

R E P O R T

P.F. Fink, Inc.

c/o Attorney Joseph A. Hoida
403 South Jefferson Street
Green Bay, Wisconsin 54301

**Site Investigation
Addendum Report**

P.F. Fink, Inc.

**One-Hour Martinizing
Dry Cleaning Service
1233 South Military Avenue
Green Bay, Wisconsin**

24871XF

March 2001



March 12, 2001

Ms. Kristin DuFresne
Wisconsin Department of Natural Resources
1125 North Military Avenue (54304)
P.O. Box 10448
Green Bay, Wisconsin 54307-0448

Subject: Site Investigation Addendum Report, One-Hour Martinizing Dry Cleaning Service,
1233 South Military Avenue, Green Bay, Wisconsin --
WDNR ERP Case No. 02-05-217270 -- STS Project No. 24871XF

Dear Ms. DuFresne:

Accompanying this letter is a copy of the Site Investigation Addendum Report for the One-Hour Martinizing Dry Cleaning Service facility located at 1233 South Military Avenue, Green Bay, Wisconsin.


Based on the results of the additional investigation activities conducted at the site referenced above, we are recommending one year of quarterly groundwater monitoring to determine the feasibility of natural attenuation of chlorinated hydrocarbons to restore groundwater quality.

Please review the attached report and comment accordingly. If you have any questions, please contact us.


Sincerely,

STS CONSULTANTS, LTD.


Paul M. Garvey
Project Scientist


Roger A. Miller, P.G.
Senior Project Hydrogeologist

"I, Roger A. Miller, P.G., 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."


Roger A. Miller, P.G.
Senior Project Hydrogeologist

March 12, 2001

Copy: P.F. Fink, Inc.
c/o Attorney Joseph A. Hoida
403 South Jefferson Street
Green Bay, Wisconsin 54301

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EXECUTIVE SUMMARY

On March 10, 1999, as part of a Phase II Subsurface Assessment associated with a real estate transaction, Northern Environmental, Inc., Green Bay, Wisconsin, identified chlorinated hydrocarbon contamination and notified the Wisconsin Department of Natural Resources (WDNR) following receipt of confirmatory analytical results.

As a result of that notification and a subsequent WDNR letter (which outlined the legal responsibilities regarding site investigation and cleanup), STS Consultants, Ltd. (STS), was retained by P.F. Fink, Inc. (former owner), to conduct site assessment activities and to provide remedial action recommendations.

To date, STS has completed a site investigation of this property, which included the following:

- 1) Ten soil borings, seven of which were converted into groundwater monitoring wells and three of which were converted to piezometers.
- 2) Chemical analyses of selected soil and groundwater samples.

Soils encountered at the One-Hour Martinizing Dry Cleaning Service (One-Hour Martinizing) site consisted primarily of silty clays. Sandy fill material was encountered immediately east of the building area to a depth of approximately 4 feet. The water table was encountered at depths of approximately 5 to 8 feet below ground surface (bgs).

Field and laboratory results, summarized in the "Additional Site Investigation and Remedial Action Recommendations Report" dated April 20, 2000, indicated Wisconsin Administrative Code Chapter NR 140 (NR 140) exceedances for some chlorinated hydrocarbons were detected in the groundwater. Chlorinated hydrocarbon-related impacts were also identified in the non-saturated zone soils near the dry cleaning machine (under the floor slab) and also in an approximate 10-foot by 10-foot area immediately east of the building. Based on these results, some additional groundwater delineation was requested by Ms. Kristin DuFresne, WDNR, in a telephone message on September 25, 2000.

The most recent environmental activities conducted at the site included the installation of two additional piezometers and one groundwater monitoring well and one additional groundwater sampling event. Based on the results of this sampling event, the geochemistry of groundwater near Monitoring Well MW-1 has changed through successive sampling events, which included



additional purging and development of MW-1. Tetrachloroethene concentrations at the MW-1 location have been reduced from 22,800 micrograms per liter ($\mu\text{g/L}$) to 13,400 $\mu\text{g/L}$ to 3.1 $\mu\text{g/L}$ in the most recent sampling event. As evidenced by the reduction of greater than three orders of magnitude, chlorinated hydrocarbons adsorbed to the soil near the MW-1 location may have been redistributed within the borehole during drilling activities. Subsequent purging may have removed additional fine-grained soil particles from around the filter pack of Monitoring Well MW-1, allowing groundwater samples to be collected that better represent actual groundwater quality near this well. Recent environmental activities are summarized in this report.

Monitoring results have indicated that shallow groundwater conditions are present. Vadose zone soil impacts are limited to an area primarily under a building floor slab and in an approximate 10-foot by 10-foot area immediately adjacent to the structure. The presence of the floor slab will limit infiltration within the building footprint to the non-saturated zone soils. Based on the age of the spill (greater than ten years) and the historical water table fluctuation, non-saturated zone soil impacts have likely contacted the water table. Based on this, remedial emphasis should be on addressing residual groundwater impacts.

To address groundwater impacts, STS recommends one year of natural attenuation monitoring to determine if biodegradation of chlorinated hydrocarbons is occurring at a reasonable rate. Natural attenuation of chlorinated hydrocarbons may be enhanced through the addition of carbon substrates (i.e., food source to sustain microbial populations).



1.0 PROJECT DIRECTORY

Project: One-Hour Martinizing Dry Cleaning Service

Project Location: 1233 South Military Avenue
Green Bay, Wisconsin

Responsible Party Representative: Mr. Joseph A. Hoida, Attorney for P.F. Fink, Inc.
403 South Jefferson Street
Green Bay, Wisconsin 54301
Phone: (920) 432-0401

Engineer: STS Consultants, Ltd.
1035 Kepler Drive
Green Bay, Wisconsin 54311

Contacts: Mr. Paul M. Garvey and
Mr. Mark A. Bergeon, P.G.
Phone: (920) 468-1978 (Fax: 920-468-3312)

Regulator: Wisconsin Department of Natural Resources
1125 North Military Avenue
P.O. Box 10448
Green Bay, Wisconsin 54307-0448

Contact: Ms. Kristin DuFresne
Phone: (920) 492-5861 (Fax: 920-492-5859)



2.0 INTRODUCTION

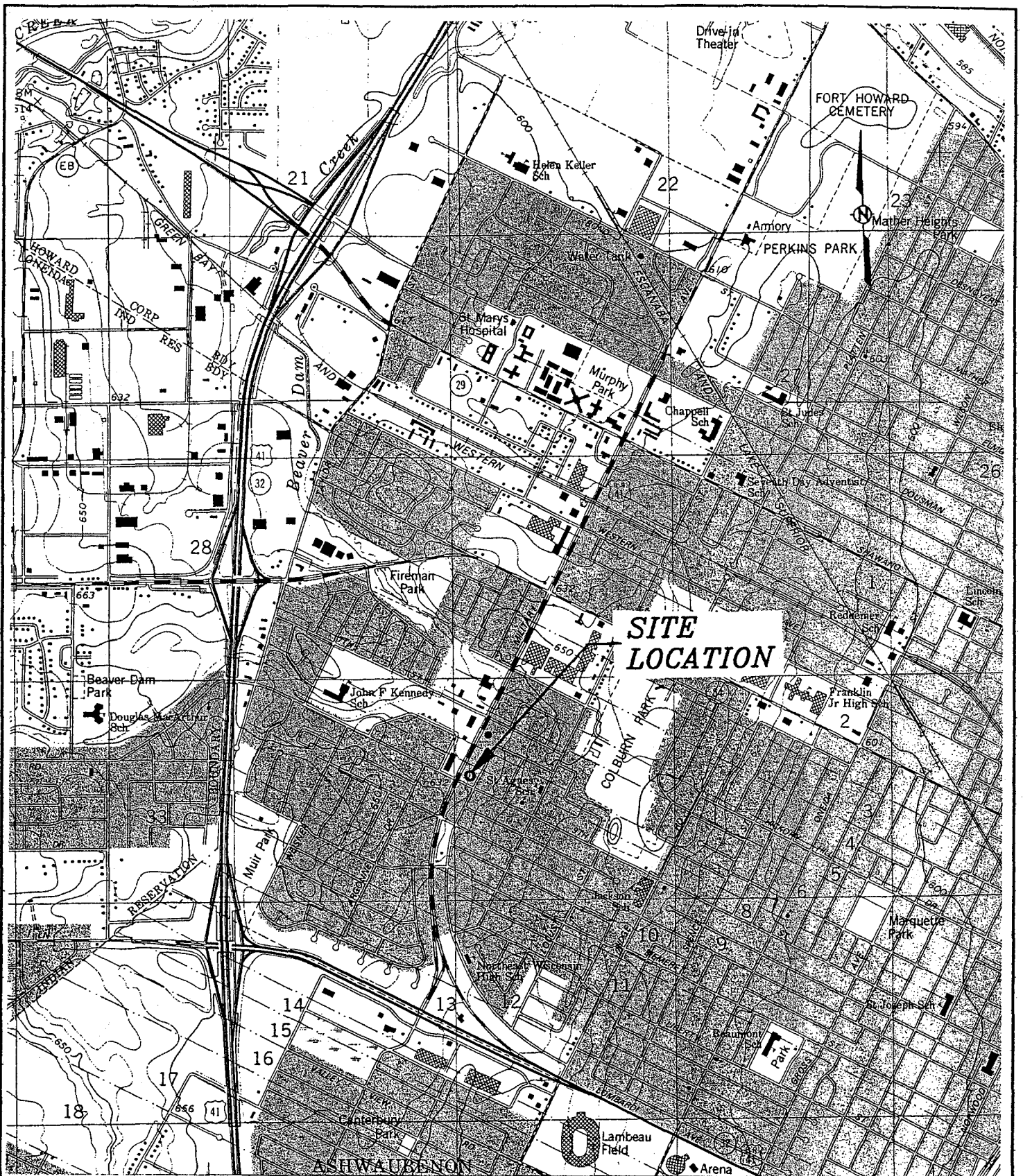
2.1 Location

The subject property is located at 1233 South Military Avenue, city of Green Bay, Brown County, Wisconsin (subdivision of Private Claim No. 8, west side of the Fox River, city of Green Bay, Brown County, Wisconsin, T24N, R20E). Figure 1 shows the site location on a portion of the Green Bay-West, Wisconsin, United States Geological Survey 7.5-minute (1:24,000-scale) quadrangle map. The One-Hour Martinizing facility is located in a one-story mini-mall developed with commercial businesses. The site is bordered to the east by a residential area.

2.2 Purpose

The purpose of this report is to provide an addendum to the April 20, 2000, report entitled "Additional Site Investigation and Remedial Action Recommendations Report." This report includes the procedures and results of additional environmental assessment activities conducted at the request of the WDNR and provides recommendations for further action.





BASE MAP SOURCE: USGS GREEN BAY WEST, WISCONSIN 7.5 MINUTE QUADRANGLE (REVISED 1982)

SITE LOCATION DIAGRAM
ONE HOUR MARTINIZING DRY CLEANING
1233 SOUTH MILITARY AVENUE
GREEN BAY, WISCONSIN



STS Consultants Ltd.
 Consulting Engineers

DRAWN BY	CPB	02/18/00
CHECKED BY	PMG	02/18/00
APPROVED BY		
CADFILE	ATXT.dwg	SCALE 1"=2000'
STS PROJECT NO.	24871XF	FIGURE NO. 1

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 ATXT.dwg
 04/01/1998 08:

3.0 PROCEDURES

3.1 Groundwater Monitoring Well Installation and Sampling

On October 10, 2000, Groundwater Management Service, Inc., Hartland, Wisconsin, mobilized a truck-mounted drill rig probe to advance three soil borings (PZ-2, PZ-6, and MW-7) at the One-Hour Martinizing site. Borings were advanced to depths of between 15 and 24 feet bgs, using a 2-inch outside diameter hydraulic probe. Some soil samples were collected using standard Geoprobe sampling techniques and then classified according to the Unified Soil Classification System (American Society for Testing and Materials [ASTM] D 2488-84). Soil boring locations are illustrated on Figure 2. The WDNR soil boring logs are included in Appendix A.

Prior to mobilizing drilling equipment to the site, STS obtained a WDNR Monitoring Well Variance Application for the installation of two piezometers and one monitoring well using hydraulic push techniques. The variance application for the small diameter wells was submitted to avoid costly disposal of soil cuttings, as would occur with conventional Chapter NR 141, Wisconsin Administrative Code, well installation techniques. Following the installation of the 2-inch-diameter hydraulic probe soil borings, wells were constructed using 3/4-inch-diameter, Schedule 40 polyvinyl chloride (PVC) with flush-threaded joints. The screened section of each piezometer consisted of a 5-foot length of 3/4-inch diameter, Schedule 40 PVC with 0.006-inch, factory-cut slots. The screened section of the water table observation well consisted of a 10-foot length of 3/4-inch-diameter, Schedule 40 PVC with 0.006-inch, factory-cut slots. The screened interval of the water table observation well (MW-7) was installed so that it would intersect the apparent water table at the time of installation.

The annulus of each well was backfilled with uniformly graded silica sand to a level above the top of the screen. The remainder of the annulus was backfilled with hydrated granular bentonite. The wells were developed by low flow purging and removing water, until the well was dry. A WDNR Monitoring Well Construction form (4400-113A) and Monitoring Well Development form (4400-113B) were completed for each well/piezometer installed (Appendix A). A copy of the approved WDNR Monitoring Well Variance Application is included in Appendix B. Groundwater monitoring well locations are illustrated on Figure 2.



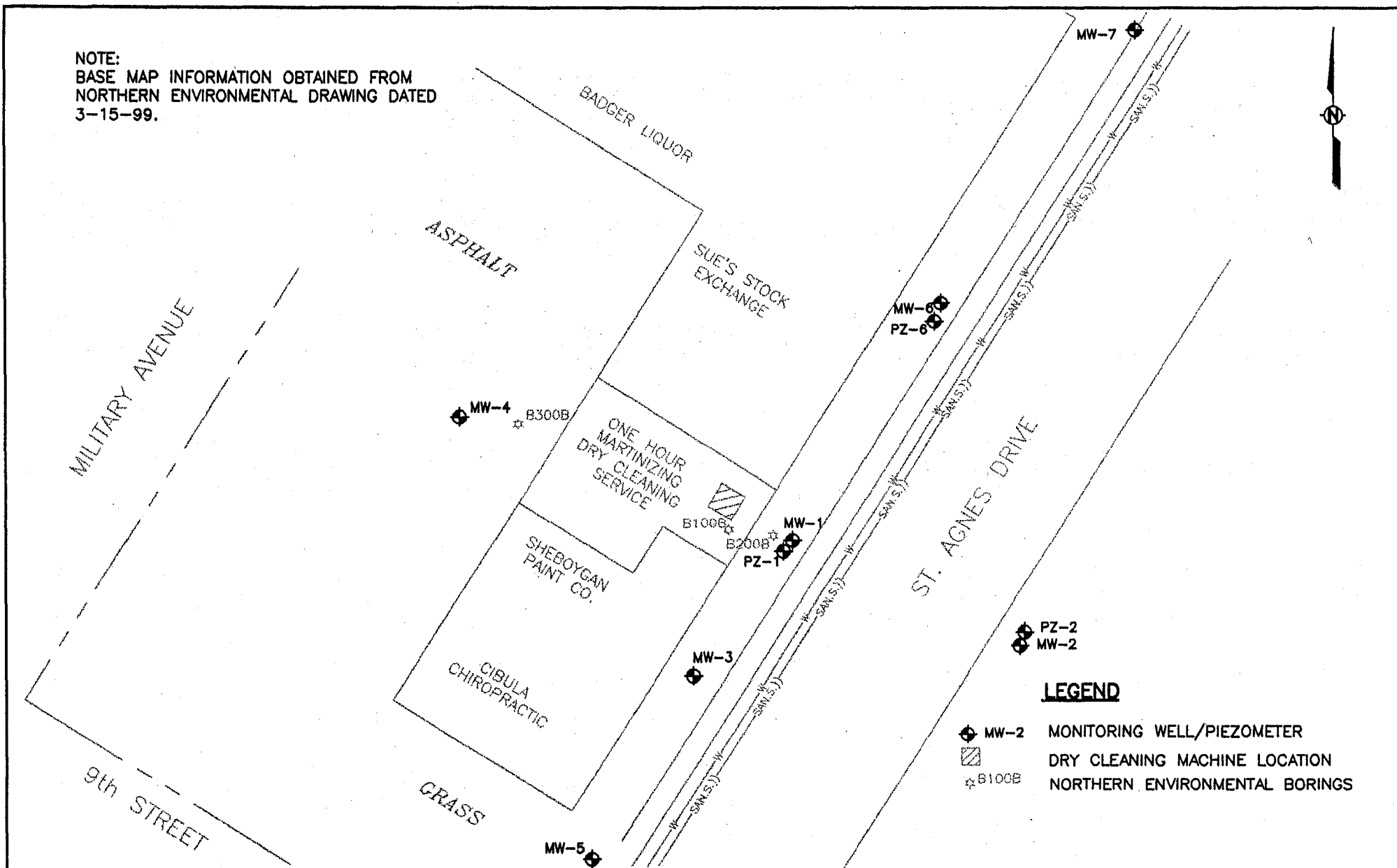
STS field personnel collected groundwater samples on October 30, 2000, from Monitoring Wells MW-1 through MW-7 and Piezometers PZ-1 and PZ-2. A groundwater analytical sample was collected from PZ-6 on November 1, 2000, due to lack of sufficient groundwater recharge on October 30, 2000, to facilitate sampling. Groundwater samples were collected using disposable polyethylene bailers for the 2-inch-diameter wells and low-flow purging using high density polyethylene tubing for the 3/4-inch-diameter wells. Groundwater samples were collected for field parameters and laboratory analysis. Field parameters include water level, pH, conductivity, temperature, color, odor, turbidity, dissolved oxygen (DO), and ferrous iron. Groundwater samples were submitted on ice to Robert E. Lee & Associates, Inc., laboratory, Green Bay, Wisconsin, under Chain of Custody control for the analysis of volatile organic compounds (VOCs), sulfate, nitrate/nitrite, methane, ethane, and ethene.

3.2 Chemical Analyses

Groundwater samples collected following the monitoring well installation activities were analyzed for VOCs (Environmental Protection Agency [EPA] Method 8021), soluble sulfate (EPA Method 300.0), and nitrate/nitrite (EPA Method 353.2). Methane, ethane, and ethene were analyzed using EPA Method 8015-B. Ferrous iron and DO concentrations were recorded in the field using Chemetrics (colorimetric) ampoules.




NOTE:
 BASE MAP INFORMATION OBTAINED FROM
 NORTHERN ENVIRONMENTAL DRAWING DATED
 3-15-99.



LEGEND

- MW-2 MONITORING WELL/PIEZOMETER
- DRY CLEANING MACHINE LOCATION
- B1006 NORTHERN ENVIRONMENTAL BORINGS

SITS Consultants Ltd.
 Consulting Engineers

 SITS PROJECT NO.
 24871XF
 SITS PROJECT FILE
 G471F006.dwg
 SCALE
 1" = 30'
 FIGURE NO.
 2

SOIL BORING/MONITORING WELL LOCATIONS
ONE HOUR MARTINIZING DRY CLEANING SERVICE
1233 SOUTH MILITARY AVENUE
GREEN BAY, WISCONSIN

DRAWN BY	JLC	DATE	1/24/01
CHECKED BY	PMG	DATE	1/24/01
APPROVED BY		DATE	
CADFILE	W:\Dwg99\24871\XF\G471F006.dwg		

4.0 RESULTS

4.1 Field Results

Soil encountered at the site consisted primarily of brown silty clays with approximately 4 to 5 feet of fill material near the surface. Soil descriptions are provided on the WDNR Form 4400-122, Soil Boring Log Information Forms, provided in Appendix A.

4.2 Groundwater Monitoring Results

The most recent static water level measurements were obtained from the groundwater monitoring wells on October 30, 2000. Groundwater elevations and field parameters were recorded during the sampling activities and are summarized on the Field Sampling Summary (Table 1).

The most recent groundwater elevations recorded in the monitoring wells were used to prepare a Groundwater Contour Map (Figure 3). The Groundwater Contour Map indicates groundwater flow is generally easterly across the site at a hydraulic gradient of approximately 0.007 feet per foot.

Based on field observations indicating that groundwater monitoring wells were installed within the natural clays at the site and slow recharge response documented during sampling activities (Piezometer PZ-6 remained dry for more than one day following purging), hydraulic conductivity (K) of saturated soils surrounding the screened interval of the monitoring wells on site has been estimated at 1×10^{-6} centimeters per second (Fetter, 1994).

Based on groundwater elevations measured on January 4, 2000, and the estimated field hydraulic conductivity, the average linear velocity of groundwater flow is estimated to be 0.024 feet per year. The vertical gradient is estimated to be slightly downward at an average gradient of 0.026 feet per foot during the October 2000 sampling event. However, a slightly upward vertical gradient was recorded at the Monitoring Well MW-2 location. Average linear velocity and vertical gradient calculations are included in Appendix C.

Results of laboratory analyses of groundwater collected from the monitoring wells are summarized on Table 2. Also indicated on Table 2 are the preventive action limits (PALs) and enforcement standards (ESs), as established under NR 140. Compounds detected in groundwater above the NR 140 ES include tetrachloroethene and trichloroethene. NR 140 ES exceedances were detected in Monitoring Wells MW-3 and Piezometer PZ-1 during the October 2000 sampling event.

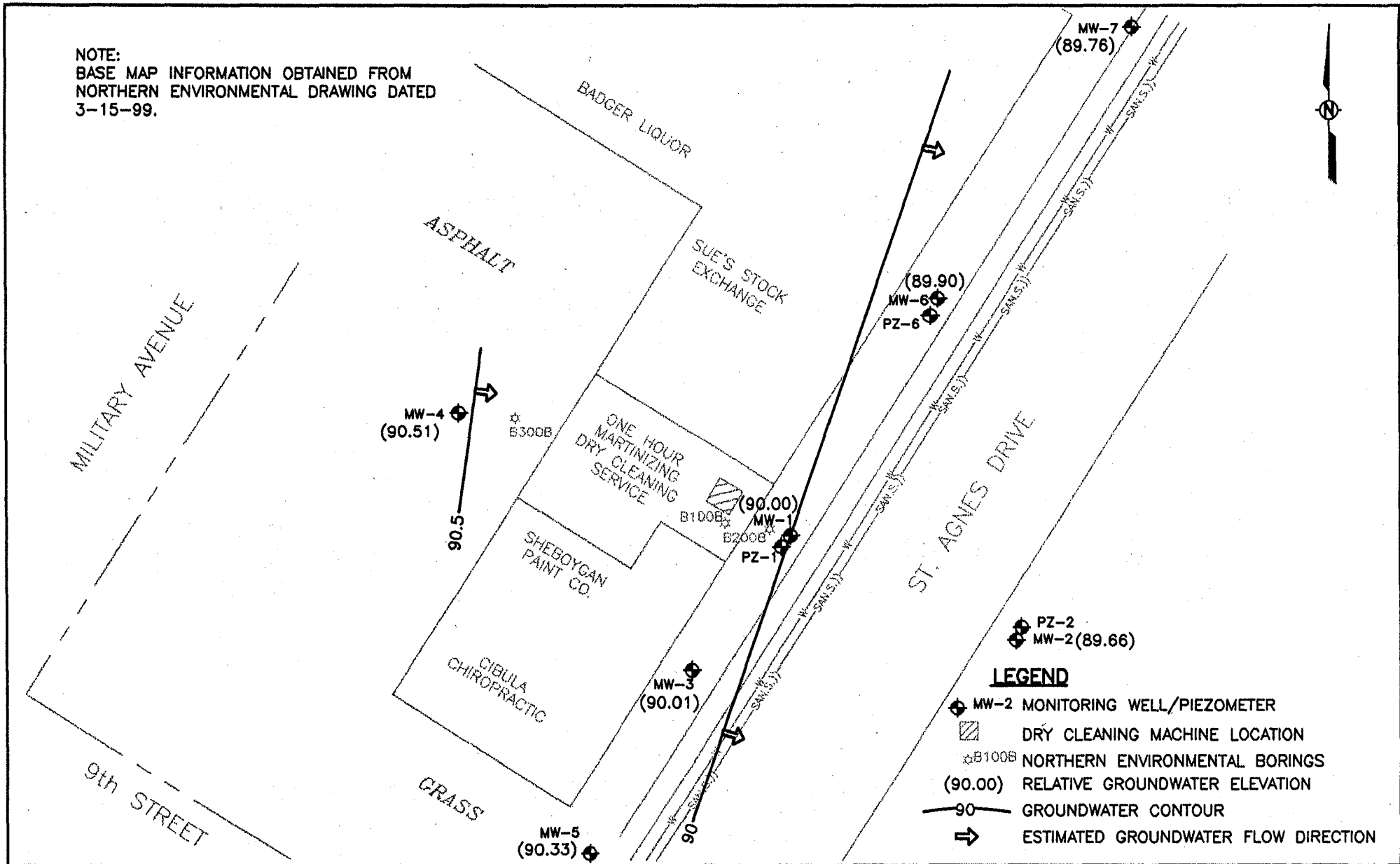


Table 1
Field Sampling Summary
One Hour Martinizing
1233 S. Military Avenue
Green Bay, Wisconsin

Location	Date	TPVC Elevation	Water Level TPVC	Water Level Elev. (ft)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)	pH (units)	Specific Conductance (µmhos/cm)	Temperature (° Celsius)	Color	Odor	Turbidity	Gallons Purged
MW-1	17-Jun-99	96.63	5.19	91.44	--	--	6.80	985	--	Clear	None	Low	5.0
	4-Jan-00	96.63	7.51	89.12	2	0.1	7.10	725	11.9	Clear	Slight	Low	4.0
	30-Oct-00	96.63	6.63	90.00	6	0.0	7.07	914	15.7	Clear	None	Low	4.0
PZ-1	17-Jun-99	96.55	6.39	90.16	--	--	8.10	395	--	Clear	None	Low	5.0
	4-Jan-00	96.55	8.07	88.48	<1	0.2	8.06	369	12.4	Lt. Brown	None	Medium	4.5
	30-Oct-00	96.55	7.28	89.27	4	0.3	7.07	1536	18.2	Clear	None	Low	6.0
MW-2	17-Jun-99	96.60	6.05	90.55	--	--	6.24	880	--	Clear	None	Low	5.0
	4-Jan-00	96.60	8.04	88.56	1	0.2	6.63	765	11.7	Clear	None	Low	3.8
	30-Oct-00	96.60	6.94	89.66	2	0.0	6.56	945	15.5	Clear	None	Low	5.0
PZ-2	30-Oct-00	96.51	6.73	89.78	1	1.0	7.80	482	14.1	Lt. Brown	None	Medium	2.0
MW-3	17-Jun-99	96.96	5.63	91.33	--	--	6.74	839	--	Clear	None	Low	4.0
	4-Jan-00	96.96	7.88	89.08	1	0.3	6.94	674	10.6	Clear	None	Low	4.0
	30-Oct-00	96.96	6.95	90.01	2	0.1	7.11	750	15.9	Clear	None	Low	5.0
MW-4	17-Jun-99	96.32	7.43	88.89	--	--	6.49	2350	--	Clear	None	Low	4.0
	4-Jan-00	96.32	6.99	89.33	<1	<0.1	6.77	1839	11.1	Clear	None	Low	4.0
	30-Oct-00	96.32	5.81	90.51	2	0.1	6.80	2480	16.6	Clear	None	Low	6.0
MW-5	4-Jan-00	97.43	7.86	89.57	5	0.1	7.26	2950	9.6	Lt. Brown	None	Low	3.8
	30-Oct-00	97.43	7.10	90.33	4	1.0	7.40	3120	15.6	Clear	None	Low	4.0
MW-6	4-Jan-00	96.65	7.59	89.06	3	0.1	7.04	1100	11.8	Clear	None	Low	4.0
	30-Oct-00	96.65	6.75	89.90	1	0.2	7.05	995	16.2	Clear	None	Low	4.0
PZ-6	30-Oct-00	96.73	7.12	89.61	--	--	--	--	--	--	--	--	2.0
	1-Nov-00	96.73	collected lab sample only			--	--	--	--	--	--	--	--
MW-7	30-Oct-00	96.33	6.57	89.76	8	0.1	7.07	1536	18.2	Clear	None	Low	2.0


Notes:
-- = not recorded

NOTE:
 BASE MAP INFORMATION OBTAINED FROM
 NORTHERN ENVIRONMENTAL DRAWING DATED
 3-15-99.



LEGEND

- MW-2 MONITORING WELL/PIEZOMETER
- DRY CLEANING MACHINE LOCATION
- B100B NORTHERN ENVIRONMENTAL BORINGS
- (90.00) RELATIVE GROUNDWATER ELEVATION
- 90 GROUNDWATER CONTOUR
- ESTIMATED GROUNDWATER FLOW DIRECTION


 STS Consultants Ltd.
 Consulting Engineers
 STS PROJECT NO. 24871XF
 STS PROJECT FILE G471F007.dwg
 SCALE 1" = 30'
 FIGURE NO. 3

GROUNDWATER CONTOUR MAP (OCTOBER 30, 2000)
ONE HOUR MARTINIZING DRY CLEANING SERVICE
1233 SOUTH MILITARY AVENUE
GREEN BAY, WISCONSIN

DRAWN BY	JLC	DATE	1/24/01
CHECKED BY	PMG	DATE	1/24/01
APPROVED BY		DATE	
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Table 2
Groundwater Analytical Results
One Hour Martinizing
1223 S. Military Avenue
Green Bay, Wisconsin

Analyte	Volatile Organic Compounds												Natural Attenuation Parameters								
	Benzene µg/L	cis 1,2-Dichloro- ethene µg/L	1,1-Dichloro- ethene µg/L	Ethyl- benzene µg/L	Bromodichloro- methane µg/L	Methylene Chloride µg/L	Naphthalene µg/L	Tetrachloro- ethene µg/L	Trichloro- ethene µg/L	Toluene µg/L	Trans-1,2-Dichloro- ethene µg/L	1,1,1-Trichloro- ethane µg/L	Trimethyl- benzenes µg/L	Xylenes µg/L	Nitrate/ Nitrite mg/L	Ethane µg/L	Ethene µg/L	Methane µg/L	Chloride mg/L	Sulfate mg/L	
MW-1	06/17/99	<94	<93	<55	<97	<124	<127	<41	2396	233 (p)	<55	<105	257 (p)	<405	<285	-	-	-	-	-	-
	01/04/00	<0.19	62	0.38	<0.19	<0.25	<0.082	<0.082	1300	85	0.13	0.33	<0.3	<0.81	<0.39	11	<14	<14	1100	72	40
	10/30/00	<0.19	<0.19	<0.18	<0.13	<0.25	<0.12	<0.082	3.1	<0.098	<0.11	<0.17	<0.13	0.35	<0.3	14	<14	<14	12	56	45
MW-2	06/17/99	<0.19	<0.19	<0.11	<0.19	<0.25	<0.25	<0.08	<0.34	<0.21	<0.11	<0.21	<0.30	<0.81	<0.57	-	-	-	-	-	-
	01/04/00	<0.19	<0.19	<0.11	<0.19	<0.25	<0.25	<0.082	<0.34	<0.21	<0.11	<0.21	<0.30	<0.81	<0.39	<0.14	<14	<14	11	17	32
	10/30/00	<0.19	<0.35	<0.18	<0.13	<0.25	<0.12	<0.082	<0.14	<0.098	<0.11	<0.17	<0.13	<0.23	<0.3	<0.069	<14	<14	<7.2	32	35
MW-3	06/17/99	<9.4	<9.3	<5.5	<9.7	<12.5	<12.7	<4.1	477	<10.6	<5.5	<10.5	<15.1	<40.5	<28.5	-	-	-	-	-	-
	01/04/00	<0.19	1.8	<0.11	<0.19	<0.25	<0.25	<0.082	482	5.2	<0.11	<0.21	<0.3	<0.81	<0.39	16	<14	<14	<7.2	47	38
	10/30/00	<0.19	2.3	<0.18	<0.13	<0.25	<0.12	<0.082	184	5.7	0.19	<0.17	<0.13	<0.23	<0.3	10	<14	<14	<7.2	21	34
MW-4	06/17/99	<0.19	<0.19	<0.11	<0.19	<0.25	<0.25	<0.08	<0.34	<0.21	0.47	<0.21	<0.30	<0.81	<0.57	-	-	-	-	-	-
	01/04/00	<0.19	<0.19	<0.11	<0.19	<0.25	<0.25	<0.082	<0.34	<0.21	<0.11	<0.21	<0.3	<0.81	<0.39	<0.14	<14	<14	11	365	339
	10/30/00	<0.19	<0.19	<0.18	<0.13	<0.25	<0.12	<0.082	1.0	<0.098	<0.11	<0.17	<0.13	<0.23	<0.3	0.25	<14	<14	9.3	407	373
MW-5	01/04/00	<0.19	<0.19	<0.11	<0.19	<0.25	<0.25	<0.082	<0.34	<0.21	<0.11	<0.21	<0.3	<0.81	<0.39	1.2	<14	<14	<7.2	1200	258
	10/30/00	<0.19	<0.19	<0.18	<0.13	<0.25	<0.12	<0.082	<0.14	<0.098	<0.11	<0.17	<0.13	<0.23	<0.3	2	<14	<14	<7.2	838	243
MW-6	01/04/00	<0.19	8.7	<0.11	<0.19	0.61	<0.25	<0.082	134	62	<0.11	<0.21	<0.3	<0.81	<0.39	2.7	<14	<14	12	193	76
	10/30/00	<0.19	<0.19	<0.18	<0.13	<0.25	<0.12	<0.082	2.2	0.44	<0.11	<0.17	<0.13	<0.23	<0.3	1.2	<14	<14	103	90	48
MW-7	10/30/00	<0.19	2.3	<0.18	<0.13	<0.25	<0.12	<0.082	<0.14	<0.098	0.11	<0.17	<0.13	<0.23	<0.3	<0.069	<14	<14	27	132	146
PZ-1	06/17/99	<0.94	<0.93	<0.55	<0.97	<1.24	<1.27	<0.41	98.3	4	<0.55	<1.05	5.04	<4.05	<2.85	-	-	-	-	-	-
	01/04/00	<0.19	1.2	<0.11	<0.19	<0.25	<0.25	<0.082	77	3.9	<0.11	<0.21	<0.19	<0.81	<0.39	<0.14	<14	<14	136	42	50
	10/30/00	<0.19	2.1	<0.18	<0.13	<0.25	<0.12	<0.082	9.6	13	<0.11	<0.17	<0.13	<0.23	<0.3	<0.069	<14	<14	81	59	70
PZ-2	10/30/00	0.24	<0.19	<0.18	0.21	<0.25	<0.12	<0.082	<0.14	<0.098	0.58	<0.17	<0.13	0.2	0.3	<0.069	<14	<14	205	14	32
PZ-6	11/01/00	<0.19	18	<0.18	<0.13	<0.25	<0.12	<0.082	1.2	4.9	0.31	<0.17	<0.13	<0.23	<0.3	-	<14	<14	306	-	-
NR 140 ES		5	70	850	700	0.6	5	40	5	5	343	NE	200	480	620						
NR140 PAL		0.5	7	85	140	0.06	0.5	8	0.5	0.5	68.6	NE	40	96	124						

Notes:
µg/L = micrograms per liter
(p) = Reported result is less than the practical quantitation limit
NE = Not established

120 Wisconsin Administrative Code Chapter NR 140 Enforcement Standard (ES) Exceedance
140 Wisconsin Administrative Code Chapter NR 140 Preventive Action Limit (PAL) Exceedance

Results of the October 30, 2000, sampling event suggest that the extent of groundwater impacts has been identified. Laboratory reports are included in Appendix B.

Geochemical indicators for naturally occurring biodegradation (DO, nitrate/nitrite, sulfate, chloride, methane, ethane, and ethene) were measured during the October 2000 sampling event. Table 1 indicates that DO was detected above 2 milligrams per liter (mg/L) in Monitoring Wells MW-1, MW-5, and MW-7 and Piezometer PZ-1. If concentrations of DO become limiting (i.e., below 1 to 2 mg/L), reducing conditions occur and nitrate and sulfate may serve as electron acceptors for anaerobic biodegradation.

As indicated on Table 2, detectable sulfate was reported in all monitoring wells. Nitrate was detected in MW-1, MW-3, MW-4, MW-5, and MW-6. The potential for biodegradation of chlorinated hydrocarbons through anaerobic reductive dechlorination exists in the area with the highest reported chlorinated hydrocarbon concentration (386 µg/L tetrachloroethene in MW-3), as reducing conditions were observed near the MW-3 location, and electron acceptors for anaerobic biodegradation (e.g., nitrate and sulfate) are present.

During reductive dechlorination, chlorine atoms on compounds, such as tetrachloroethylene, are replaced with hydrogen as anaerobic bacteria metabolize naturally occurring organics in the subsurface. An increase in chloride ions and an accumulation of chlorinated hydrocarbon daughter products are associated with reductive dechlorination (Wiedemeier, et. al., 1996). The reductive dechlorination (biotransformation) sequence is perchloroethylene (tetrachloroethene) to trichloroethene to dichloroethene to vinyl chloride to ethene. According to Wiedemeier, et. al. 1996, methane is the ultimate reductive daughter product of dechlorination through methanogenesis. During methanogenesis, methane is also produced by anaerobic bacteria, which use carbon dioxide as an electron acceptor. Accordingly, methane production is also an indicator that anaerobic groundwater conditions exist.

Ethene and ethane, daughter products of vinyl chloride biotransformation, were not detected above the method detection limits. However, trichloroethene, a daughter product of tetrachloroethene biotransformation, was detected at Monitoring Wells MW-3 and MW-6 and Piezometers PZ-1 and PZ-6 locations. Cis-1,2-dichloroethene, a daughter product of the reductive dechlorination of trichloroethene, was also detected at MW-3, PZ-1, and PZ-6.



Based on the presence of tetrachloroethene daughter products near the source area, it can be inferred that biodegradation has occurred or is occurring in the vicinity of Piezometers PZ-1 and PZ-6 and Monitoring Wells MW-3, MW-6, and MW-7.

4.3 Additional Utility Information

STS obtained additional utility information from the City of Green Bay Engineering Department. Based on record drawings, water and gas utility trenches reportedly were constructed above the depth of the apparent water table and consequently may not have acted as a conduit for migration of chlorinated hydrocarbons via groundwater. The sanitary sewer, installed in the center of St. Agnes Drive, varies in depth from approximately 7 feet bgs to 9 feet bgs and is pitched at a 0.31% slope toward the intersection of St. Agnes Drive and Ninth Street. Based on this information, it appears the sanitary sewer trench may extend approximately 2 feet below the water table at the intersection of St. Agnes Drive and Ninth Street. Storm sewer record drawings indicate that the storm sewer on St. Agnes Drive is located approximately 10 feet west of the sanitary line under the paved area of the street. The storm sewer trench varies in depth from about 5 to 6 feet bgs in the vicinity of the site. The storm sewer trench appears to be at or above the current (1999-2000) water table elevation and would likely not significantly influence chlorinated hydrocarbon migration via groundwater. A City of Green Bay engineering record drawing of utilities near the site, indicated by "Parcel B," is included in Appendix D.

The sanitary sewer, which is located approximately 25 feet east of an identified likely source area (in the general vicinity of MW-1 and MW-3), was analyzed for the potential of the sanitary trench to influence contaminant migration. To evaluate the potential for the sanitary trench to act as a conduit for groundwater chlorinated hydrocarbon impacts, STS used the Domenico Equation to estimate the potential downgradient tetrachloroethene concentration near the sanitary sewer trench, based on both the highest groundwater concentration recorded (22,800 $\mu\text{g/L}$ of tetrachloroethene) and the highest concentration recorded in the most recent sampling round (386 $\mu\text{g/L}$) ("source" concentration). Domenico (1987) developed a steady-state analytical solution for calculating groundwater concentrations along the axis of a dissolved plume based on groundwater flow velocity, source width and depth, dispersivity, biological degradation, and retardation due to sorption.



Domenico model assumptions include:

- ◆ One-dimensional flow and three-dimensional dispersion.
- ◆ First order decay rate, based on dissolved and adsorbed phases decaying at the same rate.
- ◆ Medium is isotropic and homogenous.
- ◆ Source concentration is constant.
- ◆ Source area is perpendicular to the direction of groundwater flow.

Input parameters, which were used in the Domenico Equation, include a soil porosity of 0.3, an estimated hydraulic gradient of 0.0028 feet per day, and a hydraulic conductivity of 0.007 feet per foot (Appendix B). The first order degradation rate constant for perchloroethylene ($\lambda = 0.0096$ 1/day) was obtained from the guide by P.H. Howard and Lewis, "Handbook of Environmental Degradation Rates" (1991).

A third (conservative) Domenico model was also calculated using the highest groundwater tetrachloroethene concentration recorded (22,800 $\mu\text{g/L}$) and reducing the first order degradation rate constant by one order of magnitude ($\lambda = 0.00096$ 1/day) to be conservative.

Based on Domenico Equation calculations (Appendix E), we estimate that tetrachloroethene groundwater concentrations at the sanitary sewer utility trench location will be below NR 140 PALs. Based on this information, we do not recommend additional utility investigation.



5.0 CONCLUSIONS

Based on the shallow depth of groundwater (approximately 5 to 8 feet bgs) and previous investigation results indicating that non-saturated zone soil impacts are detected primarily under the building floor slab and in a limited area (approximately 10 feet by 10 feet) adjacent to the building, remedial emphasis should be on addressing groundwater impacts, rather than soil remediation. The presence of the floor slab will limit infiltration within the building footprint to the non-saturated zone soils. Based on the age of the spill (greater than ten years) and historical water table fluctuation, non-saturated zone soil impacts have likely contacted the water table.

Groundwater at the One-Hour Martinizing location is interpreted to flow slowly to the east at approximately 0.024 feet per year, with a slight downward gradient of 0.026 feet per foot.

Tetrachloroethene in exceedance of NR 140 ES was identified in the groundwater samples collected from Monitoring Well MW-3 and Piezometer PZ-1. Tetrachloroethene was recorded above the NR 140 PAL in Monitoring Wells MW-1, MW-4, and MW-6 and Piezometer PZ-6. Concentrations of tetrachloroethene were reduced by several orders of magnitude in MW-1. In addition to the decreasing concentrations in MW-1, decreasing chlorinated hydrocarbon trends were also recorded in MW-6 and PZ-1.

As evidenced by a reduction in tetrachloroethene concentrations of more than three orders of magnitude in Monitoring Well MW-1, chlorinated hydrocarbons adsorbed to the soil may have been redistributed during drilling activities, resulting in initially higher detections. Subsequent purging may have removed additional fine-grained soil particles from around the filter pack of Monitoring Well MW-1, allowing groundwater samples to be collected that better represent actual groundwater quality near this well. Further groundwater monitoring will be necessary to confirm this interpretation. A reduction in tetrachloroethene concentrations by more than an order of magnitude in Piezometer PZ-1 may be attributed to a similar effect.

Based on field observations and laboratory results, it appears the lateral and vertical extent of groundwater impacts has been defined. Analytical results from PZ-1 indicate that dissolved-phase chlorinated hydrocarbons slightly above NR 140 ESs are present at a depth of 20 feet. Chlorinated hydrocarbons were not detected in Monitoring Well MW-2 or Piezometer PZ-2, which are located approximately 50 feet downgradient of the likely source area.



Geochemical indicators for naturally occurring biodegradation (sulfate, nitrate, and methane) and the presence of reductive dechlorination daughter products of tetrachloroethene, such as trichloroethene and cis-1,2-dichloroethene, support our conclusion that natural attenuation of chlorinated compounds is occurring at this site.



6.0 REMEDIAL ACTION PLAN

Geochemical indicator parameters and the presence of chlorinated breakdown products suggest that reductive dechlorination is occurring in the groundwater at the site. To determine the effectiveness of natural attenuation as a remedial option, STS recommends one year of groundwater monitoring to gather data to evaluate the potential for natural attenuation to reduce the concentrations of chlorinated hydrocarbons in a reasonable time frame. STS recommends sampling of Monitoring Wells MW-1, MW-3, and MW-6 and Piezometers PZ-1 and PZ-6 for VOCs on a quarterly basis and the remaining wells semiannually. In addition to VOC analysis, monitoring wells will be analyzed for natural attenuation parameters, including DO, nitrate/nitrite, sulfate, chloride, ferrous iron, methane, ethane, and ethene.

Following one year of natural attenuation monitoring, sampling data will be re-evaluated to determine if natural attenuation is occurring at a reasonable rate or if natural attenuation of chlorinated hydrocarbons should be enhanced through the addition of carbon substrates (i.e., food source to sustain microbial populations).



7.0 GENERAL QUALIFICATIONS

Conclusions presented in this report are based on subsurface conditions as revealed in the soil borings, monitoring wells, and piezometers; subsurface conditions noted at the time of study; subcontract laboratory analyses; and our professional interpretation of this information. Stratification lines shown on boring logs represent the approximate boundary between soil types. Variations may exist in both the horizontal and vertical directions between borings. Additionally, seasonal and annual fluctuations of the groundwater table may influence the distribution of dissolved compounds causing variations in groundwater quality. The scope of this report is limited to the specific project and location described herein. Our interpretation of results represents our scientific judgment based on the available information. No other warranties, either expressed or implied, are made.



8.0 REFERENCES

- Domenico, P.A., 1987. An Analytical Model for Multi-Dimensional Transport of a Decaying Contaminant Species: *Journal of Hydrology*, Volume 91, Pages 49 through 58.
- Fetter, C.W., 1994. *Applied Hydrogeology*, Third Edition, Prentice Hall, New Jersey, Page 98.
- Howard, P.H., et. al., 1991. *Handbook of Environmental Degradation Rates*, Lewis Publishers, Inc.
- Wiedemeier, T.H., et. al., 1996. Technical Protocol for Evaluating the Natural Attenuation of Chlorinated Ethenes in Groundwater, *The Proceedings of the 1996 Petroleum Hydrocarbons and Organic Chemicals in Groundwater: Prevention, Detection, and Remediation Conference*, Pages 425 through 439.



APPENDIX A

WDNR Soil Boring Log Information Forms

WDNR Monitoring Well Construction Forms

WDNR Monitoring Well Development Forms

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

Facility/Project Name One Hour Martinizing Dry Cleaning Service		License/Permit/Monitoring Number		Boring Number PZ-2	
Boring Drilled By (Firm name and name of crew chief) Groundwater Management - D. Bendorf - STS Project No. 24871XF		Date Drilling Started 10/10/2000		Date Drilling Completed 10/10/2000	
Drilling Method Geoprobe		WI Unique Well No.		DNR Well ID No.	
Common Well Name PZ-2		Final Static Water Level 86.6 Feet MSL		Surface Elevation 96.8 Feet MSL	
Borehole Diameter 2.0 Inches		Boring Location or Local Grid Origin (Check if estimated: <input type="checkbox"/>)		Local Grid Location (If applicable)	
State Plane P.C. 2-9 West Side - Fox River S/C/N		Lat. _____"		<input type="checkbox"/> N <input type="checkbox"/> E	
1/4 of 1/4 of Section T N, R		Long. _____"		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County Brown		County Code 5	
				Civil Town/City/ or Village Green Bay	

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					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5	No samples taken (see MW-6 Soil Boring Log)										
				Dark reddish brown silty clay - trace gravel - moist to wet	CL									
				End of Boring Boring advanced from 0.0 feet to 24.0 feet with 2-inch diameter hydraulic probe Installed 3/4-inch diameter Schedule 40 PVC piezometer with a 5-foot screened interval from 17.5 feet to 22.5 feet										

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

Signature	Firm STS Consultants Ltd. 1035 Kepler Drive, Green Bay, WI 54311	Tel: 920-468-1978 Fax: 920-468-3312
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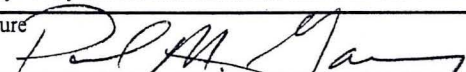
This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completions of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

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

Facility/Project Name One Hour Martinizing Dry Cleaning Service			License/Permit/Monitoring Number		Boring Number PZ-6	
Boring Drilled By (Firm name and name of crew chief) Groundwater Management - D. Bendorf - STS Project No. 24871XF			Date Drilling Started 10/10/2000		Date Drilling Completed 10/10/2000	Drilling Method Geoprobe
WI Unique Well No.	DNR Well ID No. PZ-6	Common Well Name PZ-6	Final Static Water Level 86.6 Feet MSL		Surface Elevation 97.0 Feet MSL	Borehole Diameter 2.0 Inches
Boring Location or Local Grid Origin (Check if estimated: <input type="checkbox"/>) State Plane P.C. 2-9 West Side - Fox River S/C/N			Lat. ° ' "		Local Grid Location (If applicable) <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
1/4 of	1/4 of Section	T	N, R	Long. ° ' "		Feet <input type="checkbox"/> Feet <input type="checkbox"/> W
Facility ID		County Brown	County Code 5	Civil Town/City/ or Village Green Bay		

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					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0.0 - 2.5	Fill: Topsoil - no samples taken											
			2.5 - 5.0	Fill: Dark brown silty clay and brown fine silty sand - no samples taken											
			5.0 - 24.0	Brown silty clay - no samples taken	CL										
			24.0 - 24.0	End of Boring Boring advanced from 0.0 feet to 24.0 feet with 2-inch diameter hydraulic probe Installed 3/4-inch diameter Schedule 40 PVC piezometer with a 5-foot screened interval from 19.0 feet to 24.0 feet											

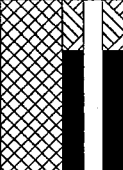

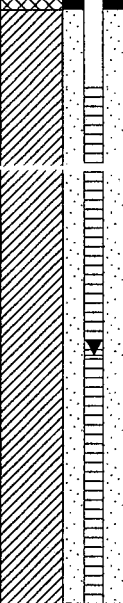
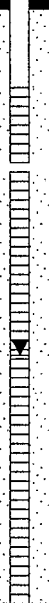
I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature:  Firm: **STS Consultants Ltd.**
1035 Kepler Drive, Green Bay, WI 54311
Tel: 920-468-1978 Fax: 920-468-3312

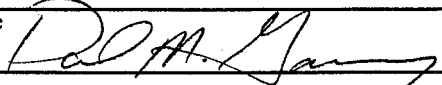
This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completions of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally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

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

Facility/Project Name One Hour Martinizing Dry Cleaning Service		License/Permit/Monitoring Number		Boring Number MW-7	
Boring Drilled By (Firm name and name of crew chief) Groundwater Management - D. Bendorf - STS Project No. 24871XF		Date Drilling Started 10/10/2000		Date Drilling Completed 10/10/2000	
Drilling Method Geoprobe		Final Static Water Level 86.3 Feet MSL		Surface Elevation 96.5 Feet MSL	
Borehole Diameter 2.0 Inches		Common Well Name MW-7		WI Unique Well No.	
DNR Well ID No.		Final Static Water Level		Surface Elevation	
Boring Location or Local Grid Origin (Check if estimated: <input type="checkbox"/>)					
State Plane P.C. 2-9 West Side - Fox River S/C/N			Lat. _____"		Local Grid Location (If applicable)
1/4 of 1/4 of Section , T N, R			Long. _____"		<input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County Brown		County Code 5	
				Civil Town/City/ or Village Green Bay	

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					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			1.5	Fill: Silty sand - no samples taken											
			3.0												
			4.5												
			6.0												
			7.5												
			9.0	Brown silty clay - no samples taken	CL										
			10.5												
			12.0												
			13.5												
			15.0	End of Boring Boring advanced from 0.0 feet to 15.0 feet with 2-inch diameter hydraulic probe											

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

Signature  Firm **STS Consultants Ltd.** 1035 Kepler Drive, Green Bay, WI 54311
Tel: 920-468-1978 Fax: 920-468-3312

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

Facility/Project Name One Hour Martinizing Dry Cleaning Service	Local Grid Location of Well _____ ft. <input type="checkbox"/> N. _____ ft. <input type="checkbox"/> E. _____ ft. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> W.	Well Name PZ-2
Facility License, Permit or Monitoring No.	Grid Origin Location (Check if estimated: <input type="checkbox"/>) Lat. _____ " Long. _____ " or	Wis. Unique Well No/DNR Well Number
Facility ID	St. Plane _____ ft. N, _____ ft. E. S/C/N	Date Well Installed 10/10/2000
Type of Well Well Code 12/pz	Section Location of Waste/Source P.C. 2-9 West Side - Fox River	Well Installed By: (Person's Name and Firm) Dan Bendorf
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Groundwater Management Services

A. Protective pipe, top elevation _____ ft. MSL		1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <u>96.51</u> ft. MSL		2. Protective cover pipe: a. Inside diameter: <u>9.0</u> in. b. Length: <u>1.0</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <u>96.8</u> ft. MSL		d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom <u>95.8</u> ft. MSL or <u>1.0</u> ft.		3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>		4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Other <input checked="" type="checkbox"/> NA
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight . . . Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite . . . Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft ³ volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input type="checkbox"/> 41 <u>hydraulic push</u> Other <input checked="" type="checkbox"/>		6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99		7. Fine sand material: Manufacturer, product name and mesh size: a. _____ NA b. Volume added _____ ft ³
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe _____		8. Filter pack material: Manufacturer, product name and mesh size: a. <u>20/40 Badger Sand</u> b. Volume added <u>1.4</u> ft ³
17. Source of water (attach analysis): _____		9. Well casing: Flush threaded PVC schedule 40 <input type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top <u>95.8</u> ft. MSL or <u>1.0</u> ft.	10. Screen material: <u>PVC</u> a. Screen Type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>	
F. Fine sand, top <u>80.3</u> ft. MSL or <u>16.5</u> ft.	b. Manufacturer <u>Crestline</u>	
G. Filter pack, top <u>80.3</u> ft. MSL or <u>16.5</u> ft.	c. Slot size: <u>0.006</u> in.	
H. Screen joint, top <u>79.3</u> ft. MSL or <u>17.5</u> ft.	d. Slotted length: <u>5.0</u> ft.	
I. Well bottom <u>74.3</u> ft. MSL or <u>22.5</u> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>	
J. Filter pack, bottom <u>72.8</u> ft. MSL or <u>24.0</u> ft.		
K. Borehole, bottom <u>72.8</u> ft. MSL or <u>24.0</u> ft.		
L. Borehole, diameter <u>2.0</u> in.		
M. O.D. well casing <u>1.05</u> in.		
N. I.D. well casing <u>0.75</u> in.		

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature [Signature] Firm **STS Consultants Ltd.** Tel: 920-468-1978
1035 Kepler Drive, Green Bay, Wisconsin Fax: 920-468-3312

Please complete both Forms 4400-113A and 4400-113B and return to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Facility/Project Name One Hour Martinizing Dry Cleaning Service	Local Grid Location of Well _____ ft. <input type="checkbox"/> N. _____ ft. <input type="checkbox"/> E. _____ ft. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> W.	Well Name PZ-6
Facility License, Permit or Monitoring No.	Grid Origin Location (Check if estimated: <input type="checkbox"/>) Lat. _____ " Long. _____ " or	Wis. Unique Well No/DNR Well Number
Facility ID	St. Plane _____ ft. N, _____ ft. E. S/C/N	Date Well Installed 10/10/2000
Type of Well Well Code 12/pz	Section Location of Waste/Source P.C. 2-9 West Side - Fox River	Well Installed By: (Person's Name and Firm) Dan Bendorf
Distance Well Is From Waste/Source Boundary _____ ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Groundwater Management Services

A. Protective pipe, top elevation _____ ft. MSL
B. Well casing, top elevation 96.73 ft. MSL
C. Land surface elevation 97.0 ft. MSL
D. Surface seal, bottom 96.0 ft. MSL or 1.0 ft.

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

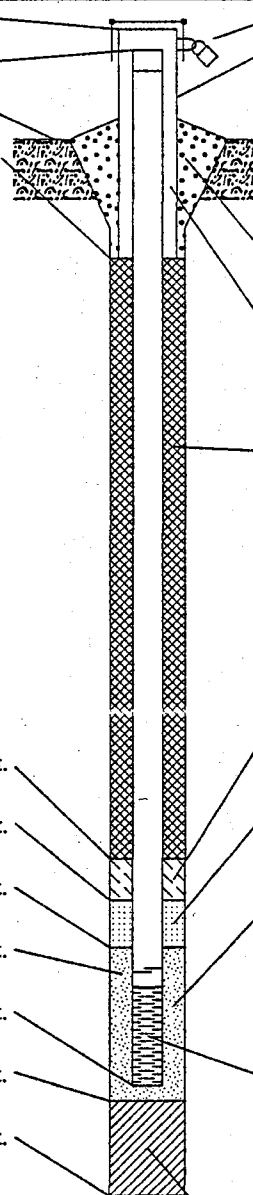
13. Sieve analysis attached? Yes No

14. Drilling method used: Rotary 5 0
Hollow Stem Auger 4 1
hydraulic push Other

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

16. Drilling additives used? Yes No
Describe _____

17. Source of water (attach analysis):



1. Cap and lock? Yes No

2. Protective cover pipe:
a. Inside diameter: 9.0 in.
b. Length: 1.0 ft.
c. Material: Steel 0 4
Other

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

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

4. Material between well casing and protective pipe:
Bentonite 3 0
Other NA

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

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

7. Fine sand material: Manufacturer, product name and mesh size:
a. _____ NA
b. Volume added _____ ft³

8. Filter pack material: Manufacturer, product name and mesh size:
a. 20/40 Badger Sand
b. Volume added 1.2 ft³

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

10. Screen material: PVC
a. Screen Type: Factory cut 1 1
Continuous slot 0 1
Other

b. Manufacturer Crestline
c. Slot size: 0.006 in.
d. Slotted length: 5.0 ft.

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

E. Bentonite seal, top 96.0 ft. MSL or 1.0 ft.
F. Fine sand, top 79.0 ft. MSL or 18.0 ft.
G. Filter pack, top 79.0 ft. MSL or 18.0 ft.
H. Screen joint, top 78.0 ft. MSL or 19.0 ft.
I. Well bottom 73.0 ft. MSL or 24.0 ft.
J. Filter pack, bottom 73.0 ft. MSL or 24.0 ft.
K. Borehole, bottom 73.0 ft. MSL or 24.0 ft.
L. Borehole, diameter 2.0 in.
M. O.D. well casing 1.05 in.
N. I.D. well casing 0.75 in.

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature [Signature] Firm STS Consultants Ltd. Tel: 920-468-1978
1035 Kepler Drive, Green Bay, Wisconsin Fax: 920-468-3312

Please complete both Forms 4400-113A and 4400-113B and return to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Route To:

Watershed/Wastewater
Remediation/Redevelopment

Waste Management
Other

Facility/Project Name One Hour Martinizing Dry Cleaning Service	Local Grid Location of Well _____ ft. <input type="checkbox"/> N. _____ ft. <input type="checkbox"/> E. _____ ft. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> W.	Well Name MW-7
Facility License, Permit or Monitoring No.	Grid Origin Location (Check if estimated: <input type="checkbox"/>) Lat. _____ " Long. _____ " or St. Plane _____ ft. N, _____ ft. E. S/C/N	Wis. Unique Well No/DNR Well Number
Facility ID	Section Location of Waste/Source P.C. 2-9 West Side - Fox River	Date Well Installed 10/10/2000
Type of Well Well Code 11/mw	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) Dan Bendorf
Distance Well Is From Waste/Source Boundary _____ ft.		Groundwater Management Services

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation 96.33 ft. MSL
- C. Land surface elevation 96.5 ft. MSL
- D. Surface seal, bottom 95.5 ft. MSL or 1.0 ft.

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

13. Sieve analysis attached? Yes No

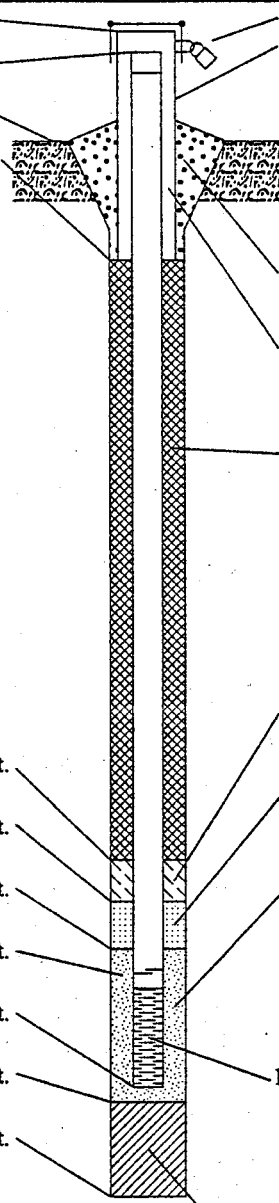
14. Drilling method used: Rotary 5 0
 Hollow Stem Auger 4 1
 hydraulic push Other

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

16. Drilling additives used? Yes No

Describe _____

17. Source of water (attach analysis): _____



- 1. Cap and lock? Yes No
- 2. Protective cover pipe:
 - a. Inside diameter: 9.0 in.
 - b. Length: 1.0 ft.
 - c. Material: Steel 0 4
Other
 - d. Additional protection? Yes No
If yes, describe: _____
- 3. Surface seal: Bentonite 3 0
Concrete 0 1
Other
- 4. Material between well casing and protective pipe: Bentonite 3 0
Other NA
- 5. Annular space seal:
 - a. Granular Bentonite 3 3
 - b. _____ Lbs/gal mud weight . Bentonite-sand slurry 3 5
 - c. _____ Lbs/gal mud weight . . . Bentonite slurry 3 1
 - d. _____ % Bentonite . . . Bentonite-cement grout 5 0
 - e. _____ Ft³ volume added for any of the above
 - f. How installed: Tremie 0 1
Tremie pumped 0 2
Gravity 0 8
- 6. Bentonite seal:
 - a. Bentonite granules 3 3
 - b. 1/4 in. 3/8 in. 1/2 in. Bentonite pellets 3 2
 - c. _____ Other
- 7. Fine sand material: Manufacturer, product name and mesh size: _____
 a. _____
 b. Volume added _____ ft³
- 8. Filter pack material: Manufacturer, product name and mesh size: _____
 a. 20/40 Badger Sand
 b. Volume added 2.0 ft³
- 9. Well casing: Flush threaded PVC schedule 40 2 3
 Flush threaded PVC schedule 80 2 4
 Other
- 10. Screen material: PVC
 a. Screen Type: Factory cut 1 1
 Continuous slot 0 1
 Other
- b. Manufacturer Crestline
- c. Slot size: 0.006 in.
- d. Slotted length: 5.0 ft.
- 11. Backfill material (below filter pack): None 1 4
 Other

- E. Bentonite seal, top 95.5 ft. MSL or 1.0 ft.
- F. Fine sand, top 93.0 ft. MSL or 3.5 ft.
- G. Filter pack, top 93.0 ft. MSL or 3.5 ft.
- H. Screen joint, top 91.5 ft. MSL or 5.0 ft.
- I. Well bottom 81.5 ft. MSL or 15.0 ft.
- J. Filter pack, bottom 81.5 ft. MSL or 15.0 ft.
- K. Borehole, bottom 81.5 ft. MSL or 15.0 ft.
- L. Borehole, diameter 2.0 in.
- M. O.D. well casing 1.05 in.
- N. I.D. well casing 0.75 in.

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

Signature [Signature] Firm **STS Consultants Ltd.** Tel: 920-468-1978
 1035 Kepler Drive, Green Bay, Wisconsin Fax: 920-468-3312

Please complete both Forms 4400-113A and 4400-113B and return to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$20,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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

Facility/Project Name One Hour Martinizing Dry Cleaning Service	County Brown	Well Name PZ-2	
Facility License, Permit or Monitoring Number	County Code 5	Wis. Unique Well Number	DNR Well Number

1. Can this well be purged dry? Yes No
2. Well development method:
- surged with bailer and bailed 41
 - surged with bailer and pumped 61
 - surged with block and bailed 42
 - surged with block and pumped 62
 - surged with block, bailed, and pumped 70
 - compressed air 20
 - bailed only 10
 - pumped only 51
 - pumped slowly 50
 - other
3. Time spent developing well **30.0 min:**
4. Depth of well (from top of well casing) **22.5 ft.**
5. Inside diameter of well **0.75 in.**
6. Volume of water in filter pack and well casing **0.8 gal.**
7. Volume of water removed from well **2.0 gal.**
8. Volume of water added (if any) **0.0 gal.**
9. Source of water added NA
10. Analysis performed on water added? Yes No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 6.73 ft.	dry ft.
Date	b. 10/30/2000	10/30/2000
Time	c. 09:30 am	10:00 am
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear <input checked="" type="checkbox"/> 10 Turbid <input type="checkbox"/> 15 (Describe) <u>light brown</u>	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) <u>clear</u>

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

14. Total suspended solids **mg/l** **mg/l**
15. COD **mg/l** **mg/l**

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

Jim Calaway
STS Consultants Ltd.

17. Additional comments on development:

Facility Address or Owner/Responsible Party Address

Name: Attorney Joseph Hoida

Firm: c/o P.F. Fink, Inc.

Street: 403 S. Jefferson Street

City/State/Zip: Green Bay, Wisconsin 54305-1625

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

Signature: *Paul M. Garvey*

Print Name: PAUL M. GARVEY

Firm: STS Consultants Ltd.

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

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

Facility/Project Name One Hour Martinizing Dry Cleaning Service	County Brown	Well Name PZ-6
Facility License, Permit or Monitoring Number	County Code 5	Wis. Unique Well Number
		DNR Well Number

1. Can this well be purged dry? Yes No

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

3. Time spent developing well **30.0 min.**

4. Depth of well (from top of well casing) **24.0 ft.**

5. Inside diameter of well **0.75 in.**

6. Volume of water in filter pack and well casing **0.7 gal.**

7. Volume of water removed from well **2.0 gal.**

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

9. Source of water added NA

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

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 7.12 ft.	dry ft.
Date	b. 10/30/2000	10/30/2000
Time	c. 09:00 am	09:30 am
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear <input checked="" type="checkbox"/> 1 0 Turbid <input type="checkbox"/> 1 5 (Describe) <u>slightly turbid, light brown</u>	Clear <input checked="" type="checkbox"/> 2 0 Turbid <input type="checkbox"/> 2 5 (Describe) <u>clear</u>

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

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

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

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

Jim Calaway
STS Consultants Ltd.

Facility Address or Owner/Responsible Party Address

Name: Attorney Joseph Hoida

Firm: c/o P.F. Fink, Inc.

Street: 403 S. Jefferson Street

City/State/Zip: Green Bay, Wisconsin 54305-1625

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

Signature: 

Print Name: PAUL M. GARVEY

Firm: STS Consultants Ltd.

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

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

Facility/Project Name One Hour Martinizing Dry Cleaning Service	County Brown	Well Name MW-7	
Facility License, Permit or Monitoring Number	County Code 5	Wis. Unique Well Number	DNR Well Number

1. Can this well be purged dry? Yes No
2. Well development method:
- surged with bailer and bailed 4 1
 - surged with bailer and pumped 6 1
 - surged with block and bailed 4 2
 - surged with block and pumped 6 2
 - surged with block, bailed, and pumped 7 0
 - compressed air 2 0
 - bailed only 1 0
 - pumped only 5 1
 - pumped slowly 5 0
 - other
3. Time spent developing well **30.0 min.**
4. Depth of well (from top of well casing) **15.0 ft.**
5. Inside diameter of well **0.75 in.**
6. Volume of water in filter pack and well casing **1.5 gal.**
7. Volume of water removed from well **2.0 gal.**
8. Volume of water added (if any) **0.0 gal.**
9. Source of water added NA
10. Analysis performed on water added? Yes No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 6.57 ft.	dry ft.
Date	b. 10/30/2000	10/30/2000
Time	c. 10:05 am	10:35 am
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear <input type="checkbox"/> 1 0 Turbid <input type="checkbox"/> 1 5 (Describe)	Clear <input type="checkbox"/> 2 0 Turbid <input type="checkbox"/> 2 5 (Describe)

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

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

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

16. Well developed by: Person's Name and Firm
Jim Calaway
STS Consultants Ltd.

17. Additional comments on development:

Facility Address or Owner/Responsible Party Address

Name: Attorney Joseph Hoida

Firm: c/o P.F. Fink, Inc.

Street: 403 S. Jefferson Street

City/State/Zip: Green Bay, Wisconsin 54305-1625

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

Signature: *Paul M. Garvey*

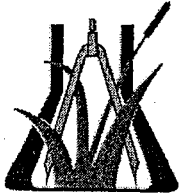
Print Name: PAUL M. GARVEY

Firm: STS Consultants Ltd.

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

APPENDIX B

Laboratory Reports



Robert E. Lee & Associates, Inc.

Engineering, Surveying, Laboratory Services

2825 S. Webster Ave.
P.O. Box 2100
Green Bay, WI 54306-2100
Phone: (920) 336-6338
Fax: (920) 336-9141
E-Mail: rel@releeinc.com

Milwaukee Area
830 Armour Rd.
Oconomowoc, WI 53066
Phone: (262)569-8893 1-800-775-8893
Fax: (262)569-7995
Wisconsin Certification Number: 405043870

PAUL GARVEY
STS CONSULTANTS, LTD - GREEN BAY
1035 KEPLER DR
GREEN BAY WI 54311

Phone: (920)468-1978
Fax: (920)468-3312
Client ID: 000875100
Contact ID: 3487

Sample Information	Number of pages attached
Report Date: 11/20/2000	Coversheet: 1
Chain Number: 82156	Analyst generated narratives: 3
Project No: 24871XF	Certificate of Analysis: 12
Project Name: NONE	Flag description: 1
Receive Date: 10/30/2000	Invoice: 2
Sample Date: 10/30/2000	Chain of Custody: 2
	DNR Form: 0
	Sample non-compliance Report: 0
	Subcontracted Lab Report: 0
	Miscellaneous: 0
	Total pages: 21

Attest:

Steve Herzog

Please visit our new Internet homepage at
www.releeinc.com

Solid sample results are reported on a dry weight basis.

ROBERT E. LEE & ASSOCIATES, INC.

CLIENT: STS CONSULTANTS, LTD - GREEN BAY
PROJECT: 24871XF
CHAIN NUMBER: 82156

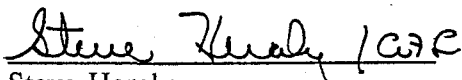
NARRATIVE

This narrative is relevant to samples MW-1 and MW-2.

The samples were analyzed for volatile organic compounds following SW-846 Method 8260.

The following is a summary of the quality control results:

1. The reported compounds were not detected in the method blank.
2. The precision between the matrix spike recovery and the matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
3. The matrix spike recovery was within laboratory limits for each of the reported compounds.
4. The matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
5. The surrogate recovery for all samples was within laboratory limits for each of the three surrogates spiked.
6. The initial and final calibration check standards verified the calibration curve for each of the reported compounds.
7. Sample MW-1 was diluted 1 to 5000.


Steve Heraly
Laboratory Coordinator
JF

ROBERT E. LEE & ASSOCIATES, INC.

CLIENT: STS CONSULTANTS, LTD - GREEN BAY
PROJECT: 24871XF
CHAIN NUMBER: 82156

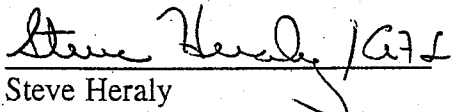
NARRATIVE

This narrative is relevant to samples MW-3, MW-4, MW-5, MW-6, MW-7, PZ-1 and PZ-2.

The samples were analyzed for volatile organic compounds following SW-846 Method 8260.

The following is a summary of the quality control results:

1. The reported compounds were not detected in the method blank.
2. The precision between the matrix spike recovery and the matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
3. The matrix spike recovery was within laboratory limits for each of the reported compounds.
4. The matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
5. The surrogate recovery for all samples was within laboratory limits for each of the three surrogates spiked.
6. The initial and final calibration check standards verified the calibration curve for each of the reported compounds.
7. Sample MW-6 was diluted 1 to 50. The result for tetrachloroethene in sample MW-3 was diluted 1 to 50.


Steve Heraly
Laboratory Coordinator
JF

ROBERT E. LEE & ASSOCIATES, INC

CLIENT: STS CONSULTANTS LTD - GREEN BAY
PROJECT: 24871XF
CHAIN NUMBER: 82156

NARRATIVE

This narrative is relevant to samples MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, PZ-1 and PZ-2.

The samples were prepared by SW-846 Method 3810 and analyzed for light hydrocarbons following SW-846 Method 8015.

Sample MW-2 was used for the matrix spikes. The following is a summary of the quality control results:

1. The reported compounds were not detected in the method blank.
2. The precision between the matrix spike recovery and the matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
3. The matrix spike recovery was within laboratory limits for each of the reported compounds.
4. The matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
5. The initial and final check standards verified the calibration curve for each of the reported compounds.



Steve Heral
Laboratory Coordinator
Ivy

STS Consultants, Ltd - Green Bay
 1035 Kepler Dr

Attn: Paul Garvey
 Phone: (920)468-1978
 Fax: (920)468-3312

Green Bay, WI 54311
 Project Number: 24871XF
 Project Name: NONE

Client ID: 000875100
 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl.Date	Analyst
Lab No.	Collect Date	Sample ID						
00REL019111	10/30/2000	MW-1						
EPA-353.2	Nitrogen-Nitrate/Nitrite	14	mg/L		0.69	2.3	11/01/2000	CLS
SW-846-8015B	Ethane	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Ethane	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Methane	12	ug/L	13	7.2	24	11/03/2000	JHI
SW-846-8260B	1,1,1-Trichloroethane	<0.13	ug/L		0.13	0.44	11/03/2000	JF
SW-846-8260B	1,1,1,2,2-Tetrachloroethane	<0.52	ug/L		0.52	1.7	11/03/2000	JF
SW-846-8260B	1,1,1,2-Trichloroethane	<0.2	ug/L		0.2	0.67	11/03/2000	JF
SW-846-8260B	1,1-Dichloroethane	<0.098	ug/L		0.098	0.33	11/03/2000	JF
SW-846-8260B	1,1-Dichloroethene	<0.18	ug/L		0.18	0.6	11/03/2000	JF
SW-846-8260B	1,2,3-Trichlorobenzene	<0.052	ug/L		0.052	0.17	11/03/2000	JF
SW-846-8260B	1,2,4-Trichlorobenzene	<0.15	ug/L		0.15	0.49	11/03/2000	JF
SW-846-8260B	1,2,4-Trimethylbenzene	0.35	ug/L	13	0.12	0.41	11/03/2000	JF
SW-846-8260B	1,2-Dibromo-3-chloropropane	<0.17	ug/L		0.17	0.55	11/03/2000	JF
SW-846-8260B	1,2-Dibromoethane	<0.084	ug/L		0.084	0.28	11/03/2000	JF
SW-846-8260B	1,2-Dichlorobenzene	<0.036	ug/L		0.036	0.12	11/03/2000	JF
SW-846-8260B	1,2-Dichloroethane	<0.35	ug/L		0.35	1.2	11/03/2000	JF
SW-846-8260B	1,2-Dichloropropane	<0.27	ug/L		0.27	0.91	11/03/2000	JF
SW-846-8260B	1,3,5-Trimethylbenzene	<0.11	ug/L		0.11	0.37	11/03/2000	JF
SW-846-8260B	1,3-Dichlorobenzene	<0.11	ug/L		0.11	0.38	11/03/2000	JF
SW-846-8260B	1,3-Dichloropropane	<0.26	ug/L		0.26	0.87	11/03/2000	JF
SW-846-8260B	1,4-Dichlorobenzene	<0.11	ug/L		0.11	0.38	11/03/2000	JF
SW-846-8260B	2,2-Dichloropropane	<0.2	ug/L		0.2	0.67	11/03/2000	JF
SW-846-8260B	2-Chlorotoluene	<0.11	ug/L		0.11	0.37	11/03/2000	JF
SW-846-8260B	4-Chlorotoluene	<0.092	ug/L		0.092	0.31	11/03/2000	JF
SW-846-8260B	Benzene	<0.19	ug/L		0.19	0.63	11/03/2000	JF
SW-846-8260B	Bromobenzene	<0.34	ug/L		0.34	1.1	11/03/2000	JF
SW-846-8260B	Bromodichloromethane	<0.25	ug/L		0.25	0.83	11/03/2000	JF
SW-846-8260B	Bromofluorobenzene-Surrogate	111	% Rec				11/03/2000	JF
SW-846-8260B	Carbon tetrachloride	<0.23	ug/L		0.23	0.76	11/03/2000	JF
SW-846-8260B	Chlorobenzene	<0.12	ug/L		0.12	0.41	11/03/2000	JF
SW-846-8260B	Chloroethane	<0.28	ug/L		0.28	0.95	11/03/2000	JF
SW-846-8260B	Chloroform	<0.18	ug/L		0.18	0.59	11/03/2000	JF
SW-846-8260B	Chloromethane	<0.13	ug/L		0.13	0.43	11/03/2000	JF
SW-846-8260B	cis-1,2-Dichloroethene	<0.19	ug/L		0.19	0.62	11/03/2000	JF
SW-846-8260B	di-Isopropyl ether	<0.4	ug/L		0.4	1.3	11/03/2000	JF
SW-846-8260B	Dibromochloromethane	<0.088	ug/L		0.088	0.29	11/03/2000	JF
SW-846-8260B	Dibromofluoromethane-Surrogate	114	% Rec				11/03/2000	JF
SW-846-8260B	Dichlorodifluoromethane	<0.21	ug/L		0.21	0.69	11/03/2000	JF
SW-846-8260B	Ethylbenzene	<0.13	ug/L		0.13	0.44	11/03/2000	JF
SW-846-8260B	Hexachlorobutadiene	<0.21	ug/L		0.21	0.71	11/03/2000	JF
SW-846-8260B	Isopropylbenzene	<0.12	ug/L		0.12	0.41	11/03/2000	JF
SW-846-8260B	Methyl-tertiary-butyl ether	<0.2	ug/L		0.2	0.65	11/03/2000	JF
SW-846-8260B	Methylene chloride	<0.12	ug/L		0.12	0.39	11/03/2000	JF
SW-846-8260B	n-Butylbenzene	<0.18	ug/L		0.18	0.59	11/03/2000	JF
SW-846-8260B	n-Propylbenzene	<0.12	ug/L		0.12	0.41	11/03/2000	JF

STS Consultants, Ltd - Green Bay
 1035 Kepler Dr

Green Bay, WI 54311
 Project Number: 24871XF
 Project Name: NONE

Attn: Paul Garvey
 Phone: (920)468-1978
 Fax: (920)468-3312
 Client ID: 000875100
 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B		Naphthalene	<0.082	ug/L	0.082	0.27	11/03/2000	JF
SW-846-8260B		p-Isopropyltoluene	<0.13	ug/L	0.13	0.42	11/03/2000	JF
SW-846-8260B		sec-Butylbenzene	<0.15	ug/L	0.15	0.49	11/03/2000	JF
SW-846-8260B		tert-Butylbenzene	<0.13	ug/L	0.13	0.43	11/03/2000	JF
SW-846-8260B		Tetrachloroethene	3.1	ug/L	0.14	0.47	11/03/2000	JF
SW-846-8260B		Toluene	<0.11	ug/L	0.11	0.37	11/03/2000	JF
SW-846-8260B		Toluene-d8-Surrogate	104	% Rec			11/03/2000	JF
SW-846-8260B		trans-1,2-Dichloroethene	<0.17	ug/L	0.17	0.57	11/03/2000	JF
SW-846-8260B		Trichloroethene	<0.098	ug/L	0.098	0.33	11/03/2000	JF
SW-846-8260B		Trichlorofluoromethane	<0.34	ug/L	0.34	1.1	11/03/2000	JF
SW-846-8260B		Vinyl chloride	<0.23	ug/L	0.23	0.78	11/03/2000	JF
SW-846-8260B		Xylenes-Total	<0.3	ug/L	0.3	0.99	11/03/2000	JF
SW-846-9038		Sulfate	45	mg/L	1.9	6.3	11/02/2000	ASW
SW-846-9251		Chloride	56	mg/L	2.1	7.0	11/01/2000	CLS
00REL019112	10/30/2000	MW-2						
EPA-353.2		Nitrogen-Nitrate/Nitrite	<0.069	mg/L	0.069	0.23	11/01/2000	CLS
SW-846-8015B		Ethane	<14	ug/L	14	47	11/03/2000	JHI
SW-846-8015B		Ethene	<14	ug/L	14	47	11/03/2000	JHI
SW-846-8015B		Methane	<7.2	ug/L	7.2	24	11/03/2000	JHI
SW-846-8260B		1,1,1-Trichloroethane	<0.13	ug/L	0.13	0.44	11/03/2000	JF
SW-846-8260B		1,1,2,2-Tetrachloroethane	<0.52	ug/L	0.52	1.7	11/03/2000	JF
SW-846-8260B		1,1,2-Trichloroethane	<0.2	ug/L	0.2	0.67	11/03/2000	JF
SW-846-8260B		1,1-Dichloroethane	<0.098	ug/L	0.098	0.33	11/03/2000	JF
SW-846-8260B		1,1-Dichloroethene	<0.18	ug/L	0.18	0.6	11/03/2000	JF
SW-846-8260B		1,2,3-Trichlorobenzene	<0.052	ug/L	0.052	0.17	11/03/2000	JF
SW-846-8260B		1,2,4-Trichlorobenzene	<0.15	ug/L	0.15	0.49	11/03/2000	JF
SW-846-8260B		1,2,4-Trimethylbenzene	<0.12	ug/L	0.12	0.41	11/03/2000	JF
SW-846-8260B		1,2-Dibromo-3-chloropropane	<0.17	ug/L	0.17	0.55	11/03/2000	JF
SW-846-8260B		1,2-Dibromoethane	<0.084	ug/L	0.084	0.28	11/03/2000	JF
SW-846-8260B		1,2-Dichlorobenzene	<0.036	ug/L	0.036	0.12	11/03/2000	JF
SW-846-8260B		1,2-Dichloroethane	<0.35	ug/L	0.35	1.2	11/03/2000	JF
SW-846-8260B		1,2-Dichloropropane	<0.27	ug/L	0.27	0.91	11/03/2000	JF
SW-846-8260B		1,3,5-Trimethylbenzene	<0.11	ug/L	0.11	0.37	11/03/2000	JF
SW-846-8260B		1,3-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/03/2000	JF
SW-846-8260B		1,3-Dichloropropane	<0.26	ug/L	0.26	0.87	11/03/2000	JF
SW-846-8260B		1,4-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/03/2000	JF
SW-846-8260B		2,2-Dichloropropane	<0.2	ug/L	0.2	0.67	11/03/2000	JF
SW-846-8260B		2-Chlorotoluene	<0.11	ug/L	0.11	0.37	11/03/2000	JF
SW-846-8260B		4-Chlorotoluene	<0.092	ug/L	0.092	0.31	11/03/2000	JF
SW-846-8260B		Benzene	<0.19	ug/L	0.19	0.63	11/03/2000	JF
SW-846-8260B		Bromobenzene	<0.34	ug/L	0.34	1.1	11/03/2000	JF
SW-846-8260B		Bromodichloromethane	<0.25	ug/L	0.25	0.83	11/03/2000	JF
SW-846-8260B		Bromofluorobenzene-Surrogate	116	% Rec			11/03/2000	JF
SW-846-8260B		Carbon tetrachloride	<0.23	ug/L	0.23	0.76	11/03/2000	JF
SW-846-8260B		Chlorobenzene	<0.12	ug/L	0.12	0.41	11/03/2000	JF
SW-846-8260B		Chloroethane	<0.28	ug/L	0.28	0.95	11/03/2000	JF

STS Consultants, Ltd - Green Bay
 1035 Kepler Dr

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Green Bay, WI 54311
 Project Number: 24871XF
 Project Name: NONE

Client ID: 000875100
 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl.Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B	Chloroform	<0.18	ug/L		0.18	0.59	11/03/2000	JF
SW-846-8260B	Chloromethane	<0.13	ug/L		0.13	0.43	11/03/2000	JF
SW-846-8260B	cis-1,2-Dichloroethene	<0.19	ug/L		0.19	0.62	11/03/2000	JF
SW-846-8260B	di-Isopropyl ether	<0.4	ug/L		0.4	1.3	11/03/2000	JF
SW-846-8260B	Dibromochloromethane	<0.088	ug/L		0.088	0.29	11/03/2000	JF
SW-846-8260B	Dibromofluoromethane-Surrogate	116	% Rec				11/03/2000	JF
SW-846-8260B	Dichlorodifluoromethane	<0.21	ug/L		0.21	0.69	11/03/2000	JF
SW-846-8260B	Ethylbenzene	<0.13	ug/L		0.13	0.44	11/03/2000	JF
SW-846-8260B	Hexachlorobutadiene	<0.21	ug/L		0.21	0.71	11/03/2000	JF
SW-846-8260B	Isopropylbenzene	<0.12	ug/L		0.12	0.41	11/03/2000	JF
SW-846-8260B	Methyl-tertiary-butyl ether	<0.2	ug/L		0.2	0.65	11/03/2000	JF
SW-846-8260B	Methylene chloride	<0.12	ug/L		0.12	0.39	11/03/2000	JF
SW-846-8260B	n-Butylbenzene	<0.18	ug/L		0.18	0.59	11/03/2000	JF
SW-846-8260B	n-Propylbenzene	<0.12	ug/L		0.12	0.41	11/03/2000	JF
SW-846-8260B	Naphthalene	<0.082	ug/L		0.082	0.27	11/03/2000	JF
SW-846-8260B	p-Isopropyltoluene	<0.13	ug/L		0.13	0.42	11/03/2000	JF
SW-846-8260B	sec-Butylbenzene	<0.15	ug/L		0.15	0.49	11/03/2000	JF
SW-846-8260B	tert-Butylbenzene	<0.13	ug/L		0.13	0.43	11/03/2000	JF
SW-846-8260B	Tetrachloroethene	<0.14	ug/L		0.14	0.47	11/03/2000	JF
SW-846-8260B	Toluene	<0.11	ug/L		0.11	0.37	11/03/2000	JF
SW-846-8260B	Toluene-d8-Surrogate	109	% Rec				11/03/2000	JF
SW-846-8260B	trans-1,2-Dichloroethene	<0.17	ug/L		0.17	0.57	11/03/2000	JF
SW-846-8260B	Trichloroethene	<0.098	ug/L		0.098	0.33	11/03/2000	JF
SW-846-8260B	Trichlorofluoromethane	<0.34	ug/L		0.34	1.1	11/03/2000	JF
SW-846-8260B	Vinyl chloride	<0.23	ug/L		0.23	0.78	11/03/2000	JF
SW-846-8260B	Xylenes-Total	<0.3	ug/L		0.3	0.99	11/03/2000	JF
SW-846-9038	Sulfate	35	mg/L		1.9	6.3	11/02/2000	ASW
SW-846-9251	Chloride	32	mg/L		2.1	7.0	11/01/2000	CLS
00REL019113	10/30/2000	MW-3						
EPA-353.2	Nitrogen-Nitrate/Nitrite	10	mg/L		0.69	2.3	11/01/2000	CLS
SW-846-8015B	Ethane	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Ethene	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Methane	<7.2	ug/L		7.2	24	11/03/2000	JHI
SW-846-8260B	1,1,1-Trichloroethane	<0.13	ug/L		0.13	0.44	11/08/2000	JF
SW-846-8260B	1,1,2,2-Tetrachloroethane	<0.52	ug/L		0.52	1.7	11/08/2000	JF
SW-846-8260B	1,1,2-Trichloroethane	<0.2	ug/L		0.2	0.67	11/08/2000	JF
SW-846-8260B	1,1-Dichloroethane	<0.098	ug/L		0.098	0.33	11/08/2000	JF
SW-846-8260B	1,1-Dichloroethene	<0.18	ug/L		0.18	0.6	11/08/2000	JF
SW-846-8260B	1,2,3-Trichlorobenzene	<0.052	ug/L		0.052	0.17	11/08/2000	JF
SW-846-8260B	1,2,4-Trichlorobenzene	<0.15	ug/L		0.15	0.49	11/08/2000	JF
SW-846-8260B	1,2,4-Trimethylbenzene	<0.12	ug/L		0.12	0.41	11/08/2000	JF
SW-846-8260B	1,2-Dibromo-3-chloropropane	<0.17	ug/L		0.17	0.55	11/08/2000	JF
SW-846-8260B	1,2-Dibromoethane	<0.084	ug/L		0.084	0.28	11/08/2000	JF
SW-846-8260B	1,2-Dichlorobenzene	<0.036	ug/L		0.036	0.12	11/08/2000	JF
SW-846-8260B	1,2-Dichloroethane	<0.35	ug/L		0.35	1.2	11/08/2000	JF
SW-846-8260B	1,2-Dichloropropane	<0.27	ug/L		0.27	0.91	11/08/2000	JF

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Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B	1,3,5-Trimethylbenzene	<0.11	ug/L		0.11	0.37	11/08/2000	JF
SW-846-8260B	1,3-Dichlorobenzene	<0.11	ug/L		0.11	0.38	11/08/2000	JF
SW-846-8260B	1,3-Dichloropropane	<0.26	ug/L		0.26	0.87	11/08/2000	JF
SW-846-8260B	1,4-Dichlorobenzene	<0.11	ug/L		0.11	0.38	11/08/2000	JF
SW-846-8260B	2,2-Dichloropropane	<0.2	ug/L		0.2	0.67	11/08/2000	JF
SW-846-8260B	2-Chlorotoluene	<0.11	ug/L		0.11	0.37	11/08/2000	JF
SW-846-8260B	4-Chlorotoluene	<0.092	ug/L		0.092	0.31	11/08/2000	JF
SW-846-8260B	Benzene	<0.19	ug/L		0.19	0.63	11/08/2000	JF
SW-846-8260B	Bromobenzene	<0.34	ug/L		0.34	1.1	11/08/2000	JF
SW-846-8260B	Bromodichloromethane	<0.25	ug/L		0.25	0.83	11/08/2000	JF
SW-846-8260B	Bromofluorobenzene-Surrogate	98	% Rec				11/08/2000	JF
SW-846-8260B	Carbon tetrachloride	<0.23	ug/L		0.23	0.76	11/08/2000	JF
SW-846-8260B	Chlorobenzene	<0.12	ug/L		0.12	0.41	11/08/2000	JF
SW-846-8260B	Chloroethane	<0.28	ug/L		0.28	0.95	11/08/2000	JF
SW-846-8260B	Chloroform	<0.18	ug/L		0.18	0.59	11/08/2000	JF
SW-846-8260B	Chloromethane	<0.13	ug/L		0.13	0.43	11/08/2000	JF
SW-846-8260B	cis-1,2-Dichloroethene	2.3	ug/L		0.19	0.62	11/08/2000	JF
SW-846-8260B	di-Isopropyl ether	<0.4	ug/L		0.4	1.3	11/08/2000	JF
SW-846-8260B	Dibromochloromethane	<0.088	ug/L		0.088	0.29	11/08/2000	JF
SW-846-8260B	Dibromofluoromethane-Surrogate	105	% Rec				11/08/2000	JF
SW-846-8260B	Dichlorodifluoromethane	<0.21	ug/L		0.21	0.69	11/08/2000	JF
SW-846-8260B	Ethylbenzene	<0.13	ug/L		0.13	0.44	11/08/2000	JF
SW-846-8260B	Hexachlorobutadiene	<0.21	ug/L		0.21	0.71	11/08/2000	JF
SW-846-8260B	Isopropylbenzene	<0.12	ug/L		0.12	0.41	11/08/2000	JF
SW-846-8260B	Methyl-tertiary-butyl ether	<0.2	ug/L		0.2	0.65	11/08/2000	JF
SW-846-8260B	Methylene chloride	<0.12	ug/L		0.12	0.39	11/08/2000	JF
SW-846-8260B	n-Butylbenzene	<0.18	ug/L		0.18	0.59	11/08/2000	JF
SW-846-8260B	n-Propylbenzene	<0.12	ug/L		0.12	0.41	11/08/2000	JF
SW-846-8260B	Naphthalene	<0.082	ug/L		0.082	0.27	11/08/2000	JF
SW-846-8260B	p-Isopropyltoluene	<0.13	ug/L		0.13	0.42	11/08/2000	JF
SW-846-8260B	sec-Butylbenzene	<0.15	ug/L		0.15	0.49	11/08/2000	JF
SW-846-8260B	tert-Butylbenzene	<0.13	ug/L		0.13	0.43	11/08/2000	JF
SW-846-8260B	Tetrachloroethene	386	ug/L		7.1	24	11/10/2000	JF
SW-846-8260B	Toluene	0.19	ug/L	13	0.11	0.37	11/08/2000	JF
SW-846-8260B	Toluene-d8-Surrogate	96	% Rec				11/08/2000	JF
SW-846-8260B	trans-1,2-Dichloroethene	<0.17	ug/L		0.17	0.57	11/08/2000	JF
SW-846-8260B	Trichloroethene	5.7	ug/L		0.098	0.33	11/08/2000	JF
SW-846-8260B	Trichlorofluoromethane	<0.34	ug/L		0.34	1.1	11/08/2000	JF
SW-846-8260B	Vinyl chloride	<0.23	ug/L		0.23	0.78	11/08/2000	JF
SW-846-8260B	Xylenes-Total	<0.3	ug/L		0.3	0.99	11/08/2000	JF
SW-846-9038	Sulfate	34	mg/L		1.9	6.3	11/02/2000	ASW
SW-846-9251	Chloride	21	mg/L		2.1	7.0	11/01/2000	CLS
00REL019114	10/30/2000	MW-4						
EPA-353.2	Nitrogen-Nitrate/Nitrite	0.25	mg/L		0.069	0.23	11/01/2000	CLS
SW-846-8015B	Ethane	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Ethene	<14	ug/L		14	47	11/03/2000	JHI

Robert E. Lee & Associates, Inc
 Wisconsin Certification Number: 405043870
 Certificate of Analysis Report

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 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl.Date	Analyst	
Lab No.	Collect Date	Sample ID							
SW-846-8015B		Methane	9.3	ug/L	13	7.2	24	11/03/2000	JHI
SW-846-8260B		1,1,1-Trichloroethane	<0.13	ug/L		0.13	0.44	11/08/2000	JF
SW-846-8260B		1,1,2,2-Tetrachloroethane	<0.52	ug/L		0.52	1.7	11/08/2000	JF
SW-846-8260B		1,1,2-Trichloroethane	<0.2	ug/L		0.2	0.67	11/08/2000	JF
SW-846-8260B		1,1-Dichloroethane	<0.098	ug/L		0.098	0.33	11/08/2000	JF
SW-846-8260B		1,1-Dichloroethene	<0.18	ug/L		0.18	0.6	11/08/2000	JF
SW-846-8260B		1,2,3-Trichlorobenzene	<0.052	ug/L		0.052	0.17	11/08/2000	JF
SW-846-8260B		1,2,4-Trichlorobenzene	<0.15	ug/L		0.15	0.49	11/08/2000	JF
SW-846-8260B		1,2,4-Trimethylbenzene	<0.12	ug/L		0.12	0.41	11/08/2000	JF
SW-846-8260B		1,2-Dibromo-3-chloropropane	<0.17	ug/L		0.17	0.55	11/08/2000	JF
SW-846-8260B		1,2-Dibromoethane	<0.084	ug/L		0.084	0.28	11/08/2000	JF
SW-846-8260B		1,2-Dichlorobenzene	<0.036	ug/L		0.036	0.12	11/08/2000	JF
SW-846-8260B		1,2-Dichloroethane	<0.35	ug/L		0.35	1.2	11/08/2000	JF
SW-846-8260B		1,2-Dichloropropane	<0.27	ug/L		0.27	0.91	11/08/2000	JF
SW-846-8260B		1,3,5-Trimethylbenzene	<0.11	ug/L		0.11	0.37	11/08/2000	JF
SW-846-8260B		1,3-Dichlorobenzene	<0.11	ug/L		0.11	0.38	11/08/2000	JF
SW-846-8260B		1,3-Dichloropropane	<0.26	ug/L		0.26	0.87	11/08/2000	JF
SW-846-8260B		1,4-Dichlorobenzene	<0.11	ug/L		0.11	0.38	11/08/2000	JF
SW-846-8260B		2,2-Dichloropropane	<0.2	ug/L		0.2	0.67	11/08/2000	JF
SW-846-8260B		2-Chlorotoluene	<0.11	ug/L		0.11	0.37	11/08/2000	JF
SW-846-8260B		4-Chlorotoluene	<0.092	ug/L		0.092	0.31	11/08/2000	JF
SW-846-8260B		Benzene	<0.19	ug/L		0.19	0.63	11/08/2000	JF
SW-846-8260B		Bromobenzene	<0.34	ug/L		0.34	1.1	11/08/2000	JF
SW-846-8260B		Bromodichloromethane	<0.25	ug/L		0.25	0.83	11/08/2000	JF
SW-846-8260B		Bromofluorobenzene-Surrogate	97	% Rec				11/08/2000	JF
SW-846-8260B		Carbon tetrachloride	<0.23	ug/L		0.23	0.76	11/08/2000	JF
SW-846-8260B		Chlorobenzene	<0.12	ug/L		0.12	0.41	11/08/2000	JF
SW-846-8260B		Chloroethane	<0.28	ug/L		0.28	0.95	11/08/2000	JF
SW-846-8260B		Chloroform	<0.18	ug/L		0.18	0.59	11/08/2000	JF
SW-846-8260B		Chloromethane	<0.13	ug/L		0.13	0.43	11/08/2000	JF
SW-846-8260B		cis-1,2-Dichloroethene	<0.19	ug/L		0.19	0.62	11/08/2000	JF
SW-846-8260B		di-Isopropyl ether	<0.4	ug/L		0.4	1.3	11/08/2000	JF
SW-846-8260B		Dibromochloromethane	<0.088	ug/L		0.088	0.29	11/08/2000	JF
SW-846-8260B		Dibromofluoromethane-Surrogate	102	% Rec				11/08/2000	JF
SW-846-8260B		Dichlorodifluoromethane	<0.21	ug/L		0.21	0.69	11/08/2000	JF
SW-846-8260B		Ethylbenzene	<0.13	ug/L		0.13	0.44	11/08/2000	JF
SW-846-8260B		Hexachlorobutadiene	<0.21	ug/L		0.21	0.71	11/08/2000	JF
SW-846-8260B		Isopropylbenzene	<0.12	ug/L		0.12	0.41	11/08/2000	JF
SW-846-8260B		Methyl-tertiary-butyl ether	<0.2	ug/L		0.2	0.65	11/08/2000	JF
SW-846-8260B		Methylene chloride	<0.12	ug/L		0.12	0.39	11/08/2000	JF
SW-846-8260B		n-Butylbenzene	<0.18	ug/L		0.18	0.59	11/08/2000	JF
SW-846-8260B		n-Propylbenzene	<0.12	ug/L		0.12	0.41	11/08/2000	JF
SW-846-8260B		Naphthalene	<0.082	ug/L		0.082	0.27	11/08/2000	JF
SW-846-8260B		p-Isopropyltoluene	<0.13	ug/L		0.13	0.42	11/08/2000	JF
SW-846-8260B		sec-Butylbenzene	<0.15	ug/L		0.15	0.49	11/08/2000	JF
SW-846-8260B		tert-Butylbenzene	<0.13	ug/L		0.13	0.43	11/08/2000	JF

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 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst	
Lab No.	Collect Date	Sample ID							
SW-846-8260B		Tetrachloroethene	1.0		ug/L	0.14	0.47	11/08/2000	JF
SW-846-8260B		Toluene	<0.11		ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		Toluene-d8-Surrogate	92		% Rec			11/08/2000	JF
SW-846-8260B		trans-1,2-Dichloroethene	<0.17		ug/L	0.17	0.57	11/08/2000	JF
SW-846-8260B		Trichloroethene	<0.098		ug/L	0.098	0.33	11/08/2000	JF
SW-846-8260B		Trichlorofluoromethane	<0.34		ug/L	0.34	1.1	11/08/2000	JF
SW-846-8260B		Vinyl chloride	<0.23		ug/L	0.23	0.78	11/08/2000	JF
SW-846-8260B		Xylenes-Total	<0.3		ug/L	0.3	0.99	11/08/2000	JF
SW-846-9038		Sulfate	373		mg/L	3.8	13	11/02/2000	ASW
SW-846-9251		Chloride	407		mg/L	21	70	11/01/2000	CLS
00REL019115	10/30/2000	MW-5							
EPA-353.2		Nitrogen-Nitrate/Nitrite	2.0		mg/L	0.069	0.23	11/01/2000	CLS
SW-846-8015B		Ethane	<14		ug/L	14	47	11/03/2000	JHI
SW-846-8015B		Ethene	<14		ug/L	14	47	11/03/2000	JHI
SW-846-8015B		Methane	<7.2		ug/L	7.2	24	11/03/2000	JHI
SW-846-8260B		1,1,1-Trichloroethane	<0.13		ug/L	0.13	0.44	11/08/2000	JF
SW-846-8260B		1,1,2,2-Tetrachloroethane	<0.52		ug/L	0.52	1.7	11/08/2000	JF
SW-846-8260B		1,1,2-Trichloroethane	<0.2		ug/L	0.2	0.67	11/08/2000	JF
SW-846-8260B		1,1-Dichloroethane	<0.098		ug/L	0.098	0.33	11/08/2000	JF
SW-846-8260B		1,1-Dichloroethene	<0.18		ug/L	0.18	0.6	11/08/2000	JF
SW-846-8260B		1,2,3-Trichlorobenzene	<0.052		ug/L	0.052	0.17	11/08/2000	JF
SW-846-8260B		1,2,4-Trichlorobenzene	<0.15		ug/L	0.15	0.49	11/08/2000	JF
SW-846-8260B		1,2,4-Trimethylbenzene	<0.12		ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		1,2-Dibromo-3-chloropropane	<0.17		ug/L	0.17	0.55	11/08/2000	JF
SW-846-8260B		1,2-Dibromoethane	<0.084		ug/L	0.084	0.28	11/08/2000	JF
SW-846-8260B		1,2-Dichlorobenzene	<0.036		ug/L	0.036	0.12	11/08/2000	JF
SW-846-8260B		1,2-Dichloroethane	<0.35		ug/L	0.35	1.2	11/08/2000	JF
SW-846-8260B		1,2-Dichloropropane	<0.27		ug/L	0.27	0.91	11/08/2000	JF
SW-846-8260B		1,3,5-Trimethylbenzene	<0.11		ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		1,3-Dichlorobenzene	<0.11		ug/L	0.11	0.38	11/08/2000	JF
SW-846-8260B		1,3-Dichloropropane	<0.26		ug/L	0.26	0.87	11/08/2000	JF
SW-846-8260B		1,4-Dichlorobenzene	<0.11		ug/L	0.11	0.38	11/08/2000	JF
SW-846-8260B		2,2-Dichloropropane	<0.2		ug/L	0.2	0.67	11/08/2000	JF
SW-846-8260B		2-Chlorotoluene	<0.11		ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		4-Chlorotoluene	<0.092		ug/L	0.092	0.31	11/08/2000	JF
SW-846-8260B		Benzene	<0.19		ug/L	0.19	0.63	11/08/2000	JF
SW-846-8260B		Bromobenzene	<0.34		ug/L	0.34	1.1	11/08/2000	JF
SW-846-8260B		Bromodichloromethane	<0.25		ug/L	0.25	0.83	11/08/2000	JF
SW-846-8260B		Bromofluorobenzene-Surrogate	105		% Rec			11/08/2000	JF
SW-846-8260B		Carbon tetrachloride	<0.23		ug/L	0.23	0.76	11/08/2000	JF
SW-846-8260B		Chlorobenzene	<0.12		ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Chloroethane	<0.28		ug/L	0.28	0.95	11/08/2000	JF
SW-846-8260B		Chloroform	<0.18		ug/L	0.18	0.59	11/08/2000	JF
SW-846-8260B		Chloromethane	<0.13		ug/L	0.13	0.43	11/08/2000	JF
SW-846-8260B		cis-1,2-Dichloroethene	<0.19		ug/L	0.19	0.62	11/08/2000	JF
SW-846-8260B		di-Isopropyl ether	<0.4		ug/L	0.4	1.3	11/08/2000	JF

STS Consultants, Ltd - Green Bay
 1035 Kepler Dr

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Green Bay, WI 54311
 Project Number: 24871XF
 Project Name: NONE

Client ID: 000875100
 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B		Dibromochloromethane	<0.088	ug/L	0.088	0.29	11/08/2000	JF
SW-846-8260B		Dibromofluoromethane-Surrogate	108	% Rec			11/08/2000	JF
SW-846-8260B		Dichlorodifluoromethane	<0.21	ug/L	0.21	0.69	11/08/2000	JF
SW-846-8260B		Ethylbenzene	<0.13	ug/L	0.13	0.44	11/08/2000	JF
SW-846-8260B		Hexachlorobutadiene	<0.21	ug/L	0.21	0.71	11/08/2000	JF
SW-846-8260B		Isopropylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Methyl-tertiary-butyl ether	<0.2	ug/L	0.2	0.65	11/08/2000	JF
SW-846-8260B		Methylene chloride	<0.12	ug/L	0.12	0.39	11/08/2000	JF
SW-846-8260B		n-Butylbenzene	<0.18	ug/L	0.18	0.59	11/08/2000	JF
SW-846-8260B		n-Propylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Naphthalene	<0.082	ug/L	0.082	0.27	11/08/2000	JF
SW-846-8260B		p-Isopropyltoluene	<0.13	ug/L	0.13	0.42	11/08/2000	JF
SW-846-8260B		sec-Butylbenzene	<0.15	ug/L	0.15	0.49	11/08/2000	JF
SW-846-8260B		tert-Butylbenzene	<0.13	ug/L	0.13	0.43	11/08/2000	JF
SW-846-8260B		Tetrachloroethene	<0.14	ug/L	0.14	0.47	11/08/2000	JF
SW-846-8260B		Toluene	<0.11	ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		Toluene-d8-Surrogate	98	% Rec			11/08/2000	JF
SW-846-8260B		trans-1,2-Dichloroethene	<0.17	ug/L	0.17	0.57	11/08/2000	JF
SW-846-8260B		Trichloroethene	<0.098	ug/L	0.098	0.33	11/08/2000	JF
SW-846-8260B		Trichlorofluoromethane	<0.34	ug/L	0.34	1.1	11/08/2000	JF
SW-846-8260B		Vinyl chloride	<0.23	ug/L	0.23	0.78	11/08/2000	JF
SW-846-8260B		Xylenes-Total	<0.3	ug/L	0.3	0.99	11/08/2000	JF
SW-846-9038		Sulfate	243	mg/L	3.8	13	11/02/2000	ASW
SW-846-9251		Chloride	838	mg/L	21	70	11/01/2000	CLS
00REL019116	10/30/2000	MW-6						
EPA-353.2		Nitrogen-Nitrate/Nitrite	1.2	mg/L	0.069	0.23	11/01/2000	CLS
SW-846-8015B		Ethane	<14	ug/L	14	47	11/03/2000	JHI
SW-846-8015B		Ethene	<14	ug/L	14	47	11/03/2000	JHI
SW-846-8015B		Methane	103	ug/L	7.2	24	11/03/2000	JHI
SW-846-8260B		1,1,1-Trichloroethane	<0.13	ug/L	0.13	0.44	11/09/2000	JF
SW-846-8260B		1,1,2,2-Tetrachloroethane	<0.52	ug/L	0.52	1.7	11/09/2000	JF
SW-846-8260B		1,1,2-Trichloroethane	<0.2	ug/L	0.2	0.67	11/09/2000	JF
SW-846-8260B		1,1-Dichloroethane	<0.098	ug/L	0.098	0.33	11/09/2000	JF
SW-846-8260B		1,1-Dichloroethene	<0.18	ug/L	0.18	0.6	11/09/2000	JF
SW-846-8260B		1,2,3-Trichlorobenzene	<0.052	ug/L	0.052	0.17	11/09/2000	JF
SW-846-8260B		1,2,4-Trichlorobenzene	<0.15	ug/L	0.15	0.49	11/09/2000	JF
SW-846-8260B		1,2,4-Trimethylbenzene	<0.12	ug/L	0.12	0.41	11/09/2000	JF
SW-846-8260B		1,2-Dibromo-3-chloropropane	<0.17	ug/L	0.17	0.55	11/09/2000	JF
SW-846-8260B		1,2-Dibromoethane	<0.084	ug/L	0.084	0.28	11/09/2000	JF
SW-846-8260B		1,2-Dichlorobenzene	<0.036	ug/L	0.036	0.12	11/09/2000	JF
SW-846-8260B		1,2-Dichloroethane	<0.35	ug/L	0.35	1.2	11/09/2000	JF
SW-846-8260B		1,2-Dichloropropane	<0.27	ug/L	0.27	0.91	11/09/2000	JF
SW-846-8260B		1,3,5-Trimethylbenzene	<0.11	ug/L	0.11	0.37	11/09/2000	JF
SW-846-8260B		1,3-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/09/2000	JF
SW-846-8260B		1,3-Dichloropropane	<0.26	ug/L	0.26	0.87	11/09/2000	JF
SW-846-8260B		1,4-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/09/2000	JF

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Green Bay, WI 54311
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 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B	2,2-Dichloropropane	<0.2	ug/L		0.2	0.67	11/09/2000	JF
SW-846-8260B	2-Chlorotoluene	<0.11	ug/L		0.11	0.37	11/09/2000	JF
SW-846-8260B	4-Chlorotoluene	<0.092	ug/L		0.092	0.31	11/09/2000	JF
SW-846-8260B	Benzene	<0.19	ug/L		0.19	0.63	11/09/2000	JF
SW-846-8260B	Bromobenzene	<0.34	ug/L		0.34	1.1	11/09/2000	JF
SW-846-8260B	Bromodichloromethane	<0.25	ug/L		0.25	0.83	11/09/2000	JF
SW-846-8260B	Bromofluorobenzene-Surrogate	98	% Rec				11/09/2000	JF
SW-846-8260B	Carbon tetrachloride	<0.23	ug/L		0.23	0.76	11/09/2000	JF
SW-846-8260B	Chlorobenzene	<0.12	ug/L		0.12	0.41	11/09/2000	JF
SW-846-8260B	Chloroethane	<0.28	ug/L		0.28	0.95	11/09/2000	JF
SW-846-8260B	Chloroform	<0.18	ug/L		0.18	0.59	11/09/2000	JF
SW-846-8260B	Chloromethane	<0.13	ug/L		0.13	0.43	11/09/2000	JF
SW-846-8260B	cis-1,2-Dichloroethene	<0.19	ug/L		0.19	0.62	11/09/2000	JF
SW-846-8260B	di-Isopropyl ether	<0.4	ug/L		0.4	1.3	11/09/2000	JF
SW-846-8260B	Dibromochloromethane	<0.088	ug/L		0.088	0.29	11/09/2000	JF
SW-846-8260B	Dibromofluoromethane-Surrogate	106	% Rec				11/09/2000	JF
SW-846-8260B	Dichlorodifluoromethane	<0.21	ug/L		0.21	0.69	11/09/2000	JF
SW-846-8260B	Ethylbenzene	<0.13	ug/L		0.13	0.44	11/09/2000	JF
SW-846-8260B	Hexachlorobutadiene	<0.21	ug/L		0.21	0.71	11/09/2000	JF
SW-846-8260B	Isopropylbenzene	<0.12	ug/L		0.12	0.41	11/09/2000	JF
SW-846-8260B	Methyl-tertiary-butyl ether	<0.2	ug/L		0.2	0.65	11/09/2000	JF
SW-846-8260B	Methylene chloride	<0.12	ug/L		0.12	0.39	11/09/2000	JF
SW-846-8260B	n-Butylbenzene	<0.18	ug/L		0.18	0.59	11/09/2000	JF
SW-846-8260B	n-Propylbenzene	<0.12	ug/L		0.12	0.41	11/09/2000	JF
SW-846-8260B	Naphthalene	<0.082	ug/L		0.082	0.27	11/09/2000	JF
SW-846-8260B	p-Isopropyltoluene	<0.13	ug/L		0.13	0.42	11/09/2000	JF
SW-846-8260B	sec-Butylbenzene	<0.15	ug/L		0.15	0.49	11/09/2000	JF
SW-846-8260B	tert-Butylbenzene	<0.13	ug/L		0.13	0.43	11/09/2000	JF
SW-846-8260B	Tetrachloroethene	2.2	ug/L		0.14	0.47	11/09/2000	JF
SW-846-8260B	Toluene	<0.11	ug/L		0.11	0.37	11/09/2000	JF
SW-846-8260B	Toluene-d8-Surrogate	95	% Rec				11/09/2000	JF
SW-846-8260B	trans-1,2-Dichloroethene	<0.17	ug/L		0.17	0.57	11/09/2000	JF
SW-846-8260B	Trichloroethene	0.44	ug/L		0.098	0.33	11/09/2000	JF
SW-846-8260B	Trichlorofluoromethane	<0.34	ug/L		0.34	1.1	11/09/2000	JF
SW-846-8260B	Vinyl chloride	<0.23	ug/L		0.23	0.78	11/09/2000	JF
SW-846-8260B	Xylenes-Total	<0.3	ug/L		0.3	0.99	11/09/2000	JF
SW-846-9038	Sulfate	48	mg/L		0.76	2.5	11/02/2000	ASW
SW-846-9251	Chloride	90	mg/L		2.1	7.0	11/01/2000	CLS
00REL019117	10/30/2000	MW-7						
EPA-353.2	Nitrogen-Nitrate/Nitrite	<0.069	mg/L		0.069	0.23	11/01/2000	CLS
SW-846-8015B	Ethane	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Ethene	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Methane	27	ug/L		7.2	24	11/03/2000	JHI
SW-846-8260B	1,1,1-Trichloroethane	<0.13	ug/L		0.13	0.44	11/08/2000	JF
SW-846-8260B	1,1,2,2-Tetrachloroethane	<0.52	ug/L		0.52	1.7	11/08/2000	JF
SW-846-8260B	1,1,2-Trichloroethane	<0.2	ug/L		0.2	0.67	11/08/2000	JF

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Green Bay, WI 54311

Client ID: 000875100

Project Number: 24871XF

Chain: 82156

Project Name: NONE

Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B		1,1-Dichloroethane	<0.098	ug/L	0.098	0.33	11/08/2000	JF
SW-846-8260B		1,1-Dichloroethene	<0.18	ug/L	0.18	0.6	11/08/2000	JF
SW-846-8260B		1,2,3-Trichlorobenzene	<0.052	ug/L	0.052	0.17	11/08/2000	JF
SW-846-8260B		1,2,4-Trichlorobenzene	<0.15	ug/L	0.15	0.49	11/08/2000	JF
SW-846-8260B		1,2,4-Trimethylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		1,2-Dibromo-3-chloropropane	<0.17	ug/L	0.17	0.55	11/08/2000	JF
SW-846-8260B		1,2-Dibromoethane	<0.084	ug/L	0.084	0.28	11/08/2000	JF
SW-846-8260B		1,2-Dichlorobenzene	<0.036	ug/L	0.036	0.12	11/08/2000	JF
SW-846-8260B		1,2-Dichloroethane	<0.35	ug/L	0.35	1.2	11/08/2000	JF
SW-846-8260B		1,2-Dichloropropane	<0.27	ug/L	0.27	0.91	11/08/2000	JF
SW-846-8260B		1,3,5-Trimethylbenzene	<0.11	ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		1,3-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/08/2000	JF
SW-846-8260B		1,3-Dichloropropane	<0.26	ug/L	0.26	0.87	11/08/2000	JF
SW-846-8260B		1,4-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/08/2000	JF
SW-846-8260B		2,2-Dichloropropane	<0.2	ug/L	0.2	0.67	11/08/2000	JF
SW-846-8260B		2-Chlorotoluene	<0.11	ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		4-Chlorotoluene	<0.092	ug/L	0.092	0.31	11/08/2000	JF
SW-846-8260B		Benzene	<0.19	ug/L	0.19	0.63	11/08/2000	JF
SW-846-8260B		Bromobenzene	<0.34	ug/L	0.34	1.1	11/08/2000	JF
SW-846-8260B		Bromodichloromethane	<0.25	ug/L	0.25	0.83	11/08/2000	JF
SW-846-8260B		Bromofluorobenzene-Surrogate	101	% Rec			11/08/2000	JF
SW-846-8260B		Carbon tetrachloride	<0.23	ug/L	0.23	0.76	11/08/2000	JF
SW-846-8260B		Chlorobenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Chloroethane	<0.28	ug/L	0.28	0.95	11/08/2000	JF
SW-846-8260B		Chloroform	<0.18	ug/L	0.18	0.59	11/08/2000	JF
SW-846-8260B		Chloromethane	<0.13	ug/L	0.13	0.43	11/08/2000	JF
SW-846-8260B		cis-1,2-Dichloroethene	2.3	ug/L	0.19	0.62	11/08/2000	JF
SW-846-8260B		di-Isopropyl ether	<0.4	ug/L	0.4	1.3	11/08/2000	JF
SW-846-8260B		Dibromochloromethane	<0.088	ug/L	0.088	0.29	11/08/2000	JF
SW-846-8260B		Dibromofluoromethane-Surrogate	108	% Rec			11/08/2000	JF
SW-846-8260B		Dichlorodifluoromethane	<0.21	ug/L	0.21	0.69	11/08/2000	JF
SW-846-8260B		Ethylbenzene	<0.13	ug/L	0.13	0.44	11/08/2000	JF
SW-846-8260B		Hexachlorobutadiene	<0.21	ug/L	0.21	0.71	11/08/2000	JF
SW-846-8260B		Isopropylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Methyl-tertiary-butyl ether	<0.2	ug/L	0.2	0.65	11/08/2000	JF
SW-846-8260B		Methylene chloride	<0.12	ug/L	0.12	0.39	11/08/2000	JF
SW-846-8260B		n-Butylbenzene	<0.18	ug/L	0.18	0.59	11/08/2000	JF
SW-846-8260B		n-Propylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Naphthalene	<0.082	ug/L	0.082	0.27	11/08/2000	JF
SW-846-8260B		p-Isopropyltoluene	<0.13	ug/L	0.13	0.42	11/08/2000	JF
SW-846-8260B		sec-Butylbenzene	<0.15	ug/L	0.15	0.49	11/08/2000	JF
SW-846-8260B		tert-Butylbenzene	<0.13	ug/L	0.13	0.43	11/08/2000	JF
SW-846-8260B		Tetrachloroethene	<0.14	ug/L	0.14	0.47	11/08/2000	JF
SW-846-8260B		Toluene	0.11	ug/L	<u>13</u>	0.37	11/08/2000	JF
SW-846-8260B		Toluene-d8-Surrogate	96	% Rec			11/08/2000	JF
SW-846-8260B		trans-1,2-Dichloroethene	<0.17	ug/L	0.17	0.57	11/08/2000	JF

STS Consultants, Ltd - Green Bay
 1035 Kepler Dr

Green Bay, WI 54311
 Project Number: 24871XF
 Project Name: NONE

Attn: Paul Garvey
 Phone: (920)468-1978
 Fax: (920)468-3312
 Client ID: 000875100
 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B		Trichloroethene	<0.098	ug/L	0.098	0.33	11/08/2000	JF
SW-846-8260B		Trichlorofluoromethane	<0.34	ug/L	0.34	1.1	11/08/2000	JF
SW-846-8260B		Vinyl chloride	<0.23	ug/L	0.23	0.78	11/08/2000	JF
SW-846-8260B		Xylenes-Total	<0.3	ug/L	0.3	0.99	11/08/2000	JF
SW-846-9038		Sulfate	146	mg/L	1.9	6.3	11/02/2000	ASW
SW-846-9251		Chloride	132	mg/L	2.1	7.0	11/01/2000	CLS
00RELO19118	10/30/2000	PZ-1						
EPA-353.2		Nitrogen-Nitrate/Nitrite	<0.069	mg/L	0.069	0.23	11/01/2000	CLS
SW-846-8015B		Ethane	<14	ug/L	14	47	11/03/2000	JHI
SW-846-8015B		Ethene	<14	ug/L	14	47	11/03/2000	JHI
SW-846-8015B		Methane	81	ug/L	7.2	24	11/03/2000	JHI
SW-846-8260B		1,1,1-Trichloroethane	<0.13	ug/L	0.13	0.44	11/08/2000	JF
SW-846-8260B		1,1,2,2-Tetrachloroethane	<0.52	ug/L	0.52	1.7	11/08/2000	JF
SW-846-8260B		1,1,2-Trichloroethane	<0.2	ug/L	0.2	0.67	11/08/2000	JF
SW-846-8260B		1,1-Dichloroethane	<0.098	ug/L	0.098	0.33	11/08/2000	JF
SW-846-8260B		1,1-Dichloroethene	<0.18	ug/L	0.18	0.6	11/08/2000	JF
SW-846-8260B		1,2,3-Trichlorobenzene	<0.052	ug/L	0.052	0.17	11/08/2000	JF
SW-846-8260B		1,2,4-Trichlorobenzene	<0.15	ug/L	0.15	0.49	11/08/2000	JF
SW-846-8260B		1,2,4-Trimethylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		1,2-Dibromo-3-chloropropane	<0.17	ug/L	0.17	0.55	11/08/2000	JF
SW-846-8260B		1,2-Dibromoethane	<0.084	ug/L	0.084	0.28	11/08/2000	JF
SW-846-8260B		1,2-Dichlorobenzene	<0.036	ug/L	0.036	0.12	11/08/2000	JF
SW-846-8260B		1,2-Dichloroethane	<0.35	ug/L	0.35	1.2	11/08/2000	JF
SW-846-8260B		1,2-Dichloropropane	<0.27	ug/L	0.27	0.91	11/08/2000	JF
SW-846-8260B		1,3,5-Trimethylbenzene	<0.11	ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		1,3-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/08/2000	JF
SW-846-8260B		1,3-Dichloropropane	<0.26	ug/L	0.26	0.87	11/08/2000	JF
SW-846-8260B		1,4-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/08/2000	JF
SW-846-8260B		2,2-Dichloropropane	<0.2	ug/L	0.2	0.67	11/08/2000	JF
SW-846-8260B		2-Chlorotoluene	<0.11	ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		4-Chlorotoluene	<0.092	ug/L	0.092	0.31	11/08/2000	JF
SW-846-8260B		Benzene	<0.19	ug/L	0.19	0.63	11/08/2000	JF
SW-846-8260B		Bromobenzene	<0.34	ug/L	0.34	1.1	11/08/2000	JF
SW-846-8260B		Bromodichloromethane	<0.25	ug/L	0.25	0.83	11/08/2000	JF
SW-846-8260B		Bromofluorobenzene-Surrogate	101	% Rec			11/08/2000	JF
SW-846-8260B		Carbon tetrachloride	<0.23	ug/L	0.23	0.76	11/08/2000	JF
SW-846-8260B		Chlorobenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Chloroethane	<0.28	ug/L	0.28	0.95	11/08/2000	JF
SW-846-8260B		Chloroform	<0.18	ug/L	0.18	0.59	11/08/2000	JF
SW-846-8260B		Chloromethane	<0.13	ug/L	0.13	0.43	11/08/2000	JF
SW-846-8260B		cis-1,2-Dichloroethene	2.1	ug/L	0.19	0.62	11/08/2000	JF
SW-846-8260B		di-Isopropyl ether	<0.4	ug/L	0.4	1.3	11/08/2000	JF
SW-846-8260B		Dibromochloromethane	<0.088	ug/L	0.088	0.29	11/08/2000	JF
SW-846-8260B		Dibromofluoromethane-Surrogate	104	% Rec			11/08/2000	JF
SW-846-8260B		Dichlorodifluoromethane	<0.21	ug/L	0.21	0.69	11/08/2000	JF
SW-846-8260B		Ethylbenzene	<0.13	ug/L	0.13	0.44	11/08/2000	JF

STS Consultants, Ltd - Green Bay
 1035 Kepler Dr

Green Bay, WI 54311
 Project Number: 24871XF
 Project Name: NONE

Attn: Paul Garvey
 Phone: (920)468-1978
 Fax: (920)468-3312
 Client ID: 000875100
 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl.Date	Analyst	
Lab No.	Collect Date	Sample ID							
SW-846-8260B		Hexachlorobutadiene	<0.21	ug/L	0.21	0.71	11/08/2000	JF	
SW-846-8260B		Isopropylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF	
SW-846-8260B		Methyl-tertiary-butyl ether	<0.2	ug/L	0.2	0.65	11/08/2000	JF	
SW-846-8260B		Methylene chloride	<0.12	ug/L	0.12	0.39	11/08/2000	JF	
SW-846-8260B		n-Butylbenzene	<0.18	ug/L	0.18	0.59	11/08/2000	JF	
SW-846-8260B		n-Propylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF	
SW-846-8260B		Naphthalene	<0.082	ug/L	0.082	0.27	11/08/2000	JF	
SW-846-8260B		p-Isopropyltoluene	<0.13	ug/L	0.13	0.42	11/08/2000	JF	
SW-846-8260B		sec-Butylbenzene	<0.15	ug/L	0.15	0.49	11/08/2000	JF	
SW-846-8260B		tert-Butylbenzene	<0.13	ug/L	0.13	0.43	11/08/2000	JF	
SW-846-8260B		Tetrachloroethene	9.6	ug/L	0.14	0.47	11/08/2000	JF	
SW-846-8260B		Toluene	<0.11	ug/L	0.11	0.37	11/08/2000	JF	
SW-846-8260B		Toluene-d8-Surrogate	95	% Rec			11/08/2000	JF	
SW-846-8260B		trans-1,2-Dichloroethene	<0.17	ug/L	0.17	0.57	11/08/2000	JF	
SW-846-8260B		Trichloroethene	12	ug/L	0.098	0.33	11/08/2000	JF	
SW-846-8260B		Trichlorofluoromethane	<0.34	ug/L	0.34	1.1	11/08/2000	JF	
SW-846-8260B		Vinyl chloride	<0.23	ug/L	0.23	0.78	11/08/2000	JF	
SW-846-8260B		Xylenes-Total	<0.3	ug/L	0.3	0.99	11/08/2000	JF	
SW-846-9038		Sulfate	70	mg/L	0.76	2.5	11/02/2000	ASW	
SW-846-9251		Chloride	59	mg/L	2.1	7.0	11/01/2000	CLS	
00REL019119	10/30/2000	PZ-2							
EPA-353.2		Nitrogen-Nitrate/Nitrite	<0.069	mg/L	0.069	0.23	11/01/2000	CLS	
SW-846-8015B		Ethane	<14	ug/L	14	47	11/03/2000	JHI	
SW-846-8015B		Ethene	<14	ug/L	14	47	11/03/2000	JHI	
SW-846-8015B		Methane	205	ug/L	7.2	24	11/03/2000	JHI	
SW-846-8260B		1,1,1-Trichloroethane	<0.13	ug/L	0.13	0.44	11/08/2000	JF	
SW-846-8260B		1,1,1,2,2-Tetrachloroethane	<0.52	ug/L	0.52	1.7	11/08/2000	JF	
SW-846-8260B		1,1,2-Trichloroethane	<0.2	ug/L	0.2	0.67	11/08/2000	JF	
SW-846-8260B		1,1-Dichloroethane	<0.098	ug/L	0.098	0.33	11/08/2000	JF	
SW-846-8260B		1,1-Dichloroethene	<0.18	ug/L	0.18	0.6	11/08/2000	JF	
SW-846-8260B		1,2,3-Trichlorobenzene	<0.052	ug/L	0.052	0.17	11/08/2000	JF	
SW-846-8260B		1,2,4-Trichlorobenzene	<0.15	ug/L	0.15	0.49	11/08/2000	JF	
SW-846-8260B		1,2,4-Trimethylbenzene	0.2	ug/L	13	0.41	11/08/2000	JF	
SW-846-8260B		1,2-Dibromo-3-chloropropane	<0.17	ug/L	0.17	0.55	11/08/2000	JF	
SW-846-8260B		1,2-Dibromoethane	<0.084	ug/L	0.084	0.28	11/08/2000	JF	
SW-846-8260B		1,2-Dichlorobenzene	<0.036	ug/L	0.036	0.12	11/08/2000	JF	
SW-846-8260B		1,2-Dichloroethane	<0.35	ug/L	0.35	1.2	11/08/2000	JF	
SW-846-8260B		1,2-Dichloropropane	<0.27	ug/L	0.27	0.91	11/08/2000	JF	
SW-846-8260B		1,3,5-Trimethylbenzene	<0.11	ug/L	0.11	0.37	11/08/2000	JF	
SW-846-8260B		1,3-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/08/2000	JF	
SW-846-8260B		1,3-Dichloropropane	<0.26	ug/L	0.26	0.87	11/08/2000	JF	
SW-846-8260B		1,4-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/08/2000	JF	
SW-846-8260B		2,2-Dichloropropane	<0.2	ug/L	0.2	0.67	11/08/2000	JF	
SW-846-8260B		2-Chlorotoluene	<0.11	ug/L	0.11	0.37	11/08/2000	JF	
SW-846-8260B		4-Chlorotoluene	<0.092	ug/L	0.092	0.31	11/08/2000	JF	
SW-846-8260B		Benzene	0.24	ug/L	13	0.19	0.63	11/08/2000	JF

STS Consultants, Ltd - Green Bay
 1035 Kepler Dr

Green Bay, WI 54311
 Project Number: 24871XF
 Project Name: NONE

Attn: Paul Garvey
 Phone: (920)468-1978
 Fax: (920)468-3312
 Client ID: 000875100
 Chain: 82156
 Report Date: 11/20/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B		Bromobenzene	<0.34	ug/L	0.34	1.1	11/08/2000	JF
SW-846-8260B		Bromodichloromethane	<0.25	ug/L	0.25	0.83	11/08/2000	JF
SW-846-8260B		Bromofluorobenzene-Surrogate	87	% Rec			11/08/2000	JF
SW-846-8260B		Carbon tetrachloride	<0.23	ug/L	0.23	0.76	11/08/2000	JF
SW-846-8260B		Chlorobenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Chloroethane	<0.28	ug/L	0.28	0.95	11/08/2000	JF
SW-846-8260B		Chloroform	<0.18	ug/L	0.18	0.59	11/08/2000	JF
SW-846-8260B		Chloromethane	<0.13	ug/L	0.13	0.43	11/08/2000	JF
SW-846-8260B		cis-1,2-Dichloroethene	<0.19	ug/L	0.19	0.62	11/08/2000	JF
SW-846-8260B		di-Isopropyl ether	<0.4	ug/L	0.4	1.3	11/08/2000	JF
SW-846-8260B		Dibromochloromethane	<0.088	ug/L	0.088	0.29	11/08/2000	JF
SW-846-8260B		Dibromofluoromethane-Surrogate	97	% Rec			11/08/2000	JF
SW-846-8260B		Dichlorodifluoromethane	<0.21	ug/L	0.21	0.69	11/08/2000	JF
SW-846-8260B		Ethylbenzene	0.21	ug/L	13	0.44	11/08/2000	JF
SW-846-8260B		Hexachlorobutadiene	<0.21	ug/L	0.21	0.71	11/08/2000	JF
SW-846-8260B		Isopropylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Methyl-tertiary-butyl ether	<0.2	ug/L	0.2	0.65	11/08/2000	JF
SW-846-8260B		Methylene chloride	<0.12	ug/L	0.12	0.39	11/08/2000	JF
SW-846-8260B		n-Butylbenzene	<0.18	ug/L	0.18	0.59	11/08/2000	JF
SW-846-8260B		n-Propylbenzene	<0.12	ug/L	0.12	0.41	11/08/2000	JF
SW-846-8260B		Naphthalene	<0.082	ug/L	0.082	0.27	11/08/2000	JF
SW-846-8260B		p-Isopropyltoluene	<0.13	ug/L	0.13	0.42	11/08/2000	JF
SW-846-8260B		sec-Butylbenzene	0.16	ug/L	13	0.49	11/08/2000	JF
SW-846-8260B		tert-Butylbenzene	<0.13	ug/L	0.13	0.43	11/08/2000	JF
SW-846-8260B		Tetrachloroethene	<0.14	ug/L	0.14	0.47	11/08/2000	JF
SW-846-8260B		Toluene	0.58	ug/L	0.11	0.37	11/08/2000	JF
SW-846-8260B		Toluene-d8-Surrogate	83	% Rec			11/08/2000	JF
SW-846-8260B		trans-1,2-Dichloroethene	<0.17	ug/L	0.17	0.57	11/08/2000	JF
SW-846-8260B		Trichloroethene	<0.098	ug/L	0.098	0.33	11/08/2000	JF
SW-846-8260B		Trichlorofluoromethane	<0.34	ug/L	0.34	1.1	11/08/2000	JF
SW-846-8260B		Vinyl chloride	<0.23	ug/L	0.23	0.78	11/08/2000	JF
SW-846-8260B		Xylenes-Total	0.30	ug/L	0.3	0.99	11/08/2000	JF
SW-846-9038		Sulfate	32	mg/L	1.9	6.3	11/02/2000	ASW
SW-846-9251		Chloride	14	mg/L	2.1	7.0	11/01/2000	CLS

Robert E. Lee & Associates, Inc.

Quality Control Report - Description of Flags

Flag	Section	Description
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13	L	The reported result is less than the practical quantitation limit (PQL).
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CHAIN OF CUSTODY RECORD

N^o 31224 82156R



RECORD NUMBER 1 THROUGH 2

Contact Person PAUL GARVEY
 Phone No. 468-1978 Office G.B.
 Project No. 24871XF PO No. _____
 Project Name 24871XF

Special Handling Request	
<input type="checkbox"/>	Rush
<input type="checkbox"/>	Verbal
<input type="checkbox"/>	Other

Laboratory REL
 Contact Person P.KNOX
 Phone No. _____
 Results Due _____

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation		Field Data				Analysis Request	Comments on Sample (Include Major Contaminants)
							Y	N	PID/FID		PH	Special Cond.		
									Ambient	Sample				
MW-1	10/30		8		7	WATER	6	1			19111		(VOCS; SULFATE; CHLORIDE; NITRATE/NITRITE; METHANE, ETHANE, ETHENE,)	
MW-2											19112			
MW-3											19113			
MW-4											19114			
MW-5											19115			
MW-6											19116			
MW-7											19117			

Collected by: <u>[Signature]</u>	Date <u>10/30/00</u>	Time <u>12:15P</u>	Delivery by: <u>[Signature]</u>	Date <u>10/30/00</u>	Time <u>1:20P</u>
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received for lab by: <u>[Signature]</u>	Date <u>10-30-00</u>	Time <u>1:32P</u>	Relinquished by:	Date	Time

Laboratory Comments Only: Seals Intact Upon Receipt? Yes No N/A X on ice

Final Disposition:	Comments (Weather Conditions, Precautions, Hazards):

Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
 Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.

6/99cp10k

STS Consultants Ltd.
 Consulting Engineers

CHAIN OF CUSTODY RECORD

No. 31223

82156



RECORD NUMBER 2 THROUGH 2

Contact Person PAUL GARVEY
 Phone No. 468-1978 Office G.B.
 Project No. 2487XF PO No. _____
 Project Name 2487XF

Special Handling Request	
<input type="checkbox"/>	Rush
<input type="checkbox"/>	Verbal
<input type="checkbox"/>	Other

Laboratory REL
 Contact Person P. KUNST
 Phone No. _____
 Results Due _____

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation		Field Data				Analysis Request	Comments on Sample (Include Major Contaminants)
							Y	N	PID/FID		PH	Special Cond.		
									Ambient	Sample				
PZ-1	10/30		X		7	WATER	6	1		19118			VOC ₂ ; SULFATE; CHLORIDE; NITRATE/NITRITE; METHANE, ETHANE, ETHYLENE	
PZ-2	↓		↓		↓	↓	↓	↓		19119				
PZ-3	↓		↓		↓	↓	↓	↓		19120				

Collected by: <u>[Signature]</u>	Date <u>10/30/00</u>	Time <u>12:45P</u>	Delivery by: <u>[Signature]</u>	Date <u>10/30/00</u>	Time <u>1:20P</u>
Received by: _____	Date _____	Time _____	Relinquished by: _____	Date _____	Time _____
Received by: _____	Date _____	Time _____	Relinquished by: _____	Date _____	Time _____
Received by: _____	Date _____	Time _____	Relinquished by: _____	Date _____	Time _____
Received for lab by: <u>[Signature]</u>	Date <u>10-30-00</u>	Time <u>1:30P</u>	Relinquished by: _____	Date _____	Time _____

Laboratory Comments Only: Seals Intact Upon Receipt? Yes No N/A X on ice

Final Disposition: _____	Comments (Weather Conditions, Precautions, Hazards): _____
_____	_____

Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
 Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.



Robert E. Lee & Associates, Inc.

Engineering, Surveying, Laboratory Services

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Green Bay, WI 54306-2100
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Fax: (262)569-7995
Wisconsin Certification Number: 405043870

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GREEN BAY WI 54311

Phone: (920)468-1978
Fax: (920)468-3312
Client ID: 000875100
Contact ID: 3487

Sample Information	Number of pages attached
Report Date: 11/29/2000	Coversheet: 1
Chain Number: 77724	Analyst generated narratives: 2
Project No: 24871XF	Certificate of Analysis: 3
Project Name: NONE	Flag description: 1
Receive Date: 11/01/2000	Invoice: 1
Sample Date: 11/01/2000	Chain of Custody: 1
	DNR Form: 0
	Sample non-compliance Report: 0
	Subcontracted Lab Report: 0
	Miscellaneous: 0
	Total pages: 9

Attest:

Please visit our new Internet homepage at

www.releeinc.com

Solid sample results are reported on a dry weight basis.

ROBERT E. LEE & ASSOCIATES, INC.

CLIENT: STS CONSULTANTS, LTD - GREEN BAY
PROJECT: 24871XF
CHAIN NUMBER: 77724

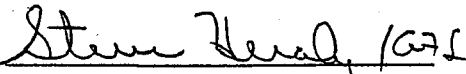
NARRATIVE

This narrative is relevant to samples PZ-6 and TRIP BLANK.

The samples were analyzed for volatile organic compounds following SW-846 Method 8260.

The following is a summary of the quality control results:

1. The reported compounds were not detected in the method blank
2. The precision between the matrix spike recovery and the matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
3. The matrix spike recovery was within laboratory limits for each of the reported compounds.
4. The matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
5. The surrogate recovery for all samples was within laboratory limits for each of the three surrogates spiked.
6. The initial and final calibration check standards verified the calibration curve for each of the reported compounds.


Steve Heraly
Laboratory Coordinator
JF

ROBERT E. LEE & ASSOCIATES, INC

CLIENT: STS CONSULTANTS LTD - GREEN BAY
PROJECT: 24871XF
CHAIN NUMBER: 77724

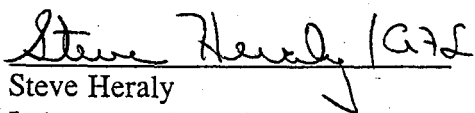
NARRATIVE

This narrative is relevant to sample PZ-6.

The sample was prepared by SW-846 Method 3810 and analyzed for light hydrocarbons following SW-846 Method 8015.

The sample used for the matrix spikes is not listed above. The following is a summary of the quality control results:

1. The reported compounds were not detected in the method blank.
2. The precision between the matrix spike recovery and the matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
3. The matrix spike recovery was within laboratory limits for each of the reported compounds.
4. The matrix spike duplicate recovery was within laboratory limits for each of the reported compounds.
5. The initial and final check standards verified the calibration curve for each of the reported compounds.


Steve Heraly
Laboratory Coordinator
Ivy

STS Consultants, Ltd - Green Bay
 1035 Kepler Dr

Green Bay, WI 54311
 Project Number: 24871XF
 Project Name: NONE

Attn: Paul Garvey
 Phone: (920)468-1978
 Fax: (920)468-3312
 Client ID: 000875100
 Chain: 77724
 Report Date: 11/29/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No	Collect Date	Sample ID						
<u>00REL019287</u>	<u>11/01/2000</u>	<u>PZ-6</u>						
SW-846-8015B	Ethane	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Ethene	<14	ug/L		14	47	11/03/2000	JHI
SW-846-8015B	Methane	306	ug/L		7.2	24	11/03/2000	JHI
SW-846-8260B	1,1,1-Trichloroethane	<0.13	ug/L		0.13	0.44	11/14/2000	JF
SW-846-8260B	1,1,2,2-Tetrachloroethane	<0.52	ug/L		0.52	1.7	11/14/2000	JF
SW-846-8260B	1,1,2-Trichloroethane	<0.2	ug/L		0.2	0.67	11/14/2000	JF
SW-846-8260B	1,1-Dichloroethane	<0.098	ug/L		0.098	0.33	11/14/2000	JF
SW-846-8260B	1,1-Dichloroethene	<0.18	ug/L		0.18	0.6	11/14/2000	JF
SW-846-8260B	1,2,3-Trichlorobenzene	<0.052	ug/L		0.052	0.17	11/14/2000	JF
SW-846-8260B	1,2,4-Trichlorobenzene	<0.15	ug/L		0.15	0.49	11/14/2000	JF
SW-846-8260B	1,2,4-Trimethylbenzene	<0.12	ug/L		0.12	0.41	11/14/2000	JF
SW-846-8260B	1,2-Dibromo-3-chloropropane	<0.17	ug/L		0.17	0.55	11/14/2000	JF
SW-846-8260B	1,2-Dibromoethane	<0.084	ug/L		0.084	0.28	11/14/2000	JF
SW-846-8260B	1,2-Dichlorobenzene	<0.036	ug/L		0.036	0.12	11/14/2000	JF
SW-846-8260B	1,2-Dichloroethane	<0.35	ug/L		0.35	1.2	11/14/2000	JF
SW-846-8260B	1,2-Dichloropropane	<0.27	ug/L		0.27	0.91	11/14/2000	JF
SW-846-8260B	1,3,5-Trimethylbenzene	<0.11	ug/L		0.11	0.37	11/14/2000	JF
SW-846-8260B	1,3-Dichlorobenzene	<0.11	ug/L		0.11	0.38	11/14/2000	JF
SW-846-8260B	1,3-Dichloropropane	<0.26	ug/L		0.26	0.87	11/14/2000	JF
SW-846-8260B	1,4-Dichlorobenzene	<0.11	ug/L		0.11	0.38	11/14/2000	JF
SW-846-8260B	2,2-Dichloropropane	<0.2	ug/L		0.2	0.67	11/14/2000	JF
SW-846-8260B	2-Chlorotoluene	<0.11	ug/L		0.11	0.37	11/14/2000	JF
SW-846-8260B	4-Chlorotoluene	<0.092	ug/L		0.092	0.31	11/14/2000	JF
SW-846-8260B	Benzene	<0.19	ug/L		0.19	0.63	11/14/2000	JF
SW-846-8260B	Bromobenzene	<0.34	ug/L		0.34	1.1	11/14/2000	JF
SW-846-8260B	Bromodichloromethane	<0.25	ug/L		0.25	0.83	11/14/2000	JF
SW-846-8260B	Bromofluorobenzene-Surrogate	102	% Rec				11/14/2000	JF
SW-846-8260B	Carbon tetrachloride	<0.23	ug/L		0.23	0.76	11/14/2000	JF
SW-846-8260B	Chlorobenzene	<0.12	ug/L		0.12	0.41	11/14/2000	JF
SW-846-8260B	Chloroethane	<0.28	ug/L		0.28	0.95	11/14/2000	JF
SW-846-8260B	Chloroform	<0.18	ug/L		0.18	0.59	11/14/2000	JF
SW-846-8260B	Chloromethane	<0.13	ug/L		0.13	0.43	11/14/2000	JF
SW-846-8260B	cis-1,2-Dichloroethene	18	ug/L		0.19	0.62	11/14/2000	JF
SW-846-8260B	di-Isopropyl ether	<0.4	ug/L		0.4	1.3	11/14/2000	JF
SW-846-8260B	Dibromochloromethane	<0.088	ug/L		0.088	0.29	11/14/2000	JF
SW-846-8260B	Dibromofluoromethane-Surrogate	105	% Rec				11/14/2000	JF
SW-846-8260B	Dichlorodifluoromethane	<0.21	ug/L		0.21	0.69	11/14/2000	JF
SW-846-8260B	Ethylbenzene	<0.13	ug/L		0.13	0.44	11/14/2000	JF
SW-846-8260B	Hexachlorobutadiene	<0.21	ug/L		0.21	0.71	11/14/2000	JF
SW-846-8260B	Isopropylbenzene	<0.12	ug/L		0.12	0.41	11/14/2000	JF
SW-846-8260B	Methyl-tertiary-butyl ether	<0.2	ug/L		0.2	0.65	11/14/2000	JF
SW-846-8260B	Methylene chloride	<0.12	ug/L		0.12	0.39	11/14/2000	JF
SW-846-8260B	n-Butylbenzene	<0.18	ug/L		0.18	0.59	11/14/2000	JF
SW-846-8260B	n-Propylbenzene	<0.12	ug/L		0.12	0.41	11/14/2000	JF
SW-846-8260B	Naphthalene	<0.082	ug/L		0.082	0.27	11/14/2000	JF

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 Client ID: 000875100
 Chain: 77724
 Report Date: 11/29/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl.Date	Analyst
Lab No.	Collect Date	Sample ID						
SW-846-8260B	11/01/2000	TRIP BLANK						
SW-846-8260B		p-Isopropyltoluene	<0.13	ug/L	0.13	0.42	11/14/2000	JF
SW-846-8260B		sec-Butylbenzene	<0.15	ug/L	0.15	0.49	11/14/2000	JF
SW-846-8260B		tert-Butylbenzene	<0.13	ug/L	0.13	0.43	11/14/2000	JF
SW-846-8260B		Tetrachloroethene	1.2	ug/L	0.14	0.47	11/14/2000	JF
SW-846-8260B		Toluene	0.31	ug/L	13	0.37	11/14/2000	JF
SW-846-8260B		Toluene-d8-Surrogate	102	% Rec			11/14/2000	JF
SW-846-8260B		trans-1,2-Dichloroethene	<0.17	ug/L	0.17	0.57	11/14/2000	JF
SW-846-8260B		Trichloroethene	4.9	ug/L	0.098	0.33	11/14/2000	JF
SW-846-8260B		Trichlorofluoromethane	<0.34	ug/L	0.34	1.1	11/14/2000	JF
SW-846-8260B		Vinyl chloride	2.2	ug/L	0.23	0.78	11/14/2000	JF
SW-846-8260B		Xylenes-Total	<0.3	ug/L	0.3	0.99	11/14/2000	JF
SW-846-8260B		1,1,1-Trichloroethane	<0.13	ug/L	0.13	0.44	11/14/2000	JF
SW-846-8260B		1,1,2,2-Tetrachloroethane	<0.52	ug/L	0.52	1.7	11/14/2000	JF
SW-846-8260B		1,1,2-Trichloroethane	<0.2	ug/L	0.2	0.67	11/14/2000	JF
SW-846-8260B		1,1-Dichloroethane	<0.098	ug/L	0.098	0.33	11/14/2000	JF
SW-846-8260B		1,1-Dichloroethene	<0.18	ug/L	0.18	0.6	11/14/2000	JF
SW-846-8260B		1,2,3-Trichlorobenzene	<0.052	ug/L	0.052	0.17	11/14/2000	JF
SW-846-8260B		1,2,4-Trichlorobenzene	<0.15	ug/L	0.15	0.49	11/14/2000	JF
SW-846-8260B		1,2,4-Trimethylbenzene	<0.12	ug/L	0.12	0.41	11/14/2000	JF
SW-846-8260B		1,2-Dibromo-3-chloropropane	<0.17	ug/L	0.17	0.55	11/14/2000	JF
SW-846-8260B		1,2-Dibromoethane	<0.084	ug/L	0.084	0.28	11/14/2000	JF
SW-846-8260B		1,2-Dichlorobenzene	<0.036	ug/L	0.036	0.12	11/14/2000	JF
SW-846-8260B		1,2-Dichloroethane	<0.35	ug/L	0.35	1.2	11/14/2000	JF
SW-846-8260B		1,2-Dichloropropane	<0.27	ug/L	0.27	0.91	11/14/2000	JF
SW-846-8260B		1,3,5-Trimethylbenzene	<0.11	ug/L	0.11	0.37	11/14/2000	JF
SW-846-8260B		1,3-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/14/2000	JF
SW-846-8260B		1,3-Dichloropropane	<0.26	ug/L	0.26	0.87	11/14/2000	JF
SW-846-8260B		1,4-Dichlorobenzene	<0.11	ug/L	0.11	0.38	11/14/2000	JF
SW-846-8260B		2,2-Dichloropropane	<0.2	ug/L	0.2	0.67	11/14/2000	JF
SW-846-8260B		2-Chlorotoluene	<0.11	ug/L	0.11	0.37	11/14/2000	JF
SW-846-8260B		4-Chlorotoluene	<0.092	ug/L	0.092	0.31	11/14/2000	JF
SW-846-8260B		Benzene	<0.19	ug/L	0.19	0.63	11/14/2000	JF
SW-846-8260B		Bromobenzene	<0.34	ug/L	0.34	1.1	11/14/2000	JF
SW-846-8260B		Bromodichloromethane	<0.25	ug/L	0.25	0.83	11/14/2000	JF
SW-846-8260B		Bromofluorobenzene-Surrogate	106	% Rec			11/14/2000	JF
SW-846-8260B		Carbon tetrachloride	<0.23	ug/L	0.23	0.76	11/14/2000	JF
SW-846-8260B		Chlorobenzene	<0.12	ug/L	0.12	0.41	11/14/2000	JF
SW-846-8260B		Chloroethane	<0.28	ug/L	0.28	0.95	11/14/2000	JF
SW-846-8260B		Chloroform	<0.18	ug/L	0.18	0.59	11/14/2000	JF
SW-846-8260B		Chloromethane	<0.13	ug/L	0.13	0.43	11/14/2000	JF
SW-846-8260B		cis-1,2-Dichloroethene	<0.19	ug/L	0.19	0.62	11/14/2000	JF
SW-846-8260B		di-Isopropyl ether	<0.4	ug/L	0.4	1.3	11/14/2000	JF
SW-846-8260B		Dibromochloromethane	<0.088	ug/L	0.088	0.29	11/14/2000	JF
SW-846-8260B		Dibromofluoromethane-Surrogate	104	% Rec			11/14/2000	JF
SW-846-8260B		Dichlorodifluoromethane	<0.21	ug/L	0.21	0.69	11/14/2000	JF

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 Report Date: 11/29/2000

Method	Parameter Name	Result	Units	Flag	MDL	PQL	Anl Date	Analyst
Lab No	Collect Date	Sample ID						
SW-846-8260B		Ethylbenzene	<0.13	ug/L	0.13	0.44	11/14/2000	JF
SW-846-8260B		Hexachlorobutadiene	<0.21	ug/L	0.21	0.71	11/14/2000	JF
SW-846-8260B		Isopropylbenzene	<0.12	ug/L	0.12	0.41	11/14/2000	JF
SW-846-8260B		Methyl-tertiary-butyl ether	<0.2	ug/L	0.2	0.65	11/14/2000	JF
SW-846-8260B		Methylene chloride	<0.12	ug/L	0.12	0.39	11/14/2000	JF
SW-846-8260B		n-Butylbenzene	<0.18	ug/L	0.18	0.59	11/14/2000	JF
SW-846-8260B		n-Propylbenzene	<0.12	ug/L	0.12	0.41	11/14/2000	JF
SW-846-8260B		Naphthalene	<0.082	ug/L	0.082	0.27	11/14/2000	JF
SW-846-8260B		p-Isopropyltoluene	<0.13	ug/L	0.13	0.42	11/14/2000	JF
SW-846-8260B		sec-Butylbenzene	<0.15	ug/L	0.15	0.49	11/14/2000	JF
SW-846-8260B		tert-Butylbenzene	<0.13	ug/L	0.13	0.43	11/14/2000	JF
SW-846-8260B		Tetrachloroethene	<0.14	ug/L	0.14	0.47	11/14/2000	JF
SW-846-8260B		Toluene	<0.11	ug/L	0.11	0.37	11/14/2000	JF
SW-846-8260B		Toluene-d8-Surrogate	104	% Rec			11/14/2000	JF
SW-846-8260B		trans-1,2-Dichloroethene	<0.17	ug/L	0.17	0.57	11/14/2000	JF
SW-846-8260B		Trichloroethene	<0.098	ug/L	0.098	0.33	11/14/2000	JF
SW-846-8260B		Trichlorofluoromethane	<0.34	ug/L	0.34	1.1	11/14/2000	JF
SW-846-8260B		Vinyl chloride	<0.23	ug/L	0.23	0.78	11/14/2000	JF
SW-846-8260B		Xylenes-Total	<0.3	ug/L	0.3	0.99	11/14/2000	JF

Robert E. Lee & Associates, Inc.

Quality Control Report - Description of Flags

Flag	Section	Description
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13	L	The reported result is less than the practical quantitation limit (PQL).
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APPENDIX C

Average Linear Velocity Calculations

Vertical Gradient Calculations



PROJECT One Hour Mortarizing - S. Military Ave, GB JOB NO. 24871XF PAGE OF
 SUBJECT Ave. Linear Velocity Calc.s - GW Flow DIVISION
 ORIGINATOR P. GARVEY DATE 1/29/01 CHECKED BY Jed DATE 1/29/01

$$V_L = \frac{KI}{n}$$

(Freeze + Cherry, 1979)

V_L = ave. linear velocity

K = hydraulic conductivity
(est. 1×10^{-6} cm/sec) Fetter 1994)

n = porosity (0.3) (assumed)

I = 0.007 ft/ft (10/30/00 - gw flow map)

$$V_L = \frac{(1 \times 10^{-6} \text{ cm/sec}) (0.007 \text{ ft/ft})}{0.3}$$

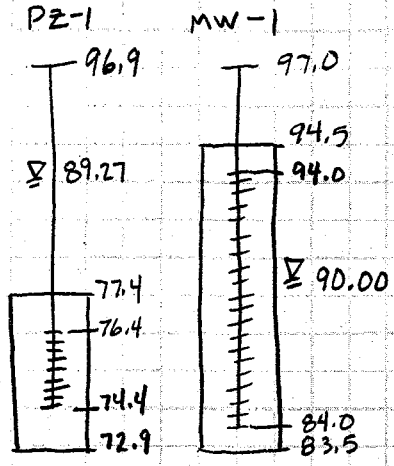
$$V_L = (2.3 \times 10^{-8} \text{ cm/sec}) \left(\frac{1 \text{ ft}}{30.48 \text{ cm}} \right) \left(\frac{86400 \text{ sec}}{1 \text{ day}} \right) \left(\frac{365 \text{ day}}{1 \text{ yr}} \right)$$

$$V_L = 0.024 \text{ ft/yr} \quad \checkmark$$

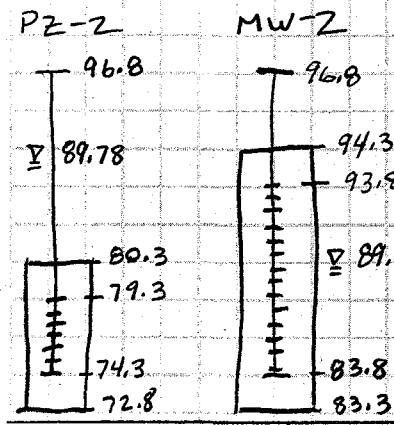
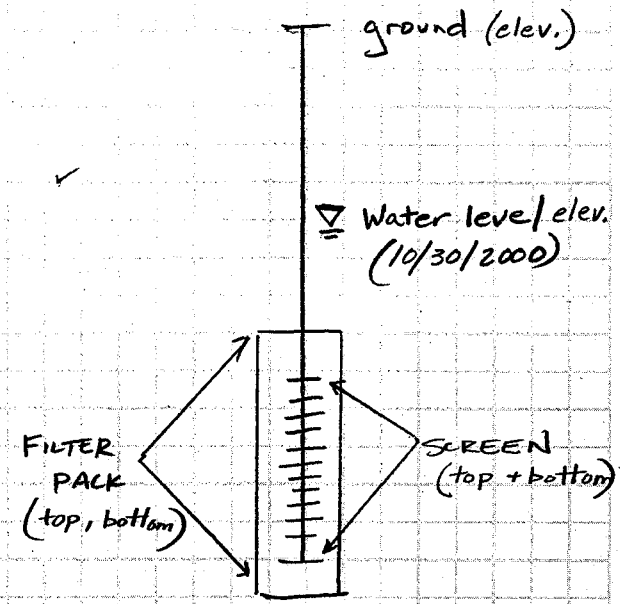


PROJECT One Hour Martinizing - S. Military JOB NO 24871XF PAGE OF
 SUBJECT Vertical Gradient Calc for Locations 1, 2, + 6 DIVISION
 ORIGINATOR P. Garvey DATE 1/29/01 CHECKED BY JGZ DATE 1/29/01

WELL DIAGRAM

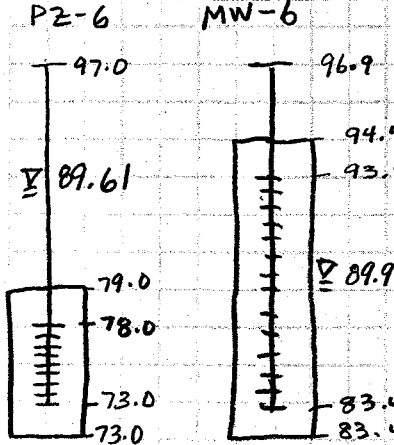


PZ-1 MW-1
 XN=75.15 XN=86.75
 $86.75 - 75.15 = 11.6$
 Ave Vert I = $\frac{90.00 - 89.27}{11.6}$ ✓
 = +0.063 ft/ft
 ∴ Downward

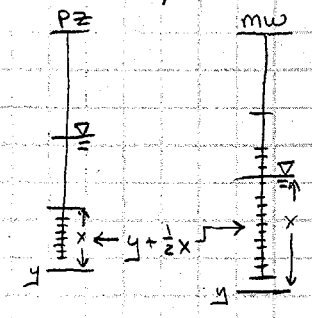


PZ-2 MW-2
 XN=76.55 XN=86.48
 $86.48 - 76.55 = 9.93$
 Ave Vert. I = $\frac{89.66 - 89.78}{9.93}$ ✓
 = -0.012 ft/ft
 ∴ upward

AVERAGE I is the change in head divided by the distance between saturated screen/filter pack.



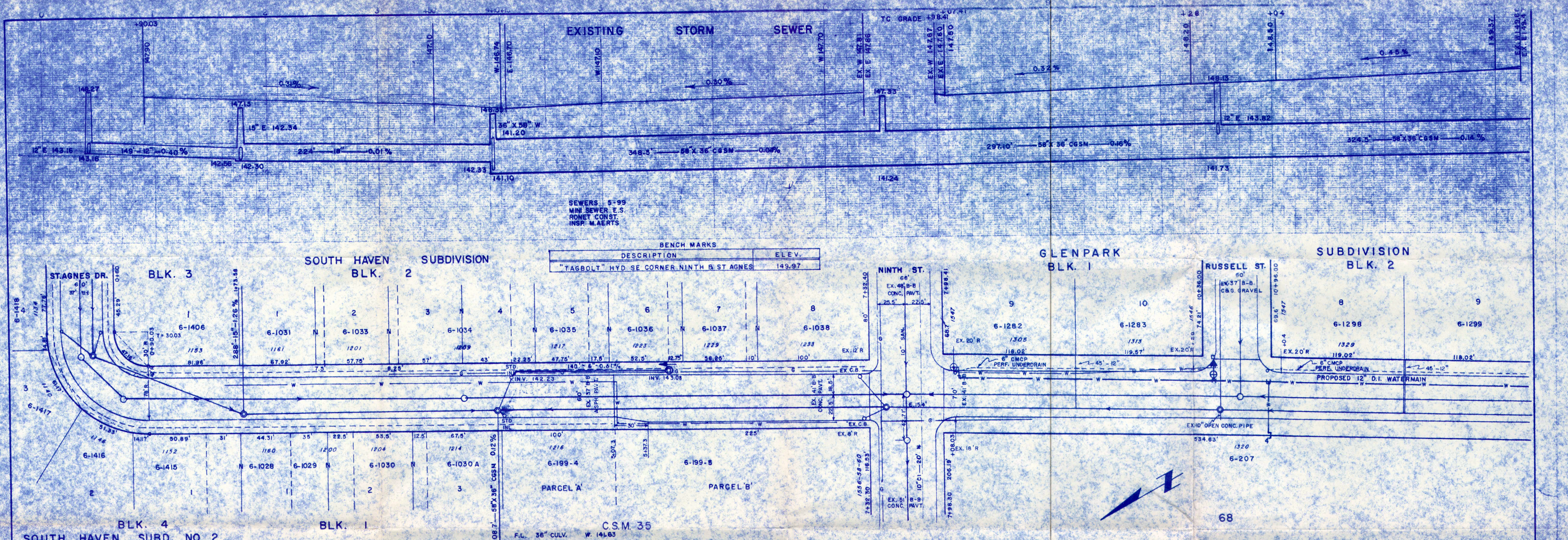
PZ-6 MW-6
 XN=76.0 XN=86.65
 $86.65 - 76.0 = 10.65$
 Ave. Vert. I = $\frac{89.90 - 89.61}{10.65}$ ✓
 = +0.027 ft/ft
 ∴ Downward



Average Vertical Gradient = $\frac{(0.063) + (-0.012) + (0.027)}{3}$
 = +0.026 ft/ft (Downward)

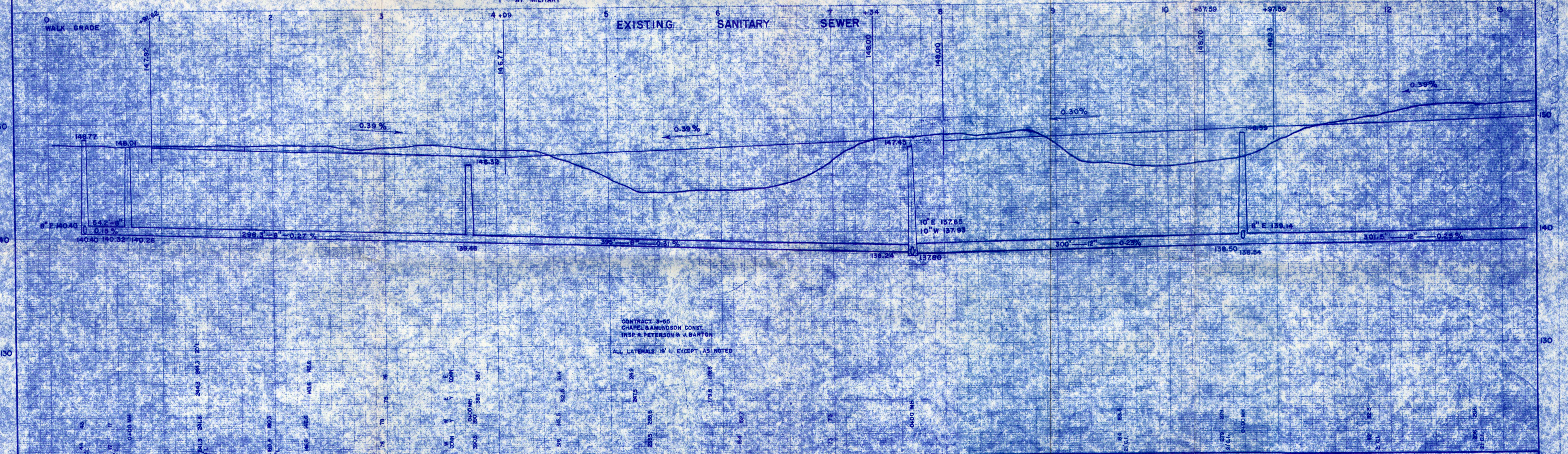
APPENDIX D

City of Green Bay Utility Record Drawing



BENCH MARKS

DESCRIPTION	ELEV.
"TAGBOLT" HYD SE CORNER NINTH & ST AGNES	149.97



<p>SCALE</p> <p>VERT. - 1" = 4'</p> <p>HOR. - 1" = 40'</p>	<p>LEGEND</p> <p>PROPOSED SEWER</p> <p>EXISTING SEWER</p> <p>COMBINED SEWER</p> <p>GAS MAIN</p> <p>WATER MAIN</p>	<p>NOTE BOOKS</p> <p>PAVEMENT 270, 329, 341</p> <p>SIDEWALK 233</p> <p>SANITARY SEWER 170 J, K</p> <p>STORM SEWER 230 J, 1-3, 16</p>	<p>SURVEY</p> <p>CONSTR.</p>	<p>APPROVED</p> <p>CITY ENGINEER</p> <p>MAYOR</p>	<p>CITY OF GREEN BAY, WISCONSIN</p> <p>OFFICE OF THE CITY ENGINEER</p>	<p>ON ST. AGNES DRIVE</p> <p>FROM ST. AGNES TO BIEMERT ST.</p>	<p>SHEET NO.</p> <p>DRAWER NO.</p> <p>FILE NO.</p> <p>DRAWN BY</p>	<p>20</p>
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INT. SHEET NO. 4 02-05-21720A 20010312-37

APPENDIX E

Domenico Equation Calculations

Domenico Equation
One Hour Martinizing - S. Military Ave., Green Bay, WI
Estimate Dissolved PCE Concentration Downgradient of Source
Non-Retarded Flow

Parameter	Value	Units	Description	Source
C(x)		µg/L	Concentration at X feet from Source	Est. PCE at Utility, Downgradient of Source
Co	386	µg/L	Concentration at Source	Highest PCE- most recent sampling round (MW-3)
x	25	feet	Distance Downgradient	Approx. distance from source to utility trench
α _x	2.5	feet	Longitudinal Dispersivity (.1x)	ASTM
α _y	0.833	feet	Transverse Dispersivity (.33α _x)	ASTM
α _z	0.125	feet	Vertical Dispersivity (.05α _x)	ASTM
λ	0.00096	1/day	First Order Degradation Constant	Handbook of Env. Degrad. Rates, P.Howard
S _w	100	feet	Groundwater Source Width	Site Estimate
S _d	10	feet	Groundwater Source Depth	Site Estimate
K	0.0028	ft/day	Hydraulic Conductivity	Site Estimate
I	0.007	ft/ft	Hydraulic Gradient	Site Estimate
θ	0.3	cm ³ -void/cm ³ -soil	Porosity	Site Estimate
v	0.0000653	ft/day	Non-Retarded Flow Velocity (KIθ)	Calculation

Solve for C(x) Where:

$$\frac{C(x)}{C_o} = \exp\left\{\frac{x}{2\alpha_x}\left[1 - \left(1 + 4\frac{\lambda\alpha_x}{v}\right)^{\frac{1}{2}}\right]\right\} \operatorname{erf}\left[\frac{S_w}{4\sqrt{\alpha_y x}}\right] \operatorname{erf}\left[\frac{S_d}{4\sqrt{\alpha_z x}}\right]$$

$$\text{Step 1} = \exp\left\{\frac{x}{2\alpha_x}\left[1 - \left(1 + 4\frac{\lambda\alpha_x}{v}\right)^{\frac{1}{2}}\right]\right\}$$

Solution to Step 1 = 5.75221E-25

$$\text{Step 2} = \left[\frac{S_w}{4\sqrt{\alpha_y x}}\right]$$

Solution to Step 2 = 5.47722575 1.000000000000

erf(Step 2) = 1.000000000

$$\text{Step 3} = \left[\frac{S_d}{4\sqrt{\alpha_z x}}\right]$$

Solution to Step 3 = 1.414213562 0.96002236

erf(Step 3) = 0.96002236

C(x)/Co = 5.52E-25

C(x) = 2.1E-22 µg/L

Calculated by: Paul M. Garvey 2/7/01

Checked by: *JMG* 3/6/01

Domenico Equation
One Hour Martinizing - S. Military Ave., Green Bay, WI
Estimate Dissolved PCE Concentration Downgradient of Source
Non-Retarded Flow

Parameter	Value	Units	Description	Source
C(x)		µg/L	Concentration at X feet from Source	Est. PCE at Utility, Downgradient of Source
Co	386	µg/L	Concentration at Source	Highest PCE- most recent sampling round (MW-3)
x	25	feet	Distance Downgradient	Approx. distance from source to utility trench
α _x	2.5	feet	Longitudinal Dispersivity (.1x)	ASTM
α _y	0.833	feet	Transverse Dispersivity (.33α _x)	ASTM
α _z	0.125	feet	Vertical Dispersivity (.05α _x)	ASTM
λ	0.00096	1/day	First Order Degradation Constant	Handbook of Env. Degrad. Rates, P.Howard
S _w	100	feet	Groundwater Source Width	Site Estimate
S _d	10	feet	Groundwater Source Depth	Site Estimate
K	0.0028	ft/day	Hydraulic Conductivity	Site Estimate
I	0.007	ft/ft	Hydraulic Gradient	Site Estimate
θ	0.3	cm ³ -void/cm ³ -soil	Porosity	Site Estimate
v	0.0000653	ft/day	Non-Retarded Flow Velocity (KIθ)	Calculation

Solve for C(x) Where:

$$\frac{C(x)}{C_o} = \exp\left\{\frac{x}{2\alpha_x}\left[1 - \left(1 + 4\frac{\lambda\alpha_x}{v}\right)^{\frac{1}{2}}\right]\right\} \operatorname{erf}\left[\frac{S_w}{4\sqrt{\alpha_y x}}\right] \operatorname{erf}\left[\frac{S_d}{4\sqrt{\alpha_z x}}\right]$$

$$\text{Step 1} = \exp\left\{\frac{x}{2\alpha_x}\left[1 - \left(1 + 4\frac{\lambda\alpha_x}{v}\right)^{\frac{1}{2}}\right]\right\}$$

Solution to Step 1 = 5.75221E-25

$$\text{Step 2} = \left[\frac{S_w}{4\sqrt{\alpha_y x}}\right]$$

Solution to Step 2 = 5.477225575 1.000000000000

erf(Step 2) = 1.000000000

$$\text{Step 3} = \left[\frac{S_d}{4\sqrt{\alpha_z x}}\right]$$

Solution to Step 3 = 1.414213562 0.96002236

erf(Step 3) = 0.96002236

C(x)/Co = 5.52E-25

C(x) = 2.1E-22 µg/L

Calculated by: Paul M. Garvey 2/7/01

Checked by: *JGZ* 3/6/01

Domenico Equation
One Hour Martinizing - S. Military Ave., Green Bay, WI
Estimate Dissolved PCE Concentration Downgradient of Source
Non-Retarded Flow

Parameter	Value	Units	Description	Source
C(x)		µg/L	Concentration at X feet from Source	Est. PCE at Utility, Downgradient of Source
Co	12,800	µg/L	Concentration at Source	Highest PCE- recorded (MW-1, 6/17/99)
x	25	feet	Distance Downgradient	Approx. distance from source to utility trench
α _x	2.5	feet	Longitudinal Dispersivity (.1x)	ASTM
α _y	0.833	feet	Transverse Dispersivity (.33α _x)	ASTM
α _z	0.125	feet	Vertical Dispersivity (.05α _x)	ASTM
λ	0.000096	1/day	First Order Degradation Constant	Degrad. Rate reduce by E-01 to be conservative
S _w	100	feet	Groundwater Source Width	Site Estimate
S _d	10	feet	Groundwater Source Depth	Site Estimate
K	0.0028	ft/day	Hydraulic Conductivity	Site Estimate
I	0.007	ft/ft	Hydraulic Gradient	Site Estimate
θ	0.3	cm ³ -void/cm ³ -soil	Porosity	Site Estimate
v	0.0000653	ft/day	Non-Retarded Flow Velocity (KIθ)	Calculation

Solve for C(x) Where:

$$\frac{C(x)}{C_o} = \exp\left\{\frac{x}{2\alpha_x}\left[1 - \left(1 + 4\frac{\lambda\alpha_x}{v}\right)^{\frac{1}{2}}\right]\right\} \operatorname{erf}\left[\frac{S_w}{4\sqrt{\alpha_y x}}\right] \operatorname{erf}\left[\frac{S_d}{4\sqrt{\alpha_z x}}\right]$$

$$\text{Step 1} = \exp\left\{\frac{x}{2\alpha_x}\left[1 - \left(1 + 4\frac{\lambda\alpha_x}{v}\right)^{\frac{1}{2}}\right]\right\}$$

Solution to Step 1 = 3.70746E-07

$$\text{Step 2} = \left[\frac{S_w}{4\sqrt{\alpha_y x}}\right]$$

Solution to Step 2 = 5.477225575 1.000000000000

erf(Step 2) = 1.000000000

$$\text{Step 3} = \left[\frac{S_d}{4\sqrt{\alpha_z x}}\right]$$

Solution to Step 3 = 1.414213562 0.96002236

erf(Step 3) = 0.96002236

C(x)/Co = 3.56E-07

C(x) = 4.6E-03 µg/L

Calculated by: Paul M. Garvey 2/7/01

Checked by: *JEG* 3/6/01