OMNI ASSOCIATES

Soil Investigation

for the

City of Appleton

at

Second Street
Appleton, WI

Outagamie County

July 7, 2000

PROJECT N1624B00

TO Gary Edelstein - RR/3

SUBJECT Soil Investigation in second St., N.W. Mau The

DATE

MESSAGE The City of Appleton hired Omnni Enginuns to do a soil bourng investigation in second St @ Mau The. They plan to do utility upgrade next year. I wanted you to have a copy of the report for your files. The soils samples did not show contamination. FYI & file. Thanks,

SIGNED Jennifer Huffman

DATE 7/20/00

REPLY

SIGNED

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EXECUTIVE SUMMARY

OMNNI has performed a limited subsurface investigation within Second Street, between Douglas Street and Outagamie Street, in the City of Appleton, Wisconsin. The purpose of the investigation was to determine if contamination from the N.W. Mauthe Superfund site, located adjacent to Second Street, had impacted the subsurface in the street. The City of Appleton is planning some utility work in the area for 2001 and is preparing for the possibility for dealing with chromium contaminated soil.

The N.W. Mauthe site was investigated in the early 1990's. Chromium contamination was found on site and the plume moved to the south toward Second Street.

Investigation activities, completed on May 9, 2000, consisted of performing a total of six soil borings (B1 – B6) in the street right-of-way. The borings were performed with a geoprobe.

This report summarizes the results of the investigation.

Analytical test results indicated that the metals detected in the soil were consistent with background levels found in Wisconsin soil.

OMNNI recommends no further action.

INTRODUCTION/BACKGROUND

A subsurface investigation was performed at the N.W. Mauthe site in 1992. Some borings were performed in Second Street as a part of the investigation. According to a report by CH2M Hill, some green discoloration was found in the soil while drilling boring W8. The investigation revealed background levels of metals in the soil and no contamination above standards in the groundwater. The groundwater collection trench used to help remediate the site is located on the north side of Second Street.

OMNNI was contracted by the City of Appleton to perform an investigation in Second Street. The City plans utility work in the street in 2001, and is planning for the possibility that contaminated soil and/or groundwater may be encountered during the work. A new water main and storm sewer is planned for Second Street.

The site is located in the SE 1/4 of the NW 1/4 of Section 34, T21N, R17E, City of Appleton, Outagamie County, Wisconsin. (See Figure 1 - Site Location Map, Appendix A.)

A total of six soil borings were performed in the street on May 9, 2000. (See Figure 2 - Site Detail Map, Appendix A.)

The site is serviced by City sewer and water.

The following are the primary contacts for the project:

Owner:	City of Appleton, 100 N. Appleton Street, Appleton, WI, 54914; (920) 832-5915. Contact: Mr. Don Wydeven.
Consultant:	OMNNI Associates, One Systems Drive, Appleton, WI 54914; (920) 735-6900. Contact: Mr. Dave Fries.

Driller:	B.E.S.T. Geoprobing, P.O. Box 12494, Green Bay, WI 54307-2494; 1-800-326-1889. Contact: Mr. Claude Dauphinais.
Laboratory:	U.S. Analytical Laboratory, 1090 Kennedy Avenue, Kimberly, WI 54136; (920) 735-8295. Contact: Mr. Chris Zabel.

GEOLOGY AND HYDROGEOLOGY

Surficial deposits in the vicinity of the site consist of sediment deposited during the Wisconsin Glaciation. According to United States Geological Survey maps (Water Resources of Wisconsin - Fox-Wolf River Basin, by Perry Olcott, 1968), glacial lake deposits consisting of silt and clay cover the site area. These soils appear to thicken in the immediate vicinity of the Fox River.

In general, subsurface materials encountered during drilling activities consisted of red-brown clay from the surface to a depth of approximately 10 feet, the depth of the borings.

The glacial deposits overlie dolomites of the Ordovician-aged Platteville Formation, Decorah Formation, and Galena Dolomite. Bedrock was not encountered during the investigation. According to the above-referenced geologic maps, the dolomite bedrock is as much as 100 feet deep in the vicinity of the site.

Topography on-site is generally flat. Off-site, it slopes gently downward to the southeast. Based on topography and the site investigation performed at the N.W. Mauthe site, the local groundwater movement is expected to be to the south - southeast. The water table on-site is shallow (less than 10 feet). Both groundwater depth and flow direction may vary due to seasonal variations, variations in soil stratigraphy, and underground structures (e.g., sewers).

FIELD ACTIVITIES

SOIL BORINGS

Soil boring activities were performed on May 9, 2000. A total of six soil borings were installed in Second Street to determine if contamination existed in the soil. Because contamination was not found in the groundwater in the area of interest, groundwater was not tested as part of this investigation.

Borings were installed to depths of 10 feet. (See DNR Forms, Appendix C, for specific information on boring construction.) All of the soil borings were properly abandoned per NR 141. (See DNR Forms, Appendix C.)

Soil samples were obtained continuously at 2.0-foot intervals for field inspection. At each sampling interval, a representative portion of the soil was also collected for possible laboratory analysis. (See Handbook of Field Procedures, Appendix D.) A single soil sample was chosen from each boring for laboratory analysis based on visual observations.

FIELD AND ANALYTICAL RESULTS

SOIL

Results of inspection of soils showed no green or yellow discoloration for all soil samples observed. All samples collected for laboratory analysis were tested for Resource Conservation and Recovery Act (RCRA) metals.

Results of analytical testing on soil samples collected during drilling activities showed levels of metals typical of background in the State of Wisconsin. (See Table 1 - Summary of Laboratory Analysis, Soil Boring Samples, Appendix B, and Laboratory Results and Chain of Custody Documentation, Appendix E.)

ANALYSIS OF DEGREE AND EXTENT OF CONTAMINATION

The investigation carried out in Second Street in the City of Appleton, WI did not identify any metals contamination above levels typically found in Wisconsin soil. Groundwater monitoring performed by CH2M Hill does not reveal any contamination in the groundwater in wells near Second Street (W8 and MW105).

CONCLUSIONS/RECOMMENDATIONS

Based on the investigation, the City should not expect to find contamination in Second Street between Douglas Street and Outagamie Street when doing utility work in 2001.

OMNNI recommends no further action at the site.

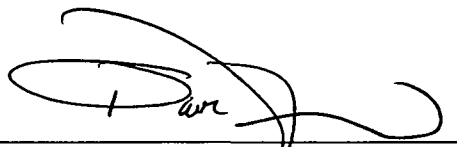
STANDARD OF CARE

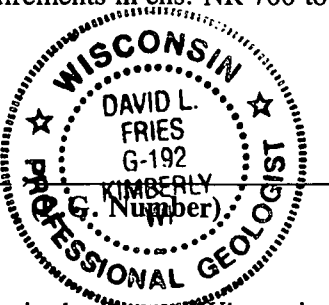
The conclusions presented in this investigation were arrived at using generally accepted hydrogeologic and engineering practices. The conclusions presented herein represent our professional opinions, based on the data collected at the time of the investigation, at the specific boring and sampling locations discussed in this report. Conditions at other locations on the property may be different than described in this investigation. The scope of this report is limited to the specific project and location described herein.

Prepared By: Dave Fries
Hydrogeologist

Reviewed By: Don Brittnacher
Don Brittnacher
Environmental Engineer

"I, Dave Fries, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."





(Professional Geologist) **(P.G. Number)**

"I, Don Brittnacher, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

Don Brittnacher

(Professional Engineer) **(P.E. Stamp)**

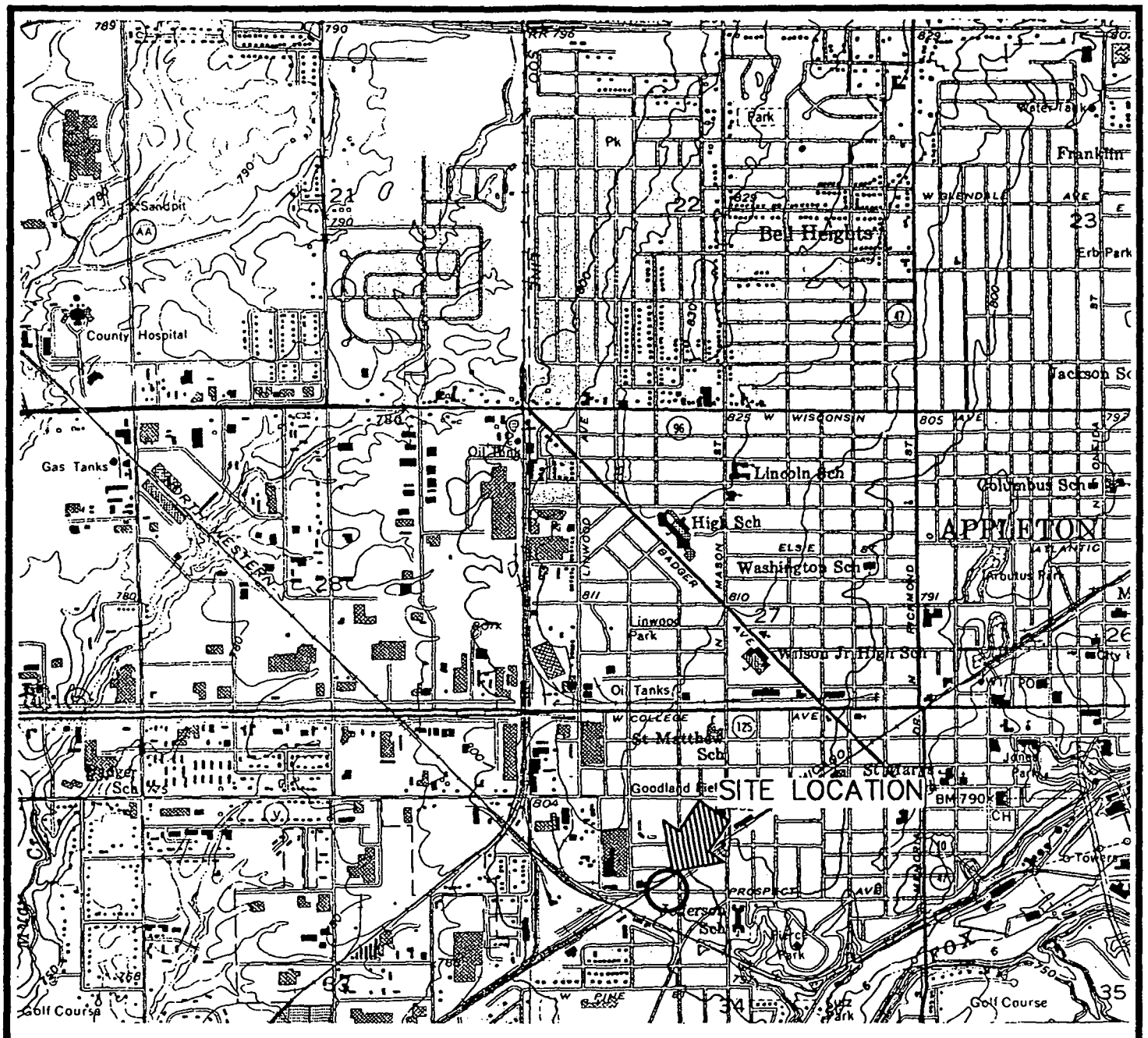
DISTRIBUTION:

Mr. Don Wydeven
City of Appleton
100 N. Appleton Street
Appleton, WI 54914

Ms. Jennifer Huffman
DNR – Appleton Field Station
3369 W. Brewster Street
Appleton, WI 54914

APPENDIX A

FIGURES



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, APPLETON, WISCONSIN QUADRANGLE, 1992.

0 1000' 2000' 4000'

SCALE 1"= 2000'

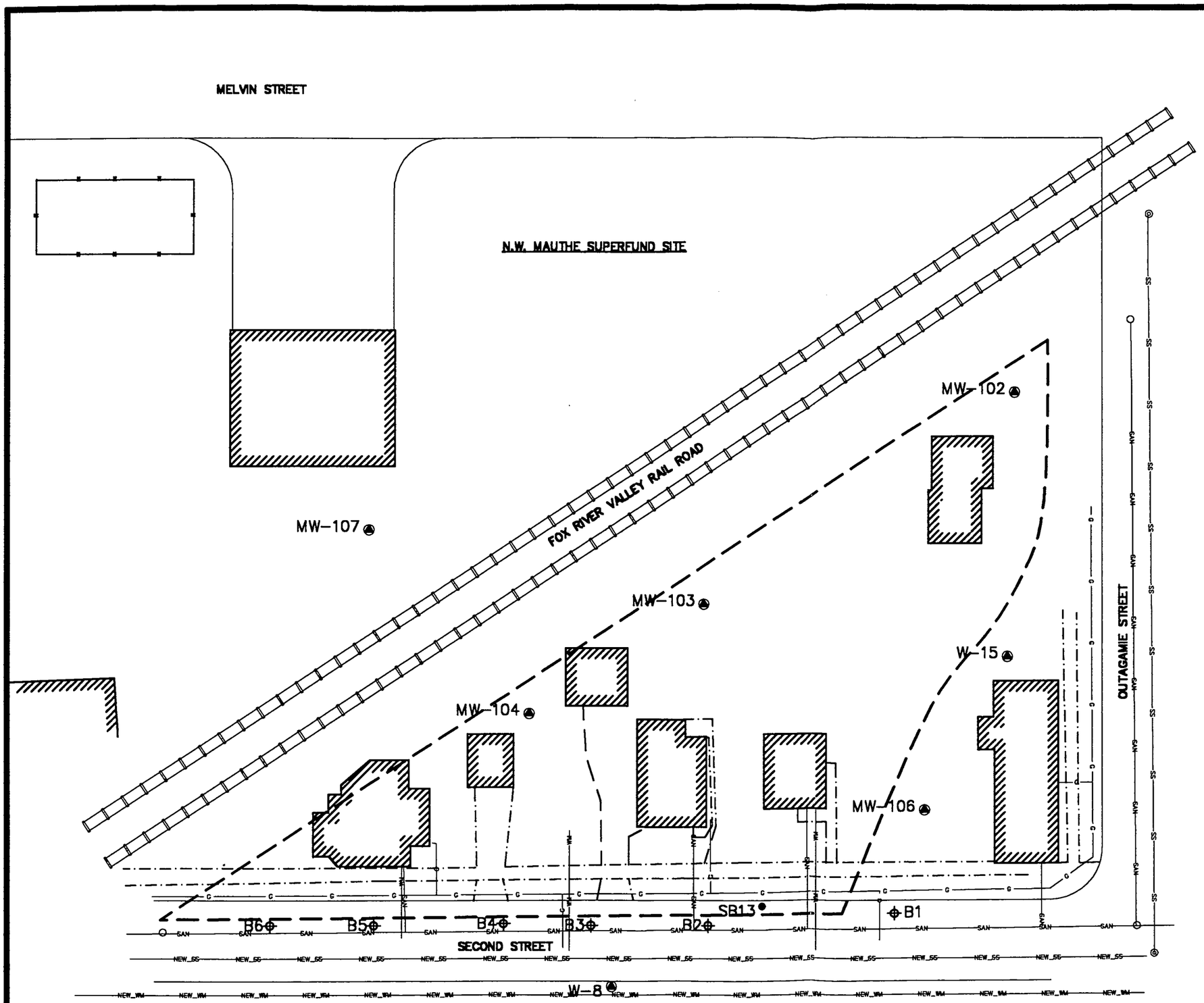
N

FIGURE 1
SITE LOCATION MAP

CITY OF APPLETON
SECOND STREET
APPLETON, WISCONSIN

OMNI ASSOCIATES
ONE SYSTEMS DRIVE
APPLETON, WI 54914
PHONE (920) 735-6900
FAX (920) 830-6100

PROJECT MANAGER:		PROJECT NO:	N1624800
PROJECT ENGINEER:		CAD FILE NO:	N162481
DRAWN BY:	dld	SCALE:	
REVIEWED BY:		DATE:	4/20/00



LOCAL GRID NORTH

N

0' 8' 20' 40'

SCALE: 1" = 40'

LEGEND:

B1 ⊕	Soil Boring Location and I.D No.
MW-106 ▲	CH_2M Hill Monitoring Well Location
SB13 ●	CH_2M Hill Soil Boring Location
W-8 ▲	CH_2M Hill Monitoring Well Location
	Building Face
	Edge of Road
	Fence
	Rail Road
	Southeast Groundwater Collection Trench
SAN	Sanitary Sewer and Manhole
G	Gas Line
WM	Water Main
SS	Storm Sewer and Manhole
	Edge of Asphalt
	Edge of Concrete Pavement
NEW_SS	Approximate New Storm Sewer
NEW_WM	Approximate New Water Main

FIGURE 2
SITE DETAIL MAP

CITY OF APPLETON
SECOND STREET
APPLETON, WISCONSIN

OMNI ASSOCIATES

ONE SYSTEMS DRIVE
APPLETON, WI 54914

PHONE (920) 735-6900
FAX (920) 830-6100

PROJECT MANAGER:		PROJECT NO:	N1624B00
PROJECT ENGINEER:		CAD FILE NO:	N1624B2
DRAWN BY:	DLD	SCALE:	1" = 40'
REVIEWED BY:		DATE:	4/20/00

APPENDIX B

TABLES

TABLE 1
SUMMARY OF LABORATORY ANALYSIS
SOIL BORING SAMPLES
MAY 9, 2000

PARAMETER	STANDARD	B1-3	B2-4	B3-5	B4-4	B5-3	B6-3
SAMPLE DEPTH		4.0 - 6.0	6.0 - 8.0	8.0 - 10.0	6.0 - 8.0	4.0 - 6.0	4.0 - 6.0
SAMPLE DATE		5/9/00	5/9/00	5/9/00	5/9/00	5/9/00	5/9/00
DETECTED RCRA METALS (mg/kg)							
ARSENIC	5.0*	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8
BARIUM	100*	35	56	20	47	62	53
CADMIUM	1.0*	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
CHROMIUM	5.0*	12	17	8.2	17	13	14
LEAD	5.0*	<6	<6	<6	<6	<6	<6
MERCURY	0.2*	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
SELENIUM	1.0*	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
SILVER	5.0*	<3	<3	<3	<3	<3	<3

*The regulatory levels for the metals are based on TCLP method 1311. Total metals analysis was performed on the samples. The total:TCLP ratio is 20:1

F:\ENVIRON\1624B\TABLES\SOIL

APPENDIX C

DNR FORMS

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
City of Appleton - Second Street		B1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
BEST Drilling & Geoprobing	5/9/2000	5/9/2000	geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	Feet MSL	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of NW 1/4 of Section 34, T 21 N, R 17 E

Lat ° ' "
Long ° ' "

Local Grid Location
☐ N Feet ☐ S
☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Outagamie	45	Appleton

Sample Number and Type	Length Att & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1	24 24		1	Sand & gravel Brown silty clay						M/W				8:20
2	24 20		2 3	Brown sand/silty clay w/no discoloration						W				8:25
3 LS	24 24		4 5							W				8:29
4	24 24		6 7	Tight red-brown clay w/no discoloration						W				8:31
5	24 24		8 9	Brown, wet, silty clay w/no discoloration						W!				8:37
			10	E.O.B. @ 10'										

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

Signature

Firm OMNNI Associates, Inc.
One Systems Drive Appleton, WI 54914-1654

Tel: (920) 735-6900
Fax: (920) 830-6100

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
City of Appleton - Second Street		B2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
BEST Drilling & Geoprobing	5/9/2000	5/9/2000	geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		B2	Feet MSL	Feet MSL	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of NW 1/4 of Section 34, T 21 N, R 17 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Outagamie	45	Appleton

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1	24 24		1	Gravel Sand w/no discoloration						Dry				9:30
2	24 20		2							Dry				9:31
			3	Red-brown clay w/gravel										
3	24 24		4	Stiff red-brown clay w/no discoloration						D/M				9:37
			5											
4 LS	24 24		6							D/M				9:45
			7											
5	24 24		8							M/W				9:51
			9											
			10	E.O.B. @ 10'										

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

Signature	Firm	Tel: (920) 735-6900
Dave	OMNNI Associates, Inc. One Systems Drive Appleton, WI 54914-1654	Fax: (920) 830-6100

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

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

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
City of Appleton - Second Street		B3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
BEST Drilling & Geoprobing	5/9/2000	5/9/2000	geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	Feet MSL	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of NW 1/4 of Section 34, T 21 N, R 17 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Outagamie	45	Appleton

Sample Number and Type	Sample Length Att & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1	24 / 24		1	Clay w/gravel & no discoloration						Dry				8:59
2	24 / 20		2							Dry				9:01
			3											
3	24 / 24		4	Stiff red-brown clay w/no discoloration						M				9:05
			5											
4	24 / 24		6							M				9:09
			7											
5 LS	24 / 24		8							W				9:15
			9	Stiff red-brown clay with gravel & no discoloration										
			10	E.O.B. @ 10'										

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

Signature Dave

Firm OMNNI Associates, Inc.
One Systems Drive Appleton, WI 54914-1654
Tel: (920) 735-6900
Fax: (920) 830-6100

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
City of Appleton - Second Street		B4

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
BEST Drilling & Geoprobing	5/9/2000	5/9/2000	geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		B4	Feet MSL	Feet MSL	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of NW 1/4 of Section 34, T 21 N, R 17 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Outagamie	45	Appleton

Sample Number and Type	Length Att & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1	24 24		0	Gravel						D/M				9:59
			1	Red-brown clay w/no discoloration										
2	24 15		2							D/M				10:02
			3											
3	24 12		4	Red-brown clay w/gravel						M				10:04
			5											
4 LS	24 24		6	Brown clay w/gravel & gray discoloration						M				10:11
			7											
5	24 24		8							M				10:17
			9											
			10	E.O.B. @ 10'										

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

Signature	Firm	Tel: (920) 735-6900
Dave	OMNNI Associates, Inc. One Systems Drive Appleton, WI 54914-1654	Fax: (920) 830-6100

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
City of Appleton - Second Street		B5

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
BEST Drilling & Geoprobing	5/9/2000	5/9/2000	geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	Feet MSL	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of NW 1/4 of Section 34, T 21 N, R 17 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Outagamie	45	Appleton

Sample Number and Type	Sample Length Att & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1	24 15		1	Gravel						M/W				10:32
			2	Clay at tip - no discoloration										
2	24 12		3	Red brown clay w/gravel						M				10:33
			4											
3 LS	24 24		5	Brown clay w/bright red discoloration						M/W				10:37
			6											
4	24 20		7	Red-brown clay w/no discoloration						M/W				10:43
			8											
5	24 24		9							M/W				10:50
			10	E.O.B. @ 10'										

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

Signature	Firm	Tel: (920) 735-6900
	OMNNI Associates, Inc. One Systems Drive Appleton, WI 54914-1654	Fax: (920) 830-6100

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
City of Appleton - Second Street		B6

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
BEST Drilling & Geoprobing	5/9/2000	5/9/2000	geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	Feet MSL	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of NW 1/4 of Section 34, T 21 N, R 17 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Outagamie	45	Appleton

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1	24 24		1	Gravel						D/M				10:59
			2	Brown clay w/gravel at tip										
2	24 20		3	Brown sand w/no discoloration						Dry				11:00
3 LS	24 24		4	Red-brown clay w/no discoloration						M				11:04
4	24 24		6							M/W				11:07
5	24 24		8							W				11:10
			10	E.O.B. @ 10'										

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

Signature	Firm	Tel: (920) 735-6900
	OMNNI Associates, Inc. One Systems Drive Appleton, WI 54914-1654	Fax: (920) 830-6100

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

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT
Form 3300-5B Rev. 4-97

All abandonment work shall be performed in accordance with the provisions of Chapters NR 811, NR 812 or 141, Wis. Admin. Code, whichever is applicable.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Outagamie

SE 1/4 of NW 1/4 of Sec. 34 ; T. 21 N; R. 17 ☒ E ☐ W

(If Applicable)

_____ Gov't Lot _____ Grid Number

Grid Location

_____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2nd Street

City, Village: Appleton

(2) FACILITY NAME City of Appleton - Second Street

Original Well Owner (If Known)

Present Well Owner: City of Appleton

Street or Route: 100 N. Appleton Street

City, State, Zip Code: Appleton, WI 54912

Facility Well No. and/or Name (If Applicable): B1

WI Unique Well No.

Reason For Abandonment: For soil sampling only

Date of Abandonment: 5/9/00

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 5/9/00

☐ Monitoring Well
☐ Water Well
☒ Drillhole
☐ Borehole

Construction Report Available? ☐ Yes ☒ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft) 10.0 (From ground surface)

Casing Diameter (in.) _____

Casing Depth (ft.) _____

Lower Drillhole Diameter (in.) _____

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

(4) Depth to Water (Feet) _____

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☐ No	

If No, Explain _____

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

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe - Gravity ☐ Conductor Pipe - Pumped
☐ Dump Bailer ☒ Other (Explain) Gravity

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☒ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite-Cement Grout

(7)

Sealing Material Used	From (Ft.)	To (Ft.)		Mix Ratio or Mud Weight
Asphalt	Surface	1.0		
Bentonite	1.0	10.0		

(8) Comments _____

(9) Name of Person or Firm Doing Sealing Work: BEST/OMNNI Associates

Signature of Person Doing Work: [signature]

Date Signed: 6/28/00

Street or Route: One Systems Drive

Telephone Number: 920-735-6900

City, State, Zip Code: Appleton, WI 54914

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer/Inspector	☐ Complying Work ☐ Noncomplying Work
Follow-up Necessary	

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT
Form 3300-5B Rev. 4-97

All abandonment work shall be performed in accordance with the provisions of Chapters NR 811, NR 812 or 141, Wis. Admin. Code, whichever is applicable.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Outagamie

SE 1/4 of NW 1/4 of Sec. 34 ; T. 21 N; R. 17 ☒ E ☐ W

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

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name:

Street Address of Well: 2nd Street

City, Village: Appleton

(2) FACILITY NAME City of Appleton - Second Street

Original Well Owner (If Known):

Present Well Owner: City of Appleton

Street or Route: 100 N. Appleton Street

City, State, Zip Code: Appleton, WI 54912

Facility Well No. and/or Name (If Applicable): B2

WI Unique Well No.:

Reason For Abandonment: For soil sampling only

Date of Abandonment: 5/9/00

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 5/9/00

☐ Monitoring Well
☐ Water Well
☒ Drillhole
☐ Borehole

Construction Report Available? ☐ Yes ☒ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft) 10.0 (From ground surface)
Casing Diameter (in.) _____
Casing Depth (ft.) _____

Lower Drillhole Diameter (in.) _____

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

(4) Depth to Water (Feet) _____

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☐ No	

If No, Explain _____

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

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe - Gravity ☐ Conductor Pipe - Pumped
☐ Dump Bailer ☒ Other (Explain) Gravity

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☒ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite-Cement Grout

(7)

Sealing Material Used	From (Ft.)	To (Ft.)		Mix Ratio or Mud Weight
Asphalt	Surface	1.0		
Bentonite	1.0	10.0		

(8) Comments _____

(9) Name of Person or Firm Doing Sealing Work: BEST/OMNNI Associates

Signature of Person Doing Work: [signature] Date Signed: 6/28/00

Street or Route: One Systems Drive Telephone Number: 920-735-6900

City, State, Zip Code: Appleton, WI 54914

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer/Inspector	☐ Complying Work ☐ Noncomplying Work
Follow-up Necessary	

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT
Form 3300-5B Rev. 4-97

All abandonment work shall be performed in accordance with the provisions of Chapters NR 811, NR 812 or 141, Wis. Admin. Code, whichever is applicable.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Outagamie

SE 1/4 of NW 1/4 of Sec. 34 ; T. 21 N; R. 17 ☒ E ☐ W

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

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2nd Street

City, Village: Appleton

(2) FACILITY NAME City of Appleton - Second Street

Original Well Owner (If Known)

Present Well Owner: City of Appleton

Street or Route: 100 N. Appleton Street

City, State, Zip Code: Appleton, WI 54912

Facility Well No. and/or Name (If Applicable): B3

WI Unique Well No.

Reason For Abandonment: For soil sampling only

Date of Abandonment: 5/9/00

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 5/9/00

☐ Monitoring Well
☐ Water Well
☒ Drillhole
☐ Borehole

Construction Report Available? ☐ Yes ☒ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft) 10.0 (From ground surface)
Casing Diameter (in.) _____
Casing Depth (ft.) _____

Lower Drillhole Diameter (in.) _____

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

(4) Depth to Water (Feet) _____

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☐ No	

If No, Explain _____

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

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe - Gravity ☐ Conductor Pipe - Pumped
☐ Dump Bailer ☒ Other (Explain) Gravity

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☒ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite-Cement Grout

(7)

Sealing Material Used	From (Ft.)	To (Ft.)		Mix Ratio or Mud Weight
Asphalt	Surface	1.0		
Bentonite	1.0	10.0		

(8) Comments _____

(9) Name of Person or Firm Doing Sealing Work: BEST/OMNNI Associates

Signature of Person Doing Work: [signature] Date Signed: 6/28/00

Street or Route: One Systems Drive Telephone Number: 920-735-6900

City, State, Zip Code: Appleton, WI 54914

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

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT
Form 3300-5B Rev. 4-97

All abandonment work shall be performed in accordance with the provisions of Chapters NR 811, NR 812 or 141, Wis. Admin. Code, whichever is applicable.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Outagamie

SE 1/4 of NW 1/4 of Sec. 34 ; T. 21 N; R. 17 ☒ E ☐ W

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

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2nd Street

City, Village: Appleton

(2) FACILITY NAME City of Appleton - Second Street

Original Well Owner (If Known)

Present Well Owner: City of Appleton

Street or Route: 100 N. Appleton Street

City, State, Zip Code: Appleton, WI 54912

Facility Well No. and/or Name (If Applicable): B4

WI Unique Well No.

Reason For Abandonment: For soil sampling only

Date of Abandonment: 5/9/00

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 5/9/00

☐ Monitoring Well
☐ Water Well
☒ Drillhole
☐ Borehole

Construction Report Available? ☐ Yes ☒ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft) (From ground surface) 10.0

Casing Diameter (in.) _____

Casing Depth (ft.) _____

Lower Drillhole Diameter (in.) _____

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

(4) Depth to Water (Feet) _____

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☐ No	

If No, Explain _____

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

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe - Gravity ☐ Conductor Pipe - Pumped
☐ Dump Bailer ☒ Other (Explain) Gravity

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☒ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite-Cement Grout

(7)

Sealing Material Used	From (Ft.)	To (Ft.)		Mix Ratio or Mud Weight
Asphalt	Surface	1.0		
Bentonite	1.0	10.0		

(8) Comments _____

(9) Name of Person or Firm Doing Sealing Work: BEST/OMNNI Associates

Signature of Person Doing Work: [signature]

Date Signed: 6/28/00

Street or Route: One Systems Drive

Telephone Number: 920-735-6900

City, State, Zip Code: Appleton, WI 54914

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer/Inspector	☐ Complying Work ☐ Noncomplying Work
Follow-up Necessary	

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT
Form 3300-5B Rev. 4-97

All abandonment work shall be performed in accordance with the provisions of Chapters NR 811, NR 812 or 141, Wis. Admin. Code, whichever is applicable.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Outagamie

SE 1/4 of NW 1/4 of Sec. 34 ; T. 21 N; R. 17 ☒ E ☐ W

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

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2nd Street

City, Village: Appleton

(2) FACILITY NAME City of Appleton - Second Street

Original Well Owner (If Known)

Present Well Owner: City of Appleton

Street or Route: 100 N. Appleton Street

City, State, Zip Code: Appleton, WI 54912

Facility Well No. and/or Name (If Applicable): B5

WI Unique Well No.

Reason For Abandonment: For soil sampling only

Date of Abandonment: 5/9/00

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 5/9/00

☐ Monitoring Well
☐ Water Well
☒ Drillhole
☐ Borehole

Construction Report Available? ☐ Yes ☒ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft) 10.0 (From ground surface)
Casing Diameter (in.) _____
Casing Depth (ft.) _____

Lower Drillhole Diameter (in.) _____

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

(4) Depth to Water (Feet) _____

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☐ No	

If No, Explain _____

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

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe - Gravity ☐ Conductor Pipe - Pumped
☐ Dump Bailer ☒ Other (Explain) Gravity

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☒ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite-Cement Grout

(7) Sealing Material Used	From (Ft.)	To (Ft.)		Mix Ratio or Mud Weight
Asphalt	Surface	1.0		
Bentonite	1.0	10.0		

(8) Comments _____

(9) Name of Person or Firm Doing Sealing Work: BEST/OMNNI Associates

Signature of Person Doing Work: [signature] Date Signed: 6/28/00

Street or Route: One Systems Drive Telephone Number: 920-735-6900

City, State, Zip Code: Appleton, WI 54914

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer/Inspector	☐ Complying Work ☐ Noncomplying Work
Follow-up Necessary	

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT
Form 3300-5B Rev. 4-97

All abandonment work shall be performed in accordance with the provisions of Chapters NR 811, NR 812 or 141, Wis. Admin. Code, whichever is applicable.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Outagamie

SE 1/4 of NW 1/4 of Sec. 34 ; T. 21 N; R. 17 ☒ E ☐ W

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

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2nd Street

City, Village: Appleton

(2) FACILITY NAME City of Appleton - Second Street

Original Well Owner (If Known)

Present Well Owner: City of Appleton

Street or Route: 100 N. Appleton Street

City, State, Zip Code: Appleton, WI 54912

Facility Well No. and/or Name (If Applicable): B6

WI Unique Well No.

Reason For Abandonment: For soil sampling only

Date of Abandonment: 5/9/00

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 5/9/00

☐ Monitoring Well
☐ Water Well
☒ Drillhole
☐ Borehole

Construction Report Available? ☐ Yes ☒ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft) 10.0 (From ground surface)
Casing Diameter (in.) _____
Casing Depth (ft.) _____

Lower Drillhole Diameter (in.) _____

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

(4) Depth to Water (Feet) _____

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☒ Yes	☐ No	

If No, Explain _____

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

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe - Gravity ☐ Conductor Pipe - Pumped
☐ Dump Bailer ☒ Other (Explain) Gravity

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☒ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite-Cement Grout

(7) Sealing Material Used	From (Ft.)	To (Ft.)		Mix Ratio or Mud Weight
Asphalt	Surface	1.0		
Bentonite	1.0	10.0		

(8) Comments _____

(9) Name of Person or Firm Doing Sealing Work: BEST/OMNNI Associates

Signature of Person Doing Work: [signature]
Date Signed: 6/28/00

Street or Route: One Systems Drive
Telephone Number: 920-735-6900

City, State, Zip Code: Appleton, WI 54914

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

DNR/COUNTY

APPENDIX D

HANDBOOK OF FIELD PROCEDURES

HANDBOOK OF FIELD PROCEDURES

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PERSONNEL QUALIFICATIONS

Kenneth E. Hawk	-	Completed 40-hour hazardous waste training. Bachelors Degree in Geology from University of Wisconsin-Oshkosh. Masters Degree in Environmental Science from University of Wisconsin-Green Bay. Licensed Professional Geologist (no. 197), State of Wisconsin Certified Site Assessor-01660.
Don Brittnacher	-	Completed 40-hour hazardous waste training. Bachelors Degree in Geology from University of Notre Dame. Masters Degree in Environmental Health Engineering from University of Notre Dame. Licensed Professional Geologist (no. 462), State of Wisconsin Licensed Professional Engineer (no. 30286), State of Wisconsin Certified Site Assessor-01658.
David L. Fries	-	Completed 40-hour hazardous waste training. Bachelors Degree in Geology from Lawrence University, Appleton, WI. Masters Degree in Environmental Science from University of Wisconsin-Green Bay. Licensed Professional Geologist (no. 192), State of Wisconsin Certified Site Assessor-01662. Certified Hazardous Materials Manager (no. 10226)
Bill Endter	-	Completed 40-hour hazardous waste training. Associate Degree in Natural Resource Technology from Fox Valley Technical College.
Deanna Drum	-	Completed 40-hour hazardous waste training. Associate Degree in Mechanical Design, Fox Valley Technical College.

SOIL BORING INSTALLATION PROCEDURES

A number of different drilling and geoprobing firms are used for environmental investigations. Borings intended to be converted to monitoring wells are advanced using 7 5/8" O.D. x 4 1/2" I.D. hollow stem augers or 6 1/4" O.D. solid stem augers powered by a truck-mounted drill rig. If bedrock drilling is required, borings are advanced using either air or mud-rotary drilling techniques. Soil borings not intended for monitoring wells are typically advanced using 4" O.D. solid stem augers. The geoprobe typically advances a 2" diameter hole. All soil borings that are not converted to permanent or temporary groundwater monitoring wells are properly abandoned per NR 141.

Samples are typically obtained from each boring at 2.5' intervals by split-spoon sampling according to ASTM D-1586. A portion of each sample is screened with a photoionization detector (PID). At each sampling interval, a representative portion of the soil is also collected for possible laboratory analysis. Soil samples are chosen from each boring for laboratory analysis based on headspace screening data, and visual and olfactory observations. In general, the sample from each boring that exhibits the highest PID reading is chosen for analysis. See the Soil Sampling Procedures below, for further information pertaining to field headspace analysis and sample collection procedures.

SOIL SAMPLING PROCEDURES

All soil sampling is performed in accordance with DNR PUBL-SW-127, Soil Sampling Requirements for LUST Site Investigations and Excavations and DILHR ch. 10, Flammable and Combustible Liquids. The soil samples are collected and analyzed in accordance with DNR PUBL-SW-130 92REV, LUST Analytical Guidance, July, 1993. Our standard instruments and sample collection procedures are as follows:

1. Soil samples are collected from a split-spoon sampler during environmental drilling.

2. Sample collector wears new latex exam gloves when collecting samples to decrease the risk of personal exposure and cross contamination.

3. A portion of the sample is collected in a sampling syringe and placed in new glass 40 ml vials, or new glass 2 oz jars, and immediately placed on ice, and later delivered to the laboratory for analysis. This procedure will be discussed in more detail later in this report. (See Table 1.)

4. The remaining portion of the sample is placed in a clean 4 oz. jar (approx. 1/2 filled), and sealed with aluminum foil and a teflon-lined lid. The headspace sample is then agitated for a minimum of 30 seconds and then allowed to equilibrate. Minimum equilibration time will correspond to the following specifications:

Minimum Sample Headspace Equilibration Time

Ambient Outside Air Temperature at the Time of Sample Collection	Minimum Amount of Time Sample Must Equilibrate at 70° F or Greater Temperature
< 40 F	40 min.
41 - 55 F	20 min.
56 - 69 F	10 min.
> 70	5 min.

INSTRUMENT SPECIFICATIONS

When the sample has completed equilibration, it is promptly field analyzed with a portable photoionization detector (PID). OMNNI uses either a Photovac Inc. Microtip HL-200 or ML-1000 or a Thermo Environmental Instruments Model 580A OVM, both equipped with an 11.2 ev lamp. A background reading is first taken. The PID probe is then inserted into the jar through a single hole in the aluminum foil. The instrument reading is measured at one-half the distance between the foil seal and the sample surface. The measured reading is then recorded.

Isobutylene at a concentration of 100 ppm is used for field calibration gas. The PID meter is field calibrated at the following times:

- At the beginning of each day
- After any significant change in temperature or humidity
- Every three hours
- After any repairs to the instrument are performed

5. All samples are returned to the laboratory as soon as possible, usually the day the sample was collected. All samples are returned to the lab with a chain-of-custody form, form #4400-151. Time of sample collection and sample PID reading are listed. Care is taken to ensure that the chain-of-custody form is properly and fully completed before submitting to the laboratory.

6. The samples are sent to a laboratory certified by the Wisconsin Department of Natural Resources.

7. Table 2 on page 9 outlines the required DNR laboratory analysis for specific UST contaminants.

Soil analyses, other than those in Table 2, will be conducted in accordance with methods approved by the DNR.

MONITORING WELL INSTALLATION AND DEVELOPMENT PROCEDURES

The permanent monitoring wells are typically constructed of two-inch, schedule 40, flush-thread PVC casings and well screens. Temporary wells are one-inch diameter, schedule 40 casings and screens. Prior to use, well parts are individually wrapped in plastic.

Permanent wells are installed and developed according to NR 141, DNR Groundwater Monitoring Well Requirements. The monitoring wells are installed with five to fifteen-foot screens which are placed in the borings to intersect the water table. Piezometers are installed with five-foot screens sealed beneath the water table. Filter pack and annular space seal material are installed by gravity as the augers are withdrawn from the hole. Wells are cut to the required height using a PVC pipe cutter.

An as-constructed well and boring survey is performed by OMNNI once field work is complete. Elevations are either based on a local datum of 100 feet, or a U.S.G.S. elevation, assigned to a mark on a reference point located at the site. Ground elevation is surveyed to the nearest 0.1 foot, and the top of the well casing to the nearest 0.01 foot.

A horizontal grid system is established at the site with the origin of the grid set on the reference point. Wells and borings are located with respect to this grid system.

To properly develop each permanent monitoring well, water is removed until a consistent water quality is obtained. This is done by removing 10 times the water volume in the well and filter pack, removing water until it is free of sediment, or removing the water until the well is purged dry. Water is removed from the wells by bailing the water with as little agitation as possible. If the water level is unaffected by bailing and large amounts of water are to be removed, the well is developed by using the surge and purge method with a Red Lion centrifugal pump. No water is added to the well during development. Temporary wells are typically developed by allowing the peristaltic pump to run until the water is as clear as possible.

The development water is barrelled, pending the results of analytical testing. If the well is suspected to be clean and small volumes of water are to be removed, the water may be spread on pavement to volatilize any possible contaminants.

GROUNDWATER SAMPLING PROCEDURES AND V.O.C. SAMPLING NOTES

A. Devices used to measure water elevation, purge wells and retrieve samples:

1. Groundwater levels are measured with a fiberglass reel tape with a weighted stainless steel "sounder" at the end.

2. In wells that have free product on top of the water surface, depth to water and depth to product are measured with a fiberglass reel tape with an interface probe at the end.

3. Wells are purged and samples are collected by one of the following methods:

   a) Wells are purged with a Voss disposable bailer.

   b) Alternate purging and sampling equipment consists of a peristaltic groundwater sampling pump.

B. Procedures for calculating purge volumes, purging wells and sampling:

1. Wells are normally sampled starting from the upgradient area and progressing toward the downgradient area of the site. When the degree of contamination is known, least contaminated wells are sampled first, the more contaminated wells sampled last.

2. All the wells are opened before the depth to groundwater is determined.

3. Wells are purged by removing four water volumes within a casing or all the water until the well runs dry.

4. Once all the wells have been purged, the samples are drawn using equipment mentioned above. (See Table 3 - Water Sample Preparation Guide)

5. Sample, odor, turbidity, temperature, conductivity and pH are determined on the unfiltered portions of the sample and recorded on the well specific field sheet.

6. When the sample requires filtering, the sample is filtered with an in-line pump (as soon after collection as possible).

7. Quality Assurance/Quality Control Samples

   a) Trip and field blanks will consist of three new 40 ml vials filled with deionized water. These are sent to the laboratory for (P)VOC analysis. If no field contamination has occurred, these samples will have no detectable (P)VOCs.

   b) One trip blank should be analyzed for every 10 samples collected. At least one trip blank is taken per site visit. Trip blanks are poured, labeled, and sealed, then taken out in the field. Trip blanks are kept with all samples collected until reaching the field.

   c) Field blanks are used if the bailers are not dedicated to a specific well. If there is a possibility for field cross-contamination of samples, field blanks may also be taken at the sample collector's discretion.

   d) One temperature blank is collected per batch of samples.

   e) One duplicate sample is collected with every 10 samples.

8. Samples are refrigerated, then transported to a state certified laboratory for testing as soon as possible.

9. A chain-of-custody will be filled out listing all samples collected, requested laboratory analysis, date and time of collection, and the name of the sample collector. This document will remain with the samples at all times and bear the names of all persons handling the samples until the samples are received by the laboratory.

C. Procedures for cleaning equipment:

1. In the field, sampling equipment is rinsed with a 10% methanol solution and then flushed three times with deionized water between each well sampled.

2. Equipment that is still contaminated after field cleaning will be rinsed with tap water, washed off with detergent, rinsed with a 10% methanol solution, and flushed three times with deionized water.

D. Transporting samples to lab:

1. Filtered, preserved, labelled, and sealed samples are iced and transported to the lab for analysis as soon as possible.

2. The laboratory will be notified by the sample collector when courier service is required.

E. The above procedures constitute normal groundwater sampling procedures for permanent groundwater monitoring wells. Modifications to each of the outlined items may be applicable for site specific conditions or special volatile organic sampling considerations. Methods used are consistent with WDNR "Groundwater Sampling Procedures Guidelines" Publ. WR-153, February, 1987.

DECONTAMINATION PROCEDURES

Decontamination is the process of removing and/or neutralizing contaminants that may have accumulated on PPE (personnel protective equipment) and equipment. Proper decontamination is a critical element in the control of hazards which helps ensure the health and safety of workers. Proper decontamination also contains the contamination to the site, thus preventing further environmental problems.

Drilling

The following decontamination procedures should be used when completing borings, installing monitoring wells, and/or installing remediation systems.

A. Between samples, the split spoon will be cleaned in a multiple rinse, surfactant solution (soap and water or Alconox solution.)

B. The sample will be collected while wearing new latex exam gloves.

C. The surface upon which the sample is collected will be cleaned between samples.

D. The latex exam gloves will be changed between samples.

E. Soil which has accumulated around the boring will either be stockpiled or barreled. If the soil is stockpiled, it will be placed on and covered with visqueen. The stockpiled or barreled soil will later be disposed of in compliance with the DNR regulations.

F. Upon completion of the boring, the augers will be decontaminated before they are used again. The following procedures will be followed when decontaminating drilling equipment:

1. A decontamination basin lined with plastic (visqueen) is set up near the work area.

2. All contaminated equipment is placed in the decontamination basin.

3. A pressurized steam cleaner is used to clean all contaminated equipment.

4. Following steam cleaning, the auger is removed from the decontamination basin.

5. Upon completion of the job, the accumulated water in the decontamination basin is pumped out and placed in a barrel. Wash water used for cleaning the split spoons is also added to the barrel. The barrel will be disposed of in compliance with all regulatory agencies.

6. The visqueen used in the decontamination basin is disposed of in compliance with all regulatory agencies.

Table 1
SOIL SAMPLE PREPARATION GUIDE*

TEST	CONTAINER SIZE**	SAMPLE SIZE	PRESERVATIVE	HOLDING TIME
GRO Gasoline Range Organics	2 oz. wide mouth jar or 40 ml vial (2 per sample)	25 g	25 ml Methanol (purge and trap grade)	4 days
DRO Diesel Range Organics	2 oz. wide mouth jar or 40 ml vial (2 per sample)	25 g	None	4 days
Total Lead/ Total Cadmium	4 oz. wide mouth jar (2 per sample)	4 oz.	None	6 months
VOC / PVOC Volatile Organic Compounds	2 oz. wide mouth jar or 40 ml vial (2 per sample)	25 g	25 ml Methanol (purge and trap grade)	4 days
PCB Polychlorinated Biphenyls	4 oz. wide mouth jar (2 per sample)	4 oz.	None	14 days
PAH Polynuclear Aromatic Hydrocarbons	4 oz. wide mouth jar (2 per sample)	4 oz.	None	14 days

* All samples will be sealed, labeled, and placed on ice immediately after collection.

** To ensure a proper seal between the sample container and the cap, no soil shall remain on the jar or cap threads. When samples are collected with the syringe, a 40 ml vial is used and the sample is preserved in the lab.

Table 2
SOIL SAMPLE ANALYSIS GUIDE FOR PETROLEUM CONTAMINATION

PETROLEUM SUBSTANCE	CLOSURE ASSESSMENT	SOLID WASTE PRO./LANDFILLS	SITE INVESTIGATIONS
Gasoline Aviation Fuel	GRO	Free Liquids GRO Benzene Haz. Waste Det.	GRO PVOC/VOC Pb
Diesel Jet Fuel No.'s 1, 2, 4 Fuel Oil	DRO	Free Liquids GRO Benzene Haz. Waste Det.	DRO PVOC PAH
Crude Oil Lubricat. Oil No. 6 Fuel Oil	DRO	Free Liquids DRO Haz. Waste Det.	DRO PAH
Unknown Petroleum	GRO and DRO	Free Liquids GRO and DRO Pb, Cd, CH S Haz Waste Det.	GRO and DRO VOC/PVOC PAH Pb, Cd
Waste Oil	DRO	Free Liquids DRO VOC Pb, Cd, CH S Haz. Waste Det.	DRO VOC/PVOC PAH PCB Pb, Cd

Table 3
WATER SAMPLE PREPARATION GUIDE *

TEST	SAMPLE SIZE / CONTAINER	PRESERVATIVE	HOLDING TIME
VOC / PVOC Volatile Organic Compounds	3 - 40 ml vials filled with no headspace	0.5 ml of 1:1 HC1	14 days
DRO Diesel Range Organics	1 - 1 liter amber glass bottles	5 ml of 1:1 HC1	7 days
GRO Gasoline Range Organics	3 - 40 ml vials filled with no headspace	0.5 ml of 1:1 HC1	14 days
PAH Polynuclear Aromatic Hydrocarbons	1 - 1 liter amber glass bottles	None	7 days
PCB Polychlorinated Biphenyls	1 - 1 liter amber glass bottle	None	7 days
LEAD / CADMIUM metals **	1 - 250 ml plastic bottle	2 ml of HNO_3 or to a pH of <2	6 months

* All samples will be sealed, labeled, and placed on ice immediately after collection.
** When testing for dissolved metals, the sample will be field filtered before preservation.

APPENDIX E

LABORATORY ANALYSIS RESULTS
AND
CHAIN OF CUSTODY DOCUMENTATION

U.S. Analytical Lab

DAVE FRIES
OMNNI ASSOCIATES INC
ONE SYSTEMS DRIVE
APPLETON WI 54914-1654

Project # N1624B00
Project Name CITY OF APPLETON
Invoice # E29718

Report Date *17-May-00*

Analyte	Result	Units	LOD	LOQ	Dil	Run Date	Method	Analyst	QC Code
Lab Code 5029718A						**Sample Type** Soil			
Sample ID B1-3						**Sample Date** 5/9/00			
Inorganic									
General									
Solids Percent	86.9	%			1	5/10/00	5021	KAH	1
Metals									
Arsenic	< 2.8	mg/kg	2.8	9.2	1	5/12/00	6010B	JLA	1
Barium	35	mg/kg	0.28	0.93	1	5/12/00	6010B	JLA	1
Cadmium	< 1.2	mg/kg	1.2	4	1	5/12/00	6010B	JLA	1
Chromium	12	mg/kg	0.55	1.8	1	5/16/00	6010B	JLA	1
Lead	< 6	mg/kg	6	20	1	5/12/00	6010B	JLA	1
Mercury	< 0.03	mg/kg	0.03	0.1	1	5/10/00	245.1	SJV	1
Selenium	< 4.9	mg/kg	4.9	16	1	5/12/00	6010B	JLA	1
Silver	< 3	mg/kg	3	10	1	5/12/00	6010B	JLA	1
Lab Code 5029718B						**Sample Type** Soil			
Sample ID B2-4						**Sample Date** 5/9/00			
Inorganic									
General									
Solids Percent	86.7	%			1	5/10/00	5021	KAH	1
Metals									
Arsenic	< 2.8	mg/kg	2.8	9.2	1	5/12/00	6010B	JLA	1
Barium	56	mg/kg	0.28	0.93	1	5/12/00	6010B	JLA	1
Cadmium	< 1.2	mg/kg	1.2	4	1	5/12/00	6010B	JLA	1
Chromium	17	mg/kg	0.55	1.8	1	5/16/00	6010B	JLA	1
Lead	< 6	mg/kg	6	20	1	5/12/00	6010B	JLA	1
Mercury	< 0.03	mg/kg	0.03	0.1	1	5/10/00	245.1	SJV	1
Selenium	< 4.9	mg/kg	4.9	16	1	5/12/00	6010B	JLA	1
Silver	< 3	mg/kg	3	10	1	5/12/00	6010B	JLA	1
Lab Code 5029718C						**Sample Type** Soil			
Sample ID B3-5						**Sample Date** 5/9/00			
Inorganic									
General									
Solids Percent	90.2	%			1	5/10/00	5021	KAH	1
Metals									
Arsenic	< 2.8	mg/kg	2.8	9.2	1	5/12/00	6010B	JLA	1

U.S. Analytical Lab

DAVE FRIES
OMNNI ASSOCIATES INC
ONE SYSTEMS DRIVE
APPLETON WI 54914-1654

Project # N1624B00
Project Name CITY OF APPLETON
Invoice # E29718

Report Date *17-May-00*

Analyte	Result	Units	LOD	LOQ	Dil	Run Date	Method	Analyst	QC Code
Lab Code 5029718C						**Sample Type** Soil			
Sample ID B3-5						**Sample Date** 5/9/00			
Barium	20	mg/kg	0.28	0.93	1	5/12/00	6010B	JLA	1
Cadmium	< 1.2	mg/kg	1.2	4	1	5/12/00	6010B	JLA	1
Chromium	8.2	mg/kg	0.55	1.8	1	5/16/00	6010B	JLA	1
Lead	< 6	mg/kg	6	20	1	5/12/00	6010B	JLA	1
Mercury	< 0.03	mg/kg	0.03	0.1	1	5/10/00	245.1	SJV	1
Selenium	< 4.9	mg/kg	4.9	16	1	5/12/00	6010B	JLA	1
Silver	< 3	mg/kg	3	10	1	5/12/00	6010B	JLA	1
Lab Code 5029718D						**Sample Type** Soil			
Sample ID B4-4						**Sample Date** 5/9/00			
Inorganic									
General									
Solids Percent	88.6	%			1	5/10/00	5021	KAH	1
Metals									
Arsenic	< 2.8	mg/kg	2.8	9.2	1	5/12/00	6010B	JLA	1
Barium	47	mg/kg	0.28	0.93	1	5/12/00	6010B	JLA	1
Cadmium	< 1.2	mg/kg	1.2	4	1	5/12/00	6010B	JLA	1
Chromium	17	mg/kg	0.55	1.8	1	5/16/00	6010B	JLA	1
Lead	< 6	mg/kg	6	20	1	5/12/00	6010B	JLA	1
Mercury	< 0.03	mg/kg	0.03	0.1	1	5/10/00	245.1	SJV	1
Selenium	< 4.9	mg/kg	4.9	16	1	5/12/00	6010B	JLA	1
Silver	< 3	mg/kg	3	10	1	5/12/00	6010B	JLA	1
Lab Code 5029718E						**Sample Type** Soil			
Sample ID B5-3						**Sample Date** 5/9/00			
Inorganic									
General									
Solids Percent	87.7	%			1	5/10/00	5021	KAH	1
Metals									
Arsenic	< 2.8	mg/kg	2.8	9.2	1	5/12/00	6010B	JLA	1
Barium	62	mg/kg	0.28	0.93	1	5/12/00	6010B	JLA	1
Cadmium	< 1.2	mg/kg	1.2	4	1	5/12/00	6010B	JLA	1
Chromium	13	mg/kg	0.55	1.8	1	5/16/00	6010B	JLA	1
Lead	< 6	mg/kg	6	20	1	5/12/00	6010B	JLA	1
Mercury	< 0.03	mg/kg	0.03	0.1	1	5/10/00	245.1	SJV	1
Selenium	< 4.9	mg/kg	4.9	16	1	5/12/00	6010B	JLA	1

U.S. Analytical Lab

DAVE FRIES
OMNNI ASSOCIATES INC
ONE SYSTEMS DRIVE
APPLETON WI 54914-1654

Project # N1624B00
Project Name CITY OF APPLETON
Invoice # E29718

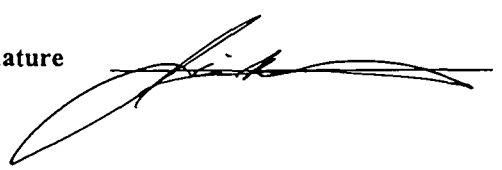
Report Date *17-May-00*

Analyte	Result	Units	LOD	LOQ	Dil	Run Date	Method	Analyst	QC Code
Lab Code 5029718E						**Sample Type** Soil			
Sample ID B5-3						**Sample Date** 5/9/00			
Silver	< 3	mg/kg	3	10	1	5/12/00	6010B	JLA	1
Lab Code 5029718F						**Sample Type** Soil			
Sample ID B6-3						**Sample Date** 5/9/00			
Inorganic									
General									
Solids Percent	86.1	%			1	5/10/00	5021	KAH	1
Metals									
Arsenic	< 2.8	mg/kg	2.8	9.2	1	5/12/00	6010B	JLA	1
Barium	53	mg/kg	0.28	0.93	1	5/12/00	6010B	JLA	1
Cadmium	< 1.2	mg/kg	1.2	4	1	5/12/00	6010B	JLA	1
Chromium	14	mg/kg	0.55	1.8	1	5/16/00	6010B	JLA	1
Lead	< 6	mg/kg	6	20	1	5/12/00	6010B	JLA	1
Mercury	< 0.03	mg/kg	0.03	0.1	1	5/10/00	245.1	SJV	1
Selenium	< 4.9	mg/kg	4.9	16	1	5/12/00	6010B	JLA	1
Silver	< 3	mg/kg	3	10	1	5/12/00	6010B	JLA	1

LOD Limit of Detection "J" Flag: Analyte detected between LOD and LOQ LOQ Limit of Quantitation

Code	*Comment*
1	All laboratory QC requirements were met for this sample.

Authorized Signature



CHAIN OF CUSTODY RECORD

Analytical Lab
1090 Kennedy Ave. • Kimberly, WI 54136
(920) 735-8295 • FAX 920-739-1738 • 800-490-4902
LAB@USOIL.COM

Rev. Date: 12-17-98

Chain # № 19036

Page ____ of ____

Lab I.D. # 5029718

Account No. : Quote No.: Q4527

Project #: N1624B00

Sampler: (signature) Dave

Sample Integrity - To be completed by receiving lab.
Method of Shipment : Client Temp. of Temp. Blank. ____ °C On Ice: X
Cooler seal intact upon receipt: X Yes ____ No Labcoded By: AJ

Project (Name / Location): City of Appleton - 2nd Street.

Reports To: Dave Fries	Invoice To: City of Appleton
Company OMNNI	Company % D. Fries - OMNNI
Address One Systems Drive	Address same
City State Zip Appleton, WI 54914	City State Zip
Phone 735-6900	Phone

Sample Handling Request
___ Rush Analysis Date Required ____
X Normal Turn Around

Analysis Requested

Lab I.D.	Sample I.D.	Collection Date	Collection Time	No. of Containers Size and Type	Description*	Preservation	DRO (Mod/TPH)	GRO (Mod/TPH)	PVOC (EPA 8021)	BTEX (EPA 8021)	VOC (EPA 8021)	VOC (EPA 8260)	O&G (EPA 413.1)	PAH (EPA 8310)	Pb	Flash Point	Other Analysis: RCRA metals	PID/ FID
5029718																		
A	B1-3	5/9/00	8:29	4, 20z	soil	—											X	
B	B2-4	5/9/00	9:45	4, 20z	soil	—											X	
C	B3-5	5/9/00	9:15	4, 20z	soil	—											X	
D	B4-4	5/9/00	10:11	4, 20z	soil	—											X	
E	B5-3	5/9/00	10:37	4, 20z	soil	—											X	
F	B6-3	5/9/00	11:04	4, 20z	soil	—											X	

Department Use Only
Split Samples: Offered ? ____ Yes ____ No
Accepted? ____ Yes ____ No
Accepted By: _____

Comments/ Special Instructions
*Specify groundwater "GW", Drinking Water "DW", Waste Water "WW", Soil "S", Air "A", etc.

Department Use Optional for Soil Samples
Disposition of unused portion of sample
Lab Should:
____ Dispose ____ Retain for ___ days
____ Return ____ Other

Relinquished By: (sign)	Time	Date	Received By: (sign)	Time	Date
Dave	11:40	5/9/00			

Received in Laboratory By: R. Woods Time: 11:40 Date: 5-9-00

OMNNI
ASSOCIATES

ENGINEERING
ARCHITECTURE
ENVIRONMENTAL

OMNNI ASSOCIATES, INC.
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