	1,212.79	32.0	1,180.79	10.0	1,190.79
R3D	1,215.51	1,213.09	136.0	1,077.09	10.0	1,087.09
R4D	1,219.21	1,216.05	133.0	1,083.05	10.0	1,093.05
GM1S	1,216.06	1,214.42	37.0	1,177.42	10.0	1,167.42
GM2S	1,211.91	1,212.32	34.0	1,178.79	10.0	1,188.79
GM3S	1,214.72	1,215.10	37.0	1,178.10	10.0	1,188.10
GM4S	1,216.13	1,214.31	36.0	1,178.31	10.0	1,188.31
GM4D	1,216.46	1,214.52	145.0	1,069.52	10.0	1,079.52
WHTW	1,199.52	--	--	--	--	--
Test Well 10		1,215.05	--	--	--	--
Staff Gauge (Bos Creek)		1,187.82	NA	NA	NA	NA

-- = Information not available NA - Not applicable

TABLE 3-2
TIME SERIES WATER LEVEL MEASUREMENTS
WEST SIDE MONITORING WELLS (WAUSAU, WI)

Well:	C 1S	C 2S	C 3S	C 4S	C 4D	C 6S	C 7S	EPA 1A	EPA 2A	EPA 3A	EPA 3B	EPA 4A
Date												
22-May-86	27.10	31.77	32.72	29.43	28.94	33.85	33.44	29.73	17.16	32.96	38.11	31.80
29-May-86	26.92	31.89	32.85	29.52	28.97	33.97	33.57	29.93	17.21	38.30	38.49	31.94
12-Jun-86	27.73	31.92	37.81	29.34	28.85	34.04	33.59	29.88	17.88	38.19	38.38	32.42
26-Jun-86	28.20	31.74	32.74	29.09	28.81	33.92	33.49	29.95	18.24	38.38	38.56	32.70
10-Jul-86	27.65	31.77	32.74	29.10	28.81	33.81	33.43	29.92	18.09	38.52	38.65	32.56
24-Jul-86	28.25	31.60	32.61	29.11	28.69	33.72	33.26	28.77	17.43	37.28	37.49	30.61
07-Aug-86	28.52	31.77	32.74	29.33	28.81	33.92	33.46	29.67	17.26	38.22	38.37	31.74
21-Aug-86	28.86	31.74	32.67	29.26	28.78	33.95	33.45	29.62	17.17	38.16	38.35	31.59
04-Sep-86	24.59	31.79	32.76	29.27	28.83	34.01	33.49	29.62	17.31	38.18	38.32	31.80
18-Sep-86	29.01	31.52	32.45	28.91	28.55	33.75	33.19	29.38	17.21	37.89	38.09	31.53
02-Oct-86	25.57	30.49	31.55	28.09	27.61	32.74	32.18	27.75	16.55	35.88	36.06	30.19
16-Oct-86	25.50	30.39	31.40	27.90	27.50	32.52	32.08	27.97	16.11	36.25	36.43	30.04
30-Oct-86	26.81	33.54	35.30	32.04	31.50	34.06	35.04	31.23	--	39.38	39.60	31.46
26-Nov-86	28.88	32.35	33.47	30.13	29.59	34.42	34.02	30.17	--	38.54	37.74	31.87
05-Jan-87	30.68	--	33.67	34.88	29.83	--	--	30.32	--	--	--	51.00

Well:	EPA 4B	EPA 4C	EPA 5	EPA 7	EPA 9	Plum	CW 6	CW 7	CW 9	CW 9 OBS	R1S	R1D
Date												
22-May-86	32.25	--	36.06	36.93	--	23.17	42.00	33.00	59.00	40.50	--	--
29-May-86	32.36	--	36.32	37.06	17.73	23.33	44.00	65.00	57.00	40.48	--	--
12-Jun-86	32.83	32.60	36.50	37.36	18.23	23.80	45.00	64.00	58.00	41.26	--	--
26-Jun-86	33.09	32.85	36.71	37.63	18.52	24.22	43.00	64.00	58.00	32.74	--	--
10-Jul-86	32.97	32.69	36.72	37.49	18.37	24.41	44.00	65.00	58.00	41.26	--	--
24-Jul-86	31.01	30.75	33.89	33.87	16.89	24.55	17.00*	64.00	57.00	40.53	--	--
07-Aug-86	32.11	31.87	36.26	36.88	17.62	24.48	41.00	64.00	43.00*	40.70	--	--
21-Aug-86	31.98	31.67	36.12	36.75	17.52	24.45	42.00	68.00	42.00	40.20	--	--
04-Sep-86	32.20	31.95	36.24	36.94	17.70	24.66	44.00	68.00	43.00	40.17	--	--
18-Sep-86	31.92	31.67	35.90	36.60	17.48	24.74	42.00	68.00	41.00	39.85	--	--
02-Oct-86	30.54	30.32	33.79	34.76	16.23	24.37	41.00	36.00*	57.00	38.52	33.12	33.51
16-Oct-86	30.44	30.14	34.16	34.92	16.05	23.94	42.00	68.00	40.00	38.26	32.82	33.26
30-Oct-86	31.89	31.62	36.61	37.00	17.28	23.31	43.00	66.00	43.00	40.55	33.71	34.53
26-Nov-86	32.25	32.03	36.35	36.97	17.75	23.69	43.00	67.00	--	40.33	34.31	34.89
05-Jan-87	103.00	--	36.48	37.18	18.08	--	43.00	--	--	--	35.28	--

Well:	R2S	R2D	R3S	R3D	R4D	GM1S	GM2S	GM3S	GM4S	GM4D
Date										
22-May-86	--	--	--	--	--	--	--	--	--	--
29-May-86	--	--	--	--	--	--	--	--	--	--
12-Jun-86	--	--	--	--	--	--	--	--	--	--
26-Jun-86	--	--	--	--	--	--	--	--	--	--
10-Jul-86	--	--	--	--	--	--	--	--	--	--
24-Jul-86	--	--	--	--	--	--	--	--	--	--
07-Aug-86	--	--	--	--	--	--	--	--	--	--
21-Aug-86	--	--	--	--	--	--	--	--	--	--
04-Sep-86	--	--	--	--	--	--	--	--	--	--
18-Sep-86	--	--	--	--	--	--	--	--	--	--
02-Oct-86	20.83	21.32	26.03	27.13	30.57	28.09	23.58	26.22	27.75	28.04
16-Oct-86	20.72	20.33	25.80	27.07	30.45	28.14	23.89	26.22	27.85	28.18
30-Oct-86	22.61	24.40	27.06	29.94	33.81	31.34	27.64	30.41	31.74	32.09
26-Nov-86	22.85	23.34	27.53	29.03	32.41	30.40	21.20	28.36	30.15	30.45
05-Jan-87	27.07	--	27.82	29.19	32.66	--	26.08	28.34	30.10	30.39

-- Water Levels Not Measured
* City Well 6 Not Pumping

for ground-water flow directions. North of Bos Creek, it appears that ground-water flows to the north and east toward City Well 6. South of Bos Creek, it appears that ground water flows predominantly east and southeast toward the Wisconsin River. The extent that Bos Creek influences flow directions is believed to be dependent on water levels in the creek. During high creek stages, water may flow from the creek into the aquifer, and during low stages ground water may discharge into the creek. The effectiveness of the creek as a boundary was not evaluated.

Variations in the alluvial deposits may also control ground-water flow. The boring logs recorded during drilling indicate that the alluvial deposits vary from fine-sandy deposits to coarse-gravelly layers. Based on the boring logs, it appears there may also be some coarse layers at depth. While no continuous layers have been mapped, it is probable that gravelly lenses were deposited in the beds of the old stream channels, which would be expected to parallel the current Wisconsin River channel. If this is true, these coarse layers would result in a greater potential for contaminant migration along higher permeability zones created by these deposits. However, water level response data collected during the pump test from individual monitoring wells has not provided any clear hydraulic evidence that these channels exist.

Alternatively, the geophysical survey (Weston, 1985) indicated the presence of a bedrock ridge south of City Well 6. If this ridge is as extensive and as high as indicated in the survey, old river channels may not exist in this area. This bedrock ridge may influence deep ground- water flow and divert it toward the Wisconsin River discharge area. There is not

sufficient information at this time to determine the presence and degree of influence of the ridge.

3.5.3 Pump Test Results

An aquifer test was conducted on the City of Wausau West Side Well Field from December 6-12, 1986. The purpose of this test was to define important aquifer characteristics which include hydraulic conductivity, transmissivity, and storage coefficient.

The test well, City Well 6, was pumped at a constant rate of 1,100 gpm throughout the seven (7) days of the test, at which time it was shut down and the recovery was monitored for 24 hours. Water levels were measured in the test well and nearby monitoring wells throughout the pump test. Water level measurements were collected by pressure transducers for the test well and those wells in the near vicinity, and by electrical measuring tapes and steel tapes for those wells at a greater distance from the test well. Figure 9 illustrates water levels recorded during the pump test at City Well 6 and two of the monitoring wells (EPA5 and EPA7).

There are a number of critical factors which could influence the pumping test and therefore were necessary to monitor. These include any pumping of nearby wells (other than the test well), changes in pumping rates of the wells, fluctuation in water levels of the nearby Wisconsin River, weather conditions (barometric pressure, temperature and precipitation), geological features (presence of a buried bedrock ridge), and anomalies in water level

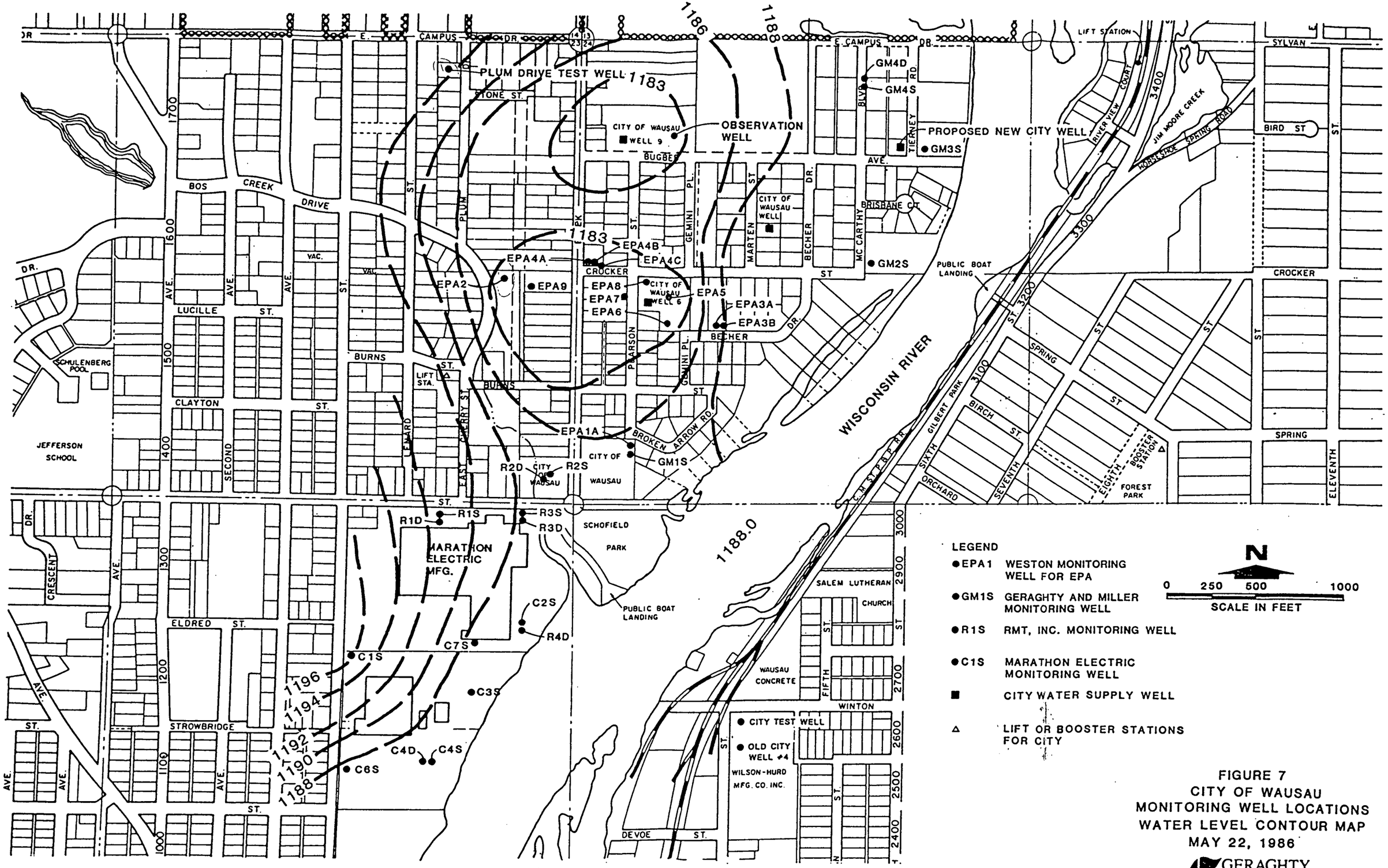


FIGURE 7
CITY OF WAUSAU
MONITORING WELL LOCATIONS
WATER LEVEL CONTOUR MAP
MAY 22, 1986

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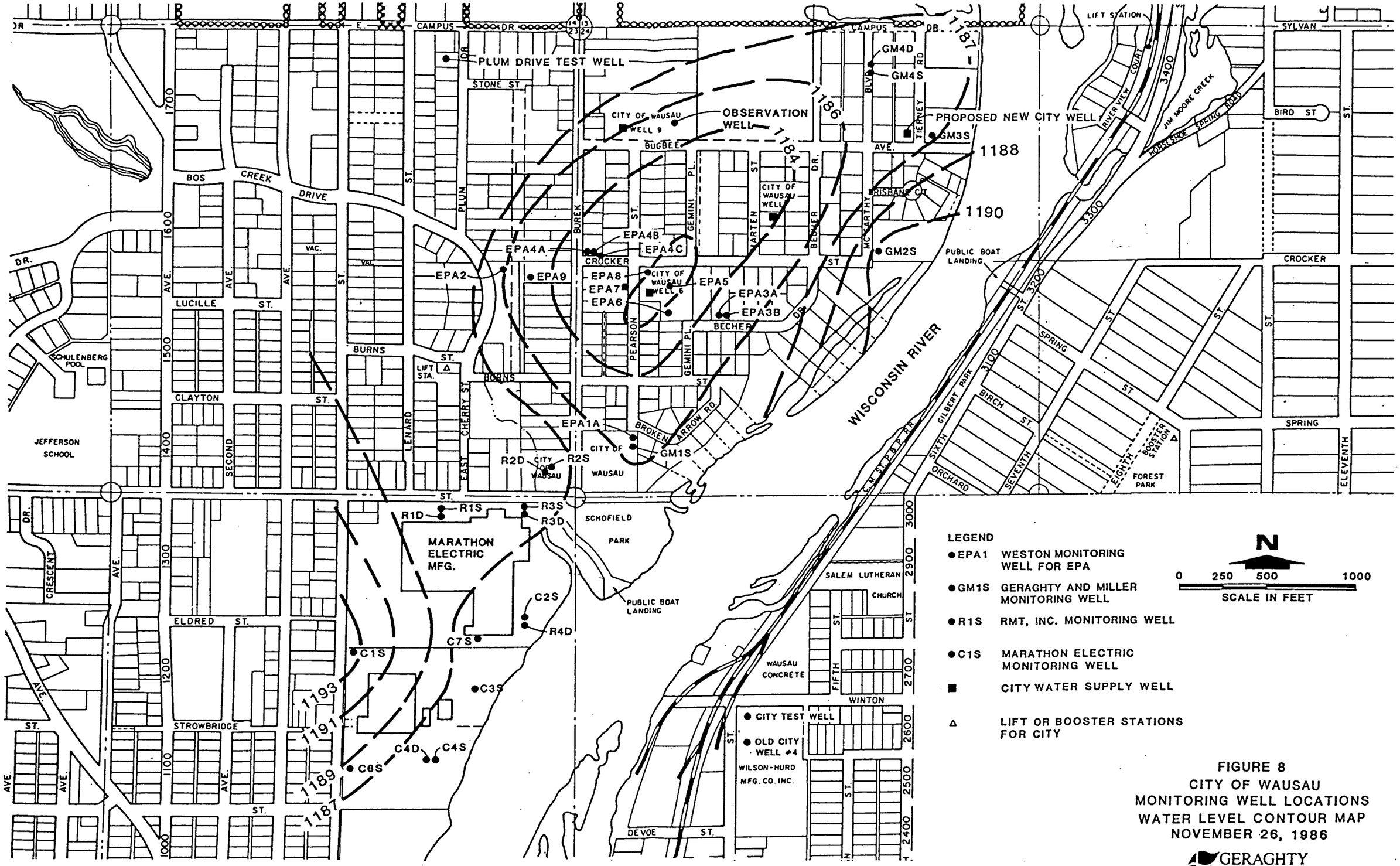
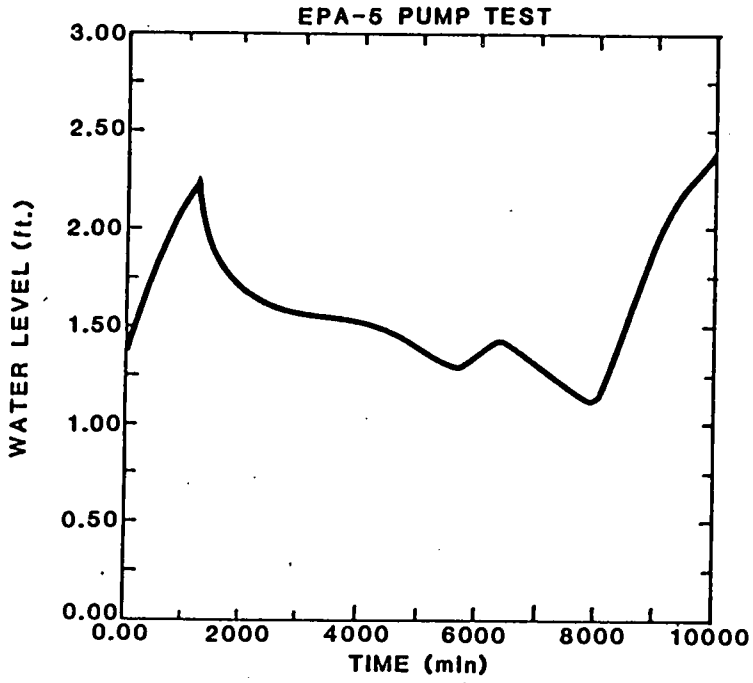
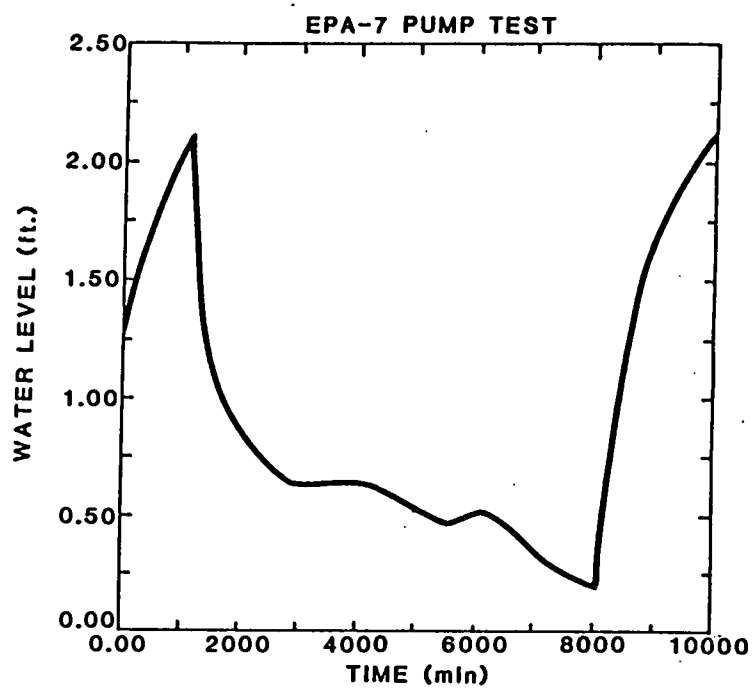
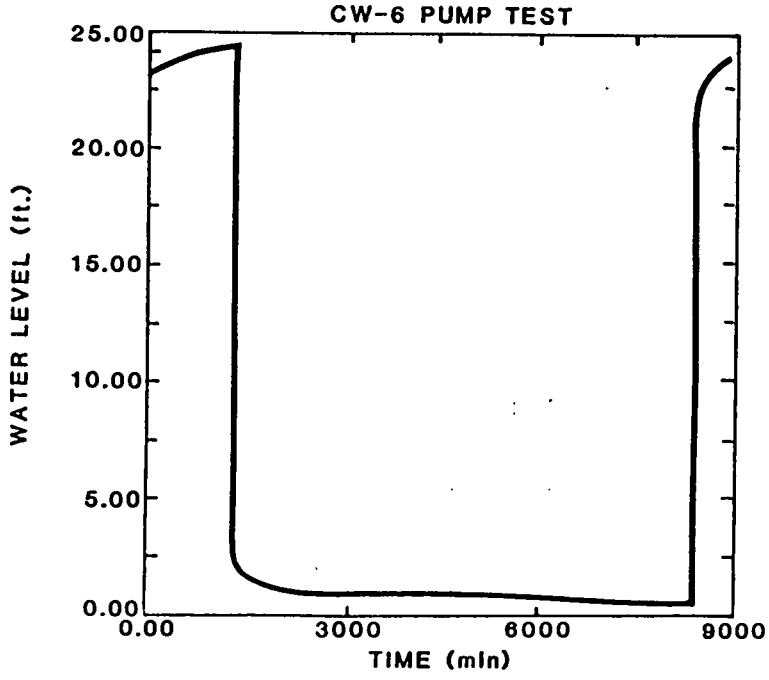


FIGURE 8
CITY OF WAUSAU
MONITORING WELL LOCATIONS
WATER LEVEL CONTOUR MAP
NOVEMBER 26, 1986

GERAGHTY & MILLER, INC.
Ground-Water Consultants







NOTE:

City Well 6 turned on
at 1200 minutes,
pumping rate = 1100 GPM

City Wells 7 and 9 turned on
at 3600 minutes,
pumping rate CW7 = 1600 GPM
pumping rate CW9 = 750 GPM

City Well 6 turned off
at 8200 minutes

FIGURE 9
CITY OF WAUSAU

WATER LEVEL RECORDS
IN SELECTED WELLS
DURING AQUIFER TEST

GERAGHTY & MILLER, INC.
Ground-Water Consultants

readings (due to movement and interference with transducers or inaccuracies in water level measurement). These are further described below:

- Due to the city's water supply needs, the wells on the west side well field were shut down only 30 hours prior to the start of the pumping test. Full recovery of the water table had not occurred at the start of the test and a correction for the antecedent trend in the water levels was incorporated into the analyses. The City operated on system reserves during the first 1000 minutes of the test without utilizing wells 7 or 9. By Monday evening (the test began Saturday morning), the city's reservoirs of water began to be depleted and additional west side wells were required to come on-line. Prior to this time, only City Well 4 on the east side of the river was pumping. City Wells 3, 7 and 9 were turned on at 2:00 a.m. Tuesday, December 9, 1986 (3800 minutes after the start of the test), at rates of 1175 gpm, 1600 gpm, and 750 gpm, respectively. City Well 4 was shut off at this time, but was required to resume pumping at 7:00 a.m. Thursday, December 11, for two hours, due to an ongoing study conducted by the USEPA and Michigan Technological University.

- The elevations of the water levels in the Wisconsin River during the time the test was in progress were recorded by the Wisconsin Valley Improvement Corporation, at a water level recorder located inside the power house at the dam south of the study area. River levels showed a fairly consistent elevation of 1187.40 ($\pm$0.3) ft/msl during the test period. The water levels measured at the

Wisconsin River from December 5 through December 12 are listed in Table 3-3.

- Changes in weather conditions during the time the test was in progress were recorded by the Wausau Flight Service at the Wausau Municipal Airport. Barometric pressure showed a steady level of 30.00 ($\pm$0.50) mm Hg during the test period; therefore, no water level changes are likely to be affected by barometric pressure fluctuations. Temperatures during the test period fell from 30°F to 0° F, with only a slight warming from time to time. Precipitation was minimal during the pump test, as only two inches of snow (0.1 inch water level equivalent) accumulated during the seven days of the test. Barometric pressure measurements, temperature readings, and precipitation amounts for December 6 through December 12 are listed in Table 3-4.

Methods of Analysis. The physical setting for the West Side Well Field consists of a wedge-shaped aquifer thinning from east to west, bounded on the east by the Wisconsin River and to the west by the rising crystalline bedrock surface. North of the well field there is an area where gravel mining has removed from 25 to 35 feet of the aquifer material over an area of several tens of acres. South of the well field area, Bos Creek may act as a boundary near the surface or have no effect at all. The underlying bedrock has little primary permeability and is discounted as a source of water. The irregular bedrock surface controls the aquifer thickness and may control flow directions in the deeper portions of the aquifer. The aquifer is composed of unconsolidated sands and gravels with minor amounts of silt.

TABLE 3-3
WISCONSIN RIVER ELEVATIONS DURING PUMP TEST

December 5, 1986		December 6, 1986		December 7, 1986		December 8, 1986	
TIME	ELEVATION	TIME	ELEVATION	TIME	ELEVATION	TIME	ELEVATION
8:00	1187.47	1:00	1187.39	1:00	1187.50	1:00	1187.72
9:00	1187.49	2:00	-	2:00	-	2:00	-
10:00	1187.50	3:00	1187.37	3:00	1187.59	3:00	1187.48
11:00	1187.54	4:00	-	4:00	-	4:00	-
12:00	1187.61	5:00	1187.38	5:00	1187.66	5:00	1187.75
13:00	1187.66	6:00	1187.38	6:00	1187.69	6:00	1187.65
14:00	1187.57	7:00	1187.40	7:00	1187.45	7:00	1187.53
15:00	1187.38	8:00	1187.42	8:00	1187.40	8:00	1187.41
16:00	1187.38	9:00	1187.42	9:00	1187.46	9:00	1187.40
17:00	1187.00	10:00	1187.40	10:00	1187.55	10:00	1187.40
18:00	-	11:00	1187.38	11:00	1187.67	11:00	1187.39
19:00	1187.40	12:00	1187.48	12:00	1187.52	12:00	1187.40
20:00	-	13:00	1187.63	13:00	1187.42	13:00	1187.49
21:00	1187.38	14:00	1187.59	14:00	1187.38	14:00	1187.55
22:00	-	15:00	1187.59	15:00	1187.39	15:00	1187.53
23:00	1187.40	16:00	1187.65	16:00	1187.39	16:00	1187.51
24:00	-	17:00	1187.79	17:00	1187.40	17:00	1187.53
		18:00	-	18:00	-	18:00	-
		19:00	1187.92	19:00	1187.38	19:00	1187.59
		20:00	-	20:00	-	20:00	-
		21:00	1187.71	21:00	1187.39	21:00	1187.62
		22:00	-	22:00	-	22:00	-
		23:00	1187.37	23:00	1187.54	23:00	1187.61
		24:00	-	24:00	-	24:00	-

December 9, 1986		December 10, 1986		December 11, 1986		December 12, 1986	
TIME	ELEVATION	TIME	ELEVATION	TIME	ELEVATION	TIME	ELEVATION
1:00	1187.54	1:00	1187.57	1:00	1187.42	1:00	1187.46
2:00	-	2:00	-	2:00	-	2:00	-
3:00	1187.39	3:00	1187.40	3:00	1187.42	3:00	1187.47
4:00	-	4:00	-	4:00	-	4:00	-
5:00	1187.40	5:00	1187.38	5:00	1187.38	5:00	1187.46
6:00	1187.40	6:00	1187.40	6:00	1187.38	6:00	1187.44
7:00	1187.38	7:00	1187.43	7:00	1187.41	7:00	1187.41
8:00	1187.38	8:00	1187.48	8:00	1187.42		
9:00	1187.40	9:00	1187.55	9:00	1187.41		
10:00	1187.39	10:00	1187.69	10:00	1187.42		
11:00	1187.41	11:00	1187.61	11:00	1187.72		
12:00	1187.39	12:00	1187.57	12:00	1187.42		
13:00	1187.40	13:00	1187.47	13:00	1187.42		
14:00	1187.43	14:00	1187.39	14:00	1187.41		
15:00	1187.44	15:00	1187.39	15:00	1187.38		
16:00	1187.44	16:00	1187.39	16:00	1187.38		
17:00	1187.45	17:00	1187.40	17:00	1187.39		
18:00	-	18:00	-	18:00	-		
19:00	1187.38	19:00	1187.43	19:00	1187.40		
20:00	-	20:00	-	20:00	-		
21:00	1187.38	21:00	1187.43	21:00	1187.43		
22:00	-	22:00	-	22:00	-		
23:00	1187.39	23:00	1187.39	23:00	1187.46		
24:00	-	24:00	-	24:00	-		

TABLE 3-4

WEATHER CONDITIONS DURING PUMP TEST
(December 6 - 13, 1986)

	Barometric Pressure (Readings at Noon)	Temperature (Noon) Degrees F	Readings (Midnight) Degrees F	(Snow)	Precipitation (Water Equivalent)
December 6, 1986	30.34 mm Hg	30	22	trace	-
December 7, 1986	30.07 mm Hg	30	21	trace	-
December 8, 1986	30.05 mm Hg	26	25	1"	0.06"
December 10, 1986	29.85 mm Hg	21	2	trace	0.01"
December 11, 1986	30.02 mm Hg	6	9	none	-
December 11, 1986	29.63 mm Hg	21	5	1"	0.03
December 12, 1986	30.16 mm Hg	6	-5	none	-
December 13, 1986	30.46 mm Hg				

Inspection of the basic water level data collected during the aquifer test indicates the aquifer responded as an unconfined aquifer with delayed yield. The aquifer test data was analyzed using Boulton's method as well as approximations using the Theis and Jacob equations to determine the transmissivity, storage coefficient, and hydraulic conductivity. The methods of analyses are well described in "Analysis and Evaluation of Pumping Test Data" (G.P., and N.A. de Ridder, lBull. 11, ILRI, 1983). Appropriate corrections were made to reflect dewatering of the unconfined aquifer and antecedent trends in water levels prior to the test start.

The average transmissivity determined using the corrected drawdown and recovery data ranges from 315,000 to 370,000 gpd/ft. These values agree with those calculated by Devaul and Green (1971, USGS Water Resources of Wisconsin, Central Wisconsin Basin) who determined coefficient of transmissivity values of the outwash deposits in Marathon County ranging from 340,000 to 900,000 gpd/ft.

The calculated storage coefficients of 0.05 to 0.34 are within the range expected for the alluvial aquifer. Values calculated by Devaul and Green (1971, USGS) were determined to be 0.10 to 0.30.

Hydraulic conductivity is related to transmissivity by the following equation:

$K = T/b$

Where: K = hydraulic conductivity

T = transmissivity

b = saturated thickness of the aquifer

Based on an average saturated thickness of the alluvial aquifer of 120 feet, the values of hydraulic conductivity average between 2625 to 3083 gpd/ft^2. These values are in agreement with those determined by Devaul and Green (1971, USGS) who indicated hydraulic conductivity of 1200 to 5600 gpd/ft^2.

Hydraulic conductivities and transmissivities were also determined by Kendy (1986, Hydrogeology of the Wisconsin River Valley in Marathon County, Wisconsin; Master's Thesis, University of Wisconsin-Madison), using a computer program to estimate transmissivity and hydraulic conductivity from specific capacity data obtained from local well drillers. Using a storage coefficient of 0.1 based on pumping test results, calculations were made for all wells screened in sand and gravel, and the obtained geometric mean of hydraulic conductivity of 1.3×10^{-3} ft/sec was obtained. Kendy also utilized short term "slug tests" to determine the hydraulic conductivity at shallow monitoring wells in the area. A mean value of 4.9×10^{-4} ft/sec was obtained from 10 of the tests performed on the wells in sand and gravel. Values as low as 4×10^{-7} ft/sec were obtained for piezometers screened in clayey material within or beneath the outwash deposits.

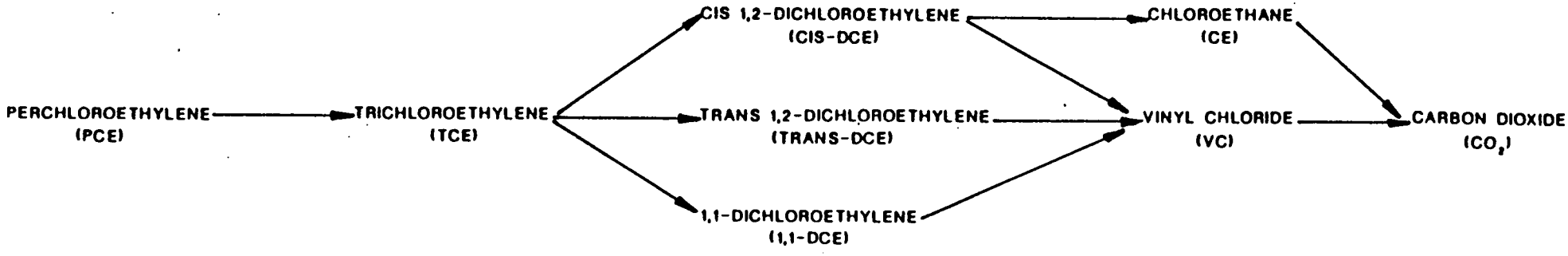
3.6 Ground Water Chemistry

3.6.1 Chemistry of PCE and TCE

Although a number of organic compounds were found in the aquifer, trichloroethylene is of primary interest due to its occurrence in City Well 6. The following discussion deals with biochemistry and physical chemistry of trichloroethylene and related compounds in ground water. (In the interest of brevity, certain abbreviations will be used throughout: Trichloroethylene will be shortened to TCE; Tetrachloroethylene or perchloroethylene will be abbreviated PCE; dichloroethylene will be abbreviated DCE; and volatile organic compounds will be shortened to VOCs).

Biodegradation. Biodegradation can change the concentrations of organic compounds in the saturated and unsaturated zones of subsurface environments. Of particular interest is the relationship between PCE and TCE. PCE can degrade to TCE, and subsequently to lower chlorinated organics. The various degradation pathways of PCE and TCE are shown in more detail in Figure 10. Degradation pathways shown are not reversible. Thus, TCE can originate from PCE, but PCE cannot be derived from TCE. The extent of biodegradation that occurs depends on the concentrations present, the concentrations of other compounds, exposure time to the biodegrading organisms and other hydrogeochemical factors. Therefore, it is not feasible to predict the rate of biodegradation at the Marathon Electric/Old City Landfill site. However, some information is available on the relative rates of biodegradation of the individual compounds. For instance, chloroethane is not usually found in ground-water samples, as it is rapidly degraded. On the other hand, trans

BIODEGRADATION PATHWAYS OF PERCHLOROETHYLENE AND TRICHLOROETHYLENE



RMT INC

Dwn. by.:	PPD
Date:	4 / 87
Proj.#:	222.04

FIGURE 10

1,2-dichloroethylene, cis 1,2-dichloroethylene and vinyl chloride degrade more slowly. These compounds are commonly found as breakdown products of PCE or TCE.

Water Solubility. Another consideration in the chemistry of these compounds is their water solubilities. All of the VOCs detected in this investigation are relatively soluble and mobile in ground water (Table 3-5).

At concentrations exceeding water solubility, these compounds (with the exception of vinyl chloride) sink in ground water due to their higher densities. This situation would occur when a large volume is spilled. For instance, a large spill of TCE could sink in the aquifer until reaching a less permeable layer such as bedrock. If the bedrock is sloped, the pooled TCE could flow downgradient and collect in depressions or pits. Over time, TCE would dissolve from the pool into the ground water.

TCE could also be preferentially transported in more permeable channels. These channels or zones may be present at or near the bedrock surface (this would be consistent with a braided formation of an old river bed). The existence of these channels would cause a complicated distribution of TCE. Evidence for this in the West Side Well Field may be found in observed concentrations of TCE at R-2D and R-3D. These wells are within 350 feet of each other, yet exhibit TCE concentrations which are different by 250 times. However, these differences could also be caused by different sources, or by ground-flow directions which cause an impact at one well but not at the other.

TABLE 3-5

SOLUBILITIES AND DENSITIES OF SELECTED
VOLATILE ORGANIC COMPOUNDS

Compound	Solubility (mg/L)	Density (H_2O = 1)
Tetrachloroethylene	150	1.63
Trichloroethylene	1,000	1.46
trans 1,2-dichloroethylene	600	1.28
cis 1,2-dichloroethylene	800	1.26
1,1-dichloroethylene	2,250	1.22
vinyl chloride	9,150	0.91

Soil/Water Partitioning. TCE tends to sorb or partition to solids which contain organic matter, such as soil. The amount of organic matter in soil decreases dramatically in the first few feet of depth; therefore, it is not practical to assign a single partition value to soil. However, for the purposes of calculation, a value of 0.5% would be reasonable for the sandy soil which is present at this site.

The resultant concentration of TCE in water, in equilibrium with TCE in the soil, can be estimated based on the relationship developed by Chiou et al. (1983). These researchers found a close correlation between the solubility of a given compound and its affinity for soil organic matter. This relationship reduces to:

$$WC = \frac{SC}{26.9\ (OMC)} \qquad \text{Eq. 1}$$

Where:

WC = soil water concentration in ug/L in equilibrium with soil organic matter.

SC = soil concentration in ug/kg in equilibrium with the water.

OMC = fractional organic matter content of soils.

For a soil concentration of 100 ug/kg (ppb), and assuming a soil organic matter consistent of 0.5% (0.005 fractional basis), the resultant water concentration of TCE in the soil is 750 ug/L (ppb).

Of the parameters in Equation 1, the most uncertainty lies in the estimate of the organic matter content of the soil. From Equation 1, it can be seen that the water concentration in the soil is inversely proportional to soil organic matter content. For instance, if the organic content estimate is 1%, then the water concentration in the soil is decreased by one-half, to 375 ug/L. The purpose of this calculation is to provide a point of reference for the observed TCE concentrations which are discussed in Section 3.6.2.

3.6.2 Occurrence of Chloroethylenes in the Aquifer

The ground-water investigation on the west side of the Wisconsin River was instigated by the discovery of TCE in City Well 6 in 1982. Although PCE and DCE were reported to have been detected (Weston, 1985), only values of TCE were reported, presumably because the other values were too low to be reliable.

Monitoring well installation and sampling was undertaken in the vicinity of City Well 6 on behalf of the USEPA by Weston from 1982-1984. Weston did not report any measurable values of VOCs in these monitoring wells. However, due to the use of an air-lift well sampling device during Weston's sampling procedures, it is possible that volatiles present in the ground water were lost by volatilization during the sampling.

In a separate investigation on behalf of the Wisconsin DNR, CH2M Hill installed and sampled seven wells on the Marathon Electric/Old City Landfill property from 1985-1986. The results of analyses of these wells, sampled for volatile organic compounds in 1985 and 1986, are summarized in Tables 3-6 and 3-7, respectively.

During the DNR's investigation, several VOC's were detected in ground water beneath the Marathon Electric/Old City Landfill property. TCE was detected at C-2S, near the southeast corner of the Marathon Electric assembly building and northeast of the landfill (see Figure 11), at a concentration of 1,060 ug/L measured on January 7, 1986. Lower levels of TCE (11-13 ug/L) were detected at C-7S, located a few feet due south of the east wing of the assembly building and north of the landfill. Within the landfill, TCE was measured in C-3S, C-4S and C-4D at concentrations ranging from 2 to 25 ug/L. Wells C-1S and C-6S, located upgradient of the landfill, contained no detectable concentrations of TCE.

Chloroform was measured at about 60 ug/L in the landfill from C-3S during both rounds of sampling by the DNR. Lower levels of chloroform were detected in both rounds at C-2S, C-7S and C-4D. DCE was found in the well nest at C-4 and also at C-2S. A portion of the DCE could be from the biodegradation of TCE in these same areas. Vinyl chloride was measured at C-4S during both rounds, in the southern edge of the landfill. 1,1,1-Trichloroethane was measured at 10-20 ug/L at C-7S during both rounds of sampling. The balance of the analytical results do not show a consistent pattern of occurrence for any VOC at levels well above the detection limits.

TABLE 3-6

RESULTS OF GROUND WATER ANALYSIS FOR VOC'S (ug/L)

(CH_2M Hill, November 25, 1985)

	Detection Limit	C-1S	C-2S	C-3S	C-4S	C-4D	C-6S	C-7S	Trip Blank	Field Blank
Per chloroethylene	0.1	ND	0.4	0.4	0.5	0.1	0.1	ND	ND	ND
Trichloroethylene	0.1	ND	280	6.9	2.0	19.7	ND	10.7	ND	ND
1,2-Dichloroethylene	0.3	ND	3.7	ND	9.3	1.4	ND	ND	ND	ND
Carbon Tetrachloride	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	0.1	ND	1.1	66	ND	1.4	ND	0.8	ND	ND
1,2-Dichloroethane	0.3	ND	ND	ND	0.4	ND	ND	ND	ND	ND
Dichloromethane	0.2	ND	0.5	0.4	0.6	0.4	1.6	1.2	0.6	0.8
Toluene	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.1	ND	ND	2.5	ND	0.3	ND	11.5	ND	ND
Vinyl Chloride	0.5	ND	ND	ND	2.2	ND	ND	ND	ND	ND
Ethyl Benzene	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorobromomethane	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND - Analyzed but not detected.

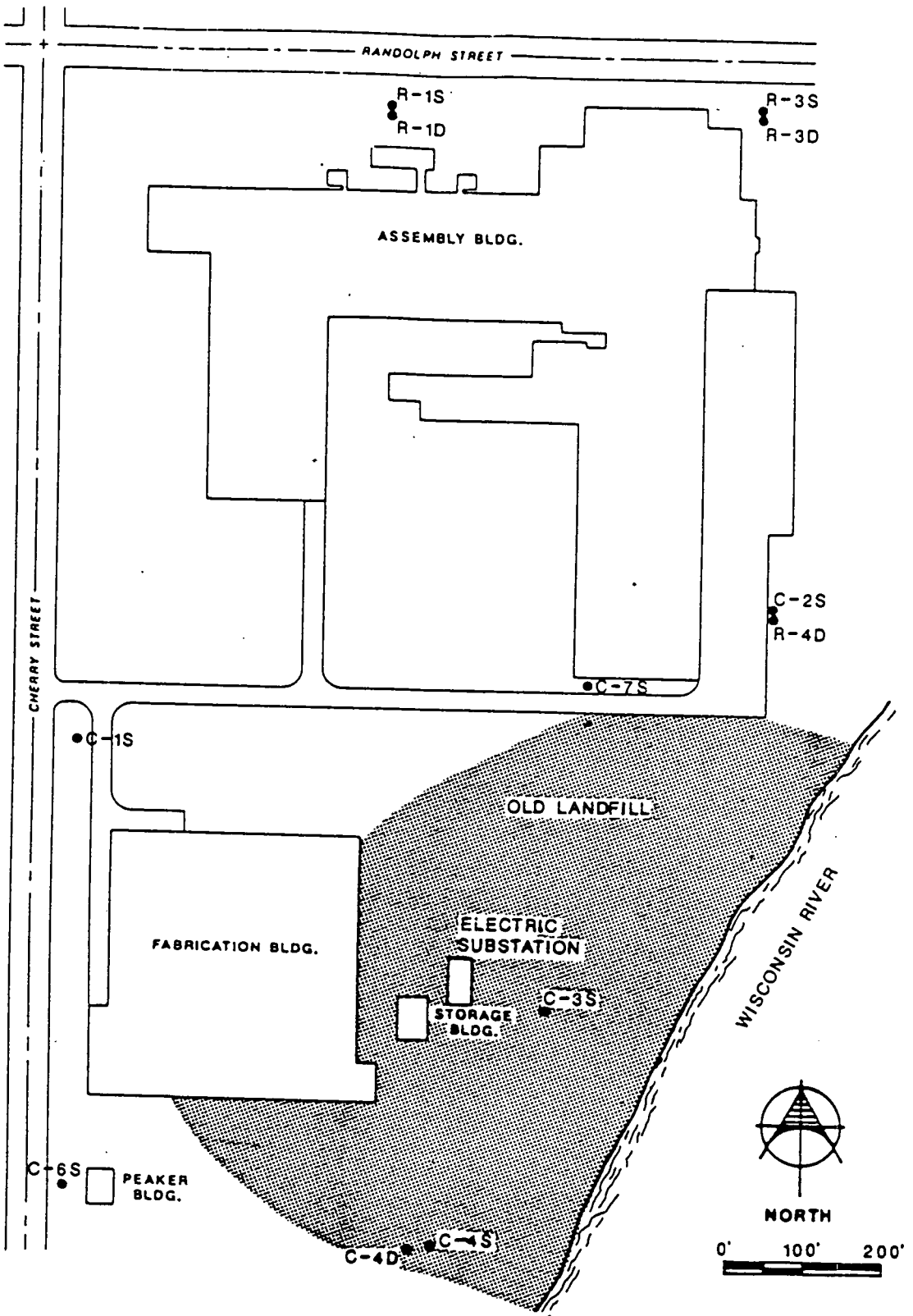
TABLE 3-7

RESULTS OF GROUND WATER ANALYSIS FOR VOC'S (ug/L)

(CH_2M Hill, JANUARY 6-7, 1986)

	Detection Limit	C-1S	C-2S	C-3S	C-4S	C-4D	C-6S	C-7S	Trip Blank	Field Blank
Per chloroethylene	0.1	ND	ND	0.3	1.1	ND	0.1	ND	ND	ND
Trichloroethylene	0.1	ND	1,060	5.0	2.6	24.6	ND	12.7	ND	ND
1,2-Dichloroethylene	0.3	ND	3.2	ND	11.4	2.5	ND	ND	ND	ND
Carbon Tetrachloride	0.1	ND	ND	98	ND	ND	ND	ND	ND	ND
Chloroform	0.1	ND	1.0	57.8	ND	1.1	0.1	0.9	ND	ND
1,2-Dichloroethane	0.3	ND	ND	ND	0.4	ND	ND	ND	ND	ND
Dichloromethane	0.2	ND	2.0	0.2	0.2	ND	ND	0.2	ND	0.4
Toluene	0.1	0.5	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.1	ND	2.0	ND	ND	0.1	ND	18.4	ND	ND
Vinyl Chloride	0.5	ND	ND	ND	3.5	ND	ND	ND	ND	ND
Ethyl Benzene	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorobromomethane	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND - Analyzed but not detected.



MARATHON ELECTRIC / OLD CITY LANDFILL PROPERTY

● LOCATIONS OF MONITORING WELLS

RMT NC

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Date:	5/7/87
Proj. #:	222.04

FIGURE 11

The VOC data from the sampling conducted by RMT and Geraghty & Miller are summarized in Table 3-8. Included in this table are data for monitoring wells north of the Old City Landfill (these results will be discussed later).

The occurrence of VOCs in the aquifer north of the landfill is localized in the deep ground water toward City Well 6. Trichloroethylene occurs at high concentrations near the bedrock surface northeast of the Old City Landfill, near the southeast corner of the assembly building (R-4D). It is also found to the northeast across Bos Creek (R-2D), at a concentration of 3,190 ug/L. However, TCE appears to occur at much lower concentrations of 4.4 ug/L at the northeast corner of the assembly building (R-3D), a location only 100 feet off a straight line drawn between R-4D and R-2D. TCE also occurs at low concentrations in EPA-4A (west-northwest of City Well 6). R-1D on the northern side of the Marathon Electric Property, and EPA-1A northeast of the property contained no detectable TCE.

In the shallow ground water, TCE was found in C-2S at concentrations ranging from 280 ug/l to 1,060 ug/l. C-2S contains high concentrations of TCE in the shallow ground water. Concentrations ranging from about 20-60 ug/L were observed at R-2S and R-3S, and again west-northwest of City Well 6 at EPA-4C and EPA-7. Figure 12 illustrates the TCE concentrations in cross section. Areas of high TCE contamination (both shallow and deep) are dispersed, and the pattern may suggest more than one source. Potential paths of migration to explain this pattern will be discussed in the next section.

TABLE 3-8

SUMMARY OF WATER QUALITY RESULTS FOR VOLATILE ORGANIC COMPOUNDS (ug/L)
(SEPTEMBER 15-17, 1986)

	Standards	Detection Limit*	C-1S	C-2S	C-3S	C-4S	C-4D	C-6S	C-7S	R-1S	R-1D	R-2S	R-2D	R-3S	R-3D	R-4D	EPA-1A	EPA-3A	EPA-3B	EPA-4A	EPA-4C	EPA-5	EPA-7	EPA-9	GM-1S	GM-2S	GW-6	GW-10	LAB BLANK	FIELD BLANK	TRIP BLANK
Tetrachloroethylene	Zero[1]	0.1	ND	ND	0.3	5.8	ND	0.2	ND	ND	0.2	ND	ND	ND	ND	15.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	5.0[2]	0.1	ND	615.	8.3	2.5	41.9	ND	10.5	0.1	ND	29.2	1140.	49.7	4.4	3190.	0.1	ND	ND	1.4	18.8	0.1	62.9	ND	ND	ND	226.	ND	ND	ND	ND
1,2-Dichloroethylene	70.0[1]	0.3	ND	10.0	ND	5.7	8.1	ND	ND	ND	ND	14.4	30.0	4.7	0.4	725.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.0	ND	ND	ND	ND
Carbon Tetrachloride	5.0[2]	0.1	ND	ND	108.	ND	ND	ND	ND	ND	ND	ND	5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	NA	0.1	ND	ND	47.5	0.2	1.1	0.7	ND	ND	2.1	ND	ND	ND	0.9	ND	ND	ND	ND	ND	0.2	0.2	0.1	ND	0.3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5.0[2]	0.3	ND	ND	ND	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichloromethane	NA	0.2	ND	5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	2000.[1]	0.1	ND	5.0	0.1	ND	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ND	ND	ND	ND	ND	ND	0.1	ND
1,1,1-Trichloroethane	200.[2]	0.1	ND	ND	ND	ND	0.1	ND	28.0	ND	ND	ND	ND	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	0.2	ND
Vinyl Chloride	1.0[2]	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

[1] Proposed Recommended Maximum Contaminant Level (federal)

[2] Proposed Maximum Contaminant Level (federal)

* - Detection limits were higher for CW-6, C-2S, R-2D and R-4D

ND - Analyzed but not detected

NA - Not Applicable

222.04 906:RPT:foley1223T

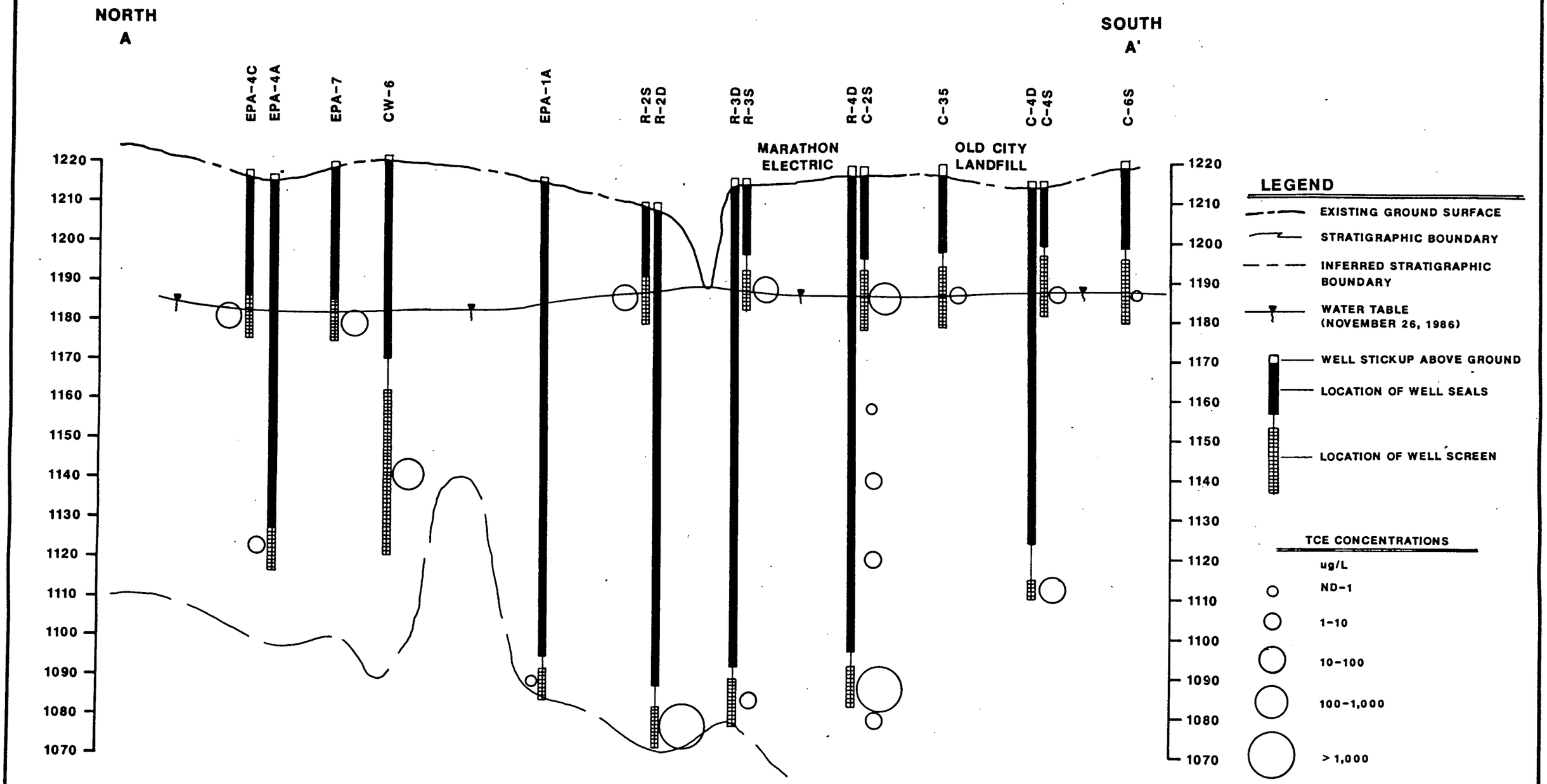


FIGURE 12

TCE CONCENTRATIONS IN CROSS SECTION A – A'

RMT INC

Dwn. by	EAP
Date	5-13-87
Proj.#	222.04

DCE was observed in those monitoring wells which were found to contain TCE. In addition, PCE was measured in R-4D at 15 ug/L, in C-4S at 5.8 ug/L, and near the detection limit at C-2S, C-3S, and C-4D, C-6S, and R-1D. Carbon tetrachloride was found at concentrations ranging up to 110 ug/L in C-3S and at 5 ug/L in R-2D. Chloroform was found at 48-66 ug/L in C-3S, and also detected in 12 other monitoring wells at concentrations near the detection limits. Positive values for additional VOCs were measured at or near the detection limits.

The highest concentrations of TCE for both the shallow and deep ground water were observed in the wellnest northeast of the Old City Landfill (C-2S/R-4D). A more thorough investigation was conducted at this site. Water samples were collected during drilling, every 20 feet where possible, as the borehole was advanced for the deep well. A complete scan for VOC was conducted on these samples and a summary of the TCE results with depth are shown in Table 3-9. The full VOC results are included in Appendix C.

The depth profile at R-4D clearly shows TCE contamination at both the water table surface and at 136 feet below land surface. There is very little contamination detected between these depths or below 136 feet. A VOC depth profile was also conducted at R-1D, the monitoring well on the north side of the Marathon Electric assembly building. No detectable concentrations of VOCs were found at the three depths sampled (37, 57, and 117 feet).

Ground water samples from monitoring wells EPA-1A, R-2D, C-2S, R-4D, GM-4S and GM-4D were submitted for a hazardous substance list scan for semi-volatiles, pesticides and PCBs. No compounds were detected above the

TABLE 3-9

TCE CONCENTRATIONS WITH DEPTH
(AUGUST 1986)

MONITORING WELL R-4D

Depth From Ground Surface (feet)	TCE (ug/L)
36	590
56	0.9
76	3.2
96	4.1
136	790
156	2.2

MONITORING WELL R-1D

37	ND
57	ND
117	ND

22.04 906:RPT:foley1223T

detection limits in any of the samples. A complete listing of the results is provided in Appendix D.

3.6.3 Potential Migration Pathways of TCE

The patterns of occurrence of VOCs, particularly TCE, were described in Section 3.6.2. The following discussion presents possible interpretations for TCE source areas and potential migration pathways.

In Section 3.5.2, the shallow ground water flow directions on the southern part of the Marathon Electric/Old City Landfill property are shown to be to the east-southeast toward the Wisconsin River. The chemical data cannot confirm this direction is correct, but do show that shallow ground water is not flowing north or northeast in this area. The shallow ground water in the landfill is characterized by high alkalinity. Monitoring Well C-3S is in the landfill, and located due south of C-7S and southeast of C-2S. Both C-7S and C-2S are located outside the landfill. Neither of these wells shows a significant impact from the high alkalinity landfill leachate that is found in C-3S. Table 3-10 provides the alkalinity results from sampling done by CH_2M Hill in 1986.

It is more difficult to assess the direction of contaminant movement at depth. Sampling by RMT/Geraghty & Miller at R-4D showed no clear impact on alkalinity from the landfill (see data in Appendix E).

The TCE contamination found at depth is presently separated from the shallow contamination as seen in the concentration profile with depth at R-4D

TABLE 3-10

ALKALINITY RESULTS FOR GROUND WATER SAMPLES
IN AND NEAR THE OLD CITY LANDFILL

Well	Alkalinity (mg/L as $CaCO_3$) 11/25/85	1/6-7/86
C-1S	56	39
C-2S	34	38
C-3S	268	228
C-4S	66	58
C-4D	433	324
C-6S	66	50
C-7S	39	35

taken from CH_2M Hill (1986)

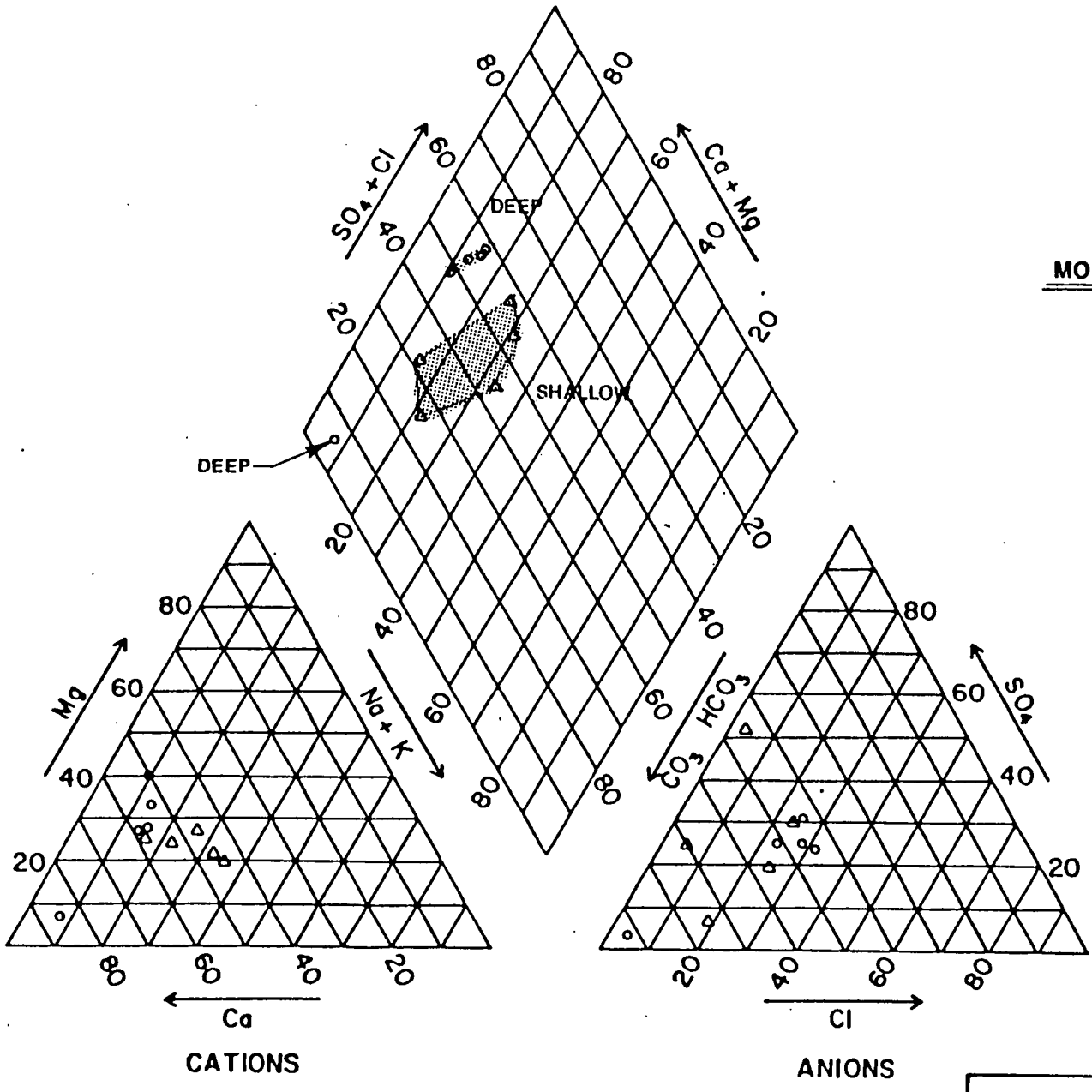
(see Table 3-7). However, in the past, surface spills may have accounted for the contamination which is now observed near the bedrock surface. In Section 3.5.2, it was shown that strong vertical gradients were not observed in the monitoring wells, and therefore, vertical flow is not postulated to link the deep and shallow contamination. In fact, the chemical composition of the ground water shows a differentiation of deep and shallow water.

A trilinear diagram is provided in Figure 13, and the differences in ground-water chemical composition are illustrated. Only those ground-water samples which exhibit cation/anion balance within $\pm$ 10% were included in the diagram. From this diagram, the shallow ground-water sample compositions are grouped separately from the deep ground-water samples, indicating that extensive vertical mixing is not occurring. The inorganic chemical analysis data used in the plots are included in Appendix E.

The outlying data point on the trilinear diagram represents EPA-1A. The ground water from this well had a field-measured pH value of 9.9. This pH value is very high, especially in comparison with the pH values for all other wells which were below 7.0. A high pH value is typically caused by the intrusion of cement-bentonite grout from the well annulus into the screened zone. This explanation is reasonable for EPA-1A, as the water is high in calcium carbonate which is indicative of cement, and not of the granitic formation.

It is possible that a large surface spill in the past could account for both the shallow and deep TCE contamination which is presently observed in the study area. TCE could sink through the alluvial aquifer and remain as a

TRILINEAR DIAGRAM SHOWING CATION AND ANION COMPOSITIONS OF GROUND WATER SAMPLES



MONITORING WELLS

△ – SHALLOW

o – DEEP

RMT INC	Dwn. by: JM
	Date: 5/7/87
	Proj. #: 222.04

FIGURE

pool on the bedrock surface, or could preferentially move through more permeable channels (as could be present in an old river valley). Alternatively, residual TCE in the unsaturated zone of an old spill site could cause a continuing source of contamination to the shallow ground water after each large rain event or water table fluctuation.

The above two scenarios are possible explanations for the observed vertical patterns of TCE distribution. In the earlier discussion, one or more sources were hypothesized to explain widely separated areas of shallow ground-water contamination. There is also a possibility that the intermittent pumping pattern at City Well 6, and the west well field in general (see Figure 4), has caused a complex distribution of TCE. The ground-water flow directions change depending on the operation of City Well 6 in conjunction with wells 7 and 9 . The resultant TCE distribution could appear to be coming from one or more sources.

The deep ground-water contamination does not correspond directly to the shallow areas. The most prominent example is at the well nest of R-3S/R-3D. R-3S contains 49.7 ug/L TCE, and R-3D contains 4.4 ug/L TCE. This pattern of occurrence may be derived when deep flow patterns are different from those near the water table surface. TCE may move in discrete channels at depth, which are not necessarily on the bedrock surface (see Table 3-10). Highly permeable zones or channels may exhibit the winding nature of an ancient stream valley. This would partially explain the large differences in TCE concentrations at wells which are close together, such as

R-3D and R-2D. If this situation is occurring, the tracking of the TCE plume becomes an extremely difficult task.

5. REFERENCES

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LaBerge, C.L. and P.E. Myers. 1983. Precambrian geology of Marathon County, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular, Number 45, 88 pp.

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APPENDIX A

BORING LOGS

The monitoring well designation system has changed over the period during which several investigations have occurred in the area. Some of the logs included in this appendix are from previous reports by other agencies or their contractors. The following table is a cross index of well designations which shows the currently used well identification code in addition to the corresponding code used in the past. It also lists the wells in the same order as the boring logs appear in the appendix.

Cross Index of Well Designations

Well Identification Code Appearing on Log	Well Identification Code Appearing in This Report
R-1D	Same
R-2D	Same
R-3D,	Same
R-4D	Same
#6	CW-6
#7	CW-7
Wausau Test Well No. 9	
#9	CW-9
1S	C-1S
B-2S	C-2S
B-3S	C-3S
B-4S	C-4S
4D	C-4D
B-6D	C-6S
B-7S	C-7S
WMW-1A	EPA-1A
WMW-3A	EPA-3A
WMW-3B	EPA-3B
WMW-4A	EPA-4A
WMW-4B	EPA-4B
WMW-4C	EPA-4C
WMW-5	EPA-5
WMW-6	EPA-6
WMW-7	EPA-7
WMW-9	EPA-9
GM-1S	Same
GM-2S	Same
GM-3S	Same
GM-4S	Same
GM-4D	Same

RMT, Inc.
F-204 (R2-81)

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Folev & Lardner
LOCATION: Wausau WI
DRILLED BY: Len J
LOGGED BY: T. E. Fox
DATE: 8/14/86

JOB NO.: 222.04
BORING NO.: R-1D
SURFACE ELEV.: 1220.16
SHEET NO.: 1 of 4

SAMPLE No.	SAMPLE Type	Recovery	Moisture HNU	Depth	VISUAL CLASSIFICATION and Remarks
1	Jar		No Detect	5	. Brown F-M Gravel, Some F-C Sand, Little Silt
2	Jar		0.2	10	. Brown F-C Sand, Some F-M Gravel, Little Silt
3	Jar		0.2	15	
4	Jar		0.2	20	
5	Jar			25	
6	Jar		0.2	30	
7	Jar		0.4	35	. Brown F-M Sand, Little to Some Silt
8	Bag	H_2O Sample		40	

GENERAL NOTES

START: 11:54 AM 8/14/86
COMPLETE: 1:45 8/14/86
RIG: IR TM 60
CREW CHIEF: Len J.
DRILLING METHOD: Dual Tube Reverse Air Rotory

WATER LEVEL OBSERVATIONS

WHILE DRILLING: See Lori H. Field Notes for Recovery Data
UPON COMPLETION:
TIME AFTER DRILLING:
DEPTH OF WATER:
DEPTH OF CAVE-IN:

Induced H_2O From 0' to 35'

F-204 (cont'd.)

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau WI
DRILLED BY: Len J.
LOGGED BY: T.E. Fox
DATE: 8/14/86

JOB NO.: 222.04
BORING NO.: R-1D
SURFACE ELEV.: 1220.16
SHEET NO.: 2 of 4

SAMPLE No.	SAMPLE Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
9	Jar				45	
					50	
10	Jar			No Detect	55	
					60	
10	Jar				65	Brown Fine Sand, Some Silt
					70	
12	Jar				75	
					80	
13	Jar				85	

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau WI
DRILLED BY: Len J.
LOGGED BY: T. F. Fox
DATE: 8/14/86

JOB NO.: 222.04
BORING NO.: R-1D
SURFACE ELEV.: 1220.16
SHEET NO.: 3 of 4

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
					90	
14	Jar			0.2	95	
					100	
15	Jar				105	. Rusty Brown at 105'-106' . Grayish Brown at 1-6'-110'
					110	
16	Jar			No Detect	115	. Brown F-C Gravel, Some F-C Sand
17	Jar			0.2	120	. Gray Fine Sand, Some Silt Appears to be Oxidizing to a Brownish Gray Upon Exposure to Air
18	Jar			0.6	125	. Weathered Bedrock
19	Jar			No Detect	130	. Hard at 124'

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau WI
DRILLED BY: Len J
LOGGED BY: T.E. Fox
DATE: 8/14/86

JOB NO.: 222.04
BORING NO.: R-1D
SURFACE ELEV.: 1220.16
SHEET NO.: 4 of 4

SAMPLE						VISUAL CLASSIFICATION and Remarks
Recovery		Moisture				
No.	Type			N	Depth	
						. End of Drilling at 133'
					135	

Notes:

HNU = VOC readings taken at 4:45 to 5:15 pm-8/14/86 of jarred samples. Upon collecting samples from cyclone separator samples were jarred with layer of Alum. foil under lid. Jars were then shook and warmed with sun when possible and measured by penatrating probe.thru Alum. foil (ppm.)

Samples

"H_2O Sample" is sample taken by Lori Huntoon thru inner tube using a 1" stainless bailer. 2/40 mil vials per sample

Bag = 10# sample taken directly from Cyclone separator - includes fines

Jar = 8oz wide mouth (specially cleaned) taken with strainer at Cyclone discharge may not include all fines, as they may have been washed thru strainer.

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:

F-204 (R2-81)

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau, WI
DRILLED BY: Len/Layne Northwest
LOGGED BY: TEF/SLM
DATE: 8/5/86

JOB NO.: 222.04
BORING NO.: R-2D
SURFACE ELEV.: 1207.69
SHEET NO.: 1 of 4

SAMPLE No.	SAMPLE Type	Recovery	Moisture	HNU	Depth	VISUAL CLASSIFICATION and Remarks
1	Jar					Dark brown to brown F-C sand, trace to some silt, trace to some gravel
2	Jar			.04	5	
3	Jar				10	
4	Jar				15	
5	Jar				20	
6	Jar				25	
7	Jar				30	
8	Jar			0.2	35	
					40	

GENERAL NOTES

START: 8/5/86 4 P.M.
COMPLETE: 8/5/86 6:30 P.M.
RIG: TH-60 Ingersoll Rand
CREW CHIEF: Len Jegerski
DRILLING METHOD: Dual tube Reverse Air Rotary

WATER LEVEL OBSERVATIONS

WHILE DRILLING:
UPON COMPLETION:
TIME AFTER DRILLING: thru dual tube well completion
DEPTH OF WATER: overnite 23.1 TOC
DEPTH OF CAVE-IN: 96.7 BGS 27.78 TOC

F-204 (Core 6.)

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau, WI
DRILLED BY: Len/Layne Northwest
LOGGED BY: TEF/SLM
DATE: 8/5/86

JOB NO.:
BORING NO.: R-2D
SURFACE ELEV.: 1207.69
SHEET NO.: 2 of 4

SAMPLE No.	SAMPLE Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
9	Jar				45	
					50	
10	Jar				55	. Brown F-M Sand . Coarser with gravel at 56' - 57'
					60	
11	Jar				65	
					70	
12	Jar				75	
					80	
13	Jar				85	

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau, WI
DRILLED BY: Len/Layne Northwest
LOGGED BY: TEF/SLM
DATE: 8/5/86

JOB NO.: 222.04
BORING NO.: R-2D
SURFACE ELEV.: 1207.69
SHEET NO.: 2 of 4

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
					90	
14	Jar				95	
					100	. Brown fine sand, some gravel
15	Jar			0.6	105	
					110	Gravel with cobbles and boulders
16	Jar				115	. Brown fine sand, some silt, trace M-C sand
					120	
17	Jar				125	
					130	

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau, WI
DRILLED BY: Len/Layne Northwest
LOGGED BY: TEF/SLM
DATE: 8/5/86

JOB NO.: 222.04
BORING NO.: R-2D
SURFACE ELEV.: 1207.69
SHEET NO.: 4 of 4

SAMPLE No.	SAMPLE Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
18	Jar			0.6	135	. Gravelly at 132' - 135'
					140	. Weathered granite bedrock No samples recovered - air pushed cuttings into fractured formation
					145	. Hard at 141 to 143
					150	. End of drilling at 143'
					155	. WL measured thru dual pipe (bottom @ - 143') @ 96.7' B.G.S. @ 7:30 A.M.
					160	* HNU Readings
					165	= 5.0 Stand By = 0.0 Ambient and background = 0.4-1.2 Reading in empty jar = 1.2

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:

F-204 (R2-81)

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau, Wisconsin
DRILLED BY: Len J./ Layne Northwest
LOGGED BY: T. Fox
DATE: 8/11/86

JOB NO.: 222.04
BORING NO.: R-3D
SURFACE ELEV.: 1213.09
SHEET NO.: 1 of 4

SAMPLE No.	SAMPLE Type	Recovery	Moisture	HNU	Depth	VISUAL CLASSIFICATION and Remarks
1	Jar			9.5	5	. Brown Gray F-M Sand, Some Silt
2	Jar			0.5	10	. Gray Brown F-C Sand, Trace-Little M-C Sand and Gravel, Trace Silt
3	Jar				15	
4	Jar			No Detect	20	
5	Jar			No Detect	25	
6	Jar				30	
7	Jar			No Detect	35	. Brown-Gray Fine Sand
8	Jar				40	

GENERAL NOTES
START: 8/11/86 10:45
COMPLETE: 8/11/86 11:55
RIG: IR TM 60
CREW CHIEF: Len J.
DRILLING METHOD: Dual Tube Reverse Air Rotary & H_2O

WATER LEVEL OBSERVATIONS
WHILE DRILLING:
UPON COMPLETION:
TIME AFTER DRILLING:
DEPTH OF WATER:
DEPTH OF CAVE-IN:

F-204 (cont'd.)

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION:
DRILLED BY: Len J./ Layne Northwest
LOGGED BY: T. Fox
DATE: 8/11/86

JOB NO.: 222.04
BORING NO.: R-3D
SURFACE ELEV.: 1213.09
SHEET NO.: 2 of 4

SAMPLE No.	SAMPLE Type	SAMPLE Recovery	SAMPLE Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
9	Bag					Grayish-Brown Fine Sand
					45	
10	Jar					
					50	Trace Fine Gravel at 50'-55'
					55	
11	Jar		No Detect			
					60	
					65	
12	Jar					
					70	
					75	
13	Jar					
					80	
					85	

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION:
DRILLED BY: Len J. /Layne Northwest
LOGGED BY: T. Fox
DATE: 8/11/86

JOB NO.: 222.04
BORING NO.: R-3D
SURFACE ELEV.: 1213.09
SHEET NO.: 3of 4

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
14	Jar			No Detect	90	Brown-Gray Fine Sand
					95	
15	Jar				100	
					105	
16	Jar			No Detect	110	
					115	
17	Jar				120	
					125	
18 19	Jar Bag			No Detect	130	Yellowish Brown F-C Sand, Little to Some Silt, Little to Some Gravel

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: Wausau, WI
DRILLED BY: Len J./ Layne Northwest
LOGGED BY: T. Fox
DATE: 8/11/86

JOB NO.: 222.04
BORING NO.: R-3D
SURFACE ELEV.: 1213.09
SHEET NO.: 4 of 4

SAMPLE No.	SAMPLE Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
19	Jar Bag				135	
					140	Driller indicates fractured bed rock at 135' to 137' - No Sample Returned End of Drilling at 137'
					145	
					150	
					155	
					160	
					165	
					170	

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:

F-204 (R2-81)

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: 8' South of C-25
DRILLED BY: Len J. / Layne Northwest
LOGGED BY: T. E. Fox
DATE: 8/12/86

JOB NO.: 222.04
BORING NO.: R-4D
SURFACE ELEV.: 1216.05
SHEET NO.: 1 of 4

SAMPLE No.	Type	Recovery / Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
		thru Dual Tube			
1	Jar			5	Brown F-M Sand, Little F-M Gravel, Trace-Little Silt
2	Jar			10	
3	Jar			15	
4	Jar			20	Brown F-C Gravel, Some Sand with Cobbles
5	Jar			25	Very Dense Fine Sand, Some Silt
6	Jar			30	Brown F-M Sand, Trace Silt, Trace Fine Gravel
7	Jar			35	
		H_2O Sample			Mostly Fine Sand at 35-40'
8	Bag			40	

2) 40ml H_2O samples w/bailer

GENERAL NOTES
START: 8/12/86
COMPLETE: 9/13/86
RIG: 1R TH 60
CREW CHIEF: Len J/John J
DRILLING METHOD: Dual Tube Reverse Air Rotory

WATER LEVEL OBSERVATIONS
WHILE DRILLING: 31.25 with bit at 36'
UPON COMPLETION:
TIME AFTER DRILLING:
DEPTH OF WATER:
DEPTH OF CAVE-IN:

Introduced H_2O at 17' to

F-204_(cont'd.)

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: 8' South of C-25
DRILLED BY: Len J. / Layne Northwest
LOGGED BY: T. E. Fox
DATE: 8/12/86

JOB NO.: 222.04
BORING NO.: R-4D
SURFACE ELEV.: 1216.05
SHEET NO.: 2 of 4

SAMPLE No.	SAMPLE Type	SAMPLE Recovery	SAMPLE Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
						Brown F-M Sand, Trace Silt
9	Jar				45	
						Brown F-C Sand, Trace Silt Trace F Gravel
10	Jar				50	
11	Jar				55	
		H_2O Sample				
12	Jar				60	
						Brown F-M Sand, Trace Silt
13	Jar				65	
14	Jar				70	
15	Jar				75	
		H_2O Sample				
16	Jar				80	
17	Jar				85	

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: 8' South of C-25
DRILLED BY: Len J. / Layne Northwest
LOGGED BY: T. E. Fox
DATE: 8/12/86

JOB NO.: 222.04
BORING NO.: R-4D
SURFACE ELEV.: 1216.05
SHEET NO.: 3 of 4

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
18	Jar				90	Brown F-M Sand
19	Jar				95	
20	Bag	H_2O Sample				Brown Fine Sand, Some Silt with Few Thin Layers of Fine to Medium Sand
					100	
21	Jar				105	
					110	
22	Jar				115	
					120	
23	Jar				125	
					130	

LOG OF TEST BORING
RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Foley & Lardner
LOCATION: 8' South of C-25
DRILLED BY: Len J. / Layne Northwest
LOGGED BY: T. E. Fox
DATE: 8/12/86

JOB NO.: 222.04
BORING NO.: R-4D
SURFACE ELEV.: 1216.05
SHEET NO.: 4 of 4

SAMPLE No.	SAMPLE Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
24	Bag				135	
25	Jar	H_2O Sample				F-C Gravel; Some F-C Sand
					140	Return H_2O turned brown at 138'
26						Brown F-C Sand, Some Gravel, Trace of Some Silt
					145	Possible Rock at 144.5' Hard Drilling at 144.5 to 147.5'
					150	No Recovery at 144.5 to 156
					155	Probable Fine Sand at 147.5 to 156 (came up drill tools)
					160	End of Drilling at 156' (no more drill rod left)
					165	
					170	

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:

#6

CITY WELLS, WAUSAU, WIS.
NW¼NW¼ sec. 24, T. 29 N., R. 7 E.
Near intersection of Crocker and Burek Sts.
Layne-Northwest Co., Contractors, 1951
Samples examined by F. T. Thwaites, Nos. 153758-153796

No. 1 Elevation 1212.25

DRIFT	0–5	5		Gravel, sandy, brown-gray
	5–20	15		Sand, coarse to medium, brown-gray to gray
	20–35	15		Gravel, fine, sandy
	35–50	15		Sand, medium to very coarse, gray
	50–55	5		No sample
	55–65	10		Sand, medium to very coarse, gray
	65–85	20		Sand, medium to coarse, gray
100	85–100	15		Sand, medium to fine, gray

54" hole
36" pipe cemented
29.5 wat
24" pipe
50
61.5
Screen
48" grave
pack

Jerry Donahue Engineering Co., Engineers Tested at 3600 g.p.m. specific capacity = 130 g.p.m./ft

#7

No. 2 900 ft. east of No. 1 Elevation 1222

DRIFT	0–5	5		Gravel, fine, sandy, light brown
	5–10	5		Sand, medium to very coarse, light brown-gy
	10–15	5		Gravel, fine, sandy, gray
	15–20	5		Sand, medium to very coarse, gray
	20–35	15		Gravel, fine to medium, sandy, gray
	35–50	15		Sand, medium to very coarse, gray
	50–85	35		Sand, medium to coarse, light gray
100	85–100	15		Sand, medium to fine, light gray

54" hole
36" pipe cemented
24 water
24" pipe
50
61
Screen
48" gravel
pack

Tested at 3180 g.p.m. specific capacity = 127.5 g.p.m./ft.

Wausau Test Well No. 9, Wausau, Wisconsin
NW 1/4, NW 1/4, Sec. 24, R 7E, T 29N
Miller Well & Pump Co., Driller - December, 1962
Sample Nos. 236210-236226 - Examined by M. E. Ostrom

NOV 15 1963
SANITARY ENGINEERIN

	0- 5	5		Snd,bn,M,Srnd,Psrtg,C&VCsnd,gvl,St,fn snd		
	5-10	5		Snd,bn,M,Srnd,Psrtg,C&VCsnd,st,fn snd		
	10-15	5		Snd,mot bn&wh,C,Srnd,VC&Msnd,st,rk frags		
	15-20	5		Snd,mot bn&wh,C,Srnd,gvl,M&VCsnd,rk frags		
	20-25	5		gvl,mot bn&wh,fn,Sang,Psrtg,VC&C,M,fn snd		
	25-30	5		Snd,mot bn&wh,M,Srnd,Fsrtg,VC&Msnd,fn snd		
D	30-45	15		Gvl,mot bn&wh,fn,Sang,VC,C,Msnd,fn snd,rd frags		33'WaterLvl.
	45-50	5		Snd,lt bn,M,Sang,Psrtg,Vst,fn snd,Csnd		
F	50-55	5		Snd,lt bn,M,Sang,Psrtg,C&fn snd,st		
	55-60	5		Snd,lt bn,M,Sang,Psrtg,VC&C,&fn snd,st		
	60-70	10		Snd,lt bn,M,Srnd,Fsrtg,C&fn snd,st		
	70-75	5		Snd,lt bn,M,Srnd,Psrtg,gvl,C&fn snd,st		
	75-80	5		Snd,lt bn,M,Srnd,Fsrtg,VC,C&fn snd,st		
	80-90	10		Snd,lt bn,M,Srnd,Gsrtg,C&fn snd,st		6" Hole
	90-105	15		Snd,bn,M,Srnd,Fsrtg,C&fn snd,st		
110	105-110	5		Snd,bn,fn,Sang,Fsrtg,Si,P,Msnd,mch st,gvl		115'

Formations: Drift

#9

1. County Marathon { Town ☐ / Village ☐ / City ☒ } Wausau (Check one and give name)

2. Location Pearson & Bugbee
Name of street and number of premise or Section, Town and Range numbers

3. Owner ☒ or Agent ☐ City of Wausau
Name of individual, partnership or firm

4. Mail Address
Complete address required

5. From well to nearest: Building_____ft; sewer_____ft; drain_____ft; septic tank_____ft;
dry well or filter bed_____ft; abandoned well_____ft.

6. Well is intended to supply water for:

7. DRILLHOLE:

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
48"	0	100			

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
30"	Steel 3/8" Wall	0	58
20"	Steel 1/2" Wall Galv.	0	60
20"	Stainless Steel Screen	60	100

9. GROUT:

Kind	From (ft.)	To (ft.)
Cement Slurry	0	56
Clay Seal	56	58

10. FORMATIONS:

Kind	From (ft.)	To (ft.)
Sand & Gravel	0	40
Sand	40	100
Range from Med. to Fine		
See attached log		

Construction of the well was completed on:
January 22 19 63

The well is terminated 24 inches ☒ above, below ☐ the permanent ground surface.

Was the well disinfected upon completion?
Yes X No_____

Was the well sealed watertight upon completion?
Yes_____ No X

11. MISCELLANEOUS DATA:

Yield test: _____ Hrs. at _____ GPM.

Depth from surface to water-level: _____ ft.

Water-level when pumping: 34 ft.

Water sample was sent to the state laboratory at:

_____ (City) on _____ 19____

Signature Miller Well & Pump Co. (Registered Well Driller) Box 155 - Wausau, Wis. (Complete Mail Address)

Please do not write in space below

Rec'd_____ No_____

Ans'd

Interpretation

	10 ml	10 ml	10 ml	10 ml	10 ml
Gas—24 hrs.					
48 hrs.					
Confirm					
B. Coli					

Examiner_____

CH2M HILL

PROJECT NUMBER L20303.A0 | BORING NUMBER 15 | SHEET 1 OF 2

SOIL BORING LOG

PROJECT Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Hollow stem augers / CME-45

WATER LEVEL AND DATE 22.5' 11/11/85 START 0900 11/11/85 FINISH 1015 11/11/85 LOGGER Johnson / McGee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME. GRADATION OR PLASTICITY. PARTICLE SIZE DISTRIBUTION. COLOR. MOISTURE CONTENT. RELATIVE DENSITY OR CONSISTENCY. SOIL STRUCTURE. MINERALOGY. USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING. DRILLING RATE. DRILLING FLUID LOSS. TESTS AND INSTRUMENTATION
	0.0 – 1.5	S-1	18"	4-6-10 (16)			Background OVA reading (.2 ppm)
	2.0 – 3.5	S-2	15"	11-16-17 (33)	Sand, fine to med. grained, brown, moist, dense		
5							
	9.5						
10	11.0	S-3	10"	7-10-10 (20)	Sand, med. to coarse grained, brown, moist, medium density (SP)		.2 OVA (background)
	14.5						
15	16.0	S-4	10"	8-13-16 (29)	As above with trace gravel		.2 OVA (background)
	19.5						
20	21.0	S-5	17"	7-11-15 (26)	Sand, med. to coarse, brown, moist medium (SP)		background OVA
	23.5						Rough drilling at ≈22.5' Possibly coarse gravel
25	25.0	S-6	1"	25/1"	Silty sand, fine, gray, tr. gravel, wet (SM)		Water at 27.4' 10:00 After driving S-7 water level at 22.5' at 10:45
	29.5						
30	31.0	S-7	1"	50/2"	See next page		

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
L20303.A0	.15	SHEET 2 OF 2

SOIL BORING LOG

PROJECT Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Hollow stem augers / CME-45

WATER LEVEL AND DATE START 11/11/85 FINISH 11/11/85 LOGGER Johnson

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	29.5	S-7	1"	50/2"		Silty sand, brown-gray, some gravel		
	31.0							
						34'		Auger refusal
35						Bottom of boring		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
L20303.A0	B-25	1	2

SOIL BORING LOG

PROJECT Brown LF - Lot 2 LIJR LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT CME 45 HSA 3¼" I.D. HSA (7¼" O.D.) STD. SPLIT SPOON

WATER LEVEL AND DATE 27.7' 11/11/85 START 15:50 - 11/11/85 FINISH 11/11/85 LOGGER J.H. Jones

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	1.5	S-1	10"	2-2-3 (5)	FILL, SAND, DK. BROWN, F. GRAVEL, MOIST		OVA BACKGROUND ~3.5 ppm
	4.0						
5	5.5	S-2	12"	4-7-8 (15)	SAND, LT. BROWN, FINE, MOIST, (SP)		OVA READING BACKGROUND
	9.0						
10	10.5	S-3	8"	4-8-11 (19)	SAND, LT. BROWN, MED. TO CSE, MOIST, (SP)		OVA READING BACKGROUND
	14.0						
15	15.5	S-4	4"	4-8-13 (21)	SAND, LT. BROWN, MED. TO CSE, MOIST, ~20% F. GRAVEL (SP)		OVA READING BACKGROUND
	19.0						
20	20.5	S-5	7"	7-9-10 (19)	SAND, LT. BROWN, MED. TO CSE, MOIST (SP)		OVA READING BACKGROUND
	24.0						
25	25.5	S-6	7"	7-7-9 (16)	SAND, LT. BROWN, FINE TO MED, MOIST		OVA READING BACKGROUND
	29						OVA READING BACKGROUND WATER AT 27.8' at 15:52 WATER AT 27.7 at 16:00
30	30.5	S-7	6"	2-4-4 (8)			

CH2M HILL

B-2S SHEET 2 OF 2

SOIL BORING LOG

PROJECT NAUSAU LF – DNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY TESTING

DRILLING METHOD AND EQUIPMENT

WATER LEVEL AND DATE START FINISH LOGGER J. H. JOHNSON

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							
	34.0						
35	35.5	S-8	10"	3-4-6 (10)	SAND, LT. BRN, FINE, WET, (SP)		OVA READING BACKGROUND
	39.0						
40	40.5		0"				NO RECOVERY
					Bottom of boring 40.5'		

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER L20303.A0 | BORING NUMBER B-35 | SHEET 1 OF 2

SOIL BORING LOG

PROJECT [illegible] LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT 7¼" OD Hollow stem augers CME-45

WATER LEVEL AND DATE 29.5' 11/12/85 START 1430-1112 FINISH 1600 11/12/85 LOGGER [illegible]

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	0.5 / 1.5	S1	15"	3-3-4 (7)	FILL, BLACK, LANG, GRAVEL, SILT, SOME CINDERS, MOIST		OVA NOT WORKING PROPERLY - BATTERY LOW
5	5.0 / 7.0	S-2	8"	14-14-16 (30)	FILL, MOTTLED, BROWN AND GRAY, SAND, SOME GRAVELS ~7'		
10	10.0 / 11.2	S-3	10"	15-13-22 (40)	SAND, LT. BROWN, MED. TO CSE., ~10% F. GRAVEL, MOIST, (SP)		ROTO-DRILLING AT ~12' B.G.S. PRIMARILY COARSE GRAVEL OR COBBLES
15	15.0 / 17.0	S-4	14"	5-8-10 18	SAND, LT. BROWN, FINE, MOIST (SP)		
20	19.5 / 21.0	S-5	5"	30-20/.2	SAND, LT. BROWN, MED. TO CSE, MOIST TO WET, (SP)		GRAVEL LODGED IN BOTTOM OF THE SPLIT SPOON
25	24.5 / 26.0	S-6	15"	4-5-6 (11)	SAND LT. BROWN, FINE TO MED, MOIST, (SP)		
30	29.5 / 31.0	S-7	8"	7-7-8 (15)	SAND, LT. [illegible], FINE TO MED, WET, SP		WATER IN DRILL STEM AT 15:46 hrs

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER L20303.A0

BORING NUMBER B-35

SHEET 2 OF 2

SOIL BORING LOG

PROJECT Wisconsin LF - Wis. DNR LOCATION

ELEVATION DRILLING CONTRACTOR Twin City

DRILLING METHOD AND EQUIPMENT 2¼ I.D. 7½" O.D. HSA's. CME 45 Rig.

WATER LEVEL AND DATE START FINISH LOGGER T. Johnson

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							
34.5							
35	34.5 – 36.0	S-3			SAND, LT. BROWN, FINE, WET		
36.0							
40					BOTTOM OF BOREHOLE @ 40'		Completed Drilling at 1605 hrs

REV 11/82 FORM D1586

L20303.A0 | 1. B-45 | SHEET 1 OF —

SOIL BORING LOG

PROJECT 1 ANNUAL LF - WDNR | LOCATION

ELEVATION | DRILLING CONTRACTOR TWIN CITY

DRILLING METHOD AND EQUIPMENT [illegible]

WATER LEVEL AND DATE 25' 11/13/85 | START [illegible] | FINISH 11/13 | LOGGER [illegible]

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	0.0						
	1.5	S-1	2"	5-4-5 (9)	FILL SILTY SAND, GRAY, SOME CLAY, MOIST		OVA BACKGROUND ~3ppm
5	4.5	S-2	5"	3-5-9 (14)	FILL, SAND, WOOD CHIPS, MOIST		[illegible] ~ PLASTIC IN AUGER CUTTINGS
10	9.5	S-3	2"	1-2-3 (5)	FILL, SAND, TR. GRAV, MOIST, SILT, CLAY, MOIST TO WET		OVA READING ~5ppm OFF AUGER CUTTINGS; 0ppm ON BACKFLUSH POSSIBLY METHANE
	11.0				~14'		
15	14.5	S-4	10"	10-10-11 (21)	SAND, FINE, LT. BROWN, MOIST (SP)		
	16.0						
20	19.5	S-5	12"	13-16-20 (36)	SAND, FINE TO MED., LT. BROWN, ~15% FINE GRAVEL, MOIST, (SP)		OVA READING ~4 to 5ppm (~1 to 2 ABOVE BACKGROUND) IN HSA & FROM SPLIT SPOON SAMPLE
	21.0						
	24.5						
25	26.0	S-6	15"	8-8-13 (21)	SAND, FINE		WATER LEVEL AT 25' B.G.S. @ 10:50 HRS
	29.5						
20	31.0	S-7	10"	13-17-21 40	SAND, FINE, LT. BROWN, WET (SP)		

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	B-45	2 OF 2

SOIL BORING LOG

PROJECT Nissan LF - WDNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY

DRILLING METHOD AND EQUIPMENT

WATER LEVEL AND DATE START FINISH LOGGER E. Dixon

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30					SAND, FINE, LT. BROWN, WET, SP		
35					BOTTOM OF BORING @ 35'		
40							

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER L20303.A0 | BORING NUMBER HD | SHEET 1 OF

SOIL BORING LOG

PROJECT City of Winona Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT Earth auger, mud rotary / CME-55

WATER LEVEL AND DATE START FINISH LOGGER SM Nicholson

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					See log of HS for 0-35'		
	34						
35	36.5	S-1	7"	3-4-6 (10)	Sand, f to m, moist, brown + gravel		
	39.5						
40	41	S-2	9"	6-7-12 (19)	Sand, fine to coarse, tr. gr, moist, brown.		
	44.5						
45	46	S-3	9"	6-9-13-4	as above		Sample = 0 to 5' & 5' to 10'
50							
	54.5						
55	56	S-4	10"	5-9-9-20	Sand, fine to med. grained moist; brown		
60							

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER L20303.AD | BORING NUMBER B-75 | SHEET 1 OF 2

SOIL BORING LOG

PROJECT Waukesha LF - WIS. DNR LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT 3½" I.D. HSA (7¼" O.D.), CME 45 RIG, STD SPLIT SPOONS

WATER LEVEL AND DATE 29.5' 11/12 START 0930 - 11/12 FINISH LOGGER T.H. Graham

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	0.0						
	1.5	S-1	12"	1-3-5 (8)	FILL, DK. GRAY TO BROWN, ORGANIC SILTY SAND ~2.0'		OVA BACKGROUND ~5 PPM
	4.5						
5	6.0	S-2	10"	15-30-15/.2'	SAND, MED TO CSE, LT. BROWN, ~10% FINE GRAVEL, MOIST, (SP)		OVA READING ~5.5 PPM IN HSA
	7.5						
10	11.0	S-3	12"	9-16-18 (34)	SAND, MED. TO CSE, LT. BROWN, ~10% FINE GRAVEL. (SP)		OVA READING BACKGROUND
	14.5						OVA BACKGROUND UP TO ~5.5 PPM
15	16.0	S-4	9"	18-22-14 (36)	SAND, MED. TO CSE, LT. BROWN, ~30% FINE TO MED. GRAVEL, MOIST TO WET (AT BOTTOM) (SP)		OVA READING BACKGROUND
	19.5						
20	21.0	S-5	10"	5-11-16 (27)	SAND, MED. TO CSE, LT. BROWN, MOIST, (SP)		OVA READING BACKGROUND
	24.5						
25	26.0	S-6	8"	12-13-13 (26)	SAND, MED. TO CSE., LT BROWN, MOIST (SP)		OVA READING UP TO 9 PPM IN HSA'S ~2 to 3 PPM above background
	29.5						
30	31	S-7	6"	7-15-11 (26)	SAND, MED. TO CSE, LT. BROWN, WET TO		OVA Response Background (~5.5 ppm)

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER L20303.A0 | BORING NUMBER 4D | SHEET 2 OF 3

SOIL BORING LOG

PROJECT City of Warren Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Mud rotary / CME-55

WATER LEVEL AND DATE START FINISH LOGGER SM McCue

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
64.5							
65	64.5–66	S-5	10"	6-13-11-9	Sand, fine to med, brown, wet		
66							
70							Broke down drill string to remove pebble
74.5							
75	74.5–76	S-6	15"	7-8-9-11	Sand, fine, brown, wet		
76							
80							
84.5							
85	84.5–86	S-7	14"	7-11-19-32	As above		
86							

REV 11.

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	ND	3 OF 3

SOIL BORING LOG

PROJECT City of Waite Park LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT [illegible] / CME-55

WATER LEVEL AND DATE START FINISH LOGGER SM McEvoy

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		94.5						
95		96	S-8	15"	10-43/6"-23	Sand, fine, moist, brown		
100								
		104.5						
105		106.4	S-9	10"	14-34-52-50/4	As above		
						Bottom of boring 106.4'		
110								

HILL

L20303.A0 | B-6D | SHEET 1 OF

SOIL BORING LOG

PROJECT City of Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Bentonite mud rotary / CME-55/75, 3 7/8" tricone

WATER LEVEL AND DATE START 11/11/85 FINISH LOGGER SMcBee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					Sand little if any gravel		Description from driller's comments
							Refer to log of B-6S
							Wyogel bentonite
10							
20							
30							
40					Cobbley sand and gravel		"boulder"
							44' lost ≈ 50% of drilling fluid
					Granite boulder or top of rock 47.5'		11/11/85
50					Bottom of boring 49.5'		11/12/85

This boring was drilled ≈5' from original location after tricone bit sheared off in hole at 55'.

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A5	B-7S	2 OF 2

SOIL BORING LOG

PROJECT Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY TESTING

DRILLING METHOD AND EQUIPMENT

WATER LEVEL AND DATE START 0930 - 11/12 FINISH LOGGER

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							WATER LEVEL AT 29.5' @ 10:53.
	34.5						
35	36.0	S-8	8	4-7-8 (15)	SAND, FINE TO MED, LT. BROWN, WET (SP)		OVA READING BACKGROUND (5.5 ppm)
							DRILLED TO 40' W/D SILT - SAND CAVING BECAME OF FLOWING SAND IN HSA'S - SET WELL TO 40' B.G.S.
40					BOTTOM OF BOREHOLE @ 40.0'		
45							

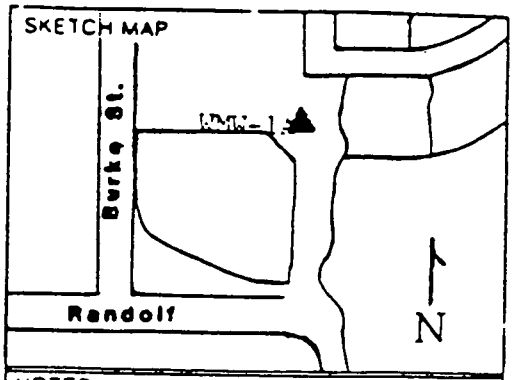
REV 11/82 FORM D1586

WISCONSIN

DRILLING LOG

WELL NUMBER MW-1A
LOCATION SW¼ Section 24, T29N, R7E.
SURFACE ELEVATION 1214.15'
DRILLING COMPANY Exploration Technology
DRILLER Steve Wonn
LOG BY: David G. Pyles

OWNER: U.S. E.P.A.
ADDRESS Schofield Park Wausau, Wisconsin
TOTAL DEPTH 141.0'
WATER LEVEL: 1186.87'
DRILLING METHOD: Rotary
DATE DRILLED: 6-21-84
HELPER: Sven Lysloff
ToC 1215.92



NOTES: Located Northeast of Baseball diamond in Schofield Park, Wausau Wisconsin

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					
			SS	8	Tan to buff, poorly sorted, sub-rounded quartz dominated sand.
					Fine to medium grain with less than 10% pebble fraction, and
5					trace silticlay.
					Reddish-brown, moderately sorted sub-angular to sub-rounded
					sand and gravel, medium to very coarse sand with rounded pebble
					fraction.
					Brown, poor to moderately sorted, subangular to sub-rounded,
10			SS	24	quarrz dominated sand. Fine to medium sand with a
					significant coarse fraction.
			SS	24	Brown to tan fine to medium grain sand, moderate to well sort,
					sub-rounded sand.
15					
			SS	49	Buff and Red-Brown, split - fraction, buff colored silt to
					fine sand well sorted, over very coarse sand and gravel,
20					angular to subangular, moderately sorted.

*ASTM D1586

DRILLING LOG

WELL NUMBER: WMW-1 A
OWNER: U.S. E.P.A.
LOCATION: SW¼ Section 24, T29N, R7E.
ADDRESS: Schofield Park Wausau, Wisconsin
TOTAL DEPTH: 141.0'
SURFACE ELEVATION: 1214.15'
WATER LEVEL: 1186.87'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 6-21-84
DRILLER: Steve Wonn
HELPER: Sven Lvsloff
LOG BY: David G. Pyles

SKETCH MAP

NOTES: Located Northeast of Baseball diamond in Schofield

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20					
			SS	45	Reddish-brown, very coarse sand to fine gravel, sub-rounded to rounded, moderately sorted, trace of medium grain sand was encountered at 24 feet.
25					
			SS	47	Tan - Brown sand range from fine sand to gravel, poorly sorted sub-rounded sands. Gravel fraction maybe a result of annular-cave-in.
30					
			SS	29	Reddish - Brown, fine to medium grained, subangular to sub-rounded, moderately sorted, sand. Small rounded pebble fraction, (less than 10%)
35					
40					

*ASTM D1586

DRILLING LOG

WELL NUMBER: WMW-1A
LOCATION: SW¼ Section 24, T29N, R7E.
SURFACE ELEVATION: 1214.15'
DRILLING COMPANY: Exploration Technology
DRILLER: Steve Wonn
LOG BY: David G. Pyles

OWNER: U.S. E.P. A
ADDRESS: Schofield Park Wausau, Wisconsin
TOTAL DEPTH: 141.0'
WATER LEVEL: 11 86.87'
DRILLING METHOD: Rotary
DATE DRILLED: 6-21-84
HELPER: Sven Lysloff

SKETCH MAP

NOTES: Located Northeast of Baseball diamond in Schofield

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0			SS	38	Tan to Brown medium grain sub-angular to sub-rounded, moderately sorted sand. Less than 10% sub-rounded to rounded pebble fraction and slight rock fragments - (Angular).
			SS	38	Same as above - (40.0 to 41.5 sample)
45					
50					
			SS	25	Tan, medium to very coarse, sub-angular to sub-rounded, moderately sorted sand. Pebble fraction is less than 5% and is rounded.
					Tan to brown medium sand to pebble - (fragmented rock). Sand
55			SS	50	fraction is well sorted sub-angular to sub-rounded with a trace of finer grain sand. Very coarse sand and pebble fraction is angular, and fragmented.
60					

*ASTM D1586

DRILLING LOG

JUN 28 1985

WELL NUMBER MW-1A
LOCATION SW¼ Section 24, T29N, R7E.
SURFACE ELEVATION 1214.15'
DRILLING COMPANY Exploration Technology
DRILLER Steve Wonn
LOG BY: David G. Pyles

OWNER U.S. E.P.A.
ADDRESS Schofield Park Wausau, Wisconsin
TOTAL DEPTH 141.0'
WATER LEVEL 1186.87'
DRILLING METHOD Rotary
DATE DRILLED 6-21-84
HELPER Sven Lysloff

SKETCH MAP

NOTES: Located Northeast of Baseball diamond in Schofield

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
60			SS	-	No sample recovered
65			SS	32	No sample recovered
70			SS	57	Tan to brown, medium grain sand, slight pebble fraction. Sand fraction is sub-angular to sub-rounded and moderately sorted. Slight pebble fraction of uniform size and consistantly rounded.
75			SS	34	Reddish, black gravel, ranging form very coarse sand to gravel, sub-angular to sub-rounded, poorly sorted.
80					

*ASTM D1586

WONN

DRILLING LOG

WELL NUMBER WMW-1 A
LOCATION SW¼ Section 24, T29N, R7E
SURFACE ELEVATION: 1214.15'
DRILLING COMPANY: Exploration & Technology
DRILLER: Steve Wonn
LOG BY: David G. Pyles

OWNER: U.S. E.P.A.
ADDRESS: Schofield Park Wausau, Wisconsin
TOTAL DEPTH 141.0'
WATER LEVEL: 1186.87'
DRILLING METHOD:
DATE DRILLED: 6-21-84
HELPER: Sven Lysloff

SKETCH MAP

NOTES: Located Northeast of Baseball diamond in Schofield

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
80					
					Red - Black very coarse sand and gravel, same as 78.5 to 80
			SS	68	sample. Maybe annular - cave-in.
85					
			SS	66	Tan to reddish brown sand, range from fine sand to fine
90					gravel, poorly sorted, angular to subangular,
					Tan to Buff, coarse sand, range fine to very coarse sand,
			SS	146	trace gravel, moderately sorted, sub-rounded,
95					
					Tan to dark brown, fine sand and gravel approximately 50%-50%
			SS	30	moderately sorted fractions, subangular to rounded

* ASTM D1586

DRILLING LOG

WELL NUMBER: WMW-1A
LOCATION: SW¼ Section 24, T29N, R7E
SURFACE ELEVATION: 1214.15'
DRILLING COMPANY: Exploration Technology
DRILLER: Steve Wonn
LOG BY: David G. Pyles

OWNER: U.S. E.P.A.
ADDRESS: Schofield Park, Wausau, Wisconsin
TOTAL DEPTH: 141.0'
WATER LEVEL: 1186.87'
DRILLING METHOD: Rotary
DATE DRILLED: 6-21-84
HELPER: Sven Lysloff

SKETCH MAP

NOTES: Located Northeast of Baseball diamond in Schofield

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
100					
			SS	66	Same as 98.5 to 100 foot sample, coarse fraction believed to be annular cave-in.
105					
					Tan to dark brown subangular to subrounded well sorted sand.
			SS	81	Trace pebble fraction.
110					
			SS	80	No sample collected
115					
					Brown, very poorly sorted sand, grading with depth becoming fractured rock and grains subangular to sub-rounded. Quartz
			SS	69	dominant mineral
120					

*ASTM D1586

SHEET 1 OF 1

DRILLING LOG

WELL NUMBER LMW-1A
LOCATION SW¼ Section 24, T29N, R7E
SURFACE ELEVATION 1214.15'
DRILLING COMPANY: Exploration Technology
DRILLER: Steve Wonn
LOG BY: David G. Pyles

OWNER: U.S. E.P.A.
ADDRESS: Schofield Park Wausau, Wisconsin
TOTAL DEPTH 141.0'
WATER LEVEL: 1186.87'
DRILLING METHOD: Rotary
DATE DRILLED: 6-21-84
HELPER: Sven Lysloff

SKETCH MAP

NOTES: Located Northeast of Baseball diamond in Schofield

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
120			SS	81	Brownish - red medium grain sand, gradational downward, to rock fragments, coarser sand fraction consistant subangular,
125					Brown to rusty red, brown sands are very coarse, subanglar and uniform. Sharp density and color contrast. Color indicitive
			SS	3501b 100+	of weathered granite, blow counts distinctly higher. Oxidized
130					fragmented weathered appearance
			SS	3501b 100+	Rusty - red fine to coarse grain weathered granite, wet to moist.
135					
			SS	3501b 115	Rusty red to burnt yellow, dense, consolidated, weathered granite, moist to dry. Bedrock texture and density.
140					

*ASTM D1586

DRILLING LOG

JUL 2 1985

SKETCH MAP

WELL NUMBER MW-1A
LOCATION SW¼ Section 24, T29N, R7E
SURFACE ELEVATION 1214.15'
DRILLING COMPANY Exploration Technology
DRILLER Steve Wonn
LOG BY: David G. Pyles

OWNER: U.S. E.P.A
ADDRESS Schofield Park Wausau, Wisconsin
TOTAL DEPTH 141.0'
WATER LEVEL: 1186.87'
DRILLING METHOD Rotary
DATE DRILLED 6-21-84
HELPER Sven Lysloff

NOTES: Located Northeast of Baseball diamond in Schofield.

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
140					
		SS	3501b 48		Rusty red, weathered, highly consolidated granite, but compositionally not hard rock, damp to dry, extremely dense. Split-spoon would drive with 350 pound weight.
145					
					Drilled ahead to 159.5, No Sample was collected but rock was very hard and drilling was stopped due to the consolidated material. (Bedrock).

*ASTM D1586

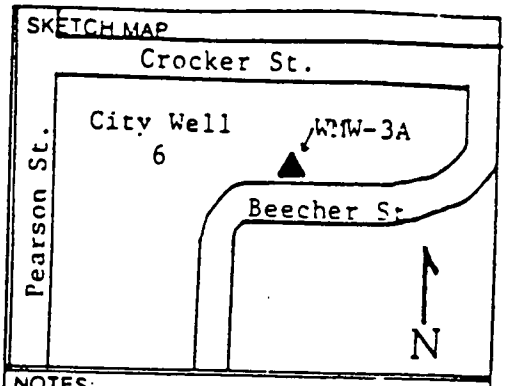
WESTERN

DRILLING LOG

WELL NUMBER: WMW- 3A
LOCATION: Beecher Street, Wausau, Wi.
SURFACE ELEVATION: 1221.14
DRILLING COMPANY: Exploration Technology
DRILLER: Steve Wonn
LOG BY: D. G. Pyles

OWNER: U.S. EPA
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 141.0'
WATER LEVEL: 1183.51
DRILLING METHOD: Rotary
DATE DRILLED: 9-25-84
HELPER:

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					
		1	S.S.	27 33 39	Red-brown to black, moderately sorted sub-angular to sub-rounded quartz dominated granules with approximately 5% pebbles, 20% coarse sand and a trace of silt and clay.
		2	S.S.	24 37 31	Red-brown, poorly sorted sub-rounded to rounded quartz dominated very coarse to coarse sand with less than 15% granules and approximately 10% silt and clay.
		3	S.S.	17 22 19	Red-brown to black, very poorly sorted, angular to sub-rounded quartz dominated granules with approximately 20% pebbles, 30% sand, and 15% silt and clay.

* ASTM D1586

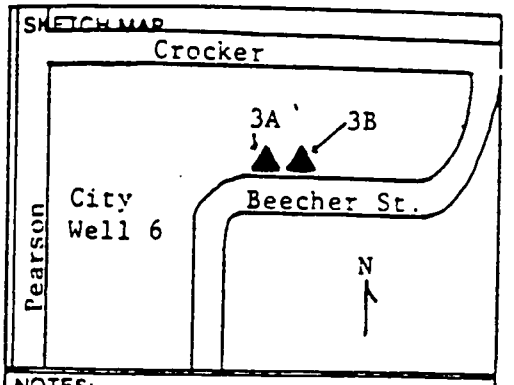
WESTERN

DRILLING LOG

WELL NUMBER: WMW-3A
LOCATION: Beecher Street, Wausau, Wisconsin
SURFACE ELEVATION: 1211.01'
DRILLING COMPANY: Exploration Technology
DRILLER: Steve Wonn
LOG BY: D. G. Pyles

OWNER: U.S. E.P.A.
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 141.0'
WATER LEVEL: 1176.23'
DRILLING METHOD: Rotary
DATE DRILLED: 9/25/84
HELPER:

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40					
		4	S.S	12 14 15	Brown, extremely well sorted, well-rounded quartz dominated sand with no particles greater than coarse sand size.
50					
		5	S.S.	13 23 24	Brown to black, moderately sorted, angular to sub-angular quartz dominated granules with approximately 15% pebbles and 10% silt and clay.
60					
		6	S.S.	18 12 12	Brown, extremely poorly sorted, angular to sub-rounded quartz dominated very coarse sand with approximately 1% pebbles, 20% granules and 30% silt and clay.
70					
		7	S.S.	12 9 9	Brown, moderately sorted, angular to sub-rounded quartz dominated medium to fine sand with inclusions of coarse sand. Approximately 35% silt and clay.
80					

* A.S.T.M. D1586

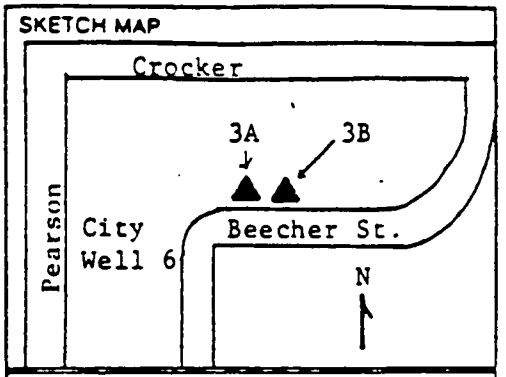
WESTERN

JUN 28 1985

DRILLING LOG

WELL NUMBER: WMW-3A
OWNER: U.S. E.P.A.
LOCATION: Beecher Street, Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 141.0'
SURFACE ELEVATION: 1211.01'
WATER LEVEL: 1176.23'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 9/25/84
DRILLER: Steve Wonn
HELPER:
LOG BY: D. G. Pyles

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
80					
		8	S.S.	11 13 20	Light brown, poorly sorted, sub-angular to sub-rounded quartz dominated medium to fine sand with inclusions of pebbles, approximately 20% silt and clay.
90					
		9	S.S.	19 15 12	Medium brown, moderately to well sorted, sub-rounded to rounded quartz dominated medium to fine sand with inclusions of granules. Approximately 30% silt and clay.
100					
		10	S.S.	10 20 21	Brown, moderately sorted, sub-angular to sub-rounded quartz dominated fine sand with inclusions of pebbles (3%) and granules (2%). Silt and clay approximately 35%.
110					
		11	S.S.	31 60 --	Brown, moderately sorted, sub-rounded to rounded quartz dominated very fine sand with inclusions of pebbles (1%) and granules (2%). Silt and clay approximately 40%.
120					

* ASTM D1586

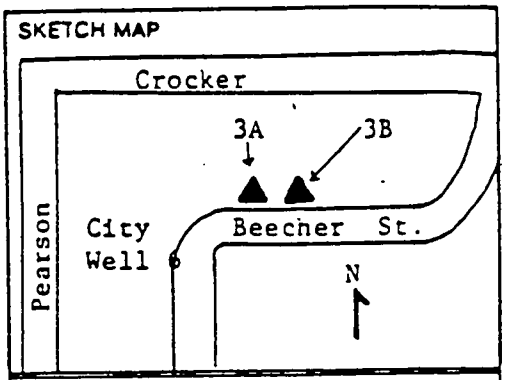
WESTON

DRILLING LOG

WELL NUMBER: WW- 3A
LOCATION: Beecher Street
Wausau, Wisconsin
SURFACE ELEVATION: 1211.01'
DRILLING COMPANY: Exploration Technology
DRILLER: Steve Wonn
LOG BY: D. G. Pyles

OWNER: U.S. EPA
ADDRESS: Clark Street
Chicago, Illinois
TOTAL DEPTH 141.0'
WATER LEVEL: 1176.23'
DRILLING METHOD: Rotary
DATE DRILLED: 9/25/84
HELPER:

SKETCH MAP



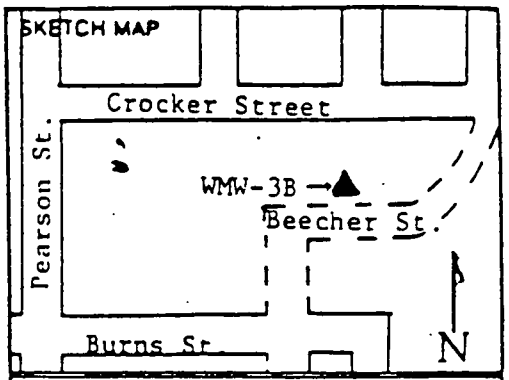
NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
120					
		12	S.S.	35 75 --	Brown, moderate to well sorted, angular to sub-rounded, quartz dominated very fine sand to silt with inclusions of pebbles (2%) and granules (1%). Clay percentage is 20%.
130					
		13	S.S.	43 100/ 10"	Brown, moderately sorted, sub-angular to sub-rounded quartz dominated medium sand with intermittant pebbles and some granules, some silt and clay.
140		14	S.S.	100/ 10"	Not able to recover.
		15	S.S.	100/ 10"	Not able to recover.
150					
160					

* ASTM D1586

DRILLING LOG

WELL NUMBER: WMW- 3B
OWNER: U.S. E.P.A.
LOCATION: Beecher Street, Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 75.0'
SURFACE ELEVATION: 1221.16
WATER LEVEL: 1183.79
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 9/22/84
DRILLER: Mark Prueher
HELPER:
LOG BY: Drill crew



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
		1			Brown, very coarse to fine sand with gravel.
20		2			Light brown, medium to fine sand, trace gravel, trace silt.
40					

*ASTM D1586

JUN 28 1985

DRILLING LOG

WELL NUMBER: WMW-3B
OWNER: U.S. E.P.A.
LOCATION: ~~Beecher Street~~ Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 75.0'
SURFACE ELEVATION: 1211.16'
WATER LEVEL: 1176.23'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 9/22/84
DRILLER: Mark Prueher
HELPER:
LOG BY: Drill Crew

SKETCH MAP

NOTES:

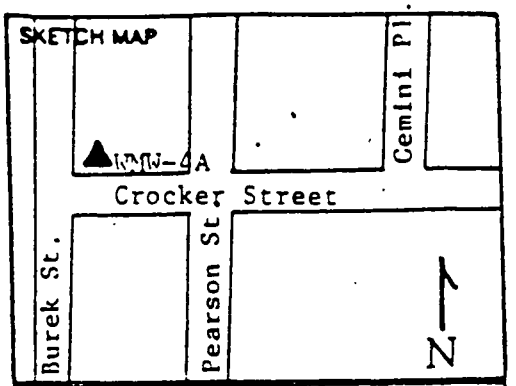
DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40		3			Light brown, medium to fine sand, trace gravel, trace silt.
50		4			Brown, very coarse to fine sand with gravel.
60		5			Light brown, medium to fine sand, trace gravel .
		6			Brown, very coarse to fine sand with gravel.
		7			Light brown, medium to fine sand, trace gravel.
70					
					End of boring 75'. Screen of 10' from 65' to 75'.
80					

* ASTM D1586

DRILLING LOG

WELL NUMBER: MW-4A
OWNER: U.S. EPA
LOCATION: Crocker & Burek St, Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 100'
SURFACE ELEVATION: 1215.63'
WATER LEVEL: 1185.71
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 9/26/84
DRILLER: Mark Prueher
HELPER: Drill crew
LOG BY:
ToC 1215.63

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
		1			Black, medium to fine sand, trace of silt.
		2			Light brown, medium to fine sand with some gravel.
		3			Light brown, coarse to fine sand with gravel.

* ASTM D1586

WESTON

JUN 28 1985

DRILLING LOG

WELL NUMBER: WMW-4A
OWNER: U.S. EPA
LOCATION: Crocker & Burek St, Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 100'
SURFACE ELEVATION: 1215.63'
WATER LEVEL: 1185.71'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 9/26/84
DRILLER: Mark Prueher
HELPER:
LOG BY: Drill crew

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40					
50					
		4			Light brown, coarse to fine sand, trace gravel.
60					
70					
80					

* ASTM D1586

DRILLING LOG

1025

WELL NUMBER: WMW-4A
OWNER: U.S. EPA
LOCATION: Crocker & Burek St, Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 100'
SURFACE ELEVATION: 1215.63'
WATER LEVEL: 1185.71'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 9/26/84
DRILLER: Mark Pruener
HELPER:
LOG BY: Drill crew

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
		5			End of boring at 117', 10' screen from 90' to 100'.

*ASTM D1586

JUN 1 1985

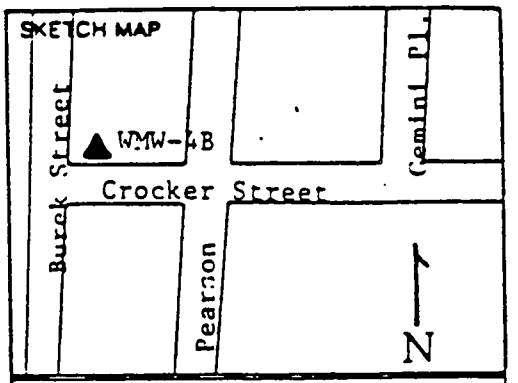
WESTON

DRILLING LOG

WELL NUMBER: WMW- 4B
LOCATION: Crocker & Burek, Wausau, Wisconsin
SURFACE ELEVATION: 1215.53'
DRILLING COMPANY: Exploration Technology
DRILLER: Mark Prueher
LOG BY: Drill Crew

OWNER: U.S. EPA
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 60.5'
WATER LEVEL: 1185.85'
DRILLING METHOD: Rotary
DATE DRILLED: 9/27/84
HELPER:
ToC 1215.53

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					
		1			Brown, grades from fine to medium to coarse silty sand.
10					Considerable mud loss.
		2			Gravel
20					
		3			Coarser sand.
30					
40					

* ASTM D1586

WESTON

DRILLING LOG

WELL NUMBER: WMW-4B
OWNER: U.S. EPA
LOCATION: Crocker & Burek, Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 60.5'
SURFACE ELEVATION: 1215.53'
WATER LEVEL: 1185.85'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 9/27/84
DRILLER: Mark Prueher
HELPER:
LOG BY: Drill crew

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
		4			Brown, grades from fine to medium to coarse silty sand.
					End of boring at 60.5'. 10' screen from 50' to 60'.

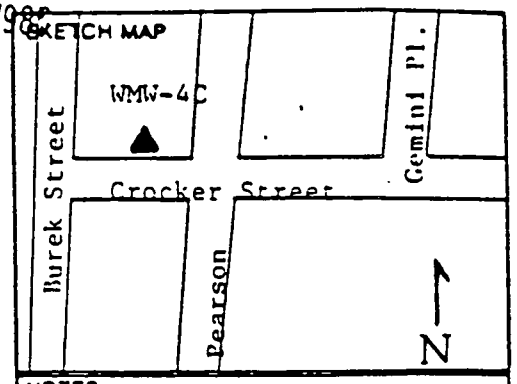
*ASTM D1586

WESTON JUN 2 8 1985

DRILLING LOG

WELL NUMBER: WMW-4C
OWNER: U.S. EPA
LOCATION: Crocker St and Burek Street Wausau, Wisconsin
ADDRESS: Clark Street Chicago, Illinois
TOTAL DEPTH: 40'
SURFACE ELEVATION: 1215.50'
WATER LEVEL: 1186.50'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 10/31/84
DRILLER: Bob Lavere
HELPER:
LOG BY: Drill crew
ToC 1215.50

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		1			Dark brown, coarse to fine sand with some silt and gravel (fill)(SP-
		2			Brown, coarse to fine sand, trace silt, trace gravel. (SP).
10					
20					
30					
40					End of boring at 40'. 10' screen from 30' to 40'.

*ASTM D1586

SHEET 1 OF 1

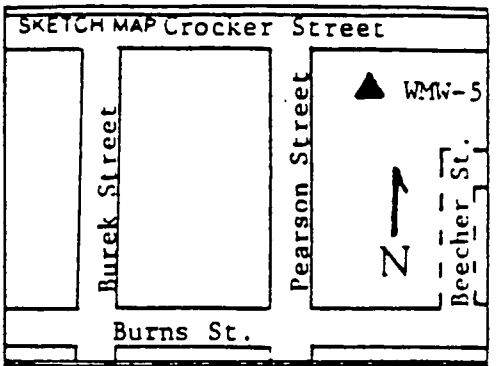
WESTON

DRILLING LOG

WELL NUMBER: WMW-5
OWNER: U.S. EPA
LOCATION: 150' east of Ch-6, Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 45'
SURFACE ELEVATION: 1219.08'
WATER LEVEL: 1185.75'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 11/2/84
DRILLER: Mark Prueher
HELPER:
LOG BY: Drill crew

ToC 1219.08

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					.3' Topsoil.
		1			Light brown, coarse to fine sand with gravel, trace silt.
10					
20					
30					
40					

*ASTM D1586

WESTERN

DRILLING LOG

WELL NUMBER: WMW-5
OWNER: U.S. EPA
LOCATION: 150' east of CW-6, Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 45'
SURFACE ELEVATION: 1219.08'
WATER LEVEL: 1185.75'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 11/2/84
DRILLER: Mark Prueher
HELPER:
LOG BY: Drill crew

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40					End of boring at 45'. 10' screen from 35 to 45'.

*ASTM D1586

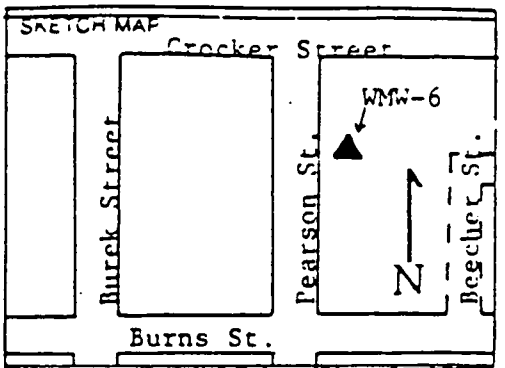
WESTON

DRILLING LOG

WELL NUMBER: WMW-6
OWNER: U.S.EPA
LOCATION: 140' Southwest of CW-6
ADDRESS: Clark Street Chicago, Illinois
Wausau, Wisconsin
TOTAL DEPTH: 45'
SURFACE ELEVATION: 1218.93'
WATER LEVEL: N/A
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 11/2/84
DRILLER: Mark Prueher
HELPER:
LOG BY: Drill crew

ToC 1218.93

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					.3' Topsoil
		1			Light brown, coarse to fine sand with trace gravel, trace silt.
10					
20					
30					
40					

*ASTM D1586

WESTON

JUN 2 0 1985

DRILLING LOG

WELL NUMBER: MW-6 | OWNER: U.S.EPA

LOCATION: 140' Southwest of CW-6 | ADDRESS: Clark Street Chicago, Illinois

Wausau, Wisconsin | TOTAL DEPTH: 45'

SURFACE ELEVATION: 1218.93 | WATER LEVEL: N/A

DRILLING COMPANY: Exploration Technology | DRILLING METHOD: Rotary | DATE DRILLED: 11/2/84

DRILLER: Mark Prueher | HELPER:

LOG BY: Drill crew

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40					
					End of boring at 45'. 10' screen from 35' to 45'.
50					

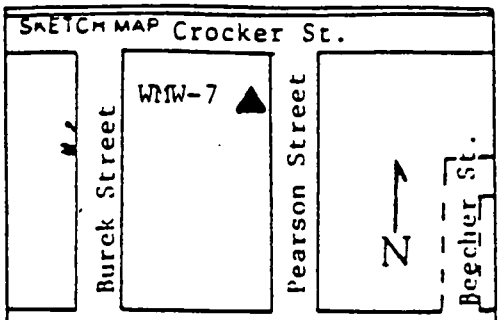
*ASTM D1586

WESTON

DRILLING LOG

WELL NUMBER: WMW-7
OWNER: U.S. EPA
LOCATION: Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 45.0'
SURFACE ELEVATION: 1219.10'
WATER LEVEL: 1185.22'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 11/26/84
DRILLER: Bob Lavere
HELPER:
LOG BY: Drill crew

SKETCH MAP



NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					
					Brown, coarse to fine sand, trace silt with gravel and cobbles (SP).
10					
20					Brown, coarse to fine sand, trace silt (SP).
30					
40					

*ASTM D1586

WESTERN

DRILLING LOG

WELL NUMBER: WMW-7
OWNER: U.S. EPA
LOCATION: Wausau, Wisconsin
ADDRESS: Clark Street, Chicago, Illinois
TOTAL DEPTH: 45.0'
SURFACE ELEVATION: 1219.10'
WATER LEVEL: 1185.22'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 11/26/84
DRILLER: Bob Lavere
HELPER:
LOG BY: Drill crew

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40					
					End of boring at 45.0'.
50					
60					
70					
80					

* ASTM D1586

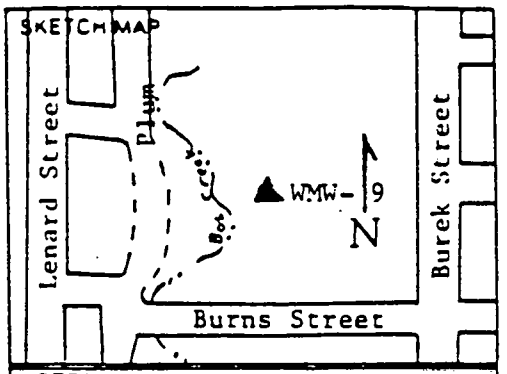
WESTON

JUN 20 1985

DRILLING LOG

WELL NUMBER: WMW-9
OWNER: U.S. EPA
LOCATION:
ADDRESS: Clark Street
Chicago, Illinois
Wausau, Wisconsin
TOTAL DEPTH: 50.0'
SURFACE ELEVATION: 1201.99'
WATER LEVEL: 1186.19'
DRILLING COMPANY: Exploration Technology
DRILLING METHOD: Rotary
DATE DRILLED: 11/30/84
DRILLER: Bob Lavere
HELPER:
LOG BY: Drill crew

SKETCH MAP



NOTES

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					Topsoil
10					Brown, coarse to fine sand, trace silt with some gravel, occasional cobbles (SP).
30					Brown, coarse to fine sand, trace silt (SP).
40					

* ASTM D1586

WESTON

DRILLING LOG

585

WELL NUMBER: WMW-9 OWNER: U.S. EPA

LOCATION: Wausau, Wisconsin ADDRESS: Clark Street Chicago, Illinois

SURFACE ELEVATION: 1201.98' TOTAL DEPTH: 50.0'

WATER LEVEL: 1186.19'

DRILLING COMPANY: Exploration Technology DRILLING METHOD: Rotary DATE DRILLED: 11/30/84

DRILLER: Bob Lavere HELPER:

LOG BY: Drill crew

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40					
					Brown, coarse to fine sand, trace silt (SP).
50					End of boring at 50.0'
60					
70					
80					

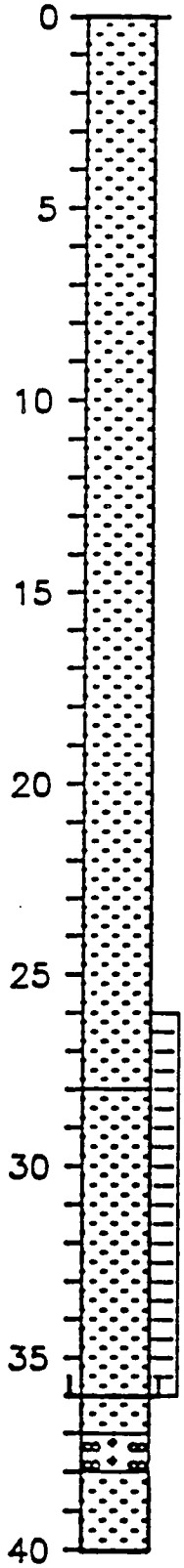
*ASTM D1586

SHEET 2 OF 2

WELL LOG

DEPTH FT. EL

DESCRIPTION



(a) SAND, MEDIUM TO COARSE GRAINED, WITH GRAVEL, BROWN, MOIST, FINER AT 23'

(b) SAND, FINE TO MEDIUM GRAINED, VERY CLEAN, WITH GRAVEL

(c) SAND AND GRAVEL, COARSER

(d) SAND, FINE, VERY CLEAN, BROWN

WELL ID GM-1S

LEGEND

Well Screen

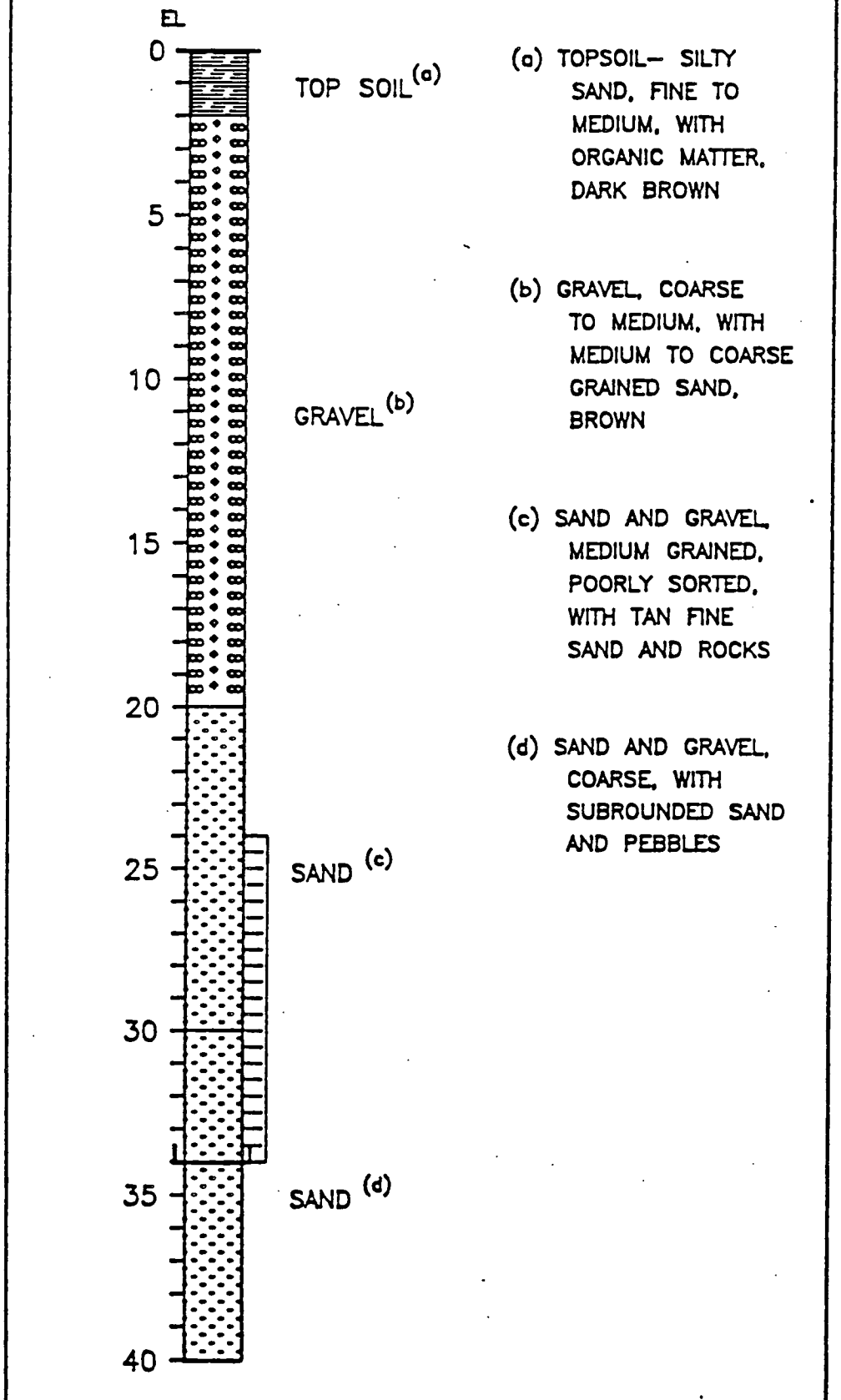
Well Bottom

DATE LOGGED 08-05-86

LOGGED BY LCH

INTERPRETED BY LCH

WELL LOG



WELL ID GM–2S

LEGEND

Well Screen

Well Bottom

DATE LOGGED 08–18–86

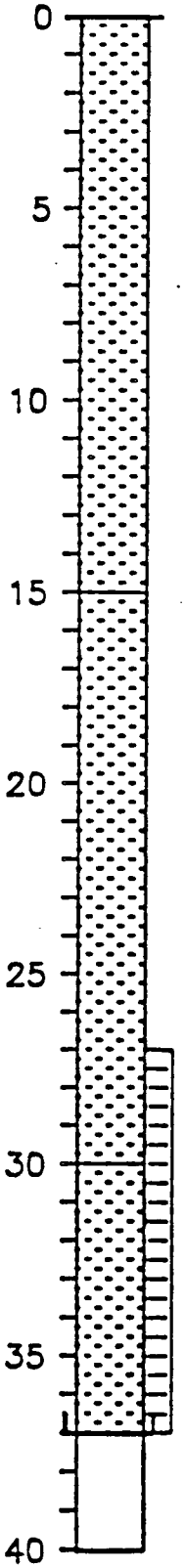
LOGGED BY PH

INTERPRETED BY LCH

WELL LOG

DEPTH FT.

EL



DESCRIPTION

(a) SAND, FINE TO COARSE GRAINED, WITH GRAVEL, DARK–MED. BROWN

(b) SAND, BECOMING FINER, WITH GRAVEL, MEDIUM BROWN

(c) SAND, COARSE, WITH SOME GRAVEL, BROWN

WELL ID GM–3S

LEGEND

Well Screen

Well Bottom

DATE LOGGED 08–19–86

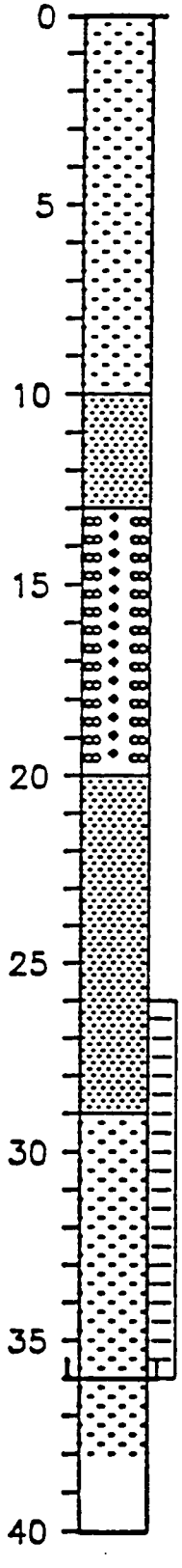
LOGGED BY LCH

INTERPRETED BY LCH

WELL LOG

DEPTH FT.

EL



DESCRIPTION

SAND [a]

SILT [b]

GRAVEL [c]

SILT [d]

SAND [e]

(a) SAND AND GRAVEL, MOIST, BECOMING COARSER

(b) SILTY SAND, WITH GRAVEL, DRY

(c) GRAVEL (COBBLES 1-1/2") MOIST

(d) SAND AND GRAVEL, LIGHT BROWN, WET

(e) COARSE SAND, MIXED WITH GRAVEL, DARK BROWN

WELL ID GM-4S

LEGEND

Well Screen

Well Bottom

DATE LOGGED 08-21-86

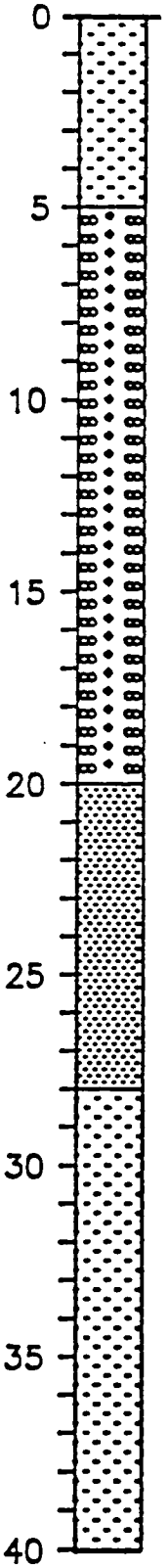
LOGGED BY LCH

INTERPRETED BY LCH

WELL LOG

DEPTH FT.

EL



DESCRIPTION

(a) SAND, MEDIUM GRAINED, BROWN

(b) GRAVEL AND SAND, MEDIUM TO COARSE GRAINED SAND, COBBLES TO 1-1/2", BROWN

(c) SILT, VERY FINE, WITH SOME SMALL GRAVEL, VERY HARD, LT.BROWN

(d) SAND, MEDIUM TO COARSE GRAINED, WITH TRACE OF GRAVEL, BROWN

WELL ID GM-4D

DATE LOGGED 08-20-86

LOGGED BY LCH

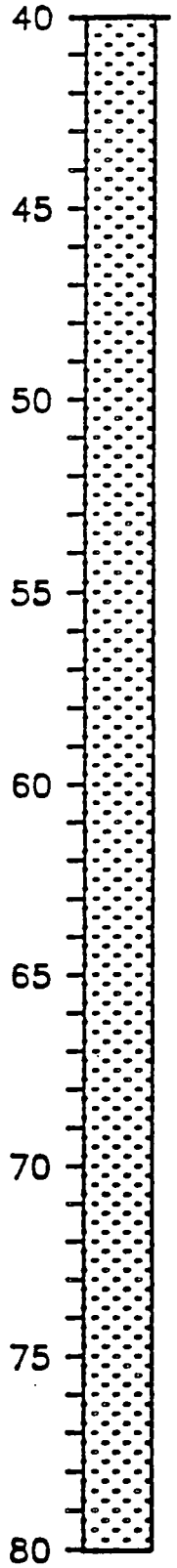
INTERPRETED BY LCH

WELL LOG

DEPTH FT.

DESCRIPTION

WELL ID GM-4D



(e) SAND, COARSE GRAINED, WITH GRAVEL INCREASING AT 55', BROWN

SAND (e)

DATE LOGGED 08-20-86

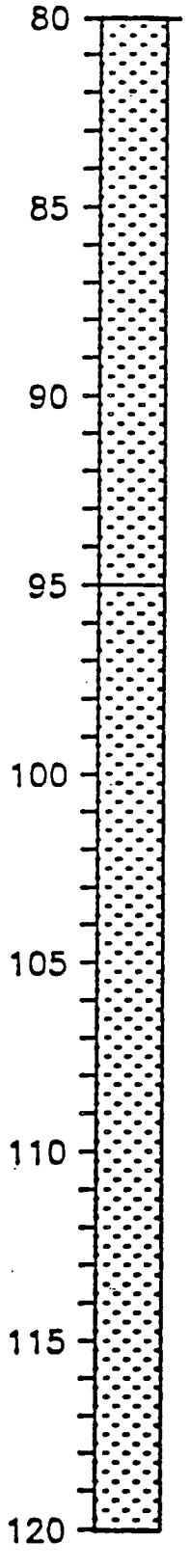
LOGGED BY LCH

INTERPRETED BY LCH

WELL LOG

DEPTH FT.

DESCRIPTION



SAND (e)

(e) SAND, COARSE GRAINED, WITH MUCH GRAVEL, BROWN

SAND (f)

(f) SAND, VERY FINE TO MEDIUM GRAINED, NO GRAVEL, CAUSING BRIDGING OF TOOLS IN HOLE

WELL ID GM-4D

DATE LOGGED 08-20-86

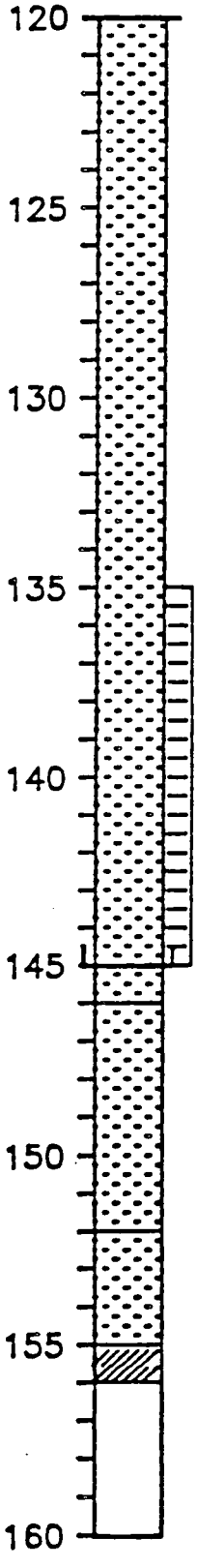
LOGGED BY LCH

INTERPRETED BY LCH

WELL LOG

DEPTH FT.

DESCRIPTION



(f) SAND, VERY FINE TO MEDIUM GRAINED, NO GRAVEL, CAUSING BRIDGING OF TOOLS IN HOLE, BROWN

(g) SAND, SAME AS 120–146' BUT COLOR CHANGE TO RUSTY RED–ORANGE COLOR

(h) SAND, MEDIUM TO COARSE GRAINED WITH MUCH GRAVEL (COBBLES TO 2–1/2 TO 3"), TANNISH–BROWN

WELL ID GM–4D

LEGEND

Well Screen

Well Bottom

DATE LOGGED 08–20–86

LOGGED BY LCH

INTERPRETED BY LCH

APPENDIX B

WELL CONSTRUCTION DIAGRAMS

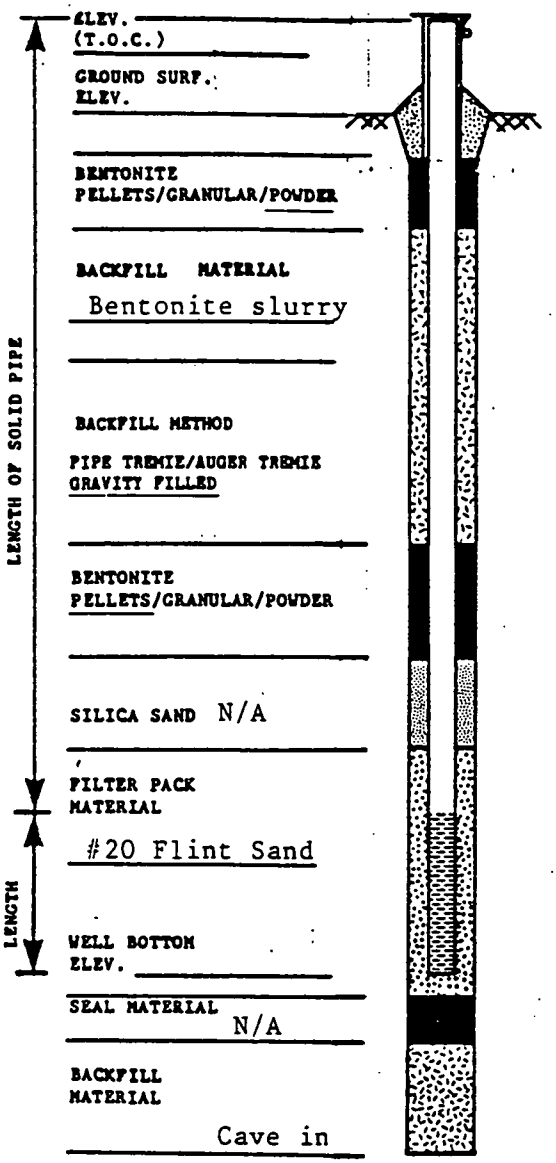
RMT

ell Diagram
-17 (R 11-85)

PROJECT NAME: Foley & Lardner NO. 222.04

WELL NO. R-1S

DATE INSTALLED 8/15/86



1) CASING DETAILS

A) TYPE OF PIPE:

PVC, STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS;

COUPLINGS, THREADED (W/TAPE?), OTHER w/ O rings

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC, STAINLESS, TEFLON, OTHER 6" Point

E) WELL SCREEN SLOT SIZE 0.010"

F) PIPE DIA: ID IN. 2.0 OD IN. 2.4

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO
PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT 9/05/86

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER Air

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 20 minutes

C) APPROXIMATE WATER VOLUME: REMOVED -8 gallons

ADDED _____

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

_____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 9/05/86 34.10' FT.

DATE/TIME _____ FT.

DATE/TIME _____ FT.

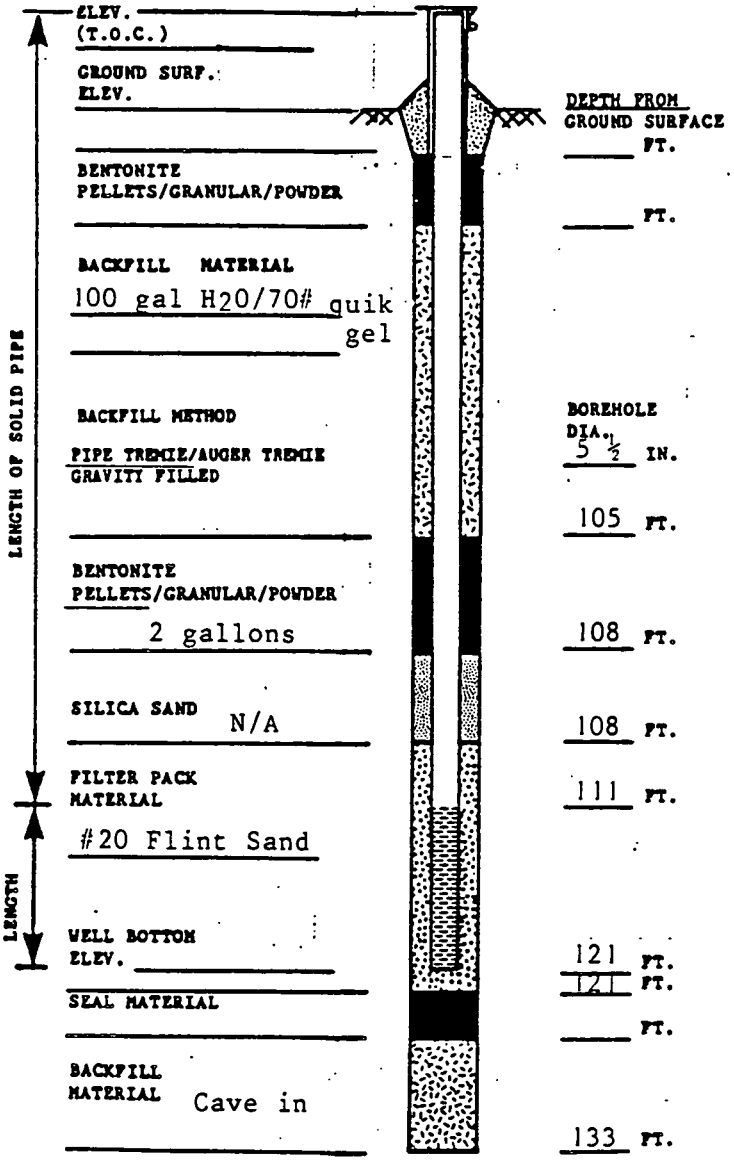
ADDITIONAL COMMENTS: _____

Well Diagram
F-17 (R 11-85)

PROJECT NAME: Foley & Lardner NO. 222.04

WELL NO. R-1D

DATE INSTALLED 8/14/86



1) CASING DETAILS

A) TYPE OF PIPE:

PVC, STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS;

COUPLINGS, THREADED (W/TAPE?), OTHER w/ O rings

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC, STAINLESS, TEFLON, OTHER w/6" Point

E) WELL SCREEN SLOT SIZE 0.010"

F) PIPE DIA: ID IN. 2.0 OD IN. 2.4

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO
PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT 9/05/86

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER Air

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 30 minutes

C) APPROXIMATE WATER VOLUME: REMOVED ~300 gallons

ADDED _____

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?
slightly silty
CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

_____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/15/86 A.M. 35.4 FT.

DATE/TIME 9/05/86 34.6 FT.

DATE/TIME _____ FT.

ADDITIONAL COMMENTS: _____

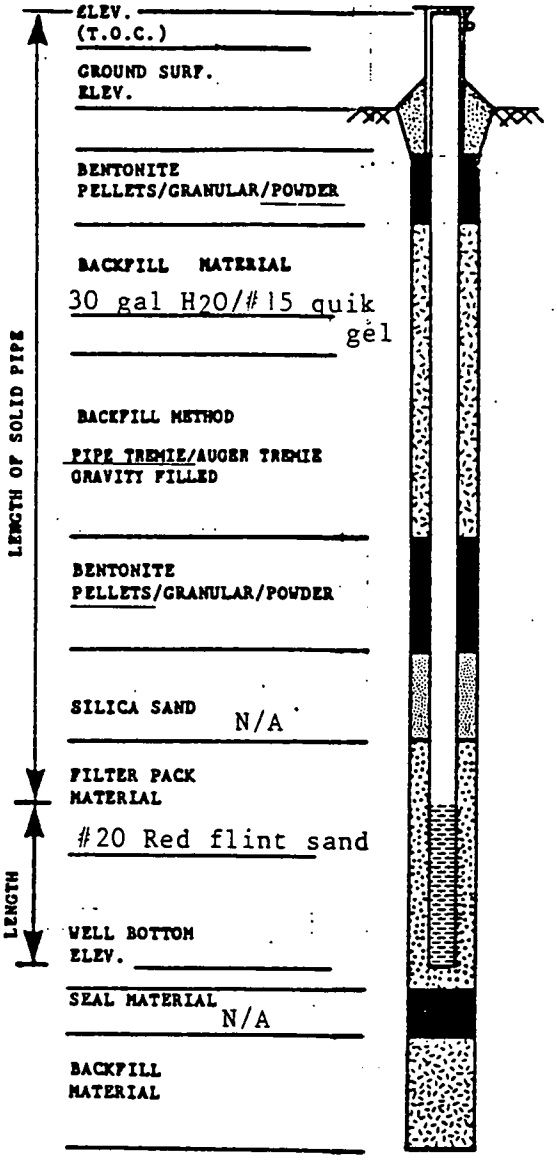
Roux

...ell Diagram
...-17 (R 11-85)

PROJECT NAME: Foley & Lardner NO. 222.04

WELL NO. R-2S

DATE INSTALLED 8/7/86



1) CASING DETAILS

A) TYPE OF PIPE:

PVC, STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS;

COUPLINGS, THREADED (W/TAPE?), OTHER w/ O rings

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC, STAINLESS, TEFLON, OTHER w/6" point

E) WELL SCREEN SLOT SIZE 0.010"

F) PIPE DIA: ID IN. 2.0 OD IN. 2.4

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO
PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT 9/04/86

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER PVC Bailer & air

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 20 minutes + 1.5 hours

C) APPROXIMATE WATER VOLUME: REMOVED 7 gallons
ADDED 0 + 10 gallons

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

_____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/7/86 22.18 FT.

DATE/TIME 8/12/86 22.40 FT.

DATE/TIME 9/4/86 22.4 FT.

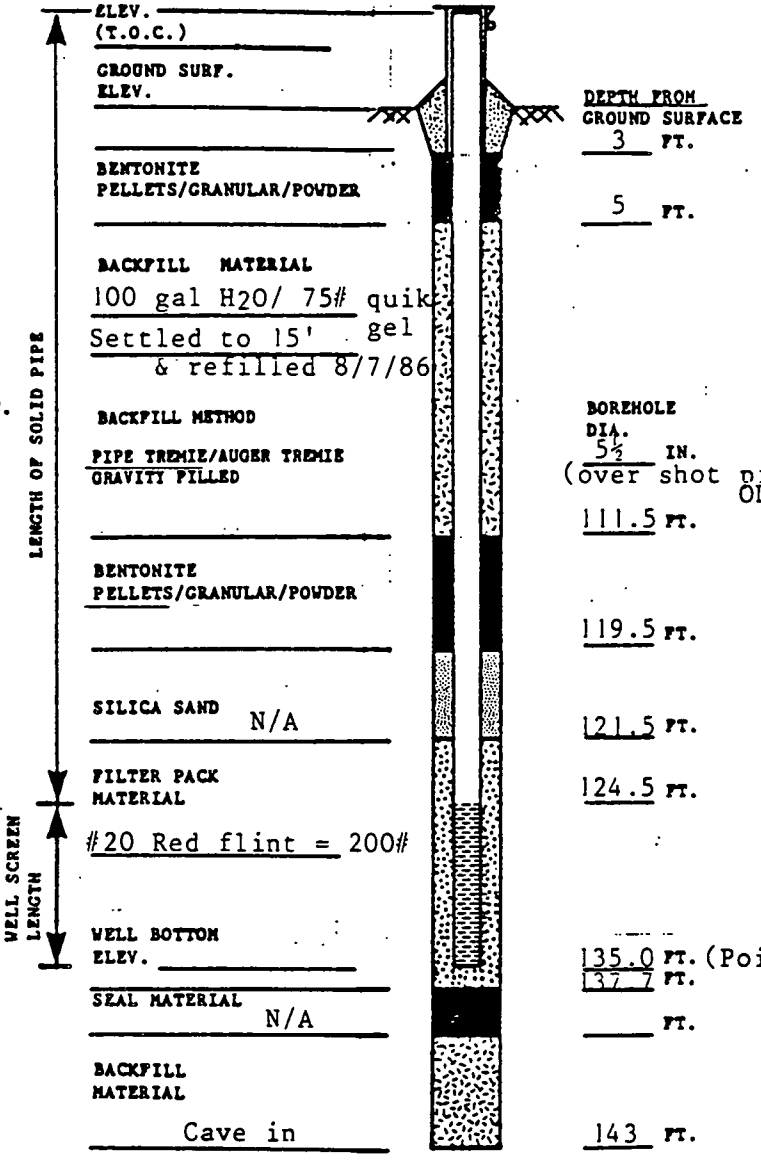
ADDITIONAL COMMENTS: Measured inside well casing open to 30.7' B.T.O.C. (@ completion)
Bailer drops to 30.0' below T.O.C. - ok

Well Diagram
F-17 (R 11-85)

PROJECT NAME: Tuley & Bardnet NO. 222.04

WELL NO. R-2D

DATE INSTALLED 8/6/86



127.0 FT.

10.5 FT.
9.5
screened)

1) CASING DETAILS

A) TYPE OF PIPE:

PVC, STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE _____

B) TYPE OF PIPE JOINTS;

COUPLINGS, THREADED (W/TAPE?), OTHER w/ O rings

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC, STAINLESS, TEFLON, OTHER w/6" point

E) WELL SCREEN SLOT SIZE 0.010

F) PIPE DIA: ID IN. 2.0 OD IN. 2.4

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO

PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT 9/04/86

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER Air

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 30 minutes

C) APPROXIMATE WATER VOLUME: REMOVED -300 gallons

ADDED _____

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

_____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/6/86 96.7' BGS 7:30 AM thru dual FT.

DATE/TIME 8/6/86 1 PM 21.7' BGS thru over tube FT.

DATE/TIME 23.1 BTOC 8/6/86 5 PM @ well shot FT.

22.78 BTOC 8/7/86 8 AM Comple

9/4/86 15:40 22.88'

ADDITIONAL COMMENTS: Well screen & pipe sealed in plastic prior to installation. After trimming & while removing overshot pipe, overshot & well pipe locked. Well was then pushed back to original depth. Bailer was sent down to 137' to confirm well pipe was in tact & open.

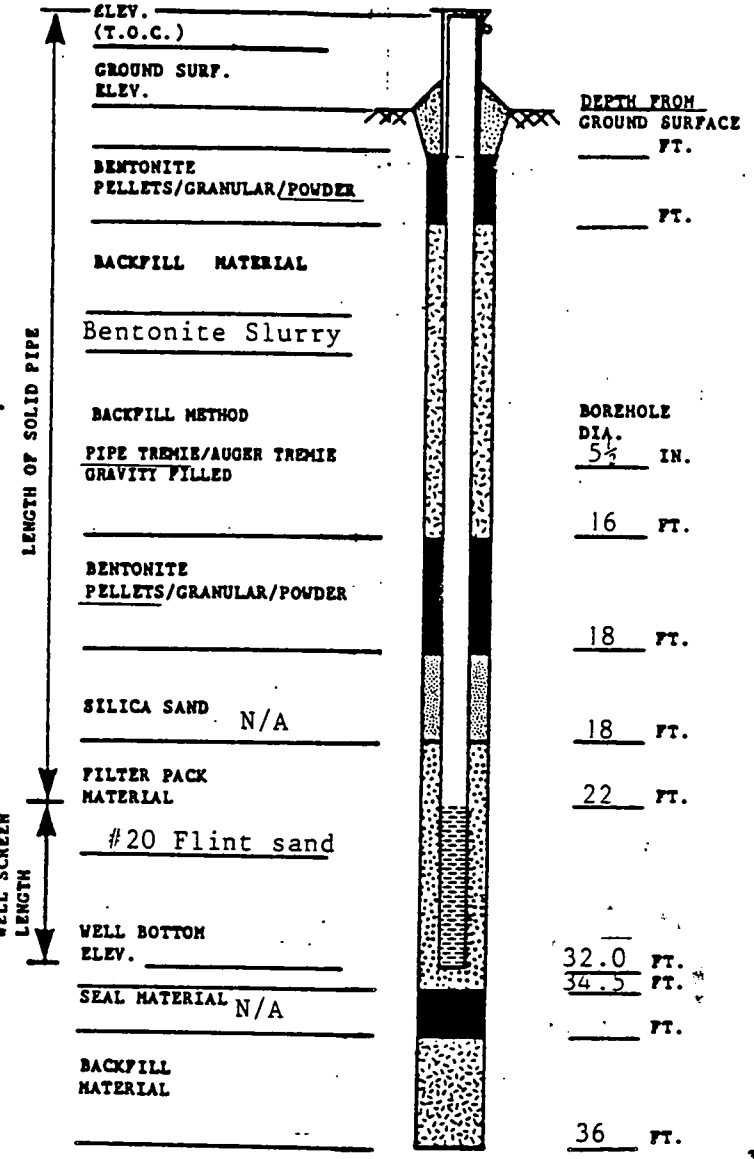
RMT

ell Diagram
-17 (R 11-85)

PROJECT NAME: Foley & Lardner NO. 222.04

WELL NO. R-3S

DATE INSTALLED 8/12/86



1) CASING DETAILS

A) TYPE OF PIPE:

PVC, STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS;

COUPLINGS, THREADED (W/TAPE?), OTHER w/ O rings

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC, STAINLESS, TEFLON, OTHER 6" unslotted point

E) WELL SCREEN SLOT SIZE 0.010"

F) PIPE DIA: ID IN. 2.0 OD IN. 2.4

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO
PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

9/04/86

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER Air

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 20 minutes

C) APPROXIMATE WATER VOLUME: REMOVED ~10 gallons

ADDED _____

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

_____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/13/86 11:30 AM 24.70 FT.

DATE/TIME 9/04/86 18:00 27.21 FT.

DATE/TIME _____ FT.

ADDITIONAL COMMENTS: Pipe open to 33.35 below ground surface w/bailer - 8/13/86

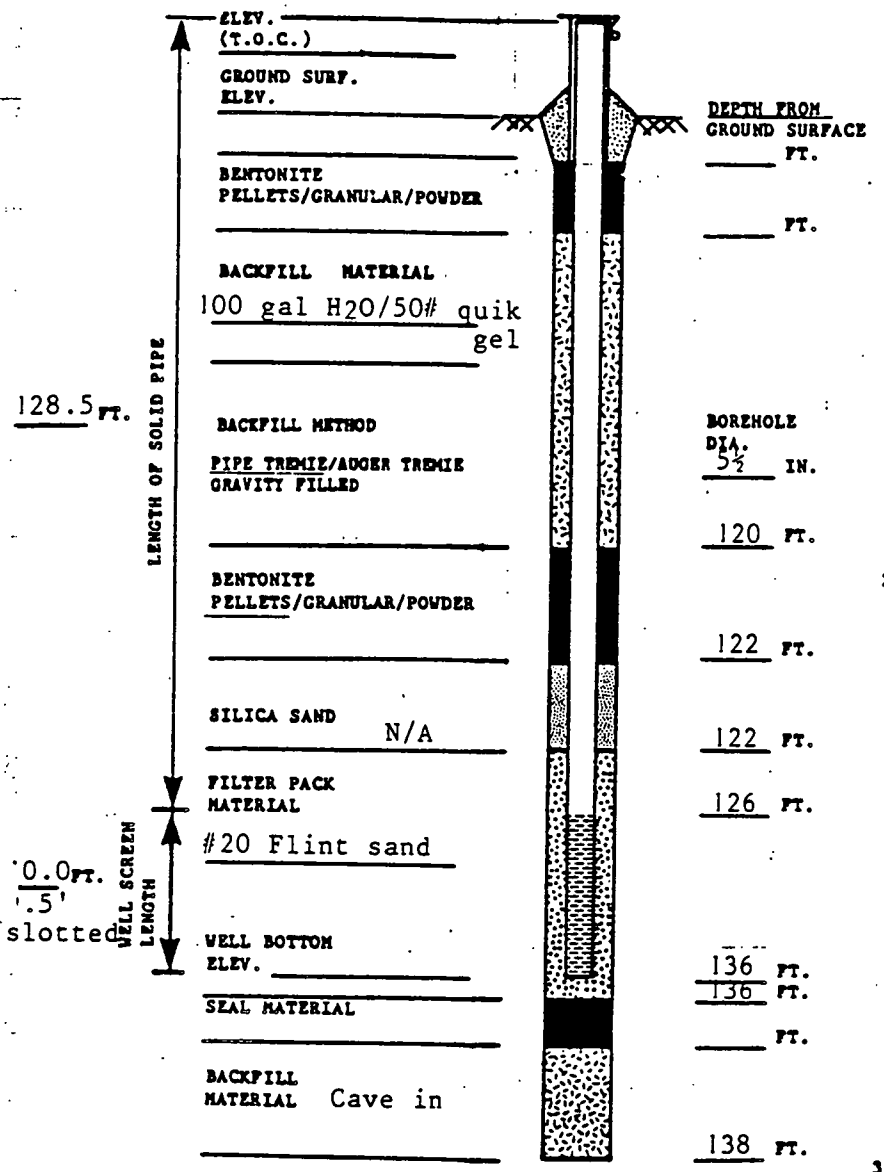
RMT

Well Diagram
F-17 (8 11-85)

PROJECT NAME: Foley & Lardner NO. 222.04

WELL NO. R-3D

DATE INSTALLED 8/11/86



1) CASING DETAILS

A) TYPE OF PIPE:

PVC, STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS;

COUPLINGS, THREADED (W/TAPE?), OTHER w/ O rings

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC, STAINLESS, TEFLON, OTHER _____

E) WELL SCREEN SLOT SIZE 0.010"

F) PIPE DIA: ID IN. 2.0 OD IN. 2.4

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO
PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

A) METHOD 9/04/86

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER Air

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 30 minutes

C) APPROXIMATE WATER VOLUME: REMOVED -650 gallons

ADDED _____

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

_____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/12/86 7:30 AM 24.5' BGS FT.

DATE/TIME 8/13/86 11:45 AM 26.2 BGS FT.

DATE/TIME 9/04/86 17:05 28.58 BTOC FT.

ADDITIONAL COMMENTS: Bailer goes down to 134.9' below ground surface - ok 8/13/86

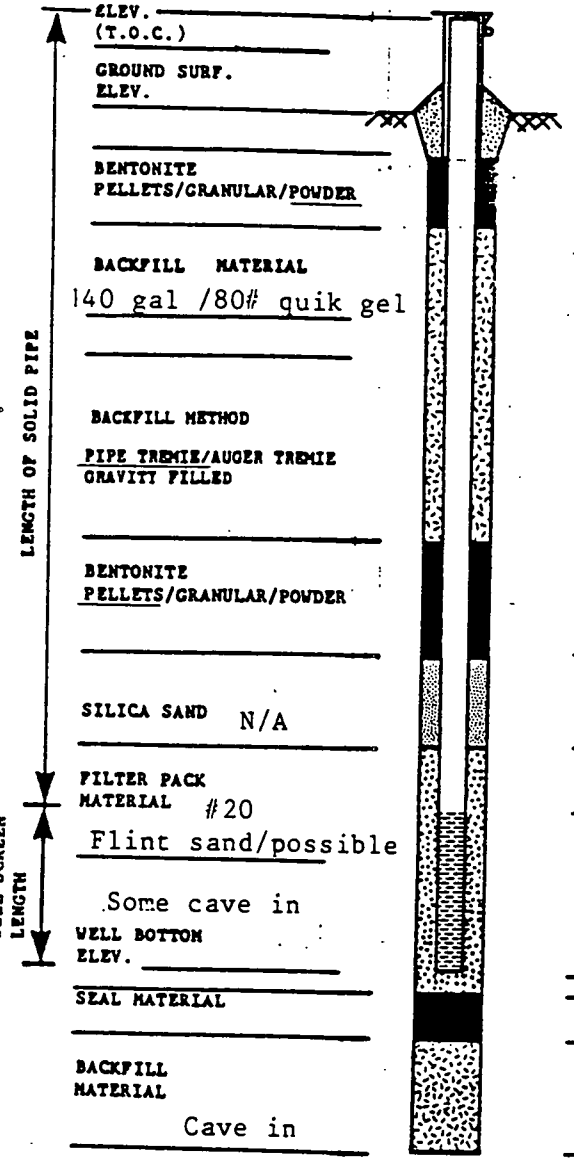
RMT

ell Diagram
-17 (2 11-85)

PROJECT NAME: Foley & Lardner NO. 222.04

WELL NO. R-4D

DATE INSTALLED 8/13/86



1) CASING DETAILS

A) TYPE OF PIPE:

PVC, STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS;

COUPLINGS, THREADED (W/TAPE?), OTHER w/ O rings

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC, STAINLESS, TEFLON, OTHER w/ 6' Point

E) WELL SCREEN SLOT SIZE 0.010"

F) PIPE DIA: ID IN. 2.0 OD IN. 2.4

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO
PROTECTOR PIPE DIA. ___ IN.

2) WELL DEVELOPMENT 9/04/86

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER Air

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 30 minutes

C) APPROXIMATE WATER VOLUME: REMOVED -750 gallons

ADDED _____

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

_____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/14/86 8AM 31.78 FT.

DATE/TIME 9/4/86 18:40 31.87 FT.

DATE/TIME _____ FT.

ADDITIONAL COMMENTS: Total length of open pipe 135.1. Bailer drops to 132.0' below TOC - Well ok, but may have some sand sediment in bottom

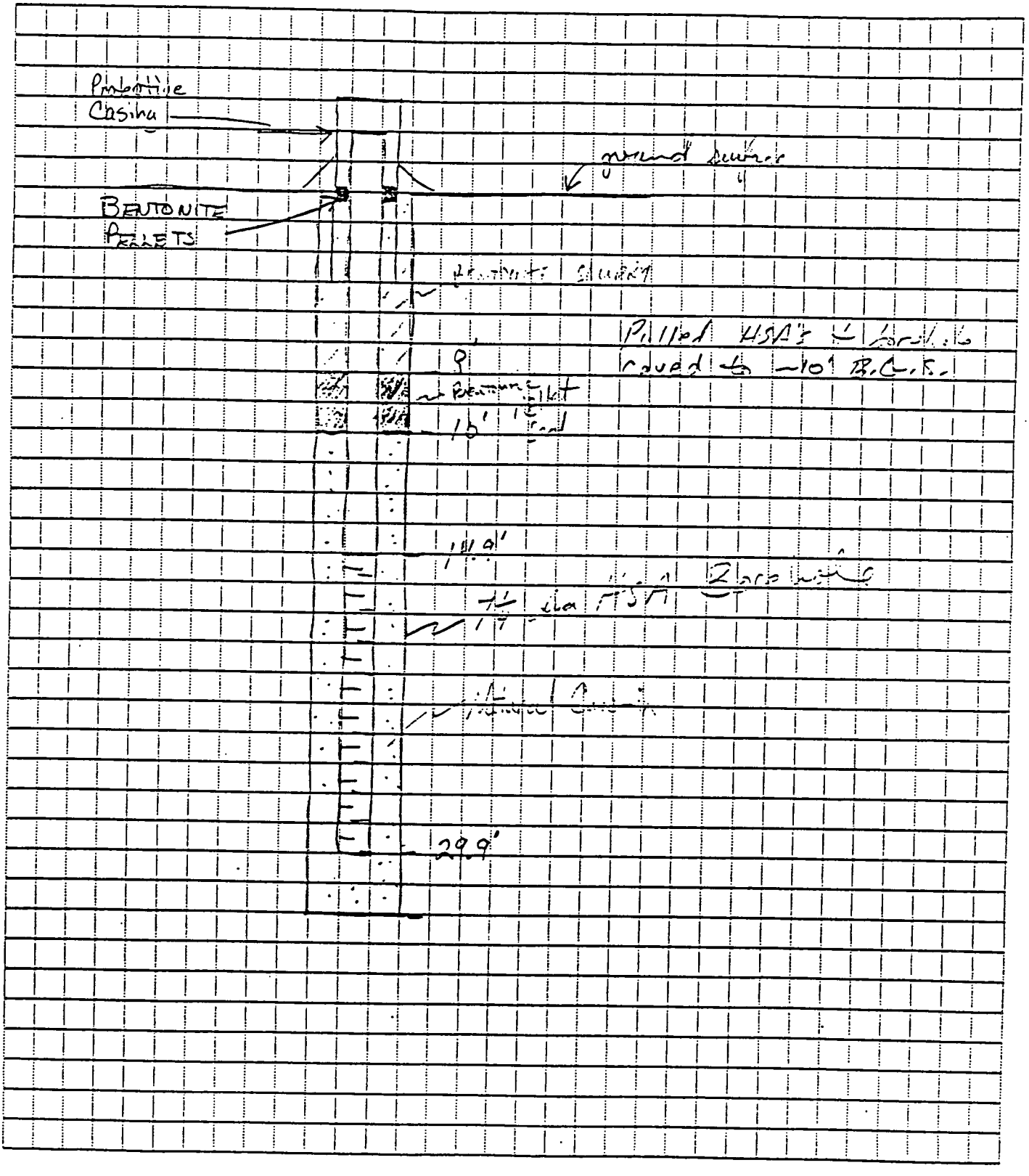
CH2M HILL

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Watsonville
PROJECT NO. 120303.A0
BORING NO. B-15
PIEZOMETER NO. B-15

INSTALLED BY IHJ DATE 11-11-93
CHECKED BY _____ DATE _____
COORDINATES _____



M05J12.R0119

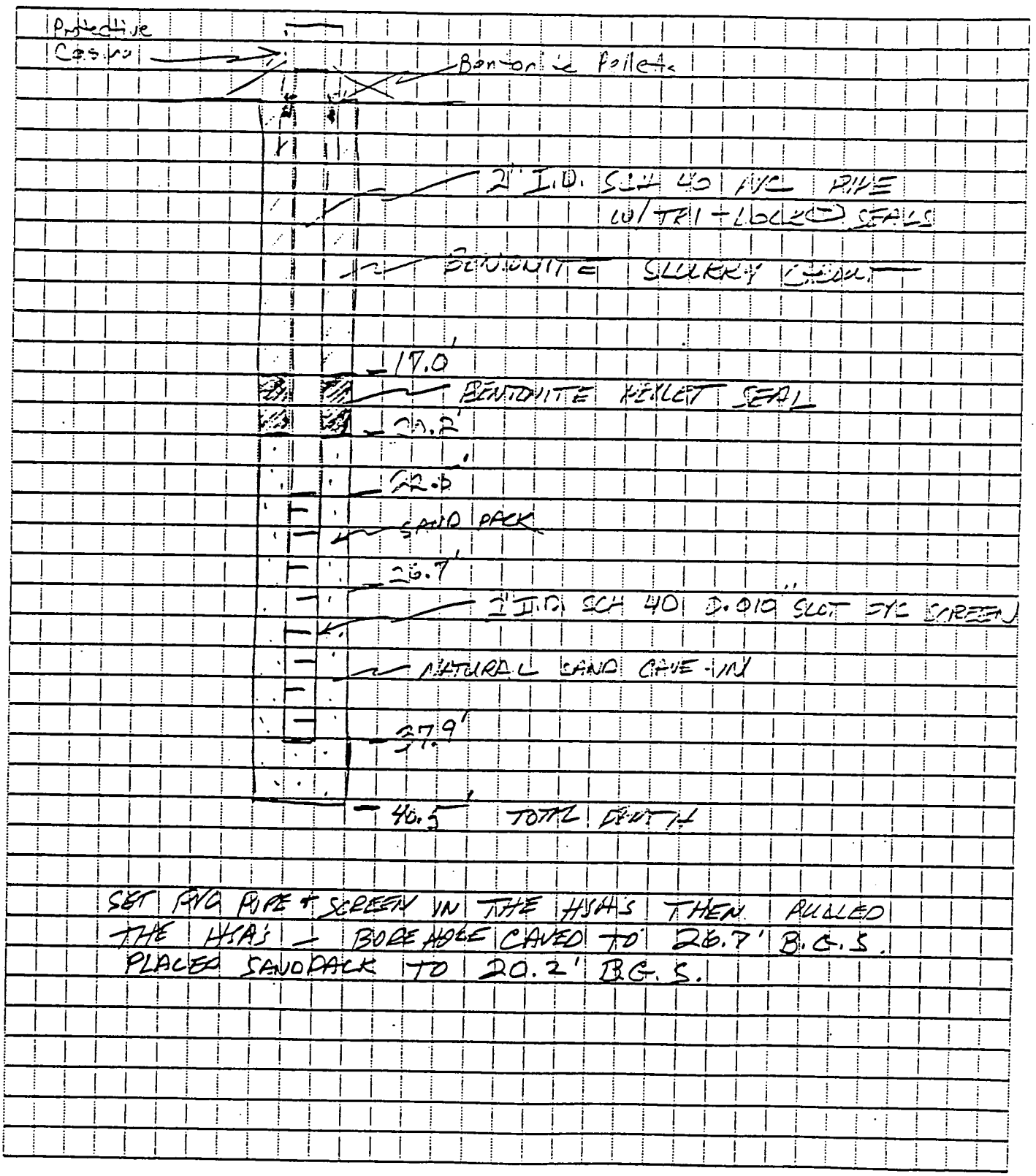
CH2M HILL

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF
PROJECT NO. 120303.AD
BORING NO. B-25
PIEZOMETER NO. B-25

INSTALLED BY I.H.J DATE 11/1/05
CHECKED BY _____ DATE _____
COORDINATES _____



SET PVC PIPE & SCREEN IN THE HSA'S THEN PULLED THE HSA'S - BOREHOLE CAVED TO 26.7' B.G.S. PLACED SANDPACK TO 20.2' B.G.S.

M05J12.R0119

CH2M HILL

FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - WDNR

PROJECT NO. 20303.A0

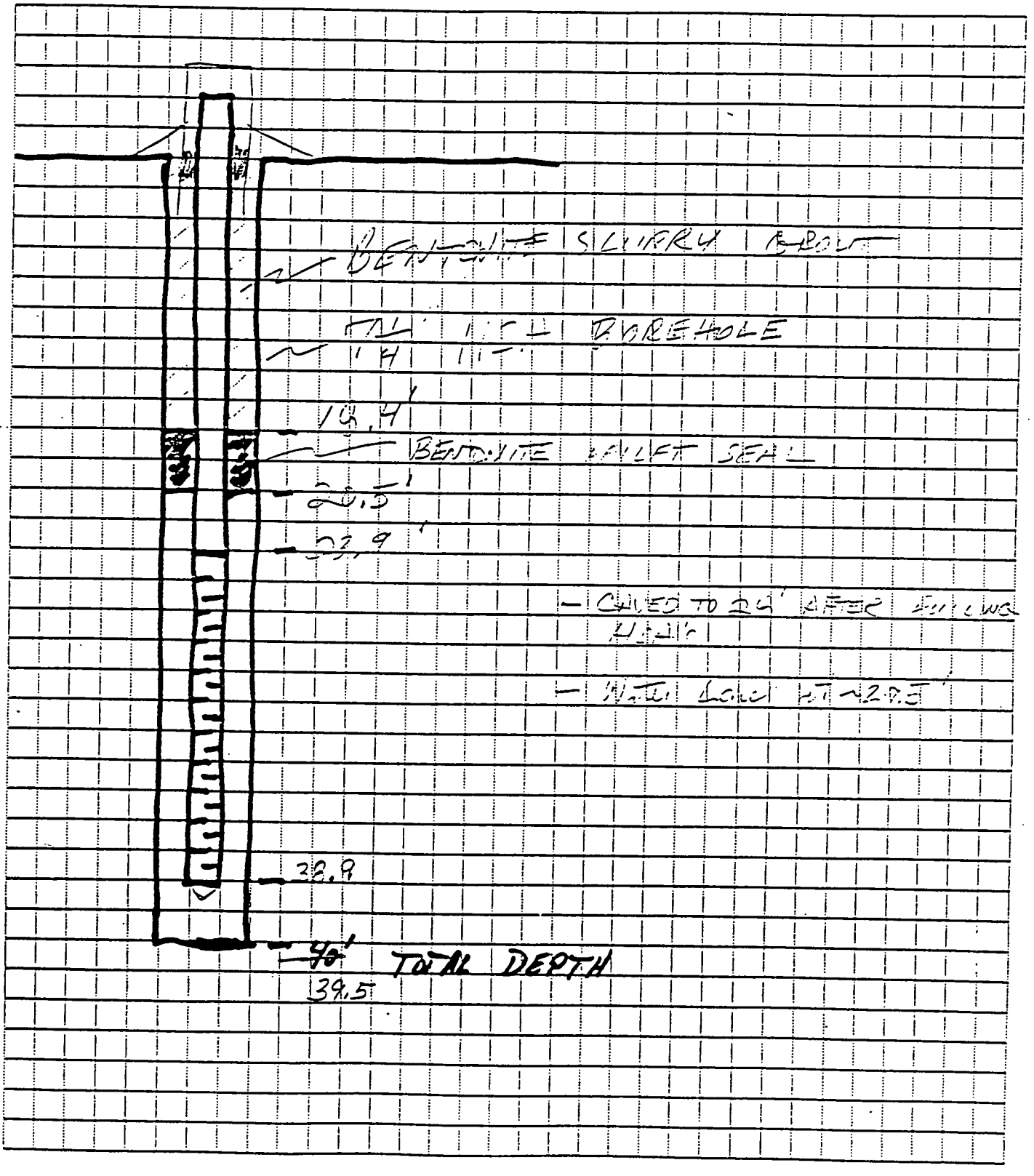
BORING NO. B-3S

PIEZOMETER NO. B-3S

INSTALLED BY IHJ DATE 11/12/85

CHECKED BY _____ DATE _____

COORDINATES _____



M05J12.R0119

CH2M HILL

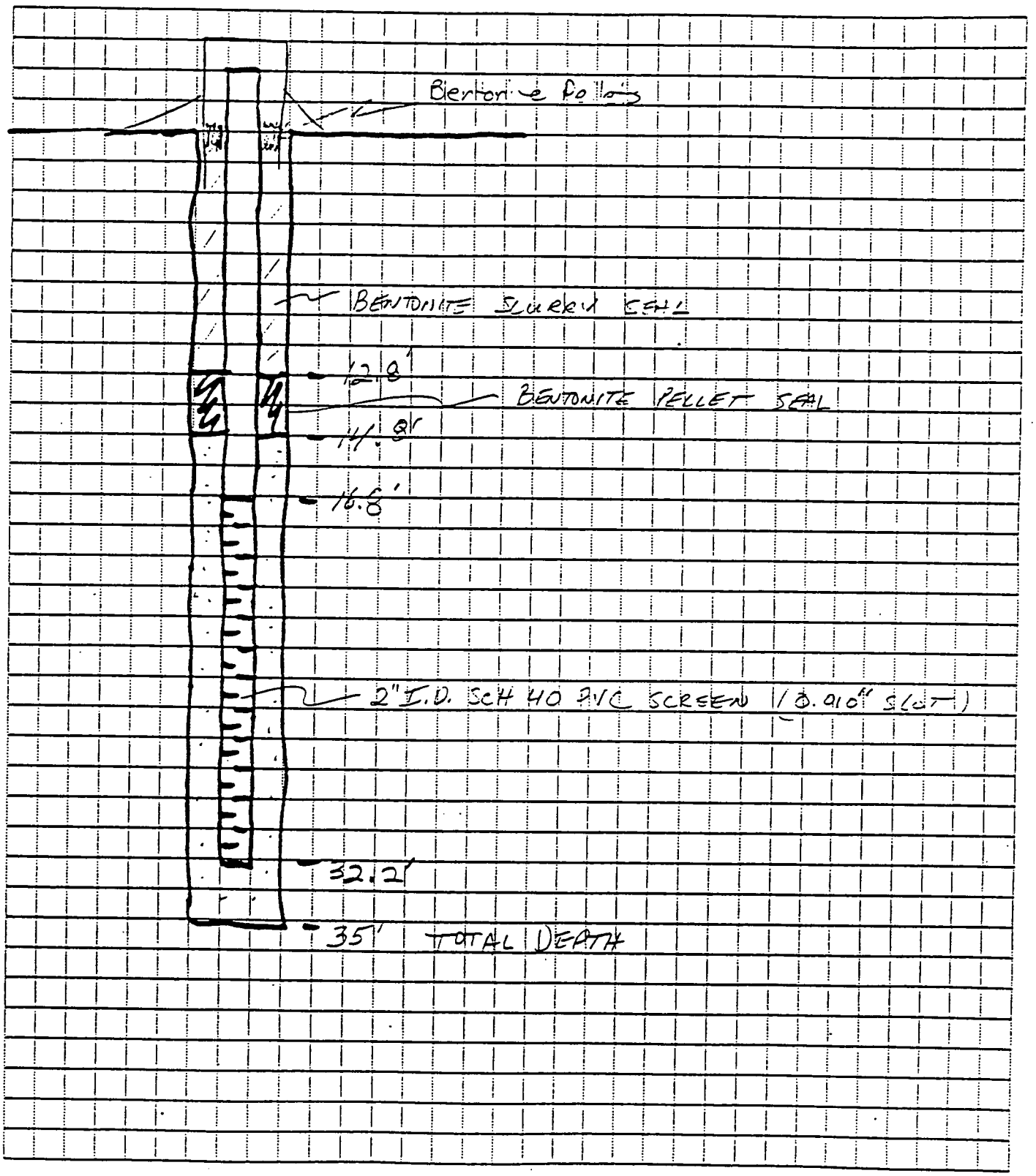
FILE NO.

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - WDNR
PROJECT NO. L20303.AD
BORING NO. B-4S
PIEZOMETER NO. B-4S

INSTALLED BY I.H.Johnson DATE 11/13/85
CHECKED BY _____ DATE _____
COORDINATES _____



M05J12.R0119

CH2M HILL

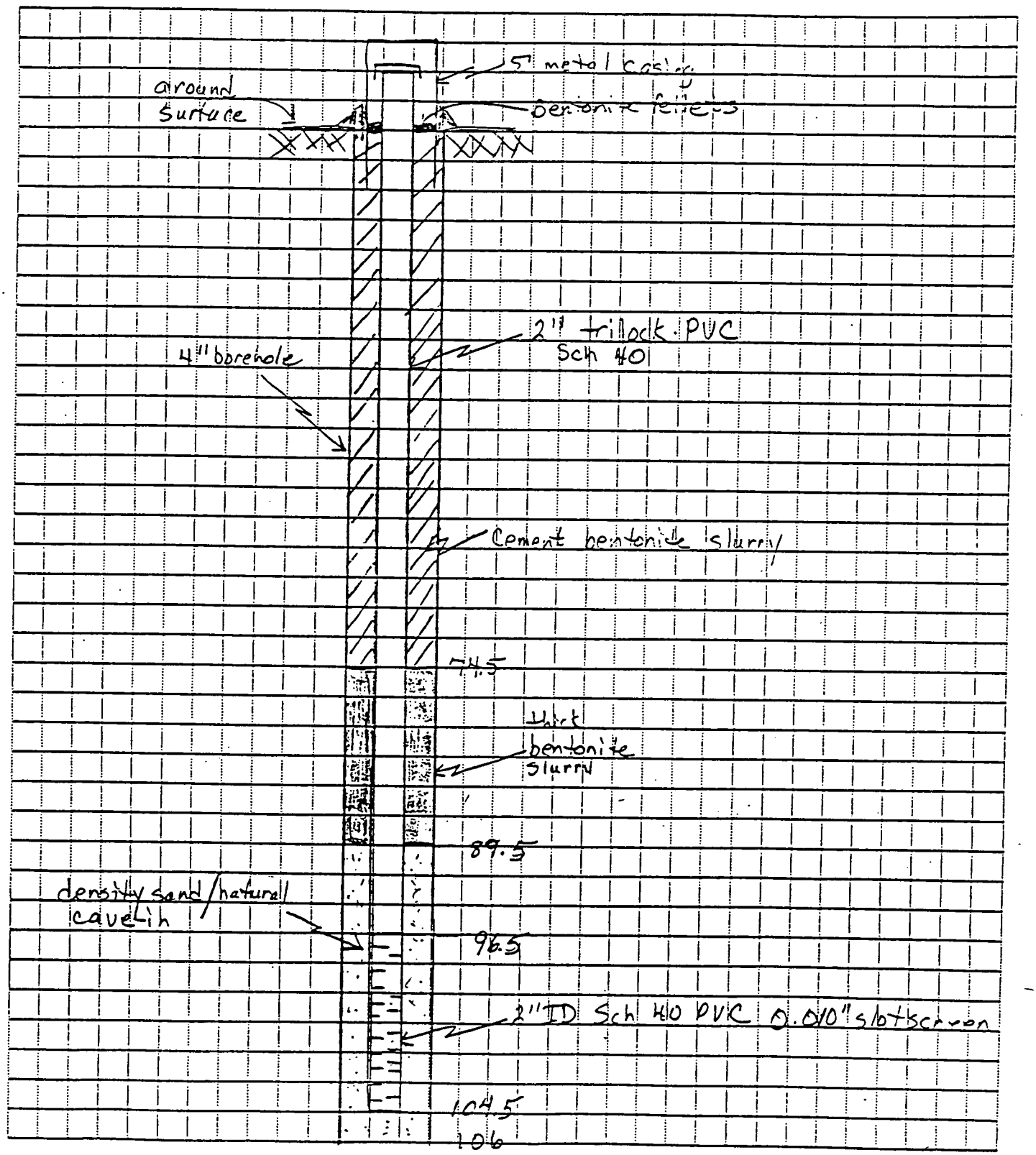
FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME City of Wausau Landfill
PROJECT NO. L2030J.A5
BORING NO. 4D
PIEZOMETER NO. _____

INSTALLED BY SM McGee DATE 11/15/85
CHECKED BY _____ DATE _____
COORDINATES _____



M05J12.R0119

CH2M HILL

FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - WDNR

PROJECT NO. L20303.A0

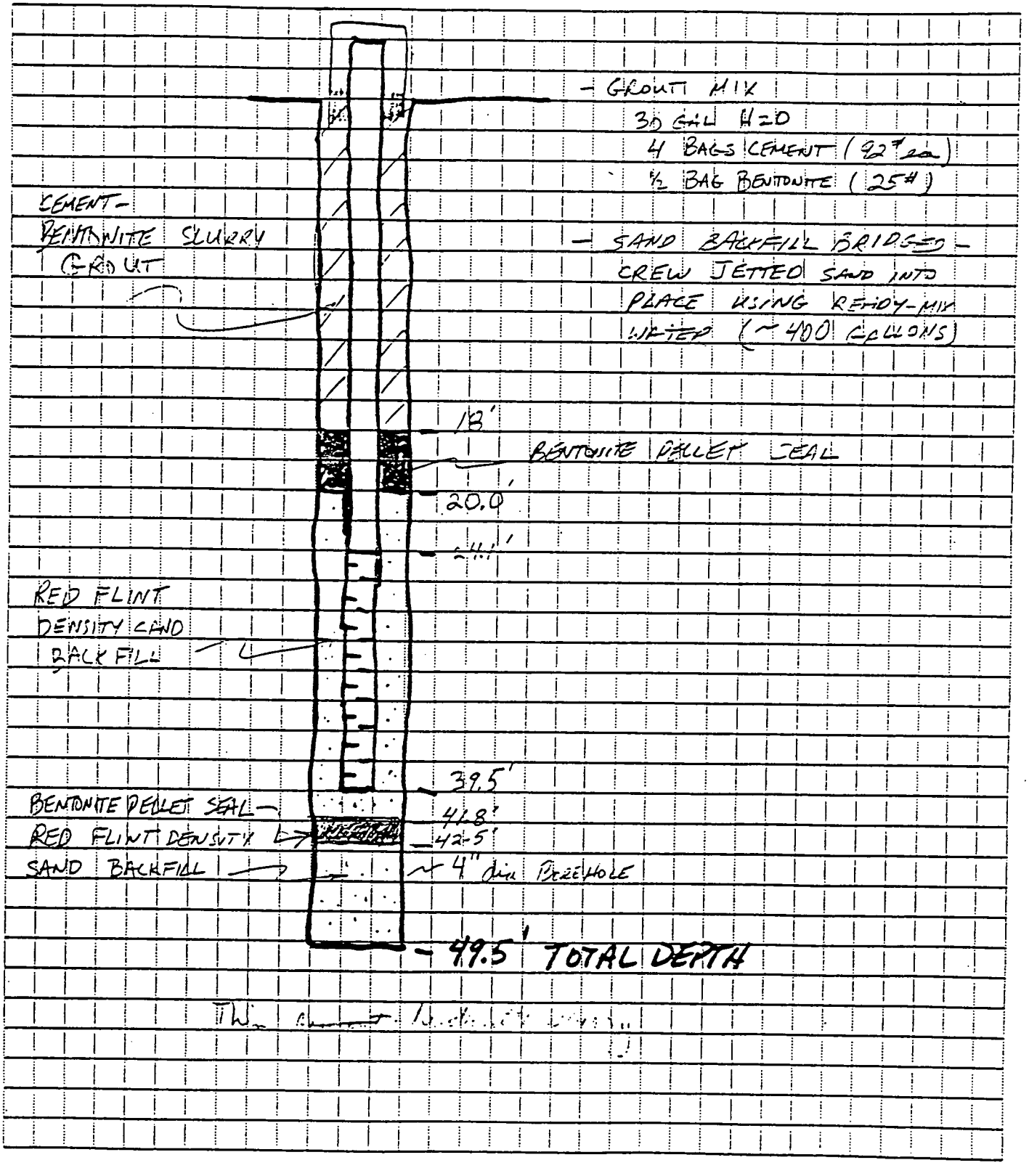
BORING NO. B-6

PIEZOMETER NO. B-6

INSTALLED BY I.H. Johnson DATE 11/13/85

CHECKED BY _____ DATE _____

COORDINATES _____



M05J12.R0119

CH2M HILL

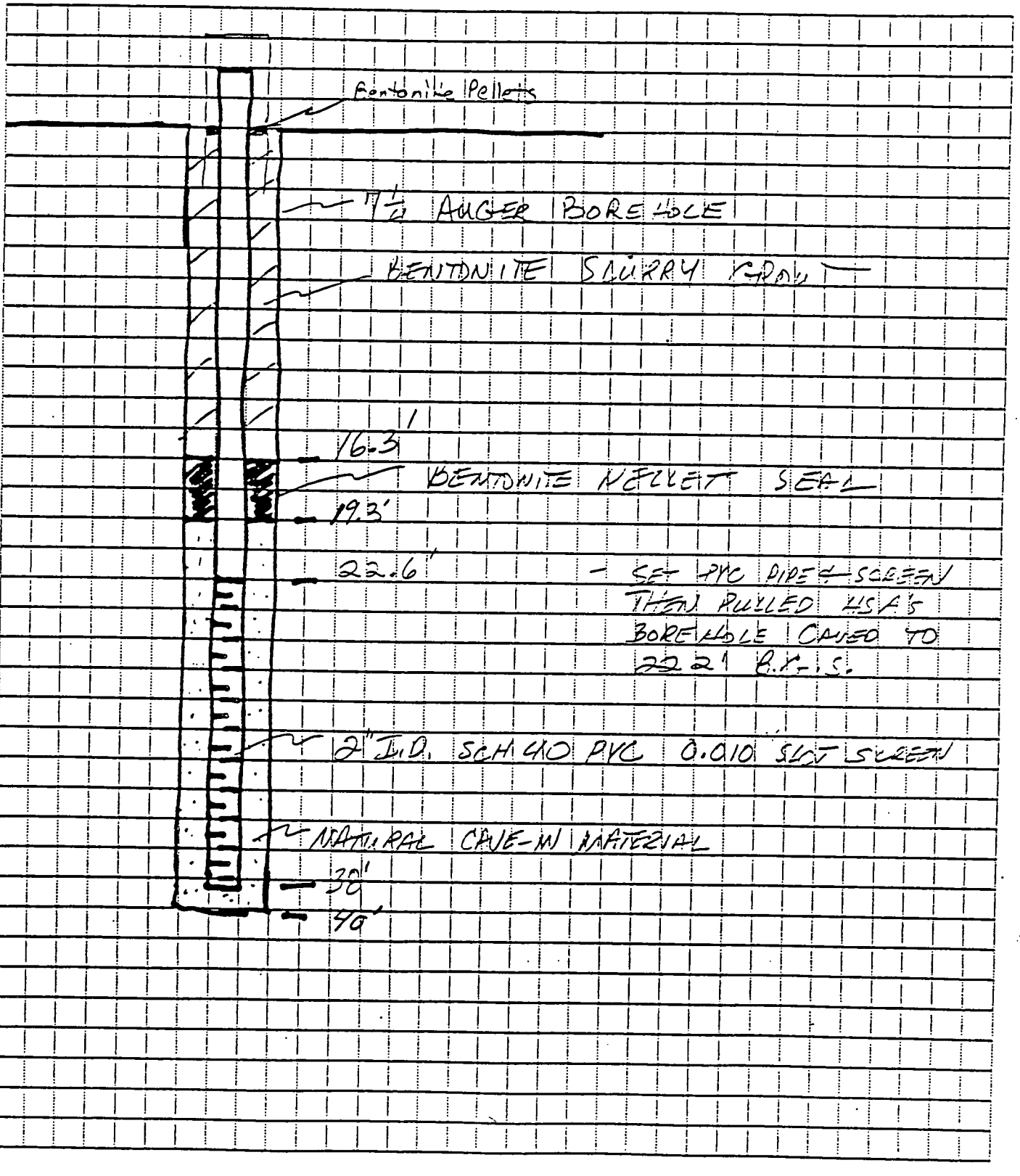
FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Winona LF - Wis. DNR
PROJECT NO. 120303.AO
BORING NO. B-7S
PIEZOMETER NO. B-7S

INSTALLED BY JHJ DATE 11/12/85
CHECKED BY _____ DATE _____
COORDINATES _____



M05J12.RC119

JUN 26 1985

Well Construction Summary

Location or Coords: Wausau, Wisconsin
SW¼, NW¼, Section 24, T29N, R7E

Elevation: Ground Level 1213
Top of Casing 1215

Drilling Summary:

Total Depth 157.5' Below Land Surface
Borehole Diameter 3 7/8"

Driller Exploration Technology, Inc.
Steve Wonn & Sven Lysloff

Rig Central Mine Equipment, Model 55
Bit(s) Standard 3 7/8 inch "TRI-CONE"

Drilling Fluid Clear - not recirculated water
Surface Casing HW Flush Joint

Well Design:

Basis: Geologic Log X Geophysical Log ____
Casing String(s): C = Casing S = Screen

Casing: C1 124.0 To land surface with 1½ foot riser pipe
~~xx~~ 2" Galvanized case pipe

Screen: S1 8 Foot No. 60 Slot Johnson Galvanized, set at 122.0' to 130.0'
S2 ____

Centralizers Bentonite Pellets set to seal sand at 119.0'

Filter Material No. 30 Flint sand 157.5' to 119.0'
Cement + Bentonite-"grout" 3.76:1 Ratio cement to Bentonite, 119.0' to 10.0'
Other Pure cement mix from 10.0' to Land Surface + 1 foot slope mound to anchor protective cover pipe.

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling: Sampling and Cased	6-21-84	1310	7-4-84	1200
Geophys. Logging:	N/A	N/A	N/A	N/A
Casing: See Above Task				
Filter Placement:	7-6-84	0625	7-6-84	0800
Cementing:	7-6-84	0800	7-6-84	1600
Development:				
Other: Poured Cement and Set-Post to Guard the Well	7-6-84	1600	7-6-84	1700

Well Development:

The development was posponed to allow the grout seal to set-up.

Comments:

Elevations are only approximations and will be surveyed by the City of Wausau

Back filled = (sand lifted) Boring to the selected interval where the sand point was located.

Personnel David G. Pyles-Roy F. Weston TAT

WESTON

JUN 20 1985

WELL DETAIL INFORMATION SHEET

JOB NO. C 810234

BORING NO. WMW-3A

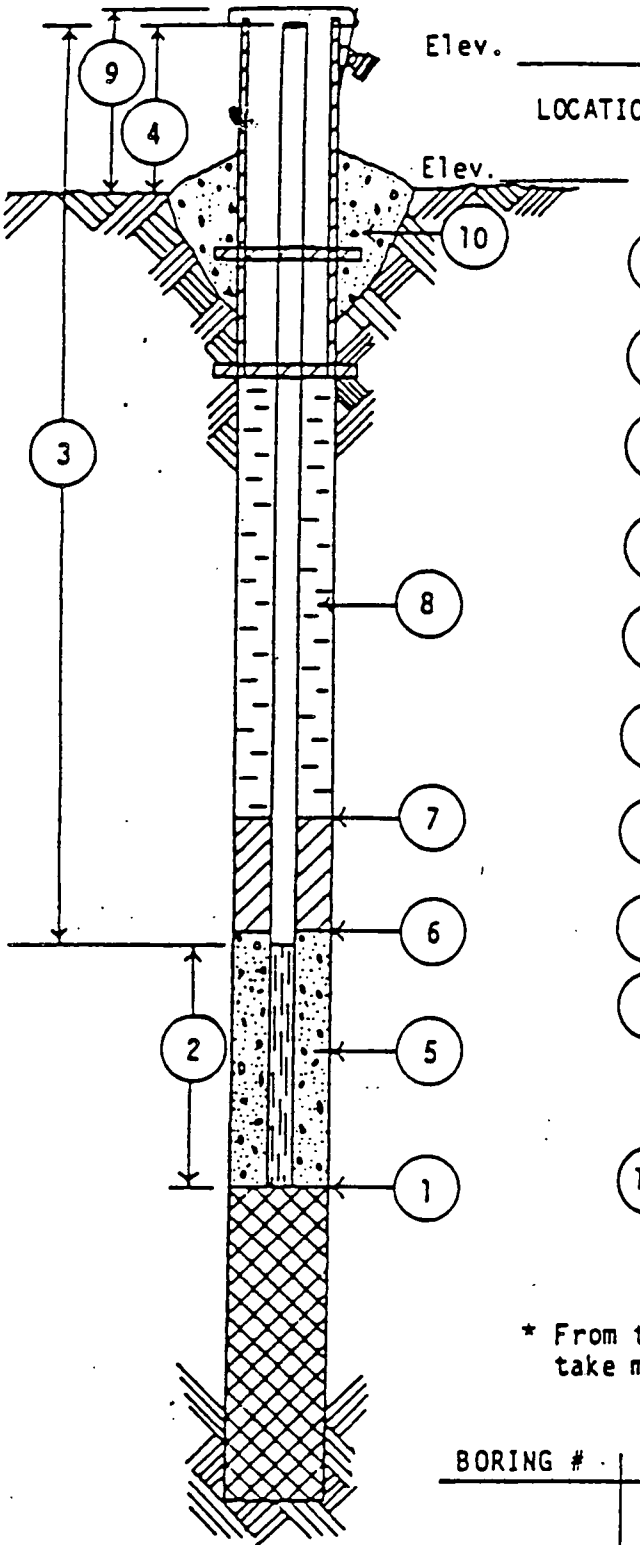
DATE 9/27/84

CHIEF SJW

LOCATION Wausau, Wisconsin

Elev. _____

Elev. _____



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

1. DEPTH TO BOTTOM OF BOREHOLE 140 FEET
2. LENGTH OF WELL POINT, (WELL SCREEN,) OR SLOTTED PIPE 10 FEET
3. TOTAL LENGTH OF SOLID PIPE 132.5 FEET @ 2 IN. DIAMETER
4. HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET
5. TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Sand
6. DEPTH OF LOWER OR BOTTOM SEAL 105 FEET
7. DEPTH OF UPPER OR TOP SEAL 103 FEET
8. TYPE OF BACKFILL Cement-Bentonite Grout
9. PROTECTIVE CASING (YES) NO
   HEIGHT ABOVE GROUND 2.5'
   LOCKING CAP (YES) NO
10. CONCRETE CAP (YES) NO

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

JUL 1 1985

JOB NO. C 810324

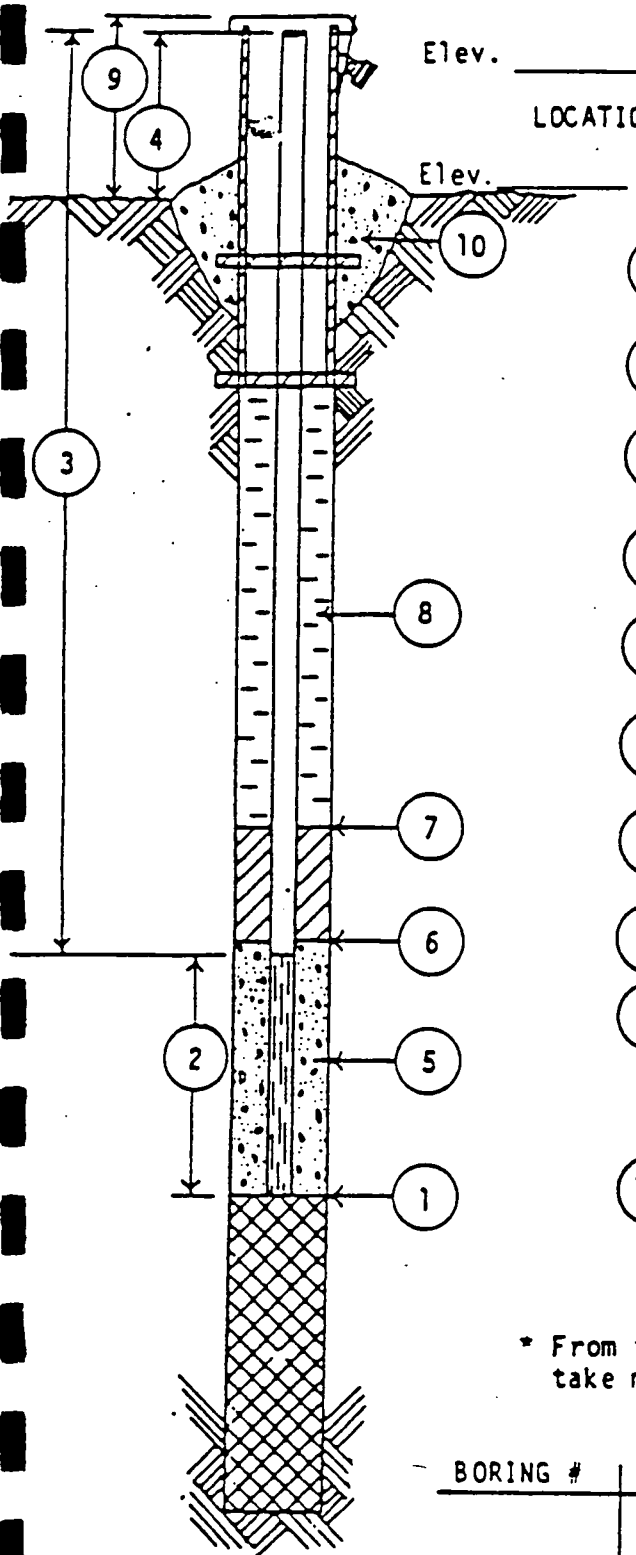
BORING NO. WMW-3B

DATE 9/22/84

Elev. _____ CHIEF MP

LOCATION Wausau

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



1. DEPTH TO BOTTOM OF BOREHOLE 75 FEET
2. LENGTH OF WELL POINT, WELL SCREEN, OR SLOTTED PIPE 10 FEET
3. TOTAL LENGTH OF SOLID PIPE 67.5 FEET @ 2 IN. DIAMETER
4. HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET
5. TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Filter Sand
6. DEPTH OF LOWER OR BOTTOM SEAL 63 FEET
7. DEPTH OF UPPER OR TOP SEAL 61 FEET
8. TYPE OF BACKFILL Grout
9. PROTECTIVE CASING (YES) NO
   HEIGHT ABOVE GROUND 2.6'
   LOCKING CAP (YES) NO
10. CONCRETE CAP (YES) NO

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

WELL DETAIL INFORMATION SHEET

JOB NO. C 810324

BORING NO. WMW-4A

DATE 9/27/84

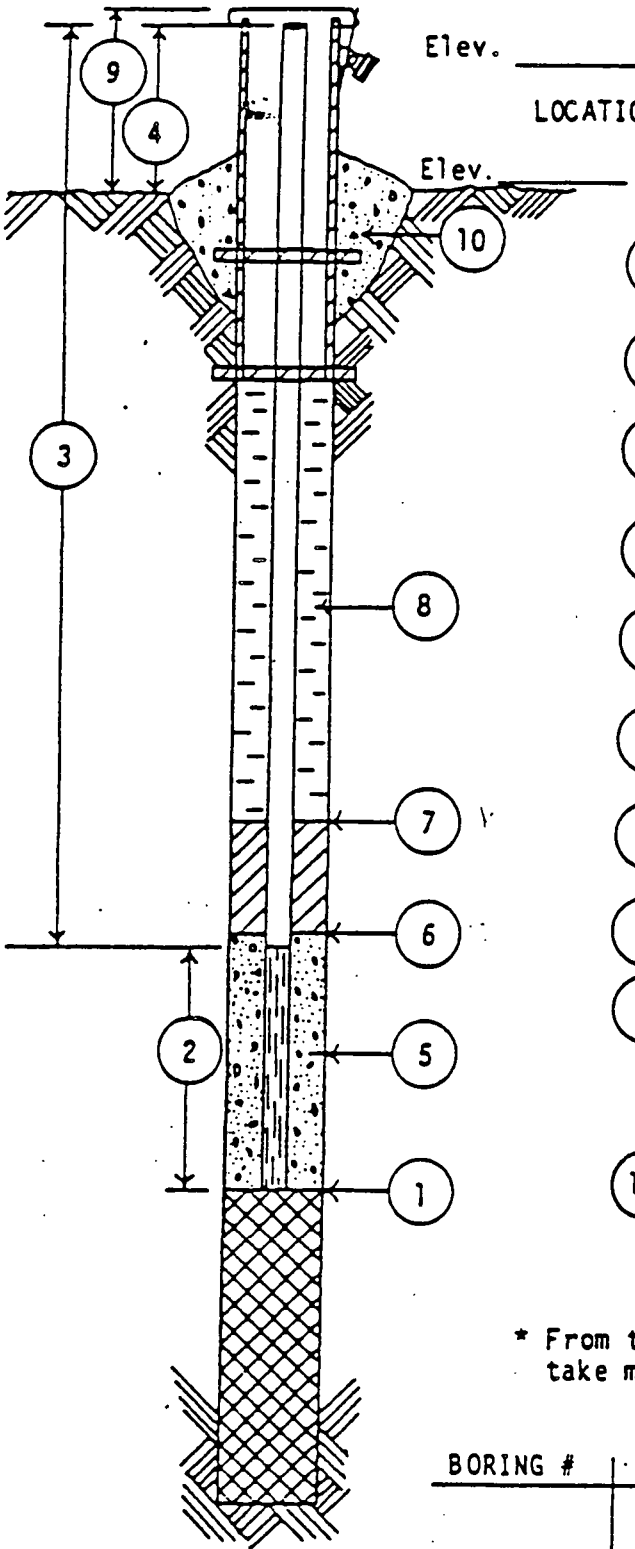
CHIEF MP

Elev. _____

LOCATION Wausau, Wisconsin

Elev. _____

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



1. DEPTH TO BOTTOM OF BOREHOLE 100 FEET
2. LENGTH OF WELL POINT, WELL SCREEN, OR SLOTTED PIPE 10 FEET
3. TOTAL LENGTH OF SOLID PIPE 90 FEET @ 2 IN. DIAMETER
4. HEIGHT OF WELL CASING ABOVE GROUND 0.0 FEET
5. TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Filter Sand
6. DEPTH OF LOWER OR BOTTOM SEAL 88 FEET
7. DEPTH OF UPPER OR TOP SEAL 36 FEET
8. TYPE OF BACKFILL Grout
9. PROTECTIVE CASING (YES) NO
   HEIGHT ABOVE GROUND 0.0
   LOCKING CAP (YES) NO
10. CONCRETE CAP (YES) NO

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

WELL DETAIL INFORMATION SHEET

JOB NO. C 810234

BORING NO. MW-4B

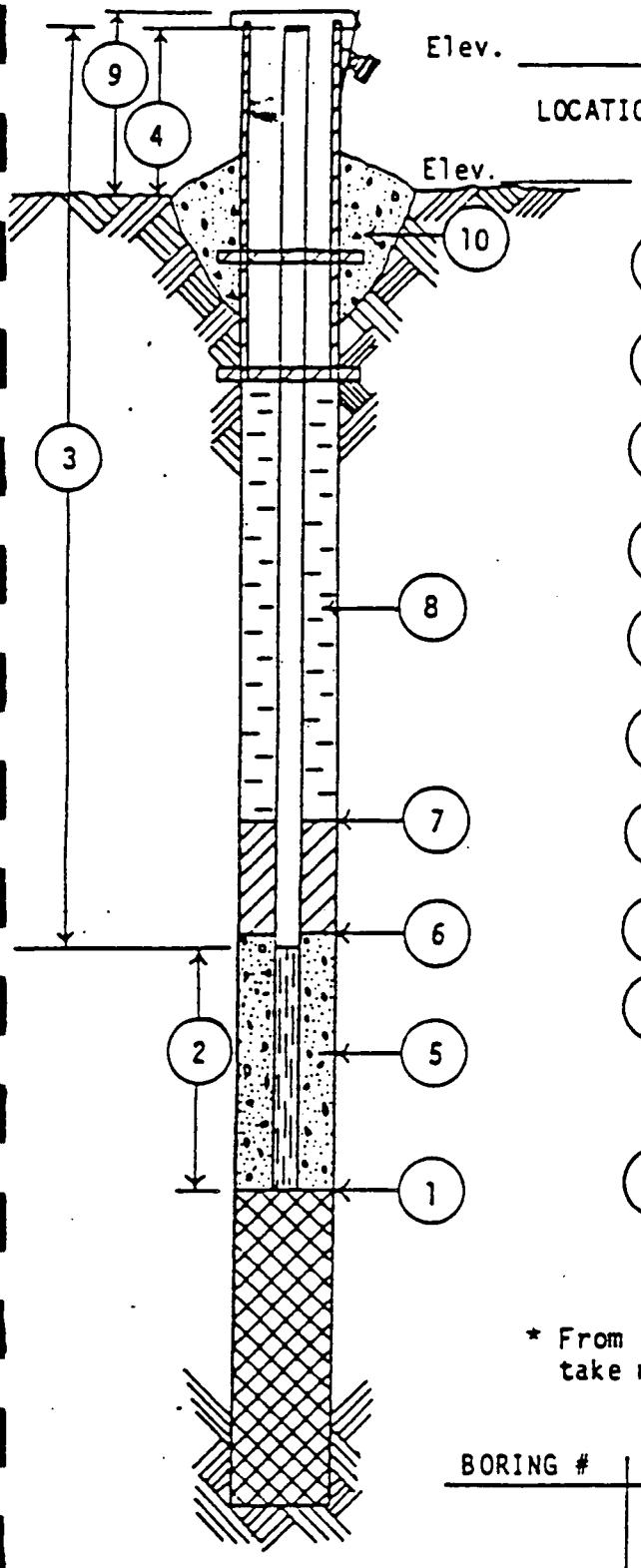
DATE 9/28/84

Elev. _____ CHIEF SJW

LOCATION Wausau

Elev. _____

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



(1) DEPTH TO BOTTOM OF BOREHOLE 60.5 FEET

(2) LENGTH OF WELL POINT (WELL SCREEN) OR SLOTTED PIPE 10 FEET

(3) TOTAL LENGTH OF SOLID PIPE 50.5 FEET @ 2 IN. DIAMETER

(4) HEIGHT OF WELL CASING ABOVE GROUND -.5 FEET

(5) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Sand

(6) DEPTH OF LOWER OR BOTTOM SEAL 39 FEET

(7) DEPTH OF UPPER OR TOP SEAL 37 FEET

(8) TYPE OF BACKFILL Cement-Bentonite Grout

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND 0'

LOCKING CAP (YES) NO

(10) CONCRETE CAP (YES) NO

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

WELL DETAIL INFORMATION SHEET 1985

JOB NO. C 810324

BORING NO. WMW-4C

DATE 10/31/84

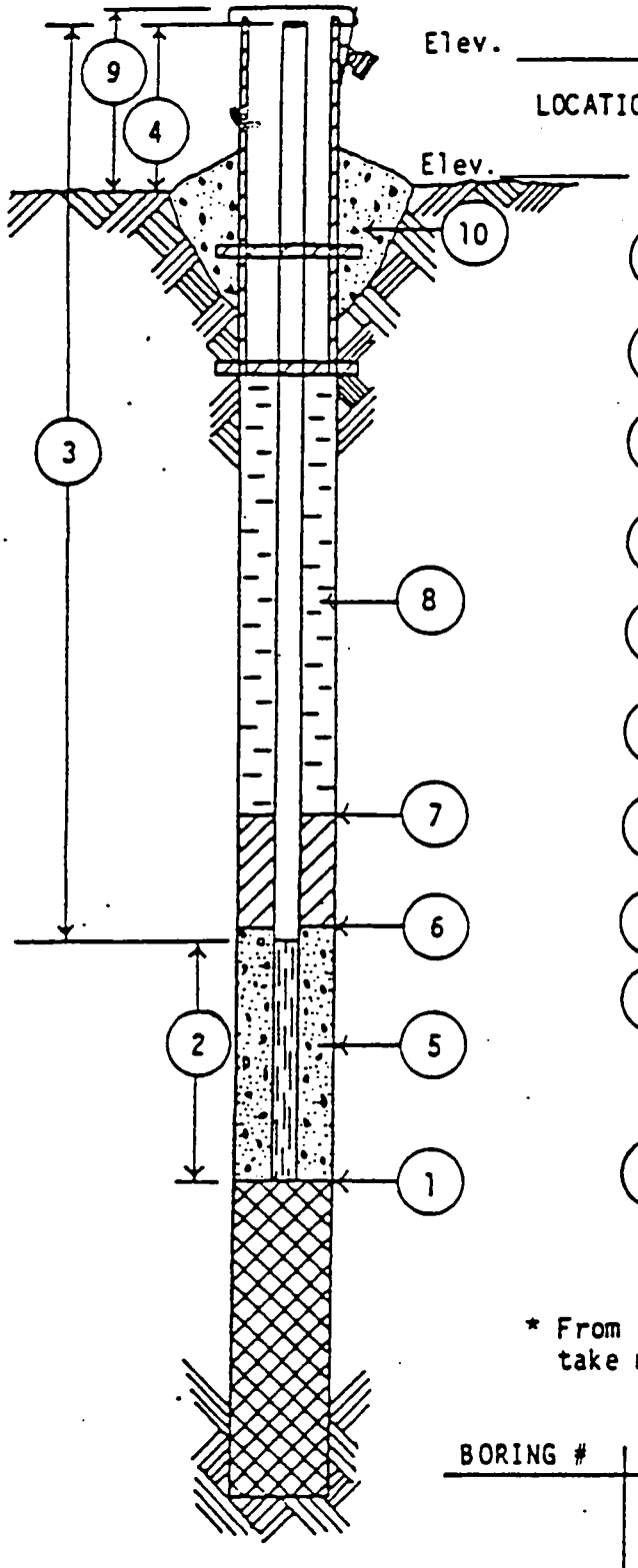
CHIEF RL

Elev. _____

LOCATION Wausau, Wisconsin

Elev. _____

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



(1) DEPTH TO BOTTOM OF BOREHOLE 40 FEET

(2) LENGTH OF WELL POINT, (WELL SCREEN), OR SLOTTED PIPE 10 FEET

(3) TOTAL LENGTH OF SOLID PIPE 30 FEET @ 2 IN. DIAMETER

(4) HEIGHT OF WELL CASING ABOVE GROUND 0.1 FEET

(5) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE _____

(6) DEPTH OF LOWER OR BOTTOM SEAL 29 FEET

(7) DEPTH OF UPPER OR TOP SEAL 1 FEET

(8) TYPE OF BACKFILL Cement & Bentonite Slurry

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND GS

LOCKING CAP (YES) NO

(10) CONCRETE CAP (YES) NO

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

WELL DETAIL INFORMATION SHEET

JOB NO. C 810324

BORING NO. MW-5

DATE 11/2/84

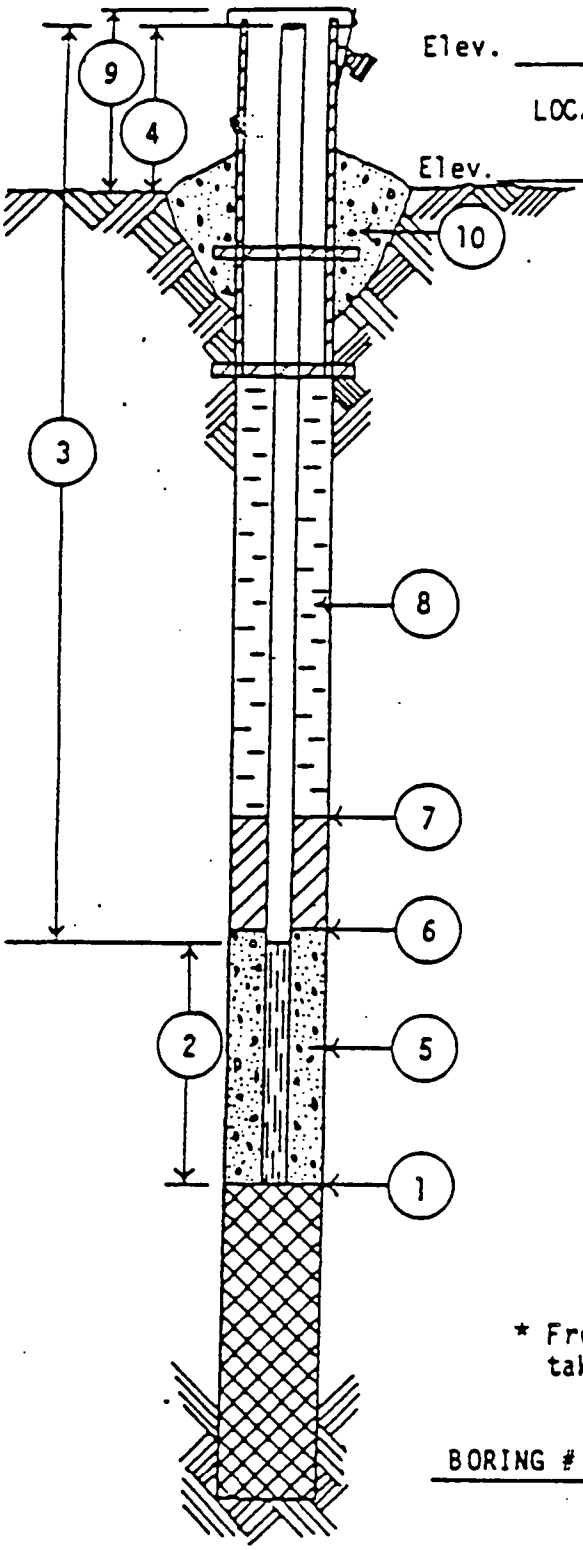
CHIEF MP

Elev. _____

LOCATION Wausau, Wisconsin

Elev. _____

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



(1) DEPTH TO BOTTOM OF BOREHOLE
45 FEET

(2) LENGTH OF WELL POINT, (WELL SCREEN,) OR SLOTTED PIPE 10 FEET

(3) TOTAL LENGTH OF SOLID PIPE 35 FEET @ 2 IN. DIAMETER

(4) HEIGHT OF WELL CASING ABOVE GROUND
0.1 FEET.

(5) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE _____

(6) DEPTH OF LOWER OR BOTTOM SEAL
34 FEET

(7) DEPTH OF UPPER OR TOP SEAL
1 FEET

(8) TYPE OF BACKFILL Cement & Bentonite Slurry

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND -

LOCKING CAP (YES) NO

(10) CONCRETE CAP (YES) NO

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

WELL DETAIL INFORMATION SHEET

JOB NO. C 810324

BORING NO. MW-6

DATE 11/2/84

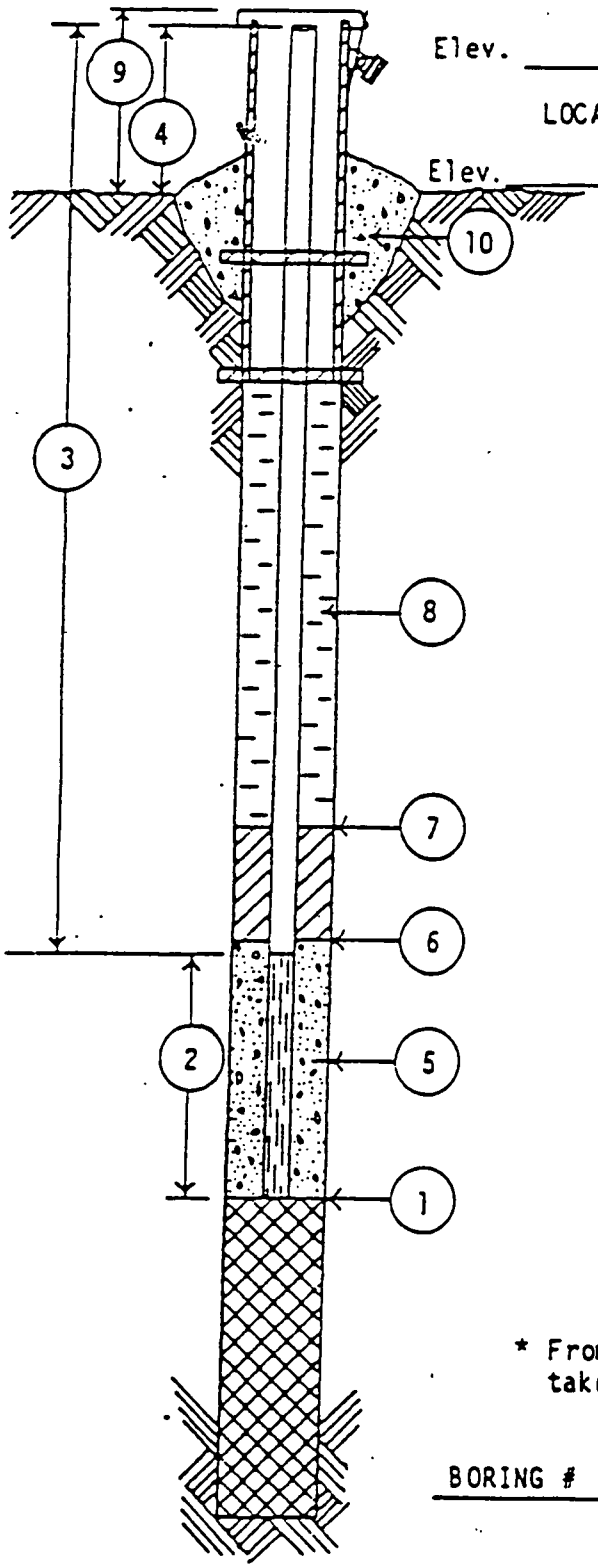
CHIEF MP

Elev. _____

LOCATION Wausau, Wisconsin

Elev. _____

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



(1) DEPTH TO BOTTOM OF BOREHOLE 45 FEET

(2) LENGTH OF WELL POINT, (WELL SCREEN), OR SLOTTED PIPE 0 FEET

(3) TOTAL LENGTH OF SOLID PIPE 35 FEET @ 2 IN. DIAMETER

(4) HEIGHT OF WELL CASING ABOVE GROUND 0.1 FEET

(5) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE _____

(6) DEPTH OF LOWER OR BOTTOM SEAL 34 FEET

(7) DEPTH OF UPPER OR TOP SEAL 1 FEET

(8) TYPE OF BACKFILL Cement & Bentonite Slurry

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND -

LOCKING CAP (YES) NO

(10) CONCRETE CAP (YES) NO

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

WELL DETAIL INFORMATION SHEET

JUN 28 1985

JOB NO. C 810324

BORING NO. WMW-7

DATE 11/26/84

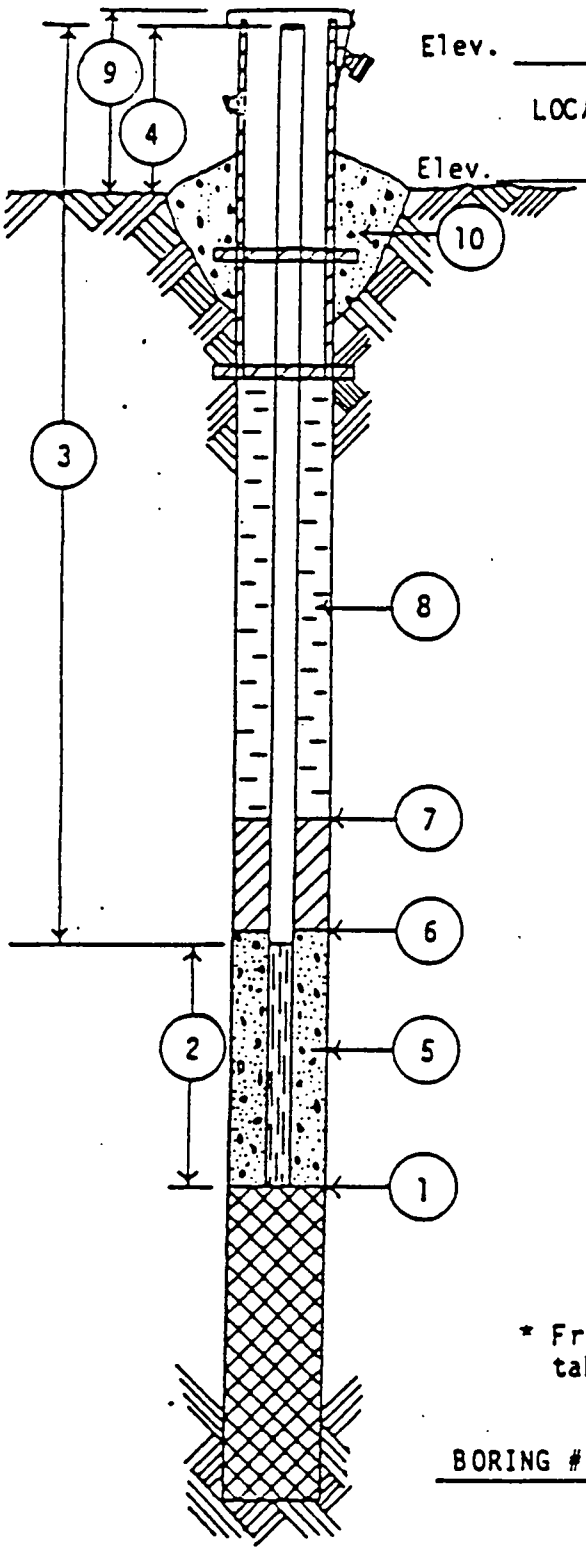
CHIEF RL

Elev. _____

LOCATION Wausau, Wisconsin, Foy F. Weston, EPA

Elev. _____

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



(1) DEPTH TO BOTTOM OF BOREHOLE 45 FEET

(2) LENGTH OF WELL POINT, (WELL SCREEN), OR SLOTTED PIPE 10 FEET

(3) TOTAL LENGTH OF SOLID PIPE 35 FEET @ 2 IN. DIAMETER

(4) HEIGHT OF WELL CASING ABOVE GROUND 0.1 FEET

(5) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE _____

(6) DEPTH OF LOWER OR BOTTOM SEAL 34 FEET

(7) DEPTH OF UPPER OR TOP SEAL 1 FEET

(8) TYPE OF BACKFILL Cement & Bentonite Slurry

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND GS

LOCKING CAP YES (NO)

(10) CONCRETE CAP (YES) NO

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

[PJS-7-45]

WELL DETAIL INFORMATION SHEET

JOB NO. C 810324

BORING NO. [illegible] WMW-9

DATE 11/30/84

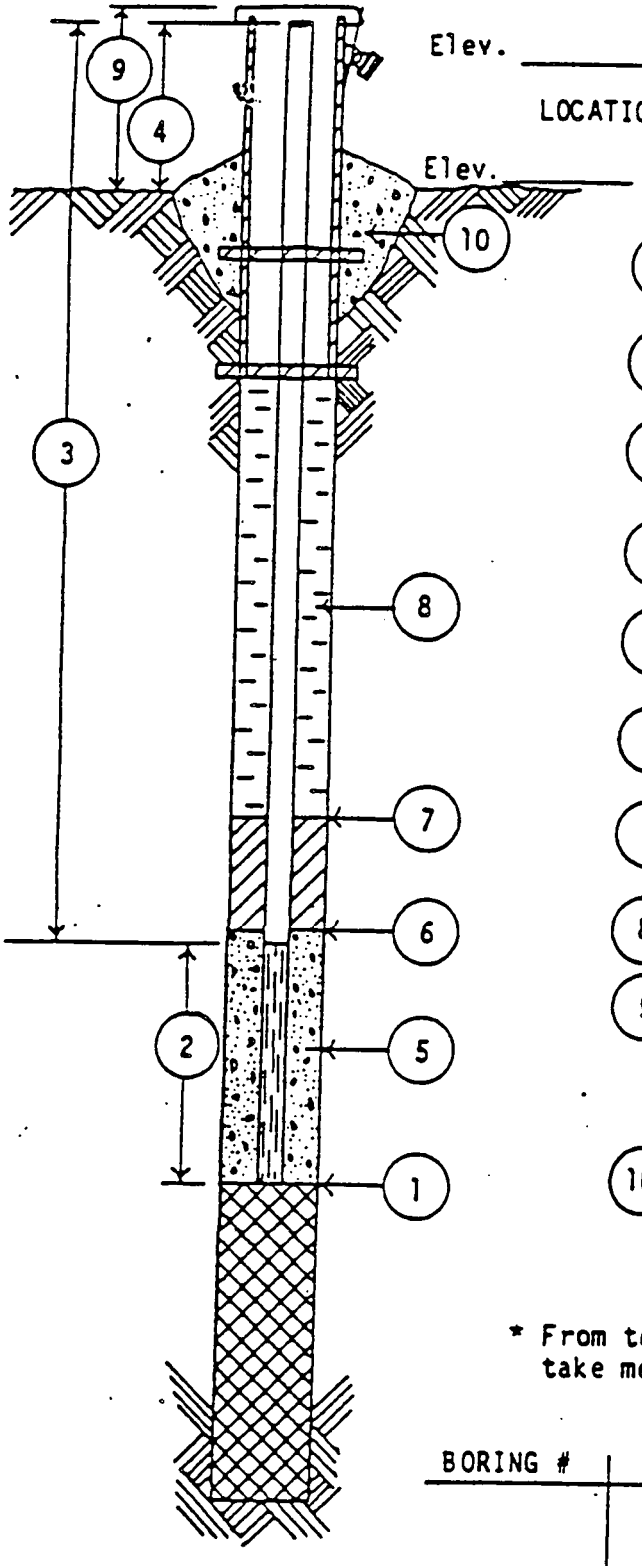
CHIEF MP

Elev. _____

LOCATION Wausau, Wisconsin; Roy F. Weston, EPA

Elev. _____

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



(1) DEPTH TO BOTTOM OF BOREHOLE
50 FEET

(2) LENGTH OF WELL POINT, (WELL SCREEN), OR SLOTTED PIPE 15 FEET

(3) TOTAL LENGTH OF SOLID PIPE 35.0 FEET @ 2 IN. DIAMETER

(4) HEIGHT OF WELL CASING ABOVE GROUND
-0.1 FEET

(5) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE -

(6) DEPTH OF LOWER OR BOTTOM SEAL
39 FEET

(7) DEPTH OF UPPER OR TOP SEAL
1 FEET

(8) TYPE OF BACKFILL Cement & Bentonite Slurry

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND GS

LOCKING CAP YES (NO)

(10) CONCRETE CAP (YES) NO

WATER LEVEL CHECKS

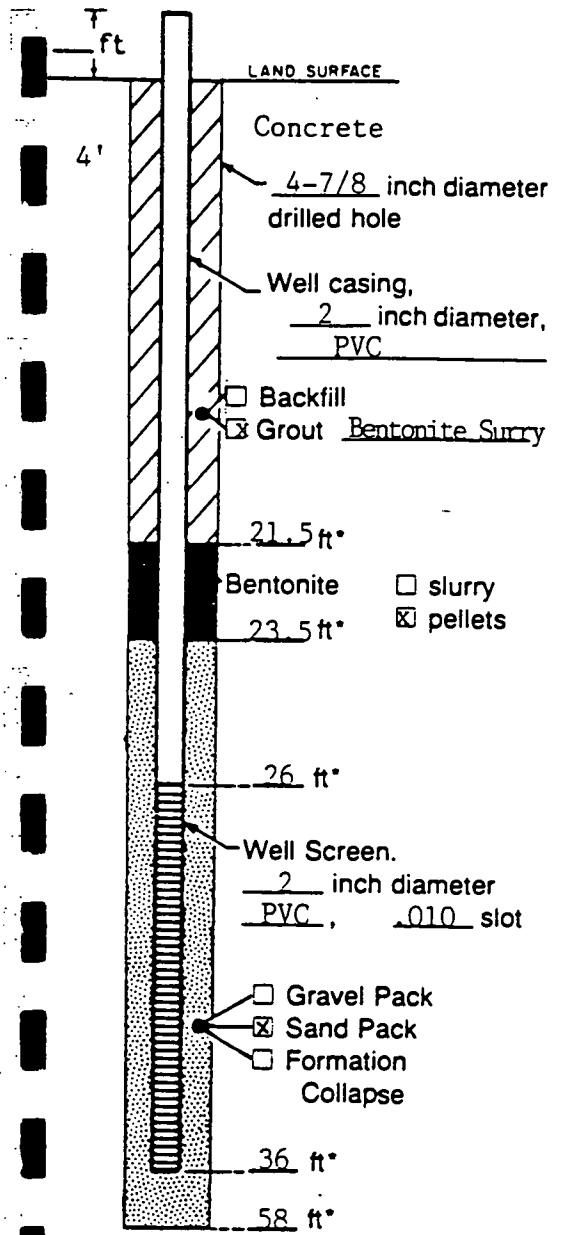
* From top of casing, if protective casing higher take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS

[PJS-7-45]

GERAGHTY & MILLER, INC.
Ground-Water Consultants

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project E1127CW1 Well GM1S

Town/City Wausau

County Marathon State WI

Permit No. _____

Land-Surface Elevation

and Datum _____ feet ☐ surveyed

_____ ☐ estimated

Installation Dates(s) 8/6/86

Drilling Method Dual-Tube

Drilling Contractor Layne N.W.

Drilling Fluid Raw water & Air

Development Techniques(s) and Date(s)

9/4/86 airlift

Fluid Loss During Drilling _____ gallons

Water Removed During Development 5 gallons

Static Depth to Water 29.93' feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration 20 minutes hours

Yield _____ gpm Date 9/04/86

Specific Capacity _____ gpm/ft

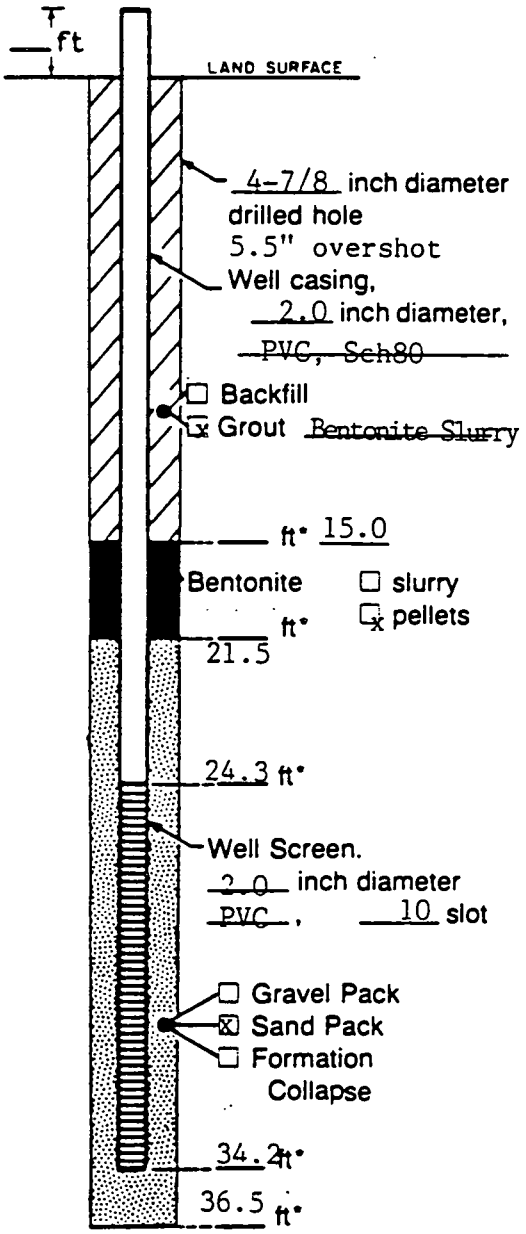
Well Purpose Monitor G.W. Quality

Remarks 8/6 15:35 WL = 27.75' BLS

Prepared by L.C. Huntoon

GERAGHTY & MILLER, INC.
Ground-Water Consultants

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Wausau E1127CW1 Well GW 2S

Town/City Wausau

County _____ State _____

Permit No. _____

Land-Surface Elevation

and Datum _____ feet ☐ surveyed

_____ ☐ estimated

Installation Dates(s) 8/19/86 7:50 a.m.-8:50 a.m.

Drilling Method Double Tube

Drilling Contractor Layne N.W.

Drilling Fluid Water & Air

Development Techniques(s) and Date(s)

9/4/86 Airlift

Fluid Loss During Drilling _____ gallons

Water Removed During Development 20 gallons

Static Depth to Water 26.5 ft/8/19/86 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration 20 minutes hours

Yield _____ gpm Date 9/4/86

Specific Capacity _____ gpm/ft

Well Purpose Monitor G.W. Quality

Remarks 9/4 water level = 25.69' BCS

Prepared by Phil Harry/ L.C. Huntoon

APPENDIX D

HAZARDOUS SUBSTANCE LIST ANALYSIS FOR SELECTED WELLS

HAZLETON LABORATORIES AMERICA, INC.
3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707 • PHONE (608) 241-4471 • TLX 703956 HAZRAL MDS UD

REPORT OF ANALYSIS

SAMPLE NUMBER: 6091428

DATE ENTERED: 09/19/8

REPORT PRINTED: 09/30/8

BARR CHRISTEL
RESIDUALS MANAGEMENT TECHNOLOGY, INC.
116 EAST WASHINGTON AVENUE
SUITE 124
MADISON, WI 53703

GROUND WATER: 19760; W-1D
PROJECT NO. 222.04

PURCHASE ORDER NUMBER: 12745

ACID FRACTION
(SEE B/N FRACTION - SEMIVOLATILE COMPOUND LIST)

BASE/NEUTRAL FRACTION

SEMIVOLATILE COMPOUNDS

COMPOUND NAME	MCG/L
PHENOL	LESS THAN 10
BIS(-2-CHLOROETHYL)ETHER	LESS THAN 10
2-CHLOROPHENOL	LESS THAN 10
1,3-DICHLOROBENZENE	LESS THAN 10
1,4-DICHLOROBENZENE	LESS THAN 10
BENZYL ALCOHOL	LESS THAN 10
1,2-DICHLOROBENZENE	LESS THAN 10
2-METHYLPHENOL	LESS THAN 10
BIS(2-CHLOROISOPROPYL)ETHER	LESS THAN 10
4-METHYLPHENOL	LESS THAN 10
N-NITROSO-DI-N-PROPYLAMINE	LESS THAN 10
HEXACHLOROETHANE	LESS THAN 10
NITROBENZENE	LESS THAN 10
ISOPHORONE	LESS THAN 10
2-NITROPHENOL	LESS THAN 10
2,4-DIMETHYLPHENOL	LESS THAN 10
BENZOIC ACID	LESS THAN 50
BIS(2-CHLOROETHOXY)METHANE	LESS THAN 10
2,4-DICHLOROPHENOL	LESS THAN 10
1,2,4-TRICHLOROBENZENE	LESS THAN 10
NAPHTHALENE	LESS THAN 10
4-CHLOROANILINE	LESS THAN 10
HEXACHLOROBUTADIENE	LESS THAN 10
4-CHLORO-3-METHYLPHENOL	LESS THAN 10
2-METHYLNAPHTHALENE	LESS THAN 10
HEXACHLOROCYCLOPENTADIENE	LESS THAN 10
2,4,6-TRICHLOROPHENOL	LESS THAN 10
2,4,5-TRICHLOROPHENOL	LESS THAN 50
2-CHLORONAPHTHALENE	LESS THAN 10

3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707 • PHONE (608) 241-4471 • TLX 703958 HAZRAL MDS UD

SAMPLE NUMBER: 60904286 PAGE 1

GROUND WATER: 19760; W-1D
PROJECT NO. 222.04

BASE/NEUTRAL FRACTION (CONTINUED)

2-NITROANILINE	LESS THAN 50
DIMETHYL PHTHALATE	LESS THAN 10
ACENAPHTHYLENE	LESS THAN 10
3-NITROANILINE	LESS THAN 50
ACENAPHTHENE	LESS THAN 10
2,4-DINITROPHENOL	LESS THAN 50
4-NITROPHENOL	LESS THAN 50
DIBENZOFURAN	LESS THAN 10
2,4-DINITROTOLUENE	LESS THAN 10
2,6-DINITROTOLUENE	LESS THAN 10
DIETHYL PHTHALATE	2 J
4-CHLOROPHENYL-PHENYLETHER	LESS THAN 10
FLUORENE	LESS THAN 10
4-NITROANILINE	LESS THAN 50
4,6-DINITRO-2-METHYLPHENOL	LESS THAN 50
N-NITROSODIPHENYLAMINE*(1)	LESS THAN 10
4-BROMOPHENYL-PHENYLETHER	LESS THAN 10
HEXACHLOROBENZENE	LESS THAN 10
PENTACHLOROPHENOL	LESS THAN 50
PHENANTHRENE	LESS THAN 10
ANTHRACENE	LESS THAN 10
DI-N-BUTYLPHTHALATE	LESS THAN 10
FLUORANTHENE	LESS THAN 10
PYRENE	LESS THAN 10
BUTYLBENZYLPHTHALATE	LESS THAN 10
3,3'-DICHLOROBENZIDINE	LESS THAN 20
BENZO(A)ANTHRACENE	LESS THAN 10
BIS(2-ETHYLHEXYL)PHTHALATE	3 J
CHRYSENE	LESS THAN 10
DI-N-OCTYL PHTHALATE	LESS THAN 10
BENZO(B)FLUORANTHENE	LESS THAN 10
BENZO(K)FLUORANTHENE	LESS THAN 10
BENZO(A)PYRENE	LESS THAN 10
INDENO(1,2,3-CD)PYRENE	LESS THAN 10
DIBENZO(A,H)ANTHRACENE	LESS THAN 10
BENZO(G,H,I)PERYLENE	LESS THAN 10

'J' INDICATES AN ESTIMATED VALUE. MASS SPECTRAL DATA INDICATED THE PRESENCE OF A COMPOUND THAT MEETS THE IDENTIFICATION CRITERIA BUT THE RESULT IS LESS THAN THE SPECIFIED DETECTION LIMIT BUT GREATER THAN ZERO.

PESTICIDE/PCB FRACTION

COMPOUND NAME	UG/L
ALPHA-BHC	LESS THAN 0.05
BETA-BHC	LESS THAN 0.05
DELTA-BHC	LESS THAN 0.05
GAMMA-BHC (LINDANE)	LESS THAN 0.05

SAMPLE NUMBER: 60904286

GROUND WATER: 19760; W-1D
PROJECT NO. 229.04

PESTICIDE/PCB FRACTION	(CONTINUED)
HEPTACHLOR	LESS THAN 0.05
ALDRIN	LESS THAN 0.05
HEPTACHLOR EPOXIDE	LESS THAN 0.05
ENDOSULFAN I	LESS THAN 0.05
DIELDRIN	LESS THAN 0.10
4,4'-DDE	LESS THAN 0.10
ENDRIN	LESS THAN 0.10
ENDOSULFAN II	LESS THAN 0.10
4,4'-DDD	LESS THAN 0.10
ENDOSULFAN SULFATE	LESS THAN 0.10
4,4'-DDT	LESS THAN 0.10
METHOXYCHLOR	LESS THAN 0.50
ENDRIN KETONE	LESS THAN 0.10
CHLORDANE	LESS THAN 0.50
TOXAPHENE	LESS THAN 1.0
PCB-1016	LESS THAN 0.50
PCB-1221	LESS THAN 0.50
PCB-1232	LESS THAN 0.50
PCB-1242	LESS THAN 0.50
PCB-1248	LESS THAN 0.50
PCB-1254	LESS THAN 1.0
PCB-1260	LESS THAN 1.0

METHOD REFERENCES

ACID FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

BASE/NEUTRAL FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

HAZLETON
3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707 • PHONE (608) 241-4471 • TLX 703956 HAZRAL MDS UD

SAMPLE NUMBER: 60904286

GROUND WATER: 19760; W-1D
PROJECT NO. 229.04

METHOD REFERENCES (CONTINUED)

PESTICIDE/PCB FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 608, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 608 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43321-43336, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8080, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

HAZLETON LABORATORIES AMERICA, INC. Chemical & Biomedical Sciences Division
3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707 • PHONE (608) 241-4471 • TLX 703956 HAZRAL MDS UD

REPORT OF ANALYSIS

SAMPLE NUMBER: A090428
DATE ENTERED: 09/19/8
REPORT PRINTED: 09/30/8

BARB CHRISTEL
RESIDUALS MANAGEMENT TECHNOLOGY, INC.
116 EAST WASHINGTON AVENUE
SUITE 124
MADISON, WI 53703

GROUND WATER: 19761; R-2D
PROJECT NO. 222.04

PURCHASE ORDER NUMBER: 12745

ACID FRACTION
(SEE B/N FRACTION - SEMIVOLATILE COMPOUND LIST)

BASE/NEUTRAL FRACTION

SEMIVOLATILE COMPOUNDS

COMPOUND NAME	MCG/L
PHENOL	LESS THAN 10
BIS(-2-CHLOROETHYL)ETHER	LESS THAN 10
2-CHLOROPHENOL	LESS THAN 10
1,3-DICHLOROBENZENE	LESS THAN 10
1,4-DICHLOROBENZENE	LESS THAN 10
BENZYL ALCOHOL	LESS THAN 10
1,2-DICHLOROBENZENE	LESS THAN 10
2-METHYLPHENOL	LESS THAN 10
BIS(2-CHLOROISOPROPYL)ETHER	LESS THAN 10
4-METHYLPHENOL	LESS THAN 10
N-NITROSO-DI-N-PROPYLAMINE	LESS THAN 10
HEXACHLOROETHANE	LESS THAN 10
NITROBENZENE	LESS THAN 10
ISOPHORONE	LESS THAN 10
2-NITROPHENOL	LESS THAN 10
2,4-DIMETHYLPHENOL	LESS THAN 10
BENZOIC ACID	LESS THAN 50
BIS(2-CHLOROETHOXY)METHANE	LESS THAN 10
2,4-DICHLOROPHENOL	LESS THAN 10
1,2,4-TRICHLOROBENZENE	LESS THAN 10
NAPHTHALENE	LESS THAN 10
4-CHLOROANILINE	LESS THAN 10
HEXACHLOROBUTADIENE	LESS THAN 10
4-CHLORO-3-METHYLPHENOL	LESS THAN 10
2-METHYLNAPHTHALENE	LESS THAN 10
HEXACHLOROCYCLOPENTADIENE	LESS THAN 10
2,4,6-TRICHLOROPHENOL	LESS THAN 10
2,4,5-TRICHLOROPHENOL	LESS THAN 50
2-CHLORONAPHTHALENE	LESS THAN 10

SAMPLE NUMBER: 61904287

GROUND WATER: 19761; R-2D
PROJECT NO. 222.04

BASE/NEUTRAL FRACTION (CONTINUED)

2-NITROANILINE	LESS THAN 50
DIMETHYL PHTHALATE	LESS THAN 10
ACENAPHTHYLENE	LESS THAN 10
3-NITROANILINE	LESS THAN 50
ACENAPHTHENE	LESS THAN 10
2,4-DINITROPHENOL	LESS THAN 50
4-NITROPHENOL	LESS THAN 50
DIBENZOFURAN	LESS THAN 10
2,4-DINITROTOLUENE	LESS THAN 10
2,6-DINITROTOLUENE	LESS THAN 10
DIETHYL PHTHALATE	1 J
4-CHLOROPHENYL-PHENYLETHER	LESS THAN 10
FLUORENE	LESS THAN 10
4-NITROANILINE	LESS THAN 50
4,6-DINITRO-2-METHYLPHENOL	LESS THAN 50
N-NITROSODIPHENYLAMINE*(1)	LESS THAN 10
4-BROMOPHENYL-PHENYLETHER	LESS THAN 10
HEXACHLOROBENZENE	LESS THAN 10
PENTACHLOROPHENOL	LESS THAN 50
PHENANTHRENE	LESS THAN 10
ANTHRACENE	LESS THAN 10
DI-N-BUTYLPHTHALATE	2 J
FLUORANTHENE	LESS THAN 10
PYRENE	LESS THAN 10
BUTYLBENZYLPHTHALATE	LESS THAN 10
3,3'-DICHLOROBENZIDINE	LESS THAN 20
BENZO(A)ANTHRACENE	LESS THAN 10
BIS(2-ETHYLHEXYL)PHTHALATE	2 J
CHRYSENE	LESS THAN 10
DI-N-OCTYL PHTHALATE	LESS THAN 10
BENZO(B)FLUORANTHENE	LESS THAN 10
BENZO(K)FLUORANTHENE	LESS THAN 10
BENZO(A)PYRENE	LESS THAN 10
INDENO(1,2,3-CD)PYRENE	LESS THAN 10
DIBENZO(A,H)ANTHRACENE	LESS THAN 10
BENZO(G,H,I)PERYLENE	LESS THAN 10

'J' INDICATES AN ESTIMATED VALUE. MASS SPECTRAL DATA INDICATED THE PRESENCE OF A COMPOUND THAT MEETS THE IDENTIFICATION CRITERIA BUT THE RESULT IS LESS THAN THE SPECIFIED DETECTION LIMIT BUT GREATER THAN ZERO.

PESTICIDE/PCB FRACTION

COMPOUND NAME	MG/L
ALPHA-BHC	LESS THAN 0.05
BETA-BHC	LESS THAN 0.05
DELTA-BHC	LESS THAN 0.05
GAMMA-BHC (LINDANE)	LESS THAN 0.05

3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707 • PHONE (608) 241-4471 • TLX 703956 HAZRAL MDS UD

SAMPLE NUMBER: 60904287

GROUND WATER: 19761; R-2D
PROJECT NO. 222.04

PESTICIDE/PCB FRACTION (CONTINUED)

HEPTACHLOR	LESS THAN 0.05
ALDRIN	LESS THAN 0.05
HEPTACHLOR EPOXIDE	LESS THAN 0.05
ENDOSULFAN I	LESS THAN 0.05
DIELDRIN	LESS THAN 0.10
4,4'-DDE	LESS THAN 0.10
ENDRIN	LESS THAN 0.10
ENDOSULFAN II	LESS THAN 0.10
4,4'-DDD	LESS THAN 0.10
ENDOSULFAN SULFATE	LESS THAN 0.10
4,4'-DDT	LESS THAN 0.10
METHOXYCHLOR	LESS THAN 0.50
ENDRIN KETONE	LESS THAN 0.10
CHLORDANE	LESS THAN 0.50
TOXAPHENE	LESS THAN 1.0
PCB-1016	LESS THAN 0.50
PCB-1221	LESS THAN 0.50
PCB-1232	LESS THAN 0.50
PCB-1242	LESS THAN 0.50
PCB-1248	LESS THAN 0.50
PCB-1254	LESS THAN 1.0
PCB-1260	LESS THAN 1.0

METHOD REFERENCES

ACID FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

BASE/NEUTRAL FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

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SAMPLE NUMBER: 611914287 PAGE

GROUND WATER: 19761; R-2D
PROJECT NO. 222.04

METHOD REFERENCES (CONTINUED)

PESTICIDE/PCB FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 608, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 608 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43321-43336, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8080, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

HAZLETON LABORATORIES AMERICA, INC. Chemical & Biomedical Sciences Division
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REPORT OF ANALYSIS

SAMPLE NUMBER: A119042[illegible]

DATE ENTERED: 09/19/8[illegible]

REPORT PRINTED: 09/30/8[illegible]

HARR CHRISTEL
RESIDUALS MANAGEMENT TECHNOLOGY, INC.
1.06 EAST WASHINGTON AVENUE
SUITE 124
MADISON, WI 53703

GROUND WATER: 19762; C-2S
PROJECT NO. 222.04

PURCHASE ORDER NUMBER: 12745

ACID FRACTION
(SEE B/N FRACTION - SEMIVOLATILE COMPOUND LIST)

BASE/NEUTRAL FRACTION

SEMIVOLATILE COMPOUNDS

COMPOUND NAME	MCG/L
PHENOL	LESS THAN 10
BIS(-2-CHLOROETHYL)ETHER	LESS THAN 10
2-CHLOROPHENOL	LESS THAN 10
1,3-DICHLOROBENZENE	LESS THAN 10
1,4-DICHLOROBENZENE	LESS THAN 10
BENZYL ALCOHOL	LESS THAN 10
1,2-DICHLOROBENZENE	LESS THAN 10
2-METHYLPHENOL	LESS THAN 10
BIS(2-CHLOROISOPROPYL)ETHER	LESS THAN 10
4-METHYLPHENOL	LESS THAN 10
N-NITROSO-DI-N-PROPYLAMINE	LESS THAN 10
HEXACHLOROETHANE	LESS THAN 10
NITROBENZENE	LESS THAN 10
ISOPHORONE	LESS THAN 10
2-NITROPHENOL	LESS THAN 10
2,4-DIMETHYLPHENOL	LESS THAN 10
BENZOIC ACID	LESS THAN 50
BIS(2-CHLOROETHOXY)METHANE	LESS THAN 10
2,4-DICHLOROPHENOL	LESS THAN 10
1,2,4-TRICHLOROBENZENE	LESS THAN 10
NAPHTHALENE	LESS THAN 10
4-CHLOROANILINE	LESS THAN 10
HEXACHLOROBUTADIENE	LESS THAN 10
4-CHLORO-3-METHYLPHENOL	LESS THAN 10
2-METHYLNAPHTHALENE	LESS THAN 10
HEXACHLOROCYCLOPENTADIENE	LESS THAN 10
2,4,6-TRICHLOROPHENOL	LESS THAN 10
2,4,5-TRICHLOROPHENOL	LESS THAN 50
2-CHLORONAPHTHALENE	LESS THAN 10

SAMPLE NUMBER: 60904288

GROUND WATER: 19762; C-2S
PROJECT NO. 222.04

BASE/NEUTRAL FRACTION (CONTINUED)

2-NITROANILINE	LESS THAN 50
DIMETHYL PHTHALATE	LESS THAN 10
ACENAPHTHYLENE	LESS THAN 10
3-NITROANILINE	LESS THAN 50
ACENAPHTHENE	LESS THAN 10
2,4-DINITROPHENOL	LESS THAN 50
4-NITROPHENOL	LESS THAN 50
DIBENZOFURAN	LESS THAN 10
2,4-DINITROTOLUENE	LESS THAN 10
2,6-DINITROTOLUENE	LESS THAN 10
DIETHYL PHTHALATE	LESS THAN 10
4-CHLOROPHENYL-PHENYLETHER	LESS THAN 10
FLUORENE	LESS THAN 10
4-NITROANILINE	LESS THAN 50
4,6-DINITRO-2-METHYLPHENOL	LESS THAN 50
N-NITROSODIPHENYLAMINE*(1)	LESS THAN 10
4-BROMOPHENYL-PHENYLETHER	LESS THAN 10
HEXACHLOROBENZENE	LESS THAN 10
PENTACHLOROPHENOL	LESS THAN 50
PHENANTHRENE	LESS THAN 10
ANTHRACENE	LESS THAN 10
DI-N-BUTYLPHTHALATE	1 J
FLUORANTHENE	LESS THAN 10
PYRENE	LESS THAN 10
BUTYLBENZYLPHTHALATE	LESS THAN 10
3,3'-DICHLOROBENZIDINE	LESS THAN 20
BENZO(A)ANTHRACENE	LESS THAN 10
BIS(2-ETHYLHEXYL)PHTHALATE	3 J
CHRYSENE	LESS THAN 10
DI-N-OCTYL PHTHALATE	LESS THAN 10
BENZO(B)FLUORANTHENE	LESS THAN 10
BENZO(K)FLUORANTHENE	LESS THAN 10
BENZO(A)PYRENE	LESS THAN 10
INDENO(1,2,3-CD)PYRENE	LESS THAN 10
DIBENZO(A,H)ANTHRACENE	LESS THAN 10
BENZO(G,H,I)PERYLENE	LESS THAN 10

'J' INDICATES AN ESTIMATED VALUE. MASS SPECTRAL DATA INDICATED THE PRESENCE OF A COMPOUND THAT MEETS THE IDENTIFICATION CRITERIA BUT THE RESULT IS LESS THAN THE SPECIFIED DETECTION LIMIT BUT GREATER THAN ZERO.

PESTICIDE/PCB FRACTION

COMPOUND NAME	UG/L
ALPHA-BHC	LESS THAN 0.05
BETA-BHC	LESS THAN 0.05
DELTA-BHC	LESS THAN 0.05
GAMMA-BHC (LINDANE)	LESS THAN 0.05

SAMPLE NUMBER: 60904288

GROUND WATER: 19762; C-2S
PROJECT NO. 227.04

PESTICIDE/PCB FRACTION (CONTINUED)

HEPTACHLOR	LESS THAN 0.05
ALDRIN	LESS THAN 0.05
HEPTACHLOR EPOXIDE	LESS THAN 0.05
ENDOSULFAN I	LESS THAN 0.05
DIELDRIN	LESS THAN 0.10
4,4'-DDE	LESS THAN 0.10
ENDRIN	LESS THAN 0.10
ENDOSULFAN II	LESS THAN 0.10
4,4'-DDD	LESS THAN 0.10
ENDOSULFAN SULFATE	LESS THAN 0.10
4,4'-DDT	LESS THAN 0.10
METHOXYCHLOR	LESS THAN 0.50
ENDRIN KETONE	LESS THAN 0.10
CHLORDANE	LESS THAN 0.50
TOXAPHENE	LESS THAN 1.0
PCB-1016	LESS THAN 0.50
PCB-1221	LESS THAN 0.50
PCB-1232	LESS THAN 0.50
PCB-1242	LESS THAN 0.50
PCB-1248	LESS THAN 0.50
PCB-1254	LESS THAN 1.0
PCB-1260	LESS THAN 1.0

METHOD REFERENCES

ACID FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

BASE/NEUTRAL FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

SAMPLE NUMBER: 6090428A

GROUND WATER: 19762; C-2S
PROJECT NO. 222.04

METHOD REFERENCES (CONTINUED)

PESTICIDE/PCB FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 608, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 608 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43321-43336, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8080, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

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REPORT OF ANALYSIS

SAMPLE NUMBER: A09042H
DATE ENTERED: 09/19/8
REPORT PRINTED: 09/30/8

BARB CHRISTEL
RESIDUALS MANAGEMENT TECHNOLOGY, INC.
106 EAST WASHINGTON AVENUE
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MADISON, WI 53703

COOLING WATER: 19763; R-4D
PROJECT NO. 222.04

PURCHASE ORDER NUMBER: 12745

ACID FRACTION
(SEE B/N FRACTION - SEMIVOLATILE COMPOUND LIST)

BASE/NEUTRAL FRACTION

SEMIVOLATILE COMPOUNDS

COMPOUND NAME	MCG/L
PHENOL	LESS THAN 10
BIS(-2-CHLOROETHYL)ETHER	LESS THAN 10
2-CHLOROPHENOL	LESS THAN 10
1,3-DICHLOROBENZENE	LESS THAN 10
1,4-DICHLOROBENZENE	LESS THAN 10
BENZYL ALCOHOL	LESS THAN 10
1,2-DICHLOROBENZENE	LESS THAN 10
2-METHYLPHENOL	LESS THAN 10
BIS(2-CHLOROISOPROPYL)ETHER	LESS THAN 10
4-METHYLPHENOL	LESS THAN 10
N-NITROSO-DI-N-PROPYLAMINE	LESS THAN 10
HEXACHLOROETHANE	LESS THAN 10
NITROBENZENE	LESS THAN 10
ISOPHORONE	LESS THAN 10
2-NITROPHENOL	LESS THAN 10
2,4-DIMETHYLPHENOL	LESS THAN 10
BENZOIC ACID	LESS THAN 50
BIS(2-CHLOROETHOXY)METHANE	LESS THAN 10
2,4-DICHLOROPHENOL	LESS THAN 10
1,2,4-TRICHLOROBENZENE	LESS THAN 10
NAPHTHALENE	LESS THAN 10
4-CHLOROANILINE	LESS THAN 10
HEXACHLOROBUTADIENE	LESS THAN 10
4-CHLORO-3-METHYLPHENOL	LESS THAN 10
2-METHYLNAPHTHALENE	LESS THAN 10
HEXACHLOROCYCLOPENTADIENE	LESS THAN 10
2,4,6-TRICHLOROPHENOL	LESS THAN 10
2,4,5-TRICHLOROPHENOL	LESS THAN 50
2-CHLORONAPHTHALENE	LESS THAN 10

HAZLETON LABORATORIES AMERICA, INC.
Chemical & Biomedical Services
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SAMPLE NUMBER: 60904289

GROUND WATER: 19763; R-40
PROJECT NO. 222.04

BASE/NEUTRAL FRACTION (CONTINUED)

2-NITROANILINE	LESS THAN 50
DIMETHYL PHTHALATE	LESS THAN 10
ACENAPHTHYLENE	LESS THAN 10
3-NITROANILINE	LESS THAN 50
ACENAPHTHENE	LESS THAN 10
2,4-DINITROPHENOL	LESS THAN 50
4-NITROPHENOL	LESS THAN 50
DIBENZOFURAN	LESS THAN 10
2,4-DINITROTOLUENE	LESS THAN 10
2,6-DINITROTOLUENE	LESS THAN 10
DIETHYL PHTHALATE	LESS THAN 10
4-CHLOROPHENYL-PHENYLETHER	LESS THAN 10
FLUORENE	LESS THAN 10
4-NITROANILINE	LESS THAN 50
4,6-DINITRO-2-METHYLPHENOL	LESS THAN 50
N-NITROSODIPHENYLAMINE*(1)	LESS THAN 10
4-BROMOPHENYL-PHENYLETHER	LESS THAN 10
HEXACHLOROBENZENE	LESS THAN 10
PENTACHLOROPHENOL	LESS THAN 50
PHENANTHRENE	LESS THAN 10
ANTHRACENE	LESS THAN 10
DI-N-BUTYL PHTHALATE	1 J
FLUORANTHENE	LESS THAN 10
PYRENE	LESS THAN 10
BUTYLBENZYL PHTHALATE	LESS THAN 10
3,3'-DICHLOROBENZIDINE	LESS THAN 20
BENZO(A)ANTHRACENE	LESS THAN 10
BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN 10
CHRYSENE	LESS THAN 10
DI-N-OCTYL PHTHALATE	LESS THAN 10
BENZO(B)FLUORANTHENE	LESS THAN 10
BENZO(K)FLUORANTHENE	LESS THAN 10
BENZO(A)PYRENE	LESS THAN 10
INDENO(1,2,3-CD)PYRENE	LESS THAN 10
DIBENZO(A,H)ANTHRACENE	LESS THAN 10
BENZO(G,H,I)PERYLENE	LESS THAN 10

'J' INDICATES AN ESTIMATED VALUE. MASS SPECTRAL DATA INDICATED THE PRESENCE OF A COMPOUND THAT MEETS THE IDENTIFICATION CRITERIA BUT THE RESULT IS LESS THAN THE SPECIFIED DETECTION LIMIT BUT GREATER THAN ZERO.

PESTICIDE/PCB FRACTION

COMPOUND NAME	MCG/L
ALPHA-BHC	LESS THAN 0.05
BETA-BHC	LESS THAN 0.05
DELTA-BHC	LESS THAN 0.05
GAMMA-BHC (LINDANE)	LESS THAN 0.05

SAMPLE NUMBER: 60904289

GROUND WATER: 19763; R-4D
PROJECT NO. 222.04

PESTICIDE/PCB FRACTION (CONTINUED)

HEPTACHLOR	LESS THAN 0.05
ALDRIN	LESS THAN 0.05
HEPTACHLOR EPOXIDE	LESS THAN 0.05
ENDOSULFAN I	LESS THAN 0.05
DIELDRIN	LESS THAN 0.10
4,4'-DDE	LESS THAN 0.10
ENDRIN	LESS THAN 0.10
ENDOSULFAN II	LESS THAN 0.10
4,4'-DDD	LESS THAN 0.10
ENDOSULFAN SULFATE	LESS THAN 0.10
4,4'-DDT	LESS THAN 0.10
METHOXYCHLOR	LESS THAN 0.50
ENDRIN KETONE	LESS THAN 0.10
CHLORDANE	LESS THAN 0.50
TOXAPHENE	LESS THAN 1.0
PCB-1016	LESS THAN 0.50
PCB-1221	LESS THAN 0.50
PCB-1232	LESS THAN 0.50
PCB-1242	LESS THAN 0.50
PCB-1248	LESS THAN 0.50
PCB-1254	LESS THAN 1.0
PCB-1260	LESS THAN 1.0

METHOD REFERENCES

ACID FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43416, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

BASE/NEUTRAL FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43416, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

HAZLETON LABORATORIES AMERICA, INC. Chemical & Biomedical Services Division
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SAMPLE NUMBER: 609104289

GROUND WATER: 19763; R-4D
PROJECT NO. 222.04

METHOD REFERENCES (CONTINUED)

PESTICIDE/PCB FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 608, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 608 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43371-43386, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8080, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

HAZLETON LABORATORIES AMERICA, INC.
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REPORT OF ANALYSIS

SAMPLE NUMBER: A1190429
DATE ENTERED: 09/19/8
REPORT PRINTED: 09/30/8

BARR CHRISTEL
RESIDUALS MANAGEMENT TECHNOLOGY, INC.
116 EAST WASHINGTON AVENUE
SUITE 124
MADISON, WI 53703

GROUND WATER: 19764; FIELD BLK
PROJECT NO. 222.04

PURCHASE ORDER NUMBER: 12745

ACID FRACTION
(SEE B/N FRACTION - SEMIVOLATILE COMPOUND LIST)

BASE/NEUTRAL FRACTION

SEMIVOLATILE COMPOUNDS

COMPOUND NAME	MCG/L
PHENOL	LESS THAN 10
BIS(2-CHLOROETHYL)ETHER	LESS THAN 10
2-CHLOROPHENOL	LESS THAN 10
1,3-DICHLOROBENZENE	LESS THAN 10
1,4-DICHLOROBENZENE	LESS THAN 10
BENZYL ALCOHOL	LESS THAN 10
1,2-DICHLOROBENZENE	LESS THAN 10
2-METHYLPHENOL	LESS THAN 10
BIS(2-CHLOROISOPROPYL)ETHER	LESS THAN 10
4-METHYLPHENOL	LESS THAN 10
N-NITROSO-DI-N-PROPYLAMINE	LESS THAN 10
HEXACHLOROETHANE	LESS THAN 10
NITROBENZENE	LESS THAN 10
ISOPHORONE	LESS THAN 10
2-NITROPHENOL	LESS THAN 10
2,4-DIMETHYLPHENOL	LESS THAN 10
BENZOIC ACID	LESS THAN 50
BIS(2-CHLOROETHOXY)METHANE	LESS THAN 10
2,4-DICHLOROPHENOL	LESS THAN 10
1,2,4-TRICHLOROBENZENE	LESS THAN 10
NAPHTHALENE	LESS THAN 10
4-CHLOROANILINE	LESS THAN 10
HEXACHLOROBUTADIENE	LESS THAN 10
4-CHLORO-3-METHYLPHENOL	LESS THAN 10
2-METHYLNAPHTHALENE	LESS THAN 10
HEXACHLOROCYCLOPENTADIENE	LESS THAN 10
2,4,6-TRICHLOROPHENOL	LESS THAN 10
2,4,5-TRICHLOROPHENOL	LESS THAN 50
2-CHLORONAPHTHALENE	LESS THAN 10

HAZLETON LABORATORIES AMERICA, INC. Chemical & BioMedical Sciences Division
3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707 • PHONE (608) 241-4471 • TLX 703956 HAZRAL MDS UD

SAMPLE NUMBER: 60904290

GROUND WATER: 19764; FIELD BLK
PROJECT NO. 229.04

BASE/NEUTRAL FRACTION (CONTINUED).

2-NITROANILINE	LESS THAN 50
DIMETHYL PHTHALATE	LESS THAN 10
ACENAPHTHYLENE	LESS THAN 10
3-NITROANILINE	LESS THAN 50
ACENAPHTHENE	LESS THAN 10
2,4-DINITROPHENOL	LESS THAN 50
4-NITROPHENOL	LESS THAN 50
DIBENZOFURAN	LESS THAN 10
2,4-DINITROTOLUENE	LESS THAN 10
2,6-DINITROTOLUENE	LESS THAN 10
DIETHYL PHTHALATE	1 J
4-CHLOROPHENYL-PHENYLETHER	LESS THAN 10
FLUORENE	LESS THAN 10
4-NITROANILINE	LESS THAN 50
4,6-DINITRO-2-METHYLPHENOL	LESS THAN 50
N-NITROSODIPHENYLAMINE*(1)	LESS THAN 10
4-BROMOPHENYL-PHENYLETHER	LESS THAN 10
HEXACHLOROBENZENE	LESS THAN 10
PENTACHLOROPHENOL	LESS THAN 50
PHENANTHRENE	LESS THAN 10
ANTHRACENE	LESS THAN 10
DI-N-BUTYLPHTHALATE	1 J
FLUORANTHENE	LESS THAN 10
PYRENE	LESS THAN 10
BUTYLBENZYLPHTHALATE	LESS THAN 10
3,3'-DICHLOROBENZIDINE	LESS THAN 20
BENZO(A)ANTHRACENE	LESS THAN 10
BIS(2-ETHYL HEXYL)PHTHALATE	2 J
CHRYSENE	LESS THAN 10
DI-N-OCTYL PHTHALATE	LESS THAN 10
BENZO(B)FLUORANTHENE	LESS THAN 10
BENZO(K)FLUORANTHENE	LESS THAN 10
BENZO(A)PYRENE	LESS THAN 10
INDENO(1,2,3-CD)PYRENE	LESS THAN 10
DIBENZO(A,H)ANTHRACENE	LESS THAN 10
BENZO(G,H,I)PERYLENE	LESS THAN 10

(1) INDICATES AN ESTIMATED VALUE. MASS SPECTRAL DATA INDICATED THE PRESENCE OF A COMPOUND THAT MEETS THE IDENTIFICATION CRITERIA BUT THE RESULT IS LESS THAN THE SPECIFIED DETECTION LIMIT BUT GREATER THAN ZERO.

PESTICIDE/PCB FRACTION

COMPOUND NAME	UG/L
ALPHA-BHC	LESS THAN 0.05
BETA-BHC	LESS THAN 0.05
DELTA-BHC	LESS THAN 0.05
GAMMA-BHC (LINDANE)	LESS THAN 0.05

HAZLETON LABORATORIES AMERICA, INC. Chemical & BioMedical Sciences Division
3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707 • PHONE (608) 241-4471 • TLX 703958 HAZRAL MDS UD

SAMPLE NUMBER: 60904290

GROUND WATER: 19764; FIELD BLK
PROJECT NO. 222.04

PESTICIDE/PCB FRACTION (CONTINUED)

HEPTACHLOR	LESS THAN 0.05
ALDRIN	LESS THAN 0.05
HEPTACHLOR EPOXIDE	LESS THAN 0.05
ENDOSULFAN I	LESS THAN 0.05
DIELDRIN	LESS THAN 0.10
4,4'-DDE	LESS THAN 0.10
ENDRIN	LESS THAN 0.10
ENDOSULFAN II	LESS THAN 0.10
4,4'-DDD	LESS THAN 0.10
ENDOSULFAN SULFATE	LESS THAN 0.10
4,4'-DDT	LESS THAN 0.10
METHOXYCHLOR	LESS THAN 0.50
ENDRIN KETONE	LESS THAN 0.10
CHLORDANE	LESS THAN 0.50
TOXAPHENE	LESS THAN 1.0
PCB-1016	LESS THAN 0.50
PCB-1221	LESS THAN 0.50
PCB-1232	LESS THAN 0.50
PCB-1242	LESS THAN 0.50
PCB-1248	LESS THAN 0.50
PCB-1254	LESS THAN 1.0
PCB-1260	LESS THAN 1.0

METHOD REFERENCES

ACID FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

BASE/NEUTRAL FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

SAMPLE NUMBER: 60904290

GROUND WATER: 19764; FIELD BLK
PROJECT NO. 222.04

METHOD REFERENCES (CONTINUED)

PESTICIDE/PCB FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 608, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 608 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43321-43336, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8080, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

HAZLETON LABORATORIES AMERICA, INC.
Chemical & BioMedical Sciences Division
3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707 • PHONE (608) 241-4471 • TLX 703958 HAZRAL MDS UD

REPORT OF ANALYSIS

SAMPLE NUMBER: A0904291

DATE ENTERED: 09/19/89

REPORT PRINTED: 09/30/89

BARB CHRISTEL
RESIDUALS MANAGEMENT TECHNOLOGY, INC.
126 EAST WASHINGTON AVENUE
SUITE 124
MADISON, WI 53703

GROUND WATER: 19765; TRIP BLK
PROJECT NO. 222.04

PURCHASE ORDER NUMBER: 12745

ACID FRACTION
(SEE B/N FRACTION - SEMIVOLATILE COMPOUND LIST)

BASE/NEUTRAL FRACTION

SEMIVOLATILE COMPOUNDS

COMPOUND NAME	MCG/L
PHENOL	LESS THAN 10
BIS(2-CHLOROETHYL)ETHER	LESS THAN 10
2-CHLOROPHENOL	LESS THAN 10
1,3-DICHLOROBENZENE	LESS THAN 10
1,4-DICHLOROBENZENE	LESS THAN 10
BENZYL ALCOHOL	LESS THAN 10
1,2-DICHLOROBENZENE	LESS THAN 10
2-METHYLPHENOL	LESS THAN 10
BIS(2-CHLOROISOPROPYL)ETHER	LESS THAN 10
4-METHYLPHENOL	LESS THAN 10
N-NITROSO-DI-N-PROPYLAMINE	LESS THAN 10
HEXACHLOROETHANE	LESS THAN 10
NITROBENZENE	LESS THAN 10
ISOPHORONE	LESS THAN 10
2-NITROPHENOL	LESS THAN 10
2,4-DIMETHYLPHENOL	LESS THAN 10
BENZOIC ACID	LESS THAN 50
BIS(2-CHLOROETHOXY)METHANE	LESS THAN 10
2,4-DICHLOROPHENOL	LESS THAN 10
1,2,4-TRICHLOROBENZENE	LESS THAN 10
NAPHTHALENE	LESS THAN 10
4-CHLOROANILINE	LESS THAN 10
HEXACHLOROBUTADIENE	LESS THAN 10
4-CHLORO-3-METHYLPHENOL	LESS THAN 10
2-METHYLNAPHTHALENE	LESS THAN 10
HEXACHLOROCYCLOPENTADIENE	LESS THAN 10
2,4,6-TRICHLOROPHENOL	LESS THAN 10
2,4,5-TRICHLOROPHENOL	LESS THAN 50
2-CHLORONAPHTHALENE	LESS THAN 10

SAMPLE NUMBER: 60904291

GROUND WATER: 19765; TRIP BLK
PROJECT NO. 222.04

BASE/NEUTRAL FRACTION (CONTINUED)

2-NITROANILINE	LESS THAN 50
DIMETHYL PHTHALATE	LESS THAN 10
ACENAPHTHYLENE	LESS THAN 10
3-NITROANILINE	LESS THAN 50
ACENAPHTHENE	LESS THAN 10
2,4-DINITROPHENOL	LESS THAN 50
4-NITROPHENOL	LESS THAN 50
DIBENZOFURAN	LESS THAN 10
2,4-DINITROTOLUENE	LESS THAN 10
2,6-DINITROTOLUENE	LESS THAN 10
DIETHYL PHTHALATE	LESS THAN 10
4-CHLOROPHENYL-PHENYLETHER	LESS THAN 10
FLUORENE	LESS THAN 10
4-NITROANILINE	LESS THAN 50
4,6-DINITRO-2-METHYLPHENOL	LESS THAN 50
N-NITROSODIPHENYLAMINE*(1)	LESS THAN 10
4-BROMOPHENYL-PHENYLETHER	LESS THAN 10
HEXACHLOROBENZENE	LESS THAN 10
PENTACHLOROPHENOL	LESS THAN 50
PHENANTHRENE	LESS THAN 10
ANTHRACENE	LESS THAN 10
DI-N-BUTYL PHTHALATE	1 J
FLUORANTHENE	LESS THAN 10
PYRENE	LESS THAN 10
BUTYLBENZYLPHTHALATE	LESS THAN 10
3,3'-DICHLOROBENZIDINE	LESS THAN 20
BENZO(A)ANTHRACENE	LESS THAN 10
BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN 10
CHRYSENE	LESS THAN 10
DI-N-OCTYL PHTHALATE	LESS THAN 10
BENZO(B)FLUORANTHENE	LESS THAN 10
BENZO(K)FLUORANTHENE	LESS THAN 10
BENZO(A)PYRENE	LESS THAN 10
INDENO(1,2,3-CD)PYRENE	LESS THAN 10
DIBENZO(A,H)ANTHRACENE	LESS THAN 10
BENZO(G,H,I)PERYLENE	LESS THAN 10

1' INDICATES AN ESTIMATED VALUE. MASS SPECTRAL DATA INDICATED THE PRESENCE OF A COMPOUND THAT MEETS THE IDENTIFICATION CRITERIA BUT THE RESULT IS LESS THAN THE SPECIFIED DETECTION LIMIT BUT GREATER THAN ZERO.

PESTICIDE/PCB FRACTION

COMPOUND NAME	UG/L
ALPHA-BHC	LESS THAN 0.05
BETA-BHC	LESS THAN 0.05
DELTA-BHC	LESS THAN 0.05
GAMMA-BHC (LINDANE)	LESS THAN 0.05

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SAMPLE NUMBER: 60904291

GROUND WATER: 19765; TRIP BLK
PROJECT NO. 229.04

PESTICIDE/PCB FRACTION (CONTINUED)

HEPTACHLOR	LESS THAN 0.05
ALDRIN	LESS THAN 0.05
HEPTACHLOR EPOXIDE	LESS THAN 0.05
ENDOSULFAN I	LESS THAN 0.05
DIELDRIN	LESS THAN 0.10
4,4'-DDE	LESS THAN 0.10
ENDRIN	LESS THAN 0.10
ENDOSULFAN II	LESS THAN 0.10
4,4'-DDD	LESS THAN 0.10
ENDOSULFAN SULFATE	LESS THAN 0.10
4,4'-DDT	LESS THAN 0.10
METHOXYCHLOR	LESS THAN 0.50
ENDRIN KETONE	LESS THAN 0.10
CHLORDANE	LESS THAN 0.50
TOXAPHENE	LESS THAN 1.0
PCB-1016	LESS THAN 0.50
PCB-1221	LESS THAN 0.50
PCB-1232	LESS THAN 0.50
PCB-1242	LESS THAN 0.50
PCB-1248	LESS THAN 0.50
PCB-1254	LESS THAN 1.0
PCB-1260	LESS THAN 1.0

METHOD REFERENCES

ACID FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
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BASE/NEUTRAL FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
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SAMPLE NUMBER: 60904291

GROUND WATER: 19765; TRIP BLK
PROJECT NO. 222.04

METHOD REFERENCES (CONTINUED)

PESTICIDE/PCB FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 608, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 608 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43321-43336, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8080, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

TABULAR LISTING OF REPORTS ENCLOSED

GERAGHTY AND MILLER

PRINTED ON: 10/24/8

PURCHASE ORDER NUMBER: PROJ. NO. E1042WA1

SAMPLE NUMBER	SAMPLE DESCRIPTION	DATE RECEIVED	PARAMETERS REQUESTED
61 10308	GROUNDWATER: GM4S; 9/24/86	10/01/86	HSL SEMI-VOLATILES; PESTICIDE/PCB'S
61 10309	GROUNDWATER: GM4D; 9/24/86	10/01/86	HSL SEMI-VOLATILES; PESTICIDE/PCB'S

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REPORT OF ANALYSIS

LORIN HUNTOON
GERAGHTY AND MILLER
3[illegible] EAST MICHIGAN STREET
SUITE 200
MILWAUKEE, WI 53202

SAMPLE NUMBER: 61000[illegible]0
DATE ENTERED: 10/01/8[illegible]
REPORT PRINTED: 10/24/8[illegible]

GROUNDWATER: GM4S; 9/24/86

PURCHASE ORDER NUMBER: PROJ. NO. E1042WA1

ACID FRACTION
(SEE B/N FRACTION - SEMIVOLATILE COMPOUND LIST)

BASE/NEUTRAL FRACTION

SEMIVOLATILE COMPOUNDS

COMPOUND NAME	MCG/L
PHENOL	LESS THAN 10
BIS(-2-CHLOROETHYL)ETHER	LESS THAN 10
2-CHLOROPHENOL	LESS THAN 10
1,3-DICHLOROBENZENE	LESS THAN 10
1,4-DICHLOROBENZENE	LESS THAN 10
BENZYL ALCOHOL	LESS THAN 10
1,2-DICHLOROBENZENE	LESS THAN 10
2-METHYLPHENOL	LESS THAN 10
BIS(2-CHLOROISOPROPYL)ETHER	LESS THAN 10
4-METHYLPHENOL	LESS THAN 10
N-NITROSO-DI-N-PROPYLAMINE	LESS THAN 10
HEXACHLOROETHANE	LESS THAN 10
NITROBENZENE	LESS THAN 10
ISOPHORONE	LESS THAN 10
2-NITROPHENOL	LESS THAN 10
2,4-DIMETHYLPHENOL	LESS THAN 10
BENZOIC ACID	LESS THAN 50
BIS(2-CHLOROETHOXY)METHANE	LESS THAN 10
2,4-DICHLOROPHENOL	LESS THAN 10
1,2,4-TRICHLOROBENZENE	LESS THAN 10
NAPHTHALENE	LESS THAN 10
4-CHLOROANILINE	LESS THAN 10
HEXACHLOROBUTADIENE	LESS THAN 10
4-CHLORO-3-METHYLPHENOL	LESS THAN 10
2-METHYLNAPHTHALENE	LESS THAN 10
HEXACHLOROCYCLOPENTADIENE	LESS THAN 10
2,4,6-TRICHLOROPHENOL	LESS THAN 10
2,4,5-TRICHLOROPHENOL	LESS THAN 50
2-CHLORONAPHTHALENE	LESS THAN 10

SAMPLE NUMBER: 61000308 PAGE 2

GROUNDWATER: GM4S; 9/24/96

BASE/NEUTRAL FRACTION (CONTINUED)

2-NITROANILINE	LESS THAN 50
DIMETHYL PHTHALATE	LESS THAN 10
ACENAPHTHYLENE	LESS THAN 10
3-NITROANILINE	LESS THAN 50
ACENAPHTHENE	LESS THAN 10
2,4-DINITROPHENOL	LESS THAN 50
4-NITROPHENOL	LESS THAN 50
DIBENZOFURAN	LESS THAN 10
2,4-DINITROTOLUENE	LESS THAN 10
2,6-DINITROTOLUENE	LESS THAN 10
DIETHYLPHTHALATE	LESS THAN 10
4-CHLOROPHENYL-PHENYLETHER	LESS THAN 10
FLUORENE	LESS THAN 10
4-NITROANILINE	LESS THAN 50
4,6-DINITRO-2-METHYLPHENOL	LESS THAN 50
N-NITROSODIPHENYLAMINE*(1)	LESS THAN 10
4-BROMOPHENYL-PHENYLETHER	LESS THAN 10
HEXACHLOROBENZENE	LESS THAN 10
PENTACHLOROPHENOL	LESS THAN 50
PHENANTHRENE	LESS THAN 10
ANTHRACENE	LESS THAN 10
DI-N-BUTYLPHTHALATE	1 J
FLUORANTHENE	LESS THAN 10
PYRENE	LESS THAN 10
BUTYLBENZYLPHTHALATE	LESS THAN 10
3,3'-DICHLOROBENZIDINE	LESS THAN 20
BENZO(A)ANTHRACENE	LESS THAN 10
BIS(2-ETHYLHEXYL)PHTHALATE	2 J
CHRYSENE	LESS THAN 10
DI-N-OCTYL PHTHALATE	LESS THAN 10
BENZO(B)FLUORANTHENE	LESS THAN 10
BENZO(K)FLUORANTHENE	LESS THAN 10
BENZO(A)PYRENE	LESS THAN 10
INDENO(1,2,3-CD)PYRENE	LESS THAN 10
DIBENZO(A,H)ANTHRACENE	LESS THAN 10
BENZO(G,H,I)PERYLENE	LESS THAN 10

*(1) CANNOT BE SEPARATED FROM DIPHENYLAMINE.

J - INDICATES AN ESTIMATED VALUE. MASS SPECTRAL DATA INDICATED THE PRESENCE OF A COMPOUND THAT MEETS THE IDENTIFICATION CRITERIA BUT THE RESULT IS LESS THAN THE SPECIFIED DETECTION LIMIT BUT GREATER THAN ZERO.

PESTICIDE/PCB FRACTION

COMPOUND NAME	MCG/L
ALPHA-BHC	LESS THAN 0.05
BETA-BHC	LESS THAN 0.05

SAMPLE NUMBER: 61000308 PAGE

GROUNDWATER: GM4S; 9/24/86

PESTICIDE/PCB FRACTION (CONTINUED)

DELTA-BHC	LESS THAN 0.05
GAMMA-BHC (LINDANE)	LESS THAN 0.05
HEPTACHLOR	LESS THAN 0.05
ALDRIN	LESS THAN 0.05
HEPTACHLOR EPOXIDE	LESS THAN 0.05
ENDOSULFAN I	LESS THAN 0.05
DIELDRIN	LESS THAN 0.10
4,4'-DDE	LESS THAN 0.10
ENDRIN	LESS THAN 0.10
ENDOSULFAN II	LESS THAN 0.10
4,4'-DDD	LESS THAN 0.10
ENDOSULFAN SULFATE	LESS THAN 0.10
4,4'-DDT	LESS THAN 0.10
METHOXYCHLOR	LESS THAN 0.50
ENDRIN KETONE	LESS THAN 0.10
CHLORDANE	LESS THAN 0.50
TOXAPHENE	LESS THAN 1.0
PCB-1016	LESS THAN 0.50
PCB-1221	LESS THAN 0.50
PCB-1232	LESS THAN 0.50
PCB-1242	LESS THAN 0.50
PCB-1248	LESS THAN 0.50
PCB-1254	LESS THAN 1.0
PCB-1260	LESS THAN 1.0

METHOD REFERENCES

ACID FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U. S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
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SAMPLE NUMBER: 61000308 PAGE 4

GROUNDWATER: GM4S; 9/24/86

METHOD REFERENCES (CONTINUED)

BASE/NEUTRAL FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCNNATI, OH (REVISED OCTOBER 1984)
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PESTICIDE/PCB FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 608, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 608 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43321-43336, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8080, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

REPORT OF ANALYSIS

LORIN HUNTOON
GERAGHTY AND MILLER
3[illegible] EAST MICHIGAN STREET
SUITE 200
MILWAUKEE, WI 53202

SAMPLE NUMBER: 610003
DATE ENTERED: 10/01/[illegible]
REPORT PRINTED: 10/24[illegible]

GROUNDWATER: GM4D; 9/24/86

PURCHASE ORDER NUMBER: PROJ. NO. E1042WA1

ACID FRACTION
(SEE B/N FRACTION - SEMIVOLATILE COMPOUND LIST)

BASE/NEUTRAL FRACTION

SEMIVOLATILE COMPOUNDS

COMPOUND NAME	MCG/L
PHENOL	LESS THAN 10
BIS(-2-CHLOROETHYL)ETHER	LESS THAN 10
2-CHLOROPHENOL	LESS THAN 10
1,3-DICHLOROBENZENE	LESS THAN 10
1,4-DICHLOROBENZENE	LESS THAN 10
BENZYL ALCOHOL	LESS THAN 10
1,2-DICHLOROBENZENE	LESS THAN 10
2-METHYLPHENOL	LESS THAN 10
BIS(2-CHLOROISOPROPYL)ETHER	LESS THAN 10
4-METHYLPHENOL	LESS THAN 10
N-NITROSO-DI-N-PROPYLAMINE	LESS THAN 10
HEXACHLOROETHANE	LESS THAN 10
NITROBENZENE	LESS THAN 10
ISOPHORONE	LESS THAN 10
2-NITROPHENOL	LESS THAN 10
2,4-DIMETHYLPHENOL	LESS THAN 10
BENZOIC ACID	LESS THAN 50
BIS(2-CHLOROETHOXY)METHANE	LESS THAN 10
2,4-DICHLOROPHENOL	LESS THAN 10
1,2,4-TRICHLOROBENZENE	LESS THAN 10
NAPHTHALENE	LESS THAN 10
4-CHLOROANILINE	LESS THAN 10
HEXACHLOROBUTADIENE	LESS THAN 10
4-CHLORO-3-METHYLPHENOL	LESS THAN 10
2-METHYLNAPHTHALENE	LESS THAN 10
HEXACHLOROCYCLOPENTADIENE	LESS THAN 10
2,4,6-TRICHLOROPHENOL	LESS THAN 10
2,4,5-TRICHLOROPHENOL	LESS THAN 50
2-CHLORONAPHTHALENE	LESS THAN 10

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GROUNDWATER: GM4D; 9/24/86

BASE/NEUTRAL FRACTION (CONTINUED)

2-NITROANILINE	LESS THAN 50
DIMETHYL PHTHALATE	LESS THAN 10
ACENAPHTHYLENE	LESS THAN 10
3-NITROANILINE	LESS THAN 50
ACENAPHTHENE	LESS THAN 10
2,4-DINITROPHENOL	LESS THAN 50
4-NITROPHENOL	LESS THAN 50
DIBENZOFURAN	LESS THAN 10
2,4-DINITROTOLUENE	LESS THAN 10
2,6-DINITROTOLUENE	LESS THAN 10
DIETHYLPHTHALATE	LESS THAN 10
4-CHLOROPHENYL-PHENYLETHER	LESS THAN 10
FLUORENE	LESS THAN 10
4-NITROANILINE	LESS THAN 50
4,6-DINITRO-2-METHYLPHENOL	LESS THAN 50
N-NITROSODIPHENYLAMINE*(1)	LESS THAN 10
4-BROMOPHENYL-PHENYLETHER	LESS THAN 10
HEXACHLOROBENZENE	LESS THAN 10
PENTACHLOROPHENOL	LESS THAN 50
PHENANTHRENE	LESS THAN 10
ANTHRACENE	LESS THAN 10
DI-N-BUTYLPHTHALATE	LESS THAN 10
FLUORANTHENE	LESS THAN 10
PYRENE	LESS THAN 10
BUTYLBENZYLPHTHALATE	LESS THAN 10
3,3'-DICHLOROBENZIDINE	LESS THAN 20
BENZO(A)ANTHRACENE	LESS THAN 10
BIS(2-ETHYLHEXYL)PHTHALATE	6 J
CHRYSENE	LESS THAN 10
DI-N-OCTYL PHTHALATE	LESS THAN 10
BENZO(B)FLUORANTHENE	LESS THAN 10
BENZO(K)FLUORANTHENE	LESS THAN 10
BENZO(A)PYRENE	LESS THAN 10
INDENO(1,2,3-CD)PYRENE	LESS THAN 10
DIBENZO(A,H)ANTHRACENE	LESS THAN 10
BENZO(G,H,I)PERYLENE	LESS THAN 10

*(1) CANNOT BE SEPARATED FROM DIPHENYLAMINE.

'J' INDICATES AN ESTIMATED VALUE. MASS SPECTRAL DATA INDICATED THE PRESENCE OF A COMPOUND THAT MEETS THE IDENTIFICATION CRITERIA BUT THE RESULT IS LESS THAN THE SPECIFIED DETECTION LIMIT BUT GREATER THAN ZERO.

PESTICIDE/PCB FRACTION

COMPOUND NAME	MCG/L
ALPHA-BHC	LESS THAN 0.05
BETA-BHC	LESS THAN 0.05

SAMPLE NUMBER: 61000309

GROUNDWATER: GM4D; 9/24/86

PESTICIDE/PCB FRACTION (CONTINUED)

DELTA-BHC	LESS THAN 0.05
GAMMA-BHC (LINDANE)	LESS THAN 0.05
HEPTACHLOR	LESS THAN 0.05
ALDRIN	LESS THAN 0.05
HEPTACHLOR EPOXIDE	LESS THAN 0.05
ENDOSULFAN I	LESS THAN 0.05
DIELDRIN	LESS THAN 0.10
4,4'-DDE	LESS THAN 0.10
ENDRIN	LESS THAN 0.10
ENDOSULFAN II	LESS THAN 0.10
4,4'-DDD	LESS THAN 0.10
ENDOSULFAN SULFATE	LESS THAN 0.10
4,4'-DDT	LESS THAN 0.10
METHOXYCHLOR	LESS THAN 0.50
ENDRIN KETONE	LESS THAN 0.10
CHLORDANE	LESS THAN 0.50
TOXAPHENE	LESS THAN 1.0
PCB-1016	LESS THAN 0.50
PCB-1221	LESS THAN 0.50
PCB-1232	LESS THAN 0.50
PCB-1242	LESS THAN 0.50
PCB-1248	LESS THAN 0.50
PCB-1254	LESS THAN 1.0
PCB-1260	LESS THAN 1.0

METHOD REFERENCES

ACID FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

SAMPLE NUMBER: 61000309

GROUNDWATER: GM4D; 9/24/86

METHOD REFERENCES (CONTINUED)

BASE/NEUTRAL FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 625, U.S. EPA, CINCNNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 625 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43385-43406, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8270, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

PESTICIDE/PCB FRACTION
METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA PUBLICATION NO. 600/4-82-057, METHOD 608, U.S. EPA, CINCINNATI, OH (REVISED OCTOBER 1984)
U.S. EPA METHOD 608 (FEDERAL REGISTER, VOLUME 49, NO. 209, PG. 43321-43336, OCTOBER 26, 1984)
TEST METHODS FOR EVALUATING SOLID WASTE, EPA PUBLICATION NO. SW-846, SECOND EDITION, METHOD 8080, U.S. EPA, WASHINGTON, DC (REVISED APRIL 1984)

APPENDIX E

INORGANIC DATA FROM WEST SIDE WELLS (WAUSAU, WI)

APPENDIX E

INORGANIC CHEMICAL DATA FROM
WEST SIDE WELLS (WAUSAU, WI)

	Detection Limit	GM-1S 9/15/86	C-2S 9/15/86	C-4S 9/17/86	C-4D 9/17/86	C-4SP 9/17/86	W-1D 9/15/86	R-2D 9/15/86	R-4D 9/15/86	C-1S 9/15/86	R-1S 9/15/86	R-1D 9/15/86	R-2S 9/15/86	R-3S 9/15/86	R-3D 9/15/86	Blank 9/15/86	Trip Blank
T. Alkalinity mg/l $CaCO_3$	20.	32.	X	211.	56.	--	120.	61.	38.	35.	44.	43.	83.	65.	47.	X	X
Cl, mg/l	0.1	1.9	27.7	18.8	21.0	--	5.1	20.4	28.7	35.4	18.3	21.6	15.6	21.1	21.1	X	X
SO_4, mg/l	0.5	10.8	17.1	242.	35.4	--	3.4	30.9	29.0	17.4	29.0	23.9	7.2	20.8	25.0	X	X
$NO_3 + NO_2$, mg/l as N	0.5	3.4	5.1	13.8	9.10	--	X	X	1.8	3.3	2.8	8.3	X	0.6	6.0	X	X
Ca, mg/l	0.008	12.2	28.8	99.2	41.0	--	43.5	29.3	28.1	36.5	23.1	33.4	23.9	23.6	30.2	0.063	0.038
Fe, mg/l	0.004	0.032	X	0.006	X	0.053	0.054	0.007	0.022	0.013	0.023	0.008	0.047	0.199	0.015	X	X
K, mg/l	1.5	2.6	X	12.1	2.3	—	3.5	X	3.5	4.7	6.4	X	6.1	6.0	3.5	3.0	X
Mg, mg/l	0.026	2.98	6.88	34.2	10.8	—	2.29	12.8	14.5	5.11	7.06	10.1	7.04	6.65	12.2	X	X
Na, mg/l	0.027	2.83	17.8	61.9	11.9	--	3.51	8.68	12.8	40.9	16.6	10.9	8.72	18.4	8.32	0.35	0.36
Pb, mg/l	0.005	--	--	0.025	--	0.024	—										

X = Analyzed but not detected

222.04 906:RPT:foley1223A

APPENDIX F

LABORATORY SHEETS FOR VOC DATA

ZIMPRO INC.
ENVIRONMENTAL & ENERGY SYSTEMS

October 15, 1986

RMT, Inc.
Suite 124
1406 East Washington Ave.
Madison, WI 53703

Attn: Tom Stotzenberg

Re: Project No. 222.04 PO #12748

Attached are the results for the water samples submitted September 17, 1986. Also attached is the chain of custody record and Zimpro's sample check-in form.

The VOC analysis was done using EPA Method 601 with PID (10.2 eV) and Hall detectors in series (Tables 1-8). The cis and trans-1,2-dichloroethylene are not separated by this analysis and are calculated based on a trans-1,2-dichloroethylene standard. Dilutions were necessary for some of the samples. Those samples appear on separate tables with detection limits reflecting the dilutions.

Inorganic results are included in Tables 9 through 11. Total alkalinity was done according to EPA 310.1. Chloride, nitrate + nitrite and sulfate were done by ion chromatography (EPA 300.0). Metals, except lead, were done by ICP emission spectroscopy (EPA 200.7). Lead was analyzed by furnace AA (EPA 239.2) per your request.

If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie-Heuser

Mary C. Christie-Heuser
Instrumentation Chemist

MCCH/ls

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474
TELEPHONE (715) 359-7211 TELEX 29-0495

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 1

RMT
VOC Analysis (ug/l)

	Detection Limit	W-9I 9-16-86	M-10 9-15-86	GM-1S 9-16-86	GM-2S 9-15-86	C-3S 9-17-86
Carbon Tetrachloride	0.1	X	X	X	X	108.
Chloroform	0.1	X	X	0.3	X	47.5
1,2-Dichloroethane	0.3	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	X	X	X	X
Dichloromethane	0.2	X	X	X	X	X
Tetrachloroethylene	0.1	X	X	X	X	0.3
Toluene	0.1	X	X	X	X	0.1
1,1,1-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	X	X	X	X	8.3
Vinyl Chloride	2.0	X	X	X	X	X
Analytical No.		21944	21946	21947	21950	21954

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 2

RMT
VOC Analysis (ug/l)

	Detection Limit	C-4S 9-17-86	C-4D 9-17-86	C-6S 9-17-86	C-7S 9-17-86	W-5S 9-17-86
Carbon Tetrachloride	Ø.1	X	X	X	X	X
Chloroform	Ø.1	Ø.2	1.1	Ø.7	X	Ø.2
1,2-Dichloroethane	Ø.3	Ø.3	X	X	X	X
1,2-Dichloroethylene	Ø.3	5.7	8.1	X	X	X
Dichloromethane	Ø.2	X	X	X	X	X
Tetrachloroethylene	Ø.1	5.8	X	Ø.2	X	X
Toluene	Ø.1	X	Ø.2	X	X	X
1,1,1-Trichloroethane	Ø.1	X	Ø.1	X	28.Ø	X
Trichloroethylene	Ø.1	2.5	41.9	X	1Ø.5	Ø.1
Vinyi Chloride	2.Ø	X	X	X	X	X
Analytical No.		21955	21958	21961	21962	21963

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 3

RMT
VOC Analysis (ug/l)

	Detection Limit	DUP 1 9-15-86	W-1D 9-16-86	C-1S 9-17-86	R-1S 9-16-86	R-1D 9-16-86
Carbon Tetrachloride	Ø.1	X	X	X	X	X
Chloroform	Ø.1	X	X	X	X	2.1
1,2-Dichloroethane	Ø.3	X	X	X	X	X
1,2-Dichloroethylene	Ø.3	X	X	X	X	X
Dichloromethane	Ø.2	X	X	X	X	X
Tetrachloroethylene	Ø.1	X	X	X	X	Ø.2
Toluene	Ø.1	X	X	X	X	X
1,1,1-Trichloroethane	Ø.1	X	X	X	X	X
Trichloroethylene	Ø.1	X	Ø.1	X	Ø.1	X
Vinyl Chloride	2.Ø	X	X	X	X	X
Analytical No.		21965	21967	21976	21979	21982

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 4

RMT
VOC Analysis (ug/l)

	Detection Limit	R-2S 9-16-86	R-3S 9-16-86	R-3D 9-16-86	W-3I 9-15-86	W-3D 9-15-86
Carbon Tetrachloride	0.1	X	X	X	X	X
Chloroform	0.1	X	X	0.9	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,2-Dichloroethylene	0.3	14.4	4.7	0.4	X	X
Dichloromethane	0.2	X	X	X	X	X
Tetrachloroethylene	0.1	X	X	X	X	X
Toluene	0.1	X	X	X	X	X
1,1,1-Trichloroethane	0.1	X	X	0.1	X	X
Trichloroethylene	0.1	29.2	49.7	4.4	X	X
Vinyl Chloride	2.0	X	X	X	X	X
Analytical No.		21985	21988	21991	21994	21995

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 5

RMT
VOC Analysis (ug/l)

	Detection Limit	W-4S 9-15-86	W-4D 9-15-86	W-7S 9-15-86	Blk 9-16-86	Field Blank 9-17-86	Trip Blank
Carbon Tetrachloride	0.1	X	X	X	X	X	X
Chloroform	0.1	0.2	X	0.1	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	X	X	X	X	X
Dichloromethane	0.2	X	X	X	X	X	X
Tetrachloroethylene	0.1	X	X	X	X	X	X
Toluene	0.1	X	X	0.2	X	0.1	X
1,1,1-Trichloroethane	0.1	X	X	X	0.2	0.2	X
Trichloroethylene	0.1	18.8	1.4	62.9	X	X	X
Vinyl Chloride	2.0	X	X	X	X	X	X
Analytical No.		21996	21997	21998	21999	22003	22004

X = Analyzed but not detected

ZIMPRO
ENVIRONMENTAL & ENERGY SYSTEMS

Table 6

RMT
VOC Analysis (ug/l)

	Detectopm Limit	M-6 9-16-86
Carbon Tetrachloride	Ø.5	X
Chloroform	Ø.5	X
1,2-Dichloroethane	1.5	X
1,2-Dichloroethylene	1.5	2.Ø
Dichloromethane	1.Ø	X
Tetrachloroethylene	Ø.5	X
Toluene	Ø.5	X
1,1,1-Trichloroethane	Ø.5	X
Trichloroethylene	Ø.5	226.
Vinyl Chloride	1Ø.Ø	X
Analytical No.		21945

X = Analyzed but not detected

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Table 7

RMT
VOC Analysis (ug/l)

	Detectopm Limit	C-2S 9-17-86
Carbon Tetrachloride	2.5	X
Chloroform	2.5	X
1,2-Dichloroethane	7.5	X
1,2-Dichloroethylene	7.5	10.0
Dichloromethane	5.0	5.0
Tetrachloroethylene	5.0	X
Toluene	2.5	5.0
1,1,1-Trichloroethane	2.5	X
Trichloroethylene	2.5	615.
Vinyl Chloride	50.0	X
Analytical No.		21951

X = Analyzed but not detected

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ENVIRONMENTAL & ENERGY SYSTEMS

Table 8

RMT
VOC Analysis (ug/l)

	Detection Limit	DUP 2 9-17-86	R-2D 9-16-86	R-4D 9-17-86
Carbon Tetrachloride	5.0	X	5.0	X
Chloroform	5.0	X	X	X
1,2-Dichloroethane	15.0	X	X	X
1,2-Dichloroethylene	15.0	705.	30.0	725.
Dichloromethane	10.0	X	X	X
Tetrachloroethylene	5.0	10.0	X	15.0
Toluene	5.0	X	X	X
1,1,1-Trichloroethane	5.0	X	X	X
Trichloroethylene	5.0	2,835.	1,135.	3,185.
Vinyl Chloride	100.	X	X	X
Analytical No.		21966	21970	21976

X = Analyzed but not detected

APPENDIX C

VOC DEPTH PROFILES AT R-4D AND R-1D (AUGUST 12-14, 1986)

APPENDIX C

VOC DEPTH PROFILES AT R-4D AND R-1D
AUGUST 12-14, 1986

	Detection Limit	R-4D(36)	R-4D(56)	R-4D(76)	R-4D(96)	R-4D(136)
Benzene	0.2	X	X	X	X	X
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	X	X	X	X	X
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	1.8	X	0.4	0.6	X
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	X	X	X	X	X
1,1-Dichloroethane	0.1	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,1-Dichloroethylene	1.0	X	X	X	X	X
1,2-Dichloroethylene	0.3	13.9	X	X	X	345.
Dichloromethane	0.2	X	X	X	X	X
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.7	X	X	X	7.5
Toluene	0.1	X	X	X	X	X
1,1,1-Trichloroethane	0.1	2.9	X	X	X	X
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	590.	0.9	3.2	4.1	790.
Vinyl Chloride	2.0	X	X	X	X	X
Trichlorofluoromethane	0.2	X	X	X	X	X
Dichlorodifluoromethane	2.0	X	X	X	X	X

X Analyzed But Not Detected

	Detection Limit	R-4D(156)	R-1D(37)	R-1D(57)	R-1D(117)
Benzene	0.2	X	X	X	X
Bromoform	0.5	X	X	X	X
Bromomethane	1.0	X	X	X	X
Carbon Tetrachloride	0.1	X	X	X	X
Chlorobenzene	0.1	X	X	X	X
Chloroethane	1.0	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X
Chloroform	0.1	X	X	X	0.2
Chloromethane	6.0	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X
Dichlorobromomethane	0.1	X	X	X	X
1,1-Dichloroethane	0.1	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X
1,1-Dichloroethylene	1.0	X	X	X	X
1,2-Dichloroethylene	0.3	0.5	X	X	X
Dichloromethane	0.2	X	X	X	X
1,2-Dichloropropane	0.5	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X
Ethylbenzene	0.2	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X
Tetrachloroethylene	0.1	X	X	X	0.6
Toluene	0.1	X	X	X	0.2
1,1,1-Trichloroethane	0.1	X	X	X	X
1,1,2-Trichloroethane	0.1	X	X	X	X
Trichloroethylene	0.1	2.2	X	X	X
Vinyl Chloride	2.0	X	X	X	X
Trichlorofluoromethane	0.2	X	X	X	X
Dichlorodifluoromethane	2.0	X	X	X	X

APPENDIX A.4

INVESTIGATION OF AN ABANDONED CITY OF WAUSAU LANDFILL, CH2M HILL, 1986

INVESTIGATION OF AN ABANDONED CITY OF WAUSAU LANDFILL

for

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

February 14, 1986

by

CH2M HILL, CENTRAL
310 West Wisconsin Avenue
Milwaukee, Wisconsin 53203

GLT187/17

RECEIVED
FEB 24 1986
U.S. EPA, REGION 5
WASTE MANAGEMENT DIVISION
HAZARDOUS WASTE ENFORCEMENT BRANCH

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B	Description of Field Methods
C	Boring Logs and Piezometer Installation Sketches
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GLT187/14

INVESTIGATION OF AN ABANDONED CITY OF WAUSAU LANDFILL

INTRODUCTION

In October 1985, CH2M HILL began a limited investigation of an abandoned City of Wausau Landfill for the Wisconsin Department of Natural Resources (DNR). This landfill is in the NW 1/4, SE 1/4, Section 23, T29N, R7E, City of Wausau, Marathon County (Figure 1).

OBJECTIVES

The objective of this investigation is to determine if contaminants from the landfill are entering the groundwater. Ultimately, the DNR is concerned about contaminants from the landfill affecting the City of Wausau water supply wells.

SCOPE

The scope of the investigation was defined by the DNR and included:

- A review of existing information available from the DNR, the City of Wausau, and published hydrogeologic information concerning the landfill, its operating history, its environmental setting, and documented contamination
- A hydrogeologic investigation in which six monitoring wells and three piezometers were to be installed
- Collection and analysis of groundwater and soil samples to determine if VOC contamination exists
- Analysis and reporting of data.

A copy of the DNR scope of work and CH2M HILL's work plan are included in Appendix A. Because of difficult drilling conditions, Gary Kulibert, the DNR's project manager, agreed to modify the scope to require installation of only one piezometer. Metals analyses, which were not included in the original scope of work, were performed on some of the soil and water samples because of foundry sand recovered from one boring.

BACKGROUND INFORMATION

PREVIOUS INVESTIGATIONS

In 1985, the Weston-Sper Technical Assistance Team prepared

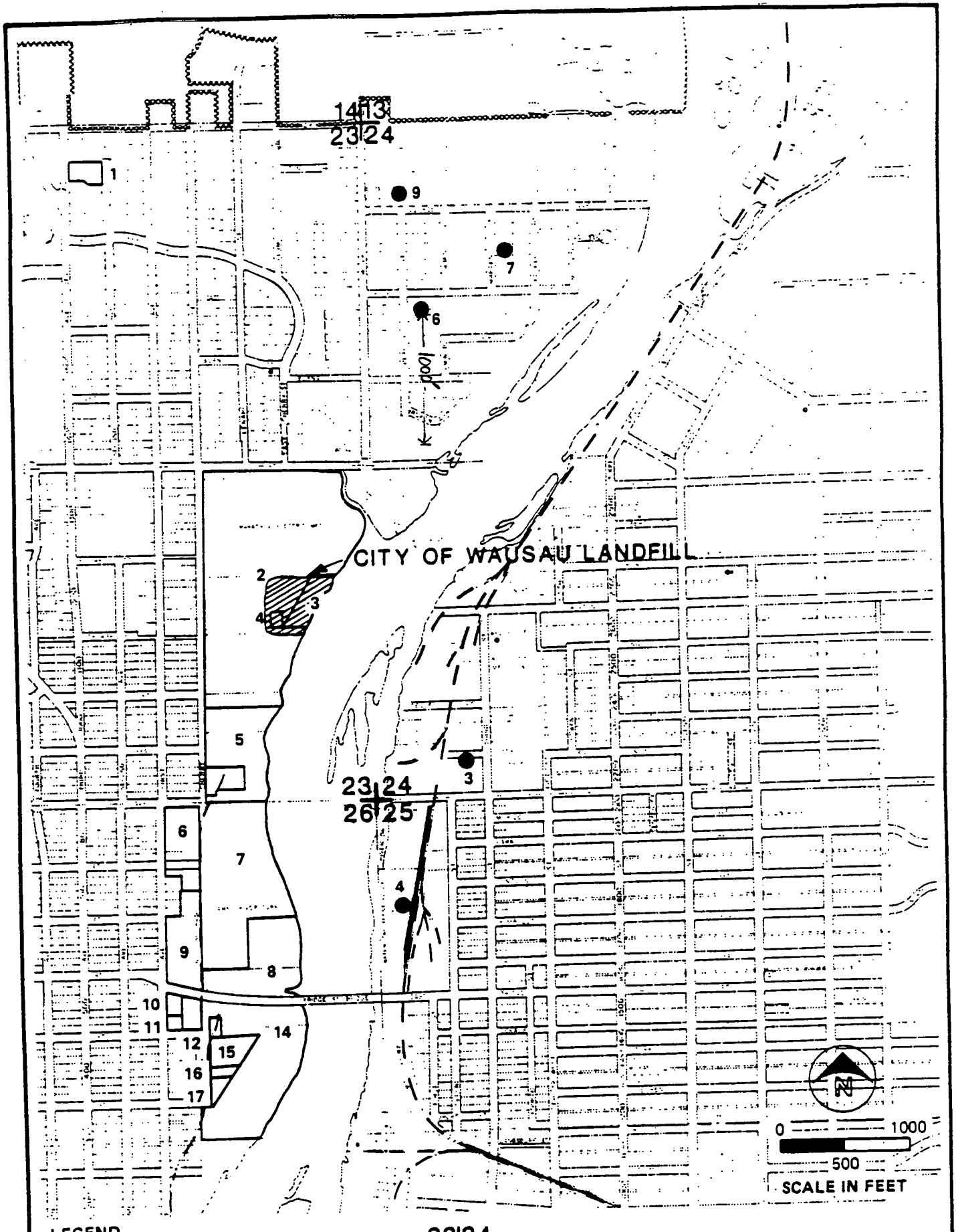


FIGURE 1.
Location Map.

CH2MHILL

Table 1
MANUFACTURING LAND OWNERSHIP WITHIN
ONE-HALF MILE OF MARATHON ELECTRIC

Map No.	Owner	Type of Activity on Property
1	George A. Digman	Insulation Firm
2	Marathon Electric Mfg.	
3	City of Wausau	Vacant Land
4	Wisconsin Public Services Corp.	Electric Substation
5	Schuette Building Center, Inc.	Lumber Yard and Building Materials Storage
6	Employers Mutual Insurance Co.	Offices and parking
7	Equitable Life Mortgage & Realty Invest.	Fiberboard containers
8	James River-Dixie Northern, Inc.	Fiberboard Containers and Printing
9	Mortenson Lumber Co.	Lumber yard
10	C.J. Crooks	Bakery Outlet
11	James A. Gierl Po-Jo Enterprises	Equipment Rental Communications Equipment
12	C.J. Crooks	Canned Goods Outlet
13	Gerritt Vander Geest	
14	S.W.E.D. Design Structures, Inc. L.C./B&K Enterprises, Inc.	Stucco and stone
15	Commonwealth Telephone Co.	Truck storage (GTE)
16	Northway Rental	Communications Rental/ Tree Experts
17	United Machine Company	Machine/Welding Shop

NOTES:
1) Map number refers to Figure 1.
2) Ownership determined from tax assessor's files.
3) Type of business refers to current business conducted on property, where known.

GLT187/13

a report for the U.S. EPA of their investigation of volatile organic contamination in the Wausau water supply wells. Part of this investigation included the installation and sampling of monitoring wells and a seismic refraction survey in the area of city well No. 6.

Several reports from the University of Wisconsin Extension, Geological and Natural History Survey provided general background concerning the geology and hydrogeology of the site.

SITE DESCRIPTION

The City of Wausau landfill is located on the west bank of the Wisconsin River in an abandoned sand and gravel quarry. It appears that the quarry was filled to the existing ground surface, then any depressions in the surrounding area were filled to form a flat surface. The approximate boundary of the landfill is shown in Figure 2. This boundary is based on an aerial photograph taken on September 28, 1948.

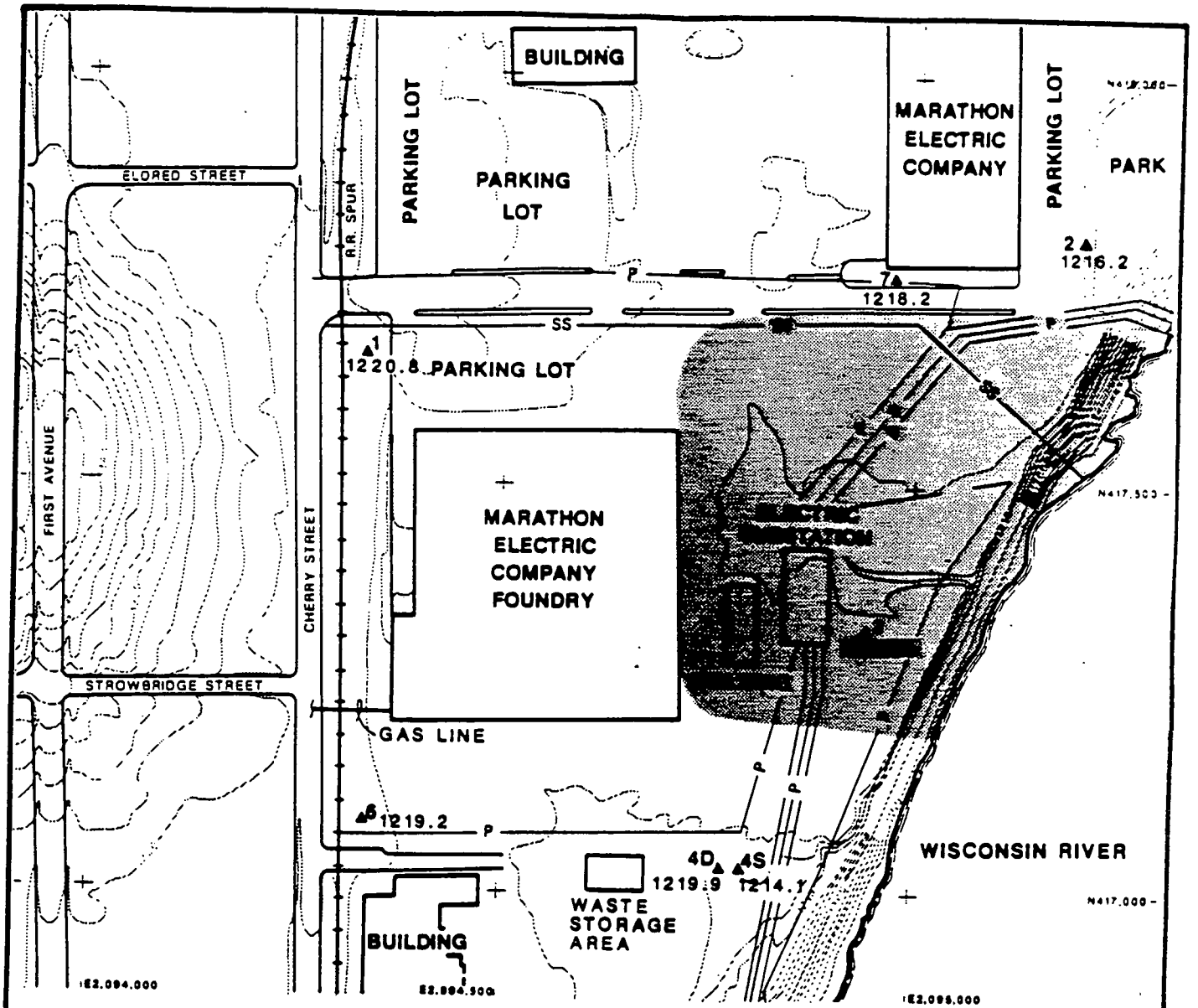
The elevation across the site ranges from 1,218 feet msl on the west to 1,210 feet msl at the top of the river bank (Figure 2), which slopes steeply to the river. The water level in the river is controlled by a dam located about 5 miles south of the landfill.

Most of the landfilled area was purchased from the City of Wausau by Marathon Electric in 1965 to provide space for parking and plant expansion. In 1969 a foundry was constructed on the southwest part of the property. This foundry was expanded to the east in 1978. To the east of the foundry, Wisconsin Public Services has an electric substation. To the north and northeast of the foundry are parking lots paved with a few inches of asphalt. As indicated in Table 1 and Figure 1, the City of Wausau retains title to the part of the filled area adjacent to the Wisconsin River.

SITE HISTORY

The landfill operated from about 1948 to 1955. During this time the landfill received residential, industrial, and commercial wastes from Wausau. People have reported seeing barrels of industrial wastes buried in the landfill (DNR, undated). There is no documentation of the amounts and types of wastes landfilled or the method of landfilling employed. Tires, demolition debris, and miscellaneous wastes were observed along the river bluff south of the landfilled area. The area north of the landfill that is currently occupied by Marathon Electric Company's offices was the site of a sawmill until about 1948 when it was purchased by its present owner.

In 1982, groundwater on the east side of the Wisconsin River was determined to be contaminated. Later it was discovered



LEGEND

- APPROXIMATE AREA OF LANDFILL
- TOPOGRAPHIC CONTOURS 2' CONTOUR INTERVAL
- —P— OVERHEAD POWERLINES
- —SS— STORM SEWER
- 6 / 1220.2 PIEZOMETER OR MONITORING WELL WITH ELEVATION OF GROUND SURFACE IN FEET MSL

NOTE: Topography from orthophotographic mapping for City of Wausau SE 1/4 Section 23 T29N, R7E prepared by Aero-Metric Engineering, Inc.

N

0 200

100

SCALE IN FEET

FIGURE 2.
Boring Location Plan.

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that well No. 6 (Figure 1), located about one-third mile northeast of the landfill, was contaminated with trichloroethylene (TCE) in the 70 to 260 parts per billion (ppb) range. Monitoring wells around well No. 6 did not detect TCE in significant concentrations. As a result of this observed contamination, potential sources, including the landfill, came under investigation.

ENVIRONMENTAL SETTING

The landfill is located on the west bank of the Wisconsin River. The soils underlying the site are outwash and alluvial sand and gravel. Bedrock underlying the site is Cambrian syenite, a rock type similar to granite with less quartz (La Berge and Meyers, 1983). The bedrock on the east side of the river is a Cambrian age rhyolite. The contact between the syenite and rhyolite is buried beneath the sand and gravel deposits the Wisconsin River valley.

Depth to the rock in the area is variable because of erosion and faulting of the bedrock. Bedrock outcrops were observed to the west of the site and a bedrock topography map based on seismic and drilling data has indicated that a bedrock ridge trending northwest-southeast may exist northeast of the site (Weston, 1985). The depth to rock in the Wisconsin River valley may be as much as 160 feet.

Both the sand and gravel deposits and the bedrock produce potable water in the Wausau area. The water supply for the City of Wausau comes from high-yield wells completed at depths of approximately 100 feet in the sand and gravel along the Wisconsin River. Well locations are shown in Figure 1. This aquifer, forming a strip about 1/2-mile wide along the Wisconsin River, has a maximum potential yield to fully developed wells in the range of 10 to 500 gallons per minute (gpm). From an area just north of the landfill and extending south through Wausau, Rothschild, and Schofield is a wider area with maximum potential yields in the 500 to 1,000 gpm range (Lippet and Hennings, 1981). Recharge to this aquifer is primarily from surface infiltration. Some recharge may also come from the underlying bedrock aquifer.

On either side of the sand and gravel aquifer, the crystalline bedrock is the major aquifer, producing maximum yields of less than 20 gpm. To the west of the landfill about a mile, this maximum yield drops to less than 5 gpm (Lippet and Hennings, 1981).

Groundwater levels in the sand and gravel aquifer appear to be closely related to levels in the Wisconsin River. Fluctuations in the river level are quickly reflected in nearby monitoring wells (Kulibert, personal communication). Water levels in monitoring wells have also been related to pumping

from the City of Wausau water supply wells. While monitoring water levels in a well about 1,000 feet south of the water supply well, the Weston-Sper Technical Assistance Team correlated 6- to 12-inch fluctuation in static water levels to pumping that had occurred within the previous hour at city well No. 6 (Weston, 1985).

Figure 3 shows the generalized water table contours, consisting of both the bedrock and sand and gravel aquifers. Just north of the landfill, the contours show that groundwater flow is from the northwest to the river. At the landfill, the flow is due east through the landfill to the river.

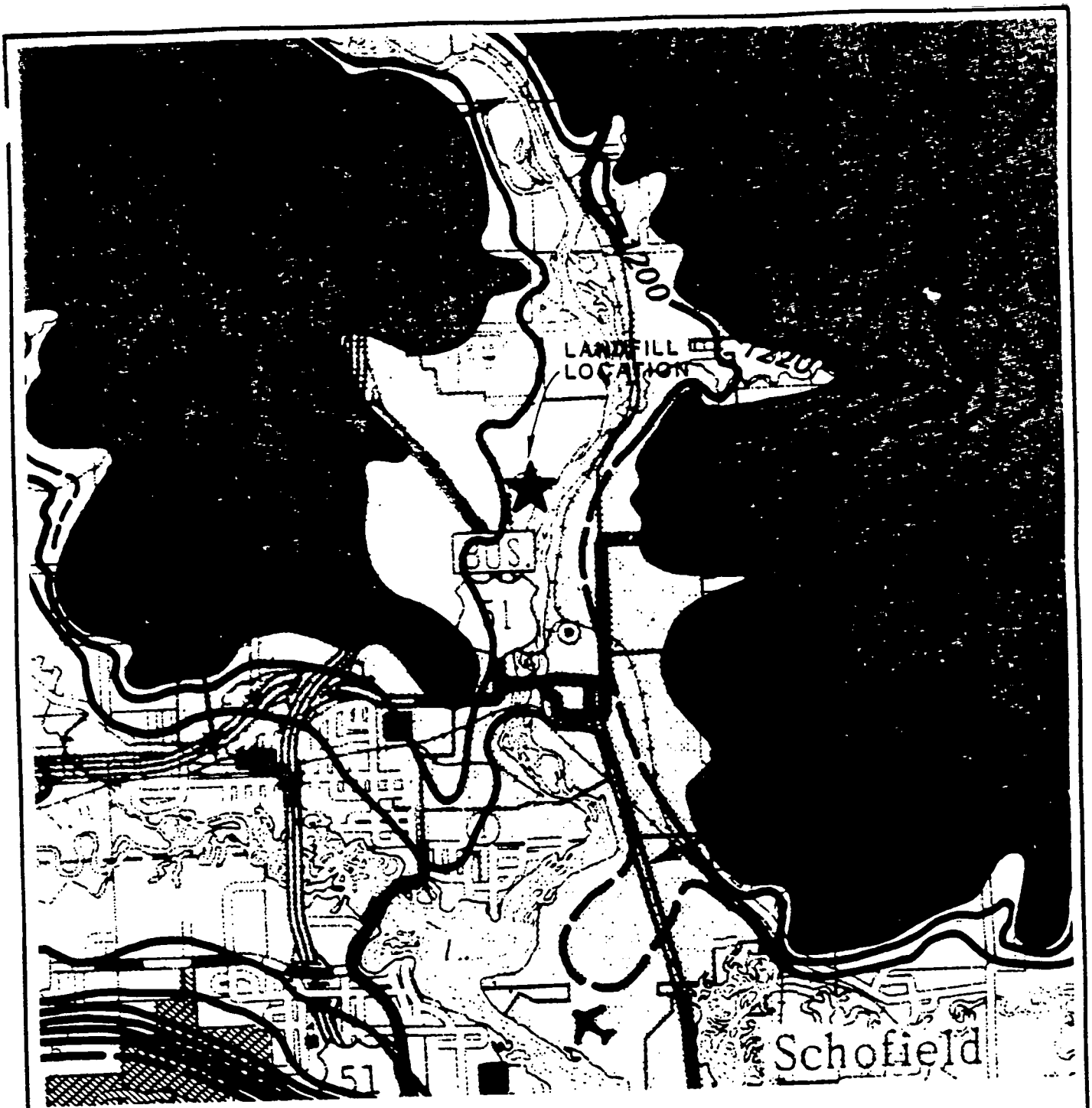
FIELD INVESTIGATIONS

Between November 11 and November 14, 1985, six monitoring wells and one piezometer were installed at the locations shown in Figure 2. Drilling was performed by Twin Cities Testing of Wausau. The borings for monitoring wells 1, 2, 3, 4D, and 7 were advanced using 3.25-inch inside diameter hollow stem augers and a CME-45 drill rig. Soil samples were collected with a standard split-spoon sampler according to ASTM D1586 (Appendix B). The split-spoon sampler was washed in trisodium phosphate (TSP) and water between samples and the drill rig and drilling equipment were steam cleaned between each boring.

Borings 4D and 6 were advanced using mud rotary techniques and a CME-55 drill rig. Bentonite mud was used to keep the borehole open and to remove cuttings. Soil samples were collected with a split-spoon sampler in boring 4D every 5 feet from 35 to 45 feet and every 10 feet to the total depth of 106 feet. The sampler was rinsed with TSP and water between samples and the drill rig was steam cleaned prior to drilling each hole. Logs of the borings are in Appendix C.

The dense granular materials encountered in the borings made it impractical to collect undisturbed soil samples. Because of boulders or cobbles encountered at boring locations 1 and 6, the deep borings planned for these locations were not drilled.

During the drilling program, it was necessary to use drilling water from three different sources, because of contamination in local water supplies. Samples of the drilling water were taken to Zimpro Laboratory in Rothschild for analysis (Table 2). Water from all three sources was used for drilling mud in boring 6. Boring 4D was advanced using only water from Lotz Readimix. In the remaining borings, water was only used to hydrate the bentonite pellets and to mix the backfill slurry. The source of water used in these monitoring wells is indicated on the piezometer installation sketches (Appendix C).



EXPLANATION

- Elevation of water table, 20-ft. interval. Datum is mean sea level
- Areas with 40 ft. interval
- Probable location of water table
- Inferred location of water table
- ? Location of water table unknown, insufficient data
- Half interval, 10-ft.
- Direction of ground-water movement
- Ground-water divide, approximate location
- Probable ground-water divide
- Federal/state lands

Data have not been field checked.

SOURCE: Lippelt & Hennings, 1981

FIGURE 3.
REGIONAL GROUNDWATER CONTOURS.

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TABLE 2
VOC DATA FOR DRILL WATER
(ug/l)

	DETECTION LIMIT	TRIP BLANK	WB-HSA-1	WB-HSA-2	WB-HSA-3	WB-ROT-1	WB-ROT-2	WB-ROT-4
Chloroform	0.1	ND	68.4	0.1	0.1	70.6	0.2	ND
Dibromochloromethane	0.1	ND	0.2	ND	ND	0.2	ND	ND
Dichlorobromomethane	0.1	ND	4.5	ND	ND	4.2	ND	ND
Ethylbenzene	0.2	ND	ND	ND	ND	ND	0.4	ND
Tetrachloroethylene	0.1	ND	0.1	ND	ND	0.1	0.3	0.1
Toluene	0.1	ND	ND	0.4	0.2	0.5	1.2	ND
Trichloroethylene	0.1	ND	1.0	ND	ND	0.4	ND	ND
Vinyl Chloride	0.5	ND	ND	ND	ND	ND	0.7	ND
Dichloromethane	0.1	3.0	ND	ND	ND	ND	ND	ND
WATER SOURCE		Zimpro	Wausau	Lotz	Lotz	Wausau	Weston	Lotz

NOTES: Zimpro = Zimpro Analytical Services in Rothschild, Wisconsin
Wausau = City of Wausau water supply
Lotz = Lotz Readimix, heated water from City of Wausau supply
Weston = City of Weston water supply

Representative samples of each formation encountered were sent for physical analysis. The analyses are described in

Appendix B. The results of the analyses are summarized in Table 3 and the data sheets are in Appendix D.

The monitoring wells were installed with approximately 10 feet of screen below the current water table and 5 feet of screen above the water table to monitor fluctuations of the water table. The piezometer was installed with 5 feet of screen at the bottom of the boring. Well installation sketches are in Appendix C.

At least 100 gallons of water was pumped from each monitoring well. At wells 4D and 6, a volume of water was removed to equal at least five times that used in drilling the hole. The flow from all wells, except 1S, was free of sediment.

RESULTS OF INVESTIGATION

HYDROGEOLOGY

The material removed from the borings was primarily sand that appear to be glacial outwash or alluvial deposits from the Wisconsin River. Profiles through the borings are presented in Figures 4 and 5. Locations of the profiles are shown in Figure 6. The soil ranged from fine sand to coarse sand and gravel. Cobbles and boulders were encountered in borings 1 and 6. These may be colluvial deposits from the granite bedrock or alluvial deposits. The cuttings from the rotary rig at the bottom of boring 6 looked like chips from the granite bedrock, which may indicate that the bottom of this boring was at or near the top of rock.

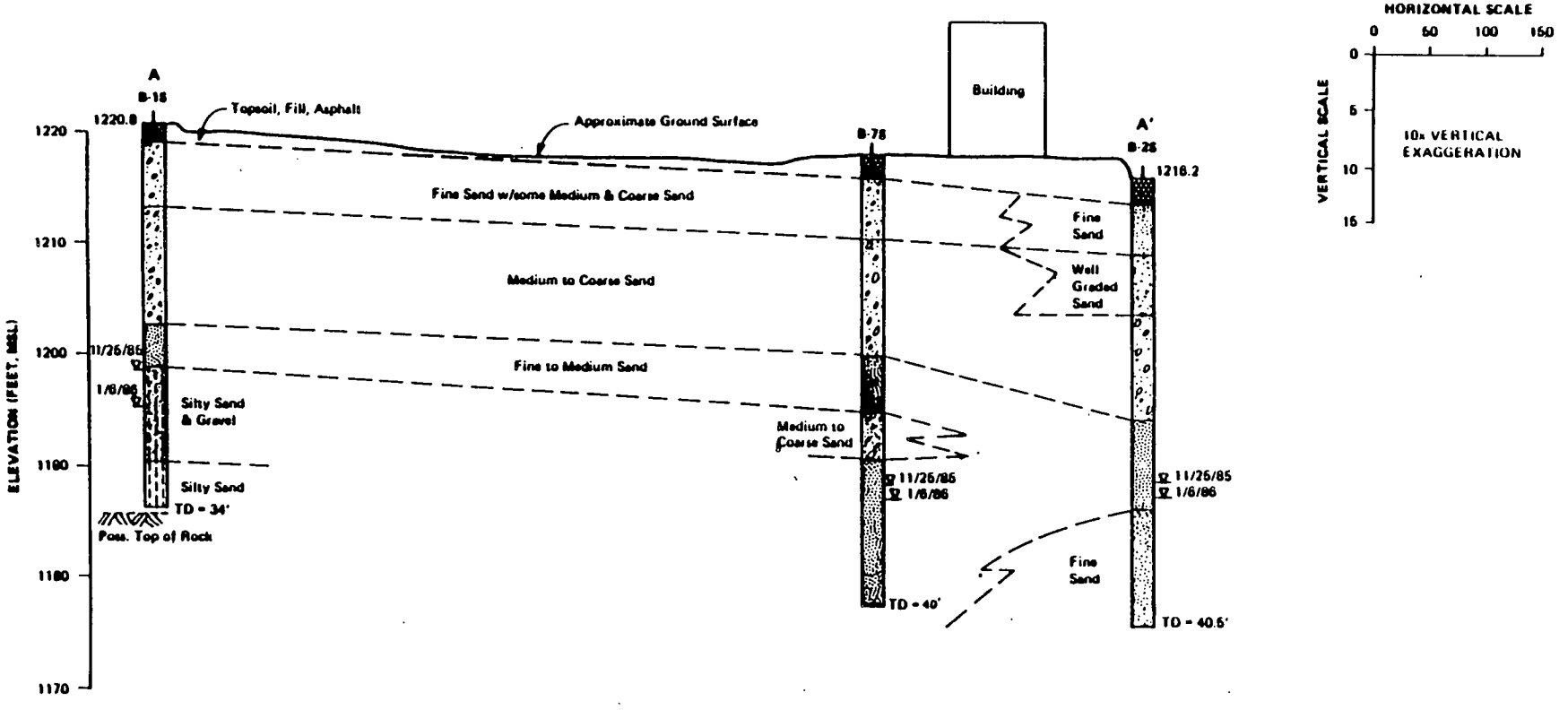
With the exception of the silty sand and gravel in boring 1S, the soils recovered from the boreholes contained less than 5 percent fine material (clay or silt). Most of the samples were poorly graded sand. All of the borings encountered fine to very fine sand near the bottom of the hole. Calculated permeabilities based on the grain size analyses ranged from 7×10^{-2} to 5×10^{-3} centimeters per second, with the poorly graded coarser sand and gravel being near the high end of this range.

Fill was encountered at locations 3 and 4. The fill at location 4 included rubbish and what appeared to be foundry sand.

Based on the groundwater and river level measurements on November 15 and 25, 1985 (Table 4 and Figure 6), it appears that the groundwater generally flows from northwest to southeast toward the river. The gradient to the west of the landfill is much greater than that under the landfill, which may be reflecting the change in transmissivity from the frac-

TABLE 3
MECHANICAL ANALYSES OF SOILS

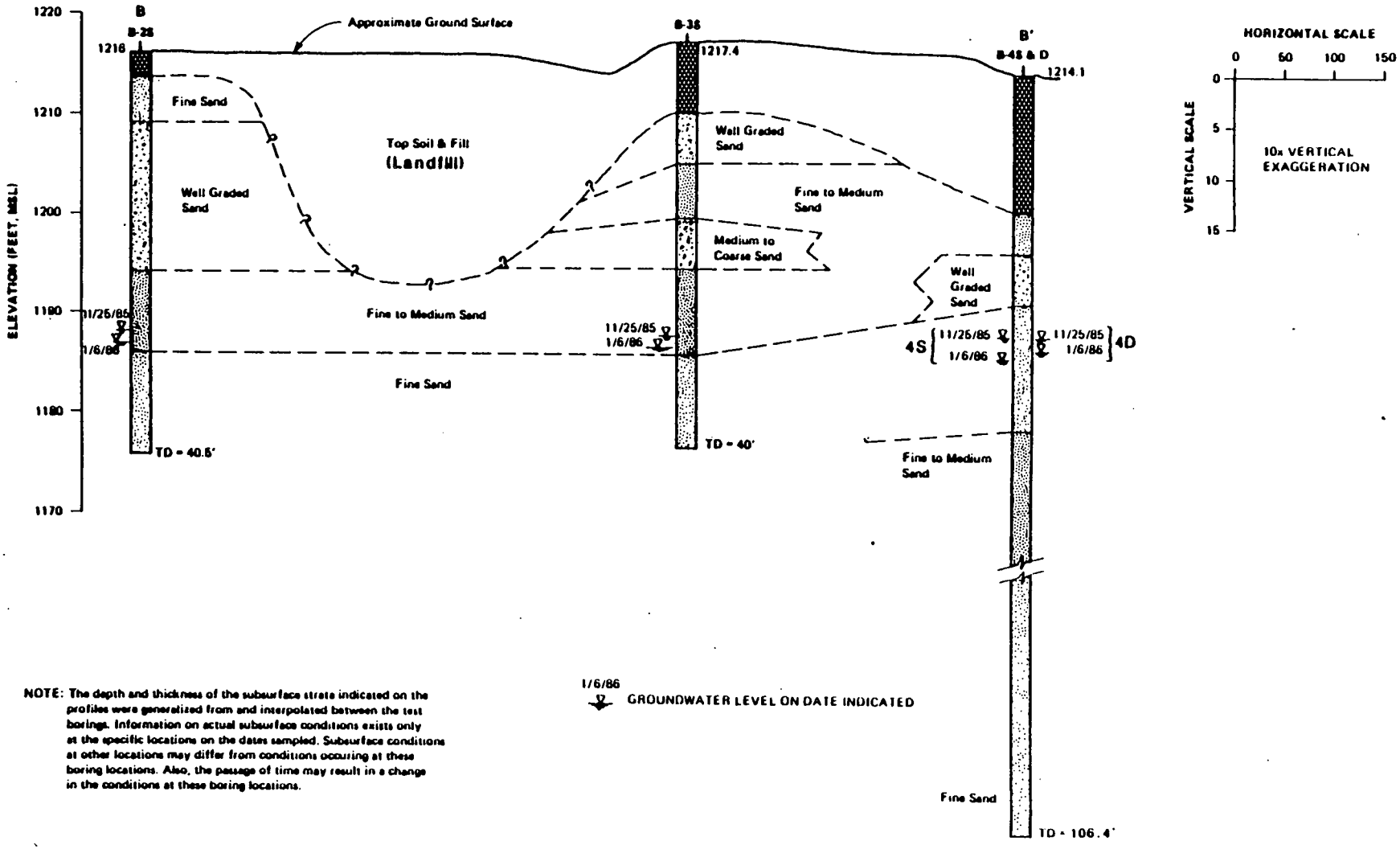
Boring Number	Sample Number	Depth (feet)	QUANTITY OF MATERIAL IN SAMPLE Gravel	Cse Sand	Med Sand	Fine Sand	Fines	Moisture Content	USCS	Comments
1S	S-3	9.5 to 11	8.7%	16.8%	44.5%	27.4%	2.6%	9.53%	SP	
1S	S-5	19.5 to 21	0.0%	0.2%	45.6%	52.3%	1.7%	14.99%	SP	
1S	S-6	23.5 to 25	25.5%	14.3%	18.7%	17.6%	24.9%	13.87%	GM	Test run with less sample mass than required by ASTM
2S	S-3	9 to 10.5	31.9%	18.0%	36.0%	11.0%	3.1%	6.78%	SW	
3S	S-3	9.5 to 11	32.4%	17.1%	36.0%	9.5%	5.0%	4.45%	SW	
3S	S-4	14.5 to 16	2.1%	3.9%	44.0%	48.0%	2.0%	9.56%	SP	
3S	S-6	24.5 to 26	0.0%	0.0%	21.0%	78.2%	0.8%	5.38%	SP	
4S	S-4	14.5 to 16	9.2%	8.6%	31.2%	48.2%	2.8%	6.97%	SP	
4S	S-5	19.5 to 21	30.1%	16.9%	37.2%	10.6%	5.2%	4.21%	SW	
4D	S-2	39.5 to 41	8.0%	2.0%	52.2%	42.2%	2.8%	17.40%	SP	
4D	S-7	84.5 to 86	0.0%	0.1%	15.9%	80.7%	3.3%	21.59%	SP	
7S	S-5	19.5 to 21	9.6%	15.4%	46.0%	26.4%	2.6%	6.64%	SP	
7S	S-7	29.5 to 31	0.1%	0.3%	35.8%	63.1%	0.7%	19.26%	SP	



NOTE: The depth and thickness of the subsurface strata indicated on the profiles were generalized from and interpolated between the test borings. Information on actual subsurface conditions exists only at the specific locations on the dates sampled. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the conditions at these boring locations.

11/26/85 ▽ GROUNDWATER LEVEL ON DATE INDICATED

FIGURE 4.
Geologic Profile A - A'



NOTE: The depth and thickness of the subsurface strata indicated on the profiles were generalized from and interpolated between the test borings. Information on actual subsurface conditions exists only at the specific locations on the dates sampled. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the conditions at these boring locations.

FIGURE 5.
Geologic Profile B-B'

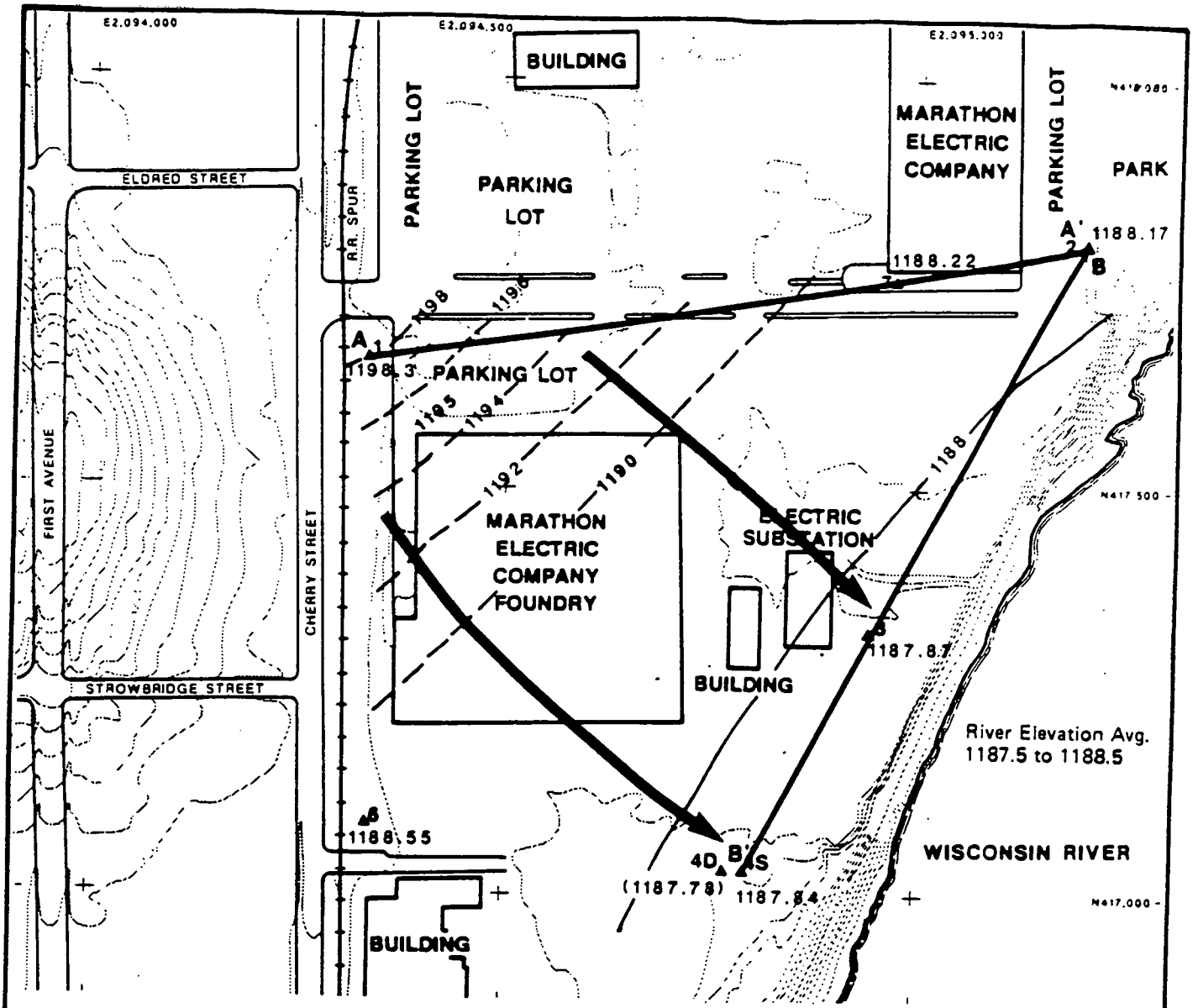
TABLE 4
WATER LEVEL MEASUREMENTS

WELL NUMBER	CASING HEIGHT (feet)	ELEVATION (feet, MSL)				WATER DEPTH FROM TOP OF CASING			GROUNDWATER ELEVATION (feet, MSL)		
		TOP OF CASING	TOP OF PVC	TIP OF SCREEN	GROUND SURFACE	11/15/85	11/25/85	1/06/86	11/15/85	11/25/85	1/06/86
1S	2.9	1223.75	1223.64	1190.9	1220.8	24.42	25.41	28.67	1199.33	1198.34	1195.08
2S	3.1	1219.28	1219.17	1178.3	1216.2	30.23	31.11	32.26	1189.05	1188.17	1187.02
3S	2.9	1220.31	1220.14	1178.5	1217.4	31.41	32.44	33.61	1188.9	1187.87	1186.7
4S	2.8	1216.92	1216.76	1181.9	1214.1	28.50	29.08	31.28	1188.42	1187.84	1185.64
4D	2.6	1216.49	1216.26	1109.4	1213.9	*	28.71	30.11	*	1187.78	1186.38
6S	2.7	1221.89	1221.63	1179.7	1219.2	30.57	33.34	34.72	1191.32	1188.55	1187.17
7S	2.8	1221.01	1220.91	1182.2	1218.2	31.88	32.79	33.80	1189.13	1188.22	1187.21

NOTES:

Refer to Figure 2 for well locations.

* The groundwater level for 4D was not determined on 11/15/85 because the well had not had time to equilibrate after drilling.



LEGEND

1187.64 GROUNDWATER ELEVATION ON NOVEMBER 25, 1985

B B' PROFILE LOCATION

GROUNDWATER FLOW PATH

N

0 200

100

SCALE IN FEET

FIGURE 6.
Groundwater Contours
November 25, 1985.

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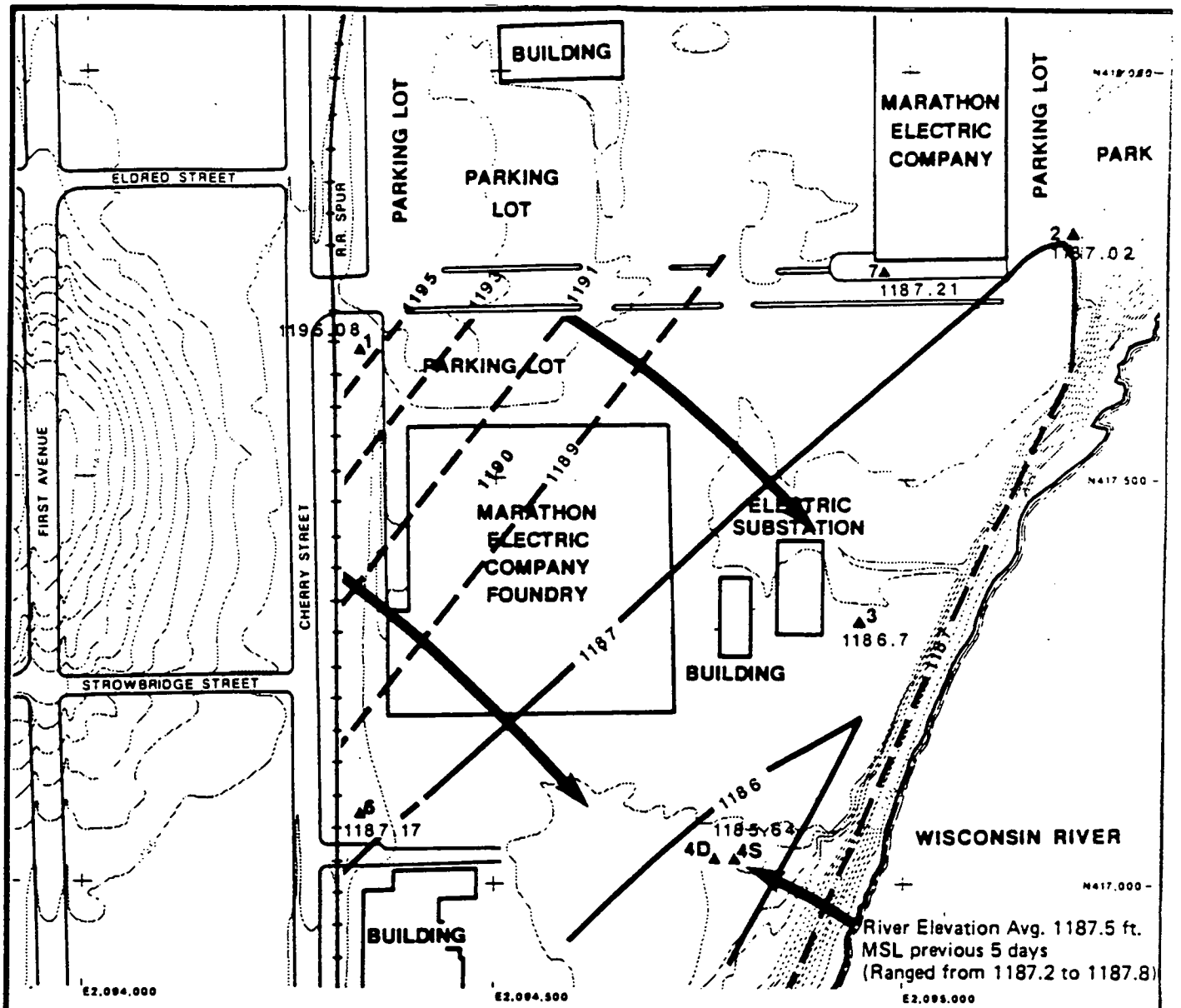
tured bedrock aquifer to the sand and gravel aquifer in the river valley. The groundwater and river level measurements on January 6, 1986 (Figure 7), indicate that groundwater flow has a similar direction as in November. On January 6, river water may have been recharging a portion of the aquifer. Such recharge may occur during periods of high river stage. With the snow covered, frozen ground to prevent recharge from the surface, recharge from the river might have been more obvious than in other seasons. It would be necessary to monitor the water levels through at least one year to determine the relationship between the river water levels and the groundwater levels, and to estimate the extent of local river bank recharge which may occur during high river stages. The steep groundwater gradient to the northwest is consistent with the regional contours shown in Figure 3. The only well nest, 4S and 4D, exhibited an upward gradient at the time of the January water level measurements. This may be the result of the upward gradient from regional discharge to the river.

ENVIRONMENTAL MONITORING

Soil samples and drilling water samples were collected during the drilling program. The drilling water was only analyzed for volatile organic compounds (VOC's). The soil samples were analyzed for VOC's and three samples, including two of the suspected foundry sand and one upgradient sample, were analyzed for metals. The results of the drilling water and soils analyses are in Tables 2 and 5, respectively.

On November 25, 1985 and January 6 and 7, 1986, groundwater samples were collected for field analysis of pH, conductivity, and temperature (Table 6), and laboratory analysis of VOC's, COD, hardness, alkalinity, and dissolved iron. Samples from wells 4S, 4D, and 1 were analyzed for phenols, arsenic, barium, cadmium, chromium, lead, selenium, mercury, silver, and hardness. The results of the laboratory analyses are in Tables 7 and 8. Only contaminants that were detected in at least one sample are listed in the tables. Table 9 contains standards, criteria, and guidelines for drinking water that could be compared to the results of the groundwater analyses.

Several of the contaminants detected in the groundwater samples exceeded drinking water standards, criteria, and guidelines. Carbon tetrachloride was detected in the January sample from well 3 at a level that exceeded the Safe Drinking Water Act (SDWA) maximum contaminant levels (MCL) and the U.S. EPA Health Advisory for chronic exposure of a 10-kilogram (kg) individual. It should be noted that carbon tetrachloride was not detected in any of the samples during the November sampling round.



LEGEND

1187.64 GROUNDWATER ELEVATION ON JANUARY 6, 1986

GROUNDWATER FLOW PATH

N

0 200

100

SCALE IN FEET

FIGURE 7.
Groundwater Contours
January 6, 1986.

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TABLE 5
SUMMARY OF CHEMICAL ANALYSIS OF SOIL
(ug/g)

	SL-B2-24	SL-HSA-3	SL-HSA-4
Cyanide	<0.11	<0.11	<0.09
Arsenic	1.02	2.16	3.42
Barium	24.2	26.3	24.7
Cadmium	<0.081	<0.077	<0.082
Chromium	2.87	2.15	1.58
Lead	1.73	3.92	6.21
Mercury	<0.008	<0.009	<0.010
Selenium	<0.10	<0.10	<0.10
Silver	0.144	<0.096	<0.102
Total Solids, %	96.18	92.71	84.65
Boring Number	2	4S	4S
Sample Depth	24 to 26.5	14.5 to 16	29.5 to 31

NOTES: Results expressed on a dry weight basis except Total Solids

ug/g = mg/kg = ppm

< = "less than" detection limit which varied with sample size

TABLE 6
page 1 of 2
SAMPLING DATA
11/25/85

ARRIVED ON SITE AT 7:40
WEATHER: CLOUDY, 9 DEGREES F

WELL NUMBER	DEPTH TO WATER * 11/15/85	11/25/85	PURGE VOLUME CALC **	ACTUAL	SAMPLING TIME	pH	CONDUCT. (uMHOS)	TEMP (degree C)
1	24.42	25.41	6.7	5 [1]	11:30	6.37	200	12
2	30.23	31.11	9	9	13:45	6.0	225	12
3	31.41	32.44	7.9	8	15:20	6.0	650	10
4S	28.5	29.08	5.35	6	16:10	6.0	1100	8
4D	28.5	28.71	64.5	70	15:30	6.0	215	10
6	30.57	33.34	9.25	7	15:45	6.0	215	8
7	31.88	32.79	6.9	9	12:40	6.0	135	12

NOTES

* MEASURED FROM TOP OF CASING

**BASED ON 5 WELL VOLUMES FROM WATER LEVEL ON 11/15/85 (gallons)

1 PURGED TO CONSTANT CONDUCTIVITY

OVA READINGS WERE TAKEN AT ALL WELLS. THE BACKGROUND OVA READING RANGED FROM 1 TO 5 PPM (ODORS FROM THE PLANT MAY HAVE AFFECTED THE READINGS). ALL OF THE WELLS EXCEPT WELL 6, WHICH HAD A READING OF 6 PPM, WERE IN THE 0 TO 5 PPM RANGE.

ARRIVED ON SITE AT 9:20
WEATHER: CLOUDY, 10 DEGREES F
OVERNIGHT: CLEAR, -12 DEGREES F

TABLE 6
page 2 of 2
FIELD SAMPLING DATA
1/06/86

WELL NUMBER	DEPTH TO WATER * 11/15/85	1/06/86	PURGE VOLUME CALC **	ACTUAL	SAMPLING TIME		pH	CONDUCT. (uMHOS)	TEMP (degree C)
1	24.42	28.67	6.7	1.5 [1]	10:10	D	6.95	200	7
2	30.23	32.26	9	9	11:55		6.09 [2]	225	10
3	31.41	33.61	7.9	5.5	14:00		6.27	600	6
4S	28.5	31.28	5.35	5	16:00		6.07 [2]	800	8
4D	28.5	30.11	64.5	65	10:55	D	5.96	250	6
6	30.57	34.72	9.25	10	15:30		6.10 [2]	190	5
7	31.88	33.80	6.9	5	14:15		5.69 [2]	205	8.5
BLANK					10:30	D	6.56	15	6

NOTES

* MEASURED FROM TOP OF CASING

**BASED ON 5 WELL VOLUMES FROM WATER LEVEL ON 11/15/85 (gallons)

[1] PURGED ON 1/06/86 BY PUMPING TWICE UNTIL DRY THEN WAITING FOR RECOVERY

[2] BACKED UP WITH pH PAPER

OVA READINGS WERE TAKEN AT ALL WELLS. THE BACKGROUND OVA READING RANGED FROM 4 TO 5 PPM. ALL OF THE WELLS HAD READINGS WITHIN THE BACKGROUND RANGE.

TABLE 7
CHEMICAL ANALYSES OF GROUNDWATER
NOVEMBER 25, 1985

	DETECTION LIMIT	TRIP BLANK	FIELD BLANK	WELL 1	WELL 2	WELL 3	WELL 4D	WELL 4S	WELL 6	WELL 7
VOCs (ug/l)										
Carbon Tetrachloride	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	0.1	ND	ND	ND	1.1	66	1.4	ND	ND	0.8
Dibromochloromethane	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorobromomethane	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.3	ND	ND	ND	ND	ND	ND	0.4	ND	ND
1,2-Dichloroethylene	0.3	ND	ND	ND	3.7	ND	1.4	9.3	ND	ND
Dichloromethane	0.2	0.6	0.8	ND	0.5	0.4	0.4	0.6	1.6	1.2
Ethylbenzene	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	0.1	ND	ND	ND	0.4	0.4	0.1	0.5	0.1	ND
Toluene	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.1	ND	ND	ND	ND	2.5	0.3	ND	ND	11.5
Trichloroethylene	0.1	ND	ND	ND	260	6.9	19.7	2.0	ND	10.7
Vinyl Chloride	0.5	ND	ND	ND	ND	ND	ND	2.2	ND	ND
OTHER (mg/l)										
Alkalinity, as Calcium Carbonate	20		ND	56	34	268	66	433	66	39
Hardness, as Calcium Carbonate	1.0		ND	74.1	123.0	491.0	151.0	755.0	61.0	88.0
COD	10		ND	12	ND	17	ND	56	ND	ND
Dissolved Iron	0.004		ND	0.077	0.004	ND	0.212	0.012	0.263	0.005
Barium	0.030		0.044	ND	---	---	ND	0.200	---	---
Lead	0.050		0.285	0.192	---	---	0.122	ND	---	---

NOTES:

ND Analyzed but not detected

--- No analysis performed

TABLE 8
CHEMICAL ANALYSES OF GROUNDWATER
JANUARY 6-7, 1986

	DETECTION LIMIT	TRIP BLANK	FIELD BLANK	WELL 1	WELL 2	WELL 3	WELL 4D	WELL 4S	WELL 6	WELL 7
VOCs (ug/l)										
Carbon Tetrachloride	0.1	ND	ND	ND	ND	98	ND	ND	ND	ND
Chloroform	0.1	ND	ND	ND	1.0	57.8	1.1	ND	0.1	0.9
Dibromochloromethane	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorobromomethane	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.3	ND	ND	ND	ND	ND	ND	0.4	ND	ND
1,2-Dichloroethylene	0.3	ND	ND	ND	3.0	ND	2.5	11.4	ND	ND
Dichloromethane	0.2	ND	0.4	ND	2.0	0.2	ND	0.2	ND	0.2
Ethylbenzene	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	0.1	ND	ND	ND	ND	0.3	ND	1.1	0.1	ND
Toluene	0.1	ND	ND	0.5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.1	ND	ND	ND	2.0	ND	0.1	ND	ND	18.4
Trichloroethylene	0.1	ND	ND	ND	1058	5.0	24.6	2.6	ND	12.7
Vinyl Chloride	0.5	ND	ND	ND	ND	ND	ND	3.5	ND	ND
OTHER (mg/l)										
Alkalinity, as Calcium Carbonate	20		---	39	38	228	58	324	50	35
Hardness, as Calcium Carbonate	1.0		---	36.0	94.0	326.0	143.0	401.0	52.0	98.0
COD	10		---	24	ND	ND	ND	33	ND	ND
Dissolved Iron	0.004		0.007	0.197	0.162	0.074	1.290	0.098	0.101	0.039

NOTES:

ND Analyzed but not detected

--- No analysis performed

Table 9
STANDARDS, CRITERIA AND GUIDELINES FOR DRINKING WATER
(ug/L)

	Wisconsin Groundwater Quality Standards		Safe Drinking Water Act				1980 CWA Ambient Water Criteria Quality (adjusted for drinking water[d])		U.S. EPA Health Advisories[e]			
	Enforcement	Preventive	Primary MCL	Proposed Primary MCL[b]	Final Primary RMCL	Proposed Primary RMCL[c]	Toxicity 10^{-6}	Risk 10^{-6}	1-day 10-kg	10-day 10-kg	Chronic 10-kg	Chronic 70-kg
Carbon Tetrachloride				5	0			0.42	4,000	160	71	500
Chloroform			100[a]					0.19				
1,2-Dichloroethane	0.5	0.05						0.94	740	740	740	2,600
1,2-Dichloroethene				5	0				2,720	2,720	1,000	3,500
Dichloromethane	150	15				70		0.19	13,300	1,500		
Ethylbenzene							2,400		21,000	21,000		
Tetrachloroethene	1	0.1						0.8		34,000	1,940	6,800
Toluene	343	68.6				680	15,000		18,000	6,000		
1,1,1-Trichloroethane	200	40					19,000		140,000	35,000	35,000	12,500
Trichloroethene	1.8	0.18		200	200	2,000		2.8				
Vinyl Chloride	0.015	0.005		5	0			2	2,600	2,600	13	46
				1	0							

o Wisconsin Groundwater Quality Standards from Chapter NR140.

o Safe Drinking Water Act (SDWA) - Primary Interim, Maximum Contaminant Levels (MCL's) - Enforceable drinking water standards not entirely health based.

o SDWA Proposed Final MCL's - Enforceable drinking water standards proposed currently for volatile organic compounds (VOC's) with other chemicals to follow over time.

o SDWA Proposed and Final Recommended Maximum Contaminant Levels (RMCL) - Nonenforceable health goals for drinking water set at a level representing "no known or anticipated adverse effects on the health of persons ... allows an adequate margin of safety."

o SDWA Health Advisories (HA's) - Short-term risk assessments for noncarcinogen end points of toxicity. Considered to be exposure levels which will result in adverse health effects over a specified short time period (1 day, 10 day, longer term).

EPA has used the 10-day Health Advisory as a factor in decision making for contaminated drinking water incidents.

o Clean Water Act (CWA) Ambient Water Quality Criteria (AWQC) Adjusted - Criterion to protect human health adjusted to account for drinking water only (excludes fish ingestion).

o SDWA Secondary MCL's - Welfare based drinking water quality goals.

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a) Based on MCL for total trihalomethanes.

b) Proposed November 13, 1985
50FR 46902

c) Proposed November 13, 1985
50FR 46936

d) Adjusted so that drinking water is the only source of contaminant Superfund Public Health Evaluation Manual. U.S. EPA, 1985.

e) From the Office of Water, U.S. EPA.

The 0.4 ug/L of 1,2-dichloroethane in the samples from well 4S exceeded the State of Wisconsin Groundwater Standard for preventive measures.

The level of tetrachloroethene in the sample taken from well 4S during January exceeded the State of Wisconsin Enforcement standards and the Clean Water Act (CWA) criteria for the 10^{-6} cancer risk. The criteria in Table 9 have been adjusted to account for drinking the water; the component of the criteria that accounts for consuming fish that live in contaminated water has been removed. The CWA criteria for the 10^{-6} cancer risk is based on a 70-kg individual drinking the contaminated water for 70 years. The state preventive standard for tetrachloroethane was met or exceeded in at least one sample taken from wells 2, 3, 6, and 4D.

The levels of trichloroethylene (TCE) in water from wells 2, 3, 4D, and 7 exceeded all standards, criteria, and guidelines. The levels detected in 4S exceeded the state's preventive standard.

The levels of vinyl chloride detected in well 4S exceeded the CWA criteria for the 10^{-6} cancer risk and the state standards.

ANALYSIS

The analytical results of the groundwater taken from some of the monitoring wells contained the chlorinated volatile compounds TCE, dichloroethylene (DCE), and vinyl chloride. TCE may biodegrade in the anaerobic environment in the subsurface to form the cis and trans isomers of 1,2-dichloroethylene, which may degrade to vinyl chloride (Mackay, et al., 1985).

At concentrations exceeding their solubility in water, compounds with specific gravities greater than water (1.63 for TCE, and 1.46 for DCE) would tend to sink into the aquifer. Further, these compounds would fall vertically in the aquifer, despite horizontal components in groundwater flow (Mackay, et al., 1985). The tendency to sink would be complemented if the dense compound were spilled in a groundwater recharge area, where there would be a downward gradient. Once the compounds are in the subsurface they may degrade and they may go into solution slowly, reducing the contaminant concentration at one point while dispersing the compound and its degradation products with groundwater movement.

The contaminants observed in the monitoring wells were at concentrations greatly below their solubilities in water. The denser contaminants in the groundwater, such as TCE, could be from a variety of sources, including:

- Groundwater moving through the landfill
- Unidentified filled areas
- A large spill in which the immiscible portion sank into the aquifer
- Small spills near or upgradient from the landfill

A large spill could affect groundwater quality if it occurred either near the landfill or some distance away. Further, it could affect groundwater quality for some time as it slowly disperses and is transported with the groundwater.

Vinyl chloride, a degradation product of TCE with a specific gravity of 0.91, was detected in well 4S. The less dense vinyl chloride would not sink into an aquifer, but rather would go into solution and move with the aquifer in a relatively small spill, or would "float" on top of the water table if the amount released exceeded its solubility limit in water. Alternatively, the vinyl chloride could be the result of the degradation of TCE carried in the groundwater to this point, where it may be rising because of its low specific gravity or because of upward groundwater gradients at this discharge point.

As part of this project, manufacturing property ownership within one-half mile of the landfill was investigated to locate other sources of contamination observed at the site. The property boundaries are shown in Figure 1 and the owner and type of business at the property, where known, is noted in Table 1. With the exception of Marathon Electric, it does not appear that there are any businesses upgradient of the landfill that could be contributing to the observed contamination. This does not rule out former businesses in the area, spills along the railroad tracks, or old filled areas. Additional monitoring wells and observation of groundwater levels, well pumping patterns, and river levels over an extended period would be necessary to determine if Marathon Electric is responsible for the observed contaminant levels. With the additional information, it may be difficult to determine if the contamination is due to Marathon Electric, the landfill, or an unknown source.

RECOMMENDATIONS

The monitoring well network detected contaminants on the north side of the landfill. Additional well nests would be needed to determine if the contamination is coming from the landfill, or is coming onto the site from other sources. The well nests should be placed to the north of the Marathon Electric Company property. The nests should include monitoring wells in the top of the water table and at least one deeper piezometer.

To get an accurate feel for the groundwater flow patterns, it would be necessary to monitor groundwater and river levels for at least one year. The flow patterns should be further refined by taking concurrent water level measurements in other monitoring wells on the west side of the Wisconsin River.

Contaminants that have or are leaving the landfill through the groundwater or the storm sewer (Figure 2) may be in the sediments adjacent to the landfill. The contaminants detected in the monitoring wells are of greater density than water and are attracted to organic material as would be found in the sediments. Since the Wisconsin River is dammed south of the site, the slower moving water might have allowed the contaminants to settle into the sediment. The sediment could be adversely affecting aquatic life and surface water quality and should be sampled. Samples should also be collected upstream of the landfill to provide background contaminant levels.

Since the extent and source of the observed contamination have not been identified, applicable remedial actions cannot be identified.

LIMITATIONS

This report has been prepared for exclusive use by the Wisconsin Department of Natural Resources specifically for investigating the release of contaminants from the City of Wausau Landfill. The analyses and recommendations contained in this report are based, in part, on the data obtained from borings. Borings indicate conditions only at specific locations and times, and only to the depths penetrated. They do not necessarily reflect variations that may exist between locations. If variations in subsurface conditions from those described are noted during additional investigations, recommendations in this report may need to be reevaluated.

CH2M HILL is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analyses without the express written authorization of CH2M HILL.

REFERENCES

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Mackay, D.M., V. Roberts, and J.A. Cherry. "Transport of Organic Contaminants in Groundwater, in Environ. Sci. Technol. Vol. 19, No. 5, 1985.

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Wisconsin Valley Improvement Co., Wisconsin River Levels at Bridge Street Gauge in Wausau for November 20, 1985 through November 27, 1985 and January 1 through 8, 1986.

GLT187/12

Appendix A
SCOPE OF WORK AND WORK PLAN

II. SCOPE OF SERVICES

This scope of work sets forth the requirements for developing an assessment of the environmental impacts associated with the abandoned City of Wausau landvill located in Section 23, T29N, RO7E, City of Wausau, Marathon County.

(I) Consultant Responsibilities: The Consultant agrees to provide the services necessary to adequately investigate the environmental impacts of the abandoned City of Wausau landfill. The Consultant will be required to conduct the investigation, compile the information into an Existing Conditions Report, and submit 8 copies of the report to the North Central District Office located in Rhinelander and 2 copies to Bureau of Solid Waste Management in Madison. This report shall be prepared using currently accepted hydrogeologic and engineering methods and shall be in conformance with the provisions of NR 180.06(1)(c).

(A) The On-Site Field Investigation shall include:

(1) Prior to beginning the field investigation organizational meetings shall be held between the Consultant and Department personnel to clarify all issues related to the project.

(2) Site Survey

(a) An existing site conditions plan sheet shall be prepared A permanent on-site benchmark shall be established for both vertical and horizontal control, and all elevations shall be related to U. S. Geological Survey Datum. The plan sheet shall indicate the locations of the study area, site boundaries, property boundaries, filled areas, buildings, water supply wells, above and below ground utilities, man-made features, surface waters, soil borings, groundwater monitoring wells, and other pertinent information. The plan sheet shall also include a 100 foot survey grid and north arrow.

(3) Soil Borings

(a) The Consultant shall perform 9 soil borings to define the soil, bedrock and groundwater conditions at the site. The locations of the borings must be approved by the project manager prior to installation. The 9 soil borings will also be used to install monitoring wells and piezometers.

(b) Where soil conditions permit, soil samples shall be collected utilizing standard undisturbed soil sampling techniques. Samples shall not be composited for testing purposes. Soil samples shall be collected from each soil layer encountered and at maximum 5-foot intervals. All soil samples shall be described.

(c) Boring logs shall be recorded for all borings. Each log shall include soil and rock descriptions and method of sampling, sample depth, date of boring, water level measurements and dates, and soil test data. All elevations shall be corrected to USGS datum.

(d) For each major soil layer encountered, a soil sample shall be analyzed for grain size distribution (mechanical and/or hydrometer as appropriate to the soil type) and classified according to the unified soil classification system.

(4) Monitoring Wells and Piezometer Nests

(a) The Consultant shall install 6 monitoring wells and 3 piezometers. The locations of the wells must be approved by the project manager prior to installation.

(b) Monitoring wells will utilize a 15-foot screen, 10 feet placed into the groundwater and 5 feet above.

(c) Piezometers will utilize a five-foot well screen, the bottom of the screen should be just above bedrock.

(d) All wells and piezometers shall be properly developed, and the development procedures shall be documented.

(e) The construction of each well shall be recorded on logs. Well log information shall include the elevations of the pipe top, ground surface, bottom of the boring, well seals and screened interval, and a description of the well construction materials. For each well, the Department's Groundwater Monitoring Well Information Form (Form 4400-89) shall be completed.

(f) The installation of each well shall conform to the standards set forth in the Department's Bureau of Solid Waste Management document titled Guidelines for Monitoring Well Installation (April 1985).

(5) Environmental Monitoring

(a) The consultant shall collect and analyze 18 soil samples to determine the concentrations of volatile organic carbon compounds.

(b) All soil sample results shall be in units of mg/kg on a dry weight basis.

(c) The method of collecting the soil samples and the locations shall be determined by the project manager prior to commencing work.

(d) The consultant shall collect and analyze 2 sets of groundwater samples to determine the concentrations of the following constituents: VOC's, ph, COD, temperature, conductivity, hardness, alkalinity, dissolved iron. The second set of groundwater samples shall be collected 30 days after the first round is collected. In the second round of groundwater quality samples the complete volatile organic compound scan will not be required. A maximum of 5 specific compounds will be identified for analysis based on the results of the first round VOC scan.

(e) The method of collecting the groundwater samples and sample collection internval shall be determined by the project manager prior to commencing work.

(B) The Existing Conditions Report shall include:

(1) Summary Section

(a) The nature and extent of contamination at the site should be described in a way that establishes a framework for determining remedial objectives and defines criteria for selecting remedial objectives and defines criteria for selecting remedial action alternatives.

(b) A discussion of the potential for further envirionmental impact as indicated by the monitoring results.

(c) A description or tabulation of the relevant environmental criteria and standards that form the need for remedial action.

(d) A discussion of the remedial action alternatives with clear statements of their advantages and disadvantages. At the end of this comparative analysis, the recommended remedial action should be identified and the reason for its selection given.

(2) Plan Sheets Section

(a) An existing site conditions plan sheet as required by A.1.a. of this contract.

(b) A minimum of 4 geologic cross-sections passing through all borings that illustrate existing topography, soil borings, soil classification and other properties, interpreted soil stratigraphy, bedrock, monitoring wells, and stabilized water level readings.

(c) A water table map based on stabilized water level readings. The existing site conditions plan shall be used as a base for this map.

(d) A plan sheet based upon a recent Department of Transportation air photo indicating the existing buildings, roads, water supplies, property ownership, etc., within a 1/2 mile radius of Marathon Electric.

(3) Technical Data Section

(a) All technical data such as boring logs, well logs, soil tests, water level measurements, soil and groundwater analysis, horizontal and vertical groundwater gradients, laboratory quality assurance data, etc.

(II) State of Wisconsin Responsibilities: The State of Wisconsin through the Department of Natural Resources agrees to provide the following support:

(A) The Department will assign a project manager to serve as the official representative of the Department, and who will resolve in writing any problems or policy and procedure issues.

(B) The Department will be responsible for all public information activities associated with the project.

(III) Consultant's Compensation. For services requested above, the Consultant shall be paid on a time and material basis using the rate schedule shown below. Total payments to the Consultant shall not exceed $45,690 without prior written approval.

Rate Schedule

Employee Time	2.9 times actual salary
Mileage	21.5¢ per mile
Subcontractors	at cost
Meals and Lodging	at cost
Other Direct Project Costs	at cost

All requests for payment must include proper backup material to substantiate the amount requested. Fee amounts are to be itemized by employee or classification as applicable. Reimbursable expenses must be supported by copies of invoices, statements or other office records.

ATTACHMENT A

INTRODUCTION

On August 21, 1985, the Wisconsin Department of Natural Resources (WDNR) requested that CH2M HILL prepare a cost estimate for a limited investigation of the City of Wausau Landfill located under a parking lot owned by Marathon Electric Company. The scope of work prepared by the WDNR is included in Appendix A.

In this work plan, the tasks outlined by WDNR are further defined and a cost estimate is provided. CH2M HILL has reorganized the tasks as follows:

Task 1-Assemble Project Team
Task 2-Evaluate Existing Data
Task 3-Prepare Health and Safety Plan
Task 4-Hydrogeologic Investigation
Task 5-Environmental Monitoring
Task 6-Report Preparation

The following sections provide further definition of these tasks and budgets for each task.

OBJECTIVES

The primary objectives of this inveatigation are to:

- o Determine, within the scope specified by the WDNR, the potential for and types of contaminants that may be leaving the City of Wausau Landfill, the extent of any existing contamination, and the potential for contamination of the Wausau water supply.
- o Identify potential remedial actions that might be required at this aite.
- o Evaluate the need for additional investigations based on existing data and data generated by this investigation.

All tasks and subtasks are directed toward accomplishment of these objectives.

SITE INVESTIGATION

TASK 1-ASSEMBLE PROJECT TEAM

This task provides time for coordination between the WDNR and CH2M HILL in meetings, meeting preparation, and telephone

conferences. The estimated budget allows for 2 people to attend 3 meetings with the WDNR. In one of these meetings, the boring location plan and monitoring well installation details will be determined by CH2M HILL and WDNR. One meeting was budgeted for a trip to Wausau and the other two meetings were budgeted for trips to Madison. An additional three mandays were budgeted for meeting preparation and telephone conferences.

TASK 2-EVALUATE EXISTING DATA

To most efficiently execute this investigation, it will be necessary to obtain available information concerning the landfill, its operating history, its environmental setting, and documented contamination. This information will be requested from the WDNR offices in Madison and Rhinelander and from the City of Wausau. During this task, a topographic map of the site will be obtained from the City of Wausau and aerial photography will be obtained from the Wisconsin Department of Transportation.

The budget for this task allows one data collection trip to Wausau and Rhinelander. Also budgeted are five days to evaluate the data and summarize the site history and environmental setting.

TASK 3-PREPARE HEALTH AND SAFETY PLAN

A health and safety assessment will be conducted to determine if the site has potentially hazardous chemical exposure levels in the air or dangerous physical features. The resultant information will be used to select and implement adequate warnings and safeguards for investigators or other onsite visitors. All available site information will be examined to select possible sources of hazardous air emissions and potentially hazardous areas. A site visit will be conducted in conjunction with the data gathering trip to Wausau.

The health and safety assessment will be used to develop a site health and safety plan that will specify the field monitoring to be performed and the protective gear to be worn by site investigators and visitors. The plan will focus on the use of personal protective equipment to minimize exposure to hazardous materials through inhalation or direct contact when performing work on or near the site.

TASK 4-HYDROGEOLOGIC INVESTIGATION

The hydrogeologic investigation will be conducted to:

- Identify the horizontal and vertical extent of groundwater contamination to the detail allowed by the limits of the scope of this investigation

- o Acquire geologic, hydrogeologic and analytical data sufficient for a general assessment of potential future groundwater contamination

- o Gather data that will assist in determining potential remedial actions

- o Determine the scope and need for additional hydrogeologic investigations

The hydrogeologic investigation has been divided into the following subtasks:

Subtask 4.1-Install Groundwater Monitoring System
Subtask 4.2-Surveying
Subtask 4.3-Monitor Groundwater Levels
Subtask 4.4-Analysis of Hydrogeologic Data

Subtask 4.1-Install Groundwater Monitoring System

The purpose of this subtask is to drill borings, sample soil and install monitoring wells and piezometers. The locations for the monitoring wells and piezometers will be determined by CH2M HILL and the WDNR after additional site data have been obtained (Task 2). The monitoring wells and piezometers will be constructed according to the WDNR's draft monitoring well installation guidelines, unless variances from these guidelines are requested of and approved by the WDNR.

A total of six monitoring wells and three piezometers will be installed. For the purposes of this proposal, it was assumed that the three piezometers will be installed in bedrock at a depth of 100 feet, and the six monitoring wells will be installed 10 feet below the water table (assumed to be 15 feet below the ground surface). Soil samples will be collected in all borings at 5-foot intervals and five feet of rock core will be recovered from the three deep borings. This will result in an estimated 450 feet of drilling with standard penetration testing, 15 feet of rock drilling, and 450 feet of monitoring well or piezometer installation.

Borings will be logged by a geologist or hydrogeologist. Soil samples will be preserved for index testing. The index testing may include grain size distribution or Atterberg limits tests. For this cost estimate, it has been assumed that 10 Atterberg limits and 15 grain size analyses will be performed.

After the monitoring wells and piezometers have been installed, they will be developed by surging, overpumping, or airlifting to establish good hydraulic connection with the surrounding soil. Once the wells have been fully developed, aquifer response tests may be performed to obtain in situ measurements of aquifer hydraulic conductivity.

Subtask 4.2-Surveying

A permanent on-site benchmark will be established to provide horizontal and vertical control of monitoring locations. The elevation will be related to USGS datum.

Once all the monitoring wells are properly installed, their locations and elevations will be surveyed. Vertical elevations will be obtained to the nearest 0.01 foot for the top of riser, top of protective casing, and ground surface at each well.

Subtask 4.3-Monitor Groundwater Levels

The water level monitoring program will define water table gradients in the vicinity of the landfill and assess surface water and groundwater relationships. Water levels will be measured form the top of the standpipe using a steel tape, stainless steel popper, or an electric water level indicator. Measurements will be made to the nearest 0.01 foot. Groundwater and surface water level measurements will be taken at the time that the two sets of water quality samples are collected (Task 5). Travel expenses are included with those for Task 5.

Subtask 4.4-Analysis of Hydrogeologic Data

This subtask will be performed to compile and analyze the data from this investigation and other investigations that could provide insight to the hydrogeology and potential for contaminant migration from this landfill. Two north-south cross sections and two east-west cross sections will be prepared during this subtask. The direction(s) of groundwater flow will be analyzed to the extent allowed by this investigation.

TASK 5-ENVIRONMENTAL MONITORING

Groundwater samples will be collected twice from each of the monitoring wells and piezometers for field or laboratory analysis. the first round of samples will be analyzed for VOC's, pH, temperature,conductivity, COD, hardness, alkalinity, and dissolved iron. The second round of sampling will occur 30 days after the first round. Analyses will be the same except that a maximum of 5 specific compounds will be selected for analysis rather than all VOC's.

Eighteen of the soil samples collected from the soil borings will be selected by the WDNR with recommendations from CH2M HILL to be analyzed for VOC's.

The samples will likely be sent to Zimpro of Rothschild, WI for analysis. The sampling program described above will result in

18 groundwater samples plus 2 blank samples and 2 duplicate samples for a total of 22 groundwater samples. Eighteen soil samples plus 2 duplicates and 1 blank sample will be submitted for a total of 21 soil samples.

TASK 6-REPORT PREPARATION

The findings of this investigation will be summarized in a report of existing site conditions. This report will follow the requirements of the scope of work prepared by the WDNR and any additional items that are required to adequately present the data generated in this investigation. The report will include a section discussing the extent of contamination, the potential for degradation of the groundwater, an analysis of the landfill as a potential source of contamination, recommendations for additional work, and potential remedial actions for the site.

Raw data generated during the investigation will be included in appendices to the report. Eight copies of the report will be provided to the WDNR's North Central District Office in Rhinelander and 2 copies will be provided to the Bureau of Solid Waste Management in Madison.

PROJECT COST

The estimated cost to complete this project is broken down in Table 1. The assumptions used to arrive at this estimate were stated in the previous discussion. If a task or subtask appears to be going over budget or if CH2M HILL feels that the scope change is necessary to meet the objectives of this investigation, the WDNR's project manager will be contacted for a resolution of the matter in question.

Appendix B
DESCRIPTION OF FIELD METHOD

DESCRIPTION OF FIELD AND LABORATORY METHODS

Standard Penetration Test

Representative samples of materials encountered in the borings were obtained at 5-foot intervals with a standard 2-inch outside diameter split-spoon sampler, following the requirements of the Standard Penetration Test (ASTM D 1586). This test is used to characterize the consistency or density of in-place soil by measuring the penetration resistance expressed as "blow counts". The blow count is the number of blows required to advance a standard split-spoon sampler 6 inches with a 140-pound hammer falling 30 inches. The sampler is driven 18 inches, and the blow count is recorded for each 6-inch increment. The sum of the second and third increments is referred to as the N-value. Low N-values indicate soft or loose deposits, while high N-values are indictive of hard or dense materials. After the sampler has been driven and the blow counts recorded, the sampler is withdrawn from the boring to recover a disturbed soil sample.

Soil samples were examined in the field and visually classified in approximate accordance with the visual-manual proceedure for description of soils (ASTM D2488). Sampling intervals and classification of soil samples are presented in the boring logs. Field soil boring logs were revised as necessary based on laboratory testing and office examination.

Natural Water Contents

The moisture content of the soil at the time of sampling is determined in the laboratory in general accordance with ASTM D 2216.

Grain Size Analyses

Grain size analyses are performed to help classify the soil and to determine the suitability of lthe soil for use as backfill material. Grain size distriabutions are determined by sieve analysis and hydrometer analysis in approximate accoardance with ASTM D 422. The percent of soil material finer than the No. 200 sieve is determined in approximate accordance with ASTM D 1140.

Appendix C
BORING LOGS AND PIEZOMETER INSTALLATION SKETCHES.

ING AND TEST PIT LOG LEGEND:

SAMPLE TYPE:

- B - BAG SAMPLE
- J - JAR SAMPLE
- S - SPLIT BARREL (ASTM D1586 UNLESS OTHERWISE NOTED)
- W - WASH SAMPLE
- ST - SHELBY TUBE
- OT - OSTERBERG TUBE
- NX - DIAMOND CORE BARREL

STANDARD PENETRATION TEST:

6"-6"-6" - THE NUMBER OF BLOWS FOR THREE 6-INCH INCREMENTS REQUIRED FROM A 140-LB HAMMER FALLING 30 INCHES TO DRIVE A STANDARD 2-INCH O.D. SPLIT-BARREL SAMPLER (ASTM D1586)

(N) - THE SUM OF BLOWS FOR THE SECOND AND THIRD 6-INCH INCREMENTS

OTES:

1. THE BORING AND/OR TEST PIT LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED. SOIL CONDITIONS AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THESE BORING AND/OR TEST PIT LOCATIONS. ALSO, THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THESE LOCATIONS.

2. BORINGS AND/OR TEST PITS WERE LOGGED IN THE FIELD BY A CH2M HILL ENGINEERING GEOLOGIST OR GEOTECHNICAL ENGINEER. SAMPLES WERE EXAMINED AND VISUALLY CLASSIFIED IN APPROXIMATE ACCORDANCE WITH ASTM D2488.

BORING AND TEST PIT LOG LEGEND

CH2M HILL

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PROJECT NUMBER L20303.A0 | BORING NUMBER 1S | SHEET 1 OF 2

SOIL BORING LOG

PROJECT Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Hollow stem augers/CME-45

WATER LEVEL AND DATE 22.5' 11/11/85 START 0900 11/11/85 FINISH 1015 11/11/85 LOGGER Johnson/McGee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0	0.0 1.5	S-1	18"	4-6-10 (16)	Topsoil, brown, sandy		Background OVA reading (.2 ppm)
	2.0 3.5	S-2	15"	11-16-17 (33)	Sand, fine to med. grained, brown, moist, dense, tr ese Gd		
5							
	9.5						
10	11.0	S-3	10"	7-10-10 (20)	Sand, fine to coarse grained, brown, moist, medium density (SP) 8.7% gr 88.7% sd 2.6% fines		.2 OVA (background)
	14.5						
15	16.0	S-4	10"	8-13-16 (29)	As above		.2 OVA (background)
	19.5						
20	21.0	S-5	17"	7-11-15 (26)	Sand, fine to medium, brown, moist medium (SP) 98.3% fine to med sd 1.7% fines		background OVA
	23.5						Rough drilling at ≈23.5' Possibly coarse gravel
25	25.0	S-6	1"	25/1"	Silty sand + gravel, fine sand, gray, wet (gm) 25.5% gr 49.6% sd 24.9% fines		Water at 27.4' 10:00 After driving S-7 water level at 22.5' at 10:45
	29.5						
30	31.0	S-7	1"	50/2"	See next page		

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CH2M HILL

L20303.A0 | 15 | SHEET 2 OF 2

SOIL BORING LOG

PROJECT Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Hollow stem augers / CME-45

WATER LEVEL AND DATE START 11/11/85 FINISH 11/11/85 LOGGER Johnson

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	29.5	S-7	1"	50/2"		Silty ~~sand~~, brown-gray, some gravel		
	31.0					34'		Auger refusal
35						Bottom of boring		

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CH2M HILL

PROJECT NUMBER: L20303.A0 | BORING NUMBER: B-25 | SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Wausau LF - Line Dike | LOCATION:

ELEVATION: | DRILLING CONTRACTOR: Twin City Test. Co.

DRILLING METHOD AND EQUIPMENT: CME 45 HSA 3¼" I.D. (7¼" O.D.) STD. SPLIT SPOON

WATER LEVEL AND DATE: 27.7' 11/11/85 | START: 15:50 - 11/11/85 | FINISH: 11/11/85 | LOGGER: T.H. Johnson

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	1.5	S-1	10"	2-2-3 (5)	FILL, SAND, DK. BROWN, TR ORGANICS MOIST		OVA BACKGROUND ~3.5 ppm
	4.0						
5	5.5	S-2	12"	4-7-8 (15)	SAND, LT. BROWN, FINE, MOIST, (SP)		OVA READING BACKGROUND
	9.0						
10	12.5	S-3	8"	4-8-11 (19)	SAND, LT. BROWN, FINE TO CSE, MOIST (SW) 31.9% GR 65% SD 3% FINES		OVA READING BACKGROUND
	14.0						
15	15.5	S-4	4"	4-8-13 (21)	SAND, LT. BROWN, MED. TO CSE. MOIST, ~20% FINE GRAVEL (SP)		OVA READING BACKGROUND
	19.0						
20	20.5	S-5	7"	7-9-10 (19)	SAND, LT. BROWN, MED. TO CSE, MOIST (SP)		OVA READING BACKGROUND
	24.0						
25	25.5	S-6	7"	7-7-9 (16)	SAND, LT. BROWN, FINE TO MED., MOIST		OVA READING BACKGROUND
	29						OVA READING BACKGROUND WATER AT 27.8' at 15:52 WATER AT 27.7 at 16:30
30	30.4	S-7	6"	2-4-4 (8)			

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER

BORING NUMBER B-25

SHEET 2 OF 2

SOIL BORING LOG

PROJECT WILLISAU LF - DNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY TEST INC.

DRILLING METHOD AND EQUIPMENT

WATER LEVEL AND DATE START FINISH LOGGER C.H. JOHN

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							
	34.0				SAND, LT. BRN, FINE, WET, (SP)		OVA READING = BACKGROUND
35	35.5	S-8	10"	3-4-6 (10)			
	39.0						
40	40.5		0"				NO RECOVERY
					Bottom of boring 40.5'		

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	B-35	1 OF 2

SOIL BORING LOG

PROJECT Wausau LF LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT 7¼" OD Hollow stem augers / CME-45

WATER LEVEL AND DATE 29.5' 11/12/85 START 14:30 - 11/12 FINISH 1600 11/12/85 LOGGER E. H. Jd

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	0.0	0.0 1.5	S1	15"	3-3-4 (7)	FILL, BLACK, SAND, GRAVEL, SILT, SOME CINDERS, MOIST		OVA NOT WORKING PROPERLY - [illegible] LOST
	4.5	4.5 6.0	S-2	8"	14-14-16 (30)	FILL, MOTTLED, BROWN AND GRAY, SAND, SOME CINDERS ~7'		
5	7.5							
10	11.5	11.5	S-3	10"	15-13-22 (40)	SAND LT. BROWN, fine TO CSE., moist (SW) 32.4% gr 62.6% sd 5% fines ~12'		ROUGH DRILLING AT ~12' B.G.S. POSSIBLY COARSE GRAVEL OR COBBLES
15	16.5	16.5	S-4	14"	5-8-10 18	SAND, LT. BROWN, FINE, MOIST some coarse sand (SP) 2.1% gr 95.9% sd 2.0% fines		
20	19.5 21.0	19.5	S-5	5"	30-20/.2	SAND, LT. BROWN, MED. TO CSE, MOIST TO WET, (SP) ~22.5'		GRAVEL LODGED IN BOTTOM OF THE SPLIT SPOON
25	24.5 26.0	24.5	S-6	15"	4-5-6 (11)	SAND LT. BROWN, FINE TO MED, MOIST (SP) 21% med sd 78.2% fine sd 0.8% fines		
	29.5	29.5				SAND, LT. BROWN, FINE TO MED WET, SP		WATER @ 29.5' B.G.S. AT 15:[illegible]
30	31.0	31.0	S-7	8"	4-7-8 (15)			

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	B-3	1 OF 2

SOIL BORING LOG

PROJECT Waupaca LF - Wis. DNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY

DRILLING METHOD AND EQUIPMENT 3¼ I.D. / 7¼" O.D.) HSA's, CME 45 RIG,

WATER LEVEL AND DATE START FINISH LOGGER I. H JOHNSON

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							
34.5							
35	34.5 – 36.0	S-8			SAND, LT. BROWN, FINE, WET		
36.0							
40					BOTTOM OF BOREHOLE @ 40'		COMPLETE DRILLING AT 1600 HRS

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	B-4S	1 OF 2

SOIL BORING LOG

PROJECT [illegible] LF - WDNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY

DRILLING METHOD AND EQUIPMENT CME 45 [illegible]

WATER LEVEL AND DATE 25' 11/13/85 START 0900-11/13 FINISH 11/13 LOGGER T. H. JOHNSON

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	0.0						
	1.5	S-1	2"	3-4-5 (9)	FILL, SILTY SAND, GRAY, SOME CLAY, MOIST		OVA BACKGROUND ~3ppm
5	4.5	S-2	5"	5-5-9 (14)	FILL, SAND, WOOD CHIPS, MOIST		PIECES OF PAPER & PLASTIC IN AUGER CUTTINGS
	6.0						
10	9.5	S-3	2"	1-2-3 (5)	FILL, SAND, DK GRAY MISC. SILT CLAY MOIST TO WET		
	11.0				~14'		OVA READING ~5ppm OFF [illegible]
	14.5				SAND, FINE, TO MED, LT BROWN, MOIST (SP)		0ppm ON BACKFLUSH - POSSIBLY METHANE
15	16.0	S-4	10"	10-10-11 (21)	92% gr 8% sd 2.8% fines		
	19.5				SAND, FINE TO COARSE, LT. BROWN, MOIST (SW)		OVA READING ~4 to 5ppm (~1 to 2 ABOVE BACKGROUND) IN HSA & FROM SPLIT SPOON SAMPLE
20	21.0	S-5	12"	13-16-20 (36)	30.1% gr 64.7% sd 5.2% fines		
	24.5				SAND, FINE		WATER LEVEL AT 25' B.G.S. @ 10:50 HRS
25	26.0	S-6	15"	8-8-13 (21)			
	29.5				SAND, FINE, LT. BROWN, WET (SP)		
30	31.0	S-7	14"	13-13-20 (33)			

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	B-4	1 OF 1

SOIL BORING LOG

PROJECT Navisan LF - WDNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY

DRILLING METHOD AND EQUIPMENT

WATER LEVEL AND DATE START FINISH LOGGER T.H. Johnson

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30					SAND, FINE, [illegible] BROWN, WET, SP		
35					BOTTOM OF BORE AT 35'		
40							

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER L20303.A0 | BORING NUMBER 4D | SHEET 1 OF 3

SOIL BORING LOG

PROJECT City of Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Bentonite mud rotary / CME-55

WATER LEVEL AND DATE START 7-3- FINISH 1410-11/14/83 LOGGER SM McGee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	24				See log of 4S for 0-35'		
35	36.5	S-1	7"	3-4-6 (10)	Sand, f-lom, moist, brown + gravel		
	39.5						
40	41	S-2	9"	6-7-12 (19)	Sand, fine to medium w. gr, moist, brown (SP) 8.0% gr 89.2% sd 2.8% fines		
	44.5						
45	46	S-3	9"	7-12-14 (26)	as above		Stopped work to fix HW plate
50							
	54.5						
55	56	S-4	10"	9-9-20 (29)	Sand, fine to med. gravel, moist, brown		
60							

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	41D	2 OF 3

SOIL BORING LOG

PROJECT City of Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Mud rotary / CME-55

WATER LEVEL AND DATE START FINISH LOGGER SM McGee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
64.5							
65	65 – 66	S-5	10"	13-11-9 (20)	Sand, fine to med, brown, wet		
70							Broke down dr... string to remove pr...
							Stopped drilling to mix clean mud
74.5							
75	75 – 76	S-6	15"	8-9-11 (20)	Sand, fine, brown, wet		
80							
84.5							
85	85 – 86	S-7	14"	11-19-32 (51)	As above (SP) 15.9% med sd 80.7% fine sd 3.3% fines		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	4D	3 of 3

SOIL BORING LOG

PROJECT City of Wausau Hz. -11 LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Mud rotary / CME-55

WATER LEVEL AND DATE START FINISH LOGGER SM McGee

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		94.5						
95		96	S-8	15"	13-16-23 (39)	Sand, fine, moist, brown		
100								
		104.5						
105			S-9	10"	34-52-50/4 102/6.4"	As above		
		106.4				Bottom of boring 106.4'		
110								

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.40	B-6D	1 OF

SOIL BORING LOG

PROJECT City of Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Bentonite mud rotary / CME-55/75, 3 7/8" tricone

WATER LEVEL AND DATE START 11/11/85 FINISH LOGGER SMcBee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS TESTS AND INSTRUMENTATION
					Sand little if any gravel		Description from driller's comments
							Refer to log of B-6S
							Wyogel bentonite
10							
20							
30							
40					Cobbley sand and gravel		"boulder"
							44' last ≈ 50% of drilling fluid
					Granite boulder or top of rock 47.5'		
50					Bottom of boring 49.5'		11/11/85 11/12/85

This boring was drilled ≈5' from original location after tricone bit sheared off in hole at 55'.

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	B-75	1 OF

SOIL BORING LOG

PROJECT Wausau LF - WIS. DNR LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT 3¼" I.D. HSA (7¼" O.D.), CME 45 RIG, STD SPLIT SPOONS

WATER LEVEL AND DATE 29.5' 11/12 START 0930 - 11/12 FINISH LOGGER T.H. Johnson

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	0.0						
	1.5	S-1	12"	1-3-5 (8)	FILL, DK. GRAY TO BROWN, ORGANIC SILTY SAND		OVA BACKGROUND ~5 PPM
					~2.0'		
	4.5						
5	6.0	S-2	10"	15-30-15/.2'	SAND, fine TO CSE, LT. BROWN, ~10% FINE GRAVEL, MOIST, (SP)		OVA READING ~5.5 PPM IN HSA
					~7.5'		
	9.5						
					SAND, MED. TO CSE. LT. BROWN, ~10% FINE GRAVEL, (SP)		OVA READING BACKGROUND
10	11.0	S-3	12"	9-16-18 (34)			OVA [illegible] TO ~5.5 PPM
	14.5						
15	16.0	S-4	9"	18-22-14 (36)	SAND, MED. TO CSE, LT. BROWN, ~30% FINE TO MED. GRAVEL, MOIST TO WET (AT 15.5-16M) (SP)		OVA READING BACKGROUND
	19.5						
					SAND, MED.-fine, LT. BROWN, MOIST (SP) 9.6% gr 87.8% sd 2.6% fines		OVA READINGS BACKGROUND
20	21.0	S-5	10"	5-11-16 (27)			
	24.5						
25	26.0	S-6	8"	12-13-13 (26)	SAND, MED. TO CSE., LT BROWN, MOIST, SP)		OVA READINGS UP TO 8 PPM IN [illegible] ~2 to 3 PPM above background
					~27'		
	29.5						
30	[illegible]	S-7	8'	7-12-11 (23)	SAND MED. TO fine, LT. BROWN, WET (SP) 35.8% med sd, 63.1% fine sd		OVA [illegible] BACKGROUND [illegible]

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	S-7	1 OF 1

SOIL BORING LOG

PROJECT Wauson Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT

WATER LEVEL AND DATE START 0930 - 11/12 FINISH LOGGER J. Johnson

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							WATER LEVEL AT 29.5' AT 1030
	34.5						
35	36.0	S-8	8	4-7-8 (15)	SAND, FINE TO MED, LT. BROWN, WET (SP)		OVA READING BACKGROUND (5.5 PPM)
							DRILLED TO 40' W/ 8" I.D. SPIRAL AUGERS. SET 4" DIA. PVC WELL TO 40'
40					BOTTOM OF BORING AT 40.0		
45							

REV 11/82 FORM 01586

Facility Name: City of Dawson Landfill | Facility ID Number: | Date: 12/03/85 | Completed By (Name and Firm): SHARA McBEE / CH2M Hill

Well Name	Well ID Number (DNR No.)	Well Location	N	S	E	W	Date Established	Well Casing Diam.	Well Casing Type	Elevations: Top of Well Casing	Elevations: Ground Surface	Elevations: Screen Top	Reference: MSL (✓)	Reference: Site Datum (✓)	Screen: Length	Screen: Material	Well Depth	Type of Well (✓): PIEZ	OW	PW	LYS	Other
1		417,660 2,094,335	✓		✓		11/11/85	2"	P	1223.64	1220.8	1205.9	✓		15'	PVC	30.9		✓			
2		417,810 2,095,205	✓		✓		11/11/85	2"	P	1219.17	1216.2	1193.3	✓		15'	PVC	40.5'		✓			
3		417,330 2,094,945	✓		✓		11/12/85	2"	P	1220.14	1217.4	1193.5	✓		15'	PVC	31.5'		✓			
4S		417,035 2,094,795	✓		✓		11/13/85	2"	P	1216.76	1214.1	1196.9	✓		15'	PVC	35'		✓			
4D		417,035 2,094,780	✓		✓		11/15/85	2"	P	1216.26	1213.9	1114.4	✓		5'	PVC	106'	✓				
6		417,085 2,094,340	✓		✓		11/13/85	2"	P	1221.63	1219.2	1194.7	✓		15'	PVC	49.5'		✓			
7		417,775 2,094,970	✓		✓		11/12/85	2"	P	1220.91	1216.2	1197.2	✓		15'	PVC	30'		✓			

Location Coordinates Are:

☐ Grid System State Plane Coordinate ☑ Northern ☐ Central

Received In:

District: _____ Area: _____ Bureau: _____

By: _____

SMS Use:

File Maint. Completed: _____ Date

Other: _____

CH2M HILL

FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau

PROJECT NO. 420303.A0

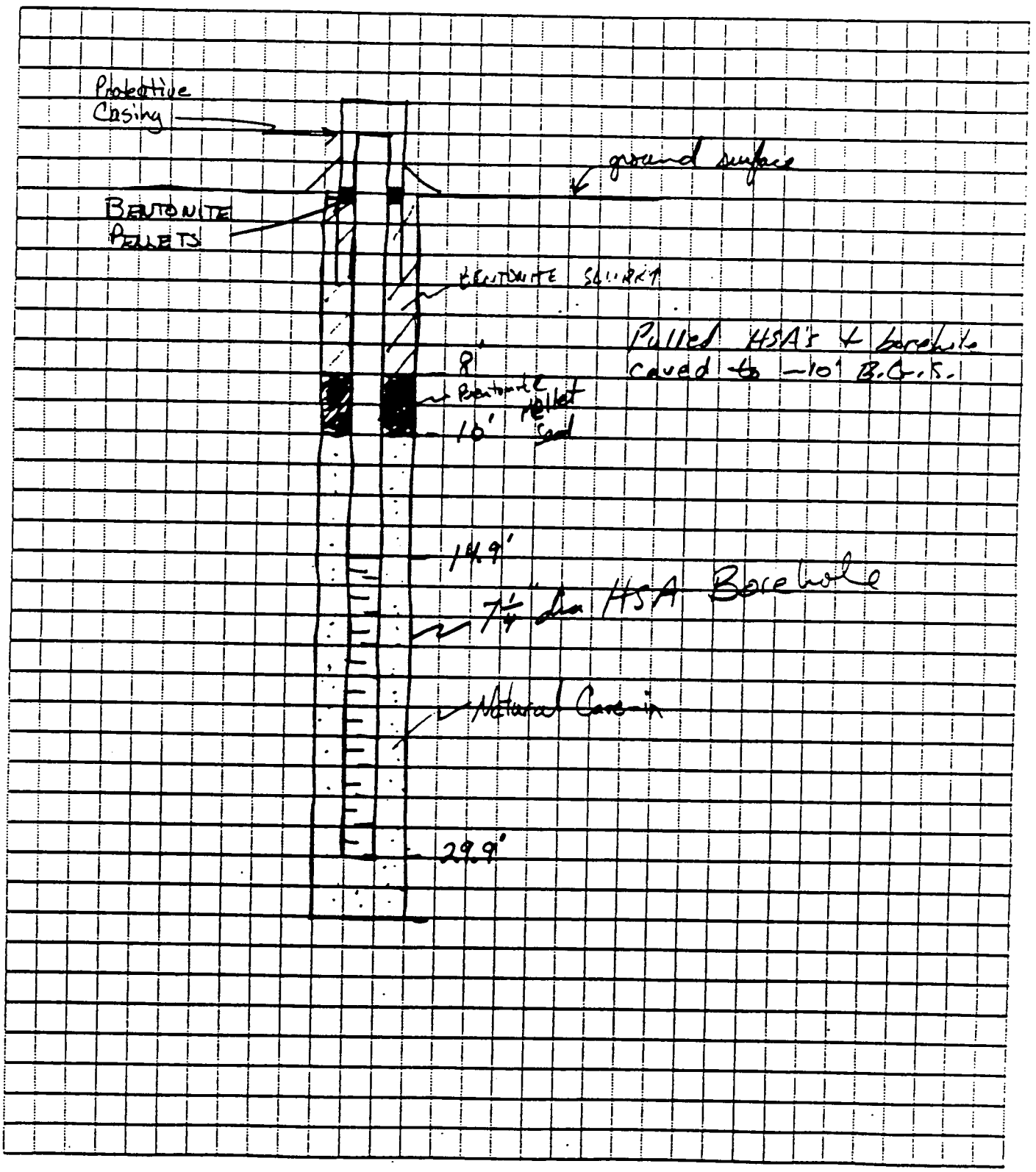
BORING NO. B-15

PIEZOMETER NO. B-15

INSTALLED BY IHS DATE 1- -5-

CHECKED BY _____ DATE _____

COORDINATES _____



CH2M HILL

FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF

PROJECT NO. L20303.A0

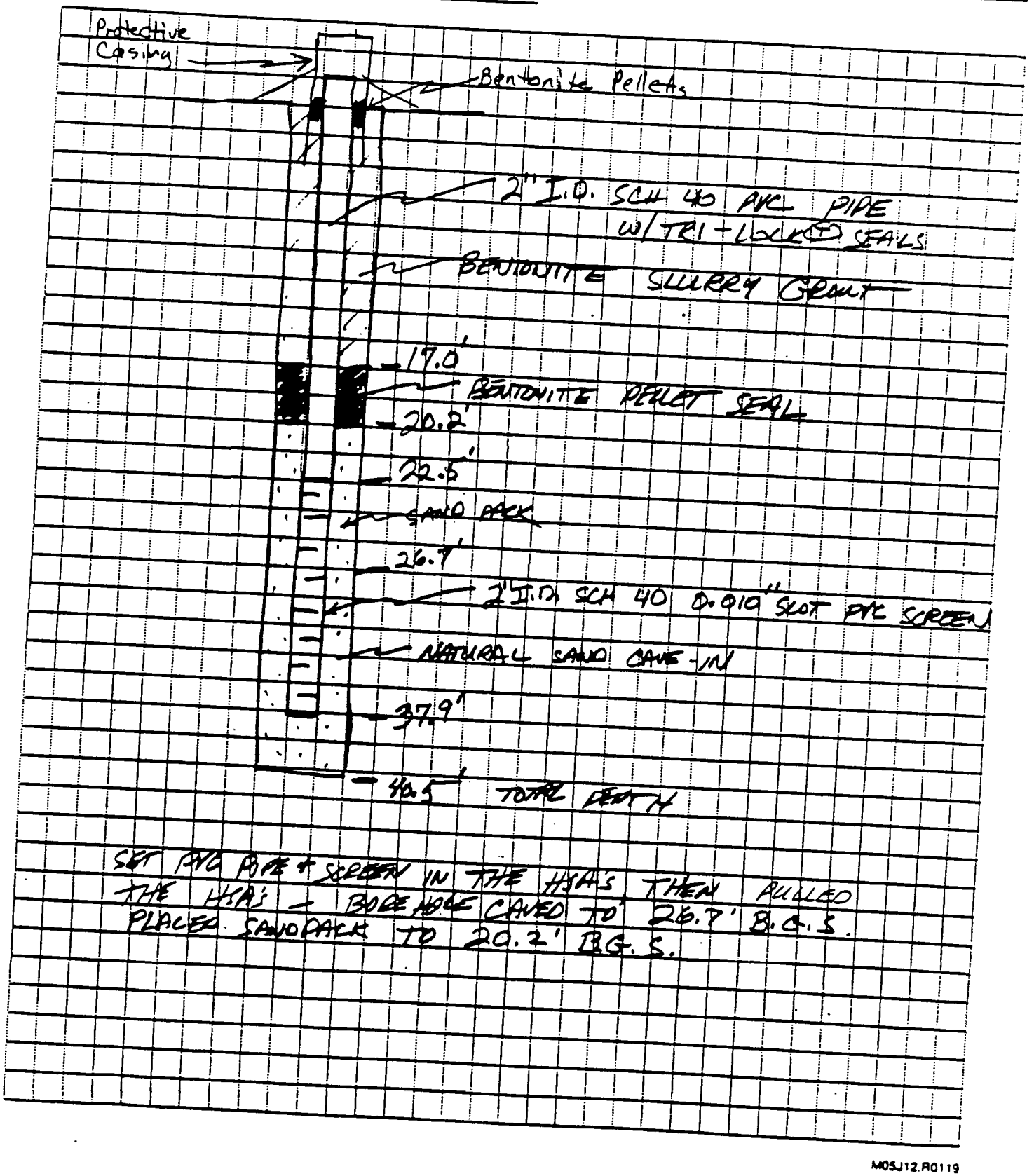
BORING NO. B-25

PIEZOMETER NO. B-25

INSTALLED BY I.H.J DATE 11/11/85

CHECKED BY _____ DATE _____

COORDINATES _____



SET PVC PIPE + SCREEN IN THE HSA'S, THEN PULLED THE HSA'S - BOREHOLE CAVED TO 26.7' B.G.S. PLACED SANDPACK TO 20.2' B.G.S.

M05J12.R0119

CH2M HILL

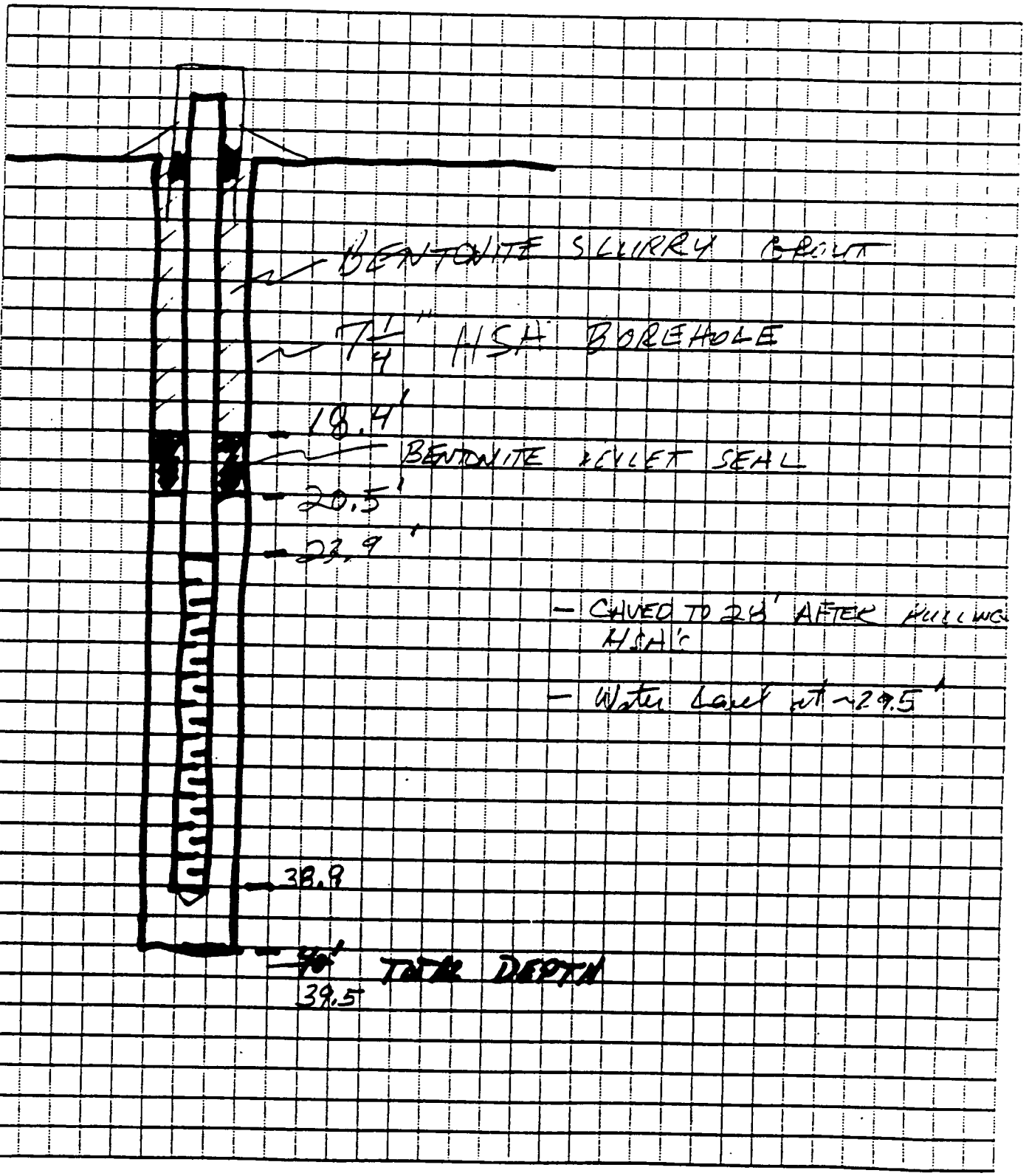
FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF. WDNR
PROJECT NO. 20303.A0
BORING NO. B-3S
PIEZOMETER NO. B-3S

INSTALLED BY IHJ DATE 11/12/85
CHECKED BY _____ DATE _____
COORDINATES _____



M05J12.R0119

CH2M HILL

FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - WDNR

PROJECT NO. 420303.A0

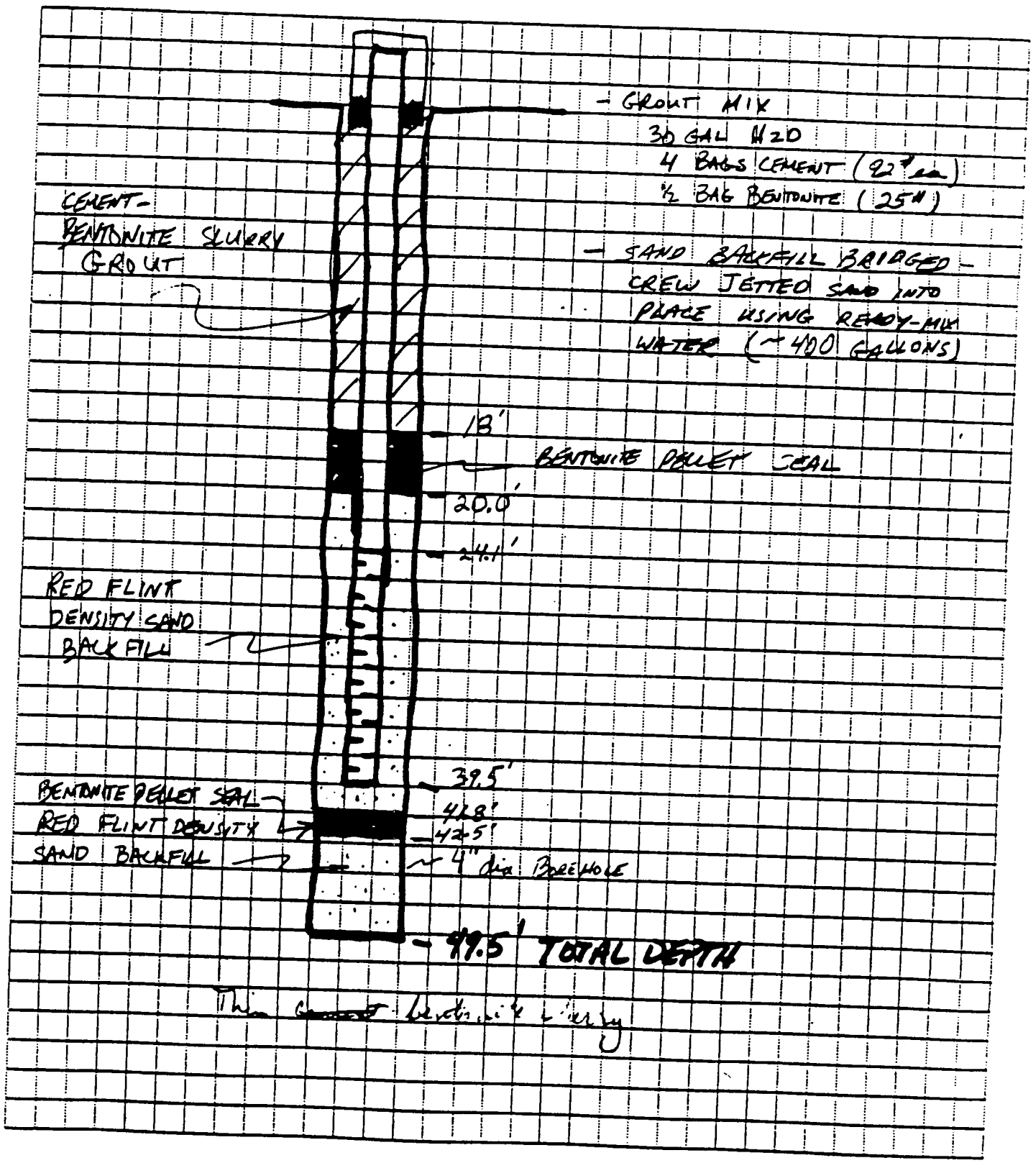
BORING NO. B-6

PIEZOMETER NO. B-6

INSTALLED BY I. H. Johnson DATE 11/13/85

CHECKED BY _____ DATE _____

COORDINATES _____



M05J12.R0119

HILL

PROJECT NUMBER 120303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 4S 19± to 21±

TYPE OF SAMPLE: SMALL BOTTLE SAMPLE NO. S-5

GROSS WET MASS TOTAL SAMPLE 458.2 TARE MASS 154.0 PAN NO. X NET WET MASS TOTAL SAMPLE

GROSS DRY MASS TOTAL SAMPLE 445.9 TARE MASS 154.0 PAN NO. X NET DRY MASS TOTAL SAMPLE, A 291.9

COARSE FRACTION: NET WET MASS ____ MOISTURE, % ____ NET DRY MASS ____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL	NET MASS RETAINED ACCUMULATIVE	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
1	154.2	154.2	0.0	0.0	0.0	0.0	100	
3/4	166.6	154.2	12.4	12.4	4.2	4.2	95.8	
1/2	191.8	166.6	25.2	37.6	8.6	12.9	87.1	
3/8	201.9	191.8	10.1	47.7	3.5	16.3	83.7	

FINE FRACTION: NET WET MASS ____ MOISTURE, % ____ NET DRY MASS, C ____

DRY MASS [redacted] PRIOR TO WASH, D 291.9

DRY MASS [redacted] AFTER WASH 278.0

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL, E (AS RECORDED)	(F)	NET MASS RETAINED INDIVIDUAL (TOTAL BASIS)	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
4	242.1	201.9	40.2		87.9	13.8	30.1	69.9	
8	281.5	242.1	39.4		127.3	13.5	43.6	56.4	
16	320.2	281.5	38.7		166.0	13.3	56.9	43.1	
30	377.0	320.2	56.8		222.8	19.5	76.3	23.7	
50	413.7	377.0	36.7		259.5	12.6	88.9	11.1	
100	424.1	413.7	10.4		269.9	3.6	92.5	7.5	
200	430.9	424.1	6.8		276.7	2.3	94.8	5.2	
PAN	432.1	430.9	1.2		277.9				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		X
GROSS WET MASS	gms	458.2
GROSS DRY MASS		445.9
MOISTURE MASS		12.3
TARE MASS		154.0
DRY SOIL MASS		291.9
MOISTURE CONTENT	%	4.21

REMARKS: FOR WASH WEIGHT = 432.2 - 154.2

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/4&5/85	Jim Emery	12/8/85		

LAB FORM 0422A 2/78

SHEET __ OF __

CH2M HILL

PROJECT NUMBER

L20303.A0

PARTICLE-SIZE ANALYSIS

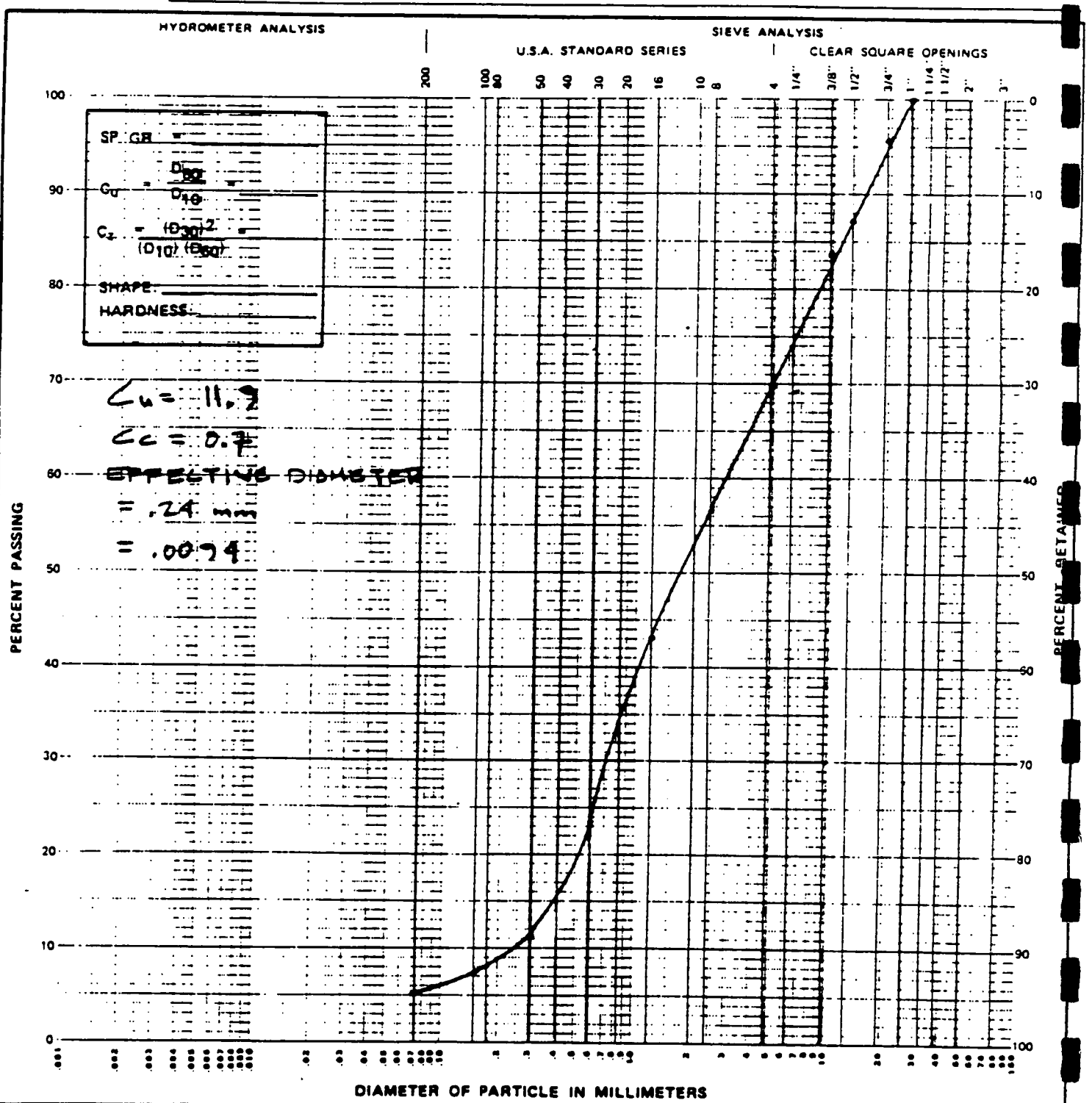
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 45 17E to 21E SAMPLE NO. S-5

TYPE OF SAMPLE:



COL-LOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION WELL GRADED SAND (SW)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/9/85	Jim Emery	12/9/85		

LAB FORM D422P – M 7/78

HILL

NOT 40 (FOURTY)

L20303.AO

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: B(40) 39½ to 41 (40 Z on Lid) SAMPLE NO. S-2

TYPE OF SAMPLE: SMALL BOTTLE

GROSS WET MASS TOTAL SAMPLE 461.1 TARE MASS 150.1 PAN NO. Z NET WET MASS TOTAL SAMPLE

GROSS DRY MASS TOTAL SAMPLE 415.0 TARE MASS 150.1 PAN NO. Z NET DRY MASS TOTAL SAMPLE, A 264.9

COARSE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS _____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED		PERCENT RETAINED		ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
			INDIVIDUAL	ACCUMULATIVE	INDIVIDUAL	ACCUMULATIVE		
3/8	150.2	150.2	0.0	0.0	0.0	0.0	100	

FINE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS, C _____

DRY MASS [redacted] PRIOR TO WASH, D 264.9

DRY MASS [redacted] AFTER WASH 258.1

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED			PERCENT RETAINED		ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
			INDIVIDUAL, g (AS RECORDED)	(F)	INDIVIDUAL (TOTAL BASIS)	INDIVIDUAL	ACCUMULATIVE		
4	152.3	150.2	2.1		2.1	0.8	0.8	99.2	
8	155.2	152.3	2.9		5.0	1.1	1.9	98.1	
16	166.6	155.2	11.4		16.4	4.3	6.2	93.8	
30	214.5	166.6	47.9		64.3	18.1	24.3	75.7	
50	340.9	214.5	126.4		190.7	47.7	72.0	28.0	
100	397.6	340.9	56.7		247.4	21.4	93.4	6.6	
200	407.6	397.6	10.0		257.4	3.8	97.2	2.8	
PAN	408.2	407.6	0.6		253.0				

MOISTURE CONTENT DATA:	UNITS	
CAN NO.		Z
GROSS WET MASS	gms	461.1
GROSS DRY MASS		415.0
MOISTURE MASS		46.1
TARE MASS		150.1
DRY SOIL MASS		264.9
MOISTURE CONTENT	%	17.4

REMARKS:

FINAL WASH WEIGHT = 408.3 - 150.2

(Soil exploration CO. on Label)

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY: Jim Emery DATE: 12/4/95 COMPUTED BY: Jim Emery DATE: 12/8/95 CHECKED BY: DATE:

LAB FORM 0422A 2/78

SHEET __ OF __

CH2M HILL

PROJECT NUMBER
L20303.A0

PARTICLE-SIZE ANALYSIS

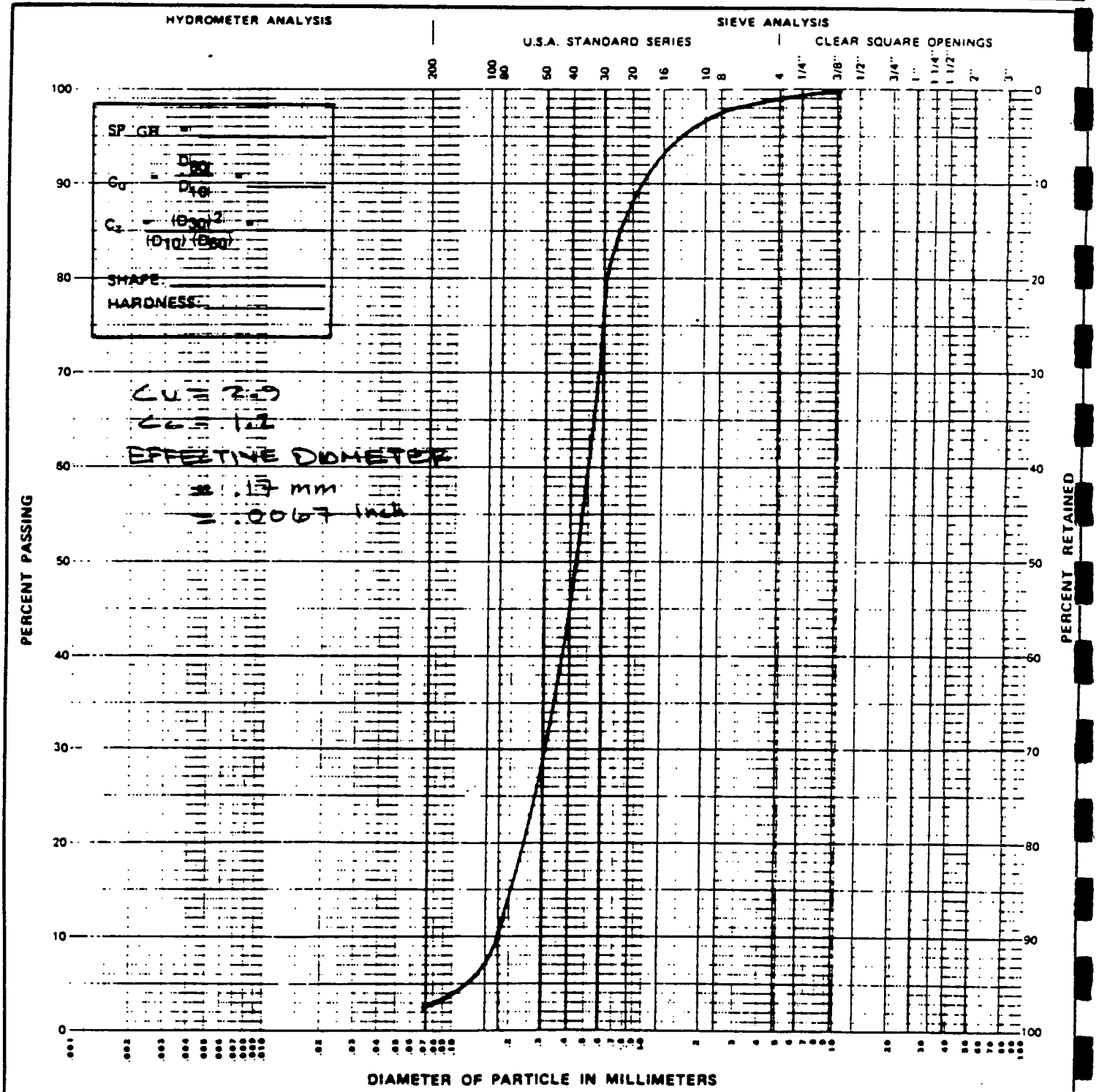
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: B4D 39' to 40' SAMPLE NO. S-2

TYPE OF SAMPLE: _____



COL-LOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION POORLY GRADED SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/4;5/85	Jim Emery	12/9/85		

LAB FORM D422P -M 7 79

SHEET ___ OF ___

CH2M HILL

PROJECT NUMBER: L 20303.A0

PARTICLE-SIZE ANALYSIS

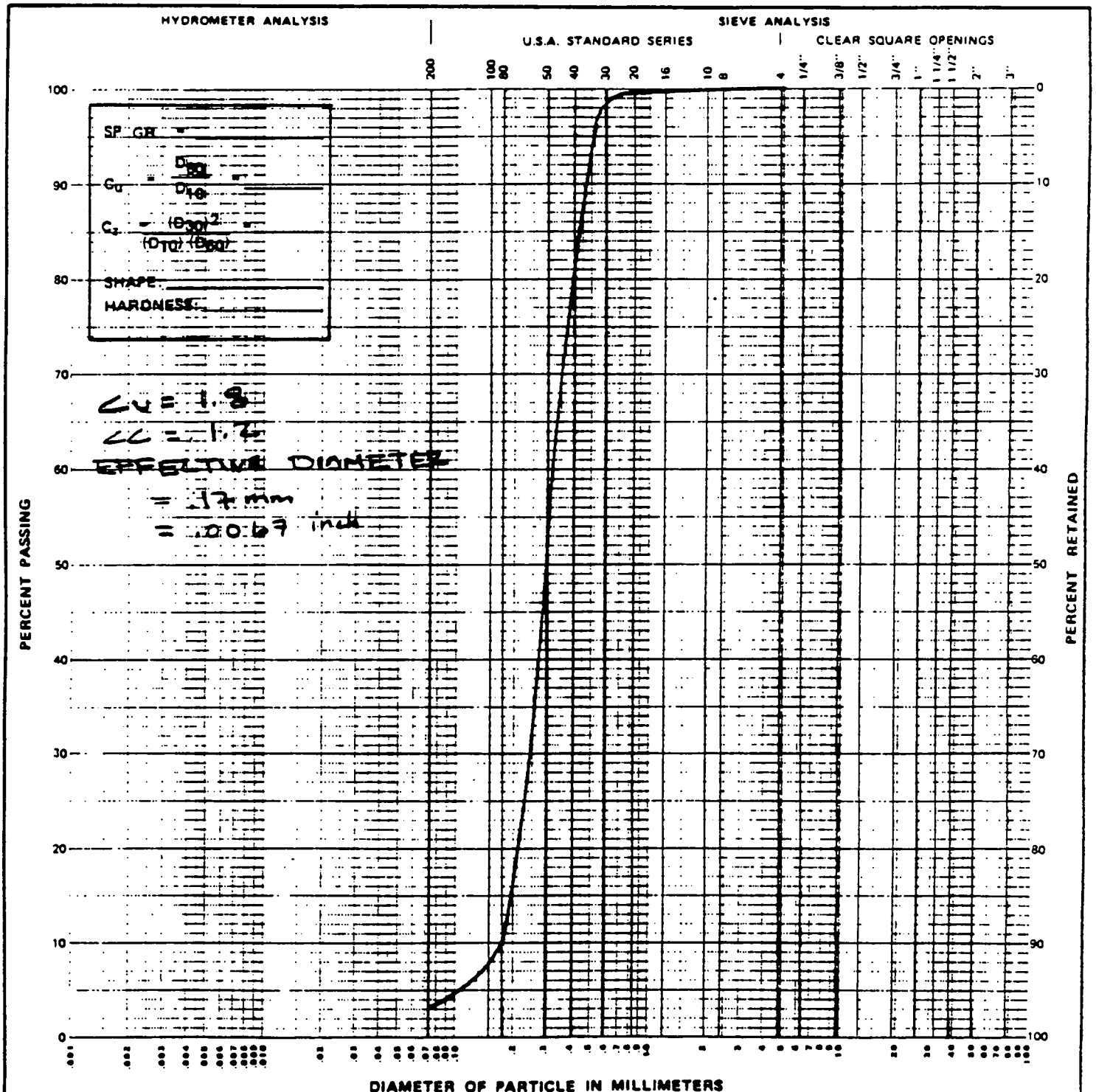
ASTM D422

PROJECT DESCRIPTION: WAUSAU

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: B-4D 89' to 86' SAMPLE NO. S-7

TYPE OF SAMPLE:



COL-LOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION: POORLY GRADED SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emern	12/4 & 5/85	Jim Emern	12/8/85		

CH2M HILL

PROJECT NUMBER 120303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: TS 19E to 21E

TYPE OF SAMPLE: SMALL BOTTLE SAMPLE NO. S-5

GROSS WET MASS TOTAL SAMPLE 467.6 TARE MASS 167.3 PAN NO. 220 NET WET MASS TOTAL SAMPLE

GROSS DRY MASS TOTAL SAMPLE 448.9 TARE MASS 167.3 PAN NO. 220 NET DRY MASS TOTAL SAMPLE, A 281.6

COARSE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS _____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL	NET MASS RETAINED ACCUMULATIVE	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
1/2	167.4	167.4	0.0	0.0	0.0	0.0	100	
3/8	175.9	167.4	8.5	8.5	3.0	3.0	97.0	

FINE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS, C _____

DRY MASS [redacted] PRIOR TO WASH, D 281.6

DRY MASS [redacted] AFTER WASH 274.8

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL (AS RECORDED)	(F)	NET MASS RETAINED INDIVIDUAL (TOTAL BASIS)	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
4	194.3	175.9	18.4		26.9	6.5	9.6	90.4	
8	228.2	194.3	33.9		60.8	12.0	21.6	78.4	
16	269.3	228.2	41.1		101.9	14.6	36.2	63.8	
30	326.6	269.3	57.3		159.2	20.3	56.5	43.5	
50	414.6	326.6	88.0		247.2	31.3	87.8	12.2	
100	435.7	414.6	21.1		268.3	7.5	95.3	4.7	
200	441.8	435.7	6.1		274.4	2.2	97.4	2.6	
PAN	442.1	441.8	0.3		274.7				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		220
GROSS WET MASS	gms	467.6
GROSS DRY MASS		448.9
MOISTURE MASS		18.7
TARE MASS		167.3
DRY SOIL MASS		281.6
MOISTURE CONTENT	%	6.64

REMARKS:

FOR WASH WEIGHT = 442.2 - 167.4

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/9/85	Jim Emery	12/8/85		

LAB FORM 0422A 2/78

SHEET __ OF __

CH2M HILL

PROJECT NUMBER 120303.A0

PARTICLE-SIZE ANALYSIS

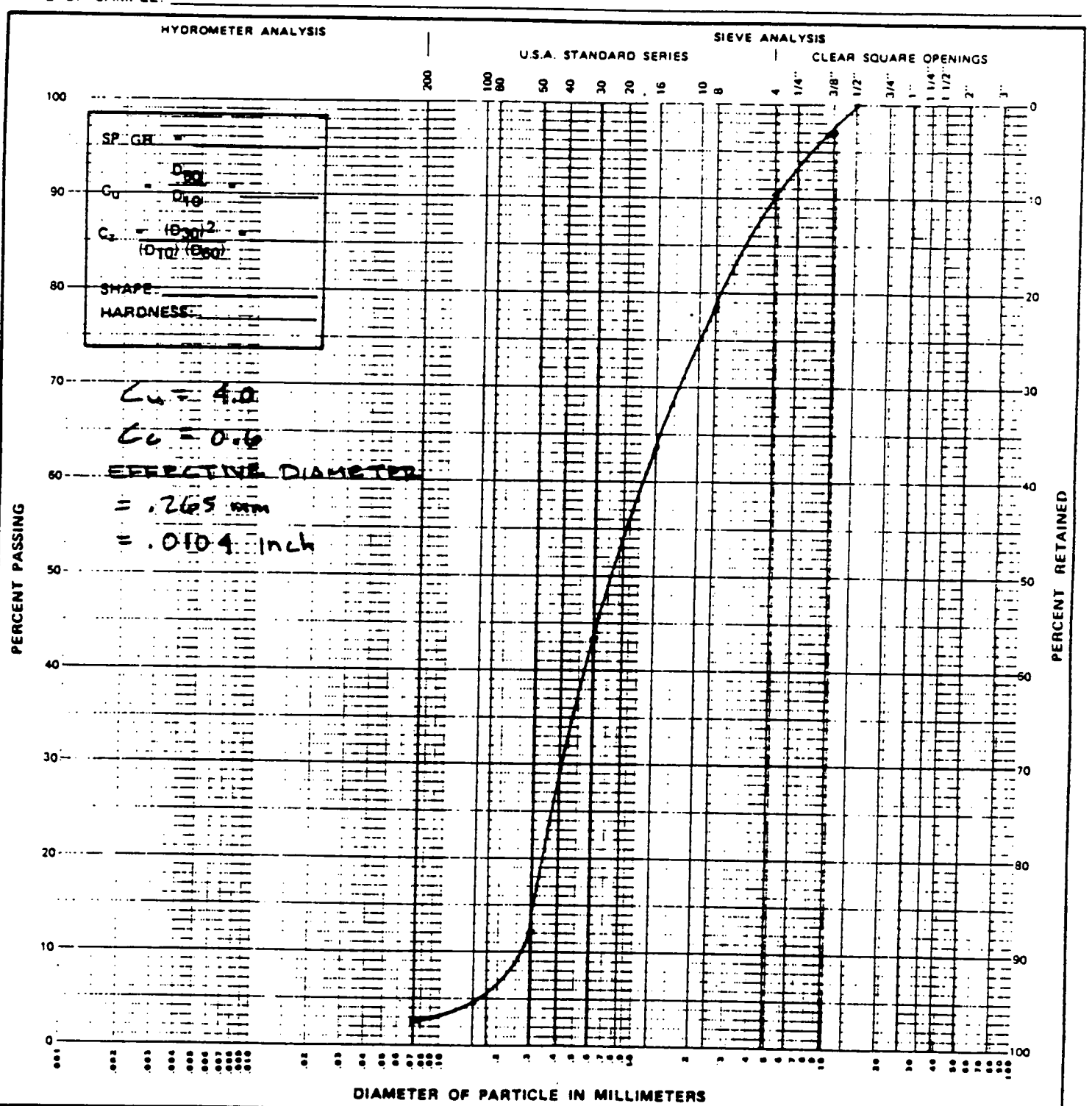
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: TS 19' to 21' SAMPLE NO. S-5

TYPE OF SAMPLE:



COL-LOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION POORLY GRADED SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/9/85	Jim Emery	12/8/85		

CH2M HILL

120303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: TS 29E to 31E SAMPLE NO. S-7

TYPE OF SAMPLE: SMALL BOTTLE

GROSS WET MASS TOTAL SAMPLE 425.9 TARE MASS 155.3 PAN NO. 8 NET WET MASS TOTAL SAMPLE

GROSS DRY MASS TOTAL SAMPLE 382.2 TARE MASS 155.3 PAN NO. 8 NET DRY MASS TOTAL SAMPLE, A 226.9

COARSE FRACTION: NET WET MASS ____ MOISTURE, % ____ NET DRY MASS ____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED		PERCENT RETAINED		ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
			INDIVIDUAL	ACCUMULATIVE	INDIVIDUAL	ACCUMULATIVE		
3/8	155.3	155.3	0.0	0.0	0.0	0.0	100	

FINE FRACTION: NET WET MASS ____ MOISTURE, % ____ NET DRY MASS, C ____

DRY MASS [redacted] PRIOR TO WASH, D 226.9

DRY MASS [redacted] AFTER WASH 225.4

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED			PERCENT RETAINED		ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
			INDIVIDUAL, E (AS RECORDED)	(F)	INDIVIDUAL (TOTAL BASIS)	INDIVIDUAL	ACCUMULATIVE		
4	155.5	155.3	0.2		0.2	0.1	0.1	99.9	
8	156.3	155.5	0.8		1.0	0.4	0.5	99.5	
16	159.0	156.3	2.7		3.7	1.2	1.6	98.4	
30	190.3	159.0	31.3		35.0	13.8	15.4	84.6	
50	319.8	190.3	129.5		164.5	57.1	72.5	27.5	
100	377.0	319.8	57.2		221.7	25.2	97.7	2.3	
200	380.6	377.0	3.6		225.3	1.6	99.3	0.7	
PAN	330.7	330.6	0.1		225.4				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		8
GROSS WET MASS	gms	425.9
GROSS DRY MASS		382.2
MOISTURE MASS		43.7
TARE MASS		155.3
DRY SOIL MASS		226.9
MOISTURE CONTENT	%	19.26

REMARKS:

FIRST WASH WEIGHT = 380.7 - 155.3

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY: JIM EIKEN DATE: 12/4&5/85 COMPUTED BY: JIM EIKEN DATE: 12/6/85 CHECKED BY: DATE:

LAB FORM C422A 2/78

SHEET ___ OF ___

CH2M HILL

PROJECT NUMBER: L20303.A0

PARTICLE-SIZE ANALYSIS

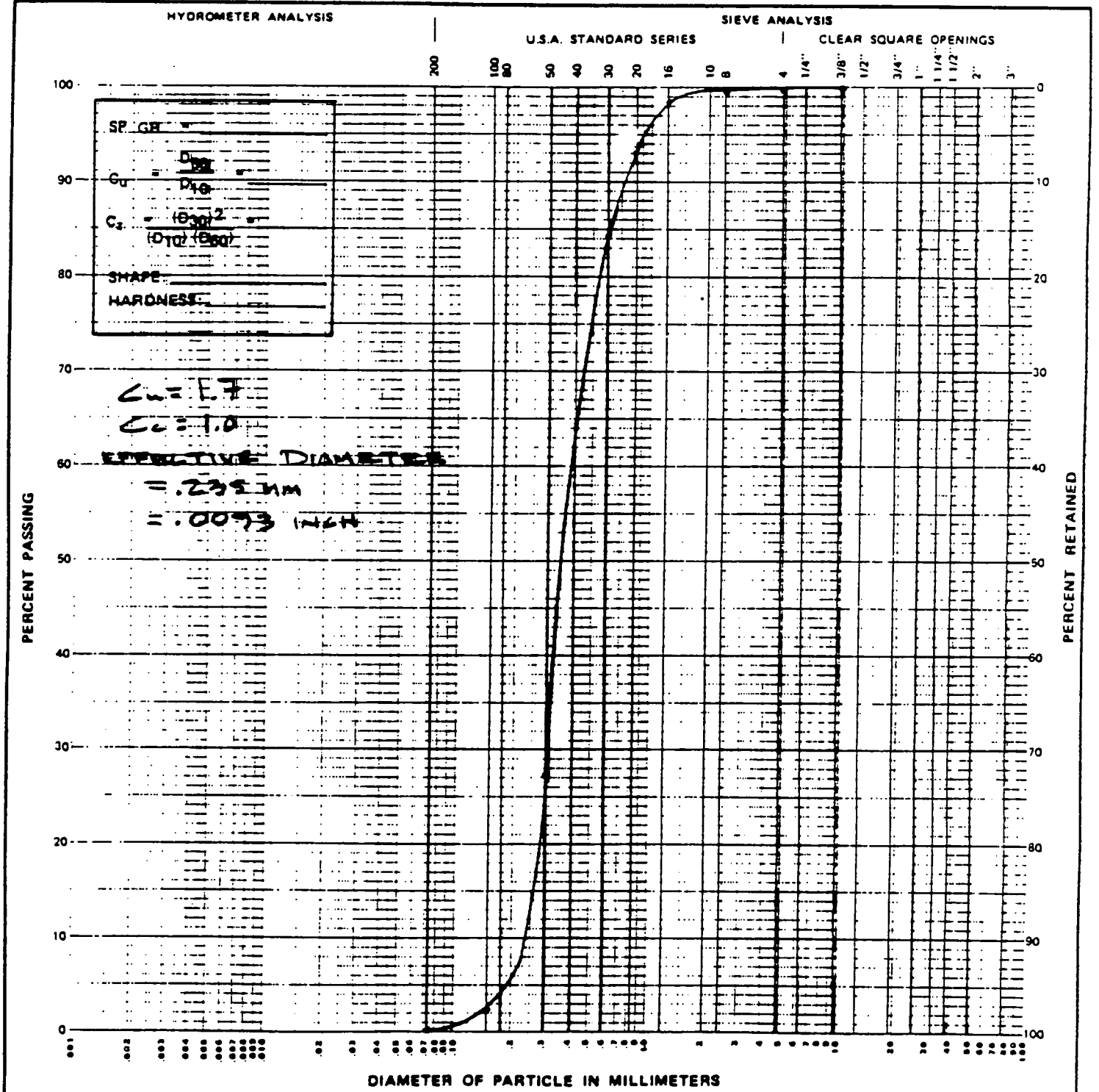
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 7S 29' to 31' SAMPLE NO. S-7

TYPE OF SAMPLE: ___



COL-LOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION: POORLY GRADE SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emmon	12/9/85	Jim Emmon	12/18/85		

CH2M HILL

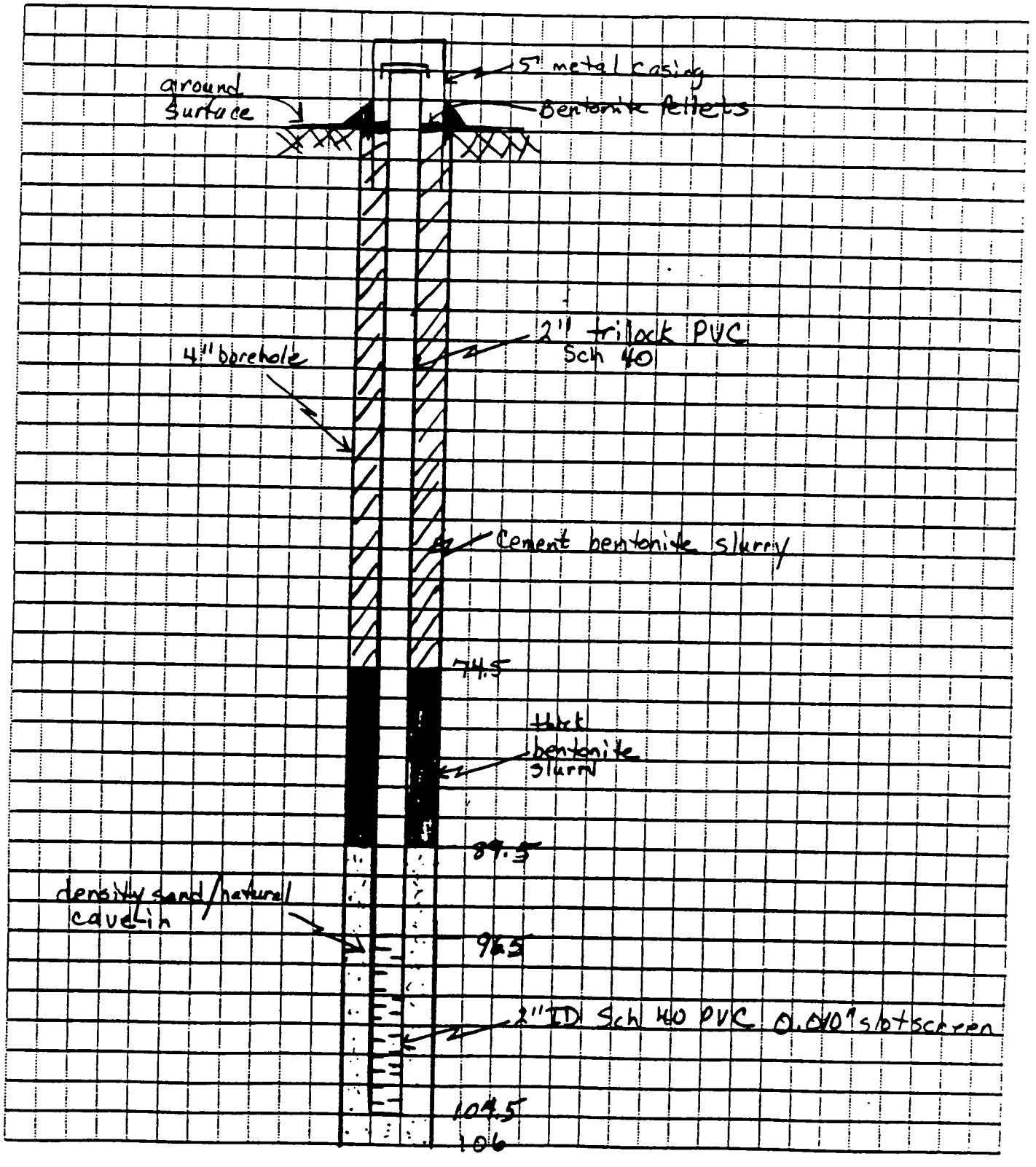
FILE NO _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME City of Wausau Landfill
PROJECT NO. L20303.AD
BORING NO. 4D
PIEZOMETER NO. _____

INSTALLED BY SM McBee DATE 11/15/85
CHECKED BY _____ DATE _____
COORDINATES _____



M05J12.R0119

CH2M HILL

FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - WDNR

PROJECT NO. L20303.A0

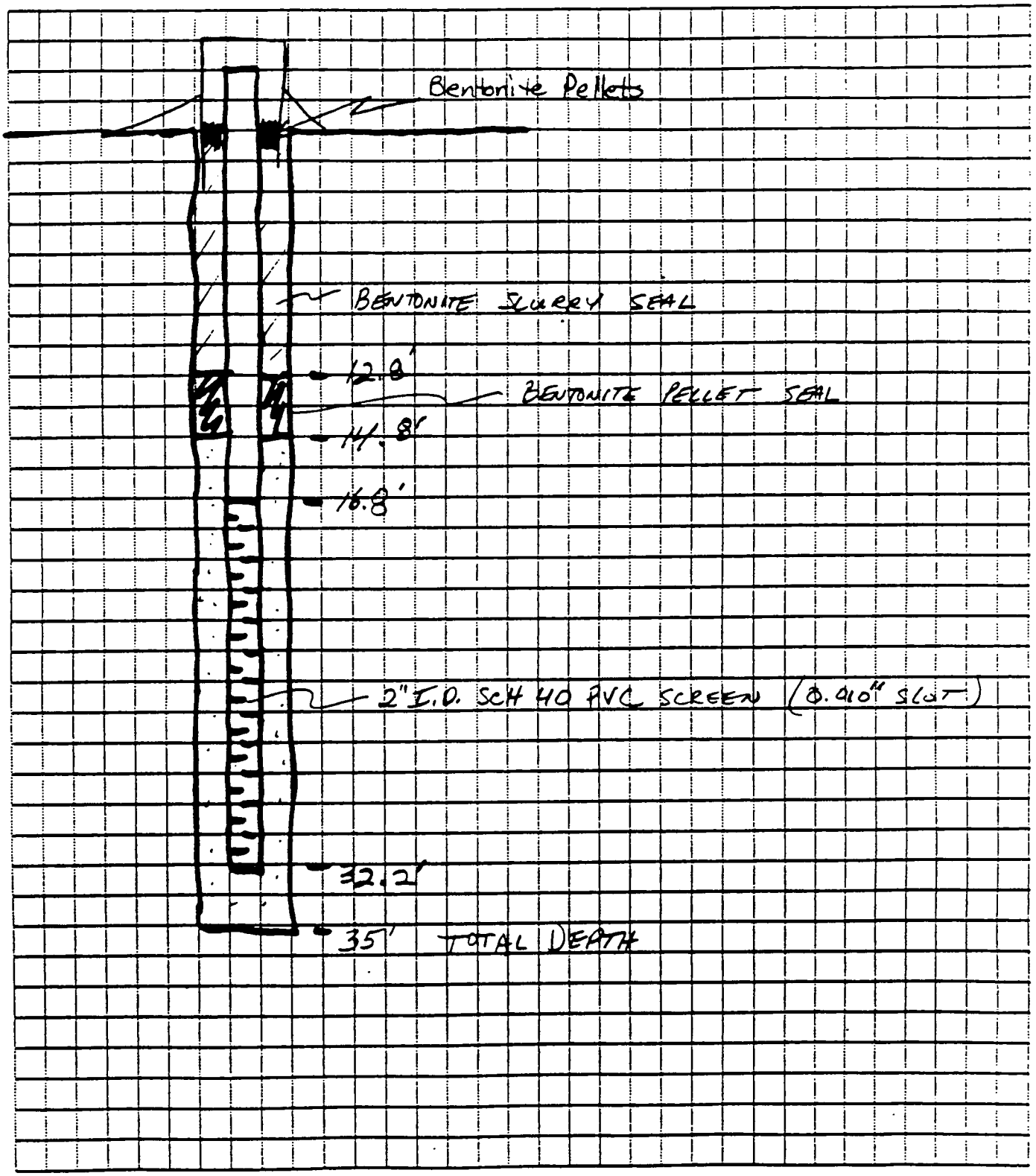
BORING NO. B-4S

PIEZOMETER NO. B-4S

INSTALLED BY I.H. Johnson DATE 11/13/85

CHECKED BY _____ DATE _____

COORDINATES _____



M05J12.R0119

CH2M HILL

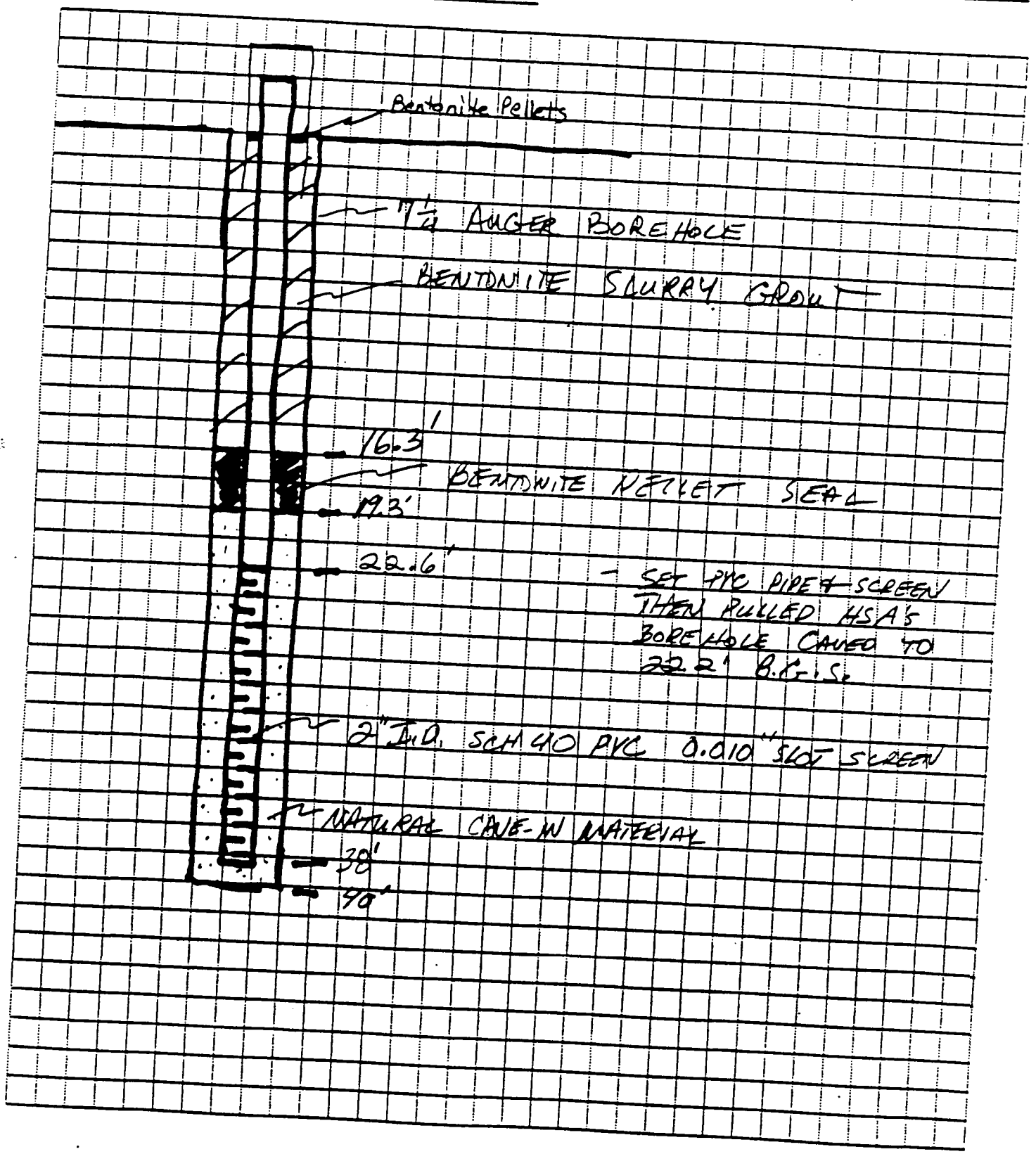
FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME: Vanover LF - Wis. Link
PROJECT NO: 120303.A0
BORING NO. B-7S
PIEZOMETER NO. B-7S

INSTALLED BY IHJ DATE 11/12-13
CHECKED BY _____ DATE _____
COORDINATES _____



M05J12.R0119

Appendix D
GEOTECHNICAL ANALYSES OF SOILS

HILL

PROJECT NUMBER: L 20303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 15 9E to 11E

TYPE OF SAMPLE: SMALL BOTTLE SAMPLE NO. S-3

GROSS WET MASS TOTAL SAMPLE 483.0 TARE MASS 154.3 PAN NO. T NET WET MASS TOTAL SAMPLE _____

GROSS DRY MASS TOTAL SAMPLE 454.4 TARE MASS 154.3 PAN NO. T NET DRY MASS TOTAL SAMPLE, A 300.1

COARSE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS _____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL	NET MASS RETAINED ACCUMULATIVE	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
3/4	154.3	154.3	0.0	0.0	0.0	0.0	100	
1/2	158.7	154.3	4.4	4.4	1.5	1.5	98.5	
3/8	160.3	158.7	1.6	6.0	0.5	2.0	98.0	

FINE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS, C _____

DRY MASS [redacted] PRIOR TO WASH, D 300.1

DRY MASS [redacted] AFTER WASH 292.9

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL (AS RECORDED)	(F)	NET MASS RETAINED INDIVIDUAL (TOTAL BASIS)	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
4	180.5	160.3	20.2		26.2	6.7	8.7	91.3	
8	219.3	180.5	38.8		65.0	12.9	21.7	78.3	
16	274.7	219.3	55.4		120.4	18.5	40.1	59.9	
30	336.4	274.7	61.7		182.1	20.6	60.7	39.3	
50	389.1	336.4	52.7		234.8	17.6	78.2	21.8	
100	440.3	389.1	51.2		286.0	17.1	95.3	4.7	
200	446.7	440.3	6.4		292.4	2.1	97.4	2.6	
PAN	447.1	446.7	0.4		292.8				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		T
GROSS WET MASS	gms	483.0
GROSS DRY MASS		454.4
MOISTURE MASS		28.6
TARE MASS		154.3
DRY SOIL MASS		300.1
MOISTURE CONTENT	%	9.53

REMARKS: FIRST WASH WEIGHT = 447.2 - 154.3

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY: Jim Emery DATE: 12/4&5/85 | COMPUTED BY: Jim Emery DATE: 12/8/85 | CHECKED BY: DATE:

LAB FORM 0422A 2/78

SHEET __ OF __

CH2M HILL

PROJECT NUMBER: L20303.A0

PARTICLE-SIZE ANALYSIS

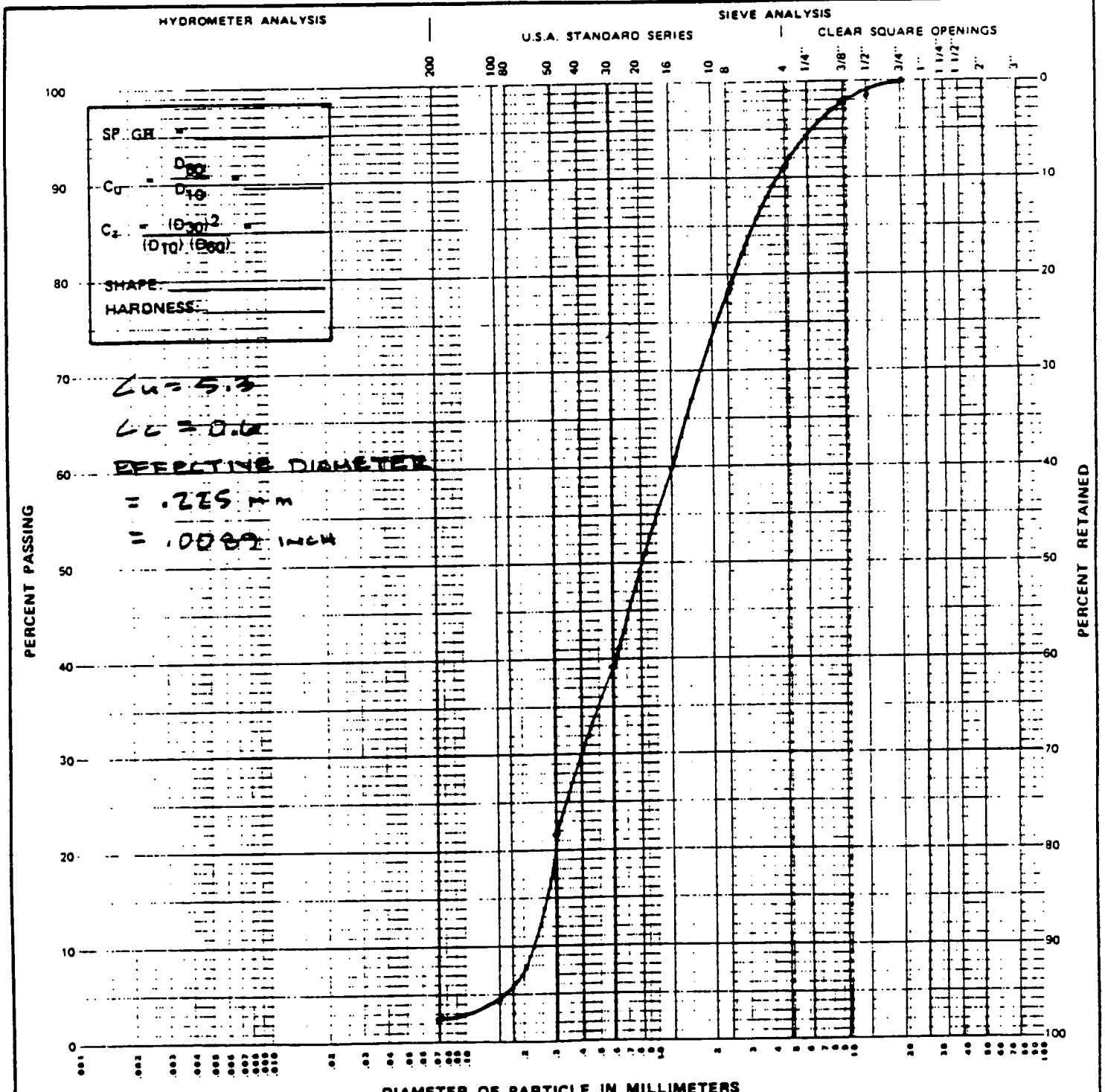
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: LS 9± to 11± SAMPLE NO. S-3

TYPE OF SAMPLE:



COLLOIDS	CLAY SIZE	SILT SIZE	SAND: FINE	SAND: MEDIUM	SAND: COARSE	GRAVEL	COBBLES

SAMPLE CLASSIFICATION: POORLY GRADED SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/9 & 5/85	Jim Emery	12/8/85		

LAB FORM D4222 -M 7/79

PROJECT NUMBER L20303.AO

SIEVE ANALYSIS

PROJECT DESCRIPTION: WAUSAU LANDFILL

ASTM D422/C136

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 15 19E to 21E

TYPE OF SAMPLE: SMALL BOTTLE SAMPLE NO. S-5

GROSS WET MASS TOTAL SAMPLE 450.8 TARE MASS 155.4 PAN NO. 7 NET WET MASS TOTAL SAMPLE

GROSS DRY MASS TOTAL SAMPLE 412.3 TARE MASS 155.4 PAN NO. 7 NET DRY MASS TOTAL SAMPLE, A 256.9

COARSE FRACTION: NET WET MASS ____ MOISTURE, % ____ NET DRY MASS ____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED		PERCENT RETAINED		ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
			INDIVIDUAL	ACCUMULATIVE	INDIVIDUAL	ACCUMULATIVE		

FINE FRACTION: NET WET MASS ____ MOISTURE, % ____ NET DRY MASS, C ____

DRY MASS [redacted] PRIOR TO WASH, D 256.9

DRY MASS [redacted] AFTER WASH 252.8

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED			PERCENT RETAINED		ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
			INDIVIDUAL (AS RECORDED)	(F)	INDIVIDUAL (TOTAL BASIS)	INDIVIDUAL	ACCUMULATIVE		
4	155.5	155.5	0.0		0.0	0.0	0.0	100	
8	155.9	155.5	0.4		0.4	0.2	0.2	99.8	
16	156.7	155.9	0.8		1.2	0.3	0.5	99.5	
30	166.7	156.7	10.0		11.2	3.9	4.4	95.6	
50	365.3	166.7	198.6		209.8	77.3	81.7	18.3	
100	404.6	365.3	39.3		249.1	15.3	97.0	3.0	
200	408.0	404.6	3.4		252.5	1.3	98.3	1.7	
PAN	408.2	408.0	0.2		252.7				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		7
GROSS WET MASS	gms	450.8
GROSS DRY MASS		412.3
MOISTURE MASS		38.5
TARE MASS		155.4
DRY SOIL MASS		256.9
MOISTURE CONTENT	%	14.99

REMARKS: POST WASH WEIGHT = 408.3 - 155.5

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY: Jim Emery DATE: 12/4&5/85 COMPUTED BY: Jim Emery DATE: 12/8/85 CHECKED BY: DATE:

SHEET ___ OF ___

CH2M HILL

PROJECT NUMBER

L20303.A0

PARTICLE-SIZE ANALYSIS

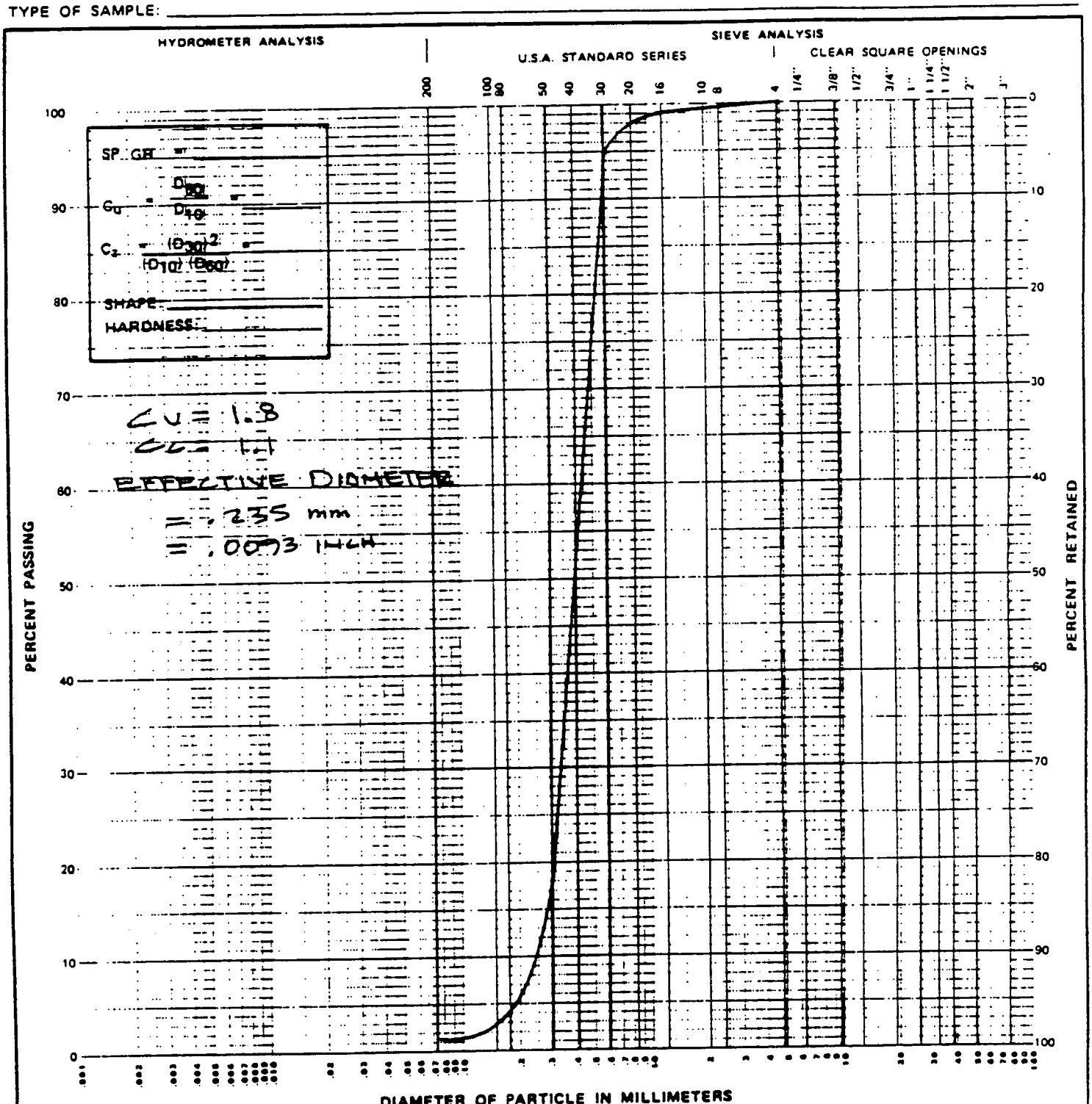
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: LS 19½ to 21' SAMPLE NO. S-5

TYPE OF SAMPLE:



COLLOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION POORLY GRADED SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
[illegible]	12/4/85	Jim Emery	12/8/85		

CH2M HILL

HYDROMETER ANALYSIS WITH SIEVE

ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 15 23' to 25' SAMPLE NO. S-6

TYPE OF SAMPLE: (Very Small amount submitted sample for this test.)

MASS PER DRY SAMPLE	28.98	JAR NO.	0	HYGROSCOPIC MOISTURE CONTENT	
HYGROSCOPIC MOISTURE, %	6.23	HYDROMETER NO.	68-3922	CAN NO.	
CORRECTED DRY MASS HYDROMETER SAMPLE, (M)	27.28	DISPERSING AGENT	Na(PO3)6	GROSS WET MASS	28.98
		AMOUNT USED	125 mL	GROSS DRY MASS	27.28
% PASSING NO. 10 SIEVE, (B)	60.21	SPECIFIC GRAVITY, G_s (a)	2.70	MOISTURE MASS	1.70
				TARE MASS	0.00
				DRY SOIL MASS	27.28
MASS OF A TOTAL SOIL REPRESENTED BY MASS OF SOIL USED IN HYDROMETER TEST, (W): $W = \frac{M}{B} \times 100 =$ 45.31				MOISTURE CONTENT	6.23

	T	r	t	H	R	P	L	K	D	
Reading Time DAY HR MIN	Elapsed Time (minutes)	Hydrometer Reading	°F / °C Temp. °C	Composite Hydrometer Correction	Corrected Hydrometer Reading	% Soil in Suspension	Effective Depth (cm)	K Value from Chart 4	Diameter of Particle (mm)	
7 08 58	0	-	72.6 22.6	-	-	-	-	-	-	
09 00	2	13.5	72.6 22.6	6.3	7.2	15.8	14.7	.01303	.0353	
03	5	11.3	72.6 22.6	6.3	5.0	11.0	15.1	.01303	.0226	
13	15	10.3	72.7 22.6	6.3	4.0	8.8	15.2	.01303	.0131	
28	30	9.5	72.8 22.7	6.3	3.2	7.1	15.3	.01302	.0093	
09 58	60	8.9	73.0 22.8	6.2	2.7	5.8	15.4	.01300	.0066	
13 08	250	—	- -	—	—	—	—	—	—	
8 08 58	1440	7.0	73.0 22.8	6.2	0.8	1.7	15.8	.01300	.0014	
07 12 02	184	8.1	72.6 22.6	6.3	1.8	4.0	15.6	.01303	.0038	Just Wash 35.27
1/2	—	33.00	33.00	0.0	0.0	0.0	0.0	—	100	
3/8	—	38.95	33.00	5.95	5.95	12.72	12.72	—	87.3	
4		44.92	33.00	11.92	11.92	25.48	12.76	—	74.5	

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED: INDIVIDUAL	NET MASS RETAINED: ACCUMULATIVE	PERCENT RETAINED: INDIVIDUAL	PERCENT RETAINED: ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	REMARKS
8	50.75	44.92	5.83	17.75	12.46	37.94	62.1	
10	51.62	50.75	0.87	18.62	1.86	39.79	60.2	
16	54.46	51.62	2.84	21.46	6.07	45.86	54.1	
30	57.55	54.46	3.09	24.55	6.60	52.47	47.5	
50	62.05	57.55	4.50	29.05	9.62	62.09	37.9	
100	65.54	62.05	3.49	32.54	7.46	69.54	30.5	
200	63.16	65.54	2.62	35.16	5.60	75.14	24.9	
Pan	63.29	63.16	0.13	35.29				

REMARKS: (SHOW UNITS OF MEASUREMENT)

Air Dry in tare 222 (Total 41=10 Also) — Wash Dry

weight of Sample wet = 86.23 - 33.00 = 53.23

weight of Dry Sample = 27.28 + 19.51 = 46.79 } Initial Moisture Content = 13.87

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Eyons	12/7 & 8/85	Jim Eyons	12/10/85		

CH2M HILL

SHEET ___ OF ___

PROJECT NUMBER 120303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 2S 9' to 10'

TYPE OF SAMPLE: SMALL BOTTLE SAMPLE NO. S-3

GROSS WET MASS TOTAL SAMPLE 467.2 TARE MASS 153.8 PAN NO. 217 NET WET MASS TOTAL SAMPLE ___

GROSS DRY MASS TOTAL SAMPLE 447.3 TARE MASS 153.8 PAN NO. 217 NET DRY MASS TOTAL SAMPLE, A 293.5

COARSE FRACTION: NET WET MASS ___ MOISTURE, % ___ NET DRY MASS ___

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL	NET MASS RETAINED ACCUMULATIVE	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
1	153.8	153.8	0.0	0.0	0.0	0.0	100	
3/4	209.8	153.8	56.0	56.0	19.1	19.1	80.9	
1/2	None Retained - Not reported on plot.							
3/8	218.9	209.8	9.1	65.1	3.1	22.2	77.8	

FINE FRACTION: NET WET MASS ___ MOISTURE, % ___ NET DRY MASS, C ___

DRY MASS [redacted] PRIOR TO WASH, D 293.5

DRY MASS [redacted] AFTER WASH 284.7

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL, E (AS RECORDED)	(F)	NET MASS RETAINED INDIVIDUAL (TOTAL BASIS)	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
4	247.3	218.9	28.4		93.5	9.7	31.9	68.1	
8	292.8	247.3	45.5		139.0	15.5	47.4	52.6	
16	330.9	292.8	38.1		177.1	13.0	60.3	39.7	
30	373.5	330.9	42.6		219.7	14.5	74.9	25.1	
50	421.7	373.5	48.2		267.9	16.4	91.3	8.7	
100	433.5	421.7	11.8		279.7	4.0	95.3	4.7	
200	438.1	433.5	4.6		284.3	1.6	96.9	3.1	
PAN	438.6	438.1	0.5		284.8				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		217
GROSS WET MASS	gms	467.2
GROSS DRY MASS		447.3
MOISTURE MASS		19.9
TARE MASS		153.8
DRY SOIL MASS		293.5
MOISTURE CONTENT	%	6.78

REMARKS:

FOR WASH WEIGHT = 438.5 - 153.8

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY: Jim Emery DATE: 12/4&5/85 COMPUTED BY: Jim Emery DATE: 12/8/85 CHECKED BY: ___ DATE: ___

LAB FORM D422A

CH2M HILL

SHEET ___ OF ___

PROJECT NUMBER
L20303.A0

PARTICLE-SIZE ANALYSIS

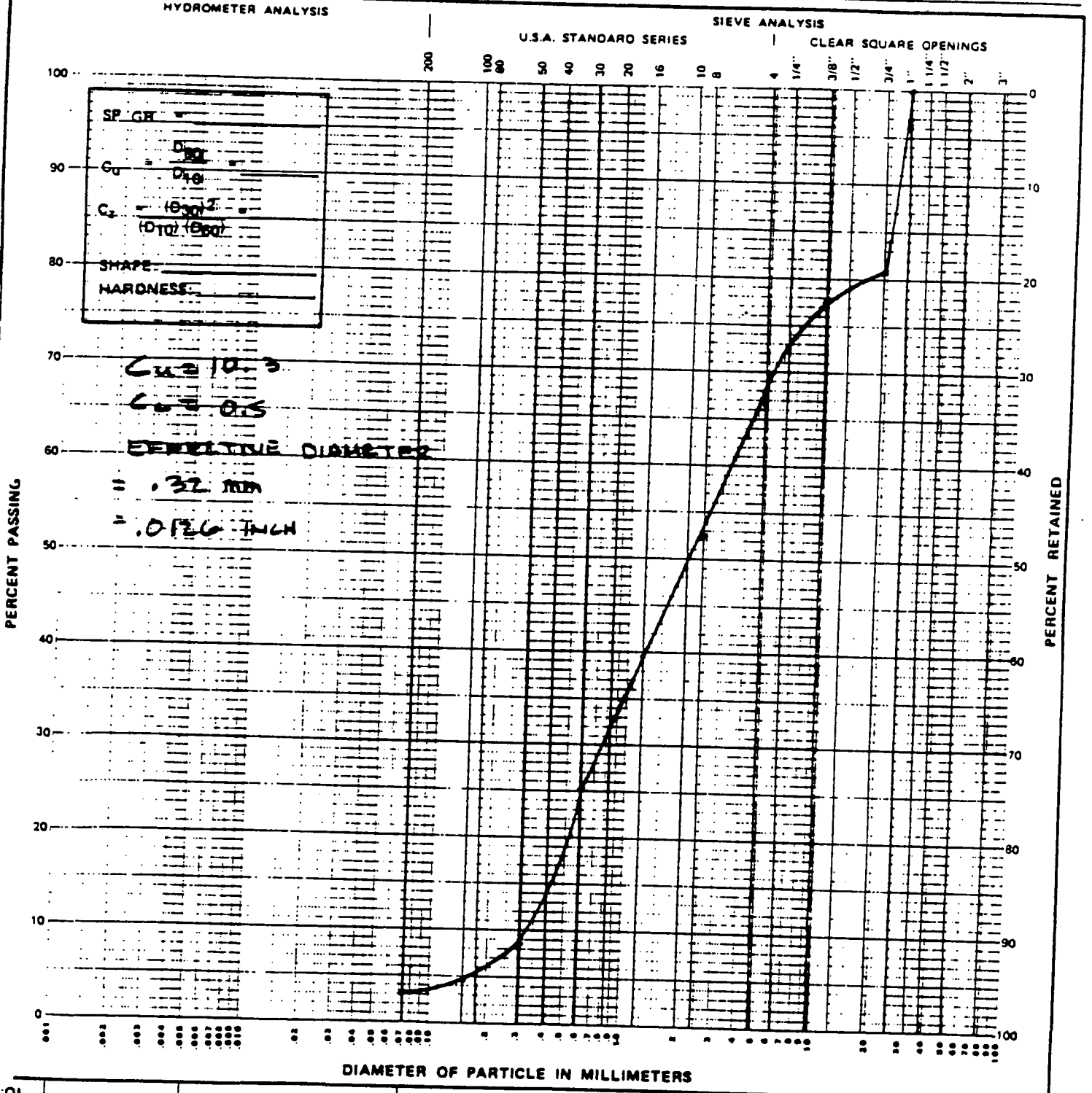
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 2 S 7° to 10° S SAMPLE NO. S-3

TYPE OF SAMPLE:



COLOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION WELL GRADED SAND (SW)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/4/95	Jim Emery	12/8/95		

HILL

PROJECT NUMBER 120303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 35 9E to 11E

TYPE OF SAMPLE: SMALL BOTTLE SAMPLE NO. S-3

GROSS WET MASS TOTAL SAMPLE 449.7 TARE MASS 149.0 PAN NO. U NET WET MASS TOTAL SAMPLE

GROSS DRY MASS TOTAL SAMPLE 436.9 TARE MASS 149.0 PAN NO. U NET DRY MASS TOTAL SAMPLE, A 287.9

COARSE FRACTION: NET WET MASS MOISTURE, % NET DRY MASS

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL	NET MASS RETAINED ACCUMULATIVE	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
1	149.0	149.0	0.0	0.0	0.0	0.0	100	
3/4	160.6	149.0	11.6	11.6	4.0	4.0	96.0	
1/2	190.4	160.6	29.8	41.4	10.4	14.4	85.6	
3/8	200.2	190.4	9.8	51.2	3.4	17.8	82.2	

FINE FRACTION: NET WET MASS MOISTURE, % NET DRY MASS, C

DRY MASS [redacted] PRIOR TO WASH, D 287.9

DRY MASS [redacted] AFTER WASH 274.0

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL (AS RECORDED)	(F)	NET MASS RETAINED INDIVIDUAL (TOTAL BASIS)	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
4	242.3	200.2	42.1		93.3	14.6	32.4	67.6	
8	281.1	242.3	38.8		132.1	13.5	45.9	54.1	
16	319.5	281.1	38.4		170.5	13.3	59.2	40.8	
30	372.6	319.5	53.1		223.6	18.4	77.7	22.3	
50	405.1	372.6	32.5		256.1	11.3	89.0	11.0	
100	415.9	405.1	10.8		266.9	3.8	92.7	7.3	
200	422.5	415.9	6.6		273.5	2.3	95.0	5.0	
PAN	423.0	422.5	0.5		274.0				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		U
GROSS WET MASS	gms	449.7
GROSS DRY MASS		436.9
MOISTURE MASS		12.8
TARE MASS		149.0
DRY SOIL MASS		287.9
MOISTURE CONTENT	%	4.45

REMARKS:

FOR WASH WEIGHT = 423.0 - 149.0

NOTES:

1. SHOW UNITS OF MEASUREMENT.

TESTED BY: Jim Emery DATE: 12/4/85 COMPUTED BY: Jim Emery DATE: 12/8/85 CHECKED BY: DATE:

LAB FORM 0422A 2/78

SHEET __ OF

CH2M HILL

PROJECT NUMBER
L20302.A0

PARTICLE-SIZE ANALYSIS

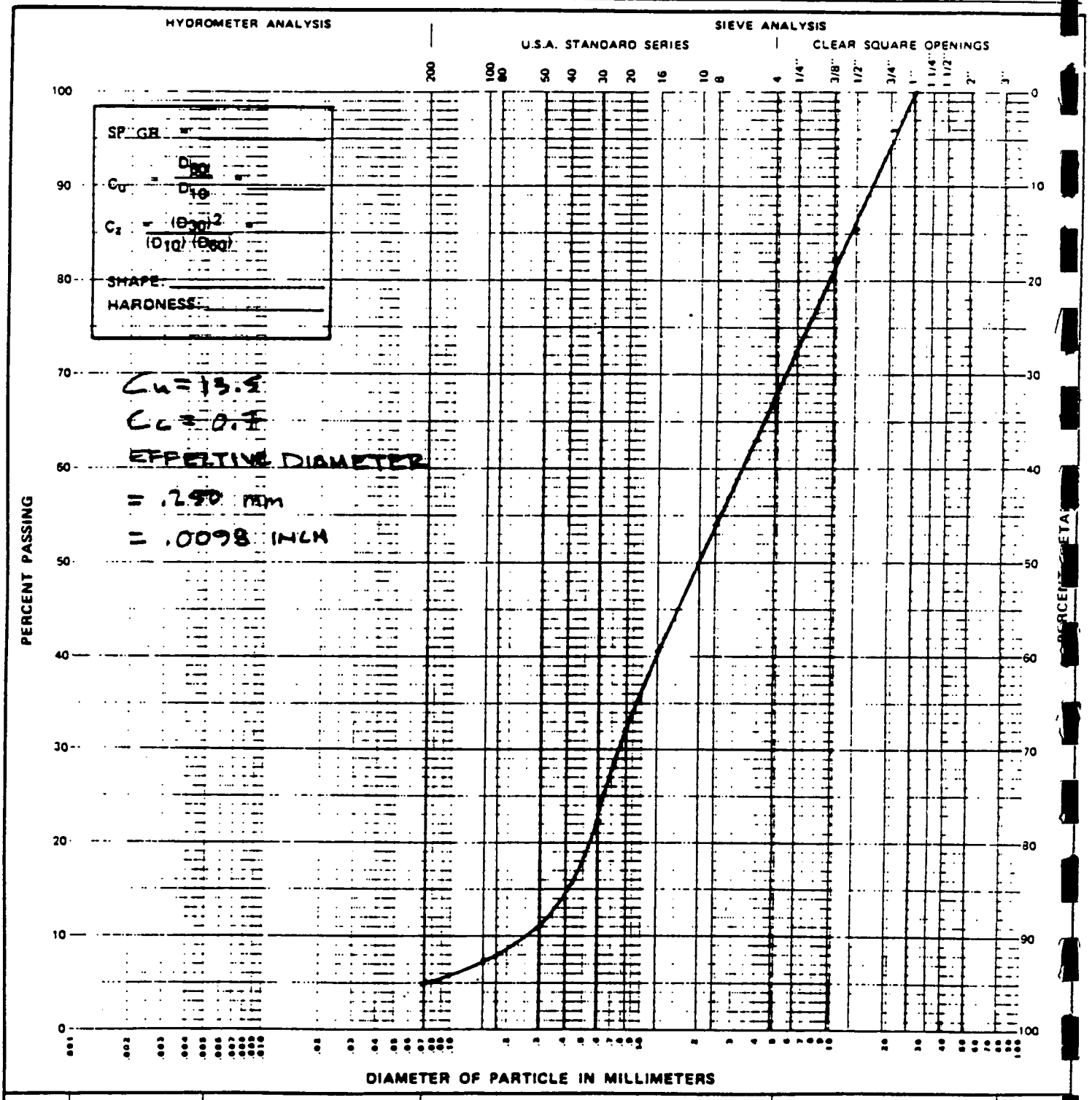
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 3 S 9E to 11E SAMPLE NO. S-3

TYPE OF SAMPLE:



COL-LOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLE
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION WELL GRADED SAND (SW)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/4/85	Jim Emery	12/6/85		

HILL

L20303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 3S 14E to 16E SAMPLE NO. S-4

TYPE OF SAMPLE: SMALL BOTTLE

GROSS WET MASS TOTAL SAMPLE 398.8 TARE MASS 149.0 PAN NO. M NET WET MASS TOTAL SAMPLE

GROSS DRY MASS TOTAL SAMPLE 377.0 TARE MASS 149.0 PAN NO. M NET DRY MASS TOTAL SAMPLE, A 228.0

COARSE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS _____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL	NET MASS RETAINED ACCUMULATIVE	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
3/8	149.2	149.2	0.0	0.0	0.0	0.0	100	

FINE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS, C _____

DRY MASS [redacted] PRIOR TO WASH, D 228.0

DRY MASS [redacted] AFTER WASH 223.7

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL (AS RECORDED)	(F)	NET MASS RETAINED INDIVIDUAL (TOTAL BASIS)	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
4	154.1	149.2	4.9		4.9	2.1	2.1	97.9	
8	160.4	154.1	6.3		11.2	2.8	4.9	95.1	
16	173.1	160.4	12.7		23.9	5.6	10.5	89.5	
30	214.7	173.1	41.6		65.5	18.2	28.7	71.3	
50	309.7	214.7	95.0		160.5	41.7	70.4	29.6	
100	369.4	309.7	59.7		220.2	26.2	96.6	3.4	
200	372.7	369.4	3.3		223.5	1.4	98.0	2.0	
PAN	372.8	372.7	0.1		223.6				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		M
GROSS WET MASS	gms	398.8
GROSS DRY MASS		377.0
MOISTURE MASS		21.8
TARE MASS		149.0
DRY SOIL MASS		228.0
MOISTURE CONTENT	%	9.56

REMARKS:

FIRST WASH WEIGHT = 372.9 - 149.2

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/4&5/85	Jim Emery	12/8/85		

LAB FORM 0422A 2/78

SHEET ___ OF ___

CH2M HILL

PROJECT NUMBER
L 20203.A0

PARTICLE-SIZE ANALYSIS

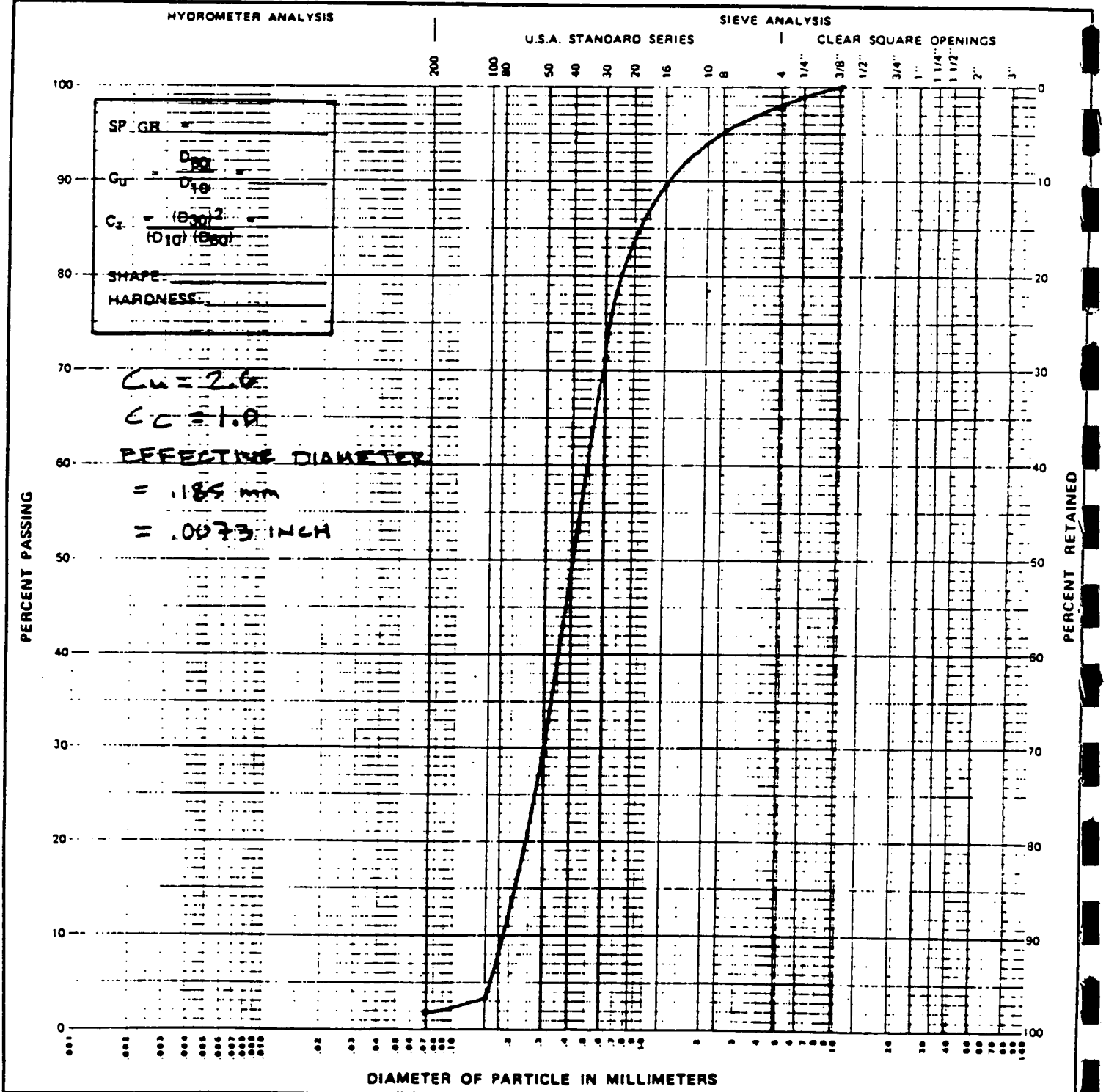
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 3 S 14E to 16E SAMPLE NO. S-4

TYPE OF SAMPLE: ___



COL-LOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION POORLY GRADED SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
LS					

SHEET ___ OF ___

CH2M HILL

PROJECT NUMBER: L20303.A0

PARTICLE-SIZE ANALYSIS

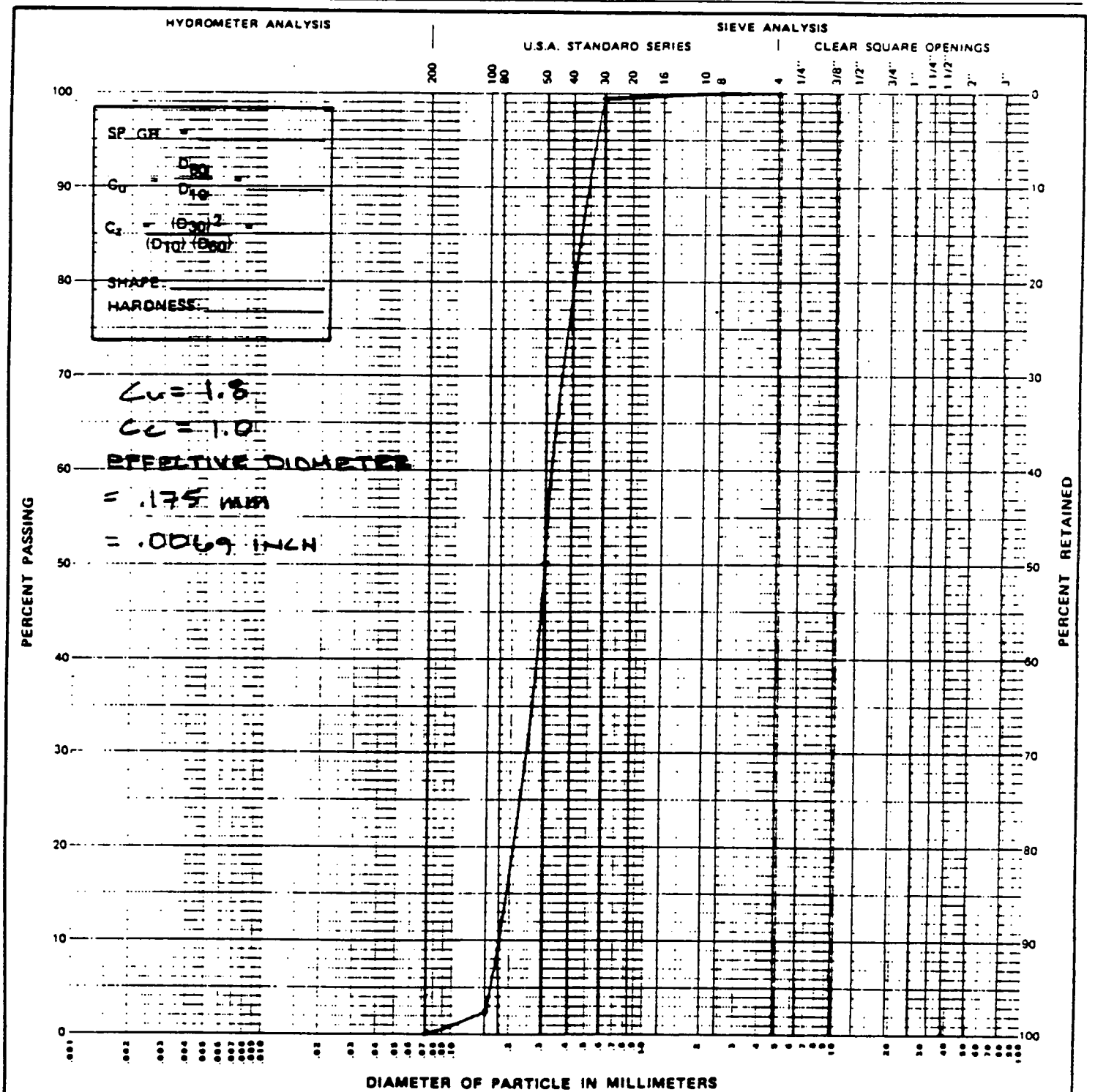
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 3S 24E to 26E SAMPLE NO. S-6

TYPE OF SAMPLE: ___



COL-LOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION POORLY GRADED SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/9-5/85	Jim Emery	12/8/85		

SHEET NUMBER 20303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 35 24S to 26E

TYPE OF SAMPLE: SMALL BOTTLE SAMPLE NO. S-6

GROSS WET MASS TOTAL SAMPLE 416.5 TARE MASS 169.6 PAN NO. 223 NET WET MASS TOTAL SAMPLE

GROSS DRY MASS TOTAL SAMPLE 403.9 TARE MASS 169.6 PAN NO. 223 NET DRY MASS TOTAL SAMPLE, A 234.3

COARSE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS _____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL	NET MASS RETAINED ACCUMULATIVE	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS

FINE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS, C _____

DRY MASS [redacted] PRIOR TO WASH, D 234.3

DRY MASS [redacted] AFTER WASH 232.6

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED INDIVIDUAL (AS RECORDED)	(F)	NET MASS RETAINED INDIVIDUAL (TOTAL BASIS)	PERCENT RETAINED INDIVIDUAL	PERCENT RETAINED ACCUMULATIVE	ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
4	169.7	169.7	0.0		0.0	0.0	0.0	100	
8	169.8	169.7	0.1		0.1	4.3×10^{-2}	4.3×10^{-2}	100	
16	169.9	169.8	0.1		0.2	8.3×10^{-2}	0.1	99.9	
30	170.8	169.9	0.9		1.1	0.4	0.5	99.5	
50	286.1	170.8	115.3		116.4	49.2	49.7	50.3	
100	398.1	286.1	112.0		228.4	47.8	97.5	2.5	
200	402.2	398.1	4.1		232.5	1.7	99.2	0.8	
PAN	402.3	402.2	0.1		232.6				

MOISTURE CONTENT DATA	UNITS	
TIN NO.		223
GROSS WET MASS	gms	416.5
GROSS DRY MASS		403.9
MOISTURE MASS		12.6
TARE MASS		169.6
DRY SOIL MASS		234.3
MOISTURE CONTENT	%	5.38

REMARKS: FIRST WASH WEIGHT = 402.3 - 169.7

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY: Jim Emery DATE: 12/4/85 | COMPUTED BY: Jim Emery DATE: 12/8/85 | CHECKED BY: DATE:

LAB FORM D422A 2/73

CH2M HILL

SHEET __ OF __

PROJECT NUMBER L20303.A0

PARTICLE-SIZE ANALYSIS

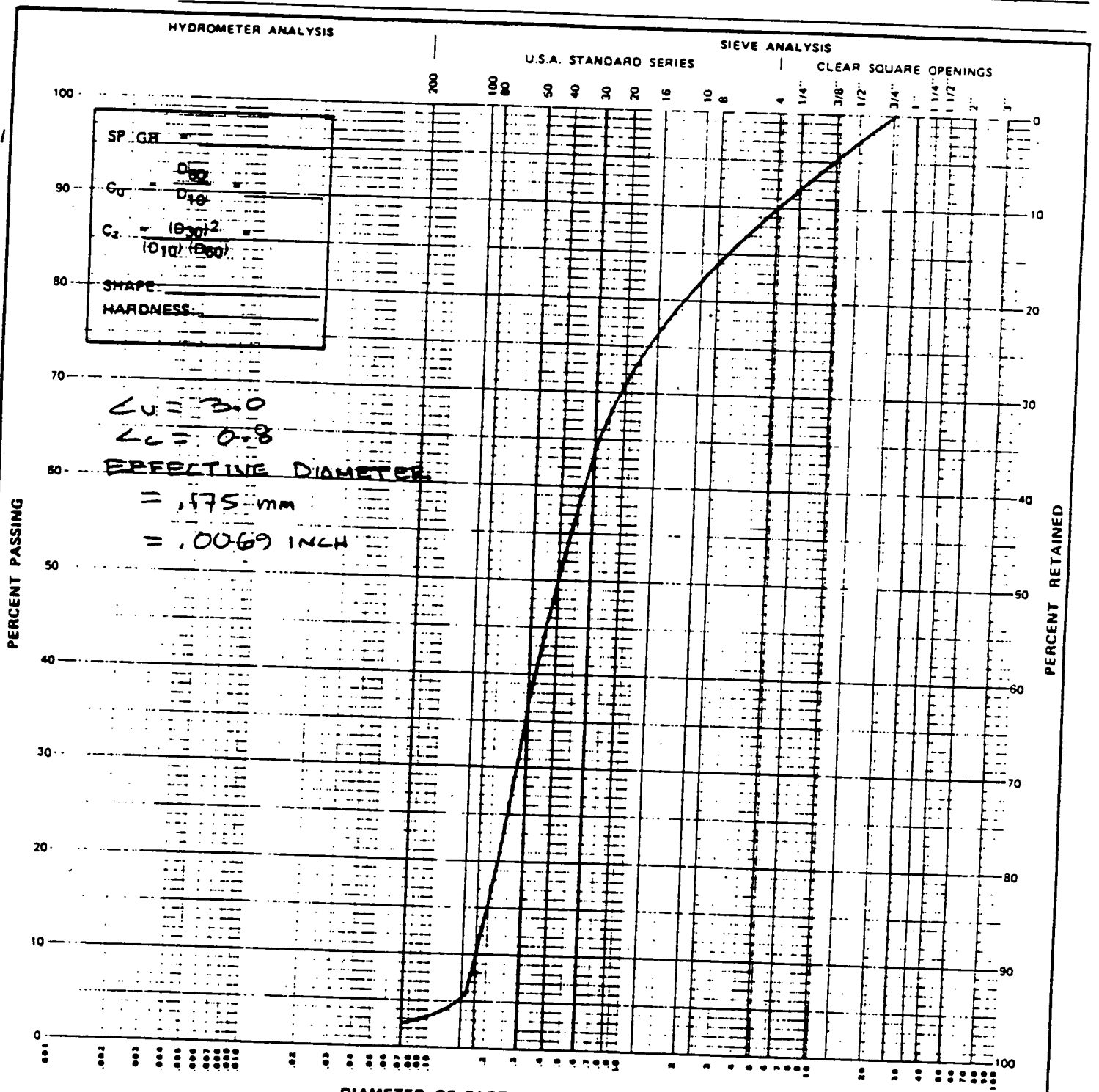
ASTM D422

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 4 S

TYPE OF SAMPLE: _____ SAMPLE NO. S-4



COLLOIDS	CLAY SIZE	SILT SIZE	SAND			GRAVEL	COBBLES
			FINE	MEDIUM	COARSE		

SAMPLE CLASSIFICATION POORLY GRADED SAND (SP)

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
JMI Emery	12/9 & 12/85	Jim Emery	12/18/85		

CH2M HILL

PROJECT NUMBER 120303.A0

SIEVE ANALYSIS

ASTM D422/C136

PROJECT DESCRIPTION: WAUSAU LANDFILL

MATERIALS LABORATORY: DENVER

SAMPLE LOCATION: 4S 14E to 16E SAMPLE NO. S-4

TYPE OF SAMPLE: SMALL BOTTLE

GROSS WET MASS TOTAL SAMPLE 300.7 TARE MASS 151.9 PAN NO. P NET WET MASS TOTAL SAMPLE _____

GROSS DRY MASS TOTAL SAMPLE 291.0 TARE MASS 151.9 PAN NO. P NET DRY MASS TOTAL SAMPLE, A 139.1

COARSE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS _____

STANDARD SIEVE DESIGNATION	GROSS MASS	TARE MASS	NET MASS RETAINED		PERCENT RETAINED		ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
			INDIVIDUAL	ACCUMULATIVE	INDIVIDUAL	ACCUMULATIVE		
3/4	152.0	152.0	0.0	0.0	0.0	0.0	100	
1/2	156.3	152.0	4.3	4.3	3.1	3.1	96.9	
3/8	159.2	156.3	2.9	7.2	2.1	5.2	94.8	

FINE FRACTION: NET WET MASS _____ MOISTURE, % _____ NET DRY MASS, C _____

DRY MASS [redacted] PRIOR TO WASH, D 139.1

DRY MASS [redacted] AFTER WASH 135.5

CONVERSION FACTOR, F = C/D = N/A

STANDARD SIEVE DESIGNATION	INDIVIDUAL GROSS MASS	TARE MASS	NET MASS RETAINED			PERCENT RETAINED		ACCUMULATIVE PERCENT PASSING	SPECIFICATIONS
			INDIVIDUAL, E (AS RECORDED)	(F)	INDIVIDUAL (TOTAL BASIS)	INDIVIDUAL	ACCUMULATIVE		
4	164.8	159.2	5.6		12.8	4.0	9.2	90.8	
8	174.3	164.8	9.5		22.3	6.8	16.0	84.0	
16	185.0	174.3	10.7		33.0	7.7	23.7	76.3	
30	203.1	185.0	18.1		51.1	13.0	36.7	63.3	
50	239.3	203.1	36.2		87.3	26.0	62.8	37.2	
100	283.9	239.3	44.6		131.9	32.1	94.8	5.2	
200	287.2	283.9	3.3		135.2	2.4	97.2	2.8	
PAN	287.4	287.2	0.2		135.4				

MOISTURE CONTENT DATA	UNITS	
CAN NO.		P
GROSS WET MASS	gms	300.7
GROSS DRY MASS		291.0
MOISTURE MASS		9.7
TARE MASS		151.9
DRY SOIL MASS		139.1
MOISTURE CONTENT	%	6.97

REMARKS:

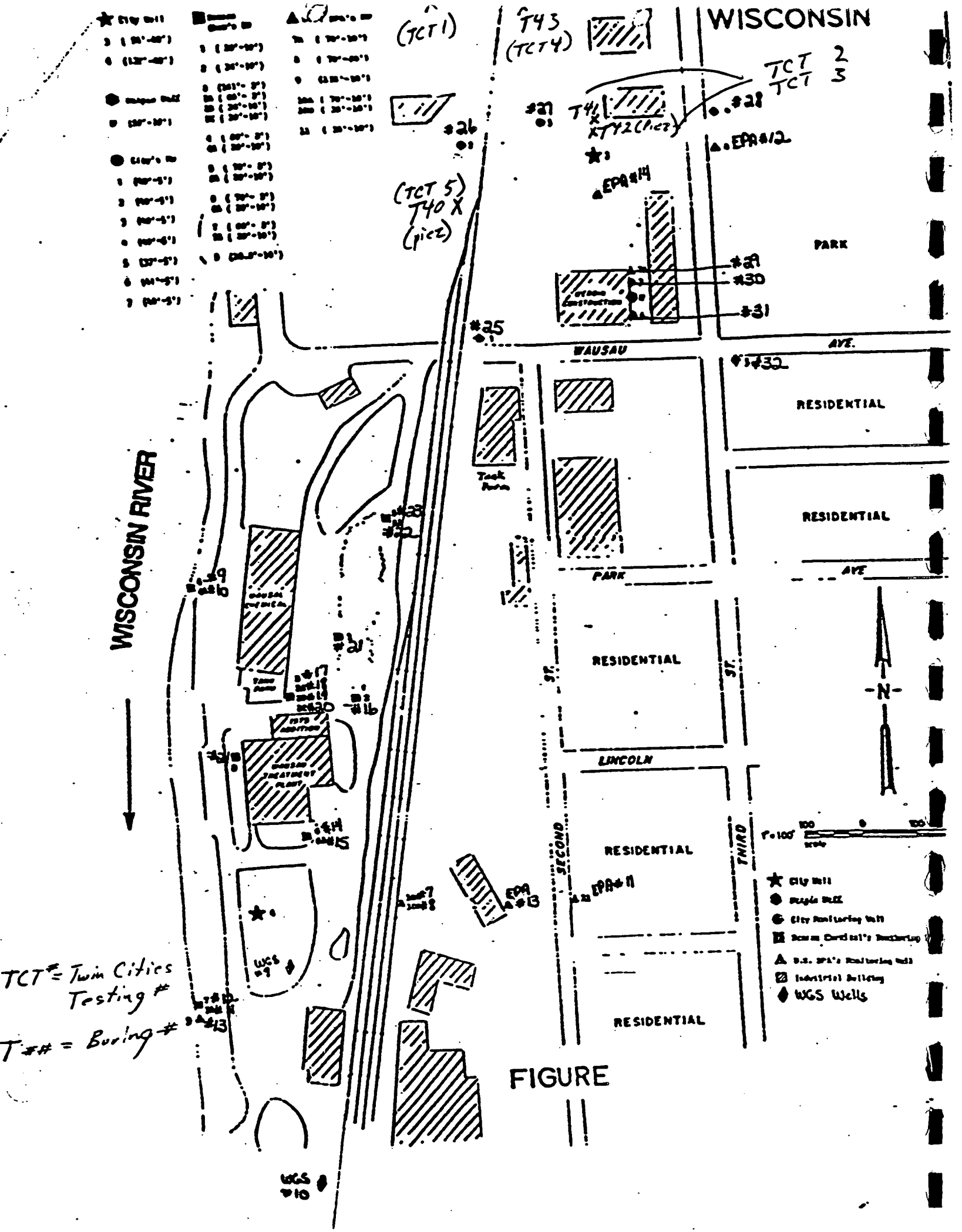
FINE WASH WEIGHT = 287.5 - 152.0

NOTES:
1. SHOW UNITS OF MEASUREMENT.

TESTED BY:	DATE:	COMPUTED BY:	DATE:	CHECKED BY:	DATE:
Jim Emery	12/4&5/85	Jim Emery	12/8/85		

LAB FORM 0422A 2/78

PARTS OF CH_2M HILL REPORT SUBMITTED PRIOR TO COMPLETION OF THE FINAL REPORT FOR REVIEW PURPOSES



TCT # = Twin Cities Testing #

T-## = Boring #

FIGURE

RECEIVED
Wis. Dept. of Natural Resources
DEC 30 1985
N. C. Dist. Hdqtrs.
RHINELANDER, WI

December 24, 1985

Gary--

We just received the Zimpro data, so I thought that I would send it for your information. I couldn't remember if I sent you the boring logs, so copies are included, along with well installation sketches and form 4400. The Guidelines for Monitoring Well Installation did not indicate which DNR office should receive the form 4400, so contact me if it needs to be sent to a different office.

Shara

ZIMPRO INC
A SUBSIDIARY OF STERLING DRUG INC.
POLLUTION CONTROL SYSTEMS

RECEIVED
DEC 23 1985
CH2M HILL-GLO

December 18, 1985

Ms. Shara Mount McBee
CH2M Hill
310 W. Wisconsin Ave.
Suite 700
P.O. Box 2090
Milwaukee, WI 53201

Dear Shara:

Attached are the results for the samples taken during the month of November in the Wausau area.

The VOC analysis was done according to EPA Method 601, a purge and trap/gas chromatographic method using PID (9.5 eV) and Hall detectors in series for detection and quantitation.

The soil samples analyzed for VOC's were done according to the low level method for soil/sediment samples. This involves taking a weighed portion of soil, adding a specific amount of reagent water to it and analyzing by EPA Method 601 as for the water samples.

The VOC results for the water samples appear in Tables 1, 2, 4, 5, and 6 and are expressed in ug/l. Table 3 contains the VOC results for the soil samples, results are based on the dry weight of the soil and expressed in ng/g.

Analysis of alkalinity, hardness, COD, cyanide and phenols were done in accordance with EPA methods. Arsenic and selenium were done by furnace AA and mercury by cold-vapor AA methods. All other metals were analyzed by ICP emission spectroscopy. Results for the soil biomass (Table 7) are expressed in ug/g on a dry weight basis. Detection limits vary slightly for the soil samples because the sample size varied.

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474
TELEPHONE (715) 359-7211 TELEX 29-0495

Results for the water samples (Table 8) are expressed in mg/l.

If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie-Heuser

Mary C. Christie-Heuser
Instrumentation Chemist

MCCH/ls

cc: J.W. Barr
J.R. Salkowski

Table 1
CH_2M Hill
VOC Analysis (ug/l)
November 12, 1985

	Detection Limit	WB-HSA-1	WB-ROT-1	WB-HSA-2
Benzene	Ø.2	X	X	X
Bromoform	Ø.5	X	X	X
Bromomethane	1.Ø	X	X	X
Carbon Tetrachloride	Ø.1	X	X	X
Chlorobenzene	Ø.1	X	X	X
Chloroethane	1.Ø	X	X	X
2-Chloroethylvinyl Ether	2.Ø	X	X	X
Chloroform	Ø.1	68.4	7Ø.6	Ø.1
Chloromethane	6.Ø	X	X	X
Dibromochloromethane	Ø.1	Ø.2	Ø.2	X
1,2-Dichlorobenzene	Ø.3	X	X	X
1,3-Dichlorobenzene	Ø.3	X	X	X
1,4-Dichlorobenzene	Ø.3	X	X	X
Dichlorobromomethane	Ø.1	4.5	4.2	X
1,1-Dichloroethane	Ø.1	X	X	X
1,2-Dichloroethane	Ø.3	X	X	X
1,1-Dichloroethylene	Ø.5	X	X	X
1,2-Dichloroethylene	Ø.3	X	X	X
Dichloromethane	Ø.2	X	X	X
1,2-Dichloropropane	Ø.5	X	X	X
cis-1,3-Dichloropropene	Ø.3	X	X	X
trans-1,3-Dichloropropene	1.Ø	X	X	X
Ethylbenzene	Ø.2	X	X	X
1,1,2,2-Tetrachloroethane	Ø.1	X	X	X
Tetrachloroethylene	Ø.1	Ø.1	Ø.1	X
Toluene	Ø.1	X	Ø.5	Ø.4
1,1,1-Trichloroethane	Ø.1	X	X	X
1,1,2-Trichloroethane	Ø.1	X	X	X
Trichloroethylene	Ø.1	1.Ø	Ø.4	X
Vinyl Chloride	Ø.5	X	X	X
Zimpro Analytical No.		14932	14933	14939

X = Analyzed but not detected

Table 2
CH_2M Hill
VOC Analysis (ug/l)
November 14, 1985

	Detection Limit	WB-HSA-3	WB-ROT-2	WB-ROT-4
Benzene	0.2	X	X	X
Bromoform	0.5	X	X	X
Bromomethane	1.0	X	X	X
Carbon Tetrachloride	0.1	X	X	X
Chlorobenzene	0.1	X	X	X
Chloroethane	1.0	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X
Chloroform	0.1	0.1	0.2	X
Chloromethane	6.0	X	X	X
Dibromochloromethane	0.1	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X
Dichlorobromomethane	0.1	X	X	X
1,1-Dichloroethane	0.1	X	X	X
1,2-Dichloroethane	0.3	X	X	X
1,1-Dichloroethylene	0.5	X	X	X
1,2-Dichloroethylene	0.3	X	X	X
Dichloromethane	0.2	X	X	X
1,2-Dichloropropane	0.5	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X
Ethylbenzene	0.2	X	0.4	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X
Tetrachloroethylene	0.1	X	0.3	0.1
Toluene	0.1	0.2	1.2	X
1,1,1-Trichloroethane	0.1	X	X	X
1,1,2-Trichloroethane	0.1	X	X	X
Trichloroethylene	0.1	X	X	X
Vinyl Chloride	0.5	X	0.7	X
Zimpro Analytical No.		14983	14984	14985

X = Analyzed but not detected

Table 3
CH2M Hill
Soils
VOC Analysis (ng/g)
November 19, 1985

	Detection Limit	SL-B2-24	SL-B4S-34	SL-HSA-2	SL-HSA-3	SL-HSA-4
Benzene	0.8	X	X	X	X	X
Bromoform	2.0	X	X	X	X	X
Bromomethane	4.0	X	X	X	X	X
Carbon Tetrachloride	0.4	X	X	X	X	X
Chlorobenzene	0.4	X	X	X	X	X
Chloroethane	4.0	X	X	X	X	X
2-Chloroethylvinyl Ether	8.0	X	X	X	X	X
Chloroform	0.4	X	X	X	X	X
Chloromethane	24.0	X	X	X	X	X
Dibromochloromethane	0.4	X	X	X	X	X
1,2-Dichlorobenzene	1.2	X	X	X	X	X
1,3-Dichlorobenzene	1.2	X	X	X	X	X
1,4-Dichlorobenzene	1.2	X	X	X	X	X
Dichlorobromomethane	0.4	X	X	X	X	X
1,1-Dichloroethane	0.4	X	X	X	X	X
1,2-Dichloroethane	1.2	X	X	X	X	X
1,1-Dichloroethylene	2.0	X	X	X	X	X
1,2-Dichloroethylene	1.2	X	X	X	X	X
Dichloromethane	0.8	1.2	53.5	2.2	4.4	9.2
1,2-Dichloropropane	2.0	X	X	X	X	X
cis-1,3-Dichloropropene	1.2	X	X	X	X	X
trans-1,3-Dichloropropene	4.0	X	X	X	X	X
Ethylbenzene	0.8	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.4	X	X	X	X	X
Tetrachloroethylene	0.4	X	X	X	X	X
Toluene	0.4	X	X	X	X	X
1,1,1-Trichloroethane	0.4	X	X	X	X	X
1,1,2-Trichloroethane	0.4	X	X	X	X	X
Trichloroethylene	0.4	X	X	X	X	X
Vinyl Chloride	2.0	X	X	X	X	X
Zimpro Analytical No.		15069	15070	15071	15072	15073

X = Analyzed but not detected

Table 4
CH_2M Hill
VOC Analysis (ug/l)
November 19, 1985

	Detection Limit	Trip Blank
Benzene	0.2	X
Bromoform	0.5	X
Bromomethane	1.0	X
Carbon Tetrachloride	0.1	X
Chlorobenzene	0.1	X
Chloroethane	1.0	X
2-Chloroethylvinyl Ether	2.0	X
Chloroform	0.1	X
Chloromethane	6.0	X
Dibromochloromethane	0.1	X
1,2-Dichlorobenzene	0.3	X
1,3-Dichlorobenzene	0.3	X
1,4-Dichlorobenzene	0.3	X
Dichlorobromomethane	0.1	X
1,1-Dichloroethane	0.1	X
1,2-Dichloroethane	0.3	X
1,1-Dichloroethylene	0.5	X
1,2-Dichloroethylene	0.3	X
Dichloromethane	0.2	3.0
1,2-Dichloropropane	0.5	X
cis-1,3-Dichloropropene	0.3	X
trans-1,3-Dichloropropene	1.0	X
Ethylbenzene	0.2	X
1,1,2,2-Tetrachloroethane	0.1	X
Tetrachloroethylene	0.1	X
Toluene	0.1	X
1,1,1-Trichloroethane	0.1	X
1,1,2-Trichloroethane	0.1	X
Trichloroethylene	0.1	X
Vinyl Chloride	0.5	X
Zimpro Analytical No.		15074

X = Analyzed but not detected

Table 5
CH_2M Hill
VOC Analysis (ug/l)
November 25, 1985

	Detection Limit	Trip Blank	Field Blank	Well 1	Well 2	Well 3
Benzene	0.2	X	X	X	X	X
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	X	X	X	X	97.
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	X	X	X	1.1	66.
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	X	X	X	X	X
1,1-Dichloroethane	0.1	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	X	X	3.7	X
Dichloromethane	0.2	0.6	0.8	X	0.5	0.4
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	0.4	0.4
Tetrachloroethylene	0.1	X	X	X	X	X
Toluene	0.1	X	X	X	2.5	X
1,1,1-Trichloroethane	0.1	X	X	X	X	X
1,1,2-Trichloroethane	0.1	X	X	X	280.	6.9
Trichloroethylene	0.1	X	X	X	X	X
Vinyl Chloride	0.5	X	X	X	X	X
Zimpro Analytical No.		15222	15223	15215	15216	15217

X = Analyzed but not detected

Table 6
CH_2M Hill
VOC Analysis (ug/l)
November 25, 1985

	Detection Limit	Well 4D	Well 4S	Well 6	Well 7
Benzene	Ø.2	X	X	X	X
Bromoform	Ø.5	X	X	X	X
Bromomethane	1.Ø	X	X	X	X
Carbon Tetrachloride	Ø.1	X	X	X	X
Chlorobenzene	Ø.1	X	X	X	X
Chloroethane	1.Ø	X	X	X	X
2-Chloroethylvinyl Ether	2.Ø	X	X	X	X
Chloroform	Ø.1	1.4	X	X	Ø.8
Chloromethane	6.Ø	X	X	X	X
Dibromochloromethane	Ø.1	X	X	X	X
1,2-Dichlorobenzene	Ø.3	X	X	X	X
1,3-Dichlorobenzene	Ø.3	X	X	X	X
1,4-Dichlorobenzene	Ø.3	X	X	X	X
Dichlorobromomethane	Ø.1	X	X	X	X
1,1-Dichloroethane	Ø.1	X	X	X	X
1,2-Dichloroethane	Ø.3	X	Ø.4	X	X
1,1-Dichloroethylene	Ø.5	X	X	X	X
1,2-Dichloroethylene	Ø.3	1.4	9.3	X	X
Dichloromethane	Ø.2	Ø.4	Ø.6	1.6	1.2
1,2-Dichloropropane	Ø.5	X	X	X	X
cis-1,3-Dichloropropene	Ø.3	X	X	X	X
trans-1,3-Dichloropropene	1.Ø	X	X	X	X
Ethylbenzene	Ø.2	X	X	X	X
1,1,2,2-Tetrachloroethane	Ø.1	X	X	X	X
Tetrachloroethylene	Ø.1	Ø.1	Ø.5	Ø.1	X
Toluene	Ø.1	X	X	X	X
1,1,1-Trichloroethane	Ø.1	Ø.3	X	X	11.5
1,1,2-Trichloroethane	Ø.1	X	X	X	X
Trichloroethylene	Ø.1	19.7	2.Ø	X	1Ø.7
Vinyl Chloride	Ø.5	X	2.2	X	X
Zimpro Analytical No.		15218	15219	15220	15221

X = Analyzed but not detected

Table 7

CH_2M Hill
Soil Borings

	SL-B2-24	SL-HSA-3	SL-HSA-4
Cyanide, ug/g	<0.11	<0.11	<0.09
Arsenic, ug/g	1.02	2.16	3.42
Barium, ug/g	24.2	26.3	24.7
Cadmium, ug/g	<0.081	<0.077	<0.082
Chromium, ug/g	2.87	2.15	1.58
Lead, ug/g	1.73	3.92	6.21
Mercury, ug/g	<0.008	<0.009	<0.010
Selenium, ug/g	<0.10	<0.10	<0.10
Silver, ug/g	0.144	<0.096	<0.102
Total Solids, %	96.18	92.71	84.65
Analytical No.	15069	15072	15073

Note: Results expressed on a dry weight basis except Total Solids

ug/g = mg/kg = ppm

< = "less than" detection limit varied with sample size

Table 8
Well Water Samples
CH_2M Hill

	Detection Limit	Field Blank	Well #1	Well #2	Well #3	Well #4D	Well #4S	Well #6	Well #7
Alkalinity, mg/l as $CaCO_3$	20.	X	56.	34.	268.	66.	433.	66.	39.
Hardness, mg/l as $CaCO_3$	1.0	X	74.1	123.	491.	151.	755.	61.	88.
COD, mg/l	10.	X	12.	X	17.	X	56.	X	X
Diss. Fe, mg/l	0.004	X	0.077	0.004	X	0.212	0.012	0.263	0.005
Arsenic, mg/l	0.005	X	X	-	-	X	X	-	-
Barium, mg/l	0.030	0.044	X	-	-	X	0.200	-	-
Cadmium, mg/l	0.004	X	X	-	-	X	X	-	-
Chromium, mg/l	0.017	X	X	-	-	X	X	-	-
Lead, mg/l	0.050	0.285	0.192	-	-	0.122	X	-	-
Mercury, mg/l	0.0004	X	X	-	-	X	X	-	-
Selenium, mg/l	0.005	X	X	-	-	X	X	-	-
Silver, mg/l	0.005	X	X	-	-	X	X	-	-
Cyanide, mg/l	0.020	X	X	-	-	X	X	-	-
Total Phenols, mg/l	0.050	X	X	-	-	X	X	-	-
Analytical No.		15223	15215	15216	15217	15218	15219	15220	15221

X = Analyzed but not detected

- = Not analyzed

State of Wisconsin
Department of Natural Resources

GROUNDWATER MONITORING WELL INFORMATION FORM

Chapter 144, Wis. Stats.
Form 4400-89

84

Facility Name: City of Dawson Landfill
Facility ID Number:
Date: 12/03/85
Completed By (Name and Firm): Staff Intern / CH2M Hill

Well Name	Well ID Number (DNR No.)	Well Location	N	S	E	W	Date Established	Well Casing Diam.	Well Casing Type	Elevations: Top of Well Casing	Elevations: Ground Surface	Elevations: Screen Top	Reference: MSL (✓)	Reference: Site Datum (✓)	Screen Length	Screen Material	Well Depth	Type of Well (✓) PIEZ	OW	PW	LYS	Other
1		417,6160	✓				11/11/85	2"	P	1229.[illegible]	1220.8	1205.7	✓		15'	PVC	30.9		✓			
		2,094,335			✓																	
2		417,810	✓				11/11/85	2"	P	1217.17	1216.2	1193.3	✓		15'	PVC	40.5'		✓			
		2,095,205			✓																	
3		417,330	✓				11/12/85	2"	P	1220.[illegible]	1217.4	1193.5	✓		15'	PVC	39.5'		✓			
		2,094,945			✓																	
4S		417,05[illegible]	✓				11/13/85	2"	P	1216.76	1214.[illegible]	1190.9	✓		15'	PVC	35'		✓			
		2,094,775			✓																	
4D		417,085	✓				11/15/85	2"	P	1216.26	1213.9	1114.4	✓		5'	PVC	106'	✓				
		2,094,780			✓																	
6		417,085	✓				11/[illegible]/85	2"	P	1221.63	1219.2	1194.7	✓		15'	PVC	49.5'		✓			
		2,094,340			✓																	
7		417,775	✓				11/12/85	2"	P	1220.91	1217.2	1192.[illegible]	✓		15'	PVC	40'		✓			
		2,094,940			✓																	

Location Coordinates Are:
☐ Grid System
State Plane Coordinate
☐ Northern
☑ Central

Received In:
District: _____ Area: _____ Bureau: _____
By: _____

SMS Use:
File Maint. Completed: _____ Date
Other: _____

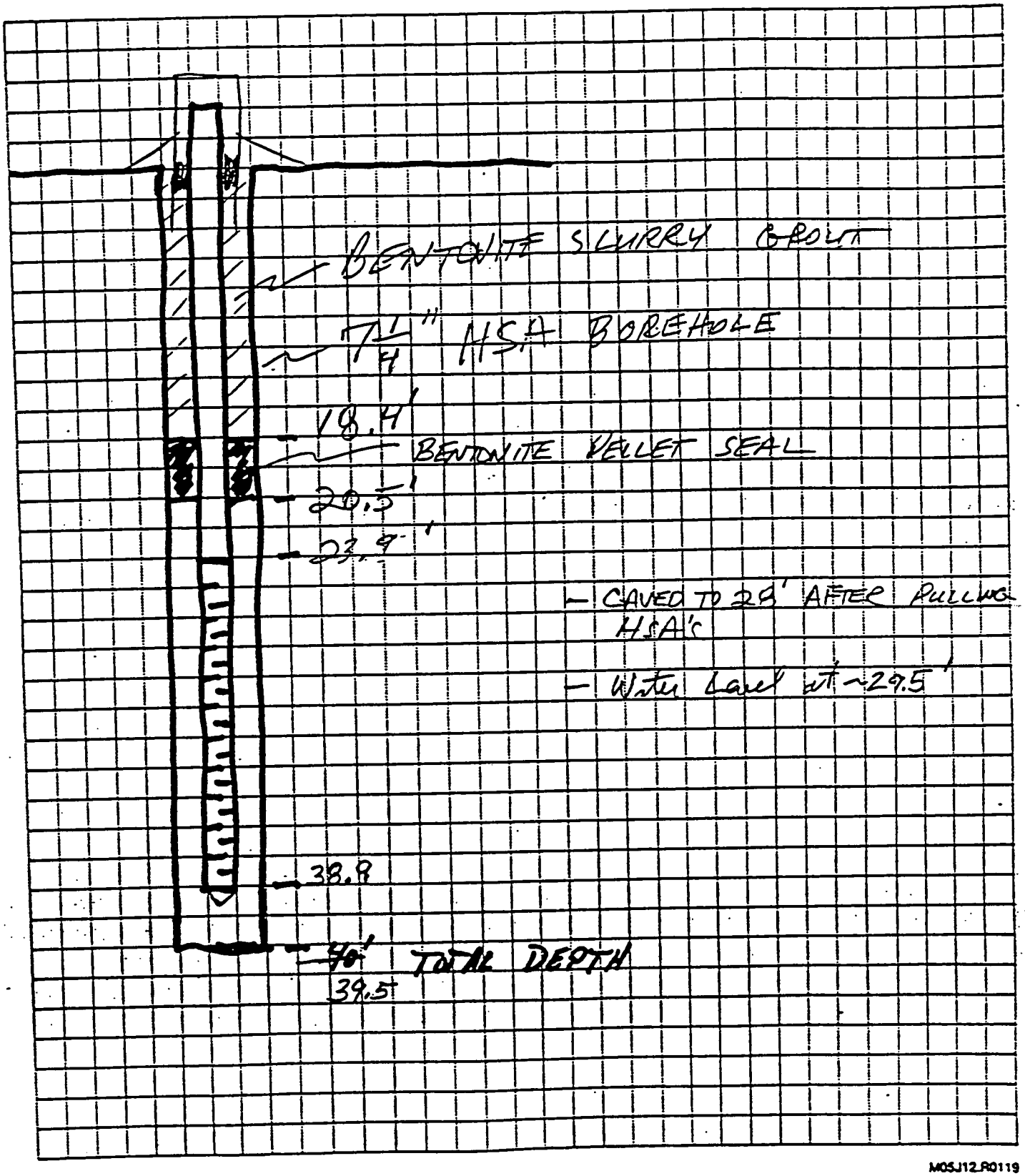
CH2M HILL

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - WDNR
PROJECT NO. 20303.AO
BORING NO. B-3S
PIEZOMETER NO. B-3S

INSTALLED BY IHJ DATE 11/12/85
CHECKED BY _____ DATE _____
COORDINATES _____



M05J12.R0119

CH2M HILL

FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - WDNR

PROJECT NO. L20303.AO

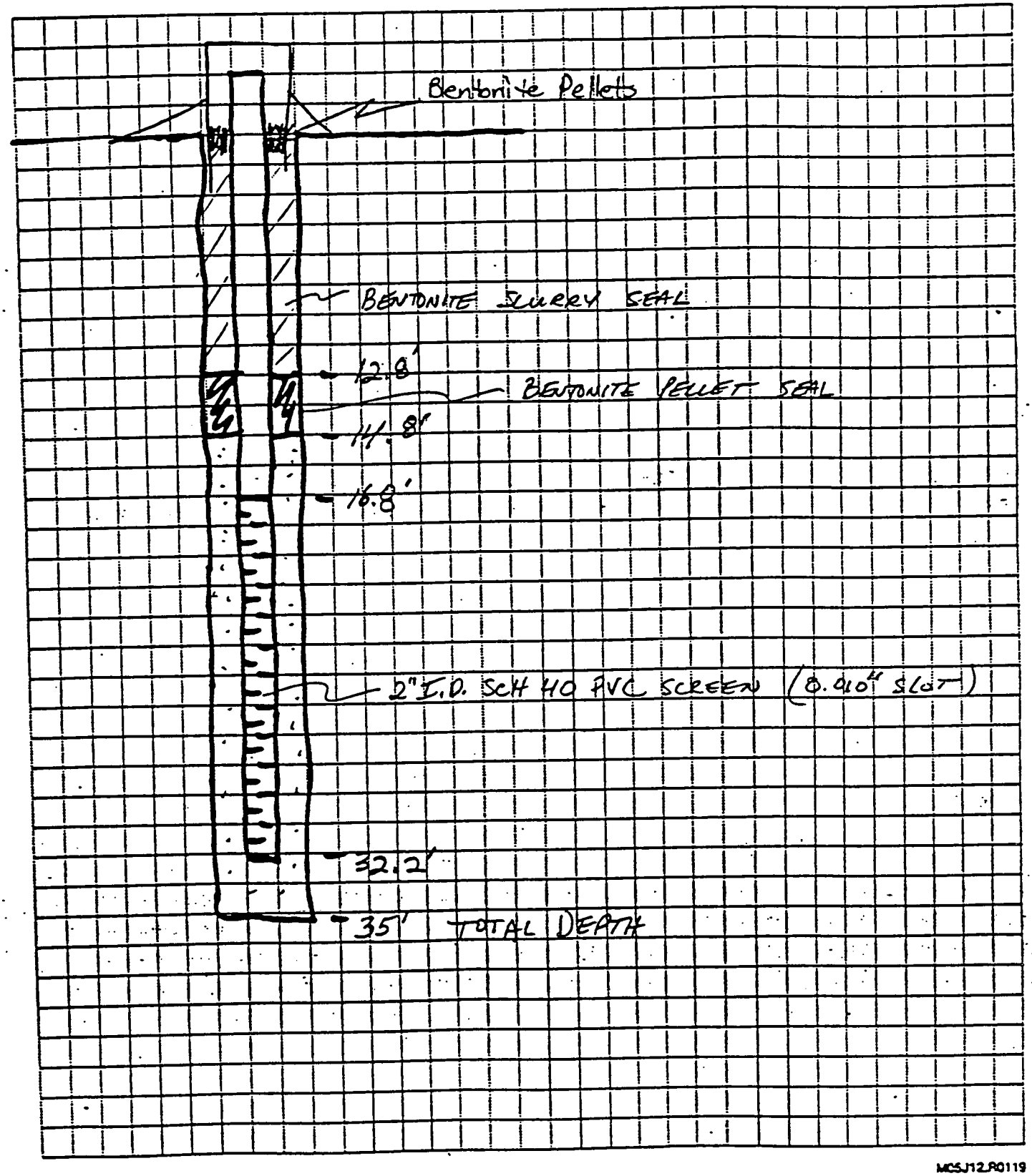
BORING NO. B-45

PIEZOMETER NO. B-45

INSTALLED BY I.H. Johnson DATE 11/13/85

CHECKED BY _____ DATE _____

COORDINATES _____



MCSJ12.R0119

CH2M HILL

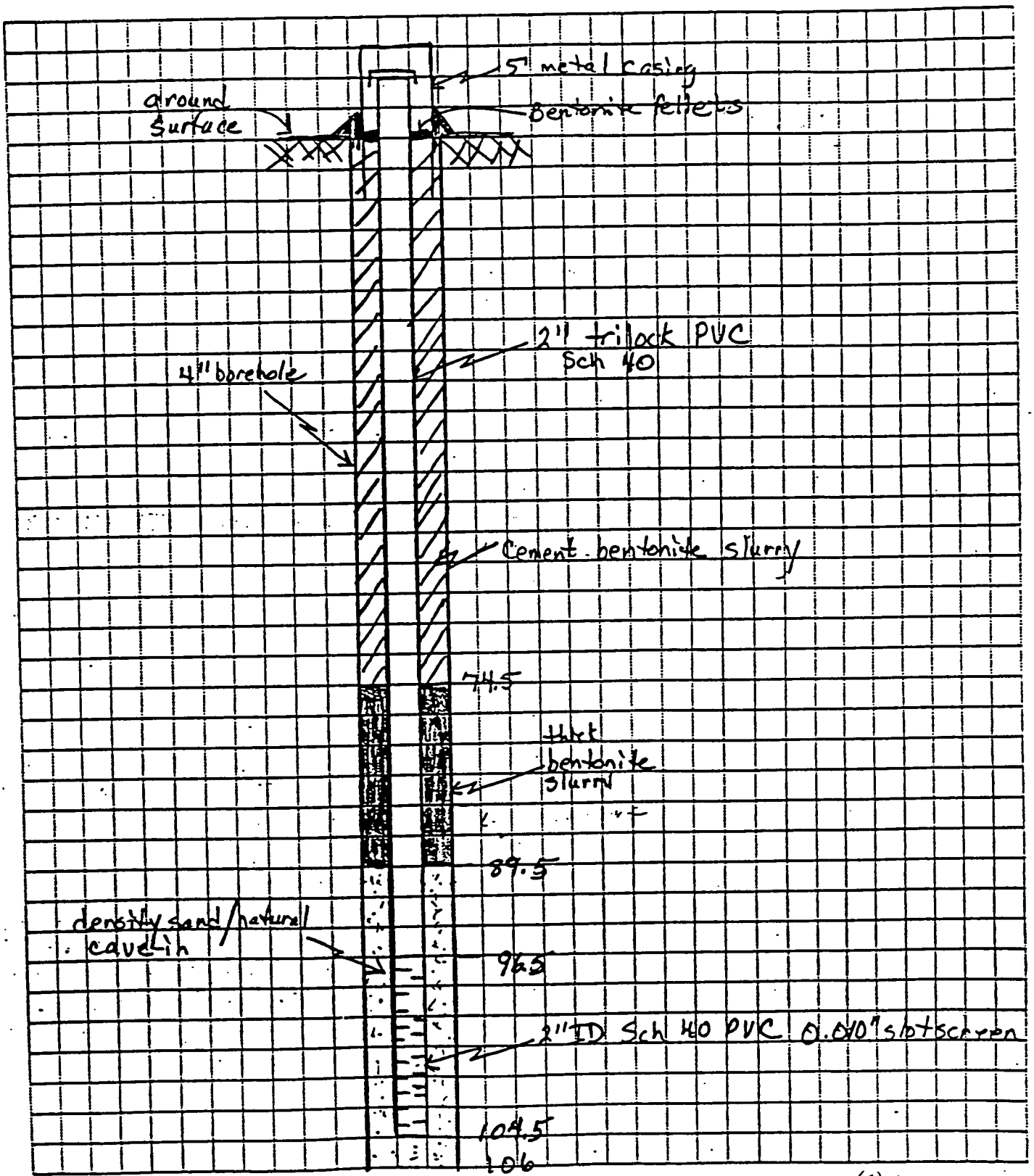
FILE NO.

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME City of Wausau Landfill
PROJECT NO. 20303.A5
BORING NO. 4D
PIEZOMETER NO.

INSTALLED BY SM McBee DATE 11/15/85
CHECKED BY DATE
COORDINATES



M05J12.R0119

CH2M HILL

FILE NO. _____

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - WDNR

PROJECT NO. 20303.A0

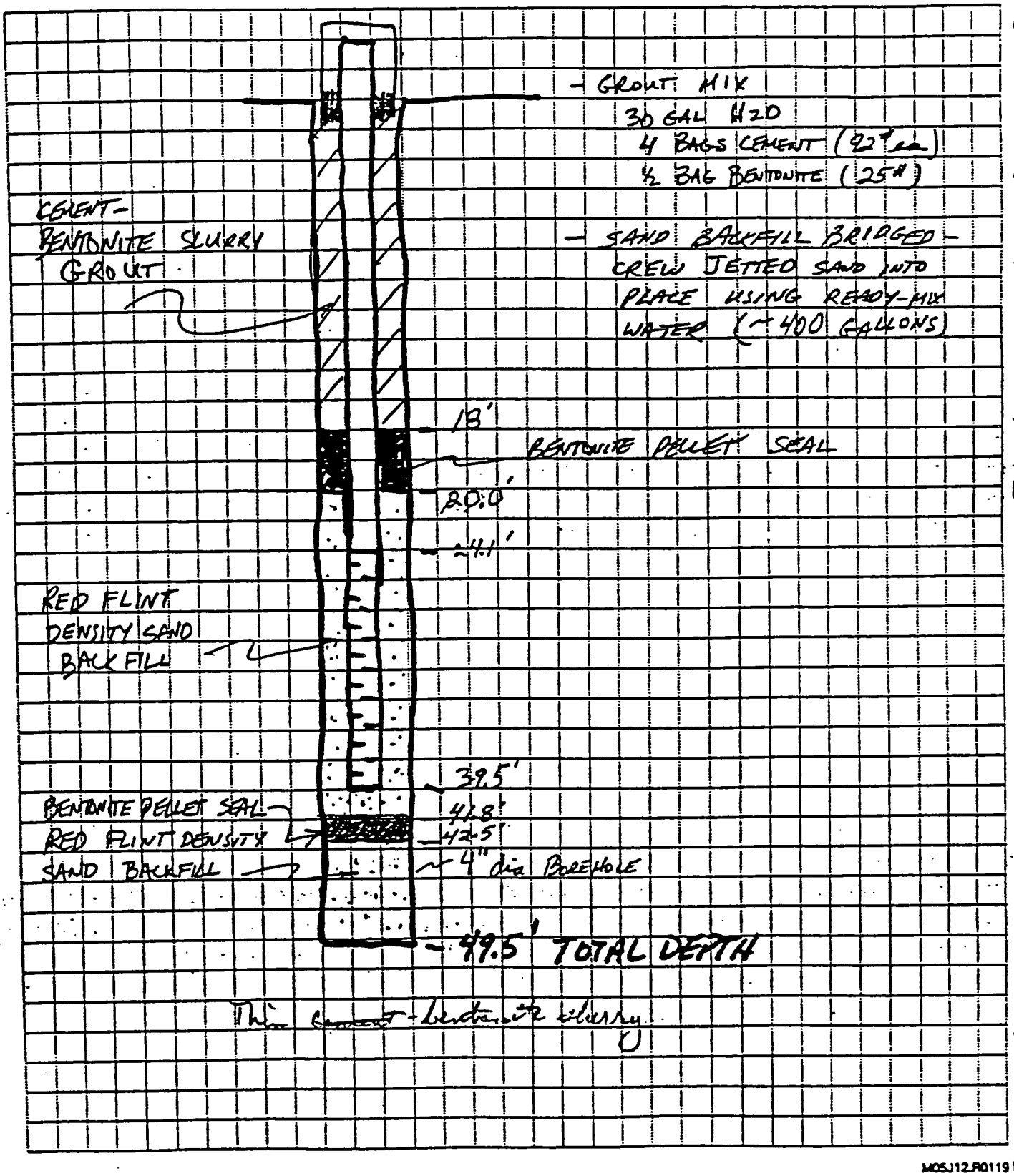
BORING NO. B-6

PIEZOMETER NO. B-6

INSTALLED BY I.H. Johnson DATE 11/13/85

CHECKED BY _____ DATE _____

COORDINATES _____



M05J12.R0119

CH2M HILL

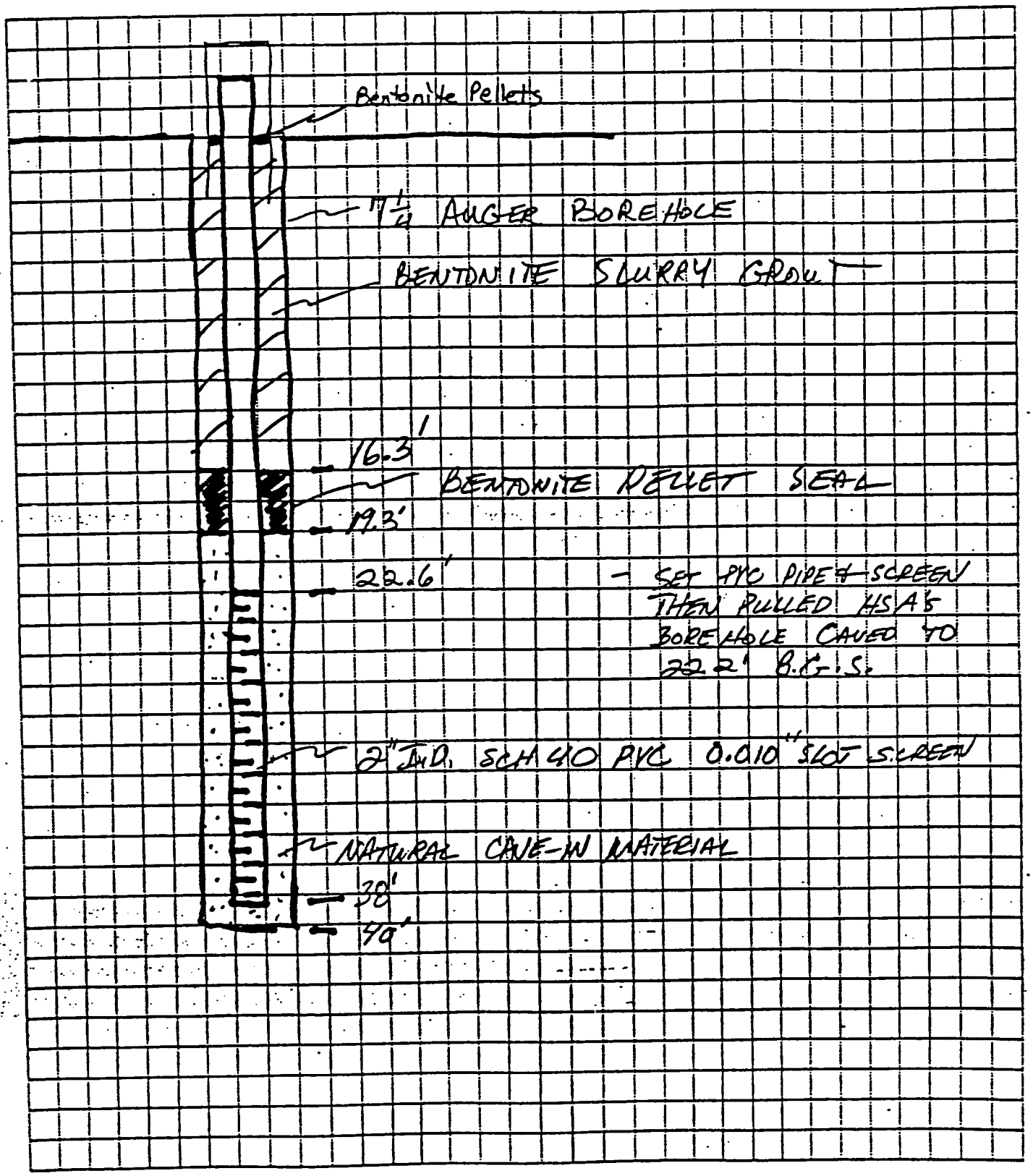
FILE NO.

PAGE 1 OF 1

PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF - Wis. DNR
PROJECT NO. 120303.A0
BORING NO. B-7S
PIEZOMETER NO. B-7S

INSTALLED BY IHJ DATE 11/12/85
CHECKED BY DATE
COORDINATES



M05J12.R0119

CH2M HILL

FILE NO. _____

PAGE 1 OF 1

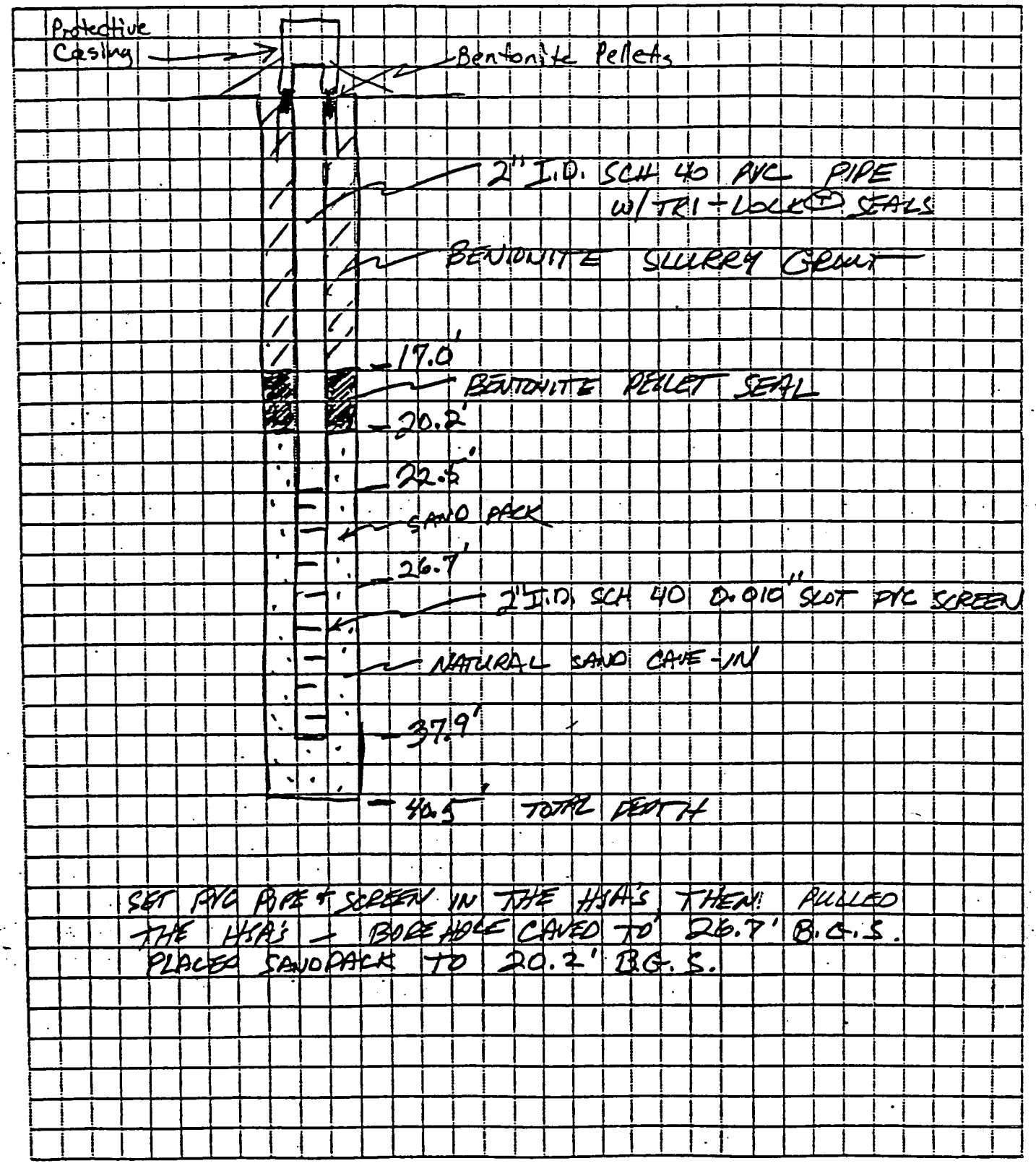
PIEZOMETER INSTALLATION SKETCH

PROJECT NAME Wausau LF — INSTALLED BY I.H.J — DATE 11/11/85

PROJECT NO. L20303.A0 — CHECKED BY _____ — DATE _____

BORING NO. B-25 — COORDINATES _____

PIEZOMETER NO. B-25



SET PVC PIPE & SCREEN IN THE HSA's, THEN PULLED THE HSA's - BOREHOLE CAVED TO 26.7' B.G.S. PLACED SANDPACK TO 20.2' B.G.S.

M05J12.R0119

CH2M HILL

L 20303.A0 | 15 | SHEET 1 OF 2

SOIL BORING LOG

PROJECT Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Hollow stem augers / CME-45

WATER LEVEL AND DATE 22.5' 11/11/85 START 0900 11/11/85 FINISH 1015 11/11/85 LOGGER Johnson / McGee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME. GRADATION OR PLASTICITY. PARTICLE SIZE DISTRIBUTION. COLOR. MOISTURE CONTENT. RELATIVE DENSITY OR CONSISTENCY. SOIL STRUCTURE. MINERALOGY. USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING. DRILLING RATE. DRILLING FLUID LOSS. TESTS AND INSTRUMENTATION
0	0.0						
	1.5	S-1	18"	4-6-10 (16)	Topsoil, brown, sandy		Background OVA reading (.2 ppm)
	2.0						
	3.5	S-2	15"	11-16-17 (33)	Sand, fine to med. grained, brown, moist, dense, tr ese Sd		
5							
	9.5						
10	11.0	S-3	10"	7-10-10 (20)	Sand, fine to coarse grained brown, moist, medium density (SP) 8.7% gr 88.7% sd 2.6% fines		.2 OVA (background)
	14.5						
15	16.0	S-4	10"	8-13-16 (29)	As above		.2 OVA (background)
	19.5						
20	21.0	S-5	17"	7-11-15 (26)	Sand, fine to medium, brown, moist medium (SP) 98.3% fine to med sd 1.7% fines		background OVA
	23.5						Rough drilling at ≈23.5' Possibly coarse gravel
	25.0	S-6	1"	25/1"	Silty sand + gravel, fine sand, gray, wet (gm)		
25					25.5% gr 49.6% Sd 24.9% fines		Water at 27.4' 10:00 After driving S-7 water level at 22.5' at 10:45
	29.5						
30	31.0	S-7	1"	50/2"	See next page		

REV 11/82 FORM D1526

CH2M HILL

L20303.A0 | .15 | SHEET 2 OF 2

SOIL BORING LOG

PROJECT Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Hollow stem augers / CME-45

WATER LEVEL AND DATE START 11/11/85 FINISH 11/11/85 LOGGER Johnson

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	29.5	S-7	1"	50/2"	Silty sand, brown-gray, some gravel		
	31.0				34'		Auger refusal
35					Bottom of boring		

REV 11/82 FORM D1586

CH2M HILL

L20303.A0 | B-25 | SHEET 1 OF 2

SOIL BORING LOG

PROJECT Williams LF - Line Line | LOCATION

ELEVATION | DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT CME 45 HC 3¼" I.D. HSA (7¼" O.D.) STD. "SPLIT SPOON"

WATER LEVEL AND DATE 27.7' 11/11/85 | START 15:00 - 11/11/85 FINISH 11/11/85 | LOGGER T.H. Johnson

ELEVATION / DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	1.5	S-1	10"	2-2-3 (5)	FILL, SAND, DK. BROWN, TR. ORGANICS MOIST		OVA BACKGROUND ~3.5 ppm
	4.0						
5	5.5	S-2	12"	4-7-8 (15)	SAND, LT. BROWN, FINE, MOIST, (SP)		OVA READING BACKGROUND
	7.0						
10	10.5	S-3	8"	4-8-11 (19)	SAND, LT. BROWN, FINE TO CSE, MOIST (SW) 31.9% GR 65% SD 3% FINES		OVA READING BACKGROUND
	14.0						
15	15.5	S-4	4"	4-8-13 (21)	SAND, LT. BROWN, MED. TO CSE, MOIST, ~20% F GRAVEL (SP)		OVA READING BACKGROUND
	19.0						
20	20.5	S-5	7"	7-9-10 (19)	SAND, LT. BROWN, MED. TO CSE, MOIST (SP)		OVA READING BACKGROUND
	24.0						
25	25.5	S-6	7"	7-7-9 (16)	SAND, LT. BROWN, FINE TO MED, MOIST		OVA READING BACKGROUND
	29						OVA READING BACKGROUND WATER AT 27.8' at 15:52 WATER HT 27.7 at 16:00
30	30.9	S-7	6"	2-4-4 (8)			

REV 11/82 FORM D1586

CH2M HILL

B-2S SHEET 2 OF 2

SOIL BORING LOG

PROJECT WAUSAU LF - DNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY TEST N.S.

DRILLING METHOD AND EQUIPMENT

WATER LEVEL AND DATE START FINISH LOGGER J.H. JOHNSON

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							
	34.0						
35	35.5	S-8	10"	3-4-6 (10)	SAND, LT. BRN, FINE, WET, (SP)		OVA READING BACKGROUND
	39.0						
40	40.5		0"				NO RECOVERY
					Bottom of boring 40.5'		

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET / OF
L20303.A0	B-35	

SOIL BORING LOG

PROJECT Wausau LF LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT 7¼" OD Hollow stem augers / CME-45

WATER LEVEL AND DATE 29.5' 11/12/85 START 14:30 - 11/12 FINISH 1600 11/12/85 LOGGER T. H. John

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0	0.0						
	1.5	S1	15"	3-3-4 (7)	FILL, BLACK, SAND, GRAVEL, SILT, SOME CINDERS, MOIST		OVA NOT WORKING PROPERLY - GAS LOW
	4.5						
5	6.0	S-2	8"	14-14-16 (30)	FILL, MOTTLED, BROWN AND GRAY, SAND, SOME CINDERS ~7'		
	9.5						
10	11.3	S-3	10"	15-18-22 (40)	SAND, LT. BROWN, fine TO CSE., moist (SW) 32 NP 0 gr 62.6% sd 5% fines ~12'		ROUGH DRILLING AT ~12' B.G.S. POSSIBLY COARSE GRAVEL OR COBBLES
	14.5						
15	16.0	S-4	14"	5-8-10 18	SAND, LT. Brown, FINE, MOIST Some coarse sand (SP) 2.1% gr 95.9% sd 2.0% fines		
20	19.5	S-5	5"	30-20/.2	SAND, LT. BROWN, MED. TO CSE, MOIST TO WET, (SP) ~22.5'		GRAVEL LODGED IN BOTTOM OF THE SPLIT SPOON
	21.0						
25	24.5	S-6	15"	4-5-6 (11)	SAND LT. BROWN, FINE TO MED, MOIST, (SP) 21% med sd 78.2% fine sd 0.8% fines		
	26.0						
	29.5				SAND, LT. BROWN, FINE TO MED. WET, SP		WATER AT 29.5' B.G.S. AT 15:46
30	31.0	S-7	8"	4-7-8 (15)			

REV 11/82 FORM D1526

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
L20303.A0	B-3	1 OF 2

SOIL BORING LOG

PROJECT Wausau LF - Wis. DNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY

DRILLING METHOD AND EQUIPMENT 3¼ I.D. (7¼" O.D.) HSA's, CME 45 RIG,

WATER LEVEL AND DATE START FINISH LOGGER I. H JOHNSON

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							
	34.5				SAND, LT. BROWN, FINE, WET		
35	36.0	S-8					
					BOTTOM OF BOREHOLE @ 40'		COMPLETE DRILLING AT 1600 HRS
40							

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER L20303.A0 | BORING NUMBER B-45 | SHEET 1 OF —

SOIL BORING LOG

PROJECT [illegible] LF - WDNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY

DRILLING METHOD AND EQUIPMENT CME 45 HSA, [illegible]

WATER LEVEL AND DATE 25' 11/13/85 START 0900-11/13 FINISH 11/13 LOGGER T. H. JOHNSON

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME. GRADATION OR PLASTICITY. PARTICLE SIZE DISTRIBUTION. COLOR. MOISTURE CONTENT. RELATIVE DENSITY OR CONSISTENCY. SOIL STRUCTURE. MINERALOGY. USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING. DRILLING RATE. DRILLING FLUID LOSS. TESTS AND INSTRUMENTATION
	0	0.0						OVA BACKGROUND ~3ppm
		1.5	S-1	2"	3-4-5 (9)	FILL, SILTY SAND, GRAY, SOME CLAY, MOIST		
	5	4.5						
		6.0	S-2	5"	5-5-9 (14)	FILL, SAND, WOOD CHIPS, MOIST		PIECES OF PAPER & PLASTIC IN AUGER CUTTINGS
	10	9.5						
		11.0	S-3	2"	1-2-3 (5)	FILL, SAND, DK GRAY MISC. SILT CLAY MOIST TO WET		OVA READING ~5ppm OFF AUGER [illegible] 6ppm ON BACKFLUSH POSSIBLY METHANE
						~14'		
	15	14.5						
		16.0	S-4	10"	10-10-11 (21)	SAND, FINE, TO MED, LT BROWN, MOIST (SP) 92% gr 8% sd 2.8% fines		
	20	19.5						OVA READING ~4 to 5ppm (~1 to 2 ABOVE BACKGROUND) IN HSA & FROM SPLIT SPOON SAMPLE
		21.0	S-5	12"	13-16-20 (36)	SAND, FINE TO CSE, LT. BROWN, MOIST (SW) 30.1% gr 64.7% sd 5.2% fines		
		24.5						
	25	26.0	S-6	15"	8-8-13 (21)	SAND, FINE		WATER LEVEL AT 25' B.G.S. @ 10:50 HRS
		29.5						
	30	31.0	S-7	19"	15-13-20 (33)	SAND, FINE, LT. BROWN, WET (SP)		

REV 11/82 FORM 01586

CH2M HILL

PROJECT NUMBER 120323.A0 | BORING NUMBER B-4 | SHEET 1 OF 1

SOIL BORING LOG

PROJECT Nawsan LF - WDNR LOCATION

ELEVATION DRILLING CONTRACTOR TWIN CITY

DRILLING METHOD AND EQUIPMENT

WATER LEVEL AND DATE START FINISH LOGGER T.H Johnson

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	30					SAND, FINE, LT. BROWN, WET, SP		
	35					BOTTOM OF BORING @ 35		
	40							

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER 120303.A0 | BORING NUMBER HD | SHEET 1 OF 3

SOIL BORING LOG

PROJECT City of Wausau Landfill | LOCATION

ELEVATION | DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Benbow rotary / CME-55

WATER LEVEL AND DATE | START ?-?-?? | FINISH 14/10-11/1483 | LOGGER SM McGee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					See log of HS for 0-35'		
	34						
35	36.5	S-1	7"	3-4-6 (10)	Sand, f to m, moist, brown + gravel		
	39.5						
40	41	S-2	9"	6-7-12 (19)	Sand, fine to medium + gr, moist, brown (SP) 8.0% gr 89.2% sd 2.8% fines		
	44.5						
45	46	S-3	9"	9-12-14 (26)	as above		Stopped work to fix HW flake
	54.5						
55	56	S-4	10"	9-9-20 (29)	Sand, fine to med. grained, moist, brown		
60							

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER L20303.A0 | 4D | SHEET 2 OF 2

SOIL BORING LOG

PROJECT City of Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Mud rotary / CME-55

WATER LEVEL AND DATE START FINISH LOGGER SM McGee

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		64.5						
	65	66	S-5	10"	13-11-9 (20)	Sand, fine to med, brown, wet		
	70							Broke down drilling mud to remove pebble Stopped drilling to mix clean mud
		74.5						
	75	76	S-6	15"	8-9-11 (20)	Sand, fine, brown, wet		
	80							
		84.5						
	85	86	S-7	14"	11-19-32 (51)	As above (SP) 15.9% med sd 80.7% fine sd 3.3% fines		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET OF
L20703.A0	HD	3 OF 3

SOIL BORING LOG

PROJECT City of Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Mud rotary / CME-55

WATER LEVEL AND DATE START FINISH LOGGER SM McBee

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	94.5						
95	96	S-8	15"	13-16-23 (39)	Sand, fine, moist, brown		
100							
	104.5						
105		S-9	10"	34-52-52/4 102/6.4"	As above		
	106.4				Bottom of boring 106.4'		
110							

CH2M HILL

PROJECT NUMBER L20303.A0 | BORING NUMBER B-6D | SHEET 1 OF

SOIL BORING LOG

PROJECT City of Wausau Landfill LOCATION

ELEVATION DRILLING CONTRACTOR Twin Cities Testing

DRILLING METHOD AND EQUIPMENT Bentonite mud rotary / CME-55/75, 3 7/8" tricone

WATER LEVEL AND DATE START 11/11/85 FINISH LOGGER SMcBee

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME. GRADATION OR PLASTICITY. PARTICLE SIZE DISTRIBUTION. COLOR. MOISTURE CONTENT. RELATIVE DENSITY OR CONSISTENCY. SOIL STRUCTURE. MINERALOGY. USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING. DRILLING RATE. DRILLING FLUID LOSS. TESTS AND INSTRUMENTATION
						Sand little if any gravel		Description from driller's comments
								Refer to log of B-6S
								Wyogel bentonite
	10							
	20							
	30							
	40					Cobbley sand and gravel		"boulder"
								44' lost ≈ 50% of drilling fluid
						Granite boulder or top of rock 42.5'		11/11/85
	50					Bottom of boring 49.5'		11/12/85

This boring was drilled ≈5' from original location after tricone bit sheared off in hole at 55'.

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET / OF
L20303.A0	B-7S	

SOIL BORING LOG

PROJECT Wausau LF - WIS. DNR LOCATION

ELEVATION DRILLING CONTRACTOR Twin City Testing

DRILLING METHOD AND EQUIPMENT 3¼" I.D. HSA (7¼" O.D.), CME 45 RIG, STD SPLIT SPOONS

WATER LEVEL AND DATE 29.5' 11/12 START 0930 - 11/12 FINISH LOGGER J.H. Johnson

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME. GRADATION OR PLASTICITY. PARTICLE SIZE DISTRIBUTION. COLOR. MOISTURE CONTENT. RELATIVE DENSITY OR CONSISTENCY. SOIL STRUCTURE. MINERALOGY. USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING. DRILLING RATE. DRILLING FLUID LOSS. TESTS AND INSTRUMENTATION
	0	0.0						
		1.5	S-1	12"	1-3-5 (8)	FILL, DK. GRAY TO BROWN, ORGANIC SILTY SAND		OVA BACKGROUND ~5 PPM
						~2.0'		
		4.5						
	5	6.0	S-2	10"	15-30-15/2"	SAND, fine TO CSE, LT. BROWN, ~10% FINE GRAVEL, MOIST, (SP)		OVA READING ~5.5 PPM IN HSA
						~7.5'		
		9.5						
	10	11.0	S-3	12"	9-16-18 (34)	SAND, MED. TO CSE. LT. BROWN, ~10% FINE GRAVEL. (SP)		OVA READING BACKGROUND
								OVA [illegible] TO ~5.5 PPM
		14.5						
	15	16.0	S-4	9"	18-22-14 (36)	SAND, MED. TO CSE, LT. BROWN, ~30% FINE TO MED. GRAVEL, MOIST TO WET AT BOTTOM) (SP)		OVA READING BACKGROUND
		19.5						
	20	21.0	S-5	10"	5-11-16 (27)	SAND, MED.-fine, LT. BROWN, MOIST (SP) 9.6% gr 87.8% sd 2.6% fines		OVA READING BACKGROUND
		24.5						
	25	26.0	S-6	8"	12-13-13 (26)	SAND, MED. TO CSE., LT BROWN, MOIST, (SP)		OVA READING UP TO 8 PPM IN [illegible] ~2 to 3 ppm above background
						~27'		
		29.5						
	30	[illegible]	S-7	8"	7-10-11 (21)	SAND MED. to fine LT. BROWN, WET (SP) 35.8% med sd, 63.1% fine sd		OVA READING BACKGROUND ~2.5 ppm

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER 20303.A0 | BORING NUMBER S-7 | SHEET — OF —

SOIL BORING LOG

PROJECT Wausau Landfill | LOCATION [illegible] TESTING

ELEVATION _____ | DRILLING CONTRACTOR _____

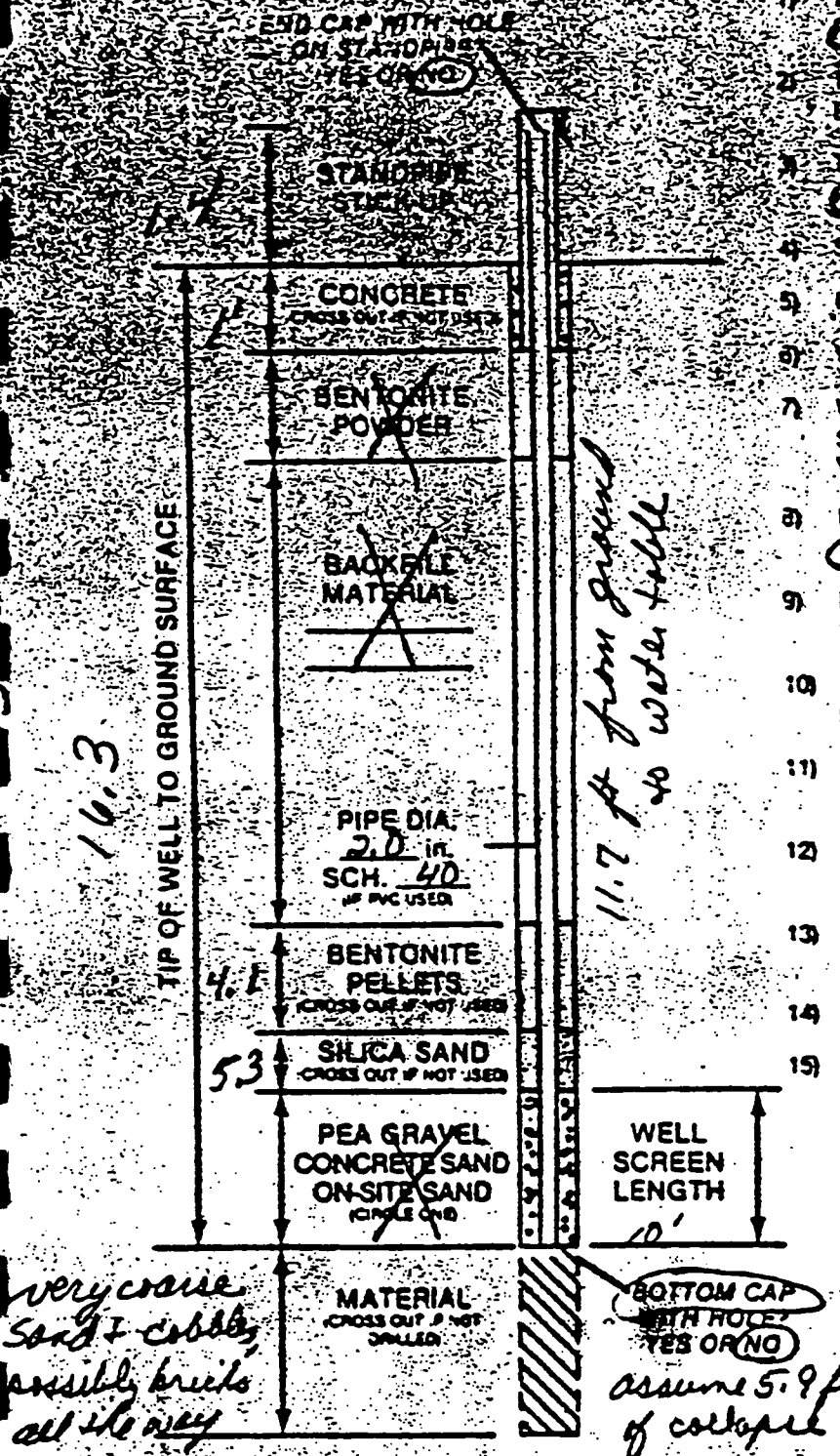
DRILLING METHOD AND EQUIPMENT _____

WATER LEVEL AND DATE _____ | START 0930 - 11/12 | FINISH _____ | LOGGER T. J. [illegible]

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME. GRADATION OR PLASTICITY. PARTICLE SIZE DISTRIBUTION. COLOR. MOISTURE CONTENT. RELATIVE DENSITY OR CONSISTENCY. SOIL STRUCTURE. MINERALOGY. USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING. DRILLING RATE. DRILLING FLUID LOSS. TESTS AND INSTRUMENTATION
30							WATER LEVEL AT 29.5 ± 10.5
	34.5				SAND, FINE TO MED, LT. Brown, WET (SP)		OVA READING BACKGROUND (5.5 ppm)
35	36.5	S-8	8	4-7-8 (15)			
							DRILLED TO 40' W/ SPLIT SPOON SAMPLING AT 5' INTERVALS IN 1.5" I.D. WELL TO [illegible]
40					BOTTOM OF BOREHOLE AT 40.0'		
45							

REV 11/82 FORM D1586

FIELD WELL STALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE .006

5) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? Started w/ solid switched due to cobbles
SOLID AUGER, HOLLOW STEM AUGER, WATER, EVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO @ 4 inches

9) HOW WAS WELL DEVELOPED? not
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
13.1 Ft. or DRY

2) OTHER MEASUREMENTS:

DATE _____ Ft. FROM T. ST. PIPE

DATE _____ Ft. FROM T. ST. PIPE

DATE _____ Ft. FROM T. ST. PIPE

DATE _____ Ft. FROM T. ST. PIPE

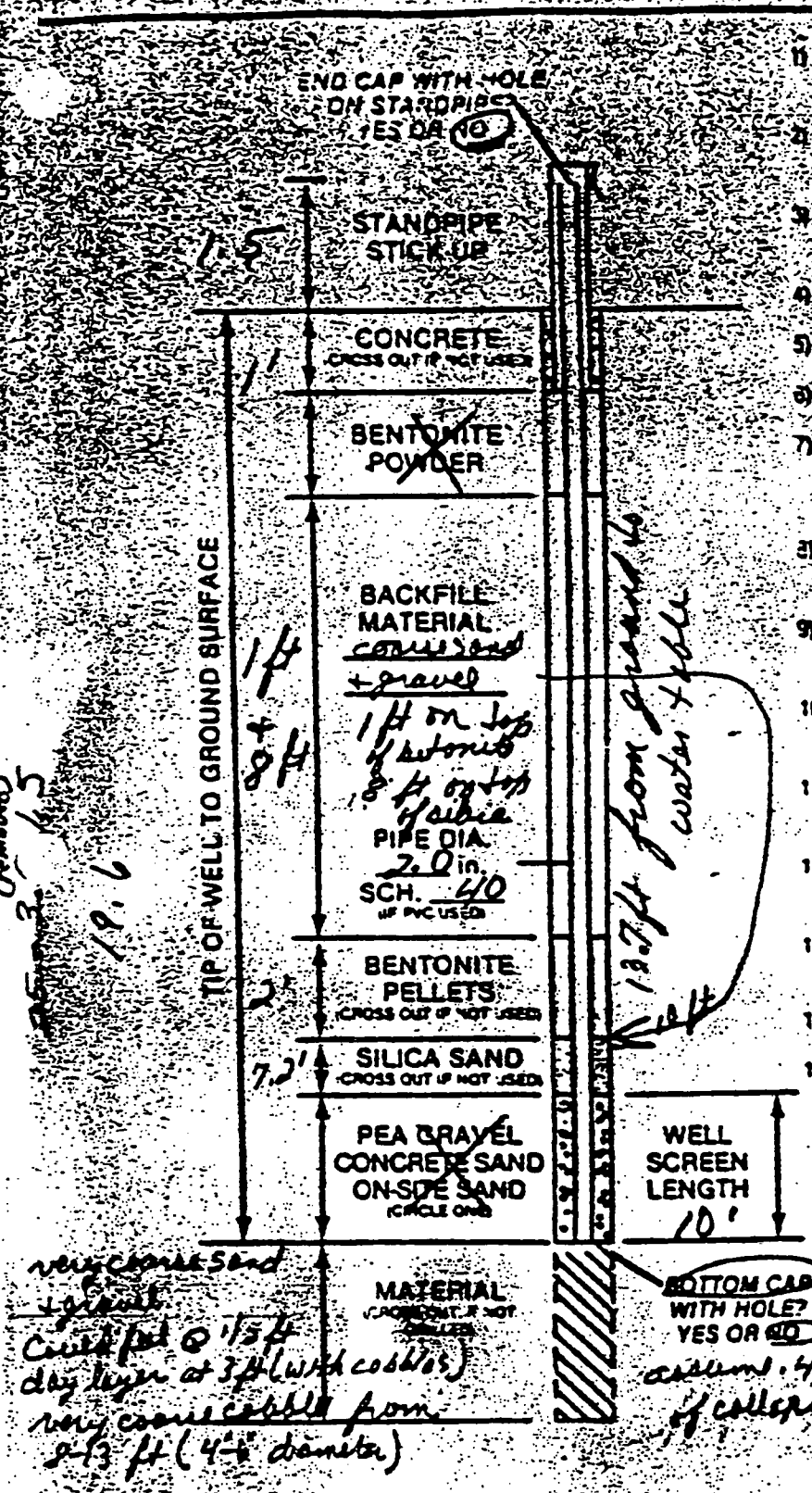
Well No. WGS #2 DATE INSTALLED 5/11/05 DRILL RIG WGS Mobile

DRILLER Lemke DRILL CREW WGS / DNR

JOB/CLIENT DNR JOB No. _____

FW: 1-983

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC GALVANIZED STAINLESS OTHER

2) TYPE OF PIPE JOINTS?
BELLED COUPLINGS THREADED OTHER

3) TYPE OF WELL SCREEN
PVC GALVANIZED STAINLESS OTHER

4) SCREEN SIZE .006"

5) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? Started w/ soil
SOLID AUGER HOLLOW STEM AUGER Switched due to cave
WATER EVERT BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? Not
BAILING PUMPING SURGING COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min. 15 min. 30 min. OTHER

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED
5 gal. 10 gal. 15 gal. OTHER

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR TURBID OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR TURBID OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT:
15.2 Ft. or DRY

2) OTHER MEASUREMENTS:

DATE _____ FT. FROM T. ST. PIPE
DATE _____ FT. FROM T. ST. PIPE
DATE _____ FT. FROM T. ST. PIPE
DATE _____ FT. FROM T. ST. PIPE

Well No. CWOS # 10 DATE INSTALLED 5/1/95 DRILL RIG CWOS mobile

DRILLER Lewis DRILL CREW CWOS/DNR

JOB/CLIENT DNR JOB No. _____

FW: 1-983

TRANSMITTAL

DATE: December 31, 1985

TO: Department of Natural Resources
Attn: Mr Ed Kruel
Box 818
Rhinelander, WI 54501

FROM: Bob Levra - Twin City Testing Corp

RECEIVED
Wis. Dept. of Natural Resources
JAN 2 - 1986
N. C. Dist. Hdqtrs.
RHINELANDER, WI

RE: Wausau East Well Field
Wausau, Wisconsin

DESCRIPTION: Attached are copies of preliminary Wausau East Well Field boring logs. We will be running some mechanical analysis on some representative samples that may slightly change the Unified Classifications.

Robert Levra

PURPOSE:

_____ As You Requested
_____ For Your Information
_____ For Your Approval
_____ Review and Reply
_____ Other (See Remarks)

REMARKS: XC: City of Wausau
M.F.
W.C.
Rausch Oil

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO 40

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
½	ORGANIC SANDY SILT, black, rather stiff (OL) TOPSOIL	COARSE ALLUVIUM								
	SILTY SAND, with gravel, brown, moist, medium dense (SM)		11		1	SB				
2	SAND, with gravel, fine to medium grained, brown, moist, medium dense (SP)									
4	SAND, with gravel, cobbles, fine to medium grained, brown, moist, dense (SP)		17		2	SB				
10	SAND, with gravel, fine to medium grained, moist, very dense (SP)		48		3	SB				
			53		4	SB				
20	SAND, with silt and gravel, medium grained, brown, moist, dense (SP-SM)		20		5	SB				
25	SAND, with gravel, fine to medium grained, brown, wet, medium dense (SP)		14		6	SB				
30	SAND, a little gravel, fine to medium grained, brown, water bearing, medium dense (SP)		11		7	SB				
			13		8	SB				
40	SAND, with gravel to a little gravel, medium grained, brown, water bearing, loose to medium dense (SP)		8		9	SB				
45	CONTINUED ON NEXT PAGE									

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO 40 (Cont.)

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D		
45	SAND, Continued (SP)	COARSE ALLUVIUM Continued	11		10	SB				
50	SAND, a little gravel, fine to medium grained, brown, water bearing, dense to medium dense (SP)		18		11	SB				
			10		12	SB				
6-	SAND, fine grained, brown, wet, very dense to medium dense to very dense (SP)		35		13	SB				
			15		14	SB				
			40		15	SB				
84	SAND, fine to medium grained, brown, water bearing, very dense (SP)		38		16	SB				
90	CONTINUED ON NEXT PAGE									

JOB NO 3410-86-408 VERTICAL SCALE 1" = 5' BORING NO 40 (Cont.)

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
90	SAND, Continued (SP)	COARSE ALLUVIUM Continued	39		17	SB				
94	SAND, fine grained, brown, wet, very dense (SP)									
116	SAND, with gravel, cobbles, fine to medium grained, brown, wet, very dense (SP)									
119	SAND, a little gravel, fine to medium grained, brown, wet, very dense (SP)		49		18	SB				
128	REFUSAL									

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
9-26	16:38	120½'	22'	128'	to	NMR
					to	
					to	
					to	

START 9-25-85 COMPLETE 9-26-85

METHOD 6" FA 0' to 8' @ 16:38

4" DC 0' to 22'

DM 8' to 128'

CREW CHIEF PINGEL

twin city testing

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO 42

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D		
	FILL, Silty Sand, with gravel, cobbles at 1' to 2', brown, moist	FILL	20		1	SB				
5	FILL, Silt, cinders, brown and reddish brown		3		2	SB				
9½	SAND, with gravel, medium grained, brown, moist, very dense (SP)	COARSE ALLUVIUM	51		3	SB				
15	SILTY SAND, with gravel to 17', reddish brown, water bearing, very dense (SM)		31/0.5'		4	SB				
20	SAND, a little gravel, fine to medium grained, brown, water bearing, dense (SP)		20		5	SB				
25	SAND, a little gravel, medium grained, brown, water bearing, dense (SP)		26		6	SB				
30	SAND, a little gravel, fine grained, brown, wet, dense (SP)		22		7	SB				
35	SAND, a little gravel, fine to medium grained, brown, wet, dense (SP)		21		8	SB				
40	SAND, a little gravel, medium to fine grained, wet, dense (SP)		21		9	SB				
45	CONTINUED ON NEXT PAGE									

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO 42 (Cont.)

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
	SAND, a little gravel, fine to medium grained, brown, wet, medium dense (SP)	COARSE ALLUVIUM Continued	15		10	SB				
50	SAND, a little gravel, medium to fine grained, brown, wet, medium dense (SP)		13		11	SB				
56½	END OF BORING		11		12	SB				

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
9-30	13:00	56½'	10'	56½'	to	NMR
					to	
					to	
					to	

START 9-27-85 COMPLETE 9-30-85

METHOD 6" FA 0' to 8' @ 13:00

4" DC 0' to 10'

DM 10' to 55'

CREW CHIEF PINGEL

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO 43

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	—	Qu
	FILL, Silty Sand, with gravel, brown, moist	FILL	7		1	SB				
4½	FILL, Sand, with silt and gravel, medium grained, brown, moist		24		2	SB				
9½	FILL, Sand, with gravel, brick, medium to coarse grained, brown, moist		39*		3	SB				
13	SAND, with gravel, medium to coarse grained, brown, water bearing, very dense (SP)	COARSE ALLUVIUM	39		4	SB				
			**		5	NSR				
24	SAND, a little gravel, fine to medium grained, water bearing, dense (SP)		19		6	SB				
29	SAND, fine grained, brown, water bearing, loose to medium dense (SP)		8		7	SB				
			10		8	SB				
39	SAND, with gravel to a little gravel, coarse grained, brown, water bearing, layers of gravel (SP)		24		9	SB				
45	CONTINUED ON NEXT PAGE		10		10	SB				

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO 43 (Cont.)

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
45	SAND, Continued (SP)	COARSE ALLUVIUM Continued								
49	SAND, fine grained, brown, water bearing, medium dense (SP)		14		11	SB				
50½	END OF BORING									

* PUSHED ROCK, "N" VALUE MAY HAVE BEEN AFFECTED

** CAVE IN

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
10-1	09:30	16'	14½'	14½'	to	13½'
10-1	11:00	50½'	19½'	50½'	to	NMR
					to	
					to	

START 9-30-86 COMPLETE 10-1-85

METHOD @ 11:00

HSA 0' to 19½'

DM 19½' to 49'

CREW CHIEF PINGEL

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO 44

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D		
½	FILL, Silty Sand, with (see #1)	FILL								
	SAND, with silt and gravel, fine grained, brown, moist, loose to dense (SP-SM)	COARSE ALLUVIUM	5		1	SB				
			20		2	SB				
9½	SAND, with gravel, medium to fine grained, brown, moist (SP)		43*		3	SB				
15½	SAND, with gravel, medium to fine grained, brown, water bearing, dense (SP)		24		4	SB				
			16		5	SB				
24	SAND, a little gravel, fine to medium grained, brown, water bearing, dense (SP)		18		6	SB				
29	SAND, medium to fine grained, brown, water bearing, loose (SP)		7		7	SB				
34	SAND, a little gravel, fine to medium grained, brown, water bearing, loose to medium dense to dense (SP)		8		8	SB				
40	CONTINUED ON NEXT PAGE		10		9	SB				

#1 organic fines, black, moist

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO 44 (Cont.)

PROJECT WAUSAU EAST WELL FIELD

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
40	SAND, Continued (SP)	COARSE ALLUVIUM Continued								
			13		10	SB				
			16		11	SB				
54	SAND, fine to medium grained, brown, water bearing, dense (SP)		24		12	SB				
55½	END OF BORING									

* PUSHED ROCK, "N" VALUE MAY BE AFFECTED

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
10-1	14:00	55½'	19½'	55½'	to	NMR
					to	
					to	
					to	

START 10-1-85 COMPLETE 10-1-85

METHOD @ 14:00

HSA 0' to 19½'

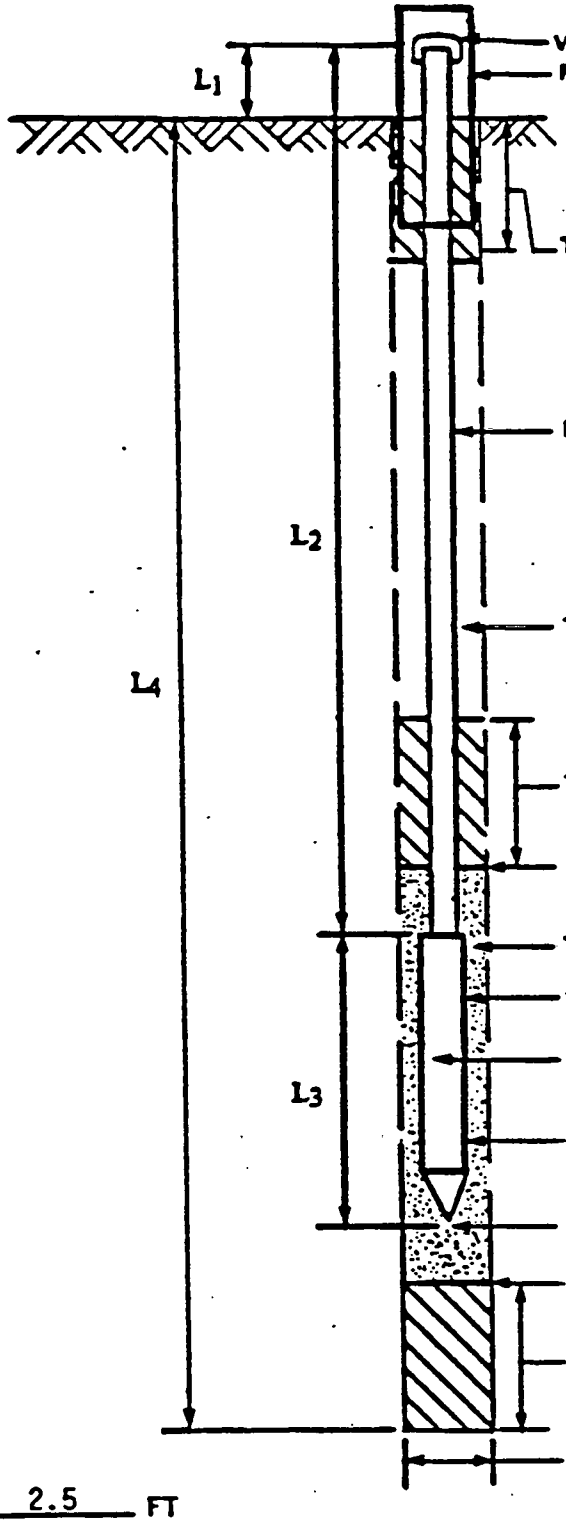
DM 19½' to 54'

CREW CHIEF PINGEL

INSTALLATION OF MONITORING WELL

JOB NO. 8410-86-408 MONITORING WELL NO. 40

GROUND SURFACE ELEVATION _____ TOP OF RISER PIPE ELEVATION (with cap removed) _____



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	2.7'
THICKNESS AND TYPE OF SEAL	2.2' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	3.2' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	65.3'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 5'
DEPTH TO BOTTOM OF MONITORING WELL	72.9'
DEPTH TO BOTTOM OF FILTER SAND	128.2'
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	7"

L_1= 2.5 FT

L_2= 70 FT

L_3= 5.4 FT

L_4= 128.2 FT

INSTALLATION COMPLETED:
Date 9-27 Time _____

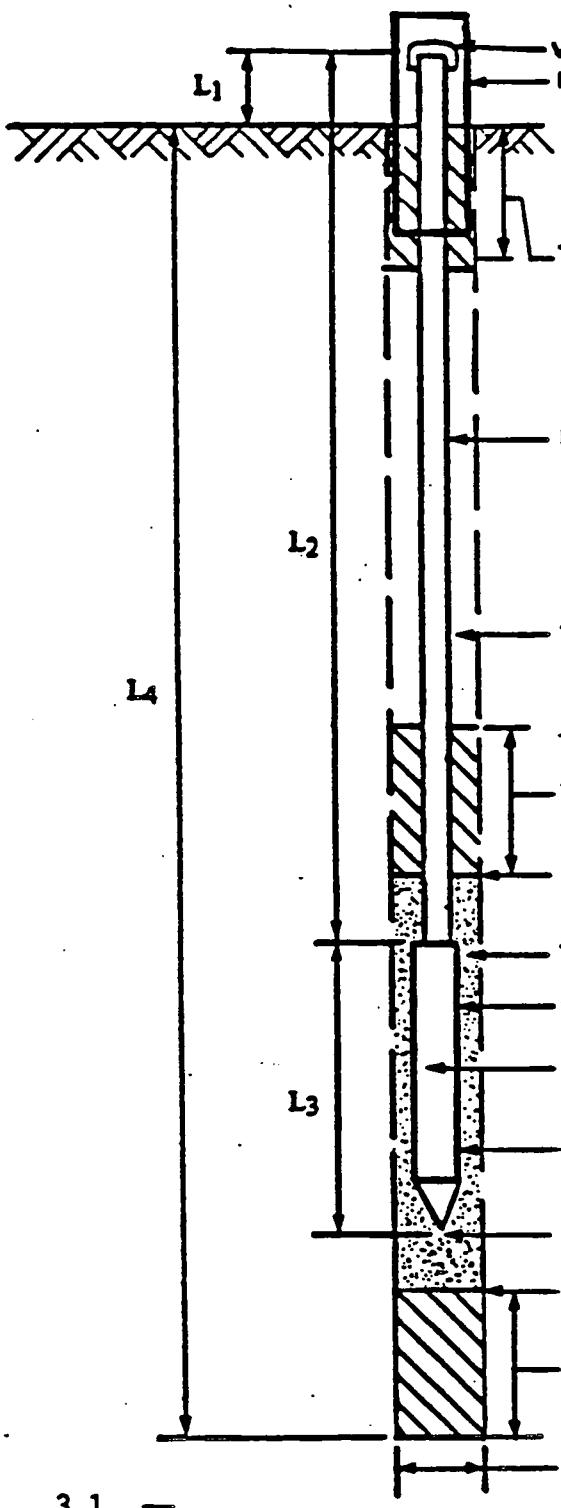
MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL *

(1) DEPTH BELOW TOP OF RISER PIPE

JOB NO. 8410-86-408 MONITORING WELL NO. 41

GROUND SURFACE ELEVATION _____ TOP OF RISER PIPE ELEVATION (with cap removed) _____



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	3.3'
THICKNESS AND TYPE OF SEAL	1.7' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	1.7' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	5.5'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 15'
DEPTH TO BOTTOM OF MONITORING WELL	22.1'
DEPTH TO BOTTOM OF FILTER SAND	22.1
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	7"

L_1 = 3.1 FT

L_2 = 10.2 FT

L_3 = 15.4 FT

L_4 = 25.0 FT

INSTALLATION COMPLETED:
Date 9-27 Time _____

MONITORING WELL WATER LEVEL MEASUREMENTS

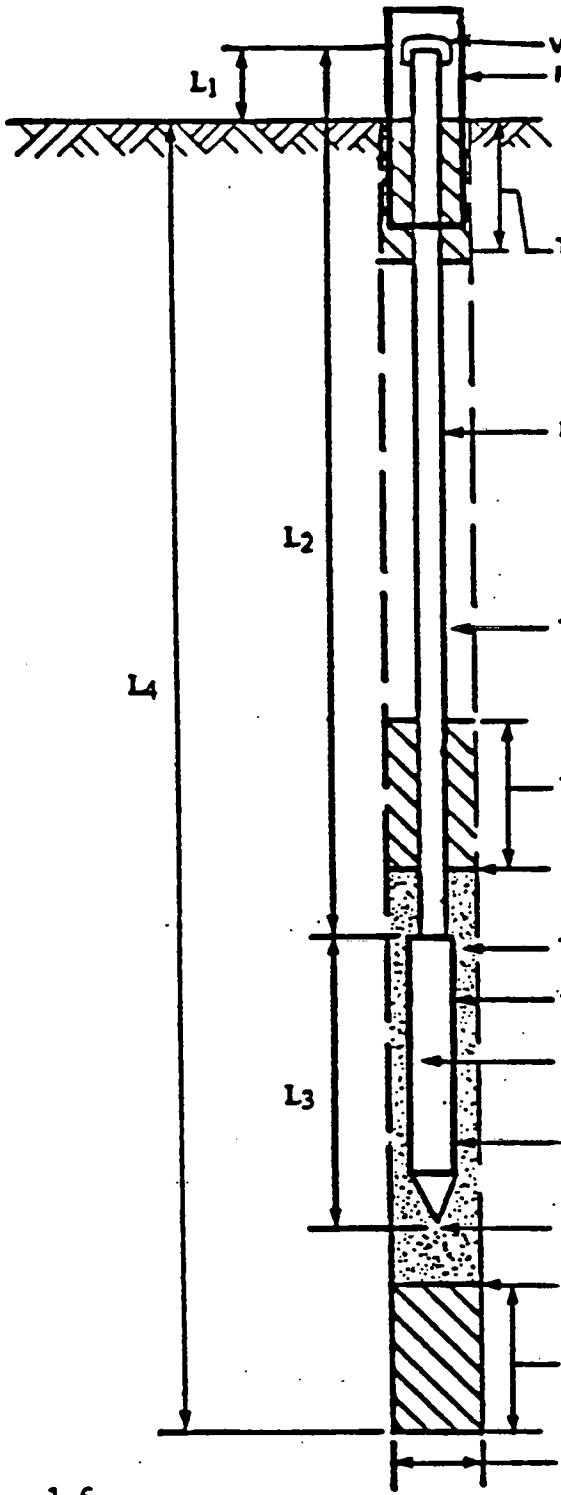
DATE	TIME	BAILED DEPTHS	WATER LEVEL *

(1) DEPTH BELOW TOP OF RISER PIPE

INSTALLATION OF MONITORING WELL

JOB NO. 8410-86-408 MONITORING WELL NO. 42

GROUND SURFACE ELEVATION _____ TOP OF RISER PIPE ELEVATION (with cap removed) _____



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	1.8'
THICKNESS AND TYPE OF SEAL	3.2' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	1.8' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	46.2'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 5.0'
DEPTH TO BOTTOM OF MONITORING WELL	54.0'
DEPTH TO BOTTOM OF FILTER SAND	55.0'
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	4"

L_1 = 1.6 FT

L_2 = 50.2 FT

L_3 = 5.4 FT

L_4 = 55.0 FT

INSTALLATION COMPLETED:
Date _____ Time _____

MONITORING WELL WATER LEVEL MEASUREMENTS

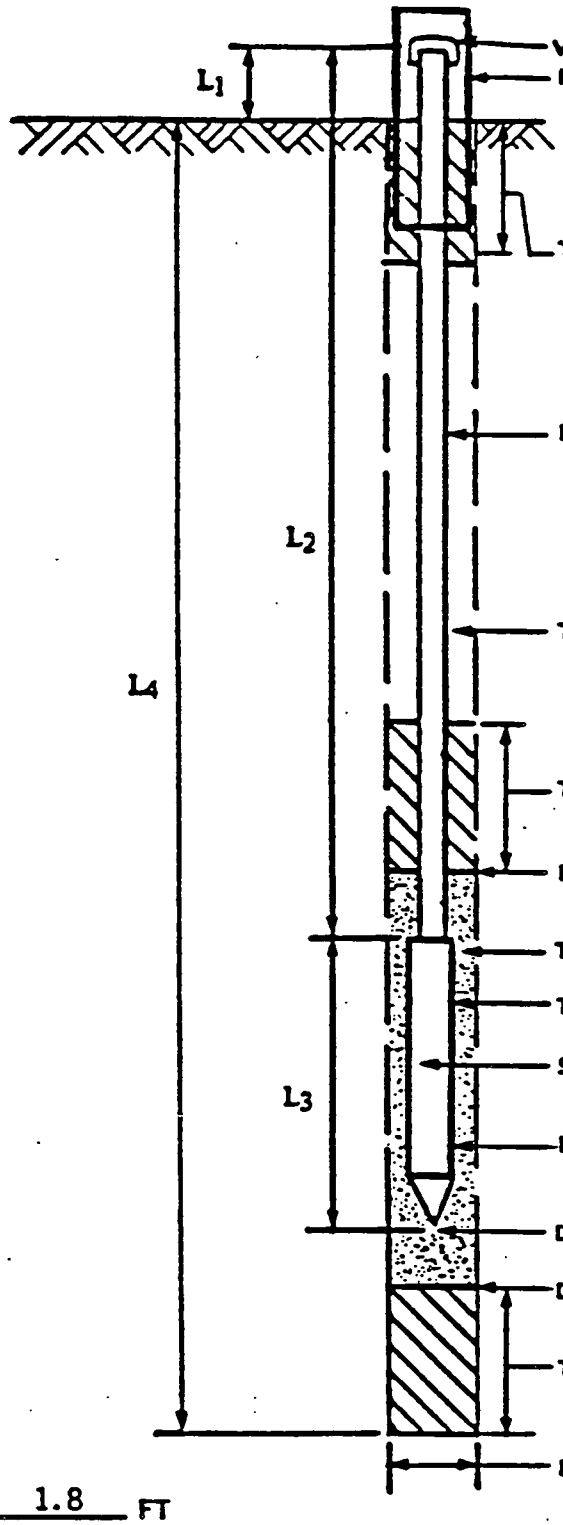
DATE	TIME	BAILED DEPTHS	WATER LEVEL *

(1) DEPTH BELOW TOP OF RISER PIPE

INSTALLATION OF MONITORING WELL

JOB NO. 8410-86-408 MONITORING WELL NO. 43

GROUND SURFACE ELEVATION _____ TOP OF RISER PIPE ELEVATION _____
(with cap removed)



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	2.0'
THICKNESS AND TYPE OF SEAL	3.0' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	1.5' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	6.3'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 15.0'
DEPTH TO BOTTOM OF MONITORING WELL	23.8'
DEPTH TO BOTTOM OF FILTER SAND	24.5'
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	7"

L_1 = 1.8 FT

L_2 = 10.2 FT

L_3 = 15.4 FT

L_4 = 24.5 FT

INSTALLATION COMPLETED:
Date 9-28-85 Time 10:45

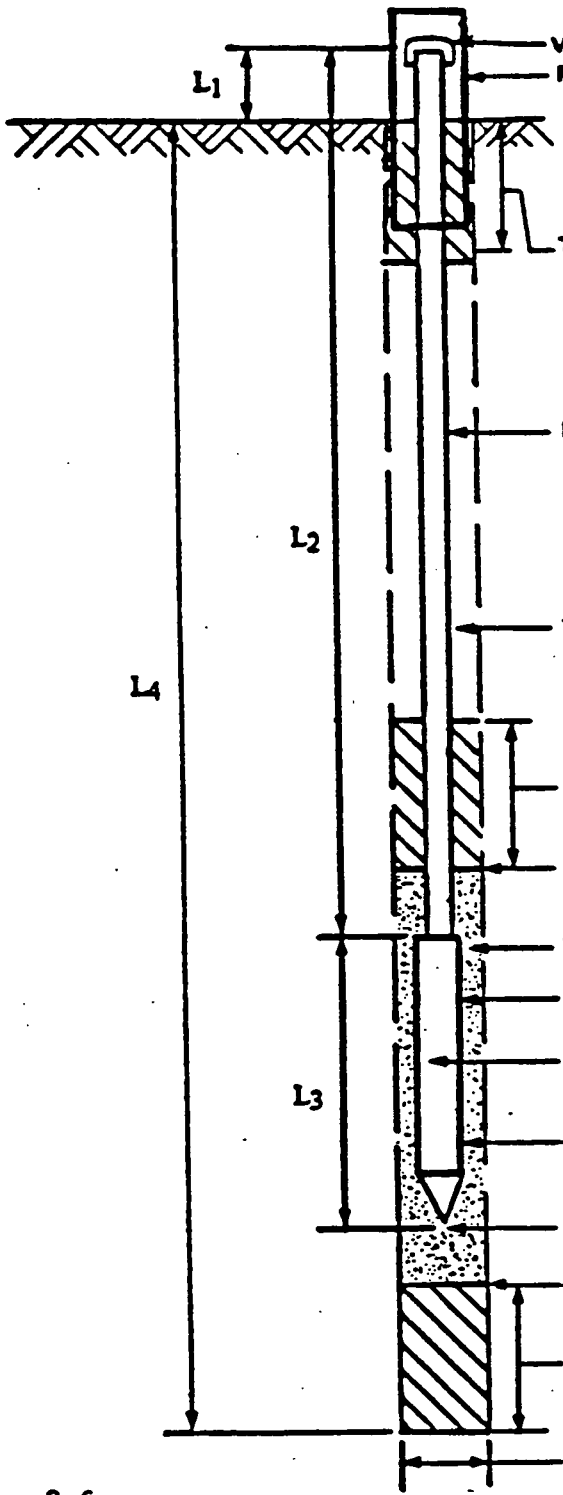
MONITORING WELL WATER LEVEL MEASUREMENTS			
DATE	TIME	BAILED DEPTHS	WATER LEVEL *

(1) DEPTH BELOW TOP OF RISER PIPE

INSTALLATION OF MONITORING WELL

JOB NO. 3410-86-408 MONITORING WELL NO. 44

GROUND SURFACE ELEVATION _____ TOP OF RISER PIPE ELEVATION _____ (with cap removed)



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	2.8'
THICKNESS AND TYPE OF SEAL	2.2' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	1.5' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	5.4'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 15.0'
DEPTH TO BOTTOM OF MONITORING WELL	23.0'
DEPTH TO BOTTOM OF FILTER SAND	25.0'
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	7"

L_1 = 2.6 FT

L_2 = 10.2 FT

L_3 = 15.4 FT

L_4 = 25.0 FT

INSTALLATION COMPLETED:
Date 9-28 Time 13:00

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL *

(1) DEPTH BELOW TOP OF RISER PIPE

Engineers
Planners
Economists
Scientists

RECEIVED
Wis. Dept. of Natural Resources
DEC 12 1985
N. C. Dist. Hdqtrs.
RHINELANDER, WI

December 11, 1985

L20303.A0

Mr. Gary Kulibert
Wisconsin Department of
Natural Resources
Box 818
Schiek Plaza
Rhinelander, Wisconsin 54501

Subject: Installation of Additional Monitoring Wells at City of Wausau Landfill

Dear Gary:

As we have discussed, additional monitoring wells installed at the old City of Wausau Landfill may help in the interpretation of the groundwater sampling results. The attached cost estimates are based on the following assumptions:

- Two wells will be installed at a depth of approximately 45 feet somewhere to the north of the previously installed wells
- No more than four samples may be selected for mechanical analysis
- No more than two soil samples may be selected for VOA analysis
- The new monitoring wells will be installed before the previously installed wells are sampled the second time
- Except for dissolved iron, groundwater samples will not be analyzed for metals

The difference in the two attached cost estimates, Options A and B, is the number of times that groundwater samples will be collected. Option A assumes that during the planned second sampling round both the old and the new wells would be sampled. A third round of sampling would be performed under

Option A to confirm the results of the second round. Option B would not allow the third sampling round.

I have $1,500 in my existing budget that could be applied to the additional field work, based on the bills for the drilling and the mechanical analysis of the soil that have just arrived. If you would like to modify the scope of the additional work or have any questions, please call me.

Sincerely,

Shara McBee

Shara Mount McBee
Project Manager

ph/GLT187/10
Enclosures

REVISION DATE: 12/10/85

COST ESTIMATE FOR ADDITIONAL WORK AT CITY OF WAUSAU LANDFILL OPTION A

TASK / SUBTASK		1-HYDROGEOLOGIC INVESTIGATION 1.1-INSTALL WELLS	1.2-SURVEY LOCATIONS	1.3-MONITOR WATER LEVELS	1.4-ANALYZE DATA	2-ENVIRON-MENTAL MONITORING	COST SUMMARY
LABOR HOURS							
P4		0	0	0	3	0	3
P2		28	1	1	8	40	78
T2		0	0	0	8	20	28
0		0	0	0	0	0	0
TOTAL LABOR HOURS		28	1	1	19	60	109
DIRECT LABOR (DOLLARS)	1986						
P4 HOURLY RATE=	$26.28	$0	$0	$0	$79	$0	$79
P2 HOURLY RATE=	$15.79	$442	$16	$16	$126	$632	$1,232
T2 HOURLY RATE=	$13.62	$0	$0	$0	$109	$272	$381
0 HOURLY RATE=	$8.64	$0	$0	$0	$0	$0	$0
TOTAL DIRECT LABOR COST		$442	$16	$16	$314	$904	$1,692
LABOR MULTIPLIER	RATE = 1.91	$844	$30	$30	$600	$1,727	$3,231
TOTAL LABOR COST		$1,287	$46	$46	$914	$2,631	$4,923
EXPENSE ITEMS							
TRANSPORTATION		$100	$0	$0	$0	$100	$200
SUBSITENCE		$150	$0	$0	$0	$330	$480
OTHER DIRECT COSTS (ODC)							
POSTAGE/FREIGHT		$0	$0	$0	$0	$150	$150
SUPPLIES		$0	$0	$0	$0	$0	$0
COMPUTER		$50	$0	$0	$100	$0	$150
REPRODUCTION		$0	$0	$0	$20	$0	$20
OTHER		$50	$0	$30	$0	$0	$80
TOTAL ODC		$100	$0	$30	$120	$150	$400
SPECIAL EQUIPMENT		$0	$0	$0	$0	$0	$0
TOTAL EXPENSE COST		$350	$0	$30	$120	$580	$1,080
SUBCONTRACTS							
DRILLING		$2,855	$0	$0	$0	$0	$2,855
LABORATORY TESTING		$175	$0	$0	$0	$1,675	$1,850
SURVEYING		$0	$150	$0	$0	$0	$150
TOTAL SUBCONTRACTS COST		$3,030	$150	$0	$0	$1,675	$4,855
TOTAL TASK COST		$4,667	$196	$76	$1,034	$4,886	$10,858

REVISION DATE: 12/11/85

COST ESTIMATE FOR ADDITIONAL WORK AT CITY OF WAUSAU LANDFILL OPTION B

TASK / SUBTASK		1-HYDROGEOLOGIC INVESTIGATION 1.1-INSTALL WELLS	1.2-SURVEY LOCATIONS	1.3-MONITOR WATER LEVELS	1.4-ANALYZE DATA	2-ENVIRONMENTAL MONITORING	COST SUMMARY
LABOR HOURS							
P4		0	0	0	1	0	1
P2		28	1	0	4	20	53
T2		0	0	0	4	0	4
0		0	0	0	0	0	0
TOTAL LABOR HOURS		28	1	0	9	20	58
DIRECT LABOR (DOLLARS)	1986						
P4 HOURLY RATE=	$26.28	$0	$0	$0	$26	$0	$26
P2 HOURLY RATE=	$15.79	$442	$16	$0	$63	$316	$837
T2 HOURLY RATE=	$13.62	$0	$0	$0	$54	$0	$54
0 HOURLY RATE=	$8.64	$0	$0	$0	$0	$0	$0
TOTAL DIRECT LABOR COST		$442	$16	$0	$144	$316	$918
LABOR MULTIPLIER	RATE = 1.91	$844	$30	$0	$275	$603	$1,753
TOTAL LABOR COST		$1,287	$46	$0	$419	$919	$2,670
EXPENSE ITEMS							
TRANSPORTATION		$100	$0	$0	$0	$0	$100
SUBSITENCE		$150	$0	$0	$0	$100	$250
OTHER DIRECT COSTS (ODC)							
POSTAGE/FREIGHT		$0	$0	$0	$0	$150	$150
SUPPLIES		$0	$0	$0	$0	$0	$0
COMPUTER		$50	$0	$0	$100	$0	$150
REPRODUCTION		$0	$0	$0	$20	$0	$20
OTHER		$50	$0	$30	$0	$0	$80
TOTAL ODC		$100	$0	$30	$120	$150	$400
SPECIAL EQUIPMENT		$0	$0	$0	$0	$0	$0
TOTAL EXPENSE COST		$350	$0	$30	$120	$250	$750
SUBCONTRACTS							
DRILLING		$2,855	$0	$0	$0	$0	$2,855
LABORATORY TESTING		$175	$0	$0	$0	$525	$700
SURVEYING		$0	$150	$0	$0	$0	$150
TOTAL SUBCONTRACTS COST		$3,030	$150	$0	$0	$525	$3,705
TOTAL TASK COST		$4,667	$196	$30	$539	$1,694	$7,125

ARRIVED ON SITE AT 7:40
WEATHER: CLOUDY, 9 DEGREES F

CITY OF WAUSAU LANDFILL
SAMPLING DATA
11/25/85

WELL NUMBER	DEPTH TO WATER * 11/15/85	11/25/85	PURGE VOLUME CALC **	ACTUAL	SAMPLING TIME	pH	CONDUCT.	TEMP
1	24.42	25.41	6.7	5 [1]	11:30	6.37	200	12
2	30.23	31.11	9	9	13:45	6.0	225	12
3	31.41	32.44	7.9	8	15:20	6.0	650	10
4S	28.5	29.08	5.35	6	16:10	6.0	1100	8
4D	28.5	28.71	64.5	70	15:30	6.0	215	10
6	30.57	33.34	9.25	7	15:45	6.0	215	8
7	31.88	32.79	6.9	9	12:40	6.0	135	12

NOTES

* MEASURED FROM TOP OF CASING

**BASED ON 5 WELL VOLUMES FROM WATER LEVEL ON 11/15/85 (gallons)

1 PURGED TO CONSTANT CONDUCTIVITY

OVA READINGS WERE TAKEN AT ALL WELLS. THE BACKGROUND OVA READING RANGED FROM 1 TO 5 PPM (ODORS FROM THE PLANT MAY HAVE AFFECTED THE READINGS). ALL OF THE WELLS EXCEPT WELL 6, WHICH HAD A READING OF 6 PPM, WERE IN THE 0 TO 5 PPM RANGE.

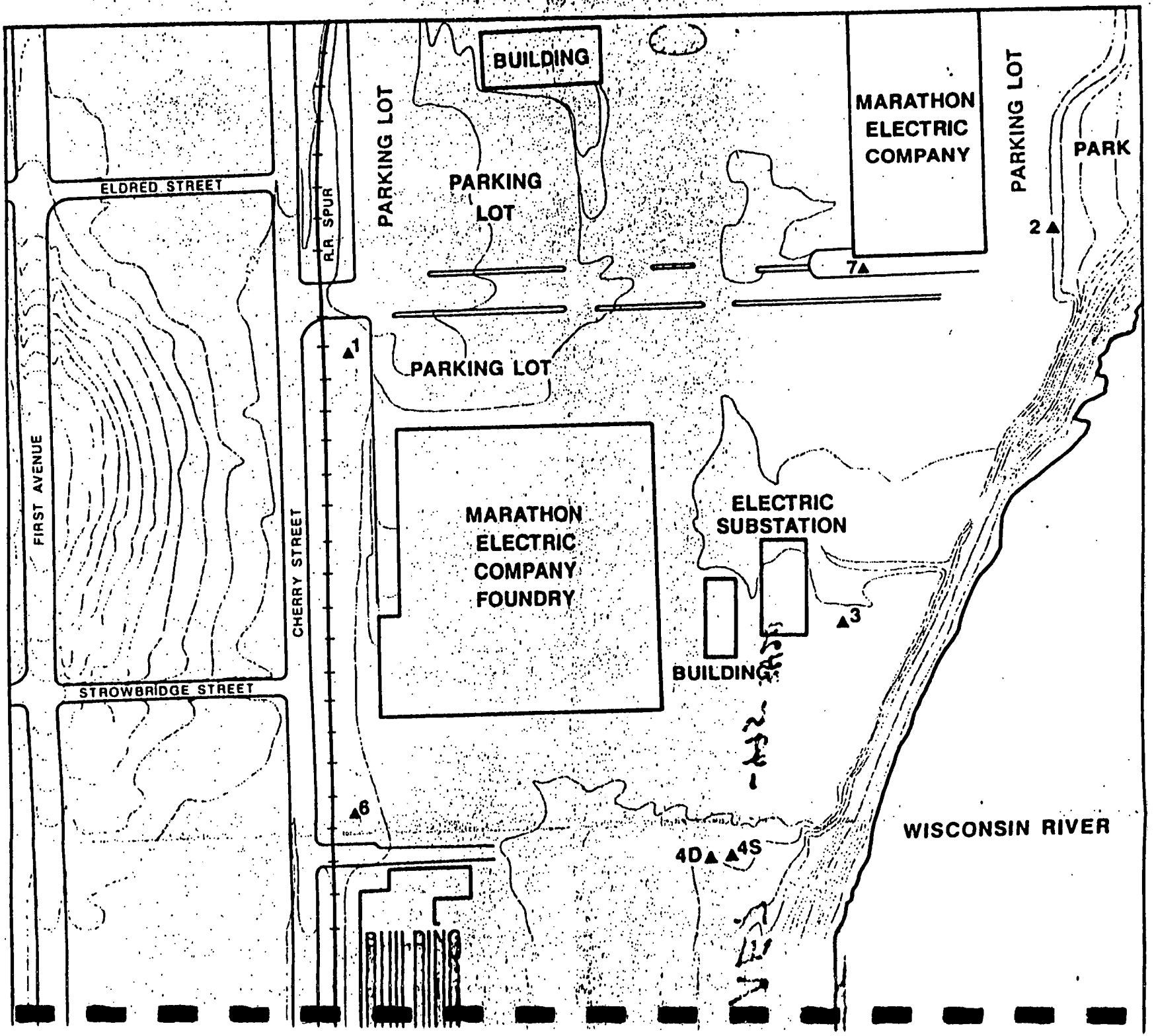
TABLE 2
GROUNDWATER LEVELS

WELL NUMBER	CASING HEIGHT (feet)	ELEVATION (feet, MSL)				WATER DEPTH FROM TOP OF CASING		GROUNDWATER ELEVATION (feet, MSL)	
		TOP OF CASING	TOP OF PVC	TIP OF SCREEN	GROUND SURFACE	11/15/85	11/25/85	11/15/85	11/25/85
1S	2.9	1223.75	1223.84	1190.9	1220.8	24.42	25.41	1199.33	1198.34
2S	3.1	1219.28	1219.17	1178.3	1216.2	30.23	31.11	1189.05	1188.17
3S	2.9	1220.31	1220.14	1178.5	1217.4	31.41	32.44	1188.9	1187.87
4S	2.8	1216.92	1216.76	1181.8	1214.1	28.50	29.08	1188.42	1187.84
4D	2.8	1216.49	1216.26	1109.4	1213.9	*	28.71		1187.78
6S	2.7	1221.89	1221.63	1179.7	1219.2	30.57	33.34	1191.32	1188.55
7S	2.8	1221.01	1220.91	1182.2	1218.2	31.88	32.79	1189.13	1188.22

NOTES:

Refer to Figure 2 for well locations.

* The groundwater level for 4D was not determined on 11/15/85 because the well had not had time to equilibrate after drilling.


BUILDING
MARATHON ELECTRIC COMPANY
PARKING LOT
PARK
ELDRED STREET
R.R. SPUR
PARKING LOT
PARKING LOT
2
7
1
PARKING LOT
FIRST AVENUE
CHERRY STREET
MARATHON ELECTRIC COMPANY FOUNDRY
ELECTRIC SUBSTATION
3
BUILDING
STROWBRIDGE STREET
6
WISCONSIN RIVER
4D
4S
BUILDING

11-4-85
10:50 AM

USGS Monitoring Well #9

Well depth = 17.32 +.25 = 17.57'
Water level = 9.60 +.25 = 9.85'

Weather
Cloudy windy
temperature in 40's-low 40's

gallons removed = 4

bailed with PVC bailer
sampled with teflon bailer
water very brown and cloudy

Michele Owens
Marsha Johnson

11-4-85
8:30AM

WGS Monitoring Well #10

well depth = 20.58 + .25 = 20.83'
water level = 12.33 + .25 = 12.58'

gallons removed = 4

water very brown & cloudy

City says Well #4 turned on at 7 AM

bailed with PVC bailer
sampled with teflon bailer

1:30PM 11-4-85

TCT Monitoring Well #3 - corner of Steel Flite Bldg.

well depth 55.30+.25 = 55.55'
water level 17.63 +.25 17.88'

did not sample today
will sample tomorrow
used water depth for monitoring well next to it because could not hear plopper

11-4-85
1:10PM

ICT Monitoring Well # 2 - corner of Steel Flite Bldg

well depth = 25.25 + .25 = 25.50'
water level = ~~17.63 + .25 (?) = 17.88 (?)~~
could not hear plopper or water at all - used piezometer water level next to it for this reading
gallons removed = 4

water reddish brown color - did not clear as bailed
VOC odor very strong next to building - fan in road of building
moved away to take samples because afraid would contaminate them

11-4-85
2:00 PM

TCT Monitoring Well #4 - Behind Ctco Building

well depth = 25.25 + .25 = 25.50'
water level = ? = ?
could not hear plopper - tape sticks to sides
about 15' N of monitoring well
waste oil and oil filter on ground

Soil boring East of well settled
and somewhat caved in

bailed with PVC bailer
sampled with teflon bailer

water reddish brown color - cleared
somewhat as bailed
gallons removed = 4

11-5-85
1:15PM

TCT Monitoring Well #3 Wausau

West to Steel Elite Building

well depth 55.21 + .25 = 55.46'
water level 17.90 + .25 = 18.15'

gallons removed = 18 1/2

bailed with ~~teflon~~ PVC bailer
sampled with teflon bailer

water clear

11-5-85
1:40 PM

TCT Monitoring Well #1 - near Lembe Cheese Bldg - West Side of RR

		tracks
well depth = 75.31'	± .25 =	75.56'
water level = 19.09'	± .25'	19.34'

gallons removed = 20
should have removed 238 gal. by calculations

bailed with PVC bailer
sampled with teflon bailer

11-5-85
2:10PM

TCT Monitoring Well #5 - behind Sco Building - West Side of RR tracks

Well depth 25.25' + .25 = 25.50'
water level = ? = ?

could not hear plopper - problem with tape sticking to sides of PVC pipe - this problem only with shallow wells & not piezometers

gallons removed = 4
water very cloudy & brown with fine sand

bailed with PVC bailer
sampled with teflon bailer

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY – WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037040740

County Code: 37 County: Marathon

Collection Date: 11/04/85 (M M / D D / Y Y)

Time (24 Hr. Clock): 12:00 (H H : M M) Field No. ___

Water System Name: WGS Monitoring Well # 10

P.O. or Municipality: Wausau

Sample Source Address: _____

_____ (or) Well No. ___

Sampling Point Description: Sampled from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 618
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By: Marsha Johnson

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	___.___
☐	009	Acrylonitrile[20]	☐	☐	___.___
☒	025	Benzene[1.0]	☐	☐	<1.0
☐	046	Bromobenzene[4.0]	☐	☐	___.___
☐	051	Bromodichloromethane[1.5]	☐	☐	___.___
☐	053	Bromoform[5.0]	☐	☐	___.___
☐	055	Bromomethane[50]	☐	☐	___.___
☐	063	n-Butylacetate[0.5]	☐	☐	___.___
☐	071	Carbon Disulfide[5.0]	☐	☐	___.___
☐	073	Carbon Tetrachloride[1.5]	☐	☐	___.___
☐	083	Chlorobenzene[2.0]	☐	☐	___.___
☐	087	Chloroethane[20]	☐	☐	___.___
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	___.___
☐	095	Chloroform[1.0]	☐	☐	___.___
☐	108	o-Chlorotoluene[1.0]	☐	☐	___.___
☐	110	p-Chlorotoluene[1.0]	☐	☐	___.___
☐	147	Dibromochloromethane[2.0]	☐	☐	___.___
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	___.___
☐	155	m-Dichlorobenzene[2.0]	☐	☐	___.___
☐	157	p-Dichlorobenzene[2.0]	☐	☐	___.___
☐	165	1,1-Dichloroethane[1.0]	☐	☐	___.___
☐	167	1,2-Dichloroethane[1.0]	☐	☐	___.___
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	___.___
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	___.___
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	233	Ethylbenzene[1.0]	☐	☐	___.___
☐	427	Fluorotrichloromethane[1.0]	☐	☐	___.___
☐	298	Isopropylbenzene[1.0]	☐	☐	___.___
☐	319	Methylethylketone (MEK)[12]	☐	☐	___.___
☐	393	Styrene[2.0]	☐	☐	___.___
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___.___
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___.___
☒	399	Tetrachloroethylene[1.0]	☐	☐	<1.0
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	___.___
☒	411	Toluene[1.0]	☐	☐	<1.0
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	___.___
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	___.___
☒	425	Trichloroethylene[1.0]	☐	☐	<1.0
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	___.___
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	___.___
☐		_____	☐	☐	___.___
☐		_____	☐	☐	___.___

Comments: CC. DIST. OWNER

Date Received and Sample No.: 85-6-2065 NOV 5 1985

Date Reported: DPD NOV 8 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY – WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037040630

County Code: 37 County: Marathon

Collection Date: 11/04/85 (MM/DD/YY)

Time (24 Hr. Clock): 11:30 Field No.

Water System Name: WGS Monitoring Well #9

P.O. or Municipality: Wausau

Sample Source Address:

(or) Well No.

Sampling Point Description: sampled from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By: Marsha Johnson

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]	Detected	Not Detected	(ug/l)
☐ 007 Acrolein[50]	☐	☐	
☐ 009 Acrylonitrile[20]	☐	☐	
☒ 025 Benzene[1.0]	☐	☐	< 1.0
☐ 046 Bromobenzene[4.0]	☐	☐	
☐ 061 Bromodichloromethane[1.5]	☐	☐	
☐ 053 Bromoform[5.0]	☐	☐	
☐ 055 Bromomethane[50]	☐	☐	
☐ 063 n-Butylacetate[0.5]	☐	☐	
☐ 071 Carbon Disulfide[5.0]	☐	☐	
☐ 073 Carbon Tetrachloride[1.5]	☐	☐	
☐ 083 Chlorobenzene[2.0]	☐	☐	
☐ 087 Chloroethane[20]	☐	☐	
☐ 093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐ 095 Chloroform[1.0]	☐	☐	
☐ 108 o-Chlorotoluene[1.0]	☐	☐	
☐ 110 p-Chlorotoluene[1.0]	☐	☐	
☐ 147 Dibromochloromethane[2.0]	☐	☐	
☐ 148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐ 153 o-Dichlorobenzene[2.0]	☐	☐	
☐ 155 m-Dichlorobenzene[2.0]	☐	☐	
☐ 157 p-Dichlorobenzene[2.0]	☐	☐	
☐ 165 1,1-Dichloroethane[1.0]	☐	☐	
☐ 167 1,2-Dichloroethane[1.0]	☐	☐	
☐ 169 1,1-Dichloroethylene[1.0]	☐	☐	
☒ 171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐ 174 Dichloroiodomethane	☐	☐	[not quantified]
☐ 181 1,2-Dichloropropane[1.0]	☐	☐	
☐ 183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐ 185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐ 233 Ethylbenzene[1.0]	☐	☐	
☐ 427 Fluorotrichloromethane[1.0]	☐	☐	
☐ 298 Isopropylbenzene[1.0]	☐	☐	
☐ 319 Methylethylketone (MEK)[12]	☐	☐	
☐ 393 Styrene[2.0]	☐	☐	
☐ 396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐ 397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒ 399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐ 401 Tetrahydrofuran (THF)[200]	☐	☐	
☒ 411 Toluene[1.0]	☐	☐	< 1.0
☐ 421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐ 423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒ 425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐ 428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐ 434 Vinyl Chloride	☐	☐	[not quantified]
☐ 437 Xylenes[2.0]	☐	☐	
☐	☐	☐	
☐	☐	☐	

CC. DIST. - OWNER

Comments

Date Received and Sample No.: 85-6 2063 NOV 5 1985

Date Reported: BPD NOV 2 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY – WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037049650

County Code: 37 County: Marathon

Collection Date: 11/05/85 (M M / D D / Y Y)

Time (24 Hr. Clock): __:__ (H H : M M) Field No. ____

Water System Name: ICI Monitoring Well #1

P.O. or Municipality: Wausau

Sample Source Address: West of RR Tracks

(or) Well No. ____

Sampling Point Description: Teflon Bailer

Send Report To:
Name: Bill Dobbins
Address: P.O. Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Marsha Johnson

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	____
☐	009 Acrylonitrile[20]	☐	☐	____
☒	025 Benzene[1.0]	☐	☒	≤ 1.0
☐	046 Bromobenzene[4.0]	☐	☐	____
☐	051 Bromodichloromethane[1.5]	☐	☐	____
☐	053 Bromoform[5.0]	☐	☐	____
☐	055 Bromomethane[50]	☐	☐	____
☐	063 n-Butylacetate[0.5]	☐	☐	____
☐	071 Carbon Disulfide[5.0]	☐	☐	____
☐	073 Carbon Tetrachloride[1.5]	☐	☐	____
☐	083 Chlorobenzene[2.0]	☐	☐	____
☐	087 Chloroethane[20]	☐	☐	____
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	____
☐	095 Chloroform[1.0]	☐	☐	____
☐	108 o-Chlorotoluene[1.0]	☐	☐	____
☐	110 p-Chlorotoluene[1.0]	☐	☐	____
☐	147 Dibromochloromethane[2.0]	☐	☐	____
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	____
☐	155 m-Dichlorobenzene[2.0]	☐	☐	____
☐	157 p-Dichlorobenzene[2.0]	☐	☐	____
☐	165 1,1-Dichloroethane[1.0]	☐	☐	____
☐	167 1,2-Dichloroethane[1.0]	☐	☐	____
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	____
☒	171 1,2-Dichloroethylene[1.0]	☐	☒	≤ 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	____
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	____
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	____
☐	233 Ethylbenzene[1.0]	☐	☐	____
☐	427 Fluorotrichloromethane[1.0]	☐	☐	____
☐	298 Isopropylbenzene[1.0]	☐	☐	____
☐	319 Methylethylketone (MEK)[12]	☐	☐	____
☐	393 Styrene[2.0]	☐	☐	____
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	____
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	____
☒	399 Tetrachloroethylene[1.0]	☐	☒	≤ 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	____
☒	411 Toluene[1.0]	☐	☒	≤ 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	____
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	____
☒	425 Trichloroethylene[1.0]	☐	☒	≤ 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	____
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	____
☐	____	☐	☐	____
☐	____	☐	☐	____

Comments: CC: Dist. Office

85-6-2100

Date Received and Sample No.: NOV 0 [illegible]

Date Reported: DPD NOV 26 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037048880

County Code: 37 County: Marathon

Collection Date: 11/04/85 (M M / D D / Y Y)

Time (24 Hr. Clock): 14:10 (H H : M M) Field No.

Water System Name: TCT Monitoring Well # 2

P.O. or Municipality: Wausau

Sample Source Address: SW Corner Steel Flite Bldg (or) Well No.

Sampling Point Description: Teflon bailer

Send Report To:
Name: Bill Dobbins
Address: P.O. Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Marsha Johnson

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☒	025 Benzene[1.0]	☐	☐	< 1.0
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	< 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐		☐	☐	
☐	CC: DIST. - OWNER	☐	☐	

Comments

Date Received and Sample No.: DEC 2 1985 NOV 5 1985

Date Reported: DPD NOV 2 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037049430

County Code: 37 County: Marathon

Collection Date: 11/05/85 (MM/DD/YY)

Time (24 Hr. Clock): 14:20 Field No.:

Water System Name: TCT Monitoring Well #3

P.O. or Municipality: Wausau

Sample Source Address:

(or) Well No.:

Sampling Point Description: sampled from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By: Marsha Johnson

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

	Detection Limits (ug/l) are indicated in brackets [ ]	Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☒	025 Benzene[1.0]	☐	☐	< 1.0
☐	046 Bromobenzene[4.0]	☐	☐	
☐	061 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	< 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐	CC: DIST. - OWNER	☐	☐	
☐		☐	☐	

Comments:

Date Received and Sample No.: [illegible] 2098 NOV 0 [illegible]

Date Reported: DPD NOV 26 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number 037048990

County Code 37 County Marathon

Collection Date 11/04/85 (M M / D D / Y Y)

Time (24 Hr. Clock) 14:40 (H H : M M) Field No. ___

Water System Name TCT Monitoring Well #4

P.O. or Municipality Wausau

Sample Source Address Behind [redacted] Rec Building (or) Well No. ___

Sampling Point Description teflon bailer

Send Report To:
Name: Bill Dobbins
Address: P.O. Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By Marsha Johnson

Account Number 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	___.___
☐	009	Acrylonitrile[20]	☐	☐	___.___
☒	025	Benzene[1.0]	☐	☐	≤ 1.0
☐	046	Bromobenzene[4.0]	☐	☐	___.___
☐	061	Bromodichloromethane[1.5]	☐	☐	___.___
☐	053	Bromoform[5.0]	☐	☐	___.___
☐	055	Bromomethane[50]	☐	☐	___.___
☐	063	n-Butylacetate[0.5]	☐	☐	___.___
☐	071	Carbon Disulfide[5.0]	☐	☐	___.___
☐	073	Carbon Tetrachloride[1.5]	☐	☐	___.___
☐	083	Chlorobenzene[2.0]	☐	☐	___.___
☐	087	Chloroethane[20]	☐	☐	___.___
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	___.___
☐	095	Chloroform[1.0]	☐	☐	___.___
☐	108	o-Chlorotoluene[1.0]	☐	☐	___.___
☐	110	p-Chlorotoluene[1.0]	☐	☐	___.___
☐	147	Dibromochloromethane[2.0]	☐	☐	___.___
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	___.___
☐	155	m-Dichlorobenzene[2.0]	☐	☐	___.___
☐	157	p-Dichlorobenzene[2.0]	☐	☐	___.___
☐	165	1,1-Dichloroethane[1.0]	☐	☐	___.___
☐	167	1,2-Dichloroethane[1.0]	☐	☐	___.___
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	___.___
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	≤ 1.0
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	___.___
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	233	Ethylbenzene[1.0]	☐	☐	___.___
☐	427	Fluorotrichloromethane[1.0]	☐	☐	___.___
☐	298	Isopropylbenzene[1.0]	☐	☐	___.___
☐	319	Methylethylketone (MEK)[12]	☐	☐	___.___
☐	393	Styrene[2.0]	☐	☐	___.___
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___.___
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___.___
☒	399	Tetrachloroethylene[1.0]	☐	☐	≤ 1.0
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	___.___
☒	411	Toluene[1.0]	☐	☐	≤ 1.0
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	___.___
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	___.___
☒	425	Trichloroethylene[1.0]	☐	☐	≤ 1.0
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	___.___
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	___.___
☐			☐	☐	___.___
☐		CC: DIST.-CHIEF	☐	☐	___.___

Comments ___

Date Received and Sample No. [redacted] NOV 5 1985

Date Reported PD NOV 2 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY
Form 3300-65 Rev. 5-84

Facility I.D. Number: 037049760
County: 37 County: Marathon
Collection Date: 11/05/85 (M M D D Y Y)
Time (24 Hr. Clock): 14:40 (H H : M M) Field No. ____

Water System Name: TCT Monitoring Well #5
P.O. or Municipality: Wausau
Sample Source Address: East of Canteen & Lemke
Cheese (or) Well No. ____
Sampling Point Description: Teflon Bailer

Send Report To:
Name: Bill Dobbins
Address: P.O. Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Marsha Johnson
Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ____
- ☒ Other (Follow Up. Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	____
☐	009 Acrylonitrile[20]	☐	☐	____
☒	025 Benzene[1.0]	☐	☒	< 1.0
☐	046 Bromobenzene[4.0]	☐	☐	____
☐	051 Bromodichloromethane[1.5]	☐	☐	____
☐	053 Bromoform[5.0]	☐	☐	____
☐	055 Bromomethane[50]	☐	☐	____
☐	063 n-Butylacetate[0.5]	☐	☐	____
☐	071 Carbon Disulfide[5.0]	☐	☐	____
☐	073 Carbon Tetrachloride[1.5]	☐	☐	____
☐	083 Chlorobenzene[2.0]	☐	☐	____
☐	087 Chloroethane[20]	☐	☐	____
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	____
☐	095 Chloroform[1.0]	☐	☐	____
☐	108 o-Chlorotoluene[1.0]	☐	☐	____
☐	110 p-Chlorotoluene[1.0]	☐	☐	____
☐	147 Dibromochloromethane[2.0]	☐	☐	____
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	____
☐	155 m-Dichlorobenzene[2.0]	☐	☐	____
☐	157 p-Dichlorobenzene[2.0]	☐	☐	____
☐	165 1,1-Dichloroethane[1.0]	☐	☐	____
☐	167 1,2-Dichloroethane[1.0]	☐	☐	____
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	____
☒	171 1,2-Dichloroethylene[1.0]	☐	☒	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	____
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	____
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	____
☐	233 Ethylbenzene[1.0]	☐	☐	____
☐	427 Fluorotrichloromethane[1.0]	☐	☐	____
☐	298 Isopropylbenzene[1.0]	☐	☐	____
☐	319 Methylethylketone (MEK)[12]	☐	☐	____
☐	393 Styrene[2.0]	☐	☐	____
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	____
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	____
☒	399 Tetrachloroethylene[1.0]	☐	☒	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	____
☒	411 Toluene[1.0]	☐	☒	< 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	____
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	____
☒	425 Trichloroethylene[1.0]	☐	☒	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	____
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	____
☐	CC. DIST. - OWNER	☐	☐	____
☐		☐	☐	____

Comments ____

Date Received and Sample No. 856 2101 NOV 6

Date Reported DPD NOV 26 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

APPENDIX A.5

EXISTING CONDITIONS REPORT AND EXPLORATION PROGRAM, WAUSAU EAST MUNICIPAL WELL FIELD, TWIN CITY TESTING CORP., 1986

EXISTING CONDITIONS REPORT

AND EXPLORATION PROGRAM

WAUSAU EAST MUNICIPAL WELL FIELD

WAUSAU, WISCONSIN

AUGUST 25, 1986

#8410 86-408

twin city testing
corporation

twin city testing
corporation

662 CROMWELL AVENUE
ST. PAUL. MN 55114
PHONE 612/645-3601

August 25, 1986

State of Wisconsin
Department of Natural Resources
107 Sutliff Avenue
Box 818
Rhinelander, Wisconsin 54501

Attn: Mr. Bill Dobbins

Subj: Existing Conditions and Exploration Report
Wausau East Municipal Well Field
Wausau, Wisconsin
#8410 86-408

Dear Mr. Dobbins:

Enclosed are ten copies of our report on the existing conditions and contamination investigation conducted at the East Wausau Well Field located in Wausau, Wisconsin.

We were authorized by you to install borings and monitoring wells in the vicinity of the East Wausau Well Field and to conduct an overview of the investigations to date. If you have any questions regarding the information in this report, please contact me at (612) 641-9360.

Very truly yours,

Twin City Testing Corporation

Jane M. Willard, M.S., CPGS
Senior Project Manager/Hydrogeologist

JMW/pw

Encs

AN EQUAL OPPORTUNITY EMPLOYER

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EXISTING CONDITIONS REPORT

AND EXPLORATION PROGRAM

WAUSAU EAST MUNICIPAL WELL FIELD

WAUSAU, WISCONSIN

#8410 86-408

1.0 INTRODUCTION

1.1 Purpose and Scope

The purpose of this investigation is to (1) to present an existing conditions report of volatile halogenated hydrocarbon ground water contamination reported at the Wausau East Municipal Well Field in Wausau, Wisconsin, (2) to supplement hydrogeologic data collected up through April, 1985, and (3) to present our conclusions and recommendations based on the data.

The scope of our services include the following.

1. Developing a work plan and site safety plan based on evaluation of available hydrogeologic and historical data relevant to the site and on meetings with the representatives of the Wisconsin Department of Natural Resources (WDNR).
2. Mobilizing a CME rotary drill rig with a two person crew to the referenced site.
3. Drilling four standard penetration borings, one to bedrock and three to approximately 40' below the water table.
4. Drilling one flight auger boring.

5. Mobilizing a field technician for soil quality sampling and monitoring well development.

6. Collecting soil samples for chemical analysis for volatile organic compounds.

7. Installing three water table monitoring wells and two piezometers.

8. Mobilizing a field technician for soil quality sampling and monitoring well development.

9. Preparing a final report including an existing conditions summary which presents factual information in regards to this project and earlier work on the site expressing our opinions regarding the hydrogeology and hydrogeochemistry of this site and need for remedial action.

2.0 BACKGROUND INFORMATION

The following reports have been issued regarding the contamination of the Wausau East Well Field and were used to construct the background information:

(1) University of Wisconsin-Madison, January 25, 1986 letter to Ed Kreul, WDNR from Eloise Kendy, abstract of Hydrogeology of the Wisconsin River Valley in Marathon County, Wisconsin

(2) Roy F. Weston, Inc. April, 1985, Hydrogeological Investigation of Volatile Organic Contamination Wausau, Wisconsin Municipal Wells, prepared for USEPA Region V,

(3) STS Consultants, April 3, 1985, Subsurface Exploration and Testing Program to Evaluate Ground Water Quality and Pre-Treatment Design Program at the Wausau Chemical Facility in Wausau, Wisconsin, #12776A

(4) STS Consultants, Ltd. July 25, 1984, Subsurface Exploration and Testing Program to Evaluate Ground Water Quality, Wasusau Chemical Facilities, Wausau, Wisconsin, #12776

(5) Twin City Testing, September 2, 1982 letter. Installation of Water Sampling Wells, Wausau, Wisconsin, prepared for Becher-Hoppe Engineers, Inc., #84-0974,

(6) Twin City Testing, June 30, 1982 letter. Installation of Water Sampling Wells, Wausau, Wisconsin, prepared for Becher-Hoppe Engineers, Inc., #84-0974.

2.1 Historical Perspective on Wausau East Municipal Well Field Contamination

The City of Wausau is located in Marathon County in north central Wisconsin. The city receives most of its potable water from six high yielding (850 gpm to 2500 gpm) municipal water wells located on either side of the Wisconsin River (Figure 1). City wells CW-3, CW-4 and CW-8 comprise the eastern well field and are located within several hundred feet of the Wisconsin River. While conducting an investigation of the City of Schofield well water in February of 1982, Zimpro Laboratories detected volatile halogenated hydrocarbons (VHHs) and trihalomethanes (THMs) in ground water samples collected from the well CW-3 in the east well field and CW-6 in the west well field.

The City of Wausau was notified and in March, 1982, additional samples were collected and analyzed. The results indicated confirmed concentrations of VHH and THMs in the tens to hundreds of parts per billion (ppb) range in wells CW-3, CW-4 and CW-8. The level of concern for these parameters, informally adopted at the time by the USEPA, was in the range of tens of ppb in drinking water.

FIGURE 1
SITE LOCATION
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN
8410 86-408

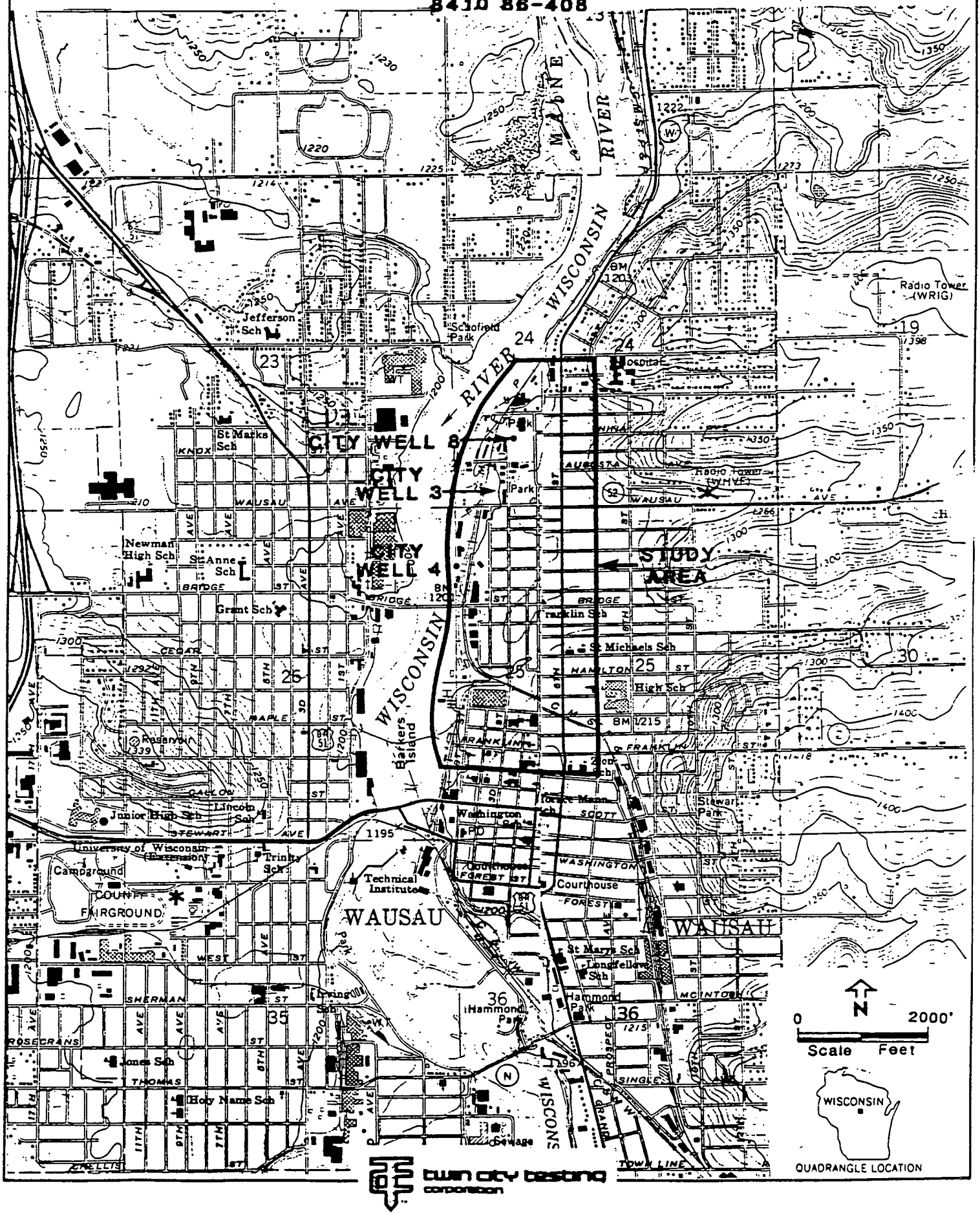


TABLE 3

SUMMARY OF DRILLING METHODS AND
MONITORNG WELL CONSTRUCTION DATA
WAUSAU EAST FIELD
WAUSAU, WISCONSIN

DNR Well #	(Original #)	Ground Surface Elevation (ft MSL)	Total Depth (ft)	Drilling Method	Drilling Fluid	Sampling Method	Screen Material/Length (ft)	Interval (ft)	Seal
7	(EPA 10A)	1204.5	76.5	R	B	SS	PVC/10	65-75	Bentonite/Cement
8	(EPA 10B)	1204.5	35.0	R	B	---	PVC/10	25-35	Bentonite/Cement
9	(STS 84)	1194.7	53.5	R	B	SS	GS/3	50.7-53.7	Bentonite
10	(STS 84A)	1194.5	19.0	FA	NA	---	GS/10	8.8-18.8	Bentonite
11	(STS B7A)	1194.7	18.5	FA	NA	---	GS/10	8.6-18.6	Bentonite
12	(STS 87)	1194.7	53.5	R	B	SS	GS/3	50-53	Bentonite
13	(EPA 9A)	1194.3	141.7	R	B	SS	PVC/10	131-141	Bentonite/Cement
14	(STS B6)	1196.2	53.0	R	B	SS	GS/3	50.3-53.3	Bentonite
15	(STS B6A)	1196.4	21.6	FA	NA	---	GS/10	11.6-21.6	Bentonite
16	(STS B2)	1195.8	25.5	FA	W	SS	GS/10	14-24	---
17	(STS B3)	1196.1	163 (bedrock)	FA	B	SS	GS/3	158-161	Bentonite
18	(STS B3A)	1195.9	65.5	FA	B	---	GS/3	62-65	Bentonite
19	(STS B3B)	1195.9	25.5	FA	W	SS	GS/10	14-24	---
20	(STS B3C)	1196.4	29.0	FA	W	SS	PVC/2	27-29	---
21	(STS B-1)	1194.2	24.5	FA	W	SS	GS/10	13-23	Bentonite
22	(STS B5A)	1194.5	18.7	FA	NA	---	GS/10	8.7-18.7	---
23	(STS B5)	1194.7	53.5	R	B	SS	GS/3	50.3-53.6	Bentonite
24	(MW-8)	1197.7	23.5	HSA	NA	SS	PVC/10	13.0-23.5	
25	(MW-1)	1197[1]	40	HSA	NA	?	PVC/5	35-40	Bentonite
26	(MW-2)	1200[1]	40	HSA	NA	SS	PVC/5	35-40	Bentonite
27	(MW-3)	1200[1]	40	HSA	NA	SS	PVC/5	35-40	Bentonite
28	(MW-4)	1200[1]	40	HSA	NA	SS	PVC/5	35-40	Bentonite
29	(EPA 7A)	1198.9	69.6	R	NA	---	PVC/10	59.5-69.7	Bentonite/Cement
30	(MW-7)	1199[1]	48.2	?	?	?	PVC/5	43.2-48.2	Bentonite
31	(MW-6)	1199[1]	41	HSA	NA	SS	PVC/5	36-41	Bentonite
32	(MW-5)	1208[1]	37	HSA	NA	SS	PVC/5	29-34	Bentonite
EPA 11		1209.9	35	R	B	NA	PVC/10	25-35	Bentonite/Cement
EPA 12		1200.1	70	R	B	SS	PVC/10	35-45	Bentonite/Cement
EPA 13		1211.1	45	R	B	SS	PVC/10	35-45	Bentonite/Cement
EPA 14		1197.4	45	R	B	SS	PVC/20	50-70	Bentonite/Cement
CW 3		1199[1]	>91	?	?	NA	41	50-91	?
CW 4		1195[1]	>132	?	?	--	PVC/40	92-132	?
Wergin		1199[1]	50	?	?	--	SS/4	46-50	?
WGS 9		1194.6	22.2	HSA	NA	?	PVC/10	6.3-16.3	Bentonite
WGS 10		1197.4	20.0	HSA	NA	?	PVC/10	9.6-19.6	Bentonite
TCT 40		1202	128	R	B	SS	PVC/5	67.9-72.9	Bentonite/Cement
TCT 41		1200	22.1	FA	NA	--	PVC/15	7.1-22.1	Bentonite/Cement
TCT 42		1200	56 1/2	R	B	SS	PVC/5	49.0-54.0	Bentonite/Cement
TCT 43		1201	50 1/2	HSA/R	B	SS	PVC/15	8.8-23.8	Bentonite/Cement
TCT 44		1202	55 1/2	HSA/R	B	SS	PVC/15	8.0-23.0	Bentonite/Cement

HSA - Hollow stem auger
FA - Flight auger
R - Rotary
NA - Not applicable
B - Bentonite
W - Water
SS - Split spoon
TWT - Thin walled tube
PVC - Poly. vinyl chloride
GS - Galvanized steel
[1]Estimated from elevation of riser and riser stick-up

sks associated with the contaminants, City officials
ound water sampling. From March, 1982 to May, 1983,
w re collected to monitor temporal changes in the
THMs. In October, 1982, the sample from well CW-4
be ylene (PCE), trichloroethylene (TCE) and 1,2-
) in the tens to hundreds ppb range. VHH contamination
e isconsin Department of Natural Resources (WDNR) to a
ou es whereas THM contamination was attributed to
the water treatment process.

City officials, acting on recommendations from private
sultation with the WDNR, proposed several short and long
du e or eliminate the organic compounds in Wausau's water

nue the use of well 3 as potable supply,
te rechlorination of the water treatment plant
ial basis, and
a emedial ground water investigation.

hi d options were implemented; when the samples from well
to be contaminated in October, 1982, it was taken off line
CW was blended with water from the west well field. The
Hoppe was hired to conduct a remedial investigation in the
l W-3 concentrating on the Wergin property, the former site
Wa sau maintenance garage (Figure 2).

Because of its historically high iron content, well CW-8 was and is used only as a back-up source.

In January, 1983, a spill of 135 gallons of PCE occurred near the loading dock of the Wausau Chemical Corporation. Efforts were made to retrieve the material with sorbants but some may have been lost to the subsurface.

During 1983, levels of PCE and DCE in well CW-3 were less than 10 ppb, while concentrations of TCE remained greater than 70 ppb. In well CW-4, concentrations of PCE ranged from 20 ppb to 130 ppb. The USEPA awarded the City of Wausau a federal grant to help fund the design, testing and installation of a packed column air stripper suitable to Wausau's municipal water system in order to provide a long term resolution to the ground water problem. As an interim measure the USEPA installed a granular activated carbon treatment system in May, 1984, in order to remove VHHs from ground water supplied from well CW-6. Subsequently, air strippers were installed at wells CW-3 and CW-4 during the Summer and Fall of 1984.

Ground water from well CW-3 is pumped through the air stripper directly to the treatment plant before distribution. Because of the high iron content, wells CW-8 and CW-4 are used to meet seasonal demand only. Ground water from well 4 is discharged through the air stripper directly to the Wisconsin River. The well has been pumped continuously, except for 3 months in 1985, to control VHH migration within the aquifer.

In March and August, 1984, STS Consultants conducted remedial investigations for Wausau Chemical in the vicinity of the loading dock. In the fall of 1984 the USEPA conducted a remedial investigation on both sides of the Wisconsin River. In the east well field area the investigation concentrated on the areas around the former City Garage and well CW 3, the railroad bed, and the Marathon Box Company.

2.1.1 Characteristics of VHHS of Concern

The characteristics of PCE, TCE and DCE are discussed in detail in the USEPA report (Weston, 1985), and are summarized in Table 1. Basically these hydrocarbons are denser than water and will sink within the saturated zone when present at concentrations higher than their individual solubilities. Once dissolved, however, they will travel with the ground water. Through time PCE will degrade to TCE, TCE to DCE and DCE to vinyl chloride.

2.1.2 History of Solvent Use in the Vicinity of Wausau East Municipal Well Field

Table 2 is a summary of historical and present businesses operating in the study area based in part on a WDNR undated memorandum attached as Appendix A. Because of the widespread use of PCE, TCE and DCE as degreasers and machinery parts cleaners, almost any of these businesses may have used these solvents. In the past, disposal procedures were not regulated, nor were the solvents perceived to be of environmental concern.

TABLE 1

CHARACTERISTICS, USES, AND STANDARDS
FOR VOLATILE HALOGENATED HYDROCARBONS
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN

Compound	Sp. Gravity	Solubility	Uses	Ground Water Standards (ppb)
Tetrachloroethylene(PCE)	1.63	150 mg/L	Dry-cleaning solvent; vapor-degreasing solvent; drying agent for metals and certain other solids; vermifuge; heat-transfer-medium; manufacture of fluoro-carbons.	6.9[1]
Trichloroethylene(TCE)	1.46	1000 mg/L	Metal degreasing; extraction solvent for oils, fats, waxes; solvent dyeing; dry cleaning; refrigerant and heat exchange liquid; fumigant; cleaning and dyeing electronic parts; diluent in paints and adhesives; textile processing; chemical intermediate; aerospace operations (flushing liquid oxygen).	31.2[1]
Trans-1,2-dichloro-ethylene(DCE)	1.26-1.28	3500-6300 mg/L	General solvent; selective solvent for production of high-grade lubricating oils; textile scouring and cleansing; fulling compounds; wetting and penetrating compounds; organic synthesis; paints; varnishes; lacquers; finish removers, spotting and dry cleaning; soil fumigant.	70[2]

[1]EPA/Office of Research and Development/Carcinogen Assessment Group
[2]EPA/Office of Drinking Water, Recommended Maximum Containment Levels FR Nov. 13, 1985

TABLE 2

HISTORICAL AND PRESENT COMMERCIAL PROPERTIES SUMMARY
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN

Business	Period of Operation	Location	Possible VHH Use
Excelsior Mill	1901-?	Wausau Ave & River	fumigant? TCE, DEC
Marathon Granite	1901-?	north of mill	degreaser?
Standard Oil	1904-?	2nd St. & Wausau Ave	gasoline, kerosene
Badger Turpentine	1912-?	DeVoe St. & River	DCE solvent? (retort) extraction solvent?
Concrete Block	1915-?	3rd & DeVoe	degreaser?
Wausau Concrete	1923-present	north of Winton St.	degreaser
City Machine Storage	1923	3rd St. north of athletic field	degreaser?
Lake Wausau Granite	1923-present	DeVoe & RR	degreaser?
Wausau Oil	1923-1939	Winton & RR	DCE solvent?
Northern Wisc. Oil	1923-1939	RR & Winton	Gasoline, kerosene oil
Auto General Storage	1923	RR & Winton	degreaser
Marathon Box	1928-	Bridge & 2nd	adhesives? degreaser, wood treatment
Deep Rock Oil	1939-	RR & Winton	fuel oil, gasoline
Fullerton Lumber	1939-present	3rd St. & DeVoe	extraction solvent? adhesive? ?
Schofield Ice & Fuel	1939	Wausau & 2nd	degreaser
DeVoe Granite Co Monument Works	1939	north of Schofield Ice	degreaser
Wausau City Garage	1939-1959	Wausau & 3rd	6 x 17,000 6 x 11,000 tanks extracation solvent?
Marathon Co. Oil	1939-	Winton & River	3 x 16,000 extraction solvent? degreaser?
Union Oil	1939-	south of Marathon Co. Oil	solvent? drying agent?
Wergin Construction	1959-present	Wausau & 3rd	
Steel-Flite Scaffolding	1961-	north of Wergin	
Leverence Electric (Archie's Monogram) (SCI?)	1961-	2404 3rd	chemical dist.
Wausau Chemical	1964-present	Wausau & River	
A.H. Rusch Dist.	present	Wausau & 2nd	degreaser?
Marathon Press Co.	present	Wausau & 2nd	degreaser?
Wisc. Valley Imp. Co.	present	3rd. & Union	

TABLE 2 (cont)

Business	Period of Operation	Location	Possible VHH use
SCI Medical Co.	present	3rd & DeVoe	solvent carrier?
Gorwitz & Sons Whls. Fur Dealers	present	Devoe & RR	dry-cleaning?
Canteen Service of Northern Wisc.	present	3rd. & DeVoe	
Wilson Hurd. Mfg. Co. (name plate mfg.)	present	3rd & Winton	paint solvents
Butterfield Refrig. & Heating	present	3rd & Winton	exchange liquid degreaser?
Lemke Cheese	present	DeVoe & River	solvent?

The following are recent reported organic solvent losses in the vicinity of wells CW-3 and CW-4.

- In December 1983, approximately 500 gallons of PCE were released at Wausau Chemical.
- In February, 1983, 135 gallons of PCE were lost at the loading dock at Wausau Chemical.
- In 1977 or 1978, an unknown volume of toluene and DCE was lost on the ground of the Wausau Chemical Corporation.
- A large PCE spill occurred at the Wausau Chemical Corporation in 1972 or 1973.

3.0 PROJECT RESULTS

3.1 Geologic Overview

3.1.1 Surficial Geology

Topographically, the area of investigation slopes to the west towards the river (Figure 1). Surface elevations range from 1250' to 1180' above mean sea level (MSL). Adjacent land areas are largely commercial and residential.

Unconsolidated glacial deposits form a veneer covering the entire central Wisconsin River basin. The present topography has been dissected by the Wisconsin River and its tributaries and is a remnant of outwash and ground

moraine deposits which form an extensive plain. Locally, the geology consists of stratified sand and gravel with laterally discontinuous clay and silt lenses, clay and stony till, ablation till and stratified gravel and sand drift (i.e. glaciofluvial deposits).

3.1.2 Bedrock Geology

Precambrian crystalline bedrock underlies the entire Central Wisconsin river basin and controls the topography and drainage patterns of the region. In the study area, syenitic plutons occur on the western side of the river and a metavolcanic pluton exists on the east side. The contact is thought to be beneath the Wisconsin River. Extensive faulting may have directed river flow in the region for a short distance; in the Wausau vicinity, the river exhibits an unusually linear reach which is attributed to the suspected fault line between the two crystalline bodies (Weston, 1985).

The bedrock topography was inferred from a seismic survey performed by the USEPA in 1984. Within the East Well Field, the bedrock surface is reported to range from 1120' MSL to 1040' MSL. The surface gently slopes to the west where it conforms to a valley trending east-west. It was concluded by the USEPA that the slope of the bedrock surface did not directly influence the flow of ground water in the vicinity of the municipal wells.

3.1.3 Hydrogeology

The surficial unconsolidated glacial outwash deposits are the principal waterbearing units within the investigated area. Specific yields of 500 gallons per minute (gpm) to 2000 gpm vary with the abundance of coarser materials.

Recharge of the surficial aquifers is reported to be primarily from infiltration of precipitation and discharge is to the Wisconsin River. However, during high water stages, the Wisconsin River may act as a line source for recharge, attributable either to the release of stored bank flow during increased recharge periods or to induced infiltration from the direct pumping of the wells. Underlying bedrock may provide some recharge; however, the water level data necessary to verify this hypothesis are lacking.

3.2 Previous Investigations

Since 1982, four remedial ground water investigations have been conducted at the Wausau East Municipal Well Field; the purpose of each was to determine the source(s) of areal and vertical distribution of ground water contamination in specific areas. Table 3 is a compilation of monitoring well installation data, with an emphasis on the vertical location of the screen, the type and thickness of the seal, and the type of drilling fluid used.

During our literature review, discrepancies in the reported top-of-riser elevations and total well depths were found as noted in the table. For clarity and consistency, the original well designations have been replaced with Wisconsin Department of Natural Resources (WDNR) numbers except where indicated on the table.

3.2.1 Becher-Hoppe, Inc. [DNR 25 to 28 and DNR 30 to DNR 32 (City MW-1 through MW-7)]

In June, 1982, Becher-Hoppe Engineers, Inc., on behalf of the City of Wausau, conducted a remedial investigation in the vicinity of the former City Garage. Seven monitoring wells were installed by hollow stem auger (HSA) methods on the property of what is now the Wergin Company (Figure 2). Each well was completed to an approximate depth of 40' and was constructed of 2" diameter, Schedule 80, flush-threaded, PVC casing and a 5' section of #12 slot PVC screen. A washed sand pack was placed around the screen which was wrapped with a Mirafi filter fabric. Bentonite was placed in the annulus from the top of the natural sand cave-in to the ground surface.

A supply well for Wergin already existed on site. According to a 1981 well test report from Miller Well & Pump, it was screened at 46' to 50' with a 6" diameter stainless steel #18 slot screen and was test pumped at 50 to 60 gpm.

In July and August, 1982, concentrations of PCE, TCE and DCE in ground water samples collected from the monitoring wells and the Wergin well. The samples from wells DNR-25, DNR-26, DNR-27 and DNR-28 showed no detectable levels of PCE, TCE or DCE. Concentrations in wells DNR-32 and DNR-31 had decreased in August, 1982.

3.2.2 STS Consultants [DNR-16 TO DNR-19 and DNR-21 (B-1 through B-3, B-3A and B3-B)]

In March, 1984, following the surface spills noted previously, a remedial investigation was conducted by STS Consultants at Wausau Chemical Corporation on behalf of the WDNR. Four monitoring wells were installed east of the Wausau Chemical building in the vicinity of the spill. A mud-rotary drill rig was used to install the monitoring wells which consisted of 2" diameter galvanized steel and either a 3' or 10' galvanized well screen. A gravel pack consisted of on-site sand and/or pea gravel and extended 2' above the top of the well screen in monitoring wells DNR-21, DNR-16, and DNR-17. No bentonite seal was used in any of the wells. Monitoring wells DNR-17 and DNR-18 had sand packs extending approximately 4 1/2' above the top of the well screen. A 6' bentonite seal was placed on top, the remaining hole was backfilled with a bentonite slurry.

In May, 1984, ground water samples were collected and analyzed for PCE, TCE and DCE. Analysis of the samples indicated that TCE and DCE were the most

persistent contaminants in the hundreds to thousands of ppb range. Benzene, ethylbenzene, toluene and vinyl chloride were also detected in varying concentrations.

3.2.3 STS Consultants [(DNR-20, DNR-9 to DNR-12, DNR-14, DNR-15, DNR-22, DNR-23), (B-3C, B-4, B-4A, B-7, B-7A, B-6, B-6A, B-5, B-5A)]

Nine 2" PVC monitoring wells were drilled and installed in late August, 1984. Monitoring wells DNR-20 and DNR-9 through DNR-12 and DNR-14, DNR-15, DNR-22 and DNR-23 were screened at 50' to 53' below the ground surface. Two and one-half feet of bentonite was placed above the well screen. The remaining annular space was then backfilled with bentonite slurry to the ground surface.

Monitoring wells DNR-10, DNR-22 and DNR-11 were screened from 18.7' to 8.7' and monitoring well DNR-15 from 21.6' to 11.6'. Pea gravel and/or on-site sand and gravel was placed around the screened internal. The remaining annular space between the borehole and casing was backfilled with on-site sand and gravel to approximately 4' below the surface. Bentonite powder and concrete were then placed at 2' and at the surface.

Ground water samples were collected in October, 1984 and analyzed for PCE, TCE and DCE. The results of this sampling indicated significant contamination from all three parameters in the sample from DNR 15 and traces of one or more parameters in the samples from DNR 12, 14 and 22.

3.2.4 USEPA--Roy F. Weston, Inc. [DNR-29, DNR-13, DNR-7,DNR-8, (EPA MW-7A, 9-A, 10-A, 10-B) and EPA 11 Through 14]

Eight monitoring wells were installed by the USEPA in the Wausau East Municipal Well Field vicinity during the Fall of 1984. This remedial investigation focused on the areas around the Marathon Box company, the former City Garage (Wergin) and the railroad bed. Well depths ranged from 35' to 141' below the ground surface. The monitoring wells were constructed of flush threaded 2" PVC casing and either a 10' or 20' continuous wrap #60 slot screen. Number 30 Red Flint filter sand was placed in the annulus around the screen and extended approximately 2' above the top of the screen.

A 2' seal of bentonite pellets was placed above the filter sand and the remaining annular space was backfilled with a 6:1 bentonite cement grout.

Simultaneous ground water sampling in November, 1984 showed that the highest levels of TCE and DCE were in samples from wells DNR-7, DNR-8 and EPA-13.

3.3 Twin City Testing Corporation (TCT-40, TCT-41, TCT-42, TCT-43 and TCT-44)

3.3.1 Soil Boring

A remedial investigation was conducted on behalf of the WDNR in July, 1985. This investigation focused on the area in the vicinity of the former City

Garage, Steel Flite Scaffolding and the railroad. Four standard penetration borings (TCT 40, TCT 42, TCT 43 and TCT 44) and one unsampled flight auger boring (TCT 41) were placed on the site. The logs of the soil borings are attached as Appendix B and are summarized on Table 3 and cross-sections A-A' and B-B' (Figures 3, 4 and 5). The stratigraphy of the site consists of sand and gravel underlain by bedrock at a depth of 128' at boring TCT-40.

3.3.2 Evidence of Soils Contamination

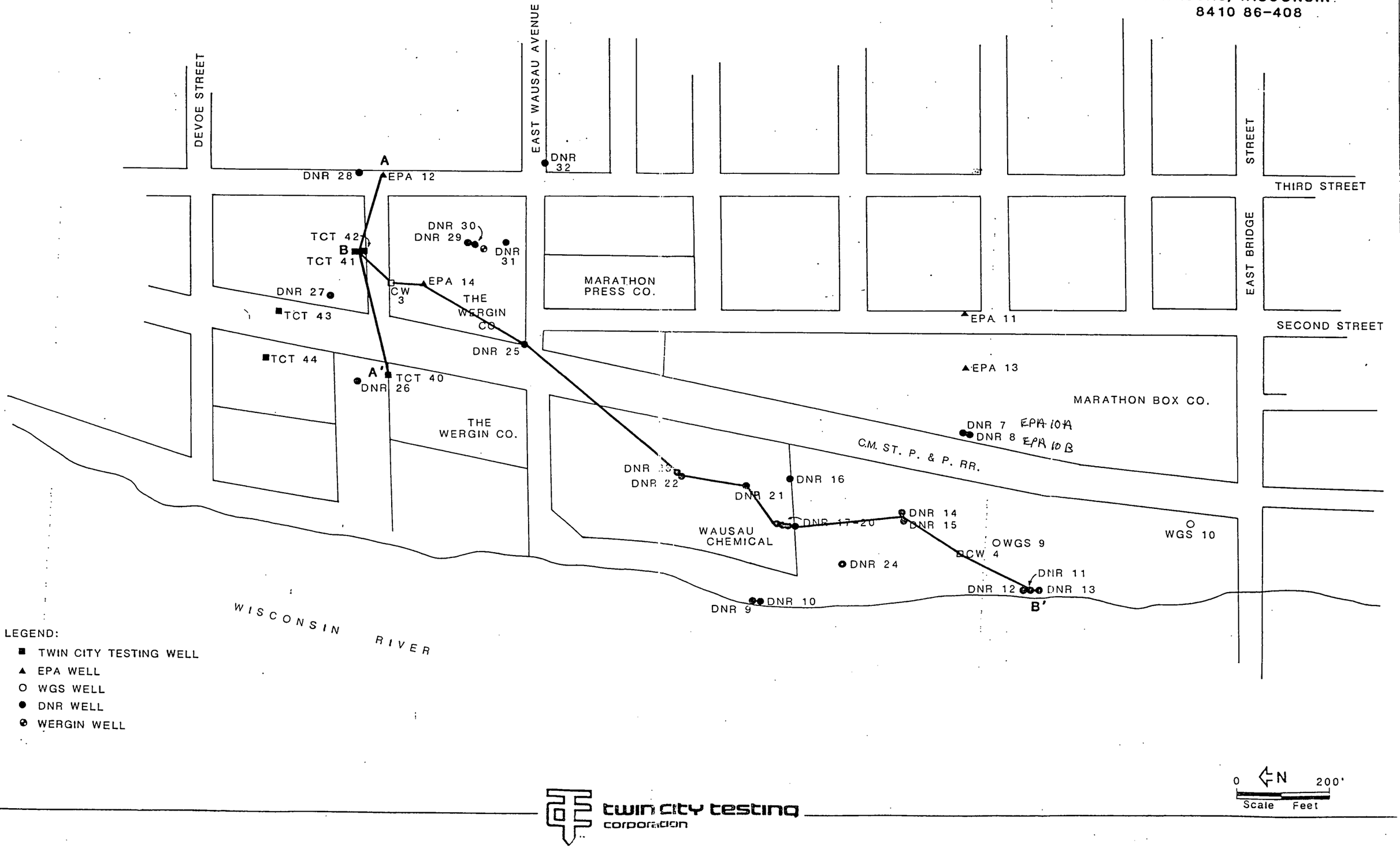
Selected soil samples collected in soil borings TCT-40, TCT-42, and TCT 43 were analyzed for volatile halogenated and aromatic hydrocarbons.

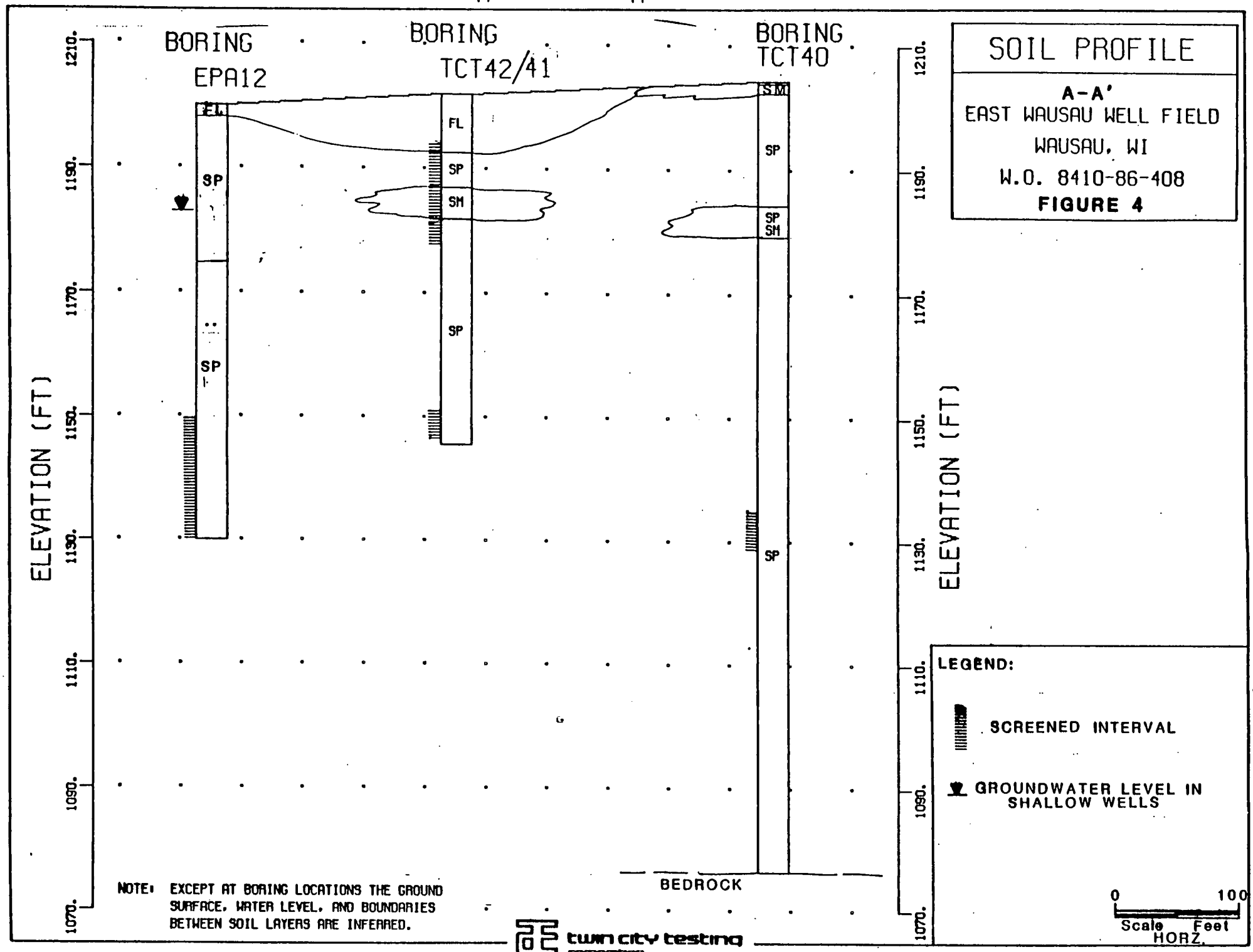
In addition, because of the use of organically augmented bentonite as a drilling mud, samples of the drilling fluid from each of the borings TCT-40, TCT 42, TCT 43 and TCT-44 were analyzed. Benzene and 1,1,1-trichloroethane were found in the samples from borings TCT 42 and TCT 44. Toluene was also detected in the sample from TCT 44.

A high boiling point material was noted as present in the soil samples from boring TCT 40 and the drilling mud. A summary of the results is presented on Table 4. The laboratory report is attached as Appendix C.

FIGURE 3
SOIL PROFILE LOCATIONS

WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN.
8410 86-408




BORING EPA12
BORING TCT42/41
BORING TCT40
SOIL PROFILE
A-A'
EAST WAUSAU WELL FIELD
WAUSAU, WI
W.O. 8410-86-408
FIGURE 4
ELEVATION (FT)
1210.
1190.
1170.
1150.
1130.
1110.
1090.
1070.
FL
SP
SM
BEDROCK
NOTE: EXCEPT AT BORING LOCATIONS THE GROUND SURFACE, WATER LEVEL, AND BOUNDARIES BETWEEN SOIL LAYERS ARE INFERRED.
LEGEND:
SCREENED INTERVAL
GROUNDWATER LEVEL IN SHALLOW WELLS
0
100
Scale Feet
HORZ.
twin city testing
corporation

B ⟷ B'

BORING TCT42/41

BORING CW 3

BORING EPA14

DNR 25

BORING DNR23/22

BORING DNR21

BORING DNR17-20

BORING DNR14/15

CW 4

BORING DNR13-11

ELEVATION (FT)

1210.
1190.
1170.
1150.
1130.
1110.
1090.
1070.
1050.
1030.

FL
SP
SM
SW

LEGEND:

SCREENED INTERVAL

GROUNDWATER LEVEL IN SHALLOW WELLS

PUMPING WELL

0 100
Scale Feet

FIGURE 5

SOIL PROFILE

B-B'

EAST WAUSAU WELL FIELD

WAUSAU, WI

W.O. 8410-86-408

TABLE 4

SOIL AND DRILLING MUD CHEMICAL DATA SUMMARY
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN

(ppb)

Boring	1,1,1 Trichloroethane	Benzene	Toluene	Remaining Method 601/602 VOA's[1]
TCT-40				
15-16.5	ND	ND	ND	ND[2]
35-36.5	ND	ND	ND	ND[2]
94-95.5	ND	ND	ND	ND[2]
Drilling mud	ND	ND	ND	ND[2]
TCT-42				
25-26.5	ND	ND	ND	ND
Drilling mud	22	1	ND	ND[2]
TCT-43				
14-16.5	ND	ND	ND	ND
Drilling mud	ND	ND	ND	ND
TCT-44				
14.5-16	ND	ND	ND	ND
Drilling mud	14	2	14.0	ND[2]
Lab blank	ND	ND	ND	ND

ND = Not detected.
[1]Complete list in laboratory report in appendix.
[2]Higher boiling point material present.

The samples were screened with a total organic vapor analyzer and no vapors were detected. No visual or olfactory evidence of contamination was noted during the drilling of the five borings.

3.3.3 Monitoring Wells

Three monitoring wells and two piezometers were installed southeast of Wergin Construction Company (formerly the City Garage) in August, 1985. Monitoring well TCT-41 and piezometer TCT-42 were constructed in a nested configuration with screens set at Elevations 1193'-1178' and 1151'-1146'. A summary of the installation of these monitoring wells is presented on Table 3. The monitoring well installation data sheets are included in Appendix D.

Monitoring wells consist of flush-threaded 2" PVC casing and a 15' #10 slot PVC screen. The three 15' screens were placed approximately 10' below the estimated static water level as water table monitoring wells TCT-41, TCT-43, and TCT-44. Boreholes that were deeper than the wells placed in them had been allowed to collapse to the desired screen depth. Piezometers TCT-40 and TCT-42 were completed with 5-foot screens placed approximately 40' below the water table. Clean sand was place in the annulus around and up to approximately 5' above the top of the screened interval. The remainder of the borehole was backfilled with a bentonite grout seal.

3.4 Water Level Measurements

Water levels were measured in selected wells over a period of several days in April, 1985 and in selected wells over a period of several days in April, 1986. These measurements are summarized in Table 5 and presented on Figures 6 and 7. Ground water elevations measured in both years represent dynamic conditions, i.e. when wells CW-3 and CW-4 were pumping as these wells have been pumped almost continuously since the installation of the air strippers. Downward vertical gradients of 0.2, 0.03 and 0.004 and 0.4 were calculated from the April, 1985 data for monitoring wells DNR -7, DNR-8, DNR-9 and DNR-10, respectively. Upward vertical gradients of 0.002, and 0.8 were calculated at DNR-19, DNR-20, DNR-22, and DNR-23, respectively.

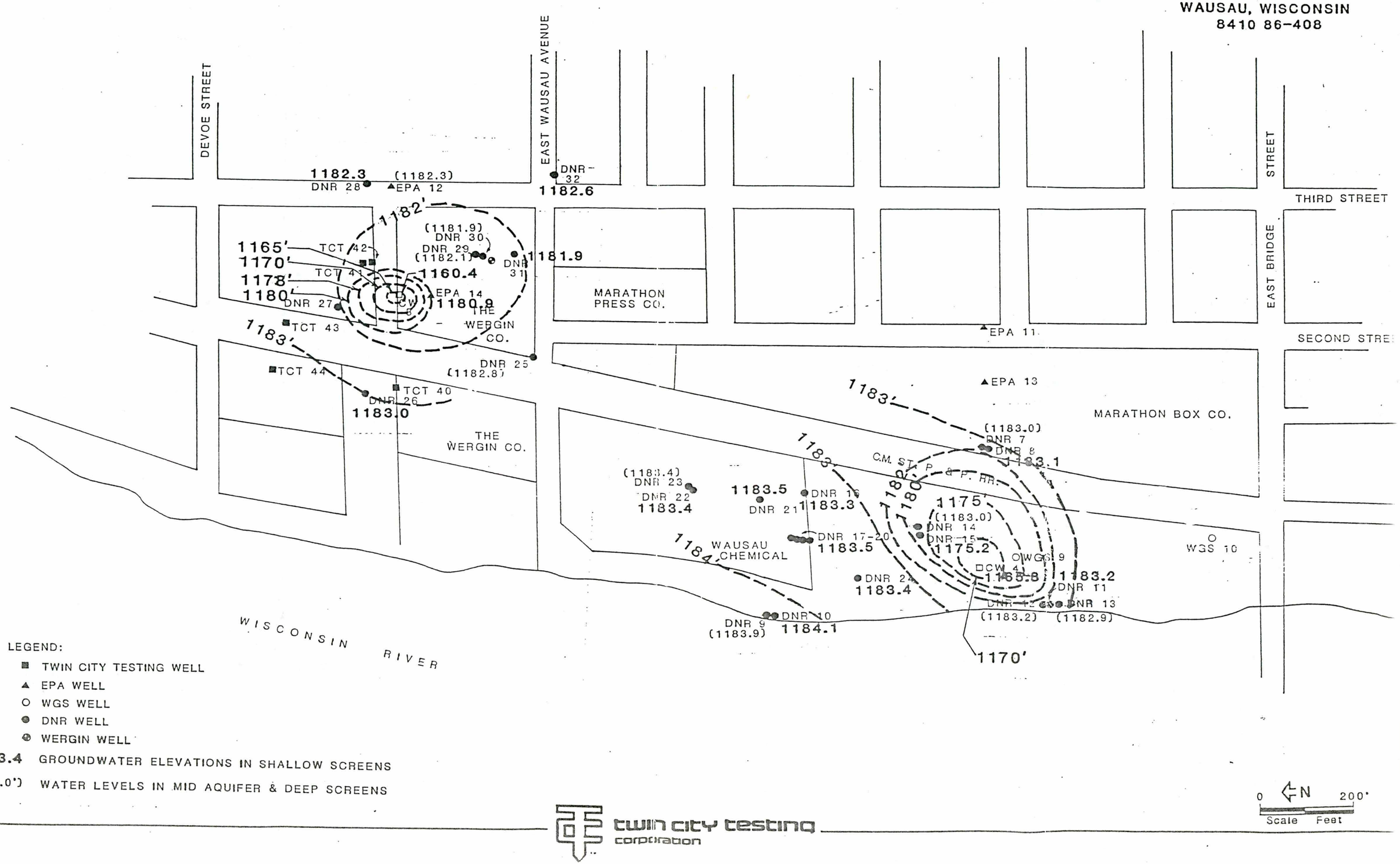
The water table configurations shown in Figures 6 and 7 were based on water levels in wells screened in the shallow part of the aquifer as indicated in Table 5. Generally, a screen was considered shallow if the top was within 20' of the water level elevation.

3.5 Water Quality Sampling

From April 15, 1985 to April 22, 1985 ground water samples and were collected from 29 of the monitoring wells in order to ascertain the areal and vertical extent of contamination in the ground water. Well WGS 9 was sampled in May, 1985 and well WGS 10 and the TCT wells were sampled in November, 1985. In April, 1986, selected wells were resampled. All sets of

FIGURE 6

GROUNDWATER ELEVATION DAT/
APRIL 1985
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN
8410 86-408



LEGEND:

- ■ TWIN CITY TESTING WELL
- ▲ EPA WELL
- ○ WGS WELL
- ● DNR WELL
- ◍ WERGIN WELL

1183.4 GROUNDWATER ELEVATIONS IN SHALLOW SCREENS

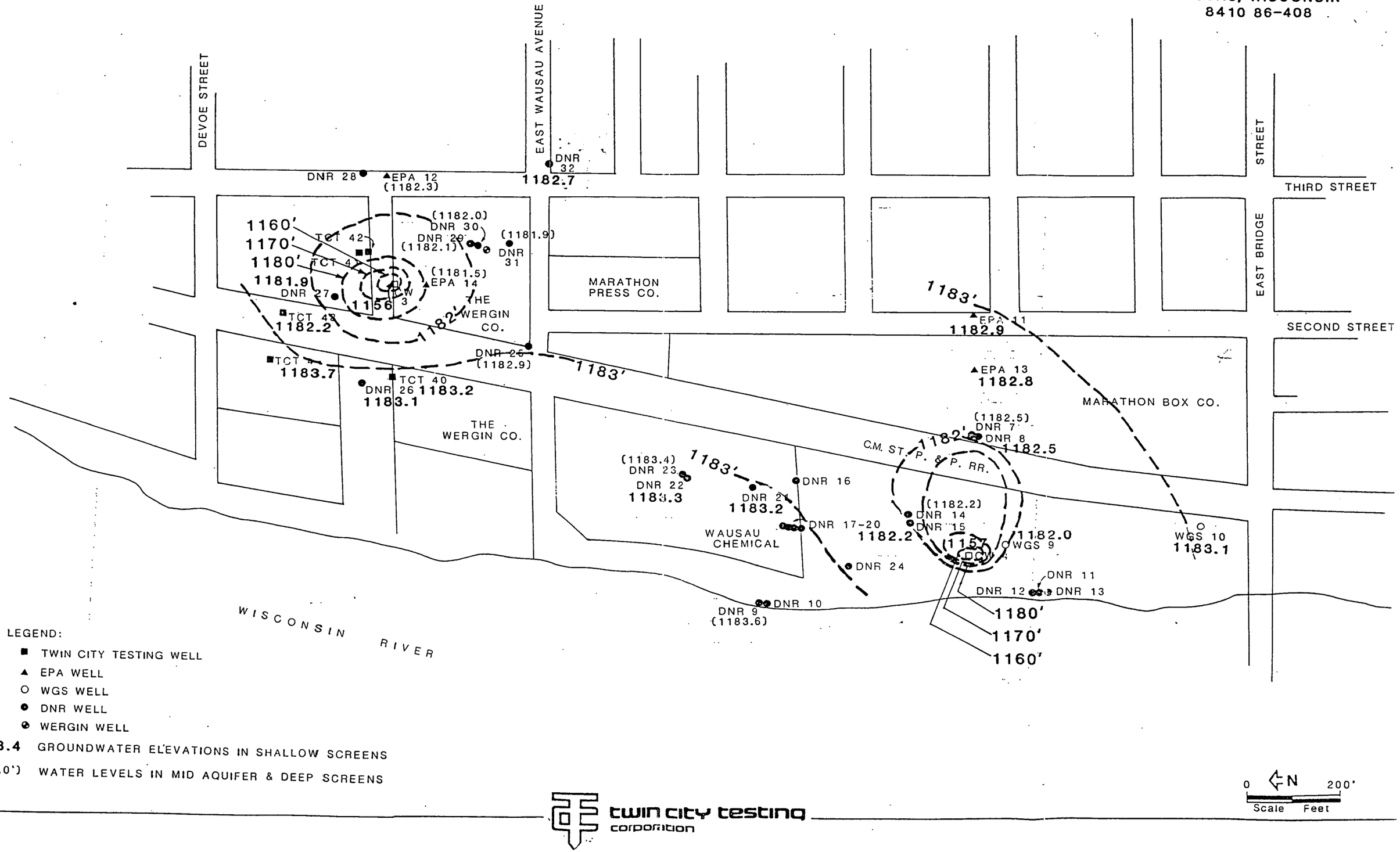
(1183.0') WATER LEVELS IN MID AQUIFER & DEEP SCREENS

0 N 200'
Scale Feet

twin city testing corporation

FIGURE 7

GROUNDWATER ELEVATION DATA
APRIL 1986
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN
8410 86-408



LEGEND:

- ■ TWIN CITY TESTING WELL
- ▲ EPA WELL
- ○ WGS WELL
- ● DNR WELL
- ◕ WERGIN WELL

1183.4 GROUNDWATER ELEVATIONS IN SHALLOW SCREENS

(1183.0') WATER LEVELS IN MID AQUIFER & DEEP SCREENS

0 N 200'
Scale Feet

twin city testing corporation

TABLE 5

SUMMARY OF GROUND WATER ELEVATIONS
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN

DNR Well	Top of Riser Elevation (ft/MSL)	Screen Interval Elevation (ft/MSL)	April, 1985 Ground Water Elevation (ft/MSL)	April, 1985 Depth of Screen Below Ground Water (ft)	April, 1986 Ground Water Elevation (ft/MSL)	April, 1986 Depth of Screen Below Ground Water (ft)
Shallow Aquifer						
8	1206.70[1]	1179.5-1169.5	1183.11	3.6	1182.50	3.0
10	1196.39	1185.7-1175.7	1184.07	I	---	---
11	1196.79	1186.1-1176.1	1183.16	I	---	---
15	1198.48 (1198.46)[2]	1184.9-1174.9	1175.15	I	1182.18 (1182.16)[2]	I
16	1197.94	1181.9-1171.9	1183.29	1.4	---	---
19	1197.94	1181.9-1171.9	1183.52	1.6	---	---
20	1198.94	1169.9-1167.4	1184.04	14.5	---	---
21	1197.03	1181.2-1171.2	1183.46	2.3	1193.18	2.0
22	1196.53 (1196.48)[2]	1185.8-1175.8	1183.38	I	1183.33 (1183.28)[2]	I
24	1198.66	1184.7-1174.2	1183.35	I	---	---
26	1202.97	1166-1161	1183.02	17	1183.07	17
27	1201.61 (1201.69)[2]	1165-1160	1182.13	17	1181.86 (1181.94)[2]	17
28	1202.06	1165-1160	1182.29	17	1182.46	17
31	1200.37	1163-1158	1181.92	19	1181.92	19
32	1210.02	1179-1174	1182.65	3	1182.67	4
EPA 11	1209.92	1184.9-1174.9	1183.11	I	1182.97	I
EPA 13	1211.10	1176.1-1166.1	1183.20	7.1	1182.75	6.8
EPA 14	1197.40[4]	1162.4-1152.4	1180.90	18.5	1181.49	19.1
CW 3	1203.40	1149-1108	1160.40	11	1156	7
CW 4	1200.79	1103-1063	1165.79	53	1157	54
Wergin	---	1153-1149	---	--	---	--
WGS 9	1195.98	1198.3-1178.3	1184.20[5]	I	1181.98	I
WGS 10	1198.86	1187.8-1177.8	1184.36[5]	I	1183.06	I
TCT 41	1203.33	1193-1178	---	---	---	I
TCT 43	1203.00	1192-1177	---	---	1182.13	I
TCT 44	1204.22	1194-1179	---	---	1181.69	I
Mid Aquifer						
7	1206.54[1]	1139.5-1129.5	1183.00	43.5	1182.52	43
9	1196.56	1143.8-1140.8	1183.89	40.0	1183.61	39.8
12	1196.60-(1196.79)[3]	1144.6-1141.6	1183.19	38.6	---	---
14	1198.00	1145.7-1142.7	1183.00	37.3	1182.25	36.6
18	1197.75[3]	1133.8-1130.8	1183.50	49.7	---	---
23	1196.49	1144.1-1141.1	1183.45	39.4	1183.36	39.3
25	1198.32	1162-1157	1182.85	21	1182.87	21
29	1201.04[1]	1139.4-1129.4	1182.06	42.7	1182.09	42.7
30	1200.61	1154-1151	1181.84	26	1181.96	28
EPA 12	1200.06	1150.2-1130.2	1182.33	32.3	1182.31	32.1
TCT 40	1204.37	1134-1129	---	---	1183.17	49
TCT 42	1201.98	1151-1146	---	---	---	---
Deep Aquifer						
13	1196.82[1](1196.64)[2]	1063.4-1053.4	1182.92	119.6	---	---
17	1198.10[2]	1038.1-1035.1	1183.47	145.4	---	---

[1]Elevations as corrected by WDNR; original reported elevation was to top of protective casing
[2]Elevations resurveyed for this study; elevation in parentheses
[3]Elevation reported by WDNR; difference from original reported elevation unexplained
[4]Elevation as originally reported; WDNR elevation 1197.94 to protective casing
[5]Measured 5/16/85
I = Intercepts water table

analytical results regarding PCE, TCE and DCE are summarized in Tables 6, 7 and 8 and are discussed in detail in Section 4.2. The laboratory reports are attached in Appendix E. In general, values increased by almost an order of magnitude in more than half of the wells sampled during both events.

The highest levels of VHH contaminated ground water were observed in monitoring wells DNR-15, DNR-16, DNR-19, and DNR-22; all are screened at the water table and all except DNR-22 are apparently downgradient of the Wausau Chemical Corporation. DNR-22 is upgradient, but near Wausau Chemical.

Ground water samples from DNR-29 and, DNR-30, and DNR-31 near the Wergin well also contained levels of volatile organic compounds that are elevated fo that vicinity. DNR-29, DNR-30, and DNR-31 are screened at depths of 26', 42.7, and 49' below the water table.

4.0 ANALYSIS AND DISCUSSION

4.1 Hydrogeology

For modeling purposes the aquifer can be assumed to be homogenous. The stratigraphy is somewhat varied, but only in fine detail.

In general, each remedial investigation appears to have been conducted without regard to any other investigation. Consequently, differences in well materials, construction, and location-vertically and horizontally--all

TABLE 6

PCE CONCENTRATIONS IN GROUND WATER SAMPLES
APRIL, 1985/APRIL, 1986
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN

(ppb)

DNR Well	April, 1985	April, 1986	
7 EPA 10A	210	1,000	
8 EPA 10B	12	5.9	
9 STS B4	ND	---	
10 STS B4A	ND	---	
11 STS B7A	ND	---	
12 STS B7	ND	---	
13 EPA 9A	ND	---	
14 STS B6	680	---	
15 STS B6A	20,000	---	
16 STS B2	1,700	---	
17 STS B3	6.3	---	
18 STS B3A	24	---	
19 STS B3B	2,000	---	
20 STS B3C	ND	---	
21 STS B1	---	---	
22 STS B5A	2,000	---	Lower Detectble
23 STS B5	2.6	---	Limit = 1.0
24 CMW 8	17	---	
25 CMW 1	1.8	ND	
26 CMW 2	3.3	ND	
27 CMW 3	ND	ND	
28 CMW 4	1.5	ND	
29 EPA 7A	240	900	
30 CMW 7	190	---	
31 CMW 6	8.9	110	
32 CMW 5	1.5	1.5	
EPA 11	4.9	4.9	
EPA 12	ND	ND	
EPA 13	3.5	3.6	
EPA 14	2.6	ND	
TCT 40	ND[2]	ND	
TCT 41	ND[2]	ND	
TCT 42	ND[2]	ND	
TCT 43	ND[2]	ND	
TCT 44	ND[2]	ND	
WGS 9	ND[1]	ND	
WGS 10	ND[2]	ND	

ND not detected
[1] 5/28/85
[2] 11/85

TABLE 7

TCE CONCENTRATIONS IN GROUND WATER SAMPLES
APRIL, 1985/APRIL, 1986
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN

DNR Well	April, 1985 (ppb)	April, 1986 (ppb)	Lower Dectable Limit (ppb)
7	34	45	1.0
8	5.2	1.8	
9	ND	---	
10	ND	---	
11	ND	---	
12	ND	---	
13	1.2	---	
14	460	---	
15	8,800	---	
16	1,400	---	
17	12	---	
18	3.7	---	
19	1,600	---	
20	ND	---	
21		---	
22	12	---	
23	ND	---	
24	2.2	---	
25	1.0	ND	
26	2.1	ND	
27	ND	ND	
28	ND	ND	
29	12	58	
30	80	---	
31	2.0	5.0	
32	1.0	1.2	
EPA 11	4.5	ND	
EPA 12	ND	ND	
EPA 13	2.1	4.1	
EPA 14	ND	ND	
TCT 40	ND[2]	ND	
TCT 41	ND[2]	ND	
TCT 42	ND[2]	ND	
TCT 43	ND[2]	ND	
TCT 44	ND[2]	ND	
WGS 9	ND[1]	ND	
WGS 10	ND[2]	ND	

ND not detected
[1] 5/28/85
[2] 11/85

introduce elements of uncertainty into the data. Ground water flow cannot be analyzed in detail as few of the monitoring well screens are at comparable depths. Generally, however, ground water flow is influenced at a distance of several hundred feet in the vicinity of the pumping wells CW-3 and CW-4 and more so away from the river. Regional flow is not apparent as there do not seem to be any wells clearly outside the influence of the pumping wells. Usable river level data are not available.

There are few or no data available to assess temporal changes in the water table. Complete sets of data have apparently not been collected on other than an annual basis and other data sets are meager.

Prior to the discovery of the ground water contamination in CW-3, it had been pumped fairly continuously and CW-4 and CW-8 had been turned on as supplements during peak usage. In April, 1982, CW-3 was turned off and CW-4 was run continuously until it was found to be contaminated in October. Then CW-3 was turned back on and the water blended with that of clean wells. After the air stripper was installed on CW-3, CW-4 was turned back on, but pumped to waste. The Wergin well has reportedly been pumped continuously at 60 gpm since August, 1982.

It is reported that CW-4 was turned off between August, 1985 and November, 1985. The water table configuration would have been considerably different in the vicinity of CW-4 and may have been different in the vicinity of CW-3.

The pumping schedule of the Wergin well is unknown as is its influence on the water table configuration.

The pumping patterns are superimposed on the supposed seasonal pattern of flow reversal during high river stages. Discharge to the river during most of the year and recharge from the river and bank storage during high flow have not been documented in this area by the wells that now exist.

Assuming a typical hydraulic conductivity for clean alluvial sands of 10^{-4} ft/sec, a gradient of 0.01 and an effective porosity of 0.3, an optimal flow velocity of 3×10^{-5} ft/sec or 1000 ft/year can be estimated as a representative value for the area under non-pumping conditions. Given the assumptions, flow velocities may range from at least 500 ft/year to 5000 ft/year. Under pumping conditions, flow velocities in the area of influence will increase in proportion to the increase in gradient.

Consequently, changes in pumping schedules that last months or gradient reversals that exist for several weeks could result in any particular volume of ground water, contaminated or uncontaminated, following a fairly tortuous and extensive path.

4.2 Hydrogeochemistry

Assessment of the distribution of contaminants is generally difficult due to varied placement of monitoring well screens, a lack of water table sampling

points and complete and representative sets of data. Generally, the multiple areas of high concentrations at differing depths (Figure 8) suggest multiple loadings over time.

In order to further evaluate the data, concentrations from the April, 1985 sampling were averaged at each nested location and plotted in Figures 9, 10 and 11. This is a technique that has been used at similar sites (Bear, 1979, Hydraulics of Ground Water).

Two areas of contamination appear in the southeast and northwest portions of the study area. The occurrence of high VHH concentrations within a relatively small areal extent suggests the principal source of VHH contaminated ground water is one or more point sources. Attribution to specific sources, other than Wausau Chemical however, is more difficult to determine. Two possibilities exist:

1. Wausau Chemical is the sole source of contamination and the plume observed in the vicinity of the Wergin Company originated from the Wausau Chemical Corporation, and
2. sources exist in addition to Wausau Chemical.

In support of the first hypothesis, it would be possible to construct a continuous plume using isoconcentration contours as in Figures 9, 10 and 11. There are a few problems, however: (1) the level of TCE in the samples from CW-3 has been relatively consistent for years, implying constant loading from a TCE source rather than degradation of the PCE slugs documented as

losses from Wausau Chemical (2) samples from DNR-25 have been "clean" which may not be consistent with flow from Wausau Chemical to CW-3; it is possible however that the screen in well DNR-25 does not intercept the plume, and (3) the trace contamination in the vicinity of wells EPA 11 and EPA 13 is difficult to attribute to a source to the west without more detailed information on the natural flow regime throughout the year.

At this time, sufficient ground water table elevations and chemical data are not available for areas adjacent to the former city garage (Wergin); most of the existing monitoring wells are not screened at the water table and are not vertically comparable to data elsewhere in the area of well CW-3. With the available data, it can not be determined if the City Garage, Marathon Press, or A. H. Rusch Distributing, as examples, contributed to the VHH contamination. Businesses to the north and west of CW-3, however, are likely not sources of contamination as indicated by the sampling from wells DNR-26, DNR-28, EPA-12, TCT 40, TCT-41, TCT-43, and TCT-44.

4.3 Remedial Actions

To date the pumping of wells CW-3 and CW-4 and the Wergin well has functioned as a recovery/gradient control well system. The water from well CW-3 has been removed from the aquifer, treated and used and the water from well CW-4 has been removed and disposed of in the Wisconsin River. It has also been reported that Wausau Chemical has recently installed a system of recovery wells in the vicinity of its loading dock. It is not known if

these wells are designed to recover free product as well as dissolved constituents nor if the system involves treatment, disposal or reuse of the pumped water.

For the long term, other available options are summarized in Table 9. Removal, containment, or in situ treatment of a soil source(s) is dependant on identifying and delineating the source(s). Contaminated soils are known to exist at Wausau Chemical and litle remediation has been reported. Other sources may also exist.

Groundwater contamination has been attributed to spills and/or contaminated soils related to spills at Wausau Chemical and may be attributable to other spills and/or contaminated soil sources. Groundwater remediation can be approached in three ways: (1) restoration, (2) containment, or (3) abandonment. The system in place is restoring the aquifer to the extent that contaminants are removed with the pumped water and is containing the contaminated groundwater within a relatively small area through gradient control.

Unfortunately, the area in which the contamination is contained is the drinking water supply source. Retention of the present municipal system as a drinking water supply will involve tremendous costs in terms of water quality monitoring and treatment system maintenance particularly if the water treatment plant continues to be the only system handling the higher

TABLE 8

DCE CONCENTRATIONS IN GROUND WATER SAMPLES
APRIL, 1985/APRIL, 1986
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN

(ppb)

DNR Well	April, 1985	April, 1986
7	7.0	18
8	14	1.4
9	ND	---
10	ND	---
11	1.5	---
12	ND	---
13	ND	---
14	100	---
15	8,800	---
16	1,000	---
17	2.6	---
18	ND	---
19	640	---
20	4.7	---
21	---	---
22	28	---
23	ND	---
24	ND	---
25	ND	ND
26	1.1	ND
27	ND	ND
28	ND	ND
29	66	260
30	230	---
31	5.7	5.0
32	ND	ND
EPA 11	ND	ND
EPA 12	ND	ND
EPA 13	1.3	1.8
EPA 14	ND	ND
TCT 40	ND[2]	ND
TCT 41	ND[2]	ND
TCT 42	ND[2]	ND
TCT 43	ND[2]	ND
TCT 44	ND[2]	ND
WGS 9	ND[1]	ND
WGS 10	ND[2]	ND

Lower Detectable Limit = 1.0

ND not detected

[1] 5/28/85

[2] 11/85

TABLE 9

FEASIBLE ALTERNATIVE RESPONSE ACTIONS
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN

Contaminated Soils and Sediments

- Excavation and off-site disposal.
- Excavation and on-site disposal.
- In situ treatment.
- In situ containment.
- No action.

Ground Water

- Containment-barriers.
- Containment-gradient control.
- Ground water withdrawal, contaminant recovery, and treatment.
- Ground water withdrawal and disposal.
- In situ treatment.
- No action.

concentrations of contaminants; i.e. if the recovery wells at Wausau Chemical do not go on line for any length of time.

The key expense is in the treatment and attempt to use the pumped water. The obvious alternative is to locate, if possible, a new water supply well(s) outside the contaminated area. In addition, well CW-3 and CW-4 can be abandoned and the contaminants allowed to migrate to the Wisconsin River, or CW-3 and CW-4 can continue to be pumped to the River in order to enhance removal of contaminants and to prevent problems related to gradient reversal during high water stages.

The logical relocation area is to the north of well CW-3 outside of its area of influence; however, the iron content problems at well CW-8, noted earlier, may preclude new wells in this area.

At this time, in situ treatment remains costly and unproven on this scale, and containment through barriers is not only unnecessary except during the high water gradient reversal but is technically not feasible because of the thickness of the aquifer and the depth to the confining layer.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Despite the deficiencies of the available data, some conclusions may be drawn.

1. The available monitoring points are not all useful to the same degree; however, they have not been utilized as fully as possible either.

2. Specific volumes of water likely followed variable paths during the past few years making it unlikely that any particular set of water quality data will "point" to responsible parties.

3. Water quality data strongly implicates Wausau Chemical Corporation as the major source of contaminants.

4. 1986 water quality data suggests properties to the north, northeast and west of CW-3 are not sources of contaminants.

In order to provide useful complete data and to remediate the contamination over the long term, the following recommendations are made:

1. additional response actions be designed and implemented in a timely manner regardless of the determination of liability,

2. all wells be resurveyed to a single datum and a surface water station on the Wisconsin River be established,

3. ground water and surface water level data be collected from all the wells and the Wisconsin River at least 3 times a year on a seasonal basis, and

4. the following commercial properties be environmentally assessed by means of soil, soil vapor, and ground water sampling and analysis: Wergin Company, Marathon Press Company, A. H. Rusch Distributing, Marathon Box Company and the railway.

6.0 METHODS AND PROCEDURES

6.1 Soil Sampling

The drill rig and tools were steam cleaned prior to mobilization and between each boring. The wash water was disposed of through run off to the sewer and evaporation.

The split barrel sampler was washed with a trisodium phosphate solution and rinsed in potable water prior to collecting each sample. Wash and rinse water were disposed of on site through infiltration.

Cutting were thin spread on site.

Soil sampling was done in accordance with ASTM: D 1586-84. Using this procedure, a 2" O.D. split barrel sampler is driven into the soil by a 140 lb weight falling 30". After an initial set of 6", the number of blows required to drive the sampler an additional 12" is known as the penetration resistance or N value. The N value is an index of the relative density of cohesionless soils and the consistency of cohesive soils.

6.2 Soil Classification

As the samples were obtained in the field, they were visually and manually classified by the crew chief in accordance with ASTM: D 2487-83 and ASTM:

D 2488. Representative portions of the samples were then returned to the laboratory for further examination and for verification of the field classification. Logs of the borings indicating the depth and identification of the various strata, the N value, water level information and pertinent information regarding the method of maintaining and advancing the drill holes are attached. Charts illustrating the soil classification procedure, the descriptive terminology and symbols used on the boring logs are also attached.

6.3 Soil Screening

Soils were scanned with an hNu Model 101 photoionization analyzer equipped with a 10.2 eV lamp and calibrated for direct reading in ppm volume/volume of benzene. Fresh soil surfaces were exposed and the hNu probe immediately placed within 1" to 2" of the soil surface.

6.4 Soil Sampling for Chemical Analysis

Special precautions were taken during the sampling procedure to protect the chemical integrity of the soil samples. This included use of laboratory cleaned glass vials for sample storage, use of clean surgical gloves for preparation of each soil sample in the field, washing sampling tools with clean water between each sampling event, and preparation of chain of custody forms.

6.5 Chain of Custody

Upon completion of a sample, a chain of custody log was initiated. The chain of custody record included the following information: project, work order number, shipped by, shipped to, sampling point, location, field ID number, date and time taken, sample type, number of containers, analysis required, sampler(s) signature(s), etc. As few people as possible handled the samples.

The chain of custody records were shipped with the samples to the laboratory. Upon arrival at the laboratory, the samples were checked in and signed over to the appropriate laboratory personnel. A copy of the chain of custody was turned over to the project manager. Upon completion of the laboratory analysis, the completed chain of custody record was returned to the project manager.

6.6 Laboratory Analysis of Drilling Mud and Soils

The samples were analyzed using a Tekmar LSC-2 Liquid Sample Concentrator linked to a Perkin-Elmer Sigma 300 Gas Chromotograph with flame ionization detectors with a six foot stainless steel column packed with SP-1000 100/120 mesh packing. Compounds were identified by column retention time and quantified by peak area comparisons with known standards.

6.7 Monitoring Well Installations and Development

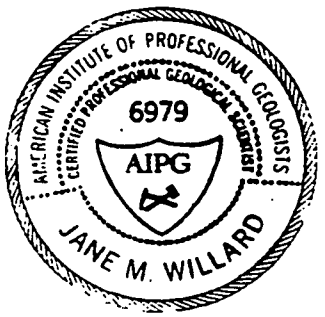
Monitoring well construction and installation details are provided on the "Installation of Monitoring Well" data sheets, attached. The site monitoring wells were developed until pH, conductivity and temperature stabilized.

7.0 REMARKS

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by:

John W. Fulton
Hydrogeologist



Jane M. Willard, M.S., CPGS
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Date: August 21, 1986

This report was reviewed by:

Gil Gabanski
Senior Hydrogeologist/Project Manager

Date: August 21, 1986

Proofread by:

APPENDIX A

HISTORY OF WAUSAU BUSINESSES

Chronological Order - History of Locations of Wausau Businesses

North East Side

1901 Excelsior Mill - At end of E. Wausau Avenue, next to Wisconsin River

1901 Marathon Granite - Just North of Excelsior Co. Mill

1904 Standard Oil - 2nd St. and E. Wausau Ave. - storage of 30,000 gal. gasoline and 15,000 gal. kerosene

1912 Beginning of Athletic Field Existence

1912 Badger Turpentine - had retort building - located North of DeVoe St. and ½ mile north of Marathon Granite Co. Located above Winton Ave at about Brown and Hilbert Streets area, but next to the Wisconsin River.

1915 Concrete Block Factory - Corner of N. 3rd St. and DeVoe St.

1923 Wausau Concrete Co. - Winton St. (present site)
402 Winton St. and 103 Winton St.

1923 City Machine Storage Shed - North of Athletic Field on 3rd St.

1923 Lake Wausau Granite - Northwest of DeVoe St. (present site)
101 DeVoe St. and 111 Winton St.

1923 Wausau Oil Co. - West of Railroad Tracks and North of Winton St.

1923 Northern Wis. Oil Co. - East of Railroad Tracks and North of Winton St.
storage of: 30,000 gal. gasoline
15,000 gal. kerosine
barrelled oil storage

1923 Auto General Storage Shed - West of last Railroad Spur and North of Winton St. between oil companies

1928 Marathon Box - Bridge St. and 2nd St.

1936 Athletic Field - PWA project - stone fence built around field
bleachers burned in 1950 and rebuilt

1939 Deep Rock Oil Co. - formerly Northern Wis. Oil Co site listed above
storage of: 15,000 gal. distillation tank
15,000 gal. fuel oil
30,000 gal. gasoline

1939 Fullerton Lumber - formerly Wausau Oil Co. site
2414 N. 3rd St.

1939 Schofield Ice and Fuel Co. - Above E. Wausau Ave. and 2nd St.

1939 Delloe Granite Co. Monument Works - North of Schofield Ice and Fuel

1939 Wausau City Garage - Corner of E. Wausau Ave and 3rd St.

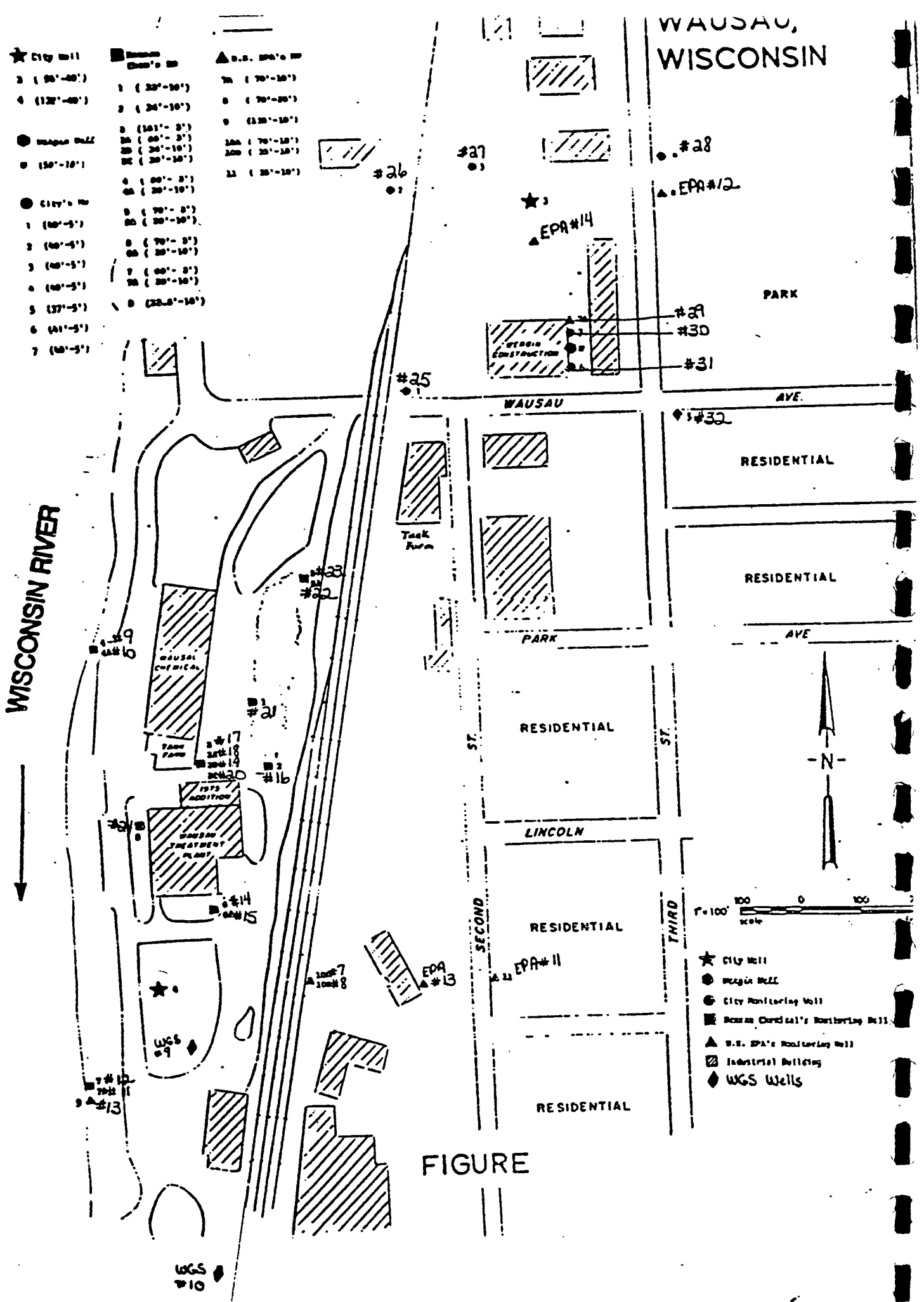
1939 Marathon Co. Oil Co. - 103 Winton St.
storage of: 17,000 gal. each, 6 tanks
11,000 gal. each, 6 tanks

1939 Union Oil Co. - West of railroad tracks and south of Marathon Co. Oil Co.
storage of 16,000 gal. each, 3 tanks

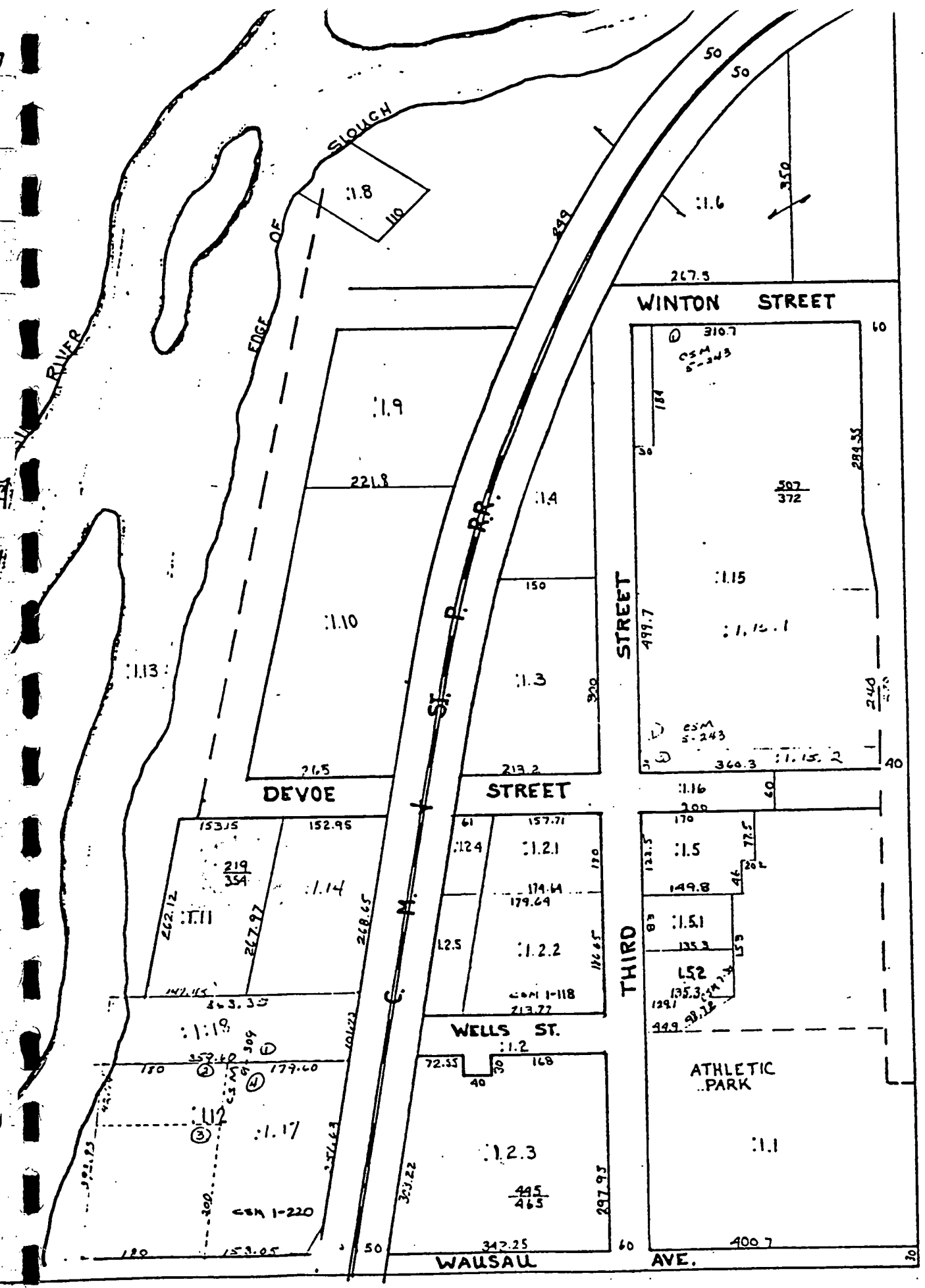
1959 Wagin Co. Construction - formerly city garage - corner (NW) of E. Wausau Ave. and 3rd St. 102 E. Wausau Ave.

1961 Steel Elite Scaffolding Co. - 2310 N. 3rd St. - formerly Northland Steel and Supply.

1961 Lawrance Electric - presently Archie's Monogram 2404 3rd St.


WAUSAU, WISCONSIN
WISCONSIN RIVER
WAUSAU AVE.
PARK
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
PARK AVE
LINCOLN
ST.
ST.
SECOND
THIRD
Task Force
WAUSAU CHEMICAL
WAUSAU TREATMENT PLANT
GEORGIA CONSTRUCTION
#25
#26
#27
#28
#29
#30
#31
#32
EPA #12
EPA #14
EPA #11
EPA #13
WGS #9
WGS #10
N
1"=100'
100 0 100
scale
City Well
Georgia Well
City Monitoring Well
Wausau Chemical's Monitoring Well
U.S. EPA's Monitoring Well
Industrial Building
WGS Wells

FIGURE


SLOUGH
EDGE OF
:1.8
110
:1.6
350
267.3
WINTON STREET
50
50
849
:1.9
221.8
:1.4
:1.10
:1.13
:1.3
150
300
213.2
215
DEVOE STREET
C.P.R. ST.
STREET
:1.15
:1.15.1
:1.15.2
499.7
310.7
184
284.35
507/372
240
360.3
40
:1.16
200
170
60
:1.5
:1.5.1
:1.5.2
149.8
135.3
129.1
499
ATHLETIC PARK
:1.1
THIRD
:1.24
:1.2.1
:1.2.2
179.64
213.77
CON 1-118
WELLS ST.
:1.2
72.33
168
:1.2.3
445/465
342.25
WAUSAU AVE.
:1.14
:1.11
219/354
267.97
268.65
462.12
:1.19
:1.12
:1.17
CON 1-220
153.05
180
179.60
359.40
309
100.23
CON 1-220

APPENDIX B

BORING LOGS

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO TCT-40

PROJECT WAUSAU EAST WELL FIELD , WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 1202')	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D		Qu
½	ORGANIC SANDY SILT, black, rather stiff (OL) TOPSOIL									
2	SILTY SAND, with gravel, brown, moist, medium dense (SM)	COARSE ALLUVIUM	11		1	SB				
4	SAND, with gravel, fine to medium grained, brown, moist, medium dense (SP)									
	SAND, with gravel, cobbles, fine to medium grained, brown, moist, dense (SP)		17		2	SB				
10	SAND, with gravel, fine to medium grained, moist, very dense (SP)		48		3	SB				
			53		4	SB				
20	SAND, with silt and gravel, medium grained, brown, moist, dense (SP-SM)		20		5	SB				
25	SAND, with gravel, fine to medium grained, brown, wet, medium dense (SP)		14		6	SB				
30	SAND, a little gravel, fine to medium grained, brown, water bearing, medium dense (SP)		11		7	SB				
			13		8	SB				
40	SAND, with gravel to a little gravel, medium grained, brown, water bearing, loose to medium dense (SP)		8		9	SB				
45	CONTINUED ON NEXT PAGE									

662 CROMWELL AVENUE twin city testing and engineering laboratory, inc. ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO TCT-40 (Cont.)

PROJECT WAUSAU EAST WELL FIELD, WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL SURFACE ELEVATION 1200'	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	F	C
45	SAND, Continued (SP)	COARSE ALLUVIUM Continued	11		10	SB				
50	SAND, a little gravel, fine to medium grained, brown, water bearing, dense to medium dense (SP)		18		11	SB				
			10		12	SB				
6-	SAND, fine grained, brown, wet, very dense to medium dense to very dense (SP)		35		13	SB				
			15		14	SB				
			40		15	SB				
84	SAND, fine to medium grained, brown, water bearing, very dense (SP)		38		16	SB				
90	CONTINUED ON NEXT PAGE									

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO TCT-40 (Cont.)

PROJECT WAUSAU EAST WELL FIELD, WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 1200')	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
90	SAND, Continued (SP)	COARSE ALLUVIUM Continued	39		17	SB				
94	SAND, fine grained, brown, wet, very dense (SP)									
116	SAND, with gravel, cobbles, fine to medium grained, brown, wet, very dense (SP)									
119	SAND, a little gravel, fine to medium grained, brown, wet, very dense (SP) Note: Monitoring well installed in boring. See attached "Installation of Monitoring Well" sheet.		49		18	SB				
128	REFUSAL									

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
9-26	16:38	120½'	22'	128'	to	NMR
					to	
					to	
					to	

START 9-25-85 COMPLETE 9-26-85

METHOD 6" FA 0' to 8' @ 16:38

4" DC 0' to 22'

DM 8' to 128'

CREW CHIEF PINGEL

twin city testing and engineering laboratory, inc.

LOG OF TEST BORING

JOB NO: 8410-86-408 VERTICAL SCALE: 1" = 5' BORING NO: TCT-42

PROJECT: WAUSAU EAST WELL FIELD, WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 1200')	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D		
	FILL, Silty Sand, with gravel, cobbles at 1' to 2', brown, moist	FILL	20		1	SB				
5	FILL, Silt, cinders, brown and reddish brown		3		2	SB				
9½	SAND, with gravel, medium grained, brown, moist, very dense (SP)	COARSE ALLUVIUM	51		3	SB				
15	SILTY SAND, with gravel to 17', reddish brown, water bearing, very dense (SM)		31/0.5'		4	SB				
20	SAND, a little gravel, fine to medium grained, brown, water bearing, dense (SP)		20		5	SB				
25	SAND, a little gravel, medium grained, brown, water bearing, dense (SP)		26		6	SB				
30	SAND, a little gravel, fine grained, brown, wet, dense (SP)		22		7	SB				
35	SAND, a little gravel, fine to medium grained, brown, wet, dense (SP)		21		8	SB				
40	SAND, a little gravel, medium to fine grained, wet, dense (SP)		21		9	SB				
45	CONTINUED ON NEXT PAGE									

662 CROMWELL AVENUE twin city testing ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO TCT-42 (Cont.)

PROJECT WAUSAU EAST WELL FIELD, WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 1200')	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
	SAND, a little gravel, fine to medium grained, brown, wet, medium dense (SP)	COARSE ALLUVIUM Continued	15		10	SB				
50	SAND, a little gravel, medium to fine grained, brown, wet, medium dense (SP)		13		11	SB				
56½	END OF BORING		11		12	SB				

Note: Monitoring well installed in boring. See attached "Installation of Monitoring Well" sheet.

Note: Monitoring Well TCT-41 also placed at this location.

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
9-30	13:00	56½'	10'	56½'	to	NMR
					to	
					to	
					to	

START 9-27-85 COMPLETE 9-30-85

METHOD 6" FA 0' to 8' @ 13:00

4" DC 0' to 10'

DM 10' to 55'

CREW CHIEF PINGEL

twin city testing

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO TCT-43

PROJECT WAUSAU EAST WELL FIELD, WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL — SURFACE ELEVATION 1201'	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D		C
	FILL, Silty Sand, with gravel, brown, moist	FILL	7		1	SB				
4½	FILL, Sand, with silt and gravel, medium grained, brown, moist		24		2	SB				
9½	FILL, Sand, with gravel, brick, medium to coarse grained, brown, moist		39*		3	SB				
13	SAND, with gravel, medium to coarse grained, brown, water bearing, very dense (SP)	COARSE ALLUVIUM	39		4	SB				
			**		5	NSR				
24	SAND, a little gravel, fine to medium grained, water bearing, dense (SP)		19		6	SB				
29	SAND, fine grained, brown, water bearing, loose to medium dense (SP)		8		7	SB				
			10		8	SB				
39	SAND, with gravel to a little gravel, coarse grained, brown, water bearing, layers of gravel (SP)		24		9	SB				
45	CONTINUED ON NEXT PAGE		10		10	SB				

662 CROMWELL AVENUE twin city testing and engineering laboratory, inc. ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO TCT-43 (Cont.)

PROJECT WAUSAU EAST WELL FIELD, WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 1201')	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
45	SAND, Continued (SP)	COARSE ALLUVIUM Continued								
49	SAND, fine grained, brown, water bearing, medium dense (SP)		14		11	SB				
50½	END OF BORING									

* PUSHED ROCK, "N" VALUE MAY HAVE BEEN AFFECTED

** CAVE IN

Note: Monitoring well installed in boring. See attached "Installation of Monitoring Well" sheet.

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
10-1	09:30	16'	14⅓'	14⅓'	to	13⅓'
10-1	11:00	50½'	19½'	50½'	to	NMR
					to	
					to	

START 9-30-86 COMPLETE 10-1-85

METHOD @ 11:00

HSA 0' to 19½'

DM 19½' to 49'

CREW CHIEF PINGEL

SE 2 (77-B)-5

twin city testing

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO TCT-44

PROJECT WAUSAU EAST WELL FIELD, WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL — SURFACE ELEVATION 1202'	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TEST W	D		
½	FILL, Silty Sand, with (see #1)	FILL								
	SAND, with silt and gravel, fine grained, brown, moist, loose to dense (SP-SM)	COARSE ALLUVIUM	5		1	SB				
			20		2	SB				
9½	SAND, with gravel, medium to fine grained, brown, moist (SP)		43*		3	SB				
15½	SAND, with gravel, medium to fine grained, brown, water bearing, dense (SP)		24		4	SB				
			16		5	SB				
24	SAND, a little gravel, fine to medium grained, brown, water bearing, dense (SP)		18		6	SB				
29	SAND, medium to fine grained, brown, water bearing, loose (SP)		7		7	SB				
34	SAND, a little gravel, fine to medium grained, brown, water bearing, loose to medium dense to dense (SP)		8		8	SB				
40	CONTINUED ON NEXT PAGE		10		9	SB				

#1 organic fines, black, moist

LOG OF TEST BORING

JOB NO 8410-86-408 VERTICAL SCALE 1" = 5' BORING NO TCT-44 (Cont.)

PROJECT WAUSAU EAST WELL FIELD, WAUSAU, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 1201')	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
40	SAND, Continued (SP)	COARSE ALLUVIUM Continued								
			13		10	SB				
			16		11	SB				
54	SAND, fine to medium grained, brown, water bearing, dense (SP)		24		12	SB				
55½	END OF BORING									

* PUSHED ROCK, "N" VALUE MAY BE AFFECTED

Note: Monitoring well installed in boring. See attached "Installation of Monitoring Well" sheet.

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
10-1	14:00	55½'	19½'	55½'	to	NMR
					to	
					to	
					to	

START 10-1-85 COMPLETE 10-1-85

METHOD @ 14:00

HSA 0' to 19½'

DM 19½' to 54'

CREW CHIEF PINGEL

twin city testing and engineering laboratory, inc.

GENERAL NOTES

DRILLING AND SAMPLING SYMBOLS

SYMBOL	DEFINITION
HSA	3 1/4" I.D. Hollow Stem Auger
_FA	4", 6" or 10" Diameter Flight Auger
_HA	2", 4" or 6" Hand Auger
_DC	2 1/2", 4", 5" or 6" Steel Drive Casing
_RC	Size A, B, or N Rotary Casing
PD	Pipe Drill or Cleanout Tube
CS	Continuous Split Barrel Sampling
DM	Drilling Mud
JW	Jetting Water
SB	2" O.D. Split Barrel Sample
_L	2 1/2" or 3 1/2" O.D. SB Liner Sample
_T	2" or 3" Thin Walled Tube Sample
3TP	3" Thin Walled Tube (Pitcher Sampler)
_TO	2" or 3" Thin Walled Tube (Osterberg Sampler)
W	Wash Sample
B	Bag Sample
P	Test Pit Sample
_Q	BQ, NQ, or PQ Wireline System
_X	AX, BX, or NX Double Tube Barrel
CR	Core Recovery - Percent
NSR	No Sample Recovered, classification based on action of drilling equipment and/or material noted in drilling fluid or on sampling bit.
NMR	No Measurement Recorded, primarily due to presence of drilling or coring fluid.
▼	Water Level Symbol

TEST SYMBOLS

SYMBOL	DEFINITION
W	Water Content - % of Dry Wt. - ASTM D 2216
D	Dry Density - Pounds Per Cubic Foot
LL, PL	Liquid and Plastic Limit - ASTM D 4318
	Additional Insertions in Last Column
Qu	Unconfined Comp. Strength-psf - ASTM D 2166
Pq	Penetrometer Reading - Tons/Square Foot
Ts	Torvane Reading - Tons/Square Foot
G	Specific Gravity - ASTM D 854
SL	Shrinkage Limits - ASTM D 427
OC	Organic Content - Combustion Method
SP	Swell Pressure - Tons/Square Foot
PS	Percent Swell
FS	Free Swell - Percent
pH	Hydrogen Ion Content, Meter Method
SC	Sulfate Content - Parts/Million, same as mg/L
CC	Chloride Content - Parts/Million, same as mg/L
C*	One Dimensional Consolidation - ASTM D 2435
Qc*	Triaxial Compression
D.S.*	Direct Shear - ASTM D 3080
K*	Coefficient of Permeability - cm/sec
D*	Dispersion Test
DH*	Double Hydrometer - ASTM D 4221
MA*	Particle Size Analysis - ASTM D 422
R	Laboratory Resistivity, in ohm - cm - ASTM G 57
E*	Pressuremeter Deformation Modulus - TSF
PM*	Pressuremeter Test
VS*	Field Vane Shear - ASTM D 2573
IR*	Infiltrometer Test - ASTM D 3385
RQD	Rock Quality Designation - Percent

* See attached data sheet or graph

WATER LEVEL

Water levels shown on the boring logs are the levels measured in the borings at the time and under the conditions indicated. In sand, the indicated levels may be considered reliable ground water levels. In clay soil, it may not be possible to determine the ground water level within the normal time required for test borings, except where lenses or layers of more pervious waterbearing soil are present. Even then, an extended period of time may be necessary to reach equilibrium. Therefore, the position of the water level symbol for cohesive or mixed texture soils may not indicate the true level of the ground water table. Perched water refers to water above an impervious layer, thus impeded in reaching the water table. The available water level information is given at the bottom of the log sheet.

DESCRIPTIVE TERMINOLOGY

DENSITY TERM	"N" VALUE	CONSISTENCY TERM
Very Loose	0-4	Soft
Loose	5-8	Medium
Medium Dense	9-15	Rather Stiff
Dense	16-30	Stiff
Very Dense	Over 30	Very Stiff

Standard "N" Penetration: Blows Per Foot of a 140 Pound Hammer Falling 30 inches on a 2 inch OD Split Barrel Sampler

Lamination	Up to 1/2" thick stratum
Layer	1/2" to 6" thick stratum
Lens	1/2" to 6" discontinous stratum, pocket
Varved	Alternating laminations of clay, silt and /or fine grained sand, or colors thereof
Dry	Powdery, no noticeable water
Moist	Below saturation
Wet	Saturated, above liquid limit
Waterbearing	Pervious soil below water

RELATIVE GRAVEL PROPORTIONS

CONDITION	TERM	RANGE
Coarse Grained Soils	A little gravel	2 - 14%
	With gravel	15 - 49%
Fine Grained Soils		
15-29% + No. 200	A little gravel	2 - 7%
15-29% + No. 200	With gravel	8 - 29%
30% + No. 200	A little gravel	2 - 14%
30% + No. 200	With gravel	15 - 24%
30% + No. 200	Gravelly	16 - 49%

RELATIVE SIZES

Boulder	Over 12"
Cobble	3" - 12"
Gravel	
Coarse	3/4" - 3"
Fine	#4 - 3/4"
Sand	
Coarse	#4 - #10
Medium	#10 - #40
Fine	#40 - #200
Silt & Clay	-#200, Based on Plasticity

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES
ASTM Designation: D 2487 - 85
(Based on Unified Soil Classification System)

SOIL ENGINEERING

			Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]	Soil Classification: Group Symbol	Soil Classification: Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3^E$	GW	Well graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3^E$	GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $1 \leq Cc \leq 3^E$	SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3^E$	SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OL	Organic clay[K,L,M,N] Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
			PI plots below "A" line	MH	Elastic silt[K,L,M]
		organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OH	Organic clay[K,L,M,P]
					Organic silt[K,L,M,Q]
Highly organic soils			Primarily organic matter, dark in color, and organic odor	PT	Peat
Fibric Peat > 67% Fibers			Hemic Peat 33%-67% Fibers		Sapric Peat < 33% Fibers

[A] Based on the material passing the 3-in. (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols:
- GW-GM well-graded gravel with silt
- GW-GC well-graded gravel with clay
- GP-GM poorly graded gravel with silt
- GP-GC poorly graded gravel with clay

[D] Sands with 5 to 12% fines require dual symbols:
- SW-SM well-graded sand with silt
- SW-SC well-graded sand with clay
- SP-SM poorly graded sand with silt
- SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains $\geq$15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains $\geq$15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains $\geq$30% plus no. 200, predominantly sand, add "sandy" to to group name.

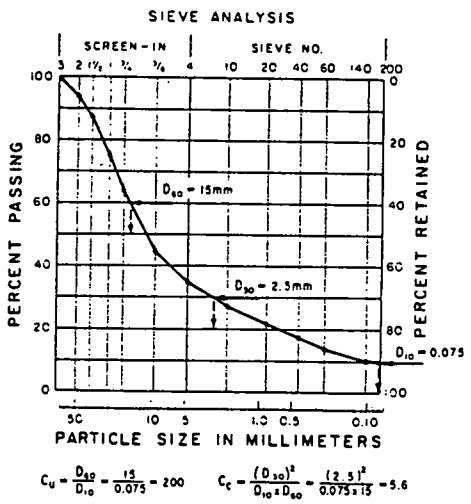
[M] If soil contains $\geq$30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI $\geq$ 4 and plots on or above "A" line.

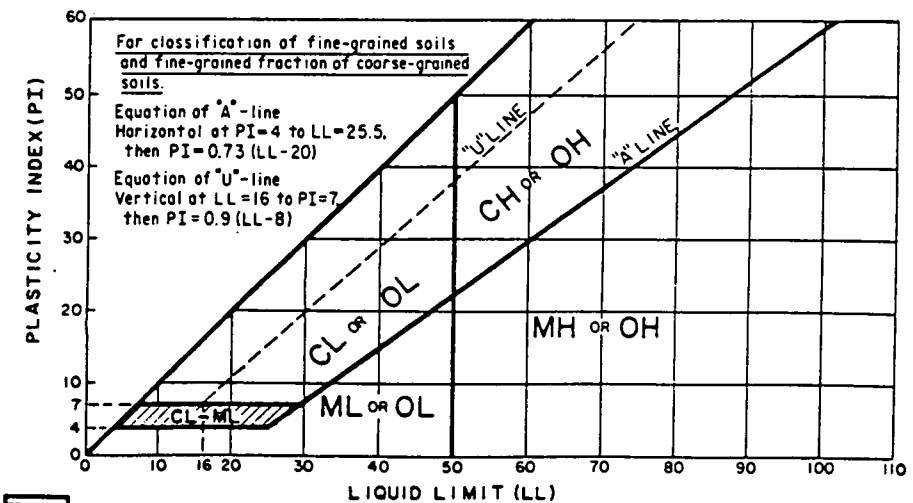
[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



$C_u = \frac{D_{60}}{D_{10}} = \frac{15}{0.075} = 200$ $\quad C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = \frac{(2.5)^2}{0.075 \times 15} = 5.6$



twin city testing corporation

APPENDIX C

TCT CHEMISTRY DATA

twin city testing
and engineering laboratory, inc.
662 CROMWELL AVENUE
ST PAUL, MN 55114
PHONE 612/645-3601

REPORT OF: CHEMICAL ANALYSIS

PROJECT: EAST WELLFIELD

Date: Oct 11, 1985

REPORTED TO: Twin City Testing Corp
662 Cromwell Ave
St Paul, Minn 55114
Att: Jane Willard

LABORATORY No. 120 86-459

INTRODUCTION:

This report presents the results of our analysis of soil samples received on Sept 29 and Oct 2, 1985. The scope of our work was limited to analyzing the samples for the presence of volatile halocarbons and aromatic hydrocarbons using gas chromatographic techniques.

SAMPLE IDENTIFICATION:

TCT# 12976 BRG#40 15-16.5'
TCT# 12977 BRG#40 Drilling mud
TCT# 12978 BRG#40 35-36.5'
TCT# 12979 BRG#40 94-95.5'
TCT# 13059 BRG#42 25-26.5'
TCT# 13060 Drilling mud
TCT# 13062 BRG#43 14-16.5'
TCT# 13063 BRG#43 Drilling mud
TCT# 13067 BRG#44 14.5-16'
TCT# 13068 BRG#44 Drilling mud
TCT# 13072 Lab Blank

METHODOLOGY:

The samples were analyzed using a Tekmar LSC-2 Liquid Sample Concentrator linked to a Perkin-Elmer Sigma 300 Gas Chromatograph with flame ionization detectors with a six foot stainless steel column packed with SP-1000 100/120 mesh packing. Compounds were identified by column retention time and quantified by peak area comparisions with known standards.

RESULTS:

The results are summarized in Table #1.

REMARKS:

The samples were consumed in the analysis.

TWIN CITY TESTING
CORPORATION

Chris Bremer	Harold D Fisher	William F Welbes
Asst. Laboratory Supervisor	Chromatography Group Leader	Manager-Organic Chemistry

AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL.

TABLE #1
VOLATILE ANALYSIS

SAMPLE IDENTIFICATION: / COUMPOUND	TCT# 12976 (ug/L)	TCT# 12977 (ug/L)	TCT# 12978 (ug/L)	Lower Detectable Limit (ug/L)
Choromethane	ND	ND	ND	5
Bromomethane	ND	ND	ND	1
Dichlorodifluoromethane]1	ND	ND	ND	1
Vinyl Chloride]	ND	ND	ND	1
Chloroethane	ND	ND	ND	1
Methylene Chloride	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	1
1,1-Dichloroethene	ND	ND	ND	1
1,1-Dichloroethane	ND	ND	ND	1
Trans-1,2-Dichloroethene	ND	ND	ND	1
Chloroform	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	ND	1
Carbon Tetrachloride	ND	ND	ND	1
Bromodichloromethane	ND	ND	ND	2
1,2-Dichloropropane	ND	ND	ND	1
Trans-1,2-Dichloropropene	ND	ND	ND	1
Trichloroethene	ND	ND	ND	1
Dibromochloromethane]1	ND	ND	ND	1
Cis-1,3-Dichloropropene]	ND	ND	ND	1
1,1,2-Trichloroethane	ND	ND	ND	1
Benzene	ND	ND	ND	1
2-Chloroethylvinyl ether	ND	ND	ND	1
Bromoform	ND	ND	ND	2
1,1,2,2-Tetrachloroethane	ND	ND	ND	1
Tetrachloroethene	ND	ND	ND	1
Toluene	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	1
Ethyl Benzene	ND	ND	ND	1
Xylenes	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	1
1,2-Dichlorobenzene	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	1

1-Compounds are not separated by this method.
For the purposes of this report:
ug/L = ppb
ND = Not detected
12976, 12977 and 12978 all contain a higher boiling material.

TABLE #1
VOLATILE ANALYSIS

SAMPLE IDENTIFICATION: COUMPOUND	TCT# 12979 (ug/L)	TCT# 13059 (ug/L)	TCT# 13060 (ug/L)	Lower Detectable Limit (ug/L)
Choromethane	ND	ND	ND	5
Bromomethane	ND	ND	ND	1
Dichlorodifluoromethane]1	ND	ND	ND	1
Vinyl Chloride]	ND	ND	ND	1
Chloroethane	ND	ND	ND	1
Methylene Chloride	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	1
1,1-Dichloroethene	ND	ND	ND	1
1,1-Dichloroethane	ND	ND	ND	1
Trans-1,2-Dichloroethene	ND	ND	ND	1
Chloroform	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	22	1
Carbon Tetrachloride	ND	ND	ND	1
Bromodichloromethane	ND	ND	ND	2
1,2-Dichloropropane	ND	ND	ND	1
Trans-1,2-Dichloropropene	ND	ND	ND	1
Trichloroethene	ND	ND	ND	1
Dibromochloromethane]1	ND	ND	ND	1
Cis-1,3-Dichloropropene]	ND	ND	ND	1
1,1,2-Trichloroethane	ND	ND	ND	1
Benzene	ND	ND	1	1
2-Chloroethylvinyl ether	ND	ND	ND	1
Bromoform	ND	ND	ND	2
1,1,2,2-Tetrachloroethane	ND	ND	ND	1
Tetrachloroethene	ND	ND	ND	1
Toluene	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	1
Ethyl Benzene	ND	ND	ND	1
Xylenes	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	1
1,2-Dichlorobenzene	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	1

1-Compounds are not separated by this method.
For the purposes of this report:
ug/L = ppb
ND = Not detected
#12979 and 13060 contain higher boiling material.

TABLE #1
VOLATILE ANALYSIS

SAMPLE IDENTIFICATION: COUMPOUND	TCT# 13062 (ug/L)	TCT# 13063 (ug/L)	TCT# 13067 (ug/L)	Lower Detectable Limit (ug/L)
Choromethane	ND	ND	ND	5
Bromomethane	ND	ND	ND	1
Dichlorodifluoromethane]1	ND	ND	ND	1
Vinyl Chloride]	ND	ND	ND	1
Chloroethane	ND	ND	ND	1
Methylene Chloride	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	1
1,1-Dichloroethene	ND	ND	ND	1
1,1-Dichloroethane	ND	ND	ND	1
Trans-1,2-Dichloroethene	ND	ND	ND	1
Chloroform	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	ND	1
Carbon Tetrachloride	ND	ND	ND	1
Bromodichloromethane	ND	ND	ND	2
1,2-Dichloropropane	ND	ND	ND	1
Trans-1,2-Dichloropropene	ND	ND	ND	1
Trichloroethene	ND	ND	ND	1
Dibromochloromethane]1	ND	ND	ND	1
Cis-1,3-Dichloropropene]	ND	ND	ND	1
1,1,2-Trichloroethane	ND	ND	ND	1
Benzene	ND	ND	ND	1
2-Chloroethylvinyl ether	ND	ND	ND	1
Bromoform	ND	ND	ND	2
1,1,2,2-Tetrachloroethane	ND	ND	ND	1
Tetrachloroethene	ND	ND	ND	1
Toluene	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	1
Ethyl Benzene	ND	ND	ND	1
Xylenes	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	1
1,2-Dichlorobenzene	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	1

1-Compounds are not separated by this method.
For the purposes of this report:
ug/L = ppb
ND = Not detected

TABLE #1
VOLATILE ANALYSIS

SAMPLE IDENTIFICATION: COUMPOUND	TCT# 13068 (ug/L)	TCT# 13072 (ug/L)	Lower Detectable Limit (ug/L)
Choromethane	ND	ND	5
Bromomethane	ND	ND	1
Dichlorodifluoromethane]1	ND	ND	1
Vinyl Chloride]	ND	ND	1
Chloroethane	ND	ND	1
Methylene Chloride	ND	ND	1
Trichlorofluoromethane	ND	ND	1
1,1-Dichloroethene	ND	ND	1
1,1-Dichloroethane	ND	ND	1
Trans-1,2-Dichloroethene	ND	ND	1
Chloroform	ND	ND	1
1,2-Dichloroethane	ND	ND	1
1,1,1-Trichloroethane	14	ND	1
Carbon Tetrachloride	ND	ND	1
Bromodichloromethane	ND	ND	2
1,2-Dichloropropane	ND	ND	1
Trans-1,2-Dichloropropene	ND	ND	1
Trichloroethene	ND	ND	1
Dibromochloromethane]1	ND	ND	1
Cis-1,3-Dichloropropene]	ND	ND	1
1,1,2-Trichloroethane	ND	ND	1
Benzene	2	ND	1
2-Chloroethylvinyl ether	ND	ND	1
Bromoform	ND	ND	2
1,1,2,2-Tetrachloroethane	ND	ND	1
Tetrachloroethene	ND	ND	1
Toluene	140	ND	1
Chlorobenzene	ND	ND	1
Ethyl Benzene	ND	ND	1
Xylenes	ND	ND	1
1,3-Dichlorobenzene	ND	ND	1
1,2-Dichlorobenzene	ND	ND	1
1,4-Dichlorobenzene	ND	ND	1

1-Compounds are not separated by this method.
For the purposes of this report:
ug/L = ppb
ND = Not detected
#13068 contains higher boiling material

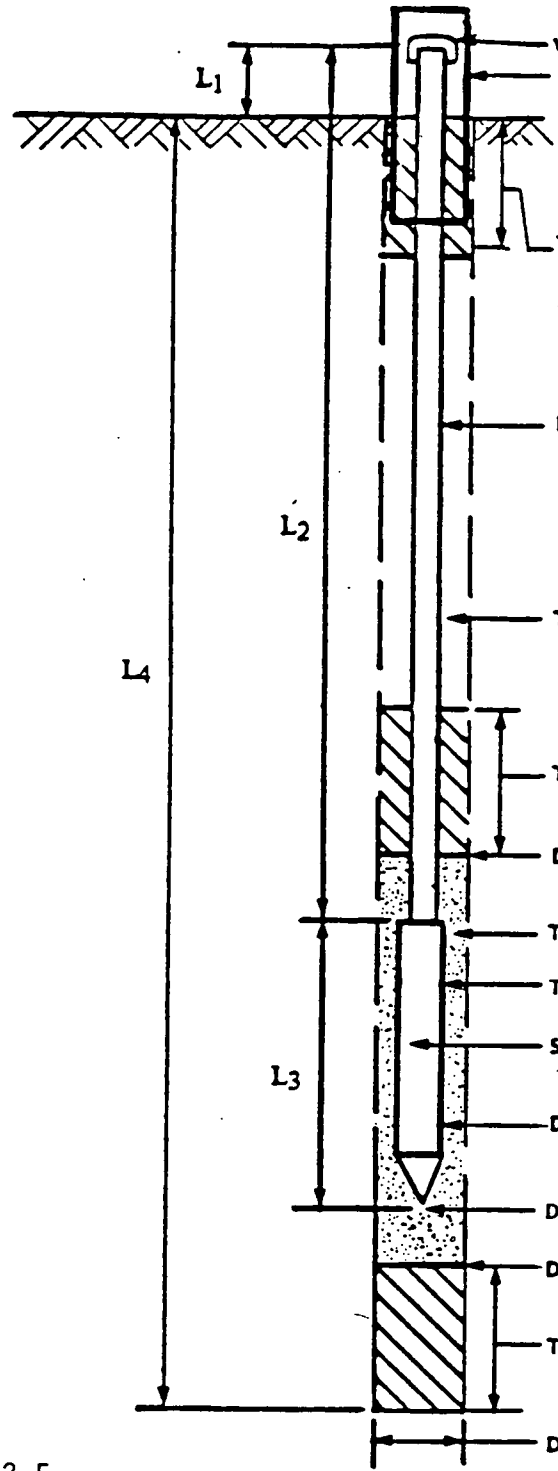
APPENDIX D

MONITORING WELL INSTALLATION DATA SHEETS

INSTALLATION OF MONITORING WELL

JOB NO. 8410-86-408 MONITORING WELL NO. TCT-40

GROUND SURFACE ELEVATION 1202' TOP OF RISER PIPE ELEVATION (with cap removed) 1204.37'



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	2.7'
THICKNESS AND TYPE OF SEAL	2.2' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	3.2' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	65.3'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 5'
DEPTH TO BOTTOM OF MONITORING WELL	72.9'
DEPTH TO BOTTOM OF FILTER SAND	128.2'
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	7"

L_1= 2.5 FT

L_2= 70 FT

L_3= 5.4 FT

L_4= 128.2 FT

INSTALLATION COMPLETED:
Date 9-27 Time

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL *

(1) DEPTH BELOW TOP OF RISER PIPE

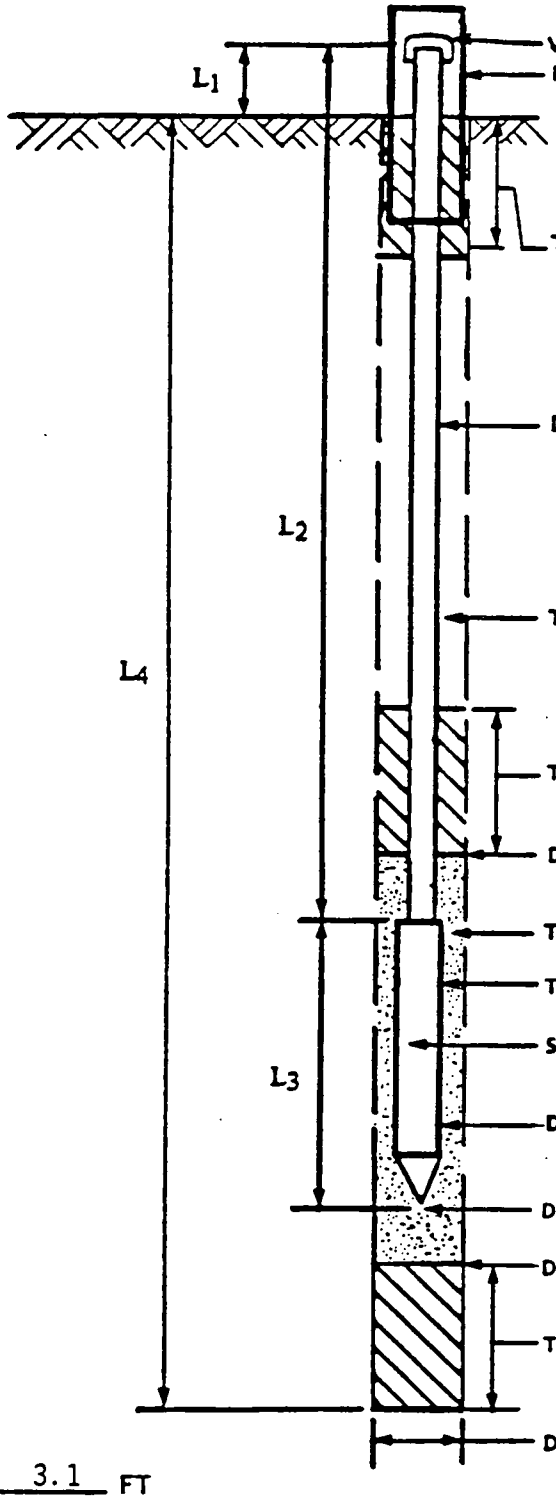
INSTALLATION OF MONITORING WELL

JOB NO. 8410-86-408

MONITORING WELL NO. TCT-41 (Placed in flight auger adjacent to boring MW-42)

GROUND SURFACE ELEVATION 1200'

TOP OF RISER PIPE ELEVATION (with cap removed) 1203.33'



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	3.3'
THICKNESS AND TYPE OF SEAL	1.7' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	1.7' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	5.5'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 15'
DEPTH TO BOTTOM OF MONITORING WELL	22.1'
DEPTH TO BOTTOM OF FILTER SAND	22.1
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	7"

L_1= 3.1 FT

L_2= 10.2 FT

L_3= 15.4 FT

L_4= 25.0 FT

INSTALLATION COMPLETED:
Date 9-27 Time _____

MONITORING WELL WATER LEVEL MEASUREMENTS			
DATE	TIME	BAILED DEPTHS	WATER LEVEL *

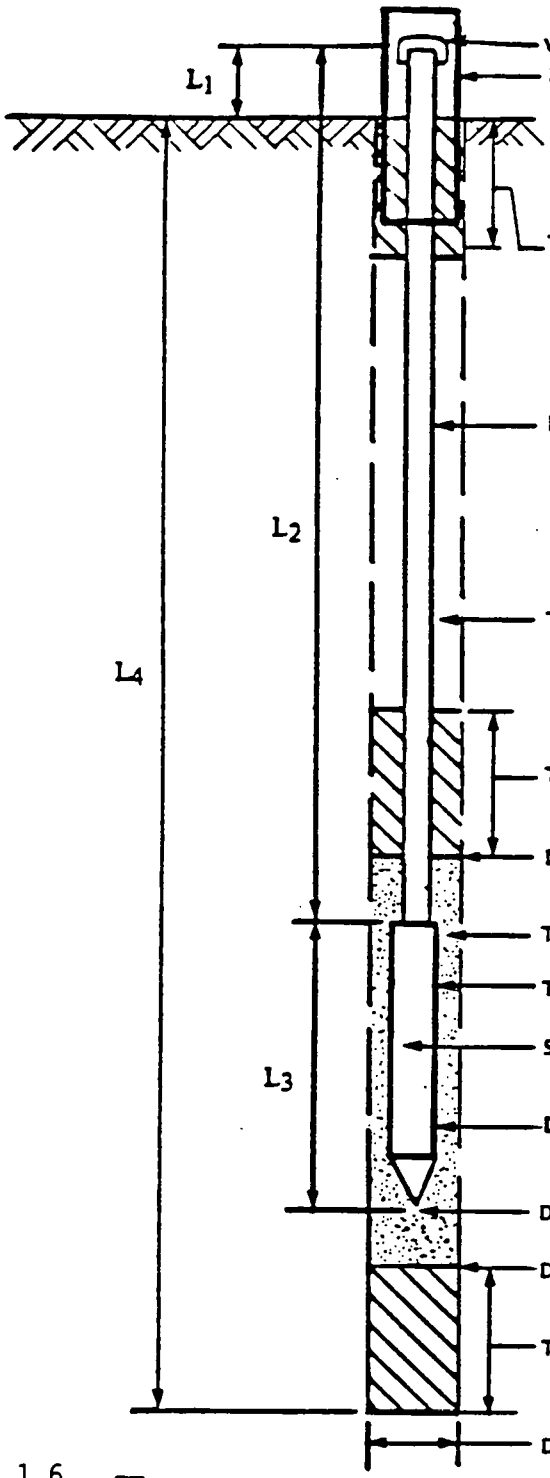
(1) DEPTH BELOW TOP OF RISER PIPE

twin city testing

INSTALLATION OF MONITORING WELL

JOB NO. 8410-86-408 MONITORING WELL NO. TCT-42

GROUND SURFACE ELEVATION 1202' TOP OF RISER PIPE ELEVATION (with cap removed) 1201.98'



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	1.8'
THICKNESS AND TYPE OF SEAL	3.2' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	1.8' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	46.2'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 5.0'
DEPTH TO BOTTOM OF MONITORING WELL	54.0'
DEPTH TO BOTTOM OF FILTER SAND	55.0'
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	4"

L_1= 1.6 FT

L_2= 50.2 FT

L_3= 5.4 FT

L_4= 55.0 FT

INSTALLATION COMPLETED:
Date _____ Time _____

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL *

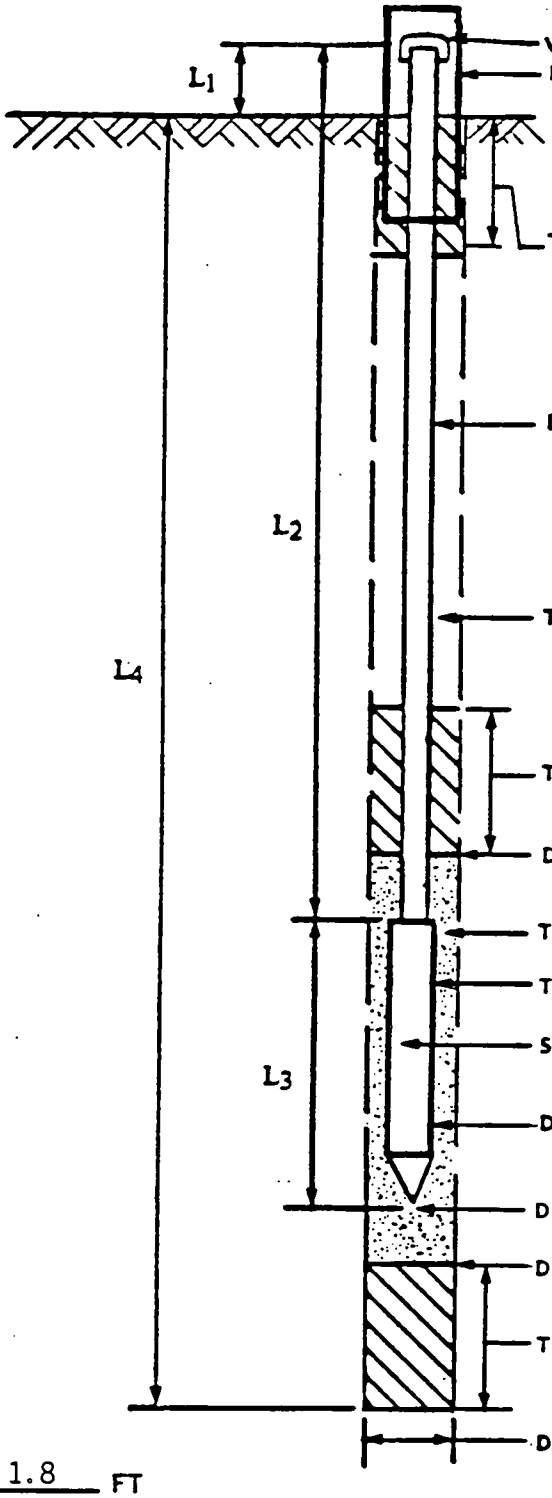
(1) DEPTH BELOW TOP OF RISER PIPE

twin city testing corporation

INSTALLATION OF MONITORING WELL

JOB NO. 8410-86-408 MONITORING WELL NO. TCT-43

GROUND SURFACE ELEVATION 1201' TOP OF RISER PIPE ELEVATION (with cap removed) 1203.00'



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	2.0'
THICKNESS AND TYPE OF SEAL	3.0' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	1.5' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	6.3'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 15.0'
DEPTH TO BOTTOM OF MONITORING WELL	23.8'
DEPTH TO BOTTOM OF FILTER SAND	24.5'
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	7"

L_1= 1.8 FT

L_2= 10.2 FT

L_3= 15.4 FT

L_4= 24.5 FT

INSTALLATION COMPLETED:
Date 9-28-85 Time 10:45

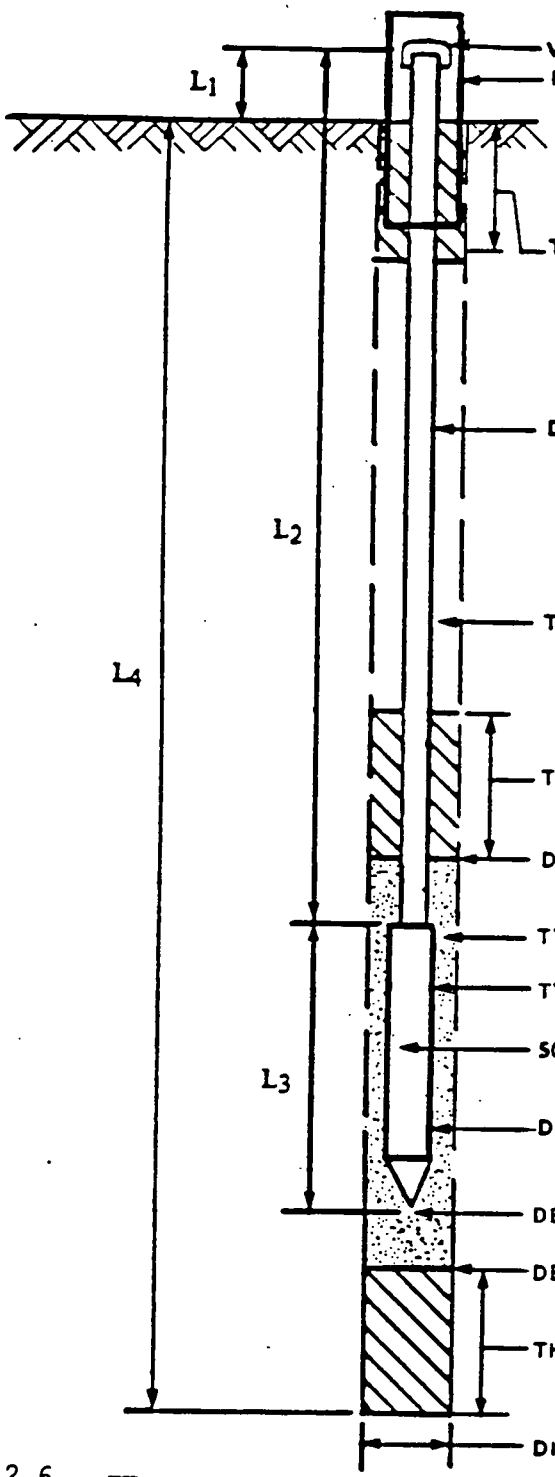
MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL *

(1) DEPTH BELOW TOP OF RISER PIPE

JOB NO. 3410-86-408 MONITORING WELL NO. TCT-44

GROUND SURFACE ELEVATION 1202' TOP OF RISER PIPE ELEVATION 1204.22'
(with cap removed)



VENTED CAP	
PROTECTIVE CASING	
Diameter and Type	4" Steel
Total Length	5.0'
Length Above Ground	2.8'
THICKNESS AND TYPE OF SEAL	2.2' Concrete
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER	Grout
THICKNESS AND TYPE OF SEAL	1.5' Bentonite Pellets
DEPTH TO TOP OF FILTER SAND	5.4'
TYPE OF FILTER AROUND SCREEN	Sand
TYPE OF MONITORING WELL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	0.010
DIAMETER AND LENGTH OF SCREEN	2" x 15.0'
DEPTH TO BOTTOM OF MONITORING WELL	23.0'
DEPTH TO BOTTOM OF FILTER SAND	25.0'
THICKNESS AND TYPE OF SEAL	none
DIAMETER OF BOREHOLE	7"

L_1= 2.6 FT

L_2= 10.2 FT

L_3= 15.4 FT

L_4= 25.0 FT

INSTALLATION COMPLETED:
Date 9-28 Time 13:00

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL *

(1) DEPTH BELOW TOP OF RISER PIPE

twin city testing corporation

APPENDIX E

WDNR CHEMISTRY RESULTS
1985-1986

Form 3300-65

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/16/85 (M M / D D / Y Y)

Time (24 Hr. Clock) 14:45 (H H : M M) Field No. ___

Send Report To:
Name: Bill Dabbins
Address: Box 818
City, State, Zip Code:

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Name: Monitoring Well DNR #7

P.O. or Municipality: Wausau

Sample Source Address: _____

_____ (or) Well No. ___

Sampling Point Description: sample taken from bailer

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	7.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	210
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	34
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐	_____	☐	☐	
☐	_____	☐	☐	

Comments _____

Date Received and Sample No. 845 4074 17

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/16/85 (MM/DD/YY)

Time (24 Hr. Clock) 14:45 (HH:MM) Field No. ___

Water System Name Monitoring Well DNR #8

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	___
☐	009	Acrylonitrile[20]	☐	☐	___
☐	025	Benzene[1.0]	☐	☐	___
☐	046	Bromobenzene[4.0]	☐	☐	___
☐	051	Bromodichloromethane[1.5]	☐	☐	___
☐	053	Bromoform[5.0]	☐	☐	___
☐	055	Bromomethane[50]	☐	☐	___
☐	063	n-Butylacetate[0.5]	☐	☐	___
☐	071	Carbon Disulfide[5.0]	☐	☐	___
☐	073	Carbon Tetrachloride[1.5]	☐	☐	___
☐	083	Chlorobenzene[2.0]	☐	☐	___
☐	087	Chloroethane[20]	☐	☐	___
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095	Chloroform[1.0]	☐	☐	___
☐	108	o-Chlorotoluene[1.0]	☐	☐	___
☐	110	p-Chlorotoluene[1.0]	☐	☐	___
☐	147	Dibromochloromethane[2.0]	☐	☐	___
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	___
☐	155	m-Dichlorobenzene[2.0]	☐	☐	___
☐	157	p-Dichlorobenzene[2.0]	☐	☐	___
☐	165	1,1-Dichloroethane[1.0]	☐	☐	___
☐	167	1,2-Dichloroethane[1.0]	☐	☐	___
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	14
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	___
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	___
☒	233	Ethylbenzene[1.0]	☐	☐	1.1
☐	427	Fluorotrichloromethane[1.0]	☐	☐	___
☐	298	Isopropylbenzene[1.0]	☐	☐	___
☐	319	Methylethylketone (MEK)[12]	☐	☐	___
☐	393	Styrene[2.0]	☐	☐	___
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399	Tetrachloroethylene[1.0]	☐	☐	12
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411	Toluene[1.0]	☐	☐	1.0
☒	421	1,1,1-Trichloroethane[1.0]	☐	☐	<1.0
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425	Trichloroethylene[1.0]	☐	☐	5.2
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☒	437	Xylenes[2.0]	☐	☐	3.6
☐	___		☐	☐	___
☐	___		☐	☐	___

Comments ___

Date Received and Sample No. 845 4072 APR 17

Date Reported DPD APR 2

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/15/85 (MM/DD/YY)

Time (24 Hr. Clock) 11:00 (HH:MM) Field No. ___

Water System Name Monitoring Well DNR # 9

P.O. or Municipality Wausau

Sample Source Address _____

_____ (or) Well No. ___

Sampling Point Description Bailed from monitoring wells

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By Kravel, DeBrock, Johnson

Account Number 150660 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐ 007	Acrolein[50]	☐	☐	___.___
☐ 009	Acrylonitrile[20]	☐	☐	___.___
☐ 025	Benzene[1.0]	☐	☐	___.___
☐ 046	Bromobenzene[4.0]	☐	☐	___.___
☐ 051	Bromodichloromethane[1.5]	☐	☐	___.___
☐ 053	Bromoform[5.0]	☐	☐	___.___
☐ 055	Bromomethane[50]	☐	☐	___.___
☐ 063	n-Butylacetate[0.5]	☐	☐	___.___
☐ 071	Carbon Disulfide[5.0]	☐	☐	___.___
☐ 073	Carbon Tetrachloride[1.5]	☐	☐	___.___
☐ 083	Chlorobenzene[2.0]	☐	☐	___.___
☐ 087	Chloroethane[20]	☐	☐	___.___
☐ 093	2-Chloroethylvinyl Ether[4.0]	☐	☐	___.___
☐ 095	Chloroform[1.0]	☐	☐	___.___
☐ 108	o-Chlorotoluene[1.0]	☐	☐	___.___
☐ 110	p-Chlorotoluene[1.0]	☐	☐	___.___
☐ 147	Dibromochloromethane[2.0]	☐	☐	___.___
☐ 148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐ 153	o-Dichlorobenzene[2.0]	☐	☐	___.___
☐ 155	m-Dichlorobenzene[2.0]	☐	☐	___.___
☐ 157	p-Dichlorobenzene[2.0]	☐	☐	___.___
☐ 165	1,1-Dichloroethane[1.0]	☐	☐	___.___
☐ 167	1,2-Dichloroethane[1.0]	☐	☐	___.___
☐ 169	1,1-Dichloroethylene[1.0]	☐	☐	___.___
☒ 171	1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐ 174	Dichloroiodomethane	☐	☐	[not quantified]
☐ 181	1,2-Dichloropropane[1.0]	☐	☐	___.___
☐ 183	cis-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐ 185	trans-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐ 233	Ethylbenzene[1.0]	☐	☐	___.___
☐ 427	Fluorotrichloromethane[1.0]	☐	☐	___.___
☐ 298	Isopropylbenzene[1.0]	☐	☐	___.___
☐ 319	Methylethylketone (MEK)[12]	☐	☐	___.___
☐ 393	Styrene[2.0]	☐	☐	___.___
☐ 396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___.___
☐ 397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___.___
☒ 399	Tetrachloroethylene[1.0]	☐	☐	<1.0
☐ 401	Tetrahydrofuran (THF)[200]	☐	☐	___.___
☐ 411	Toluene[1.0]	☐	☐	___.___
☐ 421	1,1,1-Trichloroethane[1.0]	☐	☐	___.___
☐ 423	1,1,2-Trichloroethane[1.5]	☐	☐	___.___
☒ 425	Trichloroethylene[1.0]	☐	☐	<1.0
☐ 428	Trichlorotrifluoroethane[3.0]	☐	☐	___.___
☐ 434	Vinyl Chloride	☐	☐	[not quantified]
☐ 437	Xylenes[2.0]	☐	☐	___.___
☐	_____	☐	☐	___.___
☐	Lic. Liq. - Gen.	☐	☐	___.___

Comments _____

Date Received and Sample No. [illegible] APR 1

Date Reported DPD APR 2

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/15/85 (MM/DD/YY)

Time (24 Hr. Clock) 11:20 (HH:MM) Field No.

Water System Name Monitoring Well DNR #10

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description Monitoring well bailed

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	<1.0
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☐	411	Toluene[1.0]	☐	☐	
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	<1.0
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
	434	Vinyl Chloride			[not quantified]
	437	Xylenes[2.0]			
☐			☐	☐	

DO NOT USE - UNIT

Comments

Date Received and Sample No. BLS 4030 APR 1

Date Reported DPD APR 2

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/15/85 (M M D D Y Y)

Time (24 Hr. Clock) 12:45 (H H : M M) Field No.

Water System Name Monitoring well DNR #11

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description Bailed sample from well

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	1.5
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	2.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐				
☐				

ug/l

Co. Dist. - Other

Comments

Date Received and Sample No. APR 1

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/15/85 (M M / D D / Y Y)

Time (24 Hr. Clock) 13:05 (H H : M M) Field No. ___

Water System Name Monitoring Well DNR #12

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐	___	☐	☐	
☐	___	☐	☐	

Comments ___

Date Received and Sample No. 84-5 4038

Date Reported DPD

R.H. Laessig, PhD. Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Form 3300-65 Rev. 5-84

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/15/85 (M M / D D / Y Y)

Time (24 Hr. Clock) 14:00 (H H : M M) Field No. ___

Water System Name Monitoring Well DNR #13

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	≤ 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	≤ 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	1.2
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐	___	☐	☐	
☐	___	☐	☐	

Comments ___

Date Received and Sample No. 845 4037

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/15/85 (MM/DD/YY)

Time (24 Hr. Clock) 14:35 Field No. ___

Water System Name Monitoring Well DNR # 14

P.O. or Municipality Wausau

Sample Source Address _____

_____ (or) Well No. ___

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	100
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	680
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☐	411	Toluene[1.0]	☐	☐	
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	460
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		_____	☐	☐	
☐		_____	☐	☐	

Comments _____

Date Received and Sample No. 84-5 4035

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/16/85 (MM/DD/YY)

Time (24 Hr. Clock) 13:30 (HH:MM) Field No. ___

Water System Name Monitoring Well DNR #15

P.O. or Municipality Wausau

Sample Source Address _____

(or) Well No. ___

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis 54501

Collected By M. Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐ 007	Acrolein[50]	☐	☐	
☐ 009	Acrylonitrile[20]	☐	☐	
☐ 025	Benzene[1.0]	☐	☐	
☐ 046	Bromobenzene[4.0]	☐	☐	
☐ 051	Bromodichloromethane[1.5]	☐	☐	
☐ 053	Bromoform[5.0]	☐	☐	
☐ 055	Bromomethane[50]	☐	☐	
☐ 063	n-Butylacetate[0.5]	☐	☐	
☐ 071	Carbon Disulfide[5.0]	☐	☐	
☐ 073	Carbon Tetrachloride[1.5]	☐	☐	
☐ 083	Chlorobenzene[2.0]	☐	☐	
☐ 087	Chloroethane[20]	☐	☐	
☐ 093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐ 095	Chloroform[1.0]	☐	☐	
☐ 108	o-Chlorotoluene[1.0]	☐	☐	
☐ 110	p-Chlorotoluene[1.0]	☐	☐	
☐ 147	Dibromochloromethane[2.0]	☐	☐	
☐ 148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐ 153	o-Dichlorobenzene[2.0]	☐	☐	
☐ 155	m-Dichlorobenzene[2.0]	☐	☐	
☐ 157	p-Dichlorobenzene[2.0]	☐	☐	
☐ 165	1,1-Dichloroethane[1.0]	☐	☐	
☐ 167	1,2-Dichloroethane[1.0]	☐	☐	
☐ 169	1,1-Dichloroethylene[1.0]	☐	☐	
☒ 171	1,2-Dichloroethylene[1.0]	☐	☒	8800
☐ 174	Dichloroiodomethane	☐	☐	[not quantified]
☐ 181	1,2-Dichloropropane[1.0]	☐	☐	
☐ 183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐ 185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☒ 233	Ethylbenzene[1.0]	☐	☐	1300
☐ 427	Fluorotrichloromethane[1.0]	☐	☐	
☐ 298	Isopropylbenzene[1.0]	☐	☐	
☐ 319	Methylethylketone (MEK)[12]	☐	☐	
☐ 393	Styrene[2.0]	☐	☐	
☐ 396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐ 397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒ 399	Tetrachloroethylene[1.0]	☐	☐	20,000
☐ 401	Tetrahydrofuran (THF)[200]	☐	☐	
☒ 411	Toluene[1.0]	☐	☐	4000
☒ 421	1,1,1-Trichloroethane[1.0]	☐	☐	250
☐ 423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒ 425	Trichloroethylene[1.0]	☐	☐	8800
☐ 428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐ 434	Vinyl Chloride	☐	☐	[not quantified]
☒ 437	Xylenes[2.0]	☐	☐	6800
☐	_____	☐	☐	
☐	_____	☐	☐	

CC: DIST.-OWNER

Comments _____

Date Received and Sample No. [redacted] APR 17 ..85

Date Reported DPD MAY 7 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/15/85 (M M D D Y Y)

Time (24 Hr. Clock) 15:10 (H H M M) Field No. ___

Water System Name Monitoring Well DNR #16

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	1000
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☒	233	Ethylbenzene[1.0]	☐	☐	34
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	1700
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☒	411	Toluene[1.0]	☐	☐	78
☒	421	1,1,1-Trichloroethane[1.0]	☐	☐	32
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	1400
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☒	437	Xylenes[2.0]	☐	☐	63
☐		___	☐	☐	
☐		___	☐	☐	

Comments ___

Date Received and Sample No. 845 4036

Date Reported JPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/16/85 (MM/DD/YY)

Time (24 Hr. Clock) 12:30 (HH:MM) Field No.

Water System Name Monitoring well DNR # 17

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description Sample taken from bailer

Send Report To:
Name Bill Dobbins
Address Box 818
City, State, Zip Code Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.)

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	2.6
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	6.3
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☐	411	Toluene[1.0]	☐	☐	
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	1.2
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐			☐	☐	
☐			☐	☐	

Comments

Date Received and Sample No. 845 4076 17

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/16/85 (MM/DD/YY)

Time (24 Hr. Clock) 11:45 (HH:MM) Field No. ___

Water System Name Monitoring Well DNR # 18

P.O. or Municipality Wausau

Sample Source Address _____

(or) Well No. ___

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	24.
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☒	421 1,1,1-Trichloroethane[1.0]	☐	☐	1.4
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	3.7
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☒	437 Xylenes[2.0]	☐	☐	
☐	_____	☐	☐	
☐	_____	☐	☐	

Comments _____

Date Received and Sample No. 845 4070 [illegible] 17

Date Reported DPD [illegible]

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Form 3300-60 Rev. 3-84

Facility I.D. Number _____

County Code 32 County Marathon

Collection Date 04/16/85 (MM/DD/YY)

Time (24 Hr. Clock) 12:30 (HH:MM) Field No. ____

Water System Name Monitoring Well ONR # 19

P.O. or Municipality Wausau

Sample Source Address _____

_____ (or) Well No. ____

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 618
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
	065 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
	095 Chloroform[1.0]	☐	☐	
	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
	157 p-Dichlorobenzene[2.0]	☐	☐	
	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	640
	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☒	233 Ethylbenzene[1.0]	☐	☐	700
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	2000
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	1500
☒	421 1,1,1-Trichloroethane[1.0]	☐	☐	71
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	1600
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☒	437 Xylenes[2.0]	☐	☐	5700
☐	_____	☐	☐	
☐	_____	☐	☐	

CC. DIST. - OWNER

Comments _____

Date Received and Sample No. [redacted] APR 17 [illegible]

Date Reported DPD MAY 7 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/16/85 (MM/DD/YY)

Time (24 Hr. Clock) 11:45 Field No.

Water System Name Monitoring Well DNR # 20

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 518
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	4.7
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☒	233 Ethylbenzene[1.0]	☐	☐	< 1.0
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	< 1.0
☒	421 1,1,1-Trichloroethane[1.0]	☐	☐	< 1.0
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☒	437 Xylenes[2.0]	☐	☐	< 2.0
☐	_____	☐	☐	
☐	_____	☐	☐	

Comments

Date Received and Sample No. 845 4069 MAY 17

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Form 3300-65 Rev. 5-84

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/15/85 (M M D D Y Y)

Time (24 Hr. Clock) 16:00 (H H M M) Field No. ___

Water System Name Monitoring Well DNR # 22

P.O. or Municipality Wausau

Sample Source Address _____

_____ (or) Well No. ___

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___.___
☐	009 Acrylonitrile[20]	☐	☐	___.___
☐	025 Benzene[1.0]	☐	☐	___.___
☐	046 Bromobenzene[4.0]	☐	☐	___.___
☐	051 Bromodichloromethane[1.5]	☐	☐	___.___
☐	053 Bromoform[5.0]	☐	☐	___.___
☐	055 Bromomethane[50]	☐	☐	___.___
☐	063 n-Butylacetate[0.5]	☐	☐	___.___
☐	071 Carbon Disulfide[5.0]	☐	☐	___.___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___.___
☐	083 Chlorobenzene[2.0]	☐	☐	___.___
☐	087 Chloroethane[20]	☐	☐	___.___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___.___
☐	095 Chloroform[1.0]	☐	☐	___.___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___.___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___.___
☐	147 Dibromochloromethane[2.0]	☐	☐	___.___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___.___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___.___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___.___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___.___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___.___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___.___
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	28.___
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___.___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___.___
☒	233 Ethylbenzene[1.0]	☐	☐	<1.0
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___.___
☐	298 Isopropylbenzene[1.0]	☐	☐	___.___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___.___
☐	393 Styrene[2.0]	☐	☐	___.___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___.___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___.___
☒	399 Tetrachloroethylene[1.0]	☐	☐	2000.___
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___.___
☒	411 Toluene[1.0]	☐	☐	<1.0
☒	421 1,1,1-Trichloroethane[1.0]	☐	☐	<1.0
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___.___
☒	425 Trichloroethylene[1.0]	☐	☐	12.___
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___.___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☒	437 Xylenes[2.0]	☐	☐	<2.0
☐	_____	☐	☐	___.___
☐	_____	☐	☐	___.___

Comments _____

Date Received and Sample No. 845 4033

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Form 3300-65 Rev. 5-84

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/15/85 (MM/DD/YY)

Time (24 Hr. Clock) 16:30 (HH:MM) Field No.

Water System Name Monitoring Well OWR # 23

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 618
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☒	233 Ethylbenzene[1.0]	☐	☐	< 1.0
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	2.6
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	< 1.0
☒	421 1,1,1-Trichloroethane[1.0]	☐	☐	< 1.0
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☒	437 Xylenes[2.0]	☐	☐	< 2.0
☐		☐	☐	
☐		☐	☐	

Comments

Date Received and Sample No. 845 4034

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/15/85 (MM/DD/YY)

Time (24 Hr. Clock) 11:55 (HH:MM) Field No. ___

Water System Name Monitoring Well DNR #24

P.O. or Municipality Wausau

Sample Source Address _____

_____ (or) Well No. ___

Sampling Point Description Bailed from monitoring well

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	14
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☒	233 Ethylbenzene[1.0]	☐	☐	<1.0
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	17
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	<1.0
☒	421 1,1,1-Trichloroethane[1.0]	☐	☐	<1.0
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	2.2
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☒	437 Xylenes[2.0]	☐	☐	<2.0
☐	_____	☐	☐	
☐	_____	☐	☐	

Comments _____

Date Received and Sample No. 845 4032

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Form 3300-65 Rev. 5-84

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/22/85 (MM/DD/YY)

Time (24 Hr. Clock) 10:40 (HH:MM) Field No.

Water System Name Monitoring Well #25

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson / M. DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	1.8
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐		☐	☐	
☐		☐	☐	

cc: DIST. OWNER

Comments

Date Received and Sample No. APR 23 1985

Date Reported DPD MAY 10 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/22/85 (MM/DD/YY)

Time (24 Hr. Clock) 11:45 (HH:MM) Field No. ___

Water System Name Monitoring Well DNR #26

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. DeBrock

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐ 007	Acrolein[50]	☐	☐	
☐ 009	Acrylonitrile[20]	☐	☐	
☐ 025	Benzene[1.0]	☐	☐	
☐ 046	Bromobenzene[4.0]	☐	☐	
☐ 051	Bromodichloromethane[1.5]	☐	☐	
☐ 053	Bromoform[5.0]	☐	☐	
☐ 055	Bromomethane[50]	☐	☐	
☐ 063	n-Butylacetate[0.5]	☐	☐	
☐ 071	Carbon Disulfide[5.0]	☐	☐	
☐ 073	Carbon Tetrachloride[1.5]	☐	☐	
☐ 083	Chlorobenzene[2.0]	☐	☐	
☐ 087	Chloroethane[20]	☐	☐	
☐ 093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐ 095	Chloroform[1.0]	☐	☐	
☐ 108	o-Chlorotoluene[1.0]	☐	☐	
☐ 110	p-Chlorotoluene[1.0]	☐	☐	
☐ 147	Dibromochloromethane[2.0]	☐	☐	
☐ 148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐ 153	o-Dichlorobenzene[2.0]	☐	☐	
☐ 155	m-Dichlorobenzene[2.0]	☐	☐	
☐ 157	p-Dichlorobenzene[2.0]	☐	☐	
☐ 165	1,1-Dichloroethane[1.0]	☐	☐	
☐ 167	1,2-Dichloroethane[1.0]	☐	☐	
☐ 169	1,1-Dichloroethylene[1.0]	☐	☐	
☒ 171	1,2-Dichloroethylene[1.0]	☐	☐	1.1
☐ 174	Dichloroiodomethane	☐	☐	[not quantified]
☐ 181	1,2-Dichloropropane[1.0]	☐	☐	
☐ 183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐ 185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐ 233	Ethylbenzene[1.0]	☐	☐	
☐ 427	Fluorotrichloromethane[1.0]	☐	☐	
☐ 298	Isopropylbenzene[1.0]	☐	☐	
☐ 319	Methylethylketone (MEK)[12]	☐	☐	
☐ 393	Styrene[2.0]	☐	☐	
☐ 396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐ 397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒ 399	Tetrachloroethylene[1.0]	☐	☐	3.3
☐ 401	Tetrahydrofuran (THF)[200]	☐	☐	
☐ 411	Toluene[1.0]	☐	☐	
☐ 421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐ 423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒ 425	Trichloroethylene[1.0]	☐	☐	2.1
☐ 428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐ 434	Vinyl Chloride	☐	☐	[not quantified]
☐ 437	Xylenes[2.0]	☐	☐	
☐	___	☐	☐	
☐	___	☐	☐	

CC: DIST. - OWNER

Comments ___

Date Received and Sample No. [redacted] APR 23 1985

Date Reported DPD MAY 7 1985

R.H. Laessig, PhD. Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/22/85 (MM/DD/YY)

Time (24 Hr. Clock) 11:25 (HH:MM) Field No. ____

Water System Name Monitoring Well DNR #27

P.O. or Municipality _____

Sample Source Address _____

(or) Well No. ____

Sampling Point Description sample taken from boiler

Send Report To:
Bill Dobbins
P.O. Box 818
City, State, Zip Code
Rhinelander, WI 54501

Collected By Marsha Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☐	411	Toluene[1.0]	☐	☐	
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		_____	☐	☐	
☐		_____	☐	☐	

CC: DIST. - OWNER

Comments _____

Date Received and Sample No. [redacted] APR 23 1985

Date Reported DPD MAY 6 1985

R.H. Laessig, PhD. Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/22/85 (M M D D Y Y)

Time (24 Hr. Clock) 14:15 (H H M M) Field No. ___

Water System Name Monitoring well DNR # 28

P.O. or Municipality Wausau

Sample Source Address _____

_____ (or) Well No. ___

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]	Detected	Not Detected	(ug/l)
☐ 007 Acrolein[50]	☐	☐	___.___
☐ 009 Acrylonitrile[20]	☐	☐	___.___
☐ 025 Benzene[1.0]	☐	☐	___.___
☐ 046 Bromobenzene[4.0]	☐	☐	___.___
☐ 051 Bromodichloromethane[1.5]	☐	☐	___.___
☐ 063 Bromoform[5.0]	☐	☐	___.___
☐ 065 Bromomethane[50]	☐	☐	___.___
☐ 063 n-Butylacetate[0.5]	☐	☐	___.___
☐ 071 Carbon Disulfide[5.0]	☐	☐	___.___
☐ 073 Carbon Tetrachloride[1.5]	☐	☐	___.___
☐ 083 Chlorobenzene[2.0]	☐	☐	___.___
☐ 087 Chloroethane[20]	☐	☐	___.___
☐ 093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___.___
☐ 095 Chloroform[1.0]	☐	☐	___.___
☐ 108 o-Chlorotoluene[1.0]	☐	☐	___.___
☐ 110 p-Chlorotoluene[1.0]	☐	☐	___.___
☐ 147 Dibromochloromethane[2.0]	☐	☐	___.___
☐ 148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐ 153 o-Dichlorobenzene[2.0]	☐	☐	___.___
☐ 155 m-Dichlorobenzene[2.0]	☐	☐	___.___
☐ 157 p-Dichlorobenzene[2.0]	☐	☐	___.___
☐ 165 1,1-Dichloroethane[1.0]	☐	☐	___.___
☐ 167 1,2-Dichloroethane[1.0]	☐	☐	___.___
☐ 169 1,1-Dichloroethylene[1.0]	☐	☐	___.___
☒ 171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐ 174 Dichloroiodomethane	☐	☐	[not quantified]
☐ 181 1,2-Dichloropropane[1.0]	☐	☐	___.___
☐ 183 cis-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐ 185 trans-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐ 233 Ethylbenzene[1.0]	☐	☐	___.___
☐ 427 Fluorotrichloromethane[1.0]	☐	☐	___.___
☐ 298 Isopropylbenzene[1.0]	☐	☐	___.___
☐ 319 Methylethylketone (MEK)[12]	☐	☐	___.___
☐ 393 Styrene[2.0]	☐	☐	___.___
☐ 396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___.___
☐ 397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___.___
☒ 399 Tetrachloroethylene[1.0]	☐	☐	1.5
☐ 401 Tetrahydrofuran (THF)[200]	☐	☐	___.___
☐ 411 Toluene[1.0]	☐	☐	___.___
☐ 421 1,1,1-Trichloroethane[1.0]	☐	☐	___.___
☐ 423 1,1,2-Trichloroethane[1.5]	☐	☐	___.___
☒ 425 Trichloroethylene[1.0]	☐	☐	<1.0
☐ 428 Trichlorotrifluoroethane[3.0]	☐	☐	___.___
☐ 434 Vinyl Chloride	☐	☐	[not quantified]
☐ 437 Xylenes[2.0]	☐	☐	___.___
☐ _____	☐	☐	___.___
☐ _____	☐	☐	___.___

Comments CC: DIST.-OWNER

Date Received and Sample No. [redacted] APR 23 1985

Date Reported DPD MAY 7 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

acility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/22/85 (M M D D Y Y)

Time (24 Hr. Clock) 13:00 (H H M M) Field No. ____

Water System Name Monitoring Well DNR #29

P.O. or Municipality Wausau

Sample Source Address _____

_____ (or) Well No. ____

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	66.
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	240.
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☒	411	Toluene[1.0]	☐	☐	<1.0
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	12.
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		_____	☐	☐	
☐		_____	☐	☐	

CC. DIST.-OWNER

Comments _____

Date Received and Sample No. 24 APR 23 1985 MAY 10 1985

Date Reported DSD

R.H. Laessig, PhD, Director

Facility I.D. Number [redacted]

County Code 37 County Marathon

Collection Date 04/22/85 (MM/DD/YY)

Time (24 Hr. Clock) 13:00 (HH:MM) Field No. ___

Water System Name Monitoring Well DNR #29

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐ 007	Acrolein[50]	☐	☐	___
☐ 009	Acrylonitrile[20]	☐	☐	___
☐ 025	Benzene[1.0]	☐	☐	___
☐ 046	Bromobenzene[4.0]	☐	☐	___
☐ 051	Bromodichloromethane[1.5]	☐	☐	___
☐ 053	Bromoform[5.0]	☐	☐	___
☐ 055	Bromomethane[50]	☐	☐	___
☐ 063	n-Butylacetate[0.5]	☐	☐	___
☐ 071	Carbon Disulfide[5.0]	☐	☐	___
☐ 073	Carbon Tetrachloride[1.5]	☐	☐	___
☐ 083	Chlorobenzene[2.0]	☐	☐	___
☐ 087	Chloroethane[20]	☐	☐	___
☐ 093	2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐ 095	Chloroform[1.0]	☐	☐	___
☐ 408	o-Chlorotoluene[1.0]	☐	☐	___
☐ 410	p-Chlorotoluene[1.0]	☐	☐	___
☐ 047	Dibromochloromethane[2.0]	☐	☐	___
148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐ 153	o-Dichlorobenzene[2.0]	☐	☐	___
☐ 155	m-Dichlorobenzene[2.0]	☐	☐	___
☐ 157	p-Dichlorobenzene[2.0]	☐	☐	___
☐ 165	1,1-Dichloroethane[1.0]	☐	☐	___
167	1,2-Dichloroethane[1.0]	☐	☐	___
☐ 169	1,1-Dichloroethylene[1.0]	☐	☐	___
171	1,2-Dichloroethylene[1.0]	☐	☐	66
174	Dichloroiodomethane	☐	☐	[not quantified]
☐ 181	1,2-Dichloropropane[1.0]	☐	☐	___
☐ 183	cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐ 185	trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐ 233	Ethylbenzene[1.0]	☐	☐	___
☐ 427	Fluorotrichloromethane[1.0]	☐	☐	___
☐ 298	Isopropylbenzene[1.0]	☐	☐	___
☐ 319	Methylethylketone (MEK)[12]	☐	☐	___
☐ 393	Styrene[2.0]	☐	☐	___
☐ 396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐ 397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒ 399	Tetrachloroethylene[1.0]	☐	☐	240
☐ 401	Tetrahydrofuran (THF)[200]	☐	☐	___
☒ 411	Toluene[1.0]	☐	☐	<1.0
☐ 421	1,1,1-Trichloroethane[1.0]	☐	☐	___
☐ 423	1,1,2-Trichloroethane[1.5]	☐	☐	___
☒ 425	Trichloroethylene[1.0]	☐	☐	12
☐ 428	Trichlorotrifluoroethane[3.0]	☐	☐	___
☐ 434	Vinyl Chloride	☐	☐	[not quantified]
☐ 437	Xylenes[2.0]	☐	☐	___
☐	___	☐	☐	___
☐	___	☐	☐	___

CC. DIST. - OWNER

Comments ___

Date Received and Sample No. 345 4139 APR 23 1985

Date Reported D.D MAY 10 1985

R.H. Laessig, PhD, Director

Form 3300-65 Rev. 3-84

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/22/85 (MM/DD/YY)

Time (24 Hr. Clock) 12:40 (HH:MM) Field No.

Water System Name Monitoring Well DNR # 30

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. DeBrock

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	230.
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	190.
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	<1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	80.
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐		☐	☐	
☐		☐	☐	

Comments CC: DIST.-OWNER

Date Received and Sample No. APR 23 1985

Date Reported DPD MAY 7 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Form 3300-65 Rev. 5-84

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/22/85 (M M D D Y Y)

Time (24 Hr. Clock) 1300 (H H M M) Field No. ___

Water System Name Monitoring Well DNR # 31

P.O. or Municipality Wausau

Sample Source Address _____

(or) Well No. ___

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	5.7
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	8.9
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☒	411	Toluene[1.0]	☐	☐	<1.0
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	2.0
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		_____	☐	☐	
☐		_____	☐	☐	

CC: DIST.-OWNER

Comments _____

Date Received and Sample No. [redacted] APR 23 1985

Date Reported DPD MAY 7 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/22/85 (M M / D D / Y Y)

Time (24 Hr. Clock) 1300 (H H M M) Field No. ____

Water System Name Monitoring Well DNR # 31

P.O. or Municipality Wausau

Sample Source Address _____

(or) Well No. _____

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	5.7
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	8.9
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☒	411	Toluene[1.0]	☐	☐	<1.0
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	2.0
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		_____	☐	☐	
☐		_____	☐	☐	

CC: DIST. - OWNER

Comments _____

Date Received and Sample No. [illegible] APR 23 1985

Date Reported DPD MAY 7 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Form 3300-65 Rev. 5-84

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/22/85 (MM/DD/YY)

Time (24 Hr. Clock) 16:00 Field No.

Water System Name Monitoring Well DNR #92

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	5.5
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	1.5
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐		☐	☐	
☐		☐	P	

CC: DIST. - OWNER

Comments 9th Bottle is bailer water Sample

Date Received and Sample No. APR 23 1985

Date Reported DPD MAY 10 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/16/85 (MM/DD/YY) 4-14-85 4-2-85

Time (24 Hr. Clock) 16:00 (HH:MM) Field No. ____

Water System Name Monitoring well across from Marathon Box

P.O. or Municipality Wausau

Sample Source Address EPA 11

_____ (or) Well No. ____

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	4.9
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☐	411	Toluene[1.0]	☐	☐	
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	4.5
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		_____	☐	☐	
☐		_____	☐	☐	

Comments _____

Date Received and Sample No. 845 4071 APR 17

Date Reported DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Form 3300-65 Rev. 5-84

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/22/85 (MM/DD/YY)

Time (24 Hr. Clock) 16:00 (HH:MM) Field No. ____

Water System Name Mid. EPA Next to Ball Park

P.O. or Municipality Wausau

Sample Source Address EPA 12

(or) Well No. ____

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	____
	009 Acrylonitrile[20]	☐	☐	____
☐	025 Benzene[1.0]	☐	☐	____
☐	046 Bromobenzene[4.0]	☐	☐	____
	051 Bromodichloromethane[1.5]	☐	☐	____
☐	053 Bromoform[5.0]	☐	☐	____
	055 Bromomethane[50]	☐	☐	____
☐	063 n-Butylacetate[0.5]	☐	☐	____
	071 Carbon Disulfide[5.0]	☐	☐	____
☐	073 Carbon Tetrachloride[1.5]	☐	☐	____
☐	083 Chlorobenzene[2.0]	☐	☐	____
	087 Chloroethane[20]	☐	☐	____
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	____
	095 Chloroform[1.0]	☐	☐	____
☐	108 o-Chlorotoluene[1.0]	☐	☐	____
☐	110 p-Chlorotoluene[1.0]	☐	☐	____
	147 Dibromochloromethane[2.0]	☐	☐	____
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
	153 o-Dichlorobenzene[2.0]	☐	☐	____
☐	155 m-Dichlorobenzene[2.0]	☐	☐	____
	157 p-Dichlorobenzene[2.0]	☐	☐	____
☐	165 1,1-Dichloroethane[1.0]	☐	☐	____
	167 1,2-Dichloroethane[1.0]	☐	☐	____
	169 1,1-Dichloroethylene[1.0]	☐	☐	____
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	____
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	____
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	____
☐	233 Ethylbenzene[1.0]	☐	☐	____
☐	427 Fluorotrichloromethane[1.0]	☐	☐	____
☐	298 Isopropylbenzene[1.0]	☐	☐	____
☐	319 Methylethylketone (MEK)[12]	☐	☐	____
☐	393 Styrene[2.0]	☐	☐	____
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	____
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	____
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	____
☐	411 Toluene[1.0]	☐	☐	____
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	____
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	____
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	____
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	____
☐	_____	☐	☐	____
☐	_____	☐	☐	____

CC: DIST. - OWNER

Comments _____

Date Received and Sample No. [redacted] APR 23 1985

Date Reported DPD MAY 10 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Facility I.D. Number

County Code 37 County Marathon

Collection Date 04/16/85 (MM/DD/YY)

Time (24 Hr. Clock) 14:45 Field No.

Water System Name Mon.Well corner of Main & Box

P.O. or Municipality Wausau

Sample Source Address EPA 13

(or) Well No.

Sampling Point Description Sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☐ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☐ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	1.3
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	3.5
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☐	411	Toluene[1.0]	☐	☐	
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	2.1
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		_____	☐	☐	
☐		_____	☐	☐	

Comments

Date Received and Sample No. 84-5 4073 APR 17

Date Reported DPD APR

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number _____

County Code 37 County Marathon

Collection Date 04/22/85 (MM/DD/YY)

Time (24 Hr. Clock) 14:15 (HH:MM) Field No. ____

Water System Name EPA-Werg in Junk Yard

P.O. or Municipality Wausau

Sample Source Address EPA 14

(or) Well No. ____

Sampling Point Description sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By M. Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___.___
☐	009 Acrylonitrile[20]	☐	☐	___.___
☐	025 Benzene[1.0]	☐	☐	___.___
☐	046 Bromobenzene[4.0]	☐	☐	___.___
☐	051 Bromodichloromethane[1.5]	☐	☐	___.___
☐	053 Bromoform[5.0]	☐	☐	___.___
☐	055 Bromomethane[50]	☐	☐	___.___
☐	063 n-Butylacetate[0.5]	☐	☐	___.___
☐	071 Carbon Disulfide[5.0]	☐	☐	___.___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___.___
☐	083 Chlorobenzene[2.0]	☐	☐	___.___
☐	087 Chloroethane[20]	☐	☐	___.___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___.___
☐	096 Chloroform[1.0]	☐	☐	___.___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___.___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___.___
☐	147 Dibromochloromethane[2.0]	☐	☐	___.___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___.___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___.___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___.___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___.___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___.___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___.___
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___.___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	233 Ethylbenzene[1.0]	☐	☐	___.___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___.___
☐	298 Isopropylbenzene[1.0]	☐	☐	___.___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___.___
☐	393 Styrene[2.0]	☐	☐	___.___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___.___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___.___
☒	399 Tetrachloroethylene[1.0]	☐	☐	2.6
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___.___
☒	411 Toluene[1.0]	☐	☐	2.3
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___.___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___.___
☒	425 Trichloroethylene[1.0]	☐	☐	<1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___.___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___.___
☐	_____	☐	☐	___.___
☐	_____	☐	☐	___.___

Comments CC: DIST.-OWNER

Date Received and Sample No. [redacted] APR 23 1985

Date Reported DPD MAY 10 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Form 3300-65 Rev. 5-84

Facility I.D. Number 037040630

County Code 37 County Marathon

Collection Date 06/24/85 (M M / D D / Y Y)

Time (24 Hr. Clock) 15:05 (H H : M M) Field No. ____

Water System Name DNR WGS Monitoring Well #9

P.O. or Municipality Wausau

Sample Source Address Near Wausau Municipal Well #4 (or) Well No. ____

Sampling Point Description Teflon bailer

Send Report To:
Name: Bill Dobbins
Address: P.O. Box 88
City, State, Zip Code: Rhinelander, WI 54501

Collected By Marsha Johnson

Account Number 150060 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ____
- ☒ Other (Follow Up, Misc.)

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	< 1.0
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☐	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	< 1.0
☒	421 1,1,1-Trichloroethane[1.0]	☐	☐	< 1.0
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐	____	☐	☐	
☐	____	☐	☐	

Comments ____

Date Received and Sample No. 845-1974 JUN 25 1985

Date Reported DPD JUL 9 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037040630

County Code: 37 County: Marathon

Collection Date: 05/26/85 (MM/DD/YY)

Time (24 Hr. Clock): 15:30 (HH:MM) Field No. ___

Water System Name: DNR WGES Monitoring Well #9

P.O. or Municipality: Wausau

Sample Source Address: ___

___ (or) Well No. ___

Sampling Point Description: sample taken from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 518
City, State, Zip Code: Rhinclander, Wis. 54501

Collected By: M. Johnson

Account Number: 1100 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐ 007	Acrolein[50]	☐	☐	___
☐ 009	Acrylonitrile[20]	☐	☐	___
☒ 025	Benzene[1.0]	☐	☐	<1.0
☐ 046	Bromobenzene[4.0]	☐	☐	___
☐ 051	Bromodichloromethane[1.5]	☐	☐	___
☐ 053	Bromoform[5.0]	☐	☐	___
☐ 055	Bromomethane[50]	☐	☐	___
☐ 063	n-Butylacetate[0.5]	☐	☐	___
☐ 071	Carbon Disulfide[5.0]	☐	☐	___
☐ 073	Carbon Tetrachloride[1.5]	☐	☐	___
☐ 083	Chlorobenzene[2.0]	☐	☐	___
☐ 087	Chloroethane[20]	☐	☐	___
☐ 093	2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐ 095	Chloroform[1.0]	☐	☐	___
☐ 108	o-Chlorotoluene[1.0]	☐	☐	___
☐ 110	p-Chlorotoluene[1.0]	☐	☐	___
☐ 147	Dibromochloromethane[2.0]	☐	☐	___
☐ 148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐ 153	o-Dichlorobenzene[2.0]	☐	☐	___
☐ 155	m-Dichlorobenzene[2.0]	☐	☐	___
☐ 157	p-Dichlorobenzene[2.0]	☐	☐	___
☐ 165	1,1-Dichloroethane[1.0]	☐	☐	___
☐ 167	1,2-Dichloroethane[1.0]	☐	☐	___
☐ 169	1,1-Dichloroethylene[1.0]	☐	☐	___
☒ 171	1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐ 174	Dichloroiodomethane	☐	☐	[not quantified]
☐ 181	1,2-Dichloropropane[1.0]	☐	☐	___
☐ 183	cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐ 185	trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐ 233	Ethylbenzene[1.0]	☐	☐	___
☐ 427	Fluorotrichloromethane[1.0]	☐	☐	___
☐ 298	Isopropylbenzene[1.0]	☐	☐	___
☐ 319	Methylethylketone (MEK)[12]	☐	☐	___
☐ 393	Styrene[2.0]	☐	☐	___
☐ 396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐ 397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒ 399	Tetrachloroethylene[1.0]	☐	☐	<1.0
☐ 401	Tetrahydrofuran (THF)[200]	☐	☐	___
☒ 411	Toluene[1.0]	☐	☐	<1.0
☐ 421	1,1,1-Trichloroethane[1.0]	☐	☐	___
☐ 423	1,1,2-Trichloroethane[1.5]	☐	☐	___
☒ 425	Trichloroethylene[1.0]	☐	☐	<1.0
☐ 428	Trichlorotrifluoroethane[3.0]	☐	☐	___
☐ 434	Vinyl Chloride	☐	☐	[not quantified]
☐ 437	Xylenes[2.0]	☐	☐	___
☐	___	☐	☐	___
☐	___	☐	☐	___

Comments: ___

Date Received and Sample No.: 845 4612 MAY 29 '85

Date Reported: DPD JUN 1 0 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY – WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037040630

County Code: 37 County: Marathon

Collection Date: 11/04/85 (MM/DD/YY)

Time (24 Hr. Clock): 11:30 Field No. ___

Water System Name: WGS Monitoring Well #9

P.O. or Municipality: Wausau

Sample Source Address: ___

___ (or) Well No. ___

Sampling Point Description: sampled from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By: Marsha Johnson

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___
☐	009 Acrylonitrile[20]	☐	☐	___
☒	025 Benzene[1.0]	☐	☐	< 1.0
☐	046 Bromobenzene[4.0]	☐	☐	___
☐	051 Bromodichloromethane[1.5]	☐	☐	___
☐	053 Bromoform[5.0]	☐	☐	___
☐	055 Bromomethane[50]	☐	☐	___
☐	063 n-Butylacetate[0.5]	☐	☐	___
☐	071 Carbon Disulfide[5.0]	☐	☐	___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___
☐	083 Chlorobenzene[2.0]	☐	☐	___
☐	087 Chloroethane[20]	☐	☐	___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095 Chloroform[1.0]	☐	☐	___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___
☐	147 Dibromochloromethane[2.0]	☐	☐	___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐	233 Ethylbenzene[1.0]	☐	☐	___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___
☐	298 Isopropylbenzene[1.0]	☐	☐	___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___
☐	393 Styrene[2.0]	☐	☐	___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411 Toluene[1.0]	☐	☐	< 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___
☐	CC. DIST. - OWNER	☐	☐	___
☐	___	☐	☐	___

Comments: ___

Date Received and Sample No.: 85-6-2063 NOV 5 1985

Date Reported: DPD NOV 8 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037040740

County Code: 37 County: Marathon

Collection Date: 11/04/85 (MM/DD/YY)

Time (24 Hr. Clock): 12:00 Field No. ___

Water System Name: WGS Monitoring Well #10

P.O. or Municipality: Wausau

Sample Source Address: ___

___ (or) Well No. ___

Sampling Point Description: Sampled from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 518
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By: Marsha Johnson

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___
☐	009 Acrylonitrile[20]	☐	☐	___
☒	025 Benzene[1.0]	☐	☐	< 1.0
☐	046 Bromobenzene[4.0]	☐	☐	___
☐	051 Bromodichloromethane[1.5]	☐	☐	___
☐	053 Bromoform[5.0]	☐	☐	___
☐	055 Bromomethane[50]	☐	☐	___
☐	063 n-Butylacetate[0.5]	☐	☐	___
☐	071 Carbon Disulfide[5.0]	☐	☐	___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___
☐	083 Chlorobenzene[2.0]	☐	☐	___
☐	087 Chloroethane[20]	☐	☐	___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095 Chloroform[1.0]	☐	☐	___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___
☐	147 Dibromochloromethane[2.0]	☐	☐	___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐	233 Ethylbenzene[1.0]	☐	☐	___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___
☐	298 Isopropylbenzene[1.0]	☐	☐	___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___
☐	393 Styrene[2.0]	☐	☐	___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411 Toluene[1.0]	☐	☐	< 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___
☐	___	☐	☐	___
☐	___	☐	☐	___

Comments: CC. DIST. OWNER

Date Received and Sample No.: 85-6-2065 NOV 5 1985

Date Reported: NOV 8 1985 DPD

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

...ment of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY – WATER SUPPLY

Form 3300-65 Rev. 5-84

City I.D. Number: 037049650

County Code: 37 County: Marathon

Collection Date: 11/05/85 (MM/DD/YY)

Time (24 Hr. Clock): ____:____ (HH:MM) Field No. ____

Water System Name: ICT Monitoring Well #1

P.O. or Municipality: Wausau

Sample Source Address: West of RR Tracks

(or) Well No. ____

Sampling Point Description: Teflon Bailer

Send Report To:
Name: Bill Dobbins
Address: P.O. Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Marsha Johnson

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	____.__
☐	009 Acrylonitrile[20]	☐	☐	____.__
☒	025 Benzene[1.0]	☐	☒	<1.0
☐	046 Bromobenzene[4.0]	☐	☐	____.__
☐	051 Bromodichloromethane[1.5]	☐	☐	____.__
☐	053 Bromoform[5.0]	☐	☐	____.__
☐	055 Bromomethane[50]	☐	☐	____.__
☐	063 n-Butylacetate[0.5]	☐	☐	____.__
☐	071 Carbon Disulfide[5.0]	☐	☐	____.__
☐	073 Carbon Tetrachloride[1.5]	☐	☐	____.__
☐	083 Chlorobenzene[2.0]	☐	☐	____.__
☐	087 Chloroethane[20]	☐	☐	____.__
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	____.__
☐	095 Chloroform[1.0]	☐	☐	____.__
☐	108 o-Chlorotoluene[1.0]	☐	☐	____.__
☐	110 p-Chlorotoluene[1.0]	☐	☐	____.__
☐	147 Dibromochloromethane[2.0]	☐	☐	____.__
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	____.__
☐	155 m-Dichlorobenzene[2.0]	☐	☐	____.__
☐	157 p-Dichlorobenzene[2.0]	☐	☐	____.__
☐	165 1,1-Dichloroethane[1.0]	☐	☐	____.__
☐	167 1,2-Dichloroethane[1.0]	☐	☐	____.__
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	____.__
☒	171 1,2-Dichloroethylene[1.0]	☐	☒	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	____.__
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	____.__
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	____.__
☐	233 Ethylbenzene[1.0]	☐	☐	____.__
☐	427 Fluorotrichloromethane[1.0]	☐	☐	____.__
☐	298 Isopropylbenzene[1.0]	☐	☐	____.__
☐	319 Methylethylketone (MEK)[12]	☐	☐	____.__
☐	393 Styrene[2.0]	☐	☐	____.__
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	____.__
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	____.__
☒	399 Tetrachloroethylene[1.0]	☐	☒	<1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	____.__
☒	411 Toluene[1.0]	☐	☒	<1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	____.__
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	____.__
☒	425 Trichloroethylene[1.0]	☐	☒	<1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	____.__
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	____.__
☐	____	☐	☐	____.__
☐	____	☐	☐	____.__

Comments: CC: Dist. Supt.

Date Received and Sample No.: 85-[illegible]2180 NOV 0 [illegible]

Date Reported: DPD NOV 26 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

...rtment of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY
Form 3300-65 Rev. 5-84

Facility I.D. Number 037048880
County Code 37 County Marathon
Collection Date 11/04/85 (M M / D D / Y Y)
Time (24 Hr. Clock) 14:10 (H H : M M) Field No. ___

Water System Name TCT Monitoring Well #2
P.O. or Municipality Wausau
Sample Source Address SW Corner Steel Flite Bldg (or) Well No. ___
Sampling Point Description Teflon bailer

Send Report To:
Name: Bill Dobbins
Address: P.O. Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By Marsha Johnson
Account Number 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___
☐	009 Acrylonitrile[20]	☐	☐	___
☒	025 Benzene[1.0]	☐	☐	< 1.0
☐	046 Bromobenzene[4.0]	☐	☐	___
☐	051 Bromodichloromethane[1.5]	☐	☐	___
☐	053 Bromoform[5.0]	☐	☐	___
☐	055 Bromomethane[50]	☐	☐	___
☐	063 n-Butylacetate[0.5]	☐	☐	___
☐	071 Carbon Disulfide[5.0]	☐	☐	___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___
☐	083 Chlorobenzene[2.0]	☐	☐	___
☐	087 Chloroethane[20]	☐	☐	___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095 Chloroform[1.0]	☐	☐	___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___
☐	147 Dibromochloromethane[2.0]	☐	☐	___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___
☐	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichlorodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐	233 Ethylbenzene[1.0]	☐	☐	___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___
☐	298 Isopropylbenzene[1.0]	☐	☐	___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___
☐	393 Styrene[2.0]	☐	☐	___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411 Toluene[1.0]	☐	☐	< 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___
☐	___	☐	☐	___
☐	___	☐	☐	___

CC: DIST. - OWNER

Comments ___

Date Received and Sample No. [redacted] 2060 NOV 5 1985
Date Reported DPD NOV 2 1985

R.H. Laessig, PhD. Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

tment of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY

Form 3300-65 Rev. 5-84

lity I.D. mber 037049430

County Code 37 County Marathon

Collection Date 11/05/85 (M M / D D / Y Y)

Time (24 Hr. Clock) 14:20 (H H : M M) Field No. ___

Water System Name ICT Monitoring Well #3

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description sampled from bailer

Send Report To:
Name: Bill Dobbins
Address: Box 518
City, State, Zip Code: Rhinelander, Wis. 54501

Collected By Marsha Johnson

Account Number 060030 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___.___
☐	009 Acrylonitrile[20]	☐	☐	___.___
☒	025 Benzene[1.0]	☐	☐	<1.0
☐	046 Bromobenzene[4.0]	☐	☐	___.___
☐	051 Bromodichloromethane[1.5]	☐	☐	___.___
☐	053 Bromoform[5.0]	☐	☐	___.___
☐	055 Bromomethane[50]	☐	☐	___.___
☐	063 n-Butylacetate[0.5]	☐	☐	___.___
☐	071 Carbon Disulfide[5.0]	☐	☐	___.___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___.___
☐	083 Chlorobenzene[2.0]	☐	☐	___.___
☐	087 Chloroethane[20]	☐	☐	___.___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___.___
☐	095 Chloroform[1.0]	☐	☐	___.___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___.___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___.___
☐	147 Dibromochloromethane[2.0]	☐	☐	___.___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___.___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___.___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___.___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___.___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___.___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___.___
☐	171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___.___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___.___
☐	233 Ethylbenzene[1.0]	☐	☐	___.___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___.___
☐	298 Isopropylbenzene[1.0]	☐	☐	___.___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___.___
☐	393 Styrene[2.0]	☐	☐	___.___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___.___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___.___
☒	399 Tetrachloroethylene[1.0]	☐	☐	<1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___.___
☒	411 Toluene[1.0]	☐	☐	<1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___.___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___.___
☒	425 Trichloroethylene[1.0]	☐	☐	<1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___.___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___.___
☐	CC: DIST. - OWNER	☐	☐	___.___
☐	___	☐	☐	___.___

Comments ___

Date Received and Sample No. 4856 2098 NOV 0 [illegible]

Date Reported DPD NOV 26 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY – WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number 037048990

County Marathon

Collection Date 11/04/85 (M M D D Y Y)

Time (24 Hr. Clock) 14:40 (H H : M M) Field No. ___

Water System Name TCT Monitoring Well #4

P.O. or Municipality Wausau

Sample Source Address Behind [redacted] Eco Building (or) Well No. ___

Sampling Point Description teflon bailer

Send Report To:
Name: Bill Dobbins
Address: P.O. Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By Marsha Johnson

Account Number 060080 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___
☐	009 Acrylonitrile[20]	☐	☐	___
☒	025 Benzene[1.0]	☐	☐	≤ 1.0
☐	046 Bromobenzene[4.0]	☐	☐	___
☐	051 Bromodichloromethane[1.5]	☐	☐	___
☐	053 Bromoform[5.0]	☐	☐	___
☐	055 Bromomethane[50]	☐	☐	___
☐	063 n-Butylacetate[0.5]	☐	☐	___
☐	071 Carbon Disulfide[5.0]	☐	☐	___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___
☐	083 Chlorobenzene[2.0]	☐	☐	___
☐	087 Chloroethane[20]	☐	☐	___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095 Chloroform[1.0]	☐	☐	___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___
☐	147 Dibromochloromethane[2.0]	☐	☐	___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	≤ 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐	233 Ethylbenzene[1.0]	☐	☐	___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___
☐	298 Isopropylbenzene[1.0]	☐	☐	___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___
☐	393 Styrene[2.0]	☐	☐	___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399 Tetrachloroethylene[1.0]	☐	☐	≤ 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411 Toluene[1.0]	☐	☐	≤ 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425 Trichloroethylene[1.0]	☐	☐	≤ 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___
☐	___	☐	☐	___
☐	CC: DIST. - [illegible]	☐	☐	___

Comments ___

Date Received and Sample No. 85-[illegible] 2065 NOV 5 1985

Date Reported PD NOV 2 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

...t of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY
Form 3300-65 Rev. 5-84

ID 037049760

31 County Marathon

11/05/85 (M M / D D / Y Y)

Clock 14:40 (H H : M M) Field No. ___

Water System Name: TCT Monitoring Well #5
P.O. or Municipality: Wausau
Sample Source Address: East of Canteen + Lemke
Cheese (or) Well No. ___
Sampling Point Description: Teflon Bailer

Report To:
Bill Dobbins
Address: P.O. Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Marsh Johnson
Account Number: 060030
For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

	Detection Limits (ug/l) are indicated in brackets [ ]	Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___
☐	009 Acrylonitrile[20]	☐	☐	___
☒	025 Benzene[1.0]	☐	☒	< 1.0
☐	046 Bromobenzene[4.0]	☐	☐	___
☐	051 Bromodichloromethane[1.5]	☐	☐	___
☐	053 Bromoform[5.0]	☐	☐	___
☐	055 Bromomethane[50]	☐	☐	___
☐	063 n-Butylacetate[0.5]	☐	☐	___
☐	071 Carbon Disulfide[5.0]	☐	☐	___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___
☐	083 Chlorobenzene[2.0]	☐	☐	___
☐	087 Chloroethane[20]	☐	☐	___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095 Chloroform[1.0]	☐	☐	___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___
☐	147 Dibromochloromethane[2.0]	☐	☐	___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171 1,2-Dichloroethylene[1.0]	☐	☒	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐	233 Ethylbenzene[1.0]	☐	☐	___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___
☐	298 Isopropylbenzene[1.0]	☐	☐	___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___
☐	393 Styrene[2.0]	☐	☐	___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399 Tetrachloroethylene[1.0]	☐	☒	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411 Toluene[1.0]	☐	☒	< 1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425 Trichloroethylene[1.0]	☐	☒	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___
☐	___ CC. DIST. - WATER	☐	☐	___
☐	___	☐	☐	___

Comments ___

Date Received and Sample No. 85-6-2101 NOV 0 ...

Date Reported DPD NOV 26 1985

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

TABLE 7

SUMMARY OF EAST SIDE MONITORING WELL ELEVATIONS AND DEPTHS

DRAFT

Monitoring Well	Elevation and Land Surface	Elevation of Top of Casing	Well Depth	Screen
EPA 7A	1198.90	1201.11	69.5	10.0
EPA 9A	1194.25	1196.82	141.0	10.0
EPA 10A	1204.50	1206.63	76.5	10.0
EPA 10B	1204.50	1206.41	35.0	10.0
EPA 11	1209.92	1209.92	35.0	10.0
EPA 12	1200.06	1200.06	70.0	20.0
EPA 13	1211.10	1211.10	45.0	10.0
EPA 14	1197.40	1197.40	45.0	10.0
W.Chem.B1	1195.03	1197.03	23.0	10.0
W.Chem.B2	1195.94	1197.94	24.0	10.0
W.Chem.B3	1196.16	1198.16	161.0	3.0
W.Chem.B3A	1195.81	1197.81	65.0	3.0
W.Chem.B3B	1195.94	1197.94	24.0	10.0
W.Chem.B3C	N/A	1198.94	29.0	10.0
W.Chem.B4	N/A	1196.56	60.0	3.0
W.Chem.B4A	N/A	1196.39	30.0	10.0
W.Chem.B5	N/A	1196.53	70.0	3.0
W.Chem.B5A	N/A	1196.49	30.0	10.0
W.Chem.B6	N/A	1198.00	70.0	3.0
W.Chem.B6A	N/A	1198.48	30.0	10.0
W.Chem.B7	N/A	1196.79	60.0	3.0
W.Chem.B7A	N/A	1196.60	30.0	10.0
City MW 1	N/A	1198.32	40.0	5.0
City MW 2	N/A	1202.97	40.0	5.0
City MW 3	N/A	1201.61	40.0	5.0
City MW 4	N/A	1202.06	40.0	5.0
City MW 5	N/A	1210.02	37.0	5.0
City MW 6	N/A	1200.37	41.0	5.0
City MW 7	N/A	1200.61	48.0	5.0
City MW 8	N/A	1198.66	23.5	10.5
City WI 3	N/A	1203.40	91.0	41.0
City WI 4	N/A	1200.79	132.0	40.0

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY

Form 3300-65 Rev. 5-84

Facility I.D. Number 037018850

County Code 37 County Marathon

Collection Date 04/21/86 (MM/DD/YY)

Time 24 Hr. Clock) 15:15 (HH:MM) Field No. ___

Water System Name EPA 10A-DNR 7

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By Owens

Account Number 060080 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	___
☐	009	Acrylonitrile[20]	☐	☐	___
☐	025	Benzene[1.0]	☐	☐	___
☐	046	Bromobenzene[4.0]	☐	☐	___
☐	051	Bromodichloromethane[1.5]	☐	☐	___
☐	053	Bromoform[5.0]	☐	☐	___
☐	055	Bromomethane[50]	☐	☐	___
☐	063	n-Butylacetate[0.5]	☐	☐	___
☐	071	Carbon Disulfide[5.0]	☐	☐	___
☐	073	Carbon Tetrachloride[1.5]	☐	☐	___
☐	083	Chlorobenzene[2.0]	☐	☐	___
☐	087	Chloroethane[20]	☐	☐	___
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095	Chloroform[1.0]	☐	☐	___
☐	108	o-Chlorotoluene[1.0]	☐	☐	___
☐	110	p-Chlorotoluene[1.0]	☐	☐	___
☐	147	Dibromochloromethane[2.0]	☐	☐	___
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	___
☐	155	m-Dichlorobenzene[2.0]	☐	☐	___
☐	157	p-Dichlorobenzene[2.0]	☐	☐	___
☐	165	1,1-Dichloroethane[1.0]	☐	☐	___
☐	167	1,2-Dichloroethane[1.0]	☐	☐	___
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	18
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	___
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	___
☒	233	Ethylbenzene[1.0]	☐	☐	<5.0
☐	427	Fluorotrichloromethane[1.0]	☐	☐	___
☐	298	Isopropylbenzene[1.0]	☐	☐	___
☐	319	Methylethylketone (MEK)[12]	☐	☐	___
☐	393	Styrene[2.0]	☐	☐	___
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399	Tetrachloroethylene[1.0]	☐	☐	1000
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411	Toluene[1.0]	☐	☐	<5.0
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425	Trichloroethylene[1.0]	☐	☐	45
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	___
☒	434	Vinyl Chloride	☐	☐	<1.0
☒	437	Xylenes[2.0]	☐	☐	<5.0
☐	___		☐	☐	___
☐	___		☐	☐	___

Comments ___

Date Received and Sample No. 85-5-[redacted] APR 22 1986

Date Reported DFD MAY 20 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

CC: DIST.-OWNER

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037018960

County Code: 37 County: Marathon

Collection Date: 04/21/86 (M M D D Y Y)

Time (24 Hr. Clock): 15:10 (H H M M) Field No.

Water System Name: EPA WB DNR 86

P.O. or Municipality: Wausau

Sample Source Address

(or) Well No.

Sampling Point Description: Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 418
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	061 Bromodichloromethane[1.5]	☐	☐	
☐	063 Bromoform[5.0]	☐	☐	
☐	065 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	106 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	1.4
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☒	233 Ethylbenzene[1.0]	☐	☐	<1.0
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	5.9
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	<1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	1.8
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☒	437 Xylenes[2.0]	☐	☐	4.4
☐		☐	☐	
☐		☐	☐	

Comments

Date Received and Sample No. [redacted] APR 22 1986

Date Reported DFD MAY 1 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygien
Madison, Wisconsin 53706

CC: DIST. - OWNER

Facility I.D. Number 037039310

County Code 37 County Marathon

Collection Date 04/21/86 (M M D D Y Y)

Time (24 Hr. Clock) 12 20 (H H M M) Field No.

Water System Name Weng 1

P.O. or Municipality Wausau

Sample Source Address

(or) Well No.

Sampling Point Description Monitoring well sampled w/teflon bailer

Send Report To:
Name Bill Dabbins
Address Box 818
City, State, Zip Code Rhinelander, WI 54501

Collected By Owens

Account Number 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	063 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	106 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	2.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	2.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	2.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐		☐	☐	
☐		☐	☐	

Comments

Date Received and Sample No. APR 22 1986

Date Reported APR 30 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

CC. DIST. - OWNER

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037039530

County Code: 37 County: Marathon

Collection Date: 04/21/86 (M M D D Y Y)

Time (24 Hr. Clock): 11:15 (H H : M M) Field No. ___

Water System Name: Weng 2 = ANR 26

P.O. or Municipality: Wausau

Sample Source Address: ___

(or) Well No. ___

Sampling Point Description: Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 618
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	065 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☒	434 Vinyl Chloride	☐	☐	< 1.0
☐	437 Xylenes[2.0]	☐	☐	
☐	___	☐	☐	
☐	___	☐	☐	

Comments: ___

Date Received and Sample No.: 56-4611 APR 22 1986

Date Reported: DFD MAY 20 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

CC: DIST.-OWNER

Form 3300-65 DNR Lab Rev. 6-84

Facility I.D. Number 037039420

County Code 37 County Marathon

Collection Date 04/2/86 (M M D D Y Y)

Time (24 Hr. Clock) 11:40 (H H M M) Field No. ___

Water System Name Well 3

P.O. or Municipality Wausau

Sample Source Address ___ (or) Well No. ___

Sampling Point Description Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By Owens

Account Number 060830 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___
☐	009 Acrylonitrile[20]	☐	☐	___
☐	025 Benzene[1.0]	☐	☐	___
☐	046 Bromobenzene[4.0]	☐	☐	___
☐	051 Bromodichloromethane[1.5]	☐	☐	___
☐	063 Bromoform[5.0]	☐	☐	___
☐	055 Bromomethane[50]	☐	☐	___
☐	063 n-Butylacetate[0.5]	☐	☐	___
☐	071 Carbon Disulfide[5.0]	☐	☐	___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___
☐	083 Chlorobenzene[2.0]	☐	☐	___
☐	087 Chloroethane[20]	☐	☐	___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095 Chloroform[1.0]	☐	☐	___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___
☐	147 Dibromochloromethane[2.0]	☐	☐	___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐	233 Ethylbenzene[1.0]	☐	☐	___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___
☐	298 Isopropylbenzene[1.0]	☐	☐	___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___
☐	393 Styrene[2.0]	☐	☐	___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399 Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___
☐	411 Toluene[1.0]	☐	☐	___
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___
☐	___	☐	☐	___
☐	___	☐	☐	___

Comments ___

Date Received and Sample No. 56 4512 APR 22 1986

Date Reported DPD MAY 1 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

CC: DIST. - OWNER

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY
Form 3300-65 Rev. 5-84

Facility I.D. Number: 037039640
County Code: 37 County: Marathon
Collection Date: 04/21/86 (M M D D Y Y)
Time (24 Hr. Clock): 13:45 (H H : M M) Field No. ___

Water System Name: EPA 7 = DNR 27
P.O. or Municipality: Wausau
Sample Source Address: ___
(or) Well No. ___
Sampling Point Description: Monitoring well sampled w/ teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens
Account Number: 060030

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	061 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	260.
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	900.
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	<5.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	58.
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☒	434 Vinyl Chloride	☐	☐	1.0
☐	437 Xylenes[2.0]	☐	☐	
☐	___	☐	☐	
☐	___	☐	☐	

Comments: ___

Date Received: APR 22 1986
Sample No. [redacted]
Date Reported: DPD MAY 20 1986

CC: DIST. - OWNER

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources — Form 3300-65 — DWR # 31 — Rev. 5-84

Facility I.D. Number: 037039660

County Code: 37 County: Marathon

Collection Date: 04/21/86 (M M D D Y Y)

Time (24 Hr. Clock): 13:30 (H H M M) Field No. ___

Water System Name: Werg 6

P.O. or Municipality: Wausau

Sample Source Address: ___ (or) Well No. ___

Sampling Point Description: Monitoring well sampled w/ teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	063	Bromoform[5.0]	☐	☐	
☐	065	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	096	Chloroform[1.0]	☐	☐	
☐	106	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	5.0
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	11.0
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☒	411	Toluene[1.0]	☐	☐	<1.0
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	5.0
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		___	☐	☐	
☐		___	☐	☐	

Comments: ___

Date Received: [redacted] APR 22 1986

Lab No. ___

Date Completed: UPD MAY 1 1986

CC: DIST. - OWNER

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

Department of Natural Resources

VOLATILE ORGANIC [illegible] COMPOUNDS

Form 3300-65 — Rev. 5-84

Facility I.D. Number: 037030180

County No.: 37 County: Marathon

Collection Date: 04/21/86 (MM/DD/YY)

Time (24-Hr. Clock): 15:20 (HH:MM) Field No.: ___

Water System Name: EPA 11

P.O. or Municipality: Wausau

Sample Source Address: ___ (or) Well No.: ___

Sampling Point Description: Monitoring well

Send Report To:
Name: Bill Dabbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: 060080 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	061 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
	169 1,1-Dichloroethylene[1.0]	☐	☐	
☐	171 1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☒	233 Ethylbenzene[1.0]	☐	☐	< 1.0
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	4.9
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☐	411 Toluene[1.0]	☐	☐	
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☒	437 Xylenes[2.0]	☐	☐	< 2.0
☐	___	☐	☐	
☐	___	☐	☐	

Comments: ___

Date Received: [redacted] APR 22 1986

Date Reported: DPD MAY 1 1986

cc: DIST-Dnr

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources — Form 3300-65 — Rev. 5-84

Facility I.D. Number: 037040190
County Code: 37 County: Marathon
Collection Date: 04/21/86 (MM/DD/YY)
Time (24 Hr. Clock): 13:00 (HH:MM) Field No. ____

Water System Name: W.E.P.A. 12
P.O. or Municipality: Wausau
Sample Source Address: East of 3rd St
(or) Well No. ____
Sampling Point Description: Monitoring well sampled w/ teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Krenl / Owens
Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	
☐	009	Acrylonitrile[20]	☐	☐	
☐	025	Benzene[1.0]	☐	☐	
☐	046	Bromobenzene[4.0]	☐	☐	
☐	051	Bromodichloromethane[1.5]	☐	☐	
☐	053	Bromoform[5.0]	☐	☐	
☐	055	Bromomethane[50]	☐	☐	
☐	063	n-Butylacetate[0.5]	☐	☐	
☐	071	Carbon Disulfide[5.0]	☐	☐	
☐	073	Carbon Tetrachloride[1.5]	☐	☐	
☐	083	Chlorobenzene[2.0]	☐	☐	
☐	087	Chloroethane[20]	☐	☐	
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095	Chloroform[1.0]	☐	☐	
☐	108	o-Chlorotoluene[1.0]	☐	☐	
☐	110	p-Chlorotoluene[1.0]	☐	☐	
☐	147	Dibromochloromethane[2.0]	☐	☐	
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	
☐	155	m-Dichlorobenzene[2.0]	☐	☐	
☐	157	p-Dichlorobenzene[2.0]	☐	☐	
☐	165	1,1-Dichloroethane[1.0]	☐	☐	
☐	167	1,2-Dichloroethane[1.0]	☐	☐	
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	< 1.0
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233	Ethylbenzene[1.0]	☐	☐	
☐	427	Fluorotrichloromethane[1.0]	☐	☐	
☐	298	Isopropylbenzene[1.0]	☐	☐	
☐	319	Methylethylketone (MEK)[12]	☐	☐	
☐	393	Styrene[2.0]	☐	☐	
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399	Tetrachloroethylene[1.0]	☐	☐	< 1.0
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	
☒	411	Toluene[1.0]	☐	☐	< 1.0
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425	Trichloroethylene[1.0]	☐	☐	< 1.0
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☐	437	Xylenes[2.0]	☐	☐	
☐		_____	☐	☐	
☐		_____	☐	☐	

Comments: ____

Received APR 22 1986
Date Reported: DPD APR 30 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

cc: DIST. - OWNER

Form 3300-65 Rev. 5-84

Facility I.D. Number 037019070

County Code 37 County Marathon

Collection Date 04/21/86 (MM DD YY)

Time (24 Hr. Clock) 15:10 (HH MM) Field No. ___

Water System Name EPA 13

P.O. or Municipality Wausau

Sample Source Address ___

___ (or) Well No. ___

Sampling Point Description Monitoring well

Send Report To:
Name Bill Dobbins
Address Box 818
City, State, ZIP Code Rhinelander, WI 54501

Collected By Owens

Account Number 060030

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

			Detected	Not Detected	(ug/l)
☐	007	Acrolein[50]	☐	☐	___
☐	009	Acrylonitrile[20]	☐	☐	___
☐	025	Benzene[1.0]	☐	☐	___
☐	046	Bromobenzene[4.0]	☐	☐	___
☐	051	Bromodichloromethane[1.5]	☐	☐	___
☐	053	Bromoform[5.0]	☐	☐	___
☐	055	Bromomethane[50]	☐	☐	___
☐	063	n-Butylacetate[0.5]	☐	☐	___
☐	071	Carbon Disulfide[5.0]	☐	☐	___
☐	073	Carbon Tetrachloride[1.5]	☐	☐	___
☐	083	Chlorobenzene[2.0]	☐	☐	___
☐	087	Chloroethane[20]	☐	☐	___
☐	093	2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095	Chloroform[1.0]	☐	☐	___
☐	108	o-Chlorotoluene[1.0]	☐	☐	___
☐	110	p-Chlorotoluene[1.0]	☐	☐	___
☐	147	Dibromochloromethane[2.0]	☐	☐	___
☐	148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153	o-Dichlorobenzene[2.0]	☐	☐	___
☐	155	m-Dichlorobenzene[2.0]	☐	☐	___
☐	157	p-Dichlorobenzene[2.0]	☐	☐	___
☐	165	1,1-Dichloroethane[1.0]	☐	☐	___
☐	167	1,2-Dichloroethane[1.0]	☐	☐	___
☐	169	1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171	1,2-Dichloroethylene[1.0]	☐	☐	1.8
☐	174	Dichloroiodomethane	☐	☐	[not quantified]
☐	181	1,2-Dichloropropane[1.0]	☐	☐	___
☐	183	cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185	trans-1,3-Dichloropropene[2.5]	☐	☐	___
☒	233	Ethylbenzene[1.0]	☐	☐	21.0
☐	427	Fluorotrichloromethane[1.0]	☐	☐	___
☐	298	Isopropylbenzene[1.0]	☐	☐	___
☐	319	Methylethylketone (MEK)[12]	☐	☐	___
☐	393	Styrene[2.0]	☐	☐	___
☐	396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399	Tetrachloroethylene[1.0]	☐	☐	3.6
☐	401	Tetrahydrofuran (THF)[200]	☐	☐	___
☐	411	Toluene[1.0]	☐	☐	___
☐	421	1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423	1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425	Trichloroethylene[1.0]	☐	☐	4.1
☐	428	Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434	Vinyl Chloride	☐	☐	[not quantified]
☒	437	Xylenes[2.0]	☐	☐	12.0
☐		___	☐	☐	___
☐		___	☐	☐	___

Comments ___

Date Received APR 22 1986

Laboratory No. [redacted]

Date Reported DPD APR 30 1986

cc: DIST.-OWNER

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Facility I.D. Number: 037039910

County Code: 37 County: Marathon

Collection Date: 04/21/86 (MM/DD/YY)

Time (24 Hr. Clock): 12:30 (HH:MM) Field No. ___

Water System Name: EPA 14

P.O. or Municipality: Wausau

Sample Source Address: _____ (or) Well No. ___

Sampling Point Description: Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dabbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: ___ 06030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) _____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	051 Bromodichloromethane[1.5]	☐	☐	
☐	053 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☒	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	<1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	<1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	<1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐	_____	☐	☐	
☐	_____	☐	☐	

Comments: _____

Date Received and Sample No.: 85-6- 4613 APR 22 1986

Date Reported: DFD MAY 1 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

CC: DIST.-OWNER

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037049540

County Code: 37 County: Marathon

Collection Date: 04/21/86 (MM/DD/YY)

Time (24 Hr. Clock): 11:15 Field No.

Water System Name: ICT 3 = FCT-40

P.O. or Municipality: Wausau

Sample Source Address (or) Well No.

Sampling Point Description: Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: 060080 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	061 Bromodichloromethane[1.5]	☐	☐	
☐	063 Bromoform[5.0]	☐	☐	
☐	065 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	096 Chloroform[1.0]	☐	☐	
☐	106 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	[not quantified]
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	≤1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	≤1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	≤1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐		☐	☐	
☐		☐	☐	

Comments

Date Received and Sample No. [redacted] APR 22 1986

Date Reported DPD MAY 1 1986

DD. DIST. OUARD

Department of Natural Resources

VOLATILE ORGANICS
Form 3300-65

Rev. 5-84

Facility I.D. Number: 037046940

County Code: 37 County: Marathon

Collection Date: 04/21/86 (M M D D Y Y)

Time (24 Hr. Clock): 11:00 (H H M M) Field No. ____

Water System Name: TCT 4 TCT-43

P.O. or Municipality: Wausau

Sample Source Address: ____ (or) Well No. ____

Sampling Point Description: Monitoring well sampled w/ teflon bailer

Send Report To:
Name: Bill Dabbins
Address: Box 918
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: 060080 For Lab Use Only

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ____
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	____
☐	009 Acrylonitrile[20]	☐	☐	____
☐	025 Benzene[1.0]	☐	☐	____
☐	046 Bromobenzene[4.0]	☐	☐	____
☐	051 Bromodichloromethane[1.5]	☐	☐	____
☐	053 Bromoform[5.0]	☐	☐	____
☐	055 Bromomethane[50]	☐	☐	____
☐	063 n-Butylacetate[0.5]	☐	☐	____
☐	071 Carbon Disulfide[5.0]	☐	☐	____
☐	073 Carbon Tetrachloride[1.5]	☐	☐	____
☐	083 Chlorobenzene[2.0]	☐	☐	____
☐	087 Chloroethane[20]	☐	☐	____
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	____
☐	095 Chloroform[1.0]	☐	☐	____
☐	106 o-Chlorotoluene[1.0]	☐	☐	____
☐	110 p-Chlorotoluene[1.0]	☐	☐	____
☐	147 Dibromochloromethane[2.0]	☐	☐	____
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	____
☐	155 m-Dichlorobenzene[2.0]	☐	☐	____
☐	157 p-Dichlorobenzene[2.0]	☐	☐	____
☐	165 1,1-Dichloroethane[1.0]	☐	☐	____
☐	167 1,2-Dichloroethane[1.0]	☐	☐	____
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	____
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	____
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	____
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	____
☐	233 Ethylbenzene[1.0]	☐	☐	____
☐	427 Fluorotrichloromethane[1.0]	☐	☐	____
☐	298 Isopropylbenzene[1.0]	☐	☐	____
☐	319 Methylethylketone (MEK)[12]	☐	☐	____
☐	393 Styrene[2.0]	☐	☐	____
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	____
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	____
☒	399 Tetrachloroethylene[1.0]	☐	☐	<1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	____
☒	411 Toluene[1.0]	☐	☐	1.3
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	____
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	____
☒	425 Trichloroethylene[1.0]	☐	☐	<1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	____
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	____
☐	____	☐	☐	____
☐	____	☐	☐	____

Comments: [redacted]

Date Received and Sample No.: [redacted] APR 22 1986

Date Reported: DPD MAY 1 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

DNR OWNED

Department of Natural Resources — Form 3300-65 — Rev. 5-84

Facility I.D. Number: 037048880

County Code: 37 — County: Marathon

Collection Date: 04/21/86 (M M D D Y Y)

Time (24 Hr. Clock): 10 30 (H H M M) — Field No. ___

Water System Name: TCT 9 — TCT-41

P.O. or Municipality: Wausau

Sample Source Address: ___ (or) Well No. ___

Sampling Point Description: Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: 060080 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___
☐	009 Acrylonitrile[20]	☐	☐	___
☐	025 Benzene[1.0]	☐	☐	___
☐	046 Bromobenzene[4.0]	☐	☐	___
☐	061 Bromodichloromethane[1.5]	☐	☐	___
☐	063 Bromoform[5.0]	☐	☐	___
☐	065 Bromomethane[50]	☐	☐	___
☐	063 n-Butylacetate[0.5]	☐	☐	___
☐	071 Carbon Disulfide[5.0]	☐	☐	___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___
☐	083 Chlorobenzene[2.0]	☐	☐	___
☐	087 Chloroethane[20]	☐	☐	___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095 Chloroform[1.0]	☐	☐	___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___
☐	147 Dibromochloromethane[2.0]	☐	☐	___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	≤1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐	233 Ethylbenzene[1.0]	☐	☐	___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___
☐	298 Isopropylbenzene[1.0]	☐	☐	___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___
☐	393 Styrene[2.0]	☐	☐	___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399 Tetrachloroethylene[1.0]	☐	☐	≤1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411 Toluene[1.0]	☐	☐	≤1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425 Trichloroethylene[1.0]	☐	☐	≤1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___
☐	___	☐	☐	___
☐	___	☐	☐	___

Comments: ___

Date Received and Sample No.: [redacted] APR 22 1986

Date Reported: DPD MAY 1 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

CC: DIST.-OWNER

Department of Natural Resources

VOLATILE ORGANIC WATER CHEMISTRY — WATER SUPPLY

Form 3300-65 Rev. 5-84

Facility I.D. Number: 037049650

County Code: 37 County: Marathon

Collection Date: 04/21/86 (MM/DD/YY)

Time (24 Hr. Clock): 11:30 (HH:MM) Field No. ___

Water System Name: TCT I - TCT-44

P.O. or Municipality: Wausau

Sample Source Address: ___

(or) Well No. ___

Sampling Point Description: Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 618
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens

Account Number: 060030 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community — Municipal
- ☐ O Community — Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	___
☐	009 Acrylonitrile[20]	☐	☐	___
☐	025 Benzene[1.0]	☐	☐	___
☐	046 Bromobenzene[4.0]	☐	☐	___
☐	051 Bromodichloromethane[1.5]	☐	☐	___
☐	053 Bromoform[5.0]	☐	☐	___
☐	055 Bromomethane[50]	☐	☐	___
☐	063 n-Butylacetate[0.5]	☐	☐	___
☐	071 Carbon Disulfide[5.0]	☐	☐	___
☐	073 Carbon Tetrachloride[1.5]	☐	☐	___
☐	083 Chlorobenzene[2.0]	☐	☐	___
☐	087 Chloroethane[20]	☐	☐	___
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	___
☐	095 Chloroform[1.0]	☐	☐	___
☐	108 o-Chlorotoluene[1.0]	☐	☐	___
☐	110 p-Chlorotoluene[1.0]	☐	☐	___
☐	147 Dibromochloromethane[2.0]	☐	☐	___
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	___
☐	155 m-Dichlorobenzene[2.0]	☐	☐	___
☐	157 p-Dichlorobenzene[2.0]	☐	☐	___
☐	165 1,1-Dichloroethane[1.0]	☐	☐	___
☐	167 1,2-Dichloroethane[1.0]	☐	☐	___
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	___
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	___

		Detected	Not Detected	ug/l
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	___
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	___
☐	233 Ethylbenzene[1.0]	☐	☐	___
☐	427 Fluorotrichloromethane[1.0]	☐	☐	___
☐	298 Isopropylbenzene[1.0]	☐	☐	___
☐	319 Methylethylketone (MEK)[12]	☐	☐	___
☐	393 Styrene[2.0]	☐	☐	___
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	___
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	___
☒	399 Tetrachloroethylene[1.0]	☐	☐	<1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	___
☒	411 Toluene[1.0]	☐	☐	<1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	___
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	___
☒	425 Trichloroethylene[1.0]	☐	☐	<1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	___
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	___
☐	___	☐	☐	___
☐	___	☐	☐	___

Comments: ___

Date Received and Sample No.: [redacted] APR 22 1986

Date Reported: DPD MAY 1 1986

Dr. MRT - owner

Department of Natural Resources — Form 3300-65 — Rev. 3-84

Facility I.D. Number: 037040630
County Code: 37 County: Marathon
Collection Date: 04/21/86 (MM/DD/YY)
Time (24 Hr. Clock): 14:10 (HH:MM) Field No. ___

Water System Name: WGS 9
P.O. or Municipality: Wausau
Sample Source Address: ___ Well No. ___
Sampling Point Description: Monitoring well sampled w/teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens
Account Number: 060080 (For Lab Use Only)

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in) ___
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐ 007	Acrolein[50]	☐	☐	
☐ 009	Acrylonitrile[20]	☐	☐	
☐ 025	Benzene[1.0]	☐	☐	
☐ 046	Bromobenzene[4.0]	☐	☐	
☐ 051	Bromodichloromethane[1.5]	☐	☐	
☐ 053	Bromoform[5.0]	☐	☐	
☐ 055	Bromomethane[50]	☐	☐	
☐ 063	n-Butylacetate[0.5]	☐	☐	
☐ 071	Carbon Disulfide[5.0]	☐	☐	
☐ 073	Carbon Tetrachloride[1.5]	☐	☐	
☐ 083	Chlorobenzene[2.0]	☐	☐	
☐ 087	Chloroethane[20]	☐	☐	
☐ 093	2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐ 096	Chloroform[1.0]	☐	☐	
☐ 108	o-Chlorotoluene[1.0]	☐	☐	
☐ 110	p-Chlorotoluene[1.0]	☐	☐	
☐ 147	Dibromochloromethane[2.0]	☐	☐	
☐ 148	1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐ 153	o-Dichlorobenzene[2.0]	☐	☐	
☐ 155	m-Dichlorobenzene[2.0]	☐	☐	
☐ 157	p-Dichlorobenzene[2.0]	☐	☐	
☐ 165	1,1-Dichloroethane[1.0]	☐	☐	
☐ 167	1,2-Dichloroethane[1.0]	☐	☐	
☐ 169	1,1-Dichloroethylene[1.0]	☐	☐	
☒ 171	1,2-Dichloroethylene[1.0]	☐	☐	1.0
☐ 174	Dichloroiodomethane	☐	☐	[not quantified]
☐ 181	1,2-Dichloropropane[1.0]	☐	☐	
☐ 183	cis-1,3-Dichloropropene[2.5]	☐	☐	
☐ 185	trans-1,3-Dichloropropene[2.5]	☐	☐	
☐ 233	Ethylbenzene[1.0]	☐	☐	
☐ 427	Fluorotrichloromethane[1.0]	☐	☐	
☐ 298	Isopropylbenzene[1.0]	☐	☐	
☐ 319	Methylethylketone (MEK)[12]	☐	☐	
☐ 393	Styrene[2.0]	☐	☐	
☐ 396	1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐ 397	1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒ 399	Tetrachloroethylene[1.0]	☐	☐	1.0
☐ 401	Tetrahydrofuran (THF)[200]	☐	☐	
☒ 411	Toluene[1.0]	☐	☐	1.0
☐ 421	1,1,1-Trichloroethane[1.0]	☐	☐	
☐ 423	1,1,2-Trichloroethane[1.5]	☐	☐	
☒ 425	Trichloroethylene[1.0]	☐	☐	1.0
☐ 428	Trichlorotrifluoroethane[3.0]	☐	☐	
☐ 434	Vinyl Chloride	☐	☐	[not quantified]
☐ 437	Xylenes[2.0]	☐	☐	
☐ ___		☐	☐	
☐ ___		☐	☐	

Comments: [redacted]

Date Received and Sample No.: [redacted] APR 22 1986

CC. DIST. OWNER DPD APR 30 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene
Madison, Wisconsin 53706

Department of Natural Resources — Form 3300-65 — Rev. 5-84

Facility I.D. Number: 037040740
County Code: 37 County: Marathon
Collection Date: 04/21/86 (M M D D Y Y)
Time (24 Hr. Clock): 14:15 Field No.

Water System Name: W6510
P.O. or Municipality: Wausau
Sample Source Address:
(or) Well No.
Sampling Point Description: Monitoring well sampled w/ teflon bailer

Send Report To:
Name: Bill Dobbins
Address: Box 818
City, State, Zip Code: Rhinelander, WI 54501

Collected By: Owens
Account Number: 060080

Water System Type (check ✓ one)
- ☐ M Community – Municipal
- ☐ O Community – Other Than Municipal
- ☐ N Non-Community
- ☐ P Private
- ☒ X Non-Potable Well

Sample Type (check ✓ one)
- ☐ D Distribution Sample
- ☒ W Raw Water

Analysis Type (check ✓ one)
- ☐ GC/MS Screening
- ☐ Confirmation of GC/MS Screening Sample Number (fill in)
- ☒ Other (Follow Up, Misc.

Detection Limits (ug/l) are indicated in brackets [ ]

		Detected	Not Detected	(ug/l)
☐	007 Acrolein[50]	☐	☐	
☐	009 Acrylonitrile[20]	☐	☐	
☐	025 Benzene[1.0]	☐	☐	
☐	046 Bromobenzene[4.0]	☐	☐	
☐	061 Bromodichloromethane[1.5]	☐	☐	
	063 Bromoform[5.0]	☐	☐	
☐	055 Bromomethane[50]	☐	☐	
☐	063 n-Butylacetate[0.5]	☐	☐	
☐	071 Carbon Disulfide[5.0]	☐	☐	
☐	073 Carbon Tetrachloride[1.5]	☐	☐	
☐	083 Chlorobenzene[2.0]	☐	☐	
☐	087 Chloroethane[20]	☐	☐	
☐	093 2-Chloroethylvinyl Ether[4.0]	☐	☐	
☐	095 Chloroform[1.0]	☐	☐	
☐	108 o-Chlorotoluene[1.0]	☐	☐	
☐	110 p-Chlorotoluene[1.0]	☐	☐	
☐	147 Dibromochloromethane[2.0]	☐	☐	
☐	148 1,2-Dibromo-3-Chloropropane	☐	☐	[not quantified]
☐	153 o-Dichlorobenzene[2.0]	☐	☐	
☐	155 m-Dichlorobenzene[2.0]	☐	☐	
☐	157 p-Dichlorobenzene[2.0]	☐	☐	
☐	165 1,1-Dichloroethane[1.0]	☐	☐	
☐	167 1,2-Dichloroethane[1.0]	☐	☐	
☐	169 1,1-Dichloroethylene[1.0]	☐	☐	
☒	171 1,2-Dichloroethylene[1.0]	☐	☐	<1.0
☐	174 Dichloroiodomethane	☐	☐	[not quantified]
☐	181 1,2-Dichloropropane[1.0]	☐	☐	
☐	183 cis-1,3-Dichloropropene[2.5]	☐	☐	
☐	185 trans-1,3-Dichloropropene[2.5]	☐	☐	
☐	233 Ethylbenzene[1.0]	☐	☐	
☐	427 Fluorotrichloromethane[1.0]	☐	☐	
☐	298 Isopropylbenzene[1.0]	☐	☐	
☐	319 Methylethylketone (MEK)[12]	☐	☐	
☐	393 Styrene[2.0]	☐	☐	
☐	396 1,1,1,2-Tetrachloroethane[3.0]	☐	☐	
☐	397 1,1,2,2-Tetrachloroethane[3.0]	☐	☐	
☒	399 Tetrachloroethylene[1.0]	☐	☐	<1.0
☐	401 Tetrahydrofuran (THF)[200]	☐	☐	
☒	411 Toluene[1.0]	☐	☐	<1.0
☐	421 1,1,1-Trichloroethane[1.0]	☐	☐	
☐	423 1,1,2-Trichloroethane[1.5]	☐	☐	
☒	425 Trichloroethylene[1.0]	☐	☐	<1.0
☐	428 Trichlorotrifluoroethane[3.0]	☐	☐	
☐	434 Vinyl Chloride	☐	☐	[not quantified]
☐	437 Xylenes[2.0]	☐	☐	
☐		☐	☐	
☐		☐	☐	

Comments:

Date Received and Sample No.: [redacted] APR 22 1986

Date Reported: DPD MAY 1 1986

R.H. Laessig, PhD, Director
Wisconsin State Laboratory of Hygiene

CC: DIST. - OWNER

APPENDIX A.6

MISCELLANEOUS REPORTS AND CORRESPONDENCE, WAUSAU CHEMICAL CORP.

Department of Natural Resources
INTRA-DEPARTMENT
MEMORANDUM

Madison
Station

Date May 23, 1975 IN REPLY REFER TO: 3200

TO: Tom Bashau

FROM: Carl Elskamp

SUBJECT: Sample #69651

Solvent concentrations in PPM by weight (in the water, not headspace):

Perchloroethylene	31.5
Trichloroethylene	25.6
Toluene	24.7
Xylene	7.1

From Handbook of Organic Industrial Solvents (American Mutual Ins. Alliance Technical Guide #6):

	Flammable Limits % Volume by Air		
	Lower	Upper	Flash Point °F
Perchloroethylene	---	---	non-flammable
Toluene	1.2	7.1	40
Trichloroethylene	12.5*	90*	90*
Xylene	1.0	9.9	81

* By conventional methods, trichloroethylene has not a flash point, but under certain conditions its vapors can explode. (Bureau of Mines Report of Investigation 6190) Unstabilized trichloroethylene can be violently decomposed by aluminum fires.

Note: Headspace of previous sample had 4000ppm (0.4%) toluene.

Carl Elskamp

CE:nn

NOTED:

Carl Elskamp _____
date

WAUSAU CHEMICALS

WAUSAU CHEMICAL CORPORATION

BOX 953 • 2001 RIVER DRIVE • WAUSAU, WISCONSIN 54401
PHONE 715/842-2285 • WIS. WATS 800/472-1646 • OUT OF STATE WATS 800/826-0007

May 4, 1984

Wis. Dept. of Natural Resources

MAY 07 1984

ANTIGO AREA HEADQUARTERS
ANTIGO, WISCONSIN

Mr. Jack Saltes
State of Wisconsin
Department of Revenue
Antigo, WI 54409

RE: Report on Excavation of Perchloroethylene Contaminated Soil.

Dear Mr. Saltes:

Ed Kreul asked for a report on the excavation we did to remove soil contaminated from the perchloroethylene spill of December 19, 1983.

Enclosed is a sketch of the tank farm area showing the depth to which we excavated and the perchloroethylene content of the soil at the sites tested.

Also enclosed is the boring log and soil analysis done February 16, 1984.

The tank farm project has taken on the scope of an overall expansion and will take much longer than anticipated. However, we are not storing any chemicals in bulk during the interim so this should be of minimum concern.

Sincerely,

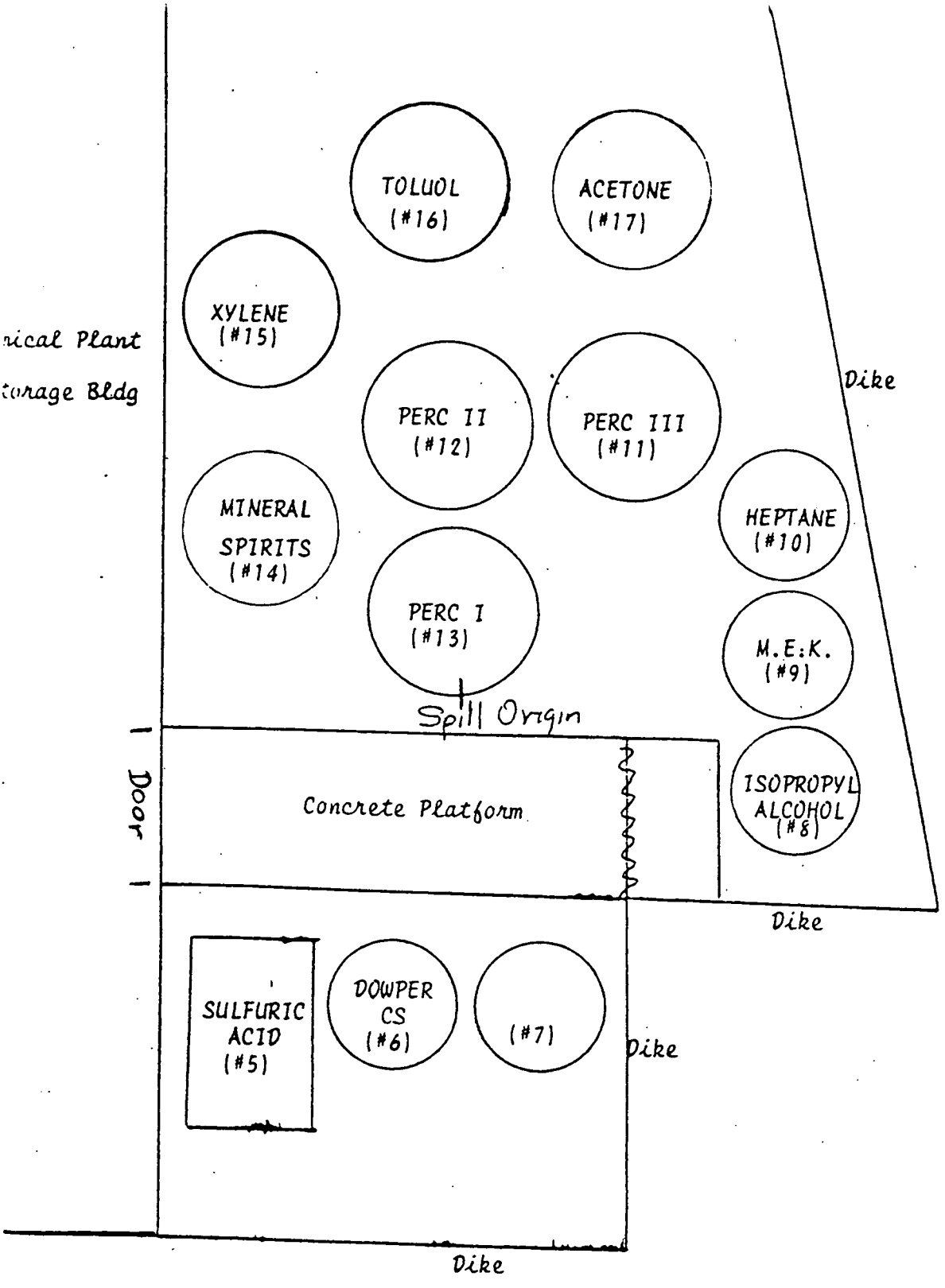
WAUSAU CHEMICAL CORPORATION

ART FLASHINSKI
Materials Manager

AF/crk

Enclosures

xc: Gary Kulibert, Rhinelander
Ted Amman, Madison SW/3



WAUSAU CHEMICAL COMPANY, INCORPORATED

WAUSAU, WISCONSIN

TANK-FARM : EPA - SPCC PLAN

SCALE: 1" = 10'

7/15/75
ROO

EXCAVATION AND ANALYSIS DESCRIPTION: (SEE CHART I & TABLE I)

Initial excavation was the Area E to about 2 feet East of the door all the way to ground water. Samples #1 and #2 showed significant solvent so excavation was continued in the West direction to ground water depth until samples did not have odor. Composite sample #3 showed a low level of solvent.

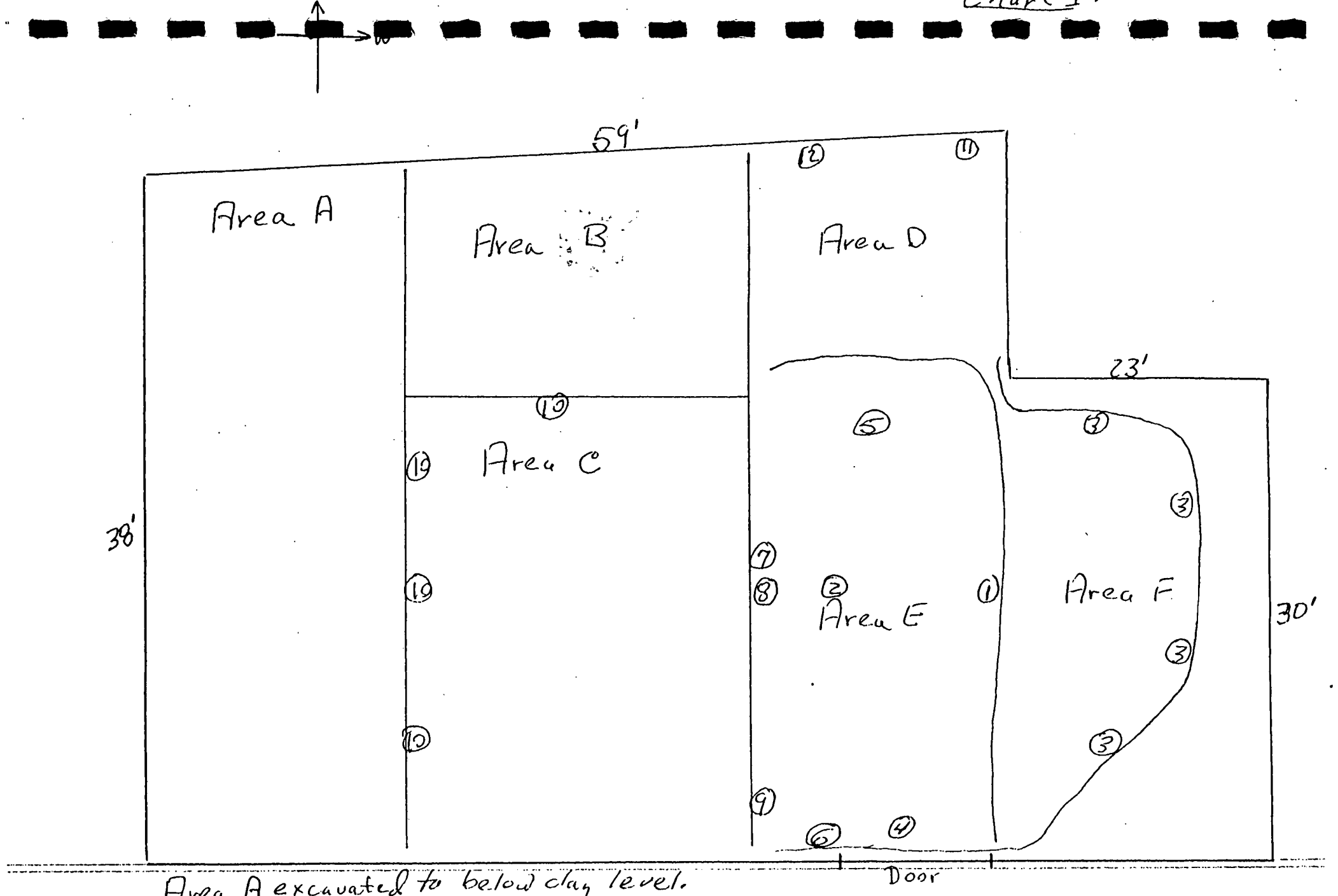
Initially area E was excavated to within 2 feet of the building. Sample #4 showed high solvent so another foot was taken out--as much as we dared as there was serious risk of collapsing the building.

Area E was further excavated to the East about 6-8 feet past the door all the way to ground water. Analysis 7, 8 and 9 confirmed a low solvent level.

The soil in area A, B and C did not have any odor until the clay layer was reached. This layer had significant odor in the C area and then was considerable odor below the clay in this area. Excavation proceeded to about 3-4 feet above ground water. Composite sample #10 showed solvent level was low.

The clay layer was removed in the A & B areas even though the odor detected was not great. Spot digging in these areas did not show any odor so analyses were not run.

Area D had strong odor and was removed to ground water. Sample #11 showed high solvent so another foot was removed. Odor level indicated that solvent level was low and no further analyses were made.



Area A excavated to below clay level.
" B " " " " "
" C " " 3-4' above ground water.
" D, E, F was excavated to ground water.

Table 1

Tetrachloroethylene in Soil

Date	Sample No.	Description	Tetrachloroethylene (ppm)	Analytical No.
4/2/84	1	West side - 10 ft.	1800 2000 (duplicate)	2598 (1)
	2	East bank - 6 ft.	1700	2599 (2)
4/3/84	1	West end - 15 ft.	<17	2611 (3)
	2	North wall - 12 ft.	1800	2612 (4)
	3	South side - 12 ft.	780	2613 (5)
4/4/84	1	North wall - 3 ft. from bottom	<20 <20 (duplicate)	2638 (6)
	2	East side - 3 ft. from bottom	<20	2639 (7)
	3	East wall - 12 ft.	<20	2719 (8)
	4	East wall - 3 ft. from bottom	250 270 (duplicate)	2720 (9)
4/4/84	1	Pile from North wall	830	2721
	2	Pile from North wall	500	2722
4/6/84	1	~~North~~ South and east sides - 3 ft. from bottom	500	2876 (10)
	2	~~North~~ South wall - 3 ft. from bottom	1300 1100 (duplicate)	2877 (11)
	3	~~South~~ South wall - 3 ft. from bottom	530	2878 (12)

ZIMPRO INC.
A SUBSIDIARY OF STERLING DRUG INC.
POLLUTION CONTROL SYSTEMS

RECEIVED
Wis. Dept. of Natural Resources
MAR 20 1984
N. C. Dist. Hdqtrs.
RHINELANDER, WI

March 19, 1984

Dept. of Natural Resources
Attn: Cathy Endress
Box 818
Rhinelander, WI 54501

Re: Wausau Chemical Analysis

Attached is my final report for the samples submitted by the Wisconsin DNR. Sorry about the delay but I had another computer malfunction which prevented me from getting to all of the data. If you have any questions concerning the results, please feel free to call.

Sincerely,

ZIMPRO INC.

David L. Schumacher /ls

David L. Schumacher

DLS/ls

cc: J.W. Barr
J.R. Salkowski

Enclosure

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474
TELEPHONE (715) 359-7211 TELEX 29-0495

Wausau Chemical

Soil and Rinse Analysis

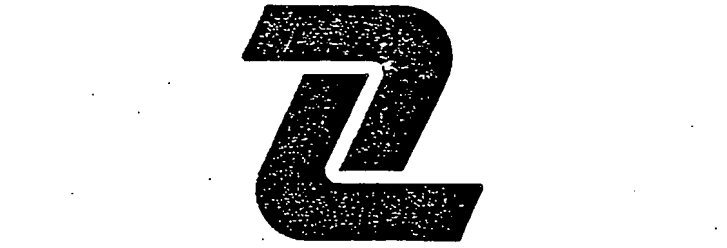
Prepared for the

Wisconsin Department of Natural Resources

By

David L. Schumacher

March 19, 1984



ENVIRONMENTAL CONTROL SYSTEMS
SUBSIDIARY OF STERLING DRUG INC.
ROTHSCHILD, WISCONSIN USA 54474
PHONE 715/359-7211 TELEX 29-0495

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Introduction

Soil samples collected from two borings at Wausau Chemicals were analyzed by gas chromatography - mass spectrometry (GC-MS) for volatile organics. In addition, the rinse water used to clean the drilling apparatus was also analyzed to insure no cross contamination took place. Analytical procedures and results are presented in the report as well as a copy of the chain of custody record (Appendix III).

Analytical Procedures

Soil and rinse samples were analyzed using EPA Methods 5030 (Purge and Trap) and 8240 (volatile GC-MS). The rinse vials were sampled directly and spiked with an internal standard just prior to purging. The soil samples required extraction with methanol before analysis and is described below.

Approximately 2 g of soil was placed into a preweighed 45 ml vial containing 20 ml of nanograde methanol (Burdick and Jackson). Another 20 ml of methanol was added to the vial and sealed with a teflon coated septum. The vial was shaken for one minute and allowed to stand for at least ½ hour. A centrifuge was used to help settle the soil particles before decanting the methanol eluent into a 15 ml crimp top vial. The vials were stored in a freezer at -15°C until analysis by GC methods. The vials containing the soil were dried in an oven and reweighed. The dry weight of the soil was used for determining the concentration of contaminants.

The methanol extracts were ultimately analyzed by the purge and trap method. However, due to the high concentration of organics the methanol extracts were diluted in organic free water in order to prevent saturation of the GC-MS detector. The dilution factor was aided by screening of the extract using a gas chromatograph equipped with a flame ionization detector. As with the rinse samples, an internal standard was added just prior to purging.

As required by EPA Method 8240 the GC-MS was tuned daily to bromofluorobenzene prior to analysis of any samples and standards (Appendix I). A system blank was also completed in order to insure the analytical instruments were free of contamination.

Organic free water field blanks were stored and analyzed in the same manner as the rinse samples. A field blank for the soil samples consisted only of an empty vial. The empty vial was filled with methanol as if there was soil present and poured into a 15 ml crimp vial. The methanol was diluted with organic free water before purging.

Calibration standards were obtained either as mixes (Supelco, Inc.) or prepared from pure compounds in methanol. Mineral spirits were determined by screening for the primary components, pentane and hexane.

Discussion of Results

Soil sample results are given in Tables 1-5. The primary components of interest are toluene, trichloroethylene, and tetrachloroethylene. The contamination levels of these three compounds are also summarized in Table 6 for easy comparison. The methanol extract from sample 7SO was analyzed in duplicate. Soil sample 9SO was prepared in duplicate. In both cases, acceptable reproducibility was achieved.

The detection limits for the soil analyses are dependent on two factors - the weight of soil extracted and the dilution factor. A less than value is given in each table indicating the detection limit for the compound in question. Some compounds (i.e. MEK, isopropanol) appear to have a relatively high level of detection. Compounds such as these do not purge as efficiently as chlorinated organics. Compounds that are water soluble will have a greater detection level than those not as water soluble.

Some interference was noted in the methanol used to perform the soil extractions. Traces of acetone, 1,2-dichloropropane, and methylene chloride were detected in sample 14SO (methanol blank). The methylene chloride contamination was fairly low and not detectable in all samples. Acetone and 1,2-dichloropropane contamination was much greater and are therefore not included in any of the results.

The rinse samples are summarized in Table 7. Detection limits for these samples did not vary and are given in the left column. There are generally traces of tetrachloroethylene detected in each sample. Sample 6R1 contained a much higher level of tetrachloroethylene (640 ppb) but this should not affect the 7S0 soil results. Minute traces of methylene chloride and toluene were detected in several of the rinse samples. It is possible that these compounds diffused through the septum during storage but none was detected in the field blank (14R1). In any case, the levels are so low to be of any consequence to the soil samples.

Table 1

DNR Soil Analysis (ug/g-soil)
Sample 3S2
Boring #1 6-7.5 ft.

Acrolein	<2200
Acrylonitrile	<2200
Benzene	<110
Bromodichloromethane	<110
Bromoform	<560
Bromomethane	<560
Carbon Disulfide	<220
Carbon Tetrachloride	<110
Chlorobenzene	<110
Chloroethane	<560
2-Chloroethylvinyl ether	<560
Chloroform	<110
Chloromethane	<560
o-Chlorotoluene	<220
p-Chlorotoluene	<220
Dibromochloromethane	<110
1,2-Dibromo-3-chloropropane	<560
o-Dichlorobenzene	<220
1,1-Dichloroethane	<110
1,2-Dichloroethane	<110
1,1-Dichloroethylene	<110
1,2-Dichloroethylene	<110
cis-1,3-Dichloropropene	<560
trans-1,3-Dichloropropene	<560
Ethylbenzene	<110
Isopropanol	<12,000
Isopropylbenzene	<220
Methylene chloride	<110
Methylethylketone (MEK)	<5700
Mineral Spirits	<340
Styrene	<220
1,1,2,2-Tetrachloroethane	<560
Tetrachloroethylene	57,000
Tetrahydrofuran	<2200
Toluene	170
1,1,1-Trichloroethane	<110
1,1,2-Trichloroethane	<110
Trichloroethylene	56
Trichlorotrifluoroethane	<220
Vinyl chloride	<560
m-Xylene	<220
o-Xylene	<220
p-Xylene	<220

Table 2

DNR Soil Analysis (ug/g-soil)
Sample 7SO
Boring #1 18-19.5 ft.

	7SO*	7SO*
Acrolein	<630	<630
Acrylontrile	<630	<630
Benzene	<32	<32
Bromodichloromethane	<32	<32
Bromoform	<160	<160
Bromomethane	<160	<160
Carbon Disulfide	<64	<64
Carbon Tetrachloride	<32	<32
Chlorobenzene	<32	<32
Chloroethene	<160	<160
2-Chloroethylvinyl ether	<160	<160
Chloroform	<32	<32
Chloromethane	<160	<160
o-Chlorotoluene	<64	<64
p-Chlorotoluene	<64	<64
Dibromochloromethane	<32	<32
1,2-Dibromo-3-chloropropane	<160	<160
o-Dichlorobenzene	<64	<64
1,1-Dichloroethane	<32	<32
1,2-Dichloroethane	<32	<32
1,1-Dichloroethylene	<32	<32
1,2-Dichloroethylene	<32	<32
cis-1,3-Dichloropropene	<160	<160
trans-1,3-Dichloropropene	<160	<160
Ethylbenzene	<32	22
Isopropanol	<3300	<3300
Isopropylbenzene	<64	<64
Methylene chloride	<13	<13
Methylethylketone (MEK)	<1600	<1600
Mineral Spirits	<95	<95
Styrene	<64	<64
1,1,2,2-Tetrachloroethane	<160	<160
Tetrachloroethylene	9500	8400
Tetrahydrofuran	<630	<630
Toluene	<15	<13
1,1,1-Trichloroethane	<32	<32
1,1,2-Trichloroethane	<32	<32
Trichloroethylene	19	16
Trichlorotrifluoroethane	64	<64
Vinyl chloride	<160	<160
m-Xylene	85	76
o-Xylene	66	60
p-Xylene	<32	57

* Duplicate Analysis of Methanol Extract

Table 3

DNR Soil Analysis (ug/g-soil)
Sample 9SO
Boring #2 3-4.5 ft.

	9SO-1*	9SO-2*
Acrolein	<400	<340
Acrylonitrile	<400	<340
Benzene	<20	<17
Bromodichloromethane	<20	<17
Bromoform	<100	<86
Bromomethane	<100	<86
Carbon Disulfide	<40	<34
Carbon Tetrachloride	<20	<17
Chlorobenzene	<20	<17
Chloroethane	<100	<86
2-Chloroethylvinyl ether	<100	<86
Chloroform	<20	<17
Chloromethane	<100	<86
o-Chlorotoluene	<40	<34
p-Chlorotoluene	<40	<34
Dibromochloromethane	<20	<17
1,2-Dibromo-3-chloropropane	<100	<86
o-Dichlorobenzene	<40	<34
1,1-Dichloroethane	<20	<17
1,2-Dichloroethane	<20	<17
1,1-Dichloroethylene	<20	<17
1,2-Dichloroethylene	<20	<17
cis-1,3-Dichloropropene	<100	<86
trans-1,3-Dichloropropene	<100	<86
Ethylbenzene	<20	<17
Isopropanol	<2100	<1800
Isopropylbenzene	<40	<34
Methylene chloride	20	15
Methylethylketone (MEK)	<1000	<870
Mineral Spirits	<60	<51
Styrene	<40	<34
1,1,2,2-Tetrachloroethane	<100	<86
Tetrachloroethylene	9,000	9,600
Tetrahydrofuran	<400	<340
Toluene	<20	<17
1,1,1-Trichloroethane	<20	<17
1,1,2-Trichloroethane	<20	<17
Trichloroethylene	<20	<17
Trichlorotrifluoroethane	<40	<34
Vinyl chloride	<100	<86
m-Xylene	<40	<34
o-Xylene	<40	<34
p-Xylene	<40	<34

* Duplicate soil sample

Table 4

DNR Soil Analysis (ug/g-soil)
Sample 13SO
Boring #2 15-16.5 ft.

	13SO
Acrolein	<430
Acrylonitrile	<430
Benzene	<22
Bromodichloromethane	<22
Bromoform	<110
Bromomethane	<110
Carbon Disulfide	<43
Carbon Tetrachloride	<22
Chlorobenzene	<22
Chloroethane	<110
2-Chloroethylvinyl ether	<110
Chloroform	<22
Chloromethane	<110
o-Chlorotoluene	<43
p-Chlorotoluene	<43
Dibromochloromethane	<22
1,2-Dibromo-3-chloropropane	<110
o-Dichlorobenzene	<43
1,1-Dichloroethane	<22
1,2-Dichloroethane	<22
1,1-Dichloroethylene	<22
1,2-Dichloroethylene	<22
cis-1,3-Dichloropropene	<110
trans-1,3-Dichloropropene	<110
Ethylbenzene	<22
Isopropanol	<2200
Isopropylbenzene	<43
Methylene chloride	24
Methylethylketone (MEK)	<1100
Mineral Spirits	<65
Styrene	<43
1,1,2,2-Tetrachloroethane	<110
Tetrachloroethylene	<22
Tetrahydrofuran	<430
Toluene	<22
1,1,1-Trichloroethane	<22
1,1,2-Trichloroethane	<22
Trichloroethylene	<22
Trichlorotrifluoroethane	<43
Vinyl chloride	<110
m-Xylene	<43
o-Xylene	<43
p-Xylene	<43

Table 5

DNR Soil Analysis (ug/ml)
Sample 14SO (Blank)

Acrolein	<10
Acrylonitrile	<10
Benzene	<0.5
Bromodichloromethane	<0.5
Bromoform	<2.5
Bromomethane	<2.5
Carbon Disulfide	<1
Carbon Tetrachloride	<0.5
Chlorobenzene	<0.5
Chloroethane	<2.5
2-Chloroethylvinyl ether	<2.5
Chloroform	<0.5
Chloromethane	<2.5
o-Chlorotoluene	<1
p-Chlorotoluene	<1
Dibromochloromethane	<0.5
1,2-Dibromo-3-chloropropane	<2.5
o-Dichlorobenzene	<1
1,1-Dichloroethane	<0.5
1,2-Dichloroethane	0.45
1,1-Dichloroethylene	<0.5
1,2-Dichloroethylene	<0.5
cis-1,3-Dichloropropene	<2.5
trans-1,3-Dichloropropene	<2.5
Ethylbenzene	<0.5
Isopropanol	<52
Isopropylbenzene	<1
Methylene chloride	1.2
Methylethylketone (MEK)	<26
Mineral Spirits	<1.5
Styrene	<1
1,1,2,2-Tetrachloroethane	<2.5
Tetrachloroethylene	<0.5
Tetrahydrofuran	<10
Toluene	<0.5
1,1,1-Trichloroethane	<0.5
1,1,2-Trichloroethane	<0.5
Trichloroethylene	<0.5
Trichlorotrifluoroethane	<1
Vinyl chloride	<2.5
m-Xylene	<1
o-Xylene	<1
p-Xylene	<1

Table 6

DNR Soil Analysis Summary (ug/g-soil)

Sample No.	3S2	7SO*		9SO-1**	9SO-2**	13SO
Boring No.	1	1		2	2	2
Depth (ft)	6-7.5	18-19.5		3-4.5	3-4.5	15-16.5
Toluene	170	16	13	<20	<17	<22
Trichloroethylene	56	19	16	<20	<17	<22
Tetrachloroethylene	57,000	9500	8400	9000	9600	<22

* Duplicate analysis of methanol extract

** Duplicate soil sample

Table 7

DNR Rinse Analysis (ug/l)

	Detection Limit	2R1	2R2	6R1	8R1	12R1	14R
Acetone	20	ND	ND	ND	ND	ND	ND
Acrolein	20	ND	ND	ND	ND	ND	ND
Acrylonitrile	20	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND
Bromoform	5	ND	ND	ND	ND	ND	ND
Bromomethane	5	ND	ND	ND	ND	ND	ND
Carbon Disulfide	2	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND	ND	ND	ND
Chlorobenzene	1	ND	ND	ND	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND
2-Chloroethylvinyl ether	5	ND	ND	ND	ND	ND	ND
Chloroform	1	ND	ND	ND	ND	ND	ND
Chloromethane	5	ND	ND	ND	ND	ND	ND
o-Chlorotoluene	2	ND	ND	ND	ND	ND	ND
p-Chlorotoluene	2	ND	ND	ND	ND	ND	ND
Dibromochloromethane	1	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	5	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene	2	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	1	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	1	ND	ND	ND	ND	ND	ND
1,2-Dichloroethylene	1	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	1	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5	ND	ND	ND	ND	ND	ND
Ethylbenzene	1	ND	ND	ND	ND	ND	ND
Isopropanol	103	ND	ND	ND	ND	ND	ND
Isopropylbenzene	2	ND	ND	ND	ND	ND	ND
Methylene chloride	1	3.3	3.7	ND	1.0	1.6	ND
Methylethylketone (MEK)	51	ND	ND	ND	ND	ND	ND
Mineral Spirits	3	ND	ND	ND	ND	ND	ND
Styrene	2	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	1	19	20	640	44	3.4	ND
Tetrahydrofuran	20	ND	ND	ND	ND	ND	ND
Toluene	1	1.3	1.0	2.5	ND	ND	ND
1,1,1-Trichloroethane	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	1	ND	ND	ND	ND	ND	ND
Trichloroethylene	1	ND	ND	1.0	ND	ND	ND
Trichlorotrifluoroethane	2	ND	ND	ND	ND	ND	ND
Vinyl chloride	5	ND	ND	ND	ND	ND	ND
m-Xylene	2	ND	ND	ND	ND	ND	ND
o-Xylene	2	ND	ND	ND	ND	ND	ND
p-Xylene	2	ND	ND	ND	ND	ND	ND

ND = not detected

Appendix I

Bromofluorobenzene GC-MS Tuning Ions

Mass	Criteria	Actual		
		2/23/84	2/24/84	2/25/84
50	15-40% of 95	33%	34%	33%
75	30-60% of 95	47%	47%	45%
95	Base Peak, 100%	100%	100%	100%
96	5-9% of 95	9%	9%	7%
173	<2% of 174	<2%	<2%	<2%
174	>50% of 95	88%	93%	95%
175	5-9% of 174	8%	7%	9%
176	95-100% of 174	100%	98%	96%
177	5-9% of 176	8%	6%	9%

Appendix II

GC-MS and Purge and Trap Conditions

Finnigan 4021 GC/MS/DS
Ionization: Electron Impact @ 70eV
6' X 2 mm ID Glass Column, 1% SP-1000 on Carbopack B (60/80)
Column Temperature: 4 min. at 45°C, 10°C/min to 220°C
Carrier Gas: Helium @ 20 cc/min
Scan Range: 35-350 amu in 2.0 seconds

Tekmar LSC-2
Volume: 5.0 ml
Purge Gas: Helium @ 30 cc/min for 13.0 minutes
Desorb: 180°C for 4.0 minutes
Trap Bake: 225°C
Valve Heater: 85°C
Trap Material: Tenax/Silica Gel/Charcol

Appendix III

CHAIN OF CUSTODY RECORD

PROJ. NO.: 12776 | PROJECT NAME: Wolman Chemical Corp

SAMPLERS: (Signature) Richard C Kimball

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
Boring No. 2	2/11/84	11:55		✓	Boring No. 2 Sample #8	1	Sample No. 8 Depth 0-1.5'
"	"	12:06			Rinse Sample BR1 & BR2	2	Rinse Sample
Boring No. 2	"	12:10		✓	Boring No. 2 Sample #9	1	Sample No 9 Depth 3-4.5'
"	"	12:22			Rinse Sample 9R1 & 9R2	2	Rinse Sample
Boring No. 2	"	12:25		✓	Boring No. 2 Sample #10	1	Sample No. 10 Depth 6-7.5' (No Grab)
"	"	12:35			Rinse Sample 10R1 & 10R2	2	Rinse Sample
Boring No. 2		12:30		✓	Boring No. 2 Sample #11	1	Sample No. 11 Depth 9-10.5'
"	"	12:50			Rinse Sample 11R1 & 11R2	2	Rinse Sample
Boring No. 2	2/11/84	12:40		✓	Boring No. 2 Sample #12	1	Sample No. 12 Depth 12-13.5'
"	"	12:58			Rinse Sample 12R1, 12R2	2	Rinse Sample
Boring No. 2	2/11/84	1:00		✓	Boring No. 2 Sample #13	1	Sample No. 13 Depth 15-16.5'
Boring 2	"	1:15			Rinse Sample 13R1 & 13R2	2	Rinse Sample
					Field Blank FCL Rinse Sample		#14R1 & 14R2
					Field Blank FCL Soil Sample		#14

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Richard C Kimball	2-16-84 2:00	Edward L. Kreul			
Relinquished by: (Signature) Edward L. Kreul	Date / Time 2-16-84 2:30	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time 2-16-84 2:30	Remarks	

Appendix III

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
12776	Wausau Chemical Corp.

SAMPLERS: (Signature) Richard C. Krause

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
Boring No. 1	2/16/84	8:00		✓	Field Blank No. 1	1	For Soil Samples
					Rinse Sample 1R1 + 1R2	2	Rinse Sample
"	2/16/84	8:45		✓	Boring # 1 Sample 1 + 1A	2	Soil Samples Depth 0-1.5'
Boring No. 1	2/16/84	9:00		✓	Boring # 1 Sample 2	1	Soil Sample Depth 3-4.5'
"	"	9:30			Rinse Sample 2R1 + 2R2	2	Rinse Sample
Boring 1	2/16/84	9:27		✓	Boring No 1 Sample 3 + 3A	2	Soil Sample # 3 (6.0-6.5') # 3A (6.5-7.5)
Boring 1	2/16/84	9:52			Rinse Sample 3R1 + 3R2	2	Rinse Sample
Boring 1	2/16/84	9:50		✓	Boring No 1 Sample 4 + 4A	2	Soil Sample # 4 (9.0-10.0') # 4A (10-10.5')
Boring 1	2/16/84	10:00			Rinse Sample 4R1 + 4R2	2	Rinse Sample
Boring 1	2/16/84	10:05		✓	Sample - 5	1	Soil Sample Depth 12'-13.5'
"	"	10:18			Rinse Sample 5R1 + 5R2	2	Rinse Sample
Boring 1	2/16/84	10:20		✓	Sample 6 + 6A	2	Soil Sample Depth 15-16.5'
Boring 1	2/16/84	10:42			Rinse Sample 6R1 + 6R2	2	Rinse Sample
Boring 1	2/16/84	10:30		✓	Sample 7	1	Soil Sample Depth 18-19.5'
Boring 1	2/16/84	10:51			Rinse Sample 7R1 + 7R2	2	Rinse Sample

Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Richard C. Krause	2-16-84 2:00	Edward J. Kraus
Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Edward J. Kraus	2-16-84 2:30	
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)
		Date / Time: 2/16/84 2:30

Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Remarks

Appendix III

CHAIN OF CUSTODY RECORD

PROJ. NO.

PROJECT NAME: Wausau Chemical Corp

SAMPLERS: (Signature) Edward J. Kearl

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
Boring #1	2/16/84	8:50		✓	Boring #1 Sample #-150	1	0-1½ ft, fill material
Boring #1		9:00		✓	Boring #1 Sample #250	1	3-4½ ft, fill material
Boring #1		9:27		✓	Boring #1 Sample #351	1	6-7½ ft, top soil
Boring #1		9:27		✓	Boring #1 Sample #352	1	6-7½ ft, brown silty sand (subsoil)
Boring #1		9:30		✓	Boring #1 Sample #450	1	9-10½ ft, black silt w/organic fraction
Boring #1		10:05		✓	Boring #1 Sample #550	1	12-13½ ft, sand & gravel
Boring #1		10:20		✓	Boring #1 Sample #650	1	15-16½ ft, sand & gravel
Boring #1	↓	10:30		✓	Boring #1 Sample #750	1	18-19½ ft, sand & gravel
Boring #2	2/16/84	11:55		✓	Boring #2 Sample #850	1	0-1½ ft, surface sand & gravel
Boring #2		12:10		✓	Boring #2 Sample #950	1	3-4½ ft, silty topsoil
Boring #2		12:25		✓	Boring #2 Sample #1050	1	6-7½ ft, sand & gravel
Boring #2		12:30		✓	Boring #2 Sample #1150	1	9-10½ ft, sand & gravel
Boring #2		12:40		✓	Boring #2 Sample #1250	1	12-13½ ft, sand & gravel
Boring #2	↓	1:00		✓	Boring #2 Sample #1350	1	15-16½ ft, sand
					Field Blank - Sample #1450	1	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Edward J. Kearl	2-16-84 2:30				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) Dave Schumacher	Date / Time 2-16-84 2:30	Remarks	

CX

MARATHON ELECTRIC

March 22, 1988

Ms. Janet Haff (5HE-12)
Waste Management Division
United States
Environmental Protection Agency
230 South Dearborn
Chicago, Illinois 60604

Re: Supplemental Response to
Information Request

Dear Ms. Haff:

Enclosed please find Marathon Electric Manufacturing Corporation's supplemental response to the February 29, 1988 information request. Due to the very short time period allowed for response, all of the information could not be included in the response you received last week.

Very truly yours,

David L. Eisenreich

jbs

Enclosure

RECEIVED
MAR 24 1988
U.S. EPA, REGION V
WASTE MANAGEMENT DIVISION
OFFICE OF THE DIRECTOR

MARATHON® ELECTRIC
)OX 8003 WAUSAU, WISCONSIN 54402-8003

Ms. Janet Haff (5HE-12)
Waste Management Division
United States
Environmental Protection Agency
230 South Dearborn
Chicago, Illinois 60604

SUPPLEMENT TO
MARATHON ELECTRIC MANUFACTURING CORPORATION'S
RESPONSE TO THE
ENVIRONMENTAL PROTECTION AGENCY'S
REQUEST FOR ADDITIONAL INFORMATION

Marathon Electric Manufacturing Corporation ("Marathon Electric"), by the undersigned authorized representative, submits the following supplemental information to its response to the Environmental Protection Agency's request for additional information dated February 29, 1988:

Request Nos. 2 and 3: Attached is Exhibit B which is referred to in the initial answer to these request numbers two and three.

Request No. 4: The answer to this request is clarified as follows:

The following is a list of all existing underground tanks on the present Marathon Electric property:

(1) two 20,000-gallon fuel oil tanks;

(2) one 500-gallon gasoline tank;

(3) one 8,000-gallon (approximate) xylene tank.

Information from past documents indicates the following tanks may have been present on the Marathon Electric property.

(1) three fuel tanks located on the north side of the Assembly Building--all removed during construction of the plant cafeteria;

(2) two fuel tanks located on the east side (parking area for offices)--believed to have been filled with sand prior to blacktopping in 1964;

(3) one paint tank located on the west side of the Model Building;

(4) one paint tank located inside of the building north of the underground boiler room--this tank was designed to be used in the event of an oven fire;

(5) one varnish tank located inside the building north of the underground boiler room;

(6) one paint tank located inside the building in the Model Shop area--this tank was designed to be used in the event of an oven fire.

VERIFICATION

STATE OF WISCONSIN)
) SS.
COUNTY OF MARATHON)

I, DAVID EISENREICH, being duly sworn on oath, state the following:

1. I am the Vice President-Administration for Marathon Electric Manufacturing Corporation ("Marathon Electric") and am authorized to execute this affidavit.

2. The above answers have been prepared with the assistance and advice of counsel. Subject to inadvertent or undisclosed error, the responses are based on and, therefore, necessarily limited by, the records and information still in existence, presently recollected and thus far discovered in the course of preparing these responses. Marathon Electric reserves the right to make any changes in these responses if it appears at any time that omissions or errors have occurred and more accurate information is available. In this respect, Marathon Electric notes that these responses have had to be prepared within the very short time period mandated by the Agency and that due to this, errors or omissions may have occurred which would not have occurred if more time would have been allowed to respond. Subject to the limitations

set forth above and the privileges asserted herein, I certify to the best of my knowledge and belief that the above responses are true and correct.

David Eisenreich

David Eisenreich

Subscribed and sworn to before me
this 22nd day of March, 1988.

Diane C. Krueger

NOTARY PUBLIC, State of Wisconsin
My Commission is/expires 1/19/92

APPENDIX B

SUPPLEMENTAL INFORMATION ON MARATHON ELECTRIC SITE

MARCH 17, 1988

TABLE OF CONTENTS

1. Borings, Wells, and Sample Location Map

2. Boring Logs for Wells R-5S, R-6S, and R-7S

3. Surface Soil Sample Results for PCE, TCE, and DCE

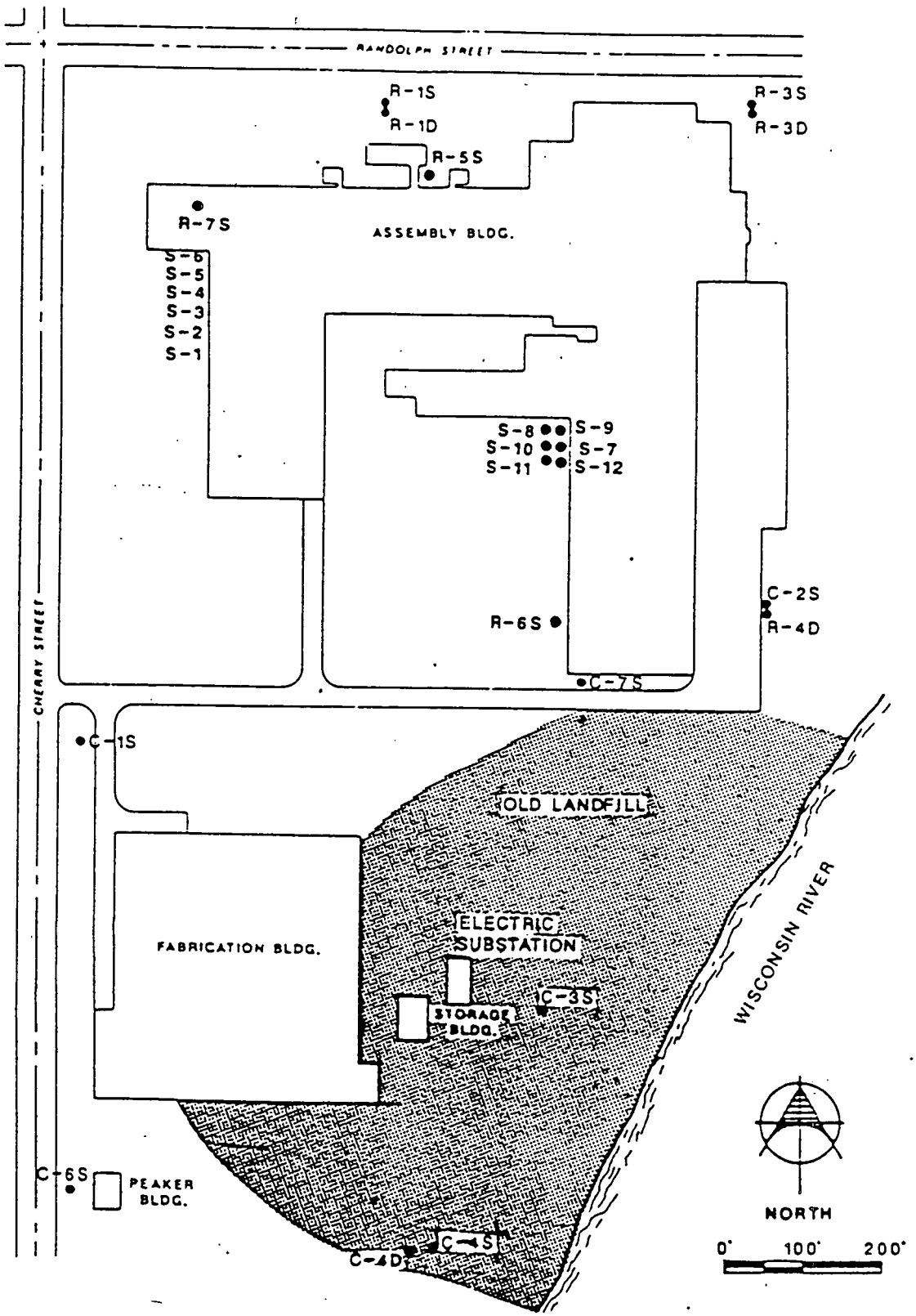
4. Table of HNU PID readings for borings

5. Soil Chemical (PCE, TCE, and DCE) Analysis Results for Samples from R-5S, R-6S, and R-6S

6. Ground Water Sample Results for PCE, TCE, and DCE

222.04 101:RTE:foley

BORINGS, WELLS, AND SAMPLE LOCATION MAP



● S-1 SURFACE SAMPLE LOCATIONS

● LOCATIONS OF MONITORING WELLS

RMT INC.

Dwn. by	JM
Date	5/7/87
Proj #	222.04

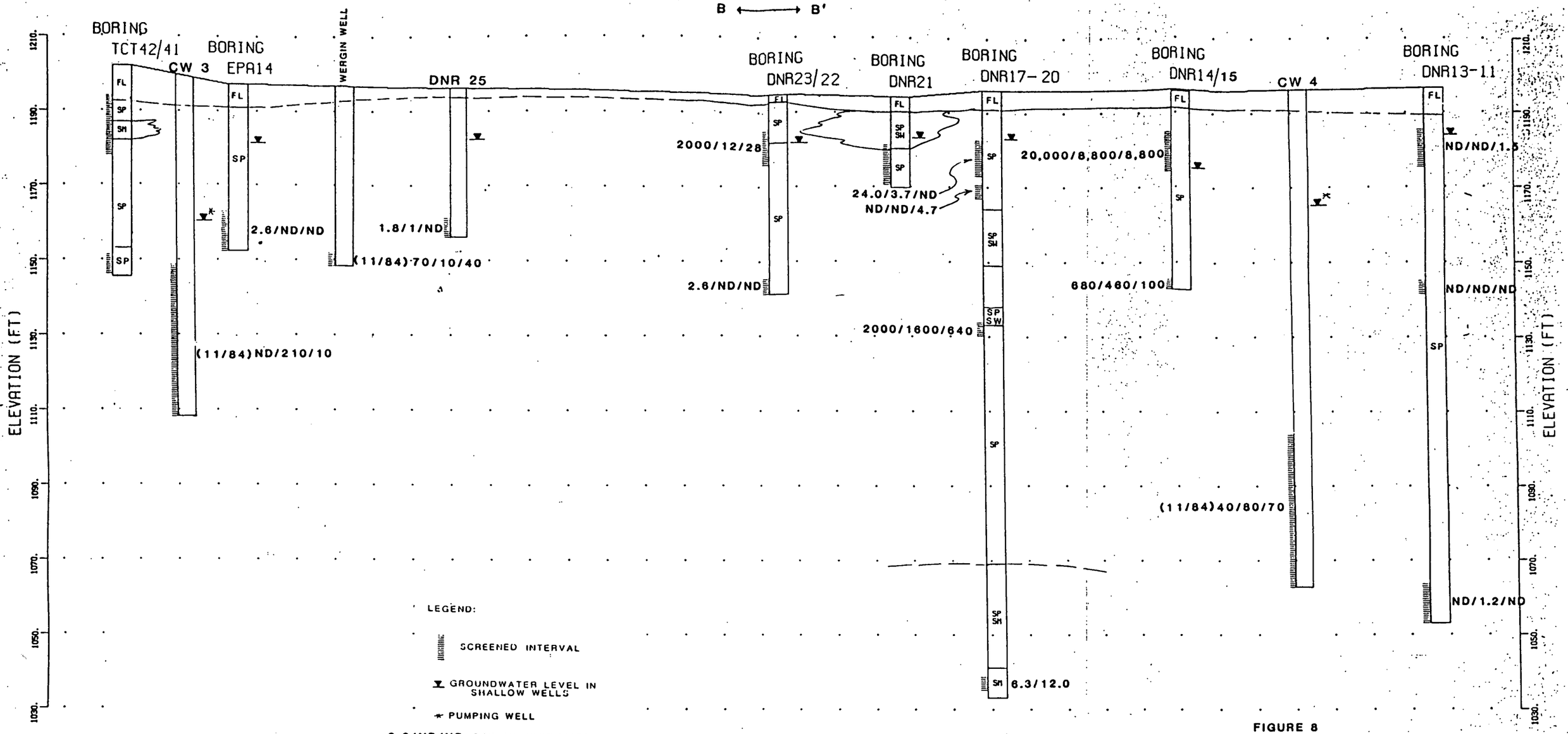
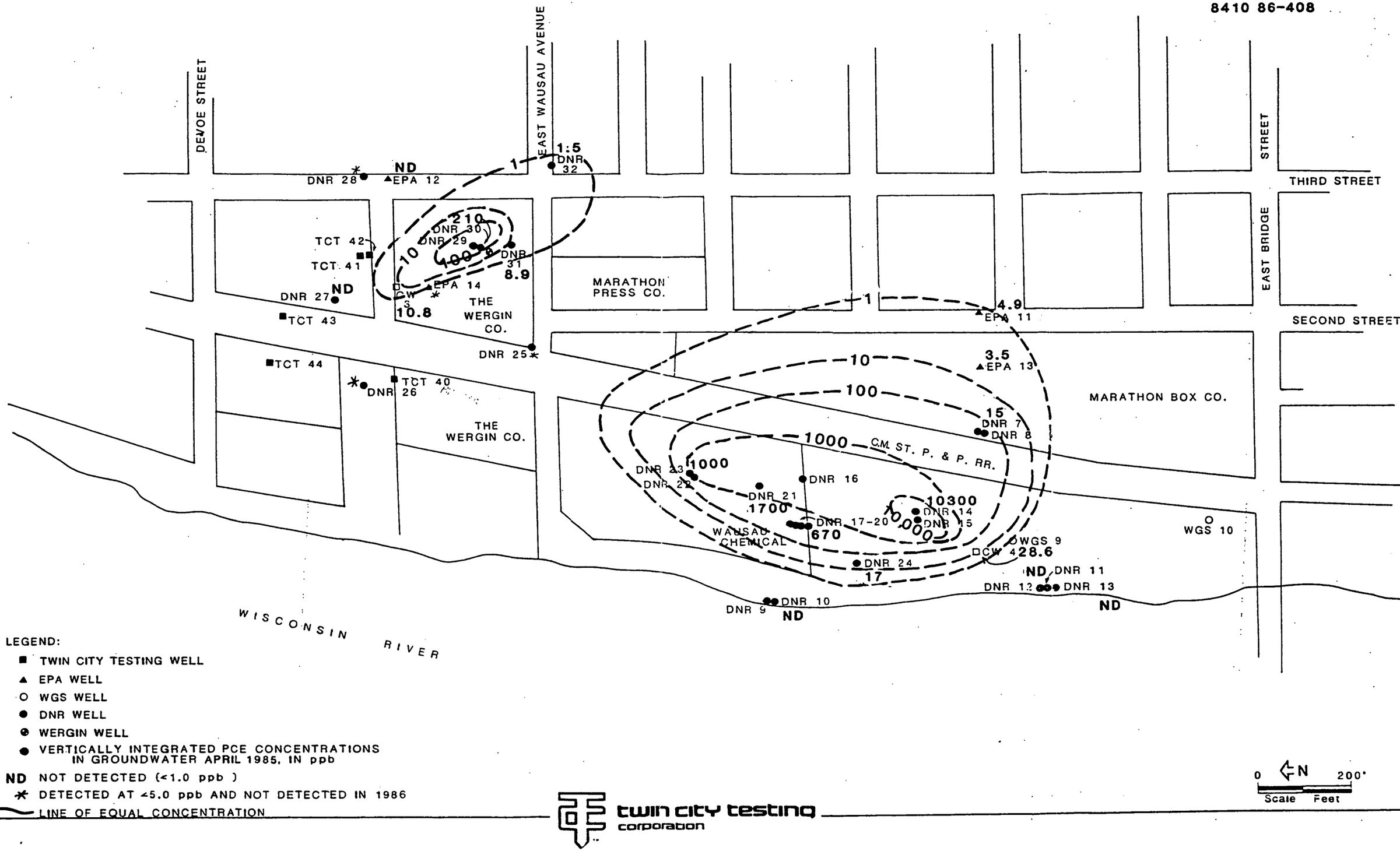


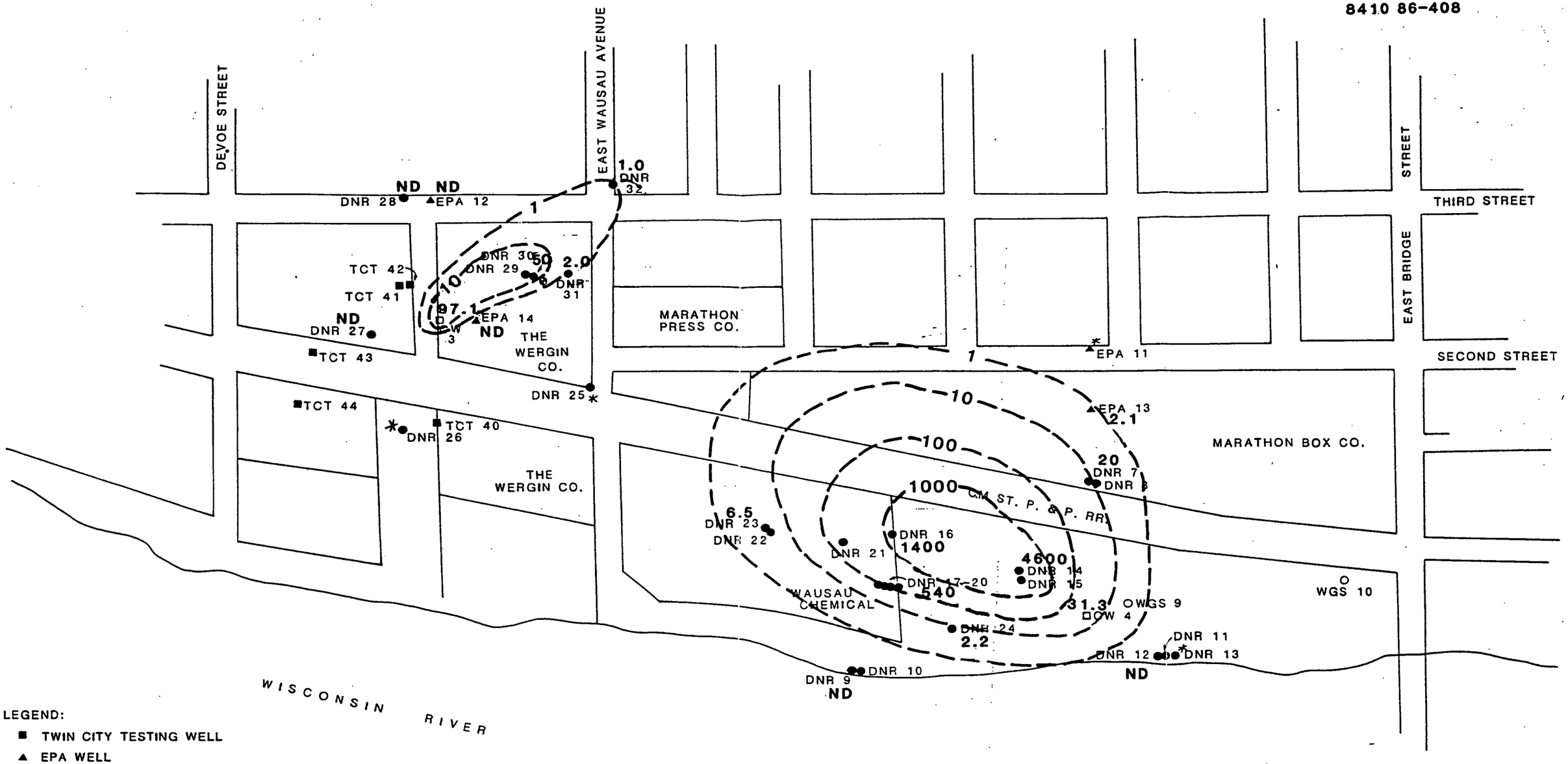
FIGURE 8
VERTICAL DISTRIBUTION OF 4/85 WATER QUALITY DATA
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN
8410 86-408

FIGURE 9
AREAL DISTRIBUTION OF INTEGRATED PCE CONCENTRATIONS WAUSAU EAST WELL FIELD WAUSAU, WISCONSIN 8410 86-408



twin city testing corporation

FIGURE 10
AREAL DISTRIBUTION OF INTEGRATED TCE CONCENTRATIONS
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN
8410 86-408



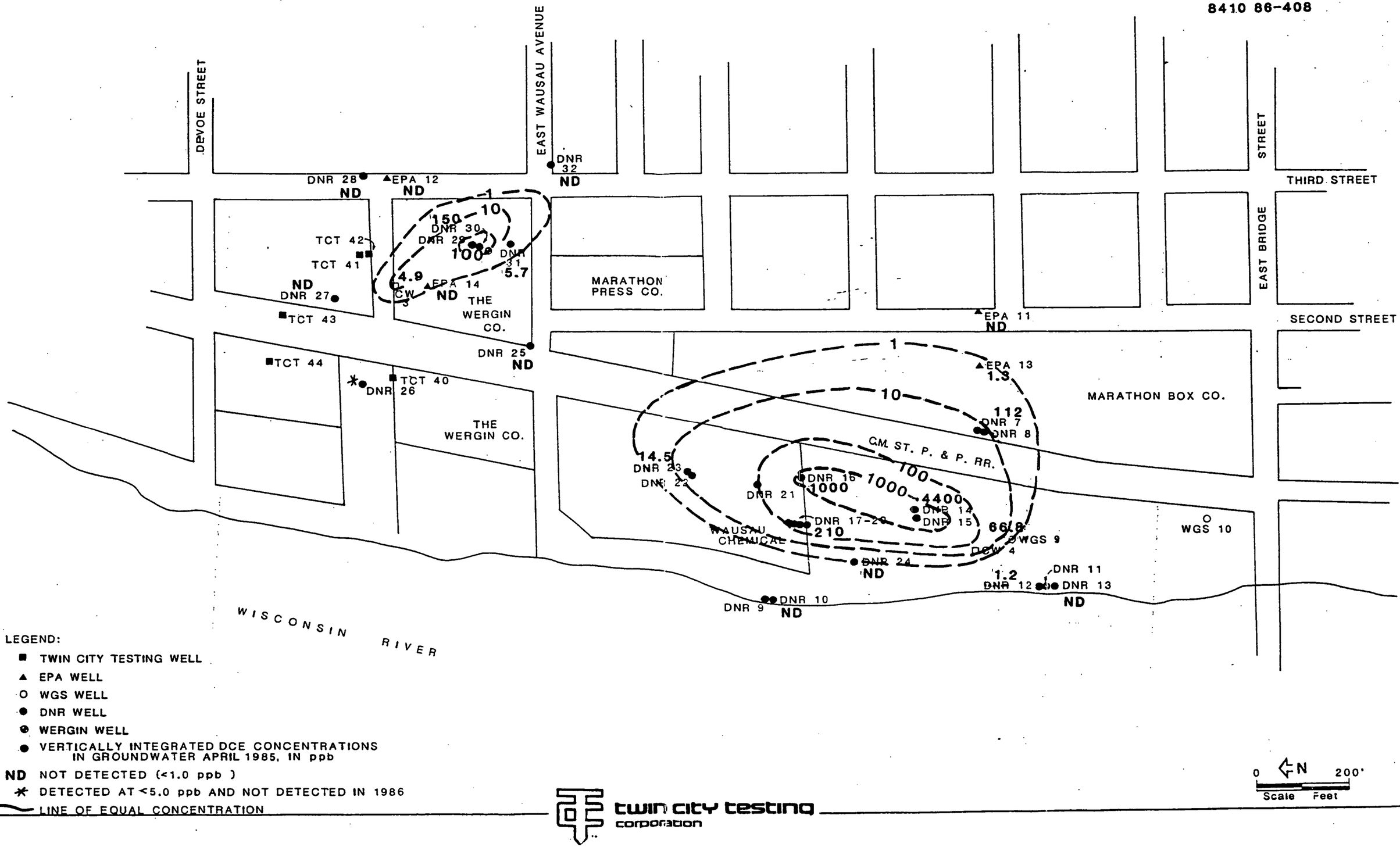
LEGEND:

- ■ TWIN CITY TESTING WELL
- ▲ EPA WELL
- O WGS WELL
- ● DNR WELL
- ◕ WERGIN WELL
- ● VERTICALLY INTEGRATED DCE CONCENTRATIONS IN GROUNDWATER APRIL 1985, IN ppb
- **ND** NOT DETECTED (<1.0 ppb)
- * DETECTED AT <5.0 ppb AND NOT DETECTED IN 1986
- —1— LINE OF EQUAL CONCENTRATION

0 N 200'
Scale Feet

twin city testing corporation

FIGURE 11
AREAL DISTRIBUTION OF INTEGRATED DCE CONCENTRATIONS
WAUSAU EAST WELL FIELD
WAUSAU, WISCONSIN
8410 86-408



LEGEND:

- ■ TWIN CITY TESTING WELL
- ▲ EPA WELL
- O WGS WELL
- ● DNR WELL
- ◉ WERGIN WELL
- ● VERTICALLY INTEGRATED DCE CONCENTRATIONS IN GROUNDWATER APRIL 1985, IN ppb
- **ND** NOT DETECTED (<1.0 ppb)
- * DETECTED AT <5.0 ppb AND NOT DETECTED IN 1986
- —1— LINE OF EQUAL CONCENTRATION

0 N 200'
Scale Feet

twin city testing corporation

BORING LOGS FOR WELLS R-5S, R-6S, AND R-7S

REPORT OF MONITORING WELL INSTALLATION AND
GEOTECHNICAL EXPLORATION PROGRAM
MARATHON ELECTRIC CORPORATION
WAUSAU, WISCONSIN
8100-87-0375

twin city testing
corporation

4**** SCHOFIELD AVE
SCHOFIELD, WI 54476
PHONE 715 359 9461

(MAILING ADDRESS)
BOX 656 WAUSAU, WI 54401

June 19, 1987

RMT, Inc
Attn: Mr Tom Stolzenburg
1406 East Washington Avenue
Madison, WI 53703

Subj: Report of Monitoring Well Installation and
Geotechnical Exploration Program
Marathon Electric Corporation
Wausau, Wisconsin
#8100-87-0375

Dear Tom

We have completed the monitoring well constructions and geotechnical exploration program for Marathon Electric Corporation. We have enclosed three copies of our report. This work was done in accordance with your March 24, 1987 authorization.

The soil samples obtained in the borings were turned over to you upon completion of this project.

If you have any questions regarding this report, or if we can be of further service to you, please contact us.

Sincerely
TWIN CITY TESTING CORPORATION

Gregory C Owens

Gregory C Owens
Vice President - Eastern Region

GCO/pas

AN EQUAL OPPORTUNITY EMPLOYER

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Surface Conditions	1
Subsurface Conditions	2
Water Conditions	2
EXPLORATION PROCEDURES	3
General	3
Sampling	3
Classification	3
Ground Water Monitoring Well Installation	4
STANDARD OF CARE	5

APPENDIX

Soil Boring Logs

General Notes

Classification of Soils for Engineering Purposes

Soil Boring Location Sketch

REPORT OF MONITORING WELL INSTALLATION AND

GEOTECHNICAL EXPLORATION PROGRAM

MARATHON ELECTRIC CORPORATION

WAUSAU, WISCONSIN

8100-87-0375

INTRODUCTION

We were authorized by RMT, Inc to install two monitoring wells on the outside of the Marathon Electric Corporation's building and one monitoring well inside of the building. The scope of our work was limited to:

1. Drilling and installing monitoring wells to depths of approximately 35 feet as directed by RMT, Inc.

2. Classifying the soils encountered in the borings and preparing logs illustrating the soil strata.

3. Preparing a brief factual report presenting boring logs, monitoring well diagrams, and a brief description of the procedures used in obtaining our results.

EXPLORATION PROGRAM RESULTS

Surface Conditions

Marathon Electric Corporation is located in the residential section on the north side of Wausau, Wisconsin. The terrain is relatively level with mowed grass areas surrounding the plant. The Wisconsin River is to its east side and runs parallel with the site. The elevation of the river is approximately 25 to 30 feet below the ground surface in the vicinity of the borings.

Subsurface Conditions

The soil and water conditions encountered at the test boring locations are illustrated by means of the attached boring logs. The logs also indicate the probable geologic origin of the encountered soils and other pertinent information. We wish to point out that subsurface conditions at other times and locations on the site may differ from those found at our test locations.

The boring logs suggest a general soil profile consisting of up to 5 feet of silty sands with a trace of organic material. Coarse grained alluvial soils were encountered in most of the soil borings ranging from 5 feet down to 35 feet.

Water Conditions

The water levels measurements made as the soil borings were conducted are recorded on the bottom of the attached soil boring logs. These measurements indicate that the ground water level is at a depth of approximately 30 feet below the existing ground surface. PVC well materials were installed in the borings to allow for sampling and long term water level measurements. These future measurements may more accurately indicate the actual water table elevations. Water levels should also be expected to fluctuate, both seasonally and from place to place.

EXPLORATION PROCEDURES

General

The soil boring and monitoring well program was conducted with a CME trailer mount drill rig during the period of March 27 through March 28, 1987. The soil boring and well locations were selected by RMT, Inc. The surface elevations were also to be determined by others and are not available at the time of this report.

Sampling

Soil sampling was done in accordance with ASTM:D1586. Using this procedure, a two inch O D split barrel sampler is driven into the soil by a 140 pound weight falling 30 inches. After an initial set of six inches, the number of blows required to drive the sampler an additional 12 inches is known as the penetration resistance or N value. The N value is an index of the relative density of cohesionless soils or the consistency of cohesive soils.

Classification

As the samples were obtained in the field, they were visually and manually classified by the crew chief in accordance with ASTM:D2488. Logs of the borings indicating the depth and identification of the various strata, the N value, water level information and pertinent information regarding the

method of maintaining and advancing the drill holes are attached. Charts illustrating the soil classification procedure, the descriptive terminology and the symbols used on the boring logs are also attached.

Ground Water Monitoring Well Installation

The borings were advanced with 4 1/4 inch ID hollow stemmed augers. Soil samples were collected at 2 1/2 foot intervals to the end of the borings. Sampling equipment and PVC material used in the wells were steamed cleaned and washed with TSP (Trisodium Phosphate) prior to installation.

The PVC materials were installed inside the 4 1/4 inch ID hollow stem augers. As the augers were being withdrawn, the annular space between the auger and the PVC well was backfilled with a commercially bagged flint sand to approximately 3 to 5 feet above the screen. A 2 foot granular bentonite seal was then placed on top of the flint sand. A bentonite slurry was placed from above the seal to approximately 3 feet from the ground surface. A locking steel protector top was set in concrete over the PVC riser.

STANDARD OF CARE

The work we performed on this project was done in accordance with currently accepted engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by:

Robert J Levra
Drilling Coordinator

This report was reviewed by:

David A Erickson, PE
Geotechnical Engineer

Proofread By Cindy Bredeck

RESIDUALS MANAGEMENT TECHNOLOGY, INC.

PROJECT: Marathon Electric
LOCATION: Wausau, Wisconsin
DRILLED BY: Twin City Testing Corporation
LOGGED BY: J Pingel
DATE: 6-24-87

BORING NO.: R5S
SURFACE ELEV.:
SHEET NO.: 1

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
1	SB	9		4		FILL, Silty Sand, silt, a trace of organic material, brown and black, moist
2	SB	15		11	5	SAND, fine to medium grained, brown, moist, medium dense, lenses of silt (SP)
3	SB	14		16	10	SAND, a little gravel, medium to coarse grained, brown, moist, dense (SP)
4	SB	15		19	15	SAND, fine to medium grained, brown, moist, dense (SP)
5	SB	15		29	20	SAND, with gravel, medium grained, brown, moist, dense (SP)
6	SB	18		37	25	SAND, with gravel, fine to medium grained, brown, moist, very dense (SP)
7	SB	19		31	30	SAND, fine to medium grained, brown, water-bearing, very dense to dense (SP)
8	SB	16		20	35	END OF BORING
					40	

GENERAL NOTES

START: 09:30
COMPLETE: 11:30
RIG:
CREW CHIEF: PINGEL
DRILLING METHOD: 4 1/4" HSA
0' to 34½'

WATER LEVEL OBSERVATIONS

WHILE DRILLING:

UPON COMPLETION: 30½'
TIME AFTER DRILLING:
DEPTH OF WATER:
DEPTH OF CAVE-IN:

PROJECT: Marathon Electric
LOCATION: Wausau, Wisconsin
DRILLED BY: Twin City Testing Corporation
LOGGED BY: J Pingel
DATE: 6-24-87

BORING NO.: R6S
SURFACE ELEV.:
SHEET NO.: 1

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
1	A					FILL, Silty Sand, a little lean clay and gravel, brown, moist, a 5" layer of concrete on the surface
2	SB	17		44	5	FILL, Sand, a little gravel, fine to medium grained, brown, moist
3	SB	18		22	10	SAND, a little gravel, medium to coarse grained, brown, wet, dense to very dense (SP)
4	SB	18		36	15	
5	SB	6"		71	20	SAND, fine to medium grained, brown, moist, very dense (SP)
6	SB	8"		54	25	SAND, a little gravel, fine to medium grained, brown, moist, very dense (SP)
7	SB	18"		29	30	SAND, fine to medium grained, brown, water bearing, dense to medium dense (SP)
8	SB	13"		10	35	
					40	END OF BORING

GENERAL NOTES
START: 14:40
COMPLETE: 16:30
RIG:
CREW CHIEF: PINGEL
DRILLING METHOD: 4½" HSA
0' to 34½'

WATER LEVEL OBSERVATIONS
WHILE DRILLING:
UPON COMPLETION: 30½'
TIME AFTER DRILLING:
DEPTH OF WATER:
DEPTH OF CAVE-IN:

RESOURCES MANAGEMENT TECHNOLOGY, INC.

PROJECT: Marathon Electric
LOCATION: Wausau, Wisconsin
DRILLED BY: Twin City Testing Corporation
LOGGED BY: J Pingel
DATE: 6-24-87

BORING NO.: R7S
SURFACE ELEV.:
SHEET NO.: 1

SAMPLE No.	SAMPLE Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks
1	A					FILL, Silty Sand, brown and black, moist, a 5" layer of concrete on the surface
2	SB	14		7	5	SAND, fine to medium grained, brown and light brown, moist, loose (SP)
3	SB	16		7	10	SAND, medium grained, brown, moist, loose to medium dense (SP)
4	SB	18		10	15	
5	SB	3		25	20	SAND, with gravel, medium to coarse grained, brown, moist, dense (SP)
6	SB	18		19	25	SAND, medium grained, brown, moist, dense to medium dense (SP)
7	SB	15		21	30	
8	SB	12		10	35	
					40	END OF BORING

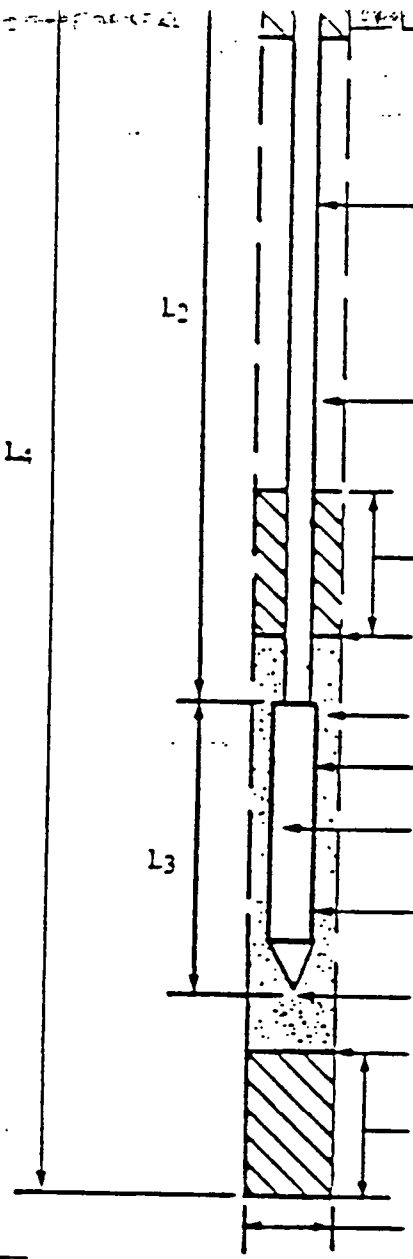
GENERAL NOTES

START: 08:40
COMPLETE: 10:05
RIG:
CREW CHIEF: PINGEL
DRILLING METHOD: 4¼" HSA

WATER LEVEL OBSERVATIONS

WHILE DRILLING: 30½'

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



THICKNESS AND TYPE OF SEAL	2.0 CONCRETE
DIAMETER AND TYPE OF RISER PIPE	2" FLUSH JOINT THREADED PVC
TYPE OF BACKFILL AROUND RISER	BENTONITE POWDER SLURRY
THICKNESS AND TYPE OF SEAL	2.0' GRANULAR BENTONITE
DEPTH TO TOP OF FILTER SAND	19.3'
TYPE OF FILTER AROUND SCREEN	SILICA SAND
TYPE OF PIEZOMETER	FLUSH JOINT THREADED PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT NO.)	.010
DIAMETER AND LENGTH OF SCREEN	2" X 10.0'
DEPTH TO BOTTOM OF PIEZOMETER	34.7'
DEPTH TO BOTTOM OF FILTER SAND	35.0'
THICKNESS AND TYPE OF SEAL	NONE
DIAMETER OF BOREHOLE	8"

L_1= 2.3 FT

L_2= 26.6 FT

L_3= 10.4 FT

L_4= 35.0 FT

INSTALLATION COMPLETED:
Date 3-27-87 Time 12:45

PIEZOMETER WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL (1)

(1) DEPTH BELOW TOP OF RISER PIPE

twin city testing corporation

SE-24 (83-B)

L_2= 26.6 FT

L_3= 10.4 FT

L_4= 35.0 FT

INSTALLATION COMPLETED:
Date 3-27-87 Time 17:45

PIEZOMETER WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL (1)

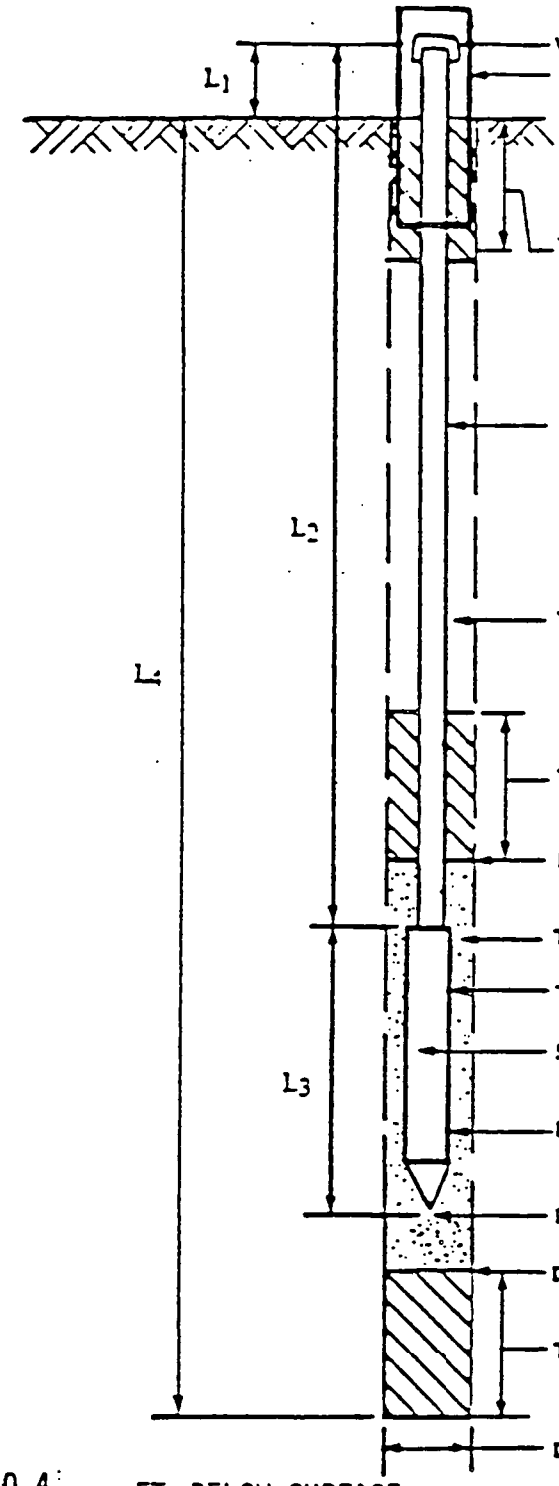
(1) DEPTH BELOW TOP OF RISER PIPE

twin city testing corporation

SE-24 (83-B)

JOB NO. 222.03 PIEZOMETER NO. R7S

GROUND SURFACE ELEVATION _____ TOP OF RISER PIPE ELEVATION _____
(with cap removed)



Protective Casing: Diameter and Type	4" STEEL
Protective Casing: Total Length	1.0'
Protective Casing: Length Above Ground	0'
Thickness and Type of Seal	1.0' SILICA SAND
Diameter and Type of Riser Pipe	2" FLUSH JOINT THREADED PVC
Type of Backfill Around Riser	BENTONITE POWDER SLURRY
Thickness and Type of Seal	2.0' GRANULAR BENTONITE
Depth to Top of Filter Sand	21.6'
Type of Filter Around Screen	CAVE-IN SAND
Type of Piezometer	FLUSH JOINT THREADED PVC
Screen Gauge or Size of Openings (Slot No.)	.010
Diameter and Length of Screen	2" X 10.0'
Depth to Bottom of Piezometer	37.0'
Depth to Bottom of Filter Sand	39.0'
Thickness and Type of Seal	NONE
Diameter of Borehole	7"

L_1= 0.4 FT BELOW SURFACE

L_2= 26.2 FT

L_3= 10.4 FT

L_4= 39.0 FT

INSTALLATION COMPLETED:
Date 3-28-87 Time 11:30

PIEZOMETER WATER LEVEL MEASUREMENTS

DATE	TIME	BAILED DEPTHS	WATER LEVEL (1)

(1) DEPTH BELOW TOP OF RISER PIPE

GENERAL NOTES

DRILLING AND SAMPLING SYMBOLS

SYMBOL	DEFINITION
HSA	3 1/4" I.D. Hollow Stem Auger
_FA	4", 6" or 10" Diameter Flight Auger
_HA	2", 4" or 6" Hand Auger
_DC	2 1/2", 4", 5" or 6" Steel Drive Casing
_RC	Size A, B, or N Rotary Casing
PD	Pipe Drill or Cleanout Tube
CS	Continuous Split Barrel Sampling
DM	Drilling Mud
JW	Jetting Water
SB	2" O.D. Split Barrel Sample
_L	2 1/2" or 3 1/2" O.D. SB Liner Sample
_T	2" or 3" Thin Walled Tube Sample
3TP	3" Thin Walled Tube (Pitcher Sampler)
_TO	2" or 3" Thin Walled Tube (Osterberg Sampler)
W	Wash Sample
B	Bag Sample
P	Test Pit Sample
_Q	BQ, NQ, or PQ Wireline System
_X	AX, BX, or NX Double Tube Barrel
CR	Core Recovery - Percent
NSR	No Sample Recovered, classification based on action of drilling equipment and/or material noted in drilling fluid or on sampling bit.
NMR	No Measurement Recorded, primarily due to presence of drilling or coring fluid.
▼	Water Level Symbol

TEST SYMBOLS

SYMBOL	DEFINITION
W	Water Content - % of Dry Wt - ASTM D 2216
D	Dry Density - Pounds Per Cubic Foot
LL, PL	Liquid and Plastic Limit - ASTM D 4318

Additional Insertions in Last Column

Qu	Unconfined Comp. Strength-psf - ASTM D 2166
Pq	Penetrometer Reading - Tons/Square Foot
Ts	Torvane Reading - Tons/Square Foot
G	Specific Gravity - ASTM D 854
SL	Shrinkage Limits - ASTM D 427
OC	Organic Content - Combustion Method
SP	Swell Pressure - Tons/Square Foot
PS	Percent Swell
FS	Free Swell - Percent
pH	Hydrogen Ion Content, Meter Method
SC	Sulfate Content - Parts/Million, same as mg/L
CC	Chloride Content - Parts/Million, same as mg/L
C*	One Dimensional Consolidation - ASTM D 2435
Qc*	Triaxial Compression
D.S.*	Direct Shear - ASTM D 3080
K*	Coefficient of Permeability - cm/sec
D*	Dispersion Test
DH*	Double Hydrometer - ASTM D 4221
MA*	Particle Size Analysis - ASTM D 422
R	Laboratory Resistivity, in ohm - cm - ASTM C 57
E*	Pressuremeter Deformation Modulus - TSF
PM*	Pressuremeter Test
VS*	Field Vane Shear - ASTM D 2573
IR*	Infiltrometer Test - ASTM D 3385
RQD	Rock Quality Designation - Percent

* See attached data sheet or graph

WATER LEVEL

Water levels shown on the boring logs are the levels measured in the borings at the time and under the conditions indicated. In sand, the indicated levels may be considered reliable ground water levels. In clay soil, it may not be possible to determine the ground water level within the normal time required for test borings, except where lenses or layers of more pervious waterbearing soil are present. Even then, an extended period of time may be necessary to reach equilibrium. Therefore, the position of the water level symbol for cohesive or mixed texture soils may not indicate the true level of the ground water table. Perched water refers to water above an impervious layer, thus impeded in reaching the water table. The available water level information is given at the bottom of the log sheet.

DESCRIPTIVE TERMINOLOGY

DENSITY TERM	"N" VALUE	CONSISTENCY TERM
Very Loose	0-4	Soft
Loose	5-8	Medium
Medium Dense	9-15	Rather Stiff
Dense	16-30	Stiff
Very Dense	Over 30	Very Stiff

Standard "N" Penetration: Blows Per Foot of a 140 Pound Hammer Falling 30 inches on a 2 inch OD Split Barrel Sampler

Lamination	Up to 1/2" thick stratum
Layer	1/2" to 6" thick stratum
Lens	1/2" to 6" discontinous stratum, pocket
Varved	Alternating laminations of clay, silt and /or fine grained sand, or colors thereof
Dry	Powdery, no noticeable water
Moist	Below saturation
Wet	Saturated, above liquid limit
Waterbearing	Pervious soil below water

RELATIVE GRAVEL PROPORTIONS

CONDITION	TERM	RANGE
Coarse Grained Soils	A little gravel	2 - 14%
	With gravel	15 - 49%
Fine Grained Soils		
15-29% + No. 200	A little gravel	2 - 7%
15-29% + No. 200	With gravel	8 - 29%
30% + No. 200	A little gravel	2 - 14%
30% + No. 200	With gravel	15 - 24%
30% + No 200	Gravelly	16 - 49%

RELATIVE SIZES

Boulder	Over 12"
Cobble	3" - 12"
Gravel	
Coarse	3/4" - 3"
Fine	#4 - 3/4"
Sand	
Coarse	#4 - #10
Medium	#10 - #40
Fine	#40 - #200
Silt & Clay	- #200, Based on Plasticity

ASTM Designation: D 2487 - 83
(Based on Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification: Group Symbol	Group Name[B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines[C]	$C_u \geq 4$ and $1 \leq C_c \leq 3$[E]	GW	Well-graded gravel[F]
			$C_u < 4$ and/or $1 > C_c > 3$[E]	GP	Poorly graded gravel[F]
		Gravels with Fines: More than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines[D]	$C_u \geq 6$ and $1 \leq C_c \leq 3$[E]	SW	Well-graded sand[I]
			$C_u < 6$ and/or $1 > C_c > 3$[E]	SP	Poorly graded sand[I]
		Sands with Fines: More than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OL	Organic clay[K,L,M,N] Organic silt[K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
			PI plots below "A" line	MH	Elastic silt[K,L,M]
		organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OH	Organic clay[K,L,M,P] Organic silt[K,L,M,O]
Highly organic soils	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name

[C] Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay

[D] Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E] $C_u = D_{60}/D_{10}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains $\geq 15\%$ sand, add "with sand" to group name

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM

[H] If fines are organic, add "with organic fines" to group name

[I] If soil contains $\geq 15\%$ gravel, add "with gravel" to group name

[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant

[L] If soil contains $\geq 30\%$ plus no. 200, predominantly sand, add "sandy" to to group name

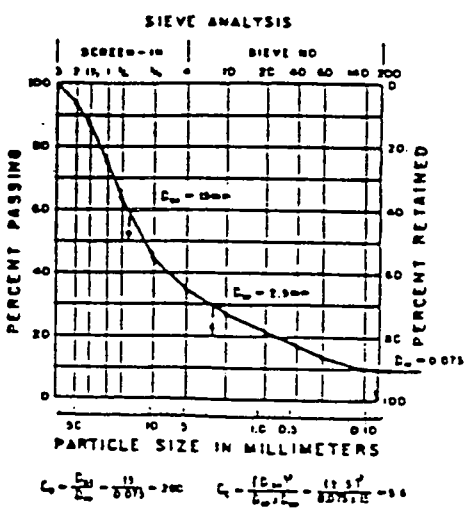
[M] If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name

[N] PI ≥ 4 and plots on or above "A" line

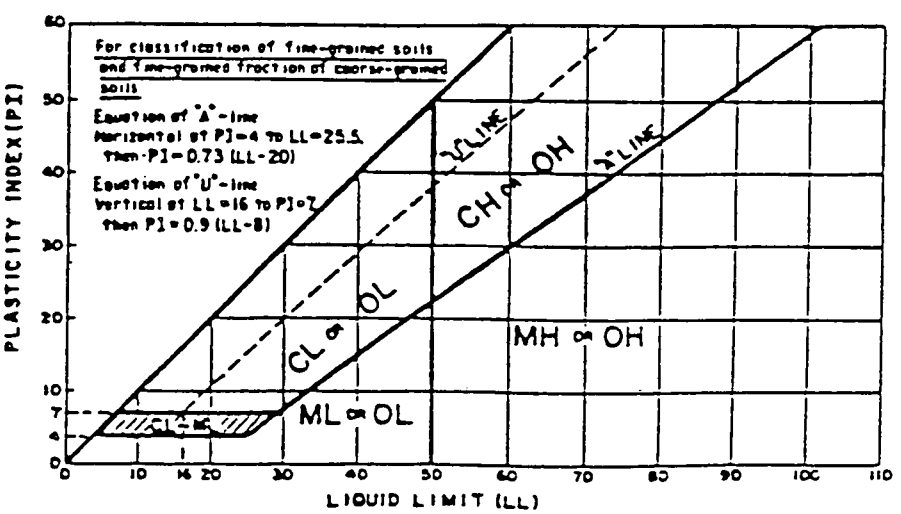
[O] PI < 4 or plots below "A" line

[P] PI plots on or above "A" line

[Q] PI plots below "A" line



$C_u = \frac{D_{60}}{D_{10}} = \frac{15}{0.07} = 200$ $C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(2.5)^2}{(15)(0.07)} = 5.6$



SF-1 (R4-B)

SURFACE SOIL SAMPLE RESULTS
FOR PCE, TCE, AND DCE

TABLE 1

RESULTS OF SURFACE SOIL SAMPLING
(ug/kg dry weight)

Sampling Location	Perchloroethylene	Trichloroethylene	1,1-Dichloroethylene
S-1	63	38.	2.0
S-2	2.0	3.3	4.8
S-3	ND*	ND	ND
S-4	ND	3.2	ND
S-5	ND	ND	ND
S-6	ND	ND	ND
S-7	13.	6.5	26.
S-8	ND	ND	ND
S-9	ND	ND	ND
S-10	ND	ND	ND
S-11	ND	ND	ND
S-12	ND	1.8	ND

* ND is not detected at 1.0 ug/kg

222.03 301:RPT:eissen0430

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER : 21585

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #1

SAMPLE DESCRIPTION: #1

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	2.0	ug/kg dry wt.
TRICHLOROETHYLENE	38	ug/kg dry wt.
TETRACHLOROETHYLENE	63	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

RMT INC.

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21587

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #3

SAMPLE DESCRIPTION: #3

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLOROETHYLENE	<1.0	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

LABORATORY REPORT

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21588

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #4

SAMPLE DESCRIPTION: #4

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLOROETHYLENE	3.2	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21589

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #5

SAMPLE DESCRIPTION: #5

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLOROETHYLENE	<1.0	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21590

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #6

SAMPLE DESCRIPTION: #6

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLOROETHYLENE	<1.0	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21591

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #7

SAMPLE DESCRIPTION: #7

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	26	ug/kg dry wt.
TRICHLOROETHYLENE	6.5	ug/kg dry wt.
TETRACHLOROETHYLENE	13	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

RMT INC.

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21592

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #8

SAMPLE DESCRIPTION: #8

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLOROETHYLENE	<1.0	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21593

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #9

SAMPLE DESCRIPTION: #9

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLOROETHYLENE	<1.0	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21594

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #10

SAMPLE DESCRIPTION: #10

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLORODETHYLENE	<1.0	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

RMT INC.

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21595

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #11

SAMPLE DESCRIPTION: #11

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLOROETHYLENE	<1.0	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

RMT INC.

LABORATORY REPORT

CLIENT : FOLEY & LARDNER
PROJECT #: 00222.03
SAMPLE NUMBER :21596

DATE: 01/19/87
P.O. #: 011287-0022203
SAMPLE POINT: #12

SAMPLE DESCRIPTION: #12

VOLATILE ORGANIC ANALYSIS

PARAMETER	RESULT	UNITS
1,1-DICHLOROETHYLENE	<1.0	ug/kg dry wt.
TRICHLORDETHYLENE	1.8	ug/kg dry wt.
TETRACHLOROETHYLENE	<1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Laboratory Director

TABLE OF HNU PID READINGS FOR BORINGS

1426 East Washington Avenue Suite 124 Madison Wisconsin 53703 (608) 255 2134 SHEET ____ OF ____

PROJECT / PROPOSAL NAME	PREPARED By	PREPARED Date	CHECKED By	CHECKED Date	PROJECT/PROPOSAL NO
Foley + Lardner	TK	3/89			882.03

HNU Readings Summary

R5S		R6S		R7S	
0-2	0	0-4.5	1.6	0-4.5	0.2
4.5-6.5	0		84		4.0
9.5-11.5	0		49.5		1.4
14.5-16.5	0		72		5.2
19.5-21.5	0		70		3.4
24.5-26.5	0		82		3.2
29.5-31.5	0		64		10.0
34.5-36.5	0		5.2		18.2

Readings taken through tin on 8 oz. Drillers jars after sitting 5-10 minutes.

* TRS - Before you pick samples for analysis I think we should talk. Just get into Roseann

SOIL CHEMICAL (PCE, TCE, and DCE) ANALYSIS
RESULTS FOR SAMPLES FROM R-5S, R-6S, AND R-6S

TABLE 2

RESULTS OF BOREHOLE SAMPLING
(ug/kg dry weight)

Sampling Location	Depth (feet)	Perchloroethylene	Trichloroethylene	1,1-Dichloroethylene
R-5S	15.5	ND*	ND	ND
R-6S	15.5	< 100	125	< 100
R-6S	35.5	ND	ND	ND
R-7S	15.5	ND	ND	ND

* ND is not detected at 1.0 ug/kg.

222.03 301:RPT:eissen0430

RMT, INC.

LABORATORY REPORT

CLIENT: Foley and Lardner

REPORT DATE: 4/3/87

PROJECT #: 222.03

P.O. #: 033087-0022203

SAMPLE #: 22515

SAMPLING DATE: 3/26-27/87

ORGANIC ANALYSIS

SAMPLE DESCRIPTION	COMPOUNDS	RESULTS	UNITS
R6S 14.5-16.5	trans 1,2 dichloroethylene	< 100	ug/kg wet wt.
	trichloroethylene	125	ug/kg wet wt.
	tetrachloroethylene	< 100	ug/kg wet wt.

Paul E. Duranceau

Paul E. Duranceau, Director of Laboratory Services

96.01:LAB:foley

RMT, INC.

LABORATORY REPORT

CLIENT: Foley and Lardner

REPORT DATE: 4/10/87

PROJECT #: 222.03

P.O. #: 040187-0022203

SAMPLE #: 22506

SAMPLING DATE: 3/26-27/87

ORGANIC ANALYSIS

SAMPLE DESCRIPTION	COMPOUNDS	RESULTS	UNITS
R5S 14.5-16.5	dichloroethylene	< 1.0	ug/kg dry wt.
	trichloroethylene	< 1.0	ug/kg dry wt.
	tetrachloroethylene	< 1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Director of Laboratory Services

96.01:LAB:foley0413

RMT, INC.

LABORATORY REPORT

CLIENT: Foley and Lardner

REPORT DATE: 4/10/87

PROJECT #: 222.03

P.O. #: 040187-0022203

SAMPLE #: 22518

SAMPLING DATE: 3/26-27/87

ORGANIC ANALYSIS

SAMPLE DESCRIPTION	COMPOUNDS	RESULTS	UNITS
R6S 34.5-36.5	dichloroethane	< 1.0	ug/kg dry wt.
	trichloroethane	< 1.0	ug/kg dry wt.
	tetrachloroethane	< 1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Director of Laboratory Services

96.01:LAB:foley0413

RMT, INC.

LABORATORY REPORT

CLIENT: Foley and Lardner

REPORT DATE: 4/10/87

PROJECT #: 222.03

P.O. #: 040187-0022203

SAMPLE #: 22522

SAMPLING DATE: 3/26-27/87

ORGANIC ANALYSIS

SAMPLE DESCRIPTION	COMPOUNDS	RESULTS	UNITS
R7S 14.5-16.5	dichloroethane ylene	< 1.0	ug/kg dry wt.
	trichloroethane ylene	< 1.0	ug/kg dry wt.
	tetrachloroethane ylene	< 1.0	ug/kg dry wt.

Paul E. Duranceau

Paul E. Duranceau, Director of Laboratory Services

RESIDUALS MANAGEMENT TECHNOLOGY, INC.
SAMPLE RECORD FORM

CLIENT: Foley + LARONAR
JOB NUMBER: 1228.03
LOCATION: WAUSAU
TYPE OF SAMPLES: SOILS
(WATER, WASTE WATER, SOLID WASTE)
COMMENTS

5. SAMPLING DATE: 3/27 + 3/26
6. SAMPLE COLLECTOR: TEK
7. AFFILIATION: RMT
8. SIGNATURE: Thomas T Koch
9. PURCHASE ORDER #:

SAMPLE DESCRIPTION			RMT LABORATORY NUMBER	SAMPLE LOCATION AND DATE (R, LS, PS, D)*
R6S	0.5-4.5	40 ml.	22512	
R6S	4.5-6.5	"	22513	
R6S	9.5-11.5	"	22514	
R6S	14.5-16.5	"	22515	
R6S	24.5-26.5	"	22516	
R6S	29.5-31.5	"	22517	
R6S	34.5-36.5	"	22518	
			—	—
R7S	0.5-4.5	"	22519	
R7S	4.5-6.5	"	22520	
R7S	9.5-11.5	"	22521	
R7S	14.5-16.5	"	22522	
R7S	24.5-26.5	"	22523	
R7S	29.5-31.5	"	22524	
R7S	34.5-36.5	"	22525	

R (REFRIGERATOR) LS (LABORATORY STORAGE) PS (PERMANENT STORAGE) D (DESTROYED)

UBSEQUENT ANALYSIS: ____ SAMPLE TEMP. ACCEPTABLE: yes (iced) SAMPLE PRESERVED PROPERLY ____

AMPLES TRANSPORTED BY:

NAME: Tom Koch DATE AND TIME: 3/28/87 10:30

AFFILIATION: RMT SIGNATURE: Thomas T Koch

AMPLES RECEIVED BY:

NAME: Rosame M Gates DATE AND TIME: 3/30/87 8:30a

AFFILIATION: RMT SIGNATURE: Rosame M. Gates

SAMPLE DESTRUCTION AUTHORIZATION:

SAMPLE NUMBERS: ____

PROJECT MANAGER: ____ DATE: ____

RMT PRINCIPAL: ____ DATE: ____

SAMPLE RECORD FORM

CLIENT: Foley + LARDNER
JOB NUMBER: 22203
LOCATION: WAUSAU
TYPE OF SAMPLES: SOILS (WATER, WASTE WATER, SOLID WASTE)
COMMENTS

5. SAMPLING DATE: 3/26
6. SAMPLE COLLECTOR: TKK
7. AFFILIATION: RMT
8. SIGNATURE: Thomas E Koch
9. PURCHASE ORDER #:

	SAMPLE DESCRIPTION		RMT LABORATORY NUMBER	SAMPLE LOCATION AND DATE (R, LS, PS, D)*
RSS	0-2	40mL	22503	
RSS	4.5-6.5	"	22504	
RSS	9.5-11.5	"	22505	
RSS	14.5-16.5	"	22506	
RSS	19.5-21.5	"	22507	
RSS	24.5-26.5	"	22508	
RSS	29.5-31.5	"	22509	
RSS	34.5-36.5	"	22510	
SB	5.4-6.0	40mL	22511	R

R (REFRIGERATOR) LS (LABORATORY STORAGE) PS (PERMANENT STORAGE) D (DESTROYED)

SUBSEQUENT ANALYSIS: ____ SAMPLE TEMP. ACCEPTABLE: yes (iced) SAMPLE PRESERVED PROPERLY ____

SAMPLES TRANSPORTED BY:

NAME: Tom Koch DATE AND TIME: 3/28/87 1030

AFFILIATION: RMT SIGNATURE: Thomas E Koch

SAMPLES RECEIVED BY:

NAME: Rosanne M Gates DATE AND TIME: 3/30/87 8:30a

AFFILIATION: RMT SIGNATURE: Rosanne M. Gates

SAMPLE DESTRUCTION AUTHORIZATION:

SAMPLE NUMBERS: ____

PROJECT MANAGER: ____ DATE: ____

RMT PRINCIPAL: ____ DATE: ____

GROUND WATER SAMPLE RESULTS FOR PCE, TCE, AND DCE

TABLE 3

RESULTS OF GROUND WATER SAMPLING
(ug/L)

Sampling Location	Perchloroethylene	Trichloroethylene	1,1-Dichloroethylene
R-5S	ND	ND	ND
R-6S	ND	4.9	ND
R-7S	ND	0.5	ND
Field Blank	ND	0.9	ND
Trip Blank	ND	2.5	ND
Detection Limits	0.5	0.5	1.0

222.03 301:RPT:eissen0430

ENVIRONMENTAL & ENERGY SYSTEMS

April 14, 1987

RMT, Inc.
Suite 124
1406 East Washington Ave.
Madison, WI 53703

Attn: Tom Stolzenberg

Re: Project No. 222.03

Attached are the results for the samples received 4-7-87. EPA Method 601 with PID (10.2 eV) and Hall detectors in series was used for the analysis. Also included is your Sample Record Form.

If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie Heuser

Mary C. Christie Heuser
Instrumentation Chemist

MCCH/ls

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474
TELEPHONE (715) 355-7211 TELEX 29-0495

ZIMPRO INC.
ENVIRONMENTAL & ENERGY SYSTEMS
ROTHSCHILD, WISCONSIN 54474
PH 715/359 7211 TELEX 29-0495

ANALYTICAL REPORT

WISCONSIN LAB CERTIFICATION NO 737053130

FOR

RMT, Inc.
Suite 124
1406 East Washington Ave.
Madison, WI 53703

Attn: Tom Stolzenberg

PO # -
SAMPLED BY: Client
DATE REC'D: 4-7-87
REPORT DATE: 4-14-87
APPROVED BY: MCCH

VOC Analysis (ug/l)

	1,2-DCE	TCE	Perc	Analytical No.
R5S	X	X	X	27729
R6S	X	4.9	X	27730
R7S	X	0.5	X	27731
Field Blank	X	0.9	X	27732
Trip Blank	X	2.5	X	27733
Detection Limit	1.0	0.5	0.5	

X = Analyzed but not detected

All analyses have been conducted in accordance with the Zimpro Inc. Analytical Services Quality Assurance Program.

SAMPLE RECORD FORM

CLIENT: 222.03
JOB NUMBER:
LOCATION:
TYPE OF SAMPLES: H2O
(WATER, WASTE WATER, SOLID WASTE)
COMMENTS

5. SAMPLING DATE: 4-6-87
6. SAMPLE COLLECTOR: KOR
7. AFFILIATION: RMT
8. SIGNATURE: Kurt O'Rourke
9. PURCHASE ORDER #:

SAMPLE DESCRIPTION	RMT LABORATORY NUMBER	SAMPLE LOCATION AND DATE (R, LS, PS, D)*			
R5S					
R6S					
R7S					

(REFRIGERATOR) LS (LABORATORY STORAGE) PS (PERMANENT STORAGE) D (DESTROYED)

BSEQUENT ANALYSIS: ____ SAMPLE TEMP. ACCEPTABLE: ____ SAMPLE PRESERVED PROPERLY ____

MPLES TRANSPORTED BY:

NAME: CITY DELV. DATE AND TIME:

AFFILIATION: SIGNATURE:

MPLES RECEIVED BY:

NAME: Mary C. Christie Heiser DATE AND TIME: 4-7-87 1305

AFFILIATION: ZIMPRO SIGNATURE: MARY C. CHRISTIE HEISER

Analytical NOS. 27729-27733
Also received RMT field trip blanks

MPLE DESTRUCTION AUTHORIZATION:

SAMPLE NUMBERS:

PROJECT MANAGER: DATE:

PUT PRINCIPAL: DATE: