

RAC V

RESPONSE ACTION CONTRACT FOR

Remedial, Enforcement Oversight, and
Non-Time Critical Removal Activities at Sites of Release
or Threatened Release of Hazardous Substance in Region V

Long-Term Remedial Action Report **N.W. Mauthe Long-Term Response Action** WA 007-RARA-056G, Contract No. 68-W6-0025

November 1998

PREPARED FOR

U.S. Environmental Protection Agency



PREPARED BY

CH2M HILL

Ecology and Environment, Inc.

TN & Associates, Inc.

Tucker, Young, Jackson, Tull, Inc.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

November 30, 1998

REPLY TO THE ATTENTION OF:

VIA FIRST CLASS MAIL

Kristin Nell
Wisconsin DNR
P.O. Box 10448
Green Bay, Wisconsin 54307-0448

RECEIVED
DEC 03 1998
LMD SOLID WASTE

**Re: N.W. Mauthe Site in Appleton, WI
Transmission of Final LTRA Report**

Dear Kristin:

I enclose a copy of the Long Term Remedial Action Report for the N.W. Mauthe Site which I just approved. The report contains among other things a cost summary and performance evaluation for the treatment system at the Mauthe Site that I thought you might find useful.

Sincerely,

A handwritten signature in cursive script that reads "Jon Peterson".

Jon Peterson, RPM
Section 6

RECEIVED

DEC 03 1998

LMD SOLID WASTE

Long-Term Remedial Action Report

for the
N.W. Mauthe Site
Appleton, Wisconsin

WA No. 007-RARA-056G

Contract No. 68-W6-0025

November 1998

CH2MHILL

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Introduction

Objectives of the LTRA

This Long-Term Response Action (LTRA) Report describes the activities that CH2M HILL performed during the implementation of the LTRA at the N.W. Mauthe Site in Appleton, Wisconsin, from January 1997 through September 1998. The primary objectives of the LTRA were identified as follows:

- Operate and maintain the groundwater collection trenches and building foundation drainage systems to capture and prevent the further migration of contaminated groundwater
- Measure groundwater elevations in the groundwater monitoring wells to verify hydraulic capture of the contaminant plume
- Sample and analyze groundwater samples from monitoring wells to track the trends of contamination concentrations, and monitor the progress of groundwater cleanup
- Operate and maintain the groundwater treatment system to consistently meet the POTW discharge permit requirements
- Sample and analyze the influent and effluent from the groundwater treatment facility to monitor process performance and check compliance with the City of Appleton Industrial User Pretreatment Permit

The LTRA activities meeting these objectives are described in this report. Selected detailed supporting data are provided in the appendixes.

Site History

The N.W. Mauthe Site is a former electroplating facility located at 725 South Outagamie Street in Appleton, Wisconsin. Norbert W. Mauthe was the owner of Wisconsin Chromium Corporation (WC) from its inception in 1946 until 1976. In 1960, WC moved from 1522 West Melvin Street to the site at 725 South Outagamie Street and engaged in hard chrome plating until 1976.

In 1976, Mr. Mauthe sold WC to Southern Plating and Machine Company, and chrome plating ceased. Electroplating of zinc, cadmium, and possibly copper and silver was conducted at an adjacent building on the same property from 1978 until 1987 under the name N.W. Mauthe Company.

Under contract to the Wisconsin Department of Natural Resources (WDNR), CH2M HILL conducted a Remedial Investigation and Feasibility Study (RI/FS) at the site beginning in November 1991. These investigations revealed that the site was contaminated with zinc, cadmium, chromium, and cyanide. Organic compounds including volatile organic

compounds (VOCs) such as 1,1,1-trichloroethane, trichloroethene, acetone, and other chlorinated hydrocarbons were also identified.

Based on the RI/FS, site-specific remedial objectives were identified as follows:

- To prevent the ingestion of groundwater containing contaminants in excess of maximum contaminant levels (MCLs) as provided in rules at 40 CFR 141.61, a total excess cancer risk of greater than 1×10^{-4} to 1×10^{-6} , or a hazard index (HI) that exceeds 1 (USEPA 1989)
- To prevent direct contact with groundwater containing contaminants with an excess lifetime cancer risk greater than 1×10^{-4} to 1×10^{-6} or a HI greater than 1 (USEPA 1989)
- To prevent release of groundwater contaminants to the Fox River at concentrations that would cause surface water criteria specified for a public water supply and for protection of aquatic life to be exceeded (Wisconsin Administrative Code NR 105)
- To remove contaminants from groundwater such that concentrations are less than the specified preventive action limits (PALs) in the Wisconsin Administrative Code NR 140

In March of 1994, a Record of Decision (ROD) was signed by the WDNR and the U.S. Environmental Protection Agency (USEPA). Following signing of the ROD, the State of Wisconsin turned the project over to the USEPA to prepare the Remedial Design (RD) and conduct the Remedial Action (RA). The USEPA awarded the RD contract to CH2M HILL on May 12, 1994, under the Alternative Remedial Contracting Strategy (ARCS) contract.

The USEPA determined that the RD/RA should be delivered in two phases. Phase I involved the excavation of contaminated soils and installation of the groundwater collection trenches. Phase II involved the construction of the groundwater treatment system. The Phase I RD was completed in March 1995 and Phase II RA was completed in June 1997.

Following the substantial completion of Phases I and II in January 1997, CH2M HILL began implementing the LTRA at the N.W. Mauth Site. The LTRA is the implementation phase of the site remedial action; i.e., operation and maintenance and performance monitoring of the groundwater collection and treatment systems at the site.

At the expiration of the work assignment (WA) under the ARCS contract, the USEPA awarded the WA for the LTRA to CH2M HILL in May 1997 as WA 007-RARA-056G. The USEPA approved the Work Plan for the LTRA on July 28, 1997. Operation of the groundwater extraction and treatment system was transferred to this LTRA WA at the start of August 1997.

Organization of the Report

This LTRA Report is organized according to the objectives of the LTRA.

- Section 1 describes the objectives of the LTRA and provides a summary of background information on site history.
- Section 2 addresses the groundwater collection and monitoring actions executed during the LTRA.

- Section 3 addresses groundwater treatment and discharge to the POTW.
- Section 4 summarizes the key conclusions of the LTRA activities.
- Section 5 summarizes recommendations for continued LTRA activities.

Sections 2 and 3 describe how the LTRA objectives were met. Detailed supporting documentation of LTRA performance reporting, relevant correspondence, a summary of LTRA O&M costs, and the certification of operational and functional status of the groundwater treatment facility are included in appendixes.

Groundwater Collection and Monitoring

As part of the LTRA, CH2M HILL conducted quarterly groundwater field sampling activities for the N.W. Mauthe site. Groundwater data were collected from monitoring wells in February, May, September, and December of 1997, and March and June of 1998.

The groundwater monitoring well network consists of 11 wells W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107, and MW-108, as shown in Figure 1. The field sampling program was designed to monitor the effectiveness of the groundwater collection systems in meeting the requirements of the LTRA and ROD.

The specific objectives of the LTRA groundwater collection and monitoring program were to:

- Provide groundwater elevation data to evaluate the hydraulic controls or capture of contaminated groundwater within the aquifer
- Provide analytical data to evaluate reduction of groundwater contaminant concentrations in the aquifer onsite in relation to the specified cleanup criteria
- Provide a trigger for the consideration and possible implementation of additional or corrective measures as contingency actions if it is determined that the collection system is not effective

These objectives were addressed in the actions described below. Groundwater collection at N. W. Mauthe achieves complete hydraulic capture of the contaminated groundwater. Overall, contaminant concentrations are tending to decrease or remain stable, while metals concentrations in the immediate vicinity of the source area are showing recent increasing trends.

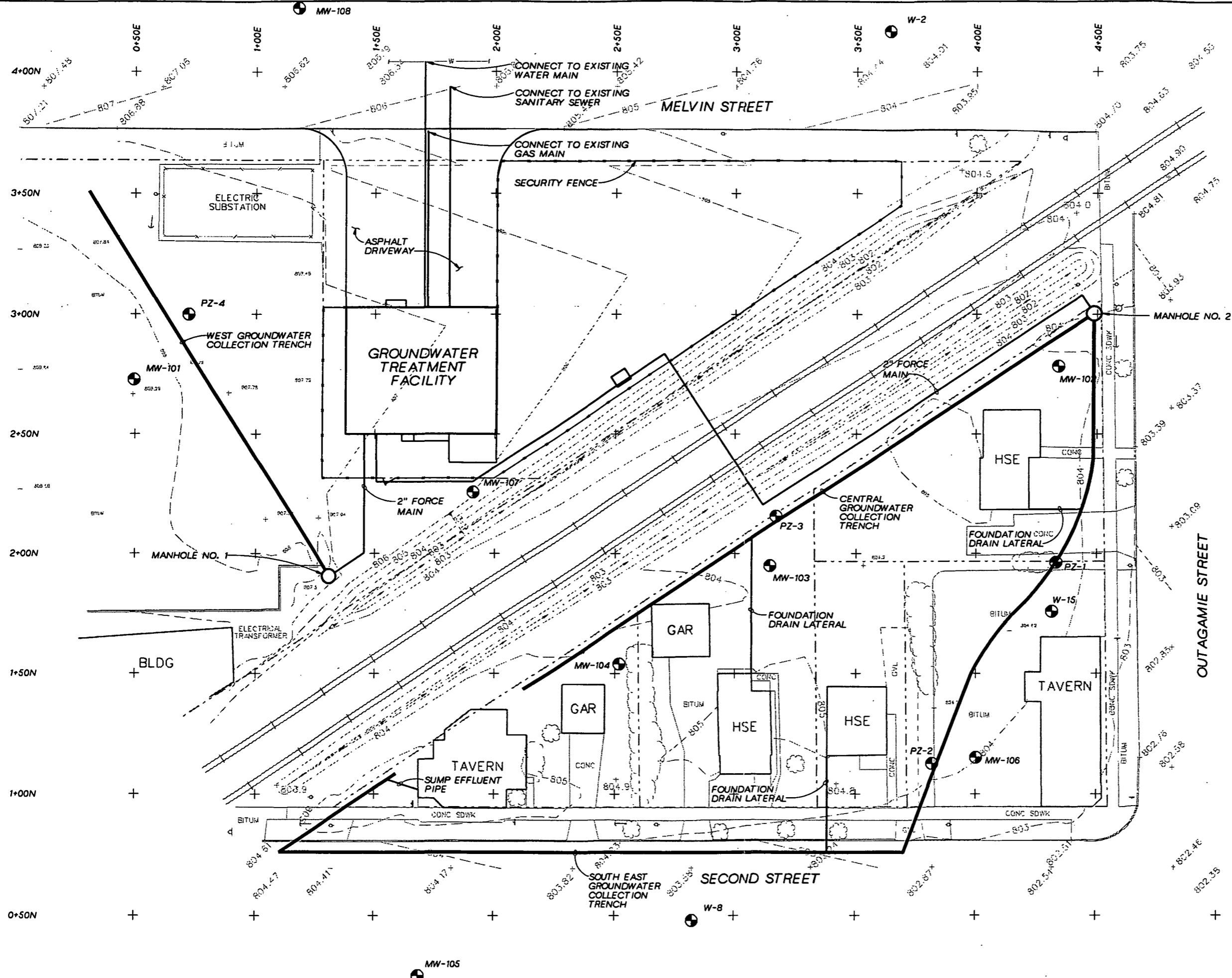
Groundwater Collection

The groundwater collection system consists of deep collection trenches and small building foundation drains. The foundation drains are connected to the collection trench drain pipe to provide a positive drain system for the local buildings generally southeast of the site.

Groundwater Collection Trenches

Groundwater is collected with a system of collection trenches as shown on Figure 1. The collection trenches were installed during Phase I of the RA. The collection trenches are approximately 30 feet deep and equipped with 4-inch-diameter drain pipes. The trenches drain groundwater to two deep manholes, each equipped with pumps that lift the collected groundwater to the groundwater treatment system.

The collection trenches act as groundwater interceptors. Groundwater elevation measurements collected from the monitoring well network (described below) during the LTRA demonstrate that the collection trenches are capturing contaminated groundwater.



LEGEND

- T — OVERHEAD TELEPHONE
- G — GAS MAIN
- P — OVERHEAD POWER
- W — WATER MAIN
- SAN — SANITARY SEWER
- STM — STORM SEWER
- FENCE
- - - - - APPROXIMATE PROPERTY LINE
- UTILITY POLE
- TREE
- SHRUB LINE
- + 804.0 SPOT ELEVATION
- - - - - CONTOUR LINE
- CONC CONCRETE PAVEMENT
- BITUM BITUMINOUS PAVEMENT
- HSE HOUSE
- GAR GARAGE
- ⊕ MONITORING WELL
- COLLECTION TRENCH

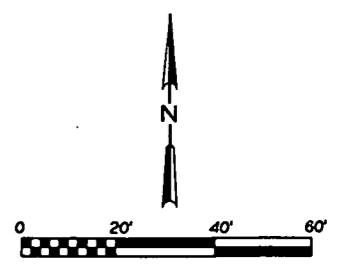


FIGURE 1
COLLECTION TRENCH AND
MONITORING WELL LOCATIONS
N.W. MAUTHE SITE
CH2MHILL

The trenches capture groundwater from the former source area and groundwater from the offsite properties southeast of the source area. The groundwater contour maps showing the hydraulic capture of the trench collection system are provided in Appendix A, *Groundwater Data Evaluation/Cleanup Status Report*.

A summary of the groundwater elevations measured at the site is presented in Table 1.

TABLE 1
Groundwater Monitoring Well Specifications and Water Levels
N.W. Mauthe Site

Well ID	TOC Elev. (ft)	Surface Elev. (ft)	Screen Interval (ft)	Total Depth from TOC (ft)	Water Elev. 2/97	Water Elev. 5/97	Water Elev. 9/97	Water Elev. 12/97	Water Elev. 3/98	Water Elev. 6/98
W-2	804.66	805.00	10	15	798.66	801.01	800.28	797.69	802.08	799.38
W-8	803.36	803.80	10	15	797.22	797.66	798.01	796.52	798.16	797.31
W-15	803.76	804.02	10	15	793.97	796.92	797.23	795.52	796.78	796.32
MW-101	807.59	808.23	20	28	797.16	799.99	798.67	798.21	801.43	800.48
MW-102	804.45	804.68	20	28	780.72	780.89	780.79	780.95	780.47	780.72
MW-103	803.74	804.23	20	27	795.29	791.83	789.60	787.78	791.03	789.13
MW-104	807.28	804.42	20	26	792.94	789.91	798.59	795.70	799.46	796.60
MW-105	803.96	804.37	10	16	793.74	800.60	800.37	799.03	800.08	800.50
MW-106	804.08	803.83	10	16	794.75	797.23	796.91	795.48	797.37	796.76
MW-107	809.01	806.47	20	31	788.23	796.60	797.64	796.49	796.68	796.31
MW-108	806.61	806.99	20	28	798.36	793.32	790.53	788.65	795.59	789.30

Groundwater elevations at the site varied seasonally with the highest elevations in summer and the lowest elevations in winter (see Appendix A for elevation trend plots). This general trend is expected to represent the normal seasonal trend in the water table, peaking at the end of summer and declining to the minimum in late winter.

Building Foundation Drainage Systems

Three homes south of the facility have foundation drain systems that are connected to the groundwater collection system via gravity piping (801 South Outagamie Street, 1414 West 2nd Street, and 1410 West 2nd Street). This piping includes check valves to prevent backup of groundwater into the foundation drain systems.

Primary responsibility for these systems belongs to the residents. However, the homeowners would be notified if the groundwater treatment system was down for an extended period of time and the groundwater elevation in the trenches rose to within 5 feet of ground surface. Notification of the homeowners was not required during the implementation of the LTRA, as described within this report.

Groundwater Monitoring

The analytical data from the groundwater monitoring program were presented in the *Groundwater Data Evaluation/Cleanup Status Report* to evaluate the effectiveness of the remedial design (see Appendix A). A summary of these data is presented below. More details are provided in Appendix A.

Analytical results for each sampling event at each well are presented in Appendix A. Data from the most recent sampling event in June 1998 are presented in Table 2.

Groundwater background conditions are represented by two upgradient monitoring wells: W-2 and MW-108. Quarterly data collected at these wells since February 1997 were averaged and these averages were used as background concentrations for the site. Results reported as less than the detection limit were used in the background calculations with an assigned value of one-half the detection limit.

Water Quality Parameters

Water quality parameter field measurements for pH, conductivity, and temperature are summarized in Appendix A. These general water quality parameters are stable except for temperature, which shows seasonal fluctuations.

Metals and Cyanide

Metals have historically been the constituents of concern at the N. W. Mauthe Site because of the releases from past operations. Since quarterly groundwater monitoring began in February 1997, concentrations of chromium, manganese, cadmium, and lead in groundwater samples are above the Wisconsin groundwater standards.

Metals data from the most recent groundwater sampling event in June 1998 indicate:

- Enforcement Standard (ES) exceedances of chromium at MW-104 and MW-107. These wells are located within or directly downgradient of the former source area. They are within the hydraulic capture zone of the collection trench system.
- Preventative Action Limit (PAL) exceedances of chromium at MW-103 and MW-101. These wells are located sidegradient/downgradient from the source area. They are within the hydraulic capture zone of the collection trench system.
- ES exceedances of manganese at MW-101 and MW-103. Manganese at these locations is attributed to naturally occurring conditions. The background concentration for manganese is 274 µg/L, which is above the state ES concentration. Because groundwater samples are collected from bailers and are not filtered, the samples may be biased high as a result of suspended solids.

The groundwater monitoring data collected since February 1997 indicate that concentrations of metals are decreasing or stable at downgradient monitoring well locations and east of the former facility (see Appendix A). Metals concentrations were observed to be decreasing at MW-101 until the last round of sampling when increases were observed. Future results from this well will confirm whether the long-term trend is increasing or decreasing at this

TABLE 2
Groundwater Analytical Results for June 1998
N.W. Mauthe Site

Parameter	W-2 ⁶ 6/10/98	W-8 6/10/98	W-15 6/10/98	MW-101 6/10/98	MW-102 6/10/98	MW-103 6/10/98	MW-104 6/10/98	MW-105 6/10/98	MW-106 6/10/98	MW-107 6/10/98	MW-108 ⁶ 6/10/98	WDNR ES ¹ (µg/L)	WDNR PAL ¹ (µg/L)	Fed. MCL ² (µg/L)	Background Conc. ⁴
TOTAL METALS (µg/L)															
Chromium	16.4 ⁶ =	9.9 =	10 =	48.2 =	3.9 U	57.6 =	219 =	13.7 =	3.9 U	6240 =	28.4 ⁶ =	100	10	100	14
Copper	18.6 B	12.6 B	13.2 B	46.8 =	9.8 U	27.5 =	9.8 U	15.3 B	10.2 B	13.8 B	25.5 =	1300	130	100 ⁵	13
Manganese	466 ⁶ =	264 =	147 =	604 =	318 =	417 =	107 =	217 =	10 =	161 =	478 ⁶ =	50	25	50 ⁵	274
Zinc	40.8 *	21.6 *	18.8 *	75.9 *	9.5 *	33.7 *	12.8 *	22.1 *	10.9 *	17.3 *	40.5 *	5000	2500	5000 ⁵	28
Cadmium	0.31 J	0.54 J	0.11 J	0.27 J	0.04 J	0.15 J	0.04 UJ	0.048 J	0.04 UJ	0.11 J	0.14 J	5	0.5	5	0.17
Mercury	0.027 J	0.016 UJ	0.016 UJ	0.044 J	0.018 J	0.02 J	0.016 UJ	0.016 UJ	0.016 UJ	0.027 J	0.021 J	2	0.2	2	0.04
Cyanide	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	200	40	200	NA
VOA (µg/L)															
1,1,1-Trichloroethane	40 U	40 U	40 U	40 UJ	40 U	40 U	2 J	40 U	40 U	340 JD	40 U	200	40	200	NA
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4 J	0.5 U	5	0.5	5	NA
1,1-Dichloroethane	85 U	85 U	85 U	85 UJ	85 U	85 U	85 U	85 U	85 U	59 JD	85 U	850	85	NA	NA
1,1-Dichloroethene	0.7 U	0.7 U	0.7 U	0.7 UJ	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	58 D	0.7 U	7	0.7	7	NA
Benzene	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	12 U	0.5 U	5	0.5	5	NA
Chloroform	0.6 U	0.6 U	0.6 U	0.6 UJ	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	15 U	0.6 U	6	0.6	NA	NA
Toluene	68 U	68 U	68 U	68 UJ	68 U	68 U	68 U	68 U	68 U	68 J	68 U	343	68.6	1000	NA
Total 1,2-Dichloroethene	7 U	7 U	7 U	7 UJ	7 U	7 U	7 U	7 U	7 U	3 UJ	7 U	70/100 ³	7/20 ³	70/100 ³	NA
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	390 D	0.5 U	5	0.5	5	NA
Xylenes, Total	120 U	120 U	120 U	120 UJ	120 U	120 U	120 U	120 U	120 U	3100 U	120 U	620	124	10000	NA

Highlighted results are above WDNR PAL (NR 140) and background concentrations.

¹Wis. Adm. Code NR 140.10.

²40 CFR 141.61 and 141.62.

³cis-1,2-dichloroethene/trans-1,2-dichloroethene.

⁴Calculated for results from February 1997 to June 1998 for W2 and W-108 (upgradient of site).

⁵Secondary MCLs.

⁶Background well.

NA - Not available.

NT - Not tested.

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"B": Compound was found in blank and in the sample.

"D": Diluted.

"DJ": Diluted and estimated.

***: Laboratory duplicate not within control limits.

location. Concentrations are tending to increase at MW-107 and MW-104, which are located within or downgradient from the source area.

Volatile Organic Compounds

VOCs have been detected in groundwater at the former facility. Since quarterly monitoring began in February 1997, trichloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethene, and chloroform in groundwater samples have been detected above Wisconsin groundwater standards at MW-101, MW-104, MW-106, and MW-107.

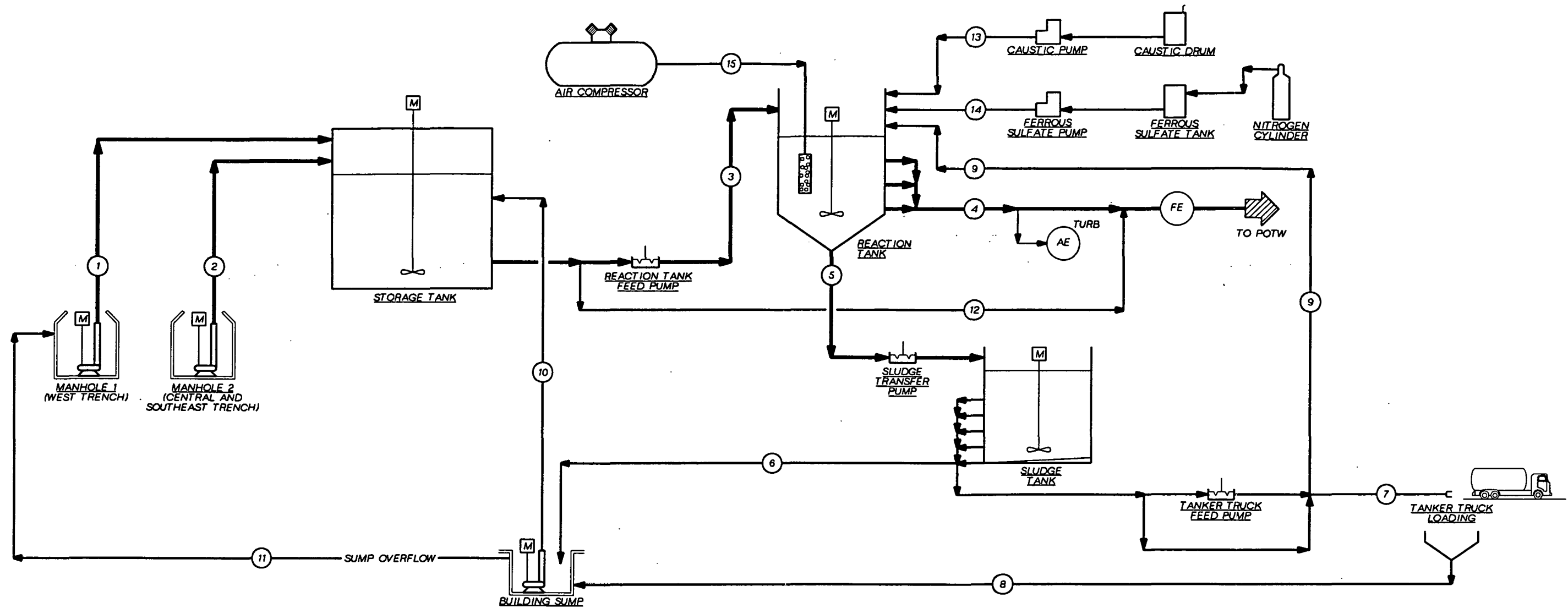
During the most recent sampling round in June 1998, these same VOCs (with the exception of chloroform) were also detected above standards only at MW-107. Well MW-107 is located within the source area of the former facility. Over the 1997 - 98 period of monitoring, the concentrations of VOCs are showing an overall decreasing trend at MW-107.

Recommendations for Groundwater Collection and Monitoring

In summary, data collected since February 1997 indicate that capture of affected groundwater is occurring at the site. Concentrations of metals and VOCs are generally decreasing or stable except at source areas or at areas formerly downgradient of the facility. The current groundwater monitoring well network provides both hydraulic and chemical monitoring of the site.

Recommendations for site and performance groundwater monitoring consist of the following:

- Continued operation of the groundwater collection trench to obtain hydraulic containment
- Continued groundwater monitoring, but reduction from quarterly to semiannual monitoring based on the generally stable to decreasing concentrations
- Removal of copper, zinc, mercury, and cyanide from the sampling requirements because these parameters were below State standards at all monitoring points during the six quarters of sampling
- Calculation of alternative concentration levels for manganese and chromium at the background wells when sufficient rounds of data are available



MAUTHE GROUNDWATER TREATMENT SYSTEM MASS BALANCE SUMMARY

ID	TYPE	FLOW/VOLUME				INSTANTANEOUS FLOW			TSS, mg/L	
		PH	UNIT	AVG	MAX	UNIT	AVG	MAX	AVG	MAX
1	MANHOLE 1 EFFLUENT	6.0 - 8.0	GPD	1,300	1,300	GPM	43	43	5	30
2	MANHOLE 2 EFFLUENT	6.0 - 8.0	GPD	1,300	1,300	GPM	43	43	5	30
3	REACTION TANK INFLUENT	6.0 - 8.0	GPD	2,600	10,400	GPM	86	86	5	2000
4	REACTION TANK EFFLUENT	6.0 - 10.0	GPD	2,600	10,400	GPM	43	43	5	30
5	SLUDGE TANK INFLUENT	6.0 - 10.0	GAL/MON	500	1,500	GPM	4	12	1% SOLIDS	2% SOLIDS
6	SLUDGE TANK DECANT	6.0 - 10.0	GAL/MON	250	750	GPM	10	70	20	500
7	TANKER TRUCK INFLUENT	6.0 - 10.0	GAL/6 MON	1,500	4,000	GPM	10	70	2% SOLIDS	10% SOLIDS
8	TANKER TRUCK OVERFLOW	6.0 - 10.0	GAL/6 MON	-	4,000	GPM	-	30	2% SOLIDS	10% SOLIDS
9	SLUDGE RETURN	6.0 - 10.0	GAL/MON	-	1,050	GPM	-	35	2% SOLIDS	2% SOLIDS
10	BUILDING SUMP EFFLUENT	6.0 - 10.0	GPD	-	10,400	GPM	86	86	20	1% SOLIDS
11	BUILDING SUMP OVERFLOW	6.0 - 10.0	GPD	-	10,400	GPM	170	170	20	1% SOLIDS
12	STORAGE TANK BYPASS TO SEWER	6.0 - 8.0	GPD	10,000	10,000	GPM	170	170	5	30
13	SODIUM HYDROXIDE ADDITION (50%)	-	ml/D	260	950	ml/MIN	50	200	-	-
14	FERROUS SULFATE HEPTAHYDRATE ADDITION (25%)	-	ml/D	500	3,600	ml/MIN	50	300	-	-
15	REACTION TANK AERATION	-	SCFM	2	5	-	-	-	-	-

NOTE: TEMPERATURES ARE EXPECTED TO RANGE FROM 50 TO 70 DEGREES F BASED ON INFLUENT TEMPERATURE.

FIGURE 2
PROCESS FLOW DIAGRAM
N.W.MAUTHE SITE
APPLETON, WISCONSIN

Treatment System Performance Monitoring

Groundwater Treatment System Description

The groundwater treatment system is designed to control the concentration of total chromium. The system operates in batch mode, treating 2,600 gallons per batch. Two chemical processes are used to treat chromium: (1) the reduction of hexavalent chromium to trivalent chromium using ferrous sulfate and (2) the co-precipitation of the chromium with other metals using sodium hydroxide. The chromium is removed by settling the hydroxide precipitate and collecting the metal hydroxide sludge.

The groundwater treatment system uses a large storage tank (9,000-gallon) as a buffer volume to receive groundwater pumped from the collection trenches. Water to be treated is pumped to a batch reaction tank where the process chemicals are added and the metal hydroxide sludge is allowed to settle. The sludge is pumped to a storage tank where it is allowed to thicken by gravity. Supernatant is decanted and returned to the storage tank, and sludge is periodically pumped into tanker trucks for disposal.

As of October 1998, there has been a very small amount of metal hydroxide sludge generated (less than 0.5 foot in the sludge storage tank). Therefore, no sludge disposal has been required. Because there has been no sludge disposal, the generated sludge has not been tested for RCRA hazardous characteristics. In accordance with the operating procedures, a RCRA Toxicity Characteristic Leaching Procedure (TCLP) analysis of the sludge and a percent solids analysis will be required before transportation and disposal of the sludge to determine the appropriate sludge management methods.

The schematic of the groundwater treatment process is shown on Figure 2.

Treatment System Startup

CH2M HILL started the groundwater treatment system on January 14, 1997. During the startup period, the reaction tank mixer required repair, and a process flow meter required replacement. Both repairs caused brief process shutdowns and were typical of the events expected during a system startup. The *Groundwater Treatment System Startup Report* was prepared by CH2M HILL and submitted to the USEPA on March 4, 1997. Requirements for sampling, monitoring, and reporting during the startup period were described and analytical results were discussed.

The treatment system achieved steady operations on February 20, 1997. The system began full-time continuous operation on February 24, 1997. From February through July, CH2M HILL operated the system for USEPA under an ARCS Remedial Action WA using Midwest Contract Operations, Inc. (MCO) as the operations subcontractor. In July 1997, CH2M HILL was tasked to continue the operations without interruption under a new RAC LTRA WA. From August 1997 through early October 1998, CH2M HILL continued to use

MCO as the operations subcontractor for the LTRA. The responsibility for system operation was transferred from USEPA to WDNR in October 1998.

Operation and Maintenance Manual

During the startup period, CH2M HILL developed an Operation and Maintenance (O&M) Manual. The *Final Groundwater Treatment System O&M Report* was submitted to the USEPA on April 29, 1997. The manual provided an overview of the treatment system, the pretreatment goals, and functions of the process equipment. Startup and shutdown procedures were described along with requirements for system sampling, monitoring, and reporting. A summary of these requirements is provided below.

Routine Permit Monitoring and Reporting Requirements

The City of Appleton POTW Industrial User Permit (Permit No. 97-21) requires monitoring of the treatment system effluent to verify compliance. The POTW has designated the groundwater treatment system discharge as Outfall 001. Outfall 001 enters the City sewer at Manhole 30-14 on Melvin Street, between the intersections of Douglas Street and Outagamie Street. The permit monitoring requirements and discharge limits are shown in Table 3. A copy of the industrial user permit is included in Appendix B. The permit monitoring requirements and discharge limits are shown in Table 3.

TABLE 3
Outfall 001 Discharge Permit Monitoring Requirements
N.W. Mauthe Site

Sample Parameter	Frequency	Limits
Flow (gpd)	During Discharge	NA
pH	During Discharge	5.0-12.4
Chromium, Total (mg/L)	1/quarter	7.0
Chromium, Hexavalent (mg/L)	During Discharge	4.5
Aluminum, Total (mg/L)	1/year	70.0
Arsenic, Total (mg/L)	1/year	1.0
Cadmium, Total (mg/L)	1/year	0.3
Chromium, Total (mg/L)	1/year	7.0
Chromium, Hexavalent (mg/L)	1/year	4.5
Copper, Total (mg/L)	1/year	3.5
Cyanide, Total (mg/L)	1/year	1.0
Lead, Total (mg/L)	1/year	2.0
Mercury, Total (µg/L)	1/year	2.0
Nickel, Total (mg/L)	1/year	2.0
Zinc, Total (mg/L)	1/year	10.0

NA – Not Applicable, No Limit.

Monthly Discharge Monitoring Reports

The POTW discharge permit requires a monthly submittal of the total flow and the minimum, maximum, and average pH values for each discharge event. The monthly reporting began for the reporting period of February 1997 (partial month), and concluded with the reporting period of September 1998. The monthly reports were submitted on the 15th of the month following the reporting period; e.g., the May 1998 report would be submitted by June 15. Beginning with the October 1998 reporting period, the WDNR is responsible for the monthly reporting to the POTW.

Copies of these monthly reports are provided in Appendix C. (Appendix C has only one representative copy of a cover letter to show the typical format of the letter. For economy, the other cover letters are not included in the appendix.)

The monthly total volume of treated groundwater is summarized below in Table 4 based on information from the monthly reports.

Biannual Discharge Monitoring Reports

CH2M HILL provided the City of Appleton three biannual reports to document the permit-required daily, quarterly, and yearly discharge monitoring results for the Groundwater Treatment System from January 1, 1997, through June 30, 1998. CH2M HILL submitted three biannual reports, covering the following periods:

- January 1 through June 30, 1997
- July 1 through December 31, 1997
- January 1 through June 30, 1998

These biannual reports, which summarize some of the information found in the Monthly Reports, are included as Appendix D.

A summary of the reported annual discharge concentrations and discharge limits is shown below in Table 5. As shown in this table, the discharges from the Groundwater Treatment System have consistently met the required discharge limits. During the entire period of LTRA operations under this RAC WA (from February 1997 through September 1998), there were no violations of the POTW discharge permit limits, even during an emergency system operations shutdown which required short-term bypass of the treatment system (described below).

TABLE 4
Monthly Effluent Discharges
N.W. Mauthe Site

Date	Discharge (gallons)
Feb-97	22,175
Mar-97	107,596
Apr-97	88,280
May-97	88,012
Jun-97	76,196
Jul-97	78,387
Aug-97	28,157
Sep-97	76,062
Oct-97	28,286
Nov-97	16,177
Dec-97	15,917
Jan-98	19,056
Feb-98	63,294
Mar-98	102,918
Apr-98	167,240
May-98	56,332
Jun-98	68,380
Jul-98	49,144
Aug-98	28,033
Sep-98	34,578

TABLE 5
Effluent Concentrations from Yearly and Quarterly Sampling
N.W. Mauthe Site

Date	Total Chromium	Hexavalent Chromium	Zinc	Cadmium	Cyanide
Permit Limit:	7,000	4,500	10,000	300	1,000
2/20/97	40	< 10	5.1	< 0.50	< 0.010
5/27/97	260	NA	NA	NA	NA
9/11/97	557	NA	NA	NA	NA
12/12/97	279	NA	NA	NA	NA
3/24/98	63.7	100	4.6	< 0.04	< 1.7
6/10/98	78.4	NA	NA	NA	NA

Units are in µg/L.

NA = Not analyzed during quarterly monitoring events.

Routine Operations and Maintenance Activities

In addition to the required discharge monitoring, routine inspections and monitoring efforts are performed daily or weekly to assess treatment system operation. The inspection and monitoring details are included in the *Final Groundwater Treatment System O&M Report*.

Log sheet forms used to record normal operations of the plant are provided in Appendix E. Completed operations log sheets are kept on file at the Groundwater Treatment Facility.

Equipment Maintenance

The manufacturers' O&M manuals were used to develop a maintenance schedule summary covering each piece of equipment. The maintenance schedule summary was developed by Midwest Contracting Operations, Inc., and is included in Appendix F.

A copy of the equipment manufacturers' O&M manuals is maintained at the Groundwater Treatment Facility. The maintenance schedule summary is also maintained at the treatment facility to plan maintenance activities.

O & M Cost Summary

A summary of the O & M cost history from August 1997 through October 1998 is presented in Appendix H. As shown in the summary information, the average cost of O & M over this period (excluding September and October 1998, which are not representative months) is about \$4,900 per month, excluding administrative costs.

The monthly administrative costs were estimated assuming a level of effort of 12 hours per month and a labor rate of \$75 per hour for \$900 per month plus expenses of \$50 per month for reprographics, computers, materials, and postage. Administrative costs cover the effort required for monthly, quarterly, and biannual reporting and data management. The overall

cost of O & M is about \$5,900 per month including estimated administrative costs.

The O & M costs from August 1997 through August 1998 (excluding administrative costs) ranged from about \$3,500 to \$7,600 per month with routine monitoring causing the largest variation in month-to-month costs. Labor and analytical costs accounted for about 87 percent of the O & M total. Labor was about 66 percent of the total, and analytical (for routine monitoring) was about 19 percent of the total.

Emergency Operation Shutdown Incident

The groundwater treatment system experienced one failure incident in 1997 which required the short-term discharge of untreated groundwater under controlled conditions. Because this incident was unique and caused adoption of some operational changes, it is described in detail.

In August 1997, the groundwater treatment plant was temporarily shut down because of a failed automatic flow control valve on the discharge pipe of the reaction tank. When the valve was removed for repair, the electronic signal from the valve to the PLC caused a software system failure, which shut down the automatic control system for the treatment facility.

Under routine conditions of groundwater collection, a short temporary shutdown of the system would have been acceptable in terms of the remedial objectives. However, the need for emergency action was created because of a combination of factors:

- The time required to repair the valve was estimated to be several days
- The unusually high water conditions in the groundwater collection trenches caused by recent rain events required continued groundwater pumping

The high water levels threatened to cause backflow of possibly contaminated groundwater into residential basements which had been recently cleaned as part of the remedial action.

CH2M HILL identified two options to temporarily resolve the problem until the control valve could be repaired: (1) operate the entire treatment system manually, or (2) directly discharge the contents of the storage tank without treatment, provided that the water in the tank did not exceed the City of Appleton POTW discharge permit limits.

Manual operation of the treatment plant was considered impractical and very labor intensive. The influent chromium concentrations had been below the discharge permit limits. Therefore, it was determined that the most cost-effective solution would be to coordinate with the Appleton POTW and directly discharge the groundwater from the storage tank to the POTW without treatment. CH2M HILL contacted Jessica Garratt, the Pretreatment Coordinator at the City of Appleton Wastewater Treatment Plant, and informed her of the situation. She agreed to allow the groundwater treatment operators to bypass the treatment process.

The treatment process was bypassed, and several batches of groundwater were discharged under controlled conditions with volume measurements and chromium monitoring for each batch. Samples of each batch of water discharged from the storage tank were analyzed for

hexavalent chromium using the onsite Hach test kit. If these results were below the permit limit of 4 mg/L, then a sample was collected for confirmatory offsite total chromium analysis. After the laboratory results were confirmed, the groundwater in the tank was discharged to the POTW without treatment. Records of flow volumes and analytical results were maintained.

On September 16, 1997, Jessica Garratt sent a letter notifying CH2M HILL of noncompliance for failure to meet the reporting requirements associated with the bypass of the groundwater treatment system. The noncompliance conditions resulted from inadequate follow-up communications. (The notice of noncompliance was not based on a permit limit violation because there were no permit limit violations during the emergency event.) The letter required the following corrective actions:

- Chromium sampling to verify compliance with the POTW limits for chromium during the bypass event. (Chromium sampling and analysis had been performed but not reported promptly.)
- Submittal of a written report documenting system failure, the start of bypass, and the return to normal treatment operation.
- Development of a contingency plan, to be called the Manual Operation Mode Action Plan, that will address responses to automated system failures in the future.

On September 29, 1997, CH2M HILL submitted the August/September Bypass Discharge Results report documenting the chromium analytical results for each batch and documenting the explanation of the system failure.

To prevent a similar failure in the future, CH2M HILL evaluated what had happened and took the following corrective actions:

- The PLC program was rewritten to allow the automatic flow control valve to be removed without causing a complete automatic control system shutdown.
- The PLC program was also critically reviewed to eliminate any other similar operating conditions that could cause a complete system failure.
- Additional operations procedures were written and incorporated in the O&M Manual--step-by-step instructions on how to operate the system in a completely manual control mode were submitted on October 20, 1997, in the Manual Operation Mode Action Plan.

CH2M HILL's timely responsiveness to the required corrective measures was acknowledged in a communication from Jessica Garratt. Overall, the WDNR expressed satisfaction with the manner in which CH2M HILL responded to the emergency situation. This facsimile, along with the August/September Bypass Discharge Results and Manual Operation Mode Report, are included in this report in Appendix C.

Certification of Operational and Functional Status

The certification of the operational and functional status of the groundwater treatment system is provided in Appendix I. This certification is in accordance with the guidance, *Remedial Action Report Documentation for Operable Unit Completion*, OSWER 9355.0-39FS, June 1992.

Summary and Conclusions

This report has summarized the LTRA activities that CH2M HILL performed at the N.W. Mauthe Site in Appleton, Wisconsin, from February 1997 through early- October 1998. The formal period of technical performance for the LTRA, specified under RAC Work Assignment No. 007-RARA-056G, was from August 1997 through early-October 1998 when responsibility for operation of the groundwater collection and treatment system passes from USEPA to the WDNR.

The primary objectives of the LTRA were met as follows:

- The groundwater collection trenches and building foundation drainage systems were operated and maintained to capture and prevent the further migration of contaminated groundwater.
- Measurement of the groundwater elevations in the groundwater monitoring wells verifies hydraulic capture of the contaminant plume.
- Analysis of the groundwater samples from the monitoring wells indicates that concentrations of metals and VOCs are generally decreasing or stable except at source areas or at areas formerly downgradient of the facility.
- The groundwater treatment system was operated and maintained to consistently meet the City of Appleton POTW User Permit requirements.
- The influent and effluent from the groundwater treatment facility were sampled and analyzed to monitor process performance and confirm compliance with the City of Appleton Industrial User Pretreatment Permit.

Recommendations

Recommendations for site and groundwater treatment performance monitoring for the continuation of the LTRA consist of the following:

- Continued operation of the groundwater collection trench to achieve hydraulic containment of the contaminated groundwater
- Continued groundwater monitoring but consider reduction of the sampling frequency from quarterly to semiannual monitoring based on the generally stable to slowly decreasing concentrations of the chemicals of concern
- Removal of copper, zinc, mercury, and cyanide from the groundwater monitoring requirements because these chemicals were below state groundwater standards at all monitoring locations during the six quarters of LTRA groundwater sampling
- Calculation of alternative concentration levels for manganese and chromium at the background wells when sufficient rounds of data are available
- Continued operation and monitoring of the groundwater treatment system

Appendix A
**Groundwater Data Evaluation/
Cleanup Status Report**

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Groundwater Data Evaluation/ Cleanup Status Report

Introduction

Site Background

The N.W. Mauthe Site is a former electroplating facility located at 725 South Outagamie Street in Appleton, Wisconsin. Norbert W. Mauthe was the owner of Wisconsin Chromium Corporation (WC) from its inception in 1946 until 1976. In 1960, WC moved from 1522 West Melvin Street to 725 South Outagamie Street, and engaged in hard chrome plating until 1976. In 1976, Mr. Mauthe sold WC to Southern Plating and Machine Company, and chrome plating ceased. Electroplating of zinc, cadmium, and possibly copper and silver was conducted at an adjacent building on the same property from 1978 until 1987 under the name N.W. Mauthe Company.

Under contract to the Wisconsin Department of Natural Resources (WDNR), CH2M HILL conducted a Remedial Investigation and Feasibility Study (RI/FS) at the site beginning in November 1991. These investigations revealed that the site was contaminated with zinc, cadmium, chromium, and cyanide. Organic compounds including 1,1,1-trichloroethane, trichloroethene, acetone, and other chlorinated hydrocarbons were also present. As a result of the RI/FS, site-specific remedial objectives were identified as follows:

- The prevention of ingestion of groundwater containing contaminants in excess of maximum contaminant levels (MCLs) (40 CFR 141.61), a total excess cancer risk of greater than 1×10^{-4} to 1×10^{-6} , or a hazard index that exceeds 1 (USEPA 1989)
- The prevention of direct contact with groundwater containing contaminants with an excess lifetime cancer risk great than 1×10^{-4} to 1×10^{-6} , or a hazard index that exceeds 1 (USEPA 1989)
- The prevention of release of groundwater contaminants to the Fox River at concentrations that would cause surface water criteria for a public water supply and for protection of aquatic life to be exceeded (Wisconsin Administrative Code NR 105)
- The removal of contaminants from groundwater such that concentrations are less than preventive action limits (PALs) (Wisconsin Administrative Code NR 140)

In March of 1994, a Record of Decision (ROD) was signed by the Agencies. Following the signature of the ROD, the State of Wisconsin turned the project over to the U.S. Environmental Protection Agency (USEPA) to prepare the Remedial Design (RD) and conduct the Remedial Action (RA). The USEPA awarded the contract for the RD to CH2M HILL on May 12, 1994, under the Alternative Remedial Contracting Strategy (ARCS) contract.

The USEPA determined that the RD/RA should be broken into two phases. Phase I involved the excavation of contaminated soils and installation of the groundwater collection trenches. Phase II involved the construction of the groundwater treatment system. The Phase I RD was completed in March 1995 and Phase II RA was completed in June 1997. Following the substantial completion of Phases I and II in January 1997, CH2M HILL began implementing the long-term response action (LTRA) at the N.W. Mauthe Site. The LTRA is the implementation phase of the site remedial action; i.e., operation and maintenance and performance monitoring of the groundwater collection and treatment systems at the site. This report discusses the results from the groundwater performance monitoring conducted from February 1997 through June 1998.

Subsurface Description

Fill covers the entire site ranging in thickness from 1 to 7 feet. The fill is typically a dark brown to black silty clay with varying amounts of sand and gravel. Underlying the fill is a till unit which is divided into an upper and lower unit. The upper till is stiff to hard red-brown silty clay 5 to 10 feet thick with traces of sand and gravel. The lower till is soft to firm, light brown to brown-gray silty clay with traces of sand and gravel. Vertical fractures are common in the upper till unit and occur less frequently in the lower till unit. Silt and sandy silt lenses occur in both units and are more frequent in the upper till unit. At the base of the lower till unit approximately 67 feet below ground surface, well-graded clayey sand 4 to 5 feet thick overlies dolomitic bedrock.

Groundwater occurs in the lower till unit approximately 5 to 20 feet below ground surface. The monitoring wells at the site are installed in the lower till unit and are screened from 5 to 30 feet below ground surface. Groundwater flow in the lower till unit at the site is naturally to the southeast. The primary flow paths for groundwater movement at the site appear to be the vertical fractures in the clay and thin sand and silt lenses. Hydraulic conductivity values are low, correlating to the fine-grained nature of the deposits (10^{-4} to 10^{-7} cm/s). Estimated groundwater flow rates are on the order of 0.1 to 112 feet per year.

Performance Monitoring Program

CH2M HILL conducted groundwater field sampling activities on a quarterly basis as part of the LTRA for the N.W. Mauthe Superfund site. The field sampling program is designed to monitor the effectiveness of the groundwater collection, treatment, and monitoring systems in meeting the requirements of the ROD. Unless otherwise noted, the procedures documented in the Field Sampling and Analysis Plan (August 1997) were followed.

The objectives of the groundwater monitoring program are to:

- Provide data to evaluate the effects of hydraulic gradient control and collection of contaminated groundwater within the aquifer
- Provide data to evaluate reduction of groundwater contaminant concentrations in the aquifer onsite in relation to associated cleanup criteria
- Provide a trigger for the implementation of additional or corrective measures if it is determined that the system is not performing effectively.

These data are evaluated in this report to evaluate the effectiveness of the remedial design.

Groundwater Sampling and Elevation Measurements

Quarterly groundwater samples were collected from 11 monitoring wells during February, May, September, and December of 1997 and March and June of 1998. The monitoring well network is comprised of 11 wells (W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107, and MW-108) as shown in Figure A-1.

- Monitoring wells W-2 and MW-108 are located upgradient of the site to monitor background conditions. W-2 is also used to monitor any petroleum contamination that may be migrating onsite from an upgradient source.
- Monitoring well MW-101, which is located west of the site, is used to monitor the effectiveness of the West Trench in preventing the migration of groundwater contamination.
- Three downgradient wells, MW-102, MW-103, and MW-104, are used to monitor changes in groundwater quality downgradient of the Central Trench and to monitor hydraulic gradient control.
- Four wells (W-8, W-15, MW-105, and MW-106) are used to monitor changes in groundwater quality outside of the Southeast Trench. Monitoring wells MW-106 and W-15 are also used to monitor hydraulic control of the Southeast Trench.
- Monitoring well MW-107 is used to provide source area groundwater quality data and hydraulic gradient information upgradient of the Central Trench.

Samples were sent to Enchem (Green Bay, WI) for February and May 1997 analysis and to Katalyst (Peoria, IL) for the remainder of the sampling rounds. The samples were analyzed for total metals and volatile organic compounds in accordance with the analytical procedures specified in the Quality Assurance Project Plan (QAPP) (August 1997). Additional analyses of aluminum, nickel, arsenic, and lead were mistakenly performed on MW-104 in March 1998. Field temperature, conductivity, and pH were measured and recorded for each well.

Groundwater elevation measurements were taken from the monitoring wells prior to sampling. The elevation measurements were used to calculate the necessary purge volume at each well. Monitoring wells were purged and sampled using the methods described in the Field Sampling Plan (August 1997).

Presentation of Results

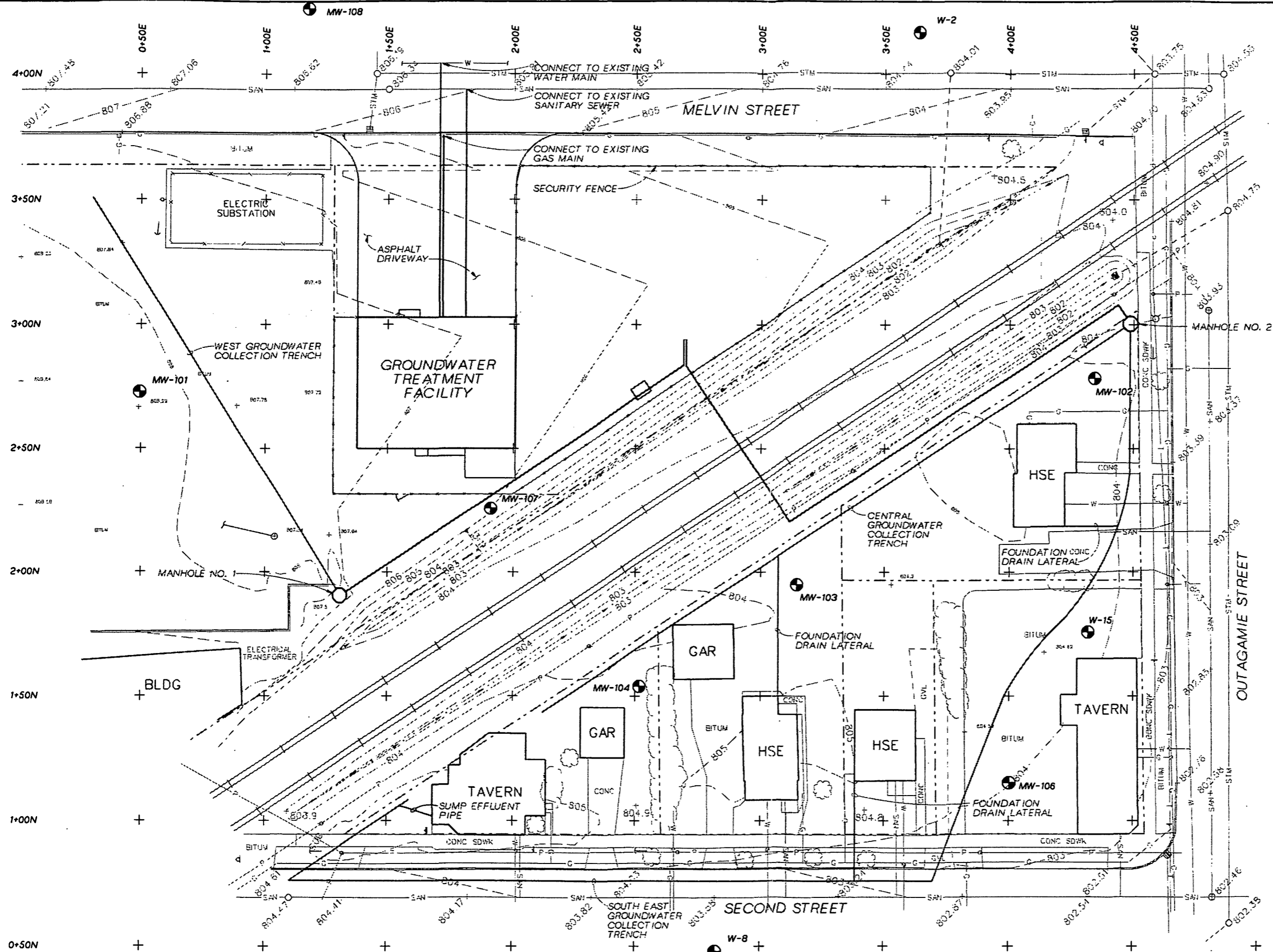
Sampling Observations

Details from each quarter of sampling are presented in Table A-1. Common sampling observations include:

- Dry- to low-volume monitoring wells. This is common for monitoring wells installed in fine-grained materials.
- Cloudy and turbid groundwater samples. This is common for monitoring wells installed in fine-grained materials when purging/sampling is completed with a bailer.

TABLE A-1
Sampling Details and Observations from Each Quarter
N.W. Mauthe Site

Quarterly Events	Dates	CH2M HILL Personnel In Attendance	Wells Sampled	Observations
First Quarter 1997	2/19/97– 2/20/97	Jill Webster, Derek Clayton, Tim Harrison	W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107, MW-108	Water was brownish and cloudy in all wells except MW-107, in which the water was green and clear. Sample at MW-106 appeared cloudy, turbid, and red-brown. MW-103 sampling was inhibited due to water inflow into flush mount during purging.
Second Quarter 1997	5/27/97– 5/28/97	Jill Webster, Gina Bayer	W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107, MW-108	Water was medium to light brown and cloudy in MW-108. Brown and turbid in MW-101, MW-108, and MW-104. Water in samples from W-2, MW-105, MW-103, and W-15 was clear. MW-107 water was light green and clear.
Third Quarter 1997	9/11/97– 9/18/97	Pat Allen, Dave Shekoski	W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107, MW-108	MW-107, MW-108, MW-102, and MW-106 samples were light to medium brown. Samples from MW-103, and MW-105 were brown and slightly turbid. Water in W-8 and MW-104 was clear. Wells W-2 and MW-102 were too dry to complete sampling. Samples had to be re-collected at W-2, MW-102, MW-103, and MW-104 because carrier lost them. All wells except MW-104 did not recharge well.
Fourth Quarter 1997	12/11/97–12/12/97	Dave Shekoski, Rich Baldino	W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107, MW-108	W-2 and W-8 were dry (purged at 3 vol.) W-15 was also dry. MW-106 and MW-103 had low volumes.
First Quarter 1998	3/24/98–3/25/98	Dave Shekoski, Mike Heitmann	W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107, MW-108	W-2, MW-102, W-15, MW-105, W-8 completely dry with poor recovery. MW-101 started clear but became turbid.
Second Quarter 1998	6/9/98	Pat Allen, Dave Shekoski	W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107, MW-108	W-2 dry at 4 gallons and water was brown and cloudy. MW-102 was dry at 2.5 gallons and water was clear. MW-106 samples were medium light red-brown, and well was almost dry. Water in MW-105 was light brown and turbid; well was almost dry. W-8 was dry at 4 gallons; water was clear. Water from MW-103 was cloudy. MW-104 samples were clear. Samples from MW-108 were light brown and turbid. Water in MW-107 was cloudy and yellow to brown. Samples from MW-101 were light to dark brown and cloudy. Approximately 10' away from MW-106 was a parked car with a leaking gas tank.



- LEGEND**
- T — OVERHEAD TELEPHONE
 - G — GAS MAIN
 - P — OVERHEAD POWER
 - W — WATER MAIN
 - SAN — SANITARY SEWER
 - STW — STORM SEWER
 - F — FENCE
 - - - APPROXIMATE PROPERTY LINE
 - UTILITY POLE
 - TREE
 - SHRUB LINE
 - + 804.0 SPOT ELEVATION
 - - - CONTOUR LINE
 - CONC CONCRETE PAVEMENT
 - BITUM BITUMINOUS PAVEMENT
 - HSE HOUSE
 - GAR GARAGE
 - ⊕ MONITORING WELL

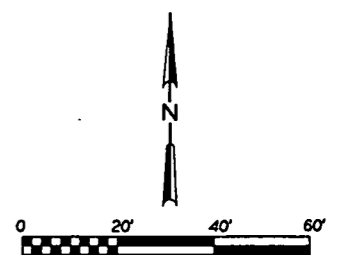


FIGURE A-1
SITE MAP
N.W. MAUTHE

- Green groundwater samples from MW-107. This is reflective of the source area location of this monitoring well.

Groundwater Elevation and Capture Analysis

Groundwater elevations measured at the site are presented in Table A-2.

TABLE A-2
Groundwater Monitoring Well Specifications and Water Levels
N.W. Mauthe Site

Well ID	TOC Elev. (ft)	Surface Elev. (ft)	Screened Interval (ft)	Total Depth from TOC (ft)	Water Elev. 2/97	Water Elev. 5/97	Water Elev. 9/97	Water Elev. 12/97	Water Elev. 3/98	Water Elev. 6/98
W-2	804.66	805.00	10	15	798.66	801.01	800.28	797.69	802.08	799.38
W-8	803.36	803.80	10	15	797.22	797.66	798.01	796.52	798.16	797.31
W-15	803.76	804.02	10	15	793.97	796.92	797.23	795.52	796.78	796.32
MW-101	807.59	808.23	20	28	797.16	799.99	798.67	798.21	801.43	800.48
MW-102	804.45	804.68	20	28	780.72	780.89	780.79	780.95	780.47	780.72
MW-103	803.74	804.23	20	27	795.29	791.83	789.60	787.78	791.03	789.13
MW-104	807.28	804.42	20	26	792.94	789.91	798.59	795.70	799.46	796.60
MW-105	803.96	804.37	10	16	793.74	800.60	800.37	799.03	800.08	800.50
MW-106	804.08	803.83	10	16	794.75	797.23	796.91	795.48	797.37	796.76
MW-107	809.01	806.47	20	31	788.23	796.60	797.64	796.49	796.68	796.31
MW-108	806.61	806.99	20	28	798.36	793.32	790.53	788.65	795.59	789.30

Groundwater elevations at the site varied seasonally with the highest elevations in the spring and summer and the lowest elevations in the fall and winter (see Attachment A for trend plots). This trend is expected to represent the normal seasonal trend in the water table.

The groundwater collection trench has created a local groundwater depression at the site. Groundwater elevations collected in June 1998 show capture of groundwater from the former facility and to the southeast (see Figure A-2). Groundwater elevation contour maps for the other sampling events show similar capture zones (Attachment A).

Water Quality Results

Analytical results for each sampling event at each well are presented in Attachment B. Data from the most recent sampling event in June 1998 are presented in Table A-3. Upgradient monitoring well locations, W-2 and MW-108, are considered background locations. Quarterly data collected at these wells since February 1997 were averaged and are used as

background concentrations for the site. Results reported as less than the detection limit were used in the calculations with an assigned value of one-half the detection limit.

The EPA Region V validation included a comparison of the data packages and QA/QC results to the requirements described in the Special Analytical Service (SAS) methods. QA/QC qualifiers resulting from the EPA Region V validation have been added to the tables in Attachment B. Attachment C provides the data validation reports completed by EPA.

Field parameter results for pH, conductivity, and temperature are presented in Table A-4. Parameters are generally stable except for temperature, which shows seasonal fluctuations.

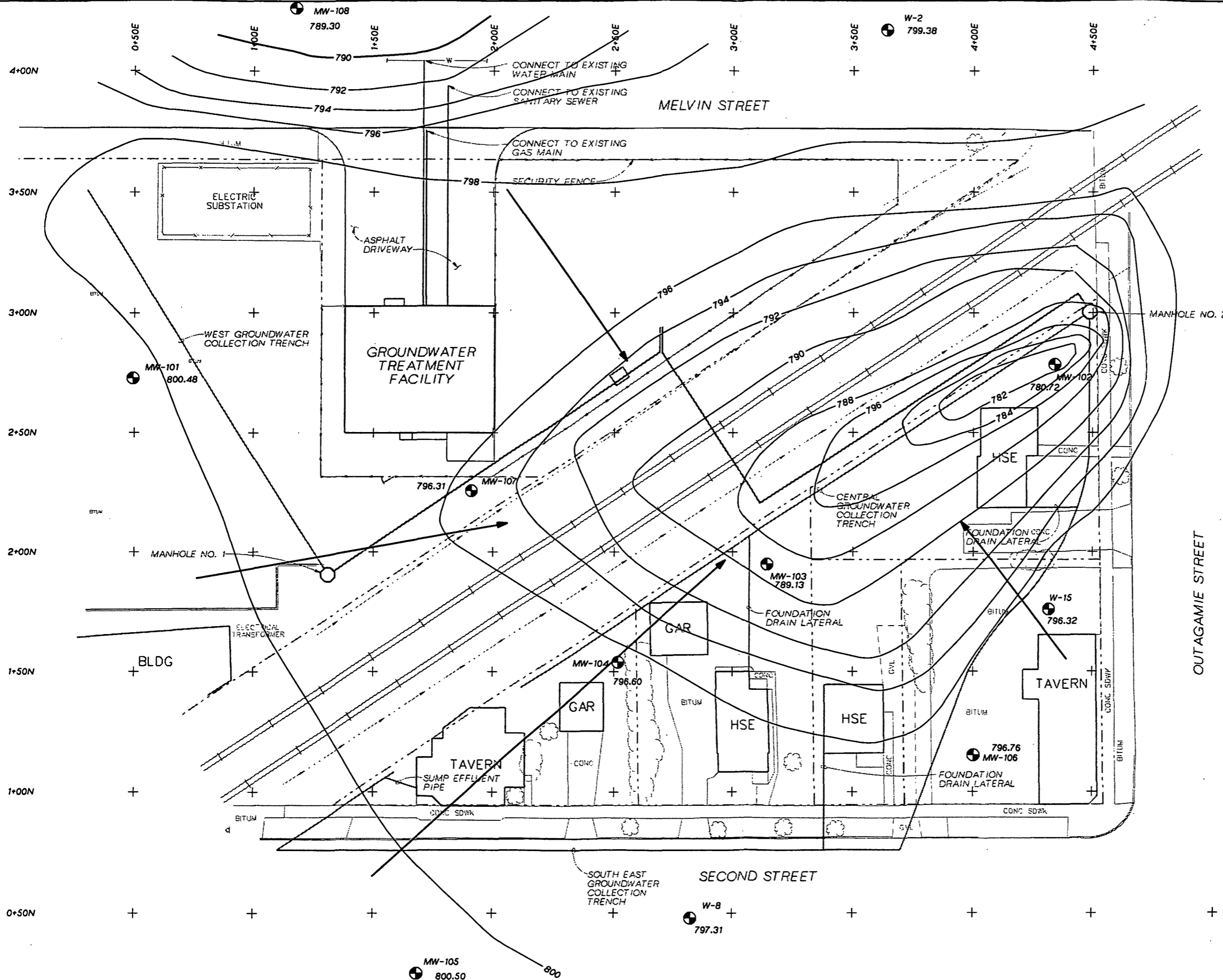
Metals/Cyanide

Metals have historically been the constituents of concern due to their former use at the site. Since quarterly monitoring began in February 1997, concentrations of chromium, manganese, cadmium, and lead in groundwater samples from the site are above Wisconsin DNR standards. As shown in Table A-3, calculated background concentrations (from W-2 and MW-108) are above state standards for chromium and manganese. This has been our observation and experience at other sites in the Appleton area where groundwater samples are obtained from the clay till unit. Data from the most recent sampling event in June 1998, shown previously in Table A-3, indicate:

- Enforcement Standard (ES) exceedances of chromium at MW-104 and MW-107. These wells are located within or directly downgradient of the former source area. They are within the hydraulic capture zone of the collection trench.
- Preventative Action Limit (PAL) exceedances of chromium at MW-103, MW-101, W-2, and MW-108. MW-103 and MW-101 are located sidegradient/downgradient from the source area. They are within the hydraulic capture zone of the collection trench. W-2 and MW-108 are background locations.
- ES exceedances of manganese at MW-101, MW-102, MW-103, W-2 (background well), and MW-108 (background well). Manganese at these locations is attributed to naturally occurring conditions. Background concentration for manganese is 274 µg/L above the State ES level. Because groundwater samples are collected from bailers and are not filtered, the samples may be biased high as a result of suspended solids.

Chromium has the largest distribution within groundwater at the site and is used to show the extent of groundwater contamination for metals. Recent concentrations of chromium are shown on Figure A-3.

Concentrations of metals are decreasing or stable at downgradient monitoring well locations and at sidegradient monitoring well locations east of the former facility (see Attachment B). Concentrations were observed to be decreasing at MW-101 until the last round of sampling when increases were observed. Future results from this well will confirm whether the long-term trend is increasing or decreasing at this location. Concentrations are increasing at MW-107 and MW-104, which are located within, or downgradient from, the source area.



- LEGEND**
- FENCE
 - - - APPROXIMATE PROPERTY LINE
 - (o) TREE
 - (o) SHRUB LINE
 - CONC CONCRETE PAVEMENT
 - BITUM BITUMINOUS PAVEMENT
 - HSE HOUSE
 - GAR GARAGE
 - (●) MONITORING WELL
 - 794- GROUNDWATER ELEVATION CONTOUR
 - GROUNDWATER FLOW DIRECTION

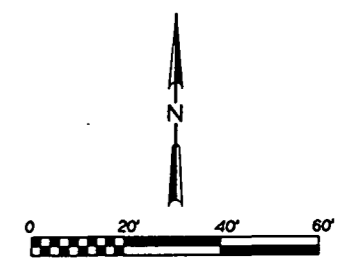


FIGURE A-2
GROUNDWATER ELEVATION MAP
JUNE 1998
N.W. MAUTHE

TABLE A-3
Groundwater Analytical Results for June 1998
N.W. Mauthe Site

Parameter	W-2 ⁶ 6/10/98	W-8 6/10/98	W-15 6/10/98	MW-101 6/10/98	MW-102 6/10/98	MW-103 6/10/98	MW-104 6/10/98	MW-105 6/10/98	MW-106 6/10/98	MW-107 6/10/98	MW-108 ⁶ 6/10/98	WDNR ES ¹ (µg/L)	WDNR PAL ¹ (µg/L)	Fed. MCL ² (µg/L)	Background Conc. ⁴
TOTAL METALS (µg/L)															
Chromium	16.4 [*]	9.9 =	10 =	48.2 [*]	3.9 U	57.6 [*]	219 [*]	13.7 =	3.9 U	6240 [*]	28.4 [*]	100	10	100	14
Copper	18.6 B	12.6 B	13.2 B	46.8 =	9.8 U	27.5 =	9.8 U	15.3 B	10.2 B	13.8 B	25.5 =	1300	130	100 ⁵	13
Manganese	466 [*]	264 =	147 =	604 [*]	318 [*]	417 [*]	107 =	217 =	10 =	161 =	478 [*]	50	25	50 ⁵	274
Zinc	40.8 *	21.6 *	18.8 *	75.9 *	9.5 *	33.7 *	12.8 *	22.1 *	10.9 *	17.3 *	40.5 *	5000	2500	5000 ⁵	28
Cadmium	0.31 J	0.54 J	0.11 J	0.27 J	0.04 J	0.15 J	0.04 UJ	0.048 J	0.04 UJ	0.11 J	0.14 J	5	0.5	5	0.17
Mercury	0.027 J	0.016 UJ	0.016 UJ	0.044 J	0.018 J	0.02 J	0.016 UJ	0.016 UJ	0.016 UJ	0.027 J	0.021 J	2	0.2	2	0.04
Cyanide	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	200	40	200	NA
VOA (µg/L)															
1,1,1-Trichloroethane	40 U	40 U	40 U	40 UJ	40 U	40 U	2 J	40 U	40 U	340 ^{JD}	40 U	200	40	200	NA
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4 ^J	0.5 U	5	0.5	5	NA
1,1-Dichloroethane	85 U	85 U	85 U	85 UJ	85 U	85 U	85 U	85 U	85 U	59 ^{JD}	85 U	850	85	NA	NA
1,1-Dichloroethene	0.7 U	0.7 U	0.7 U	0.7 UJ	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	58 ^D	0.7 U	7	0.7	7	NA
Benzene	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	12 U	0.5 U	5	0.5	5	NA
Chloroform	0.6 U	0.6 U	0.6 U	0.6 UJ	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	15 U	0.6 U	6	0.6	NA	NA
Toluene	68 U	68 U	68 U	68 UJ	68 U	68 U	68 U	68 U	68 U	68 J	68 U	343	68.6	1000	NA
Total 1,2-Dichloroethene	7 U	7 U	7 U	7 UJ	7 U	7 U	7 U	7 U	7 U	3 UJ	7 U	70/100 ³	7/20 ³	70/100 ³	NA
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	390 ^D	0.5 U	5	0.5	5	NA
Xylenes, Total	120 U	120 U	120 U	120 UJ	120 U	120 U	120 U	120 U	120 U	3100 U	120 U	620	124	10000	NA

Highlighted results are above WDNR PAL (NR 140) and background concentrations.

¹Wis. Adm. Code NR 140.10.

²40 CFR 141.61 and 141.62.

³ cis-1,2-dichloroethene/trans-1,2-dichloroethene.

⁴ Calculated for results from February 1997 to June 1998 for W2 and W-108 (upgradient of site).

⁵ Secondary MCLs.

⁶ Background well.

NA - Not available.

NT - Not tested.

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

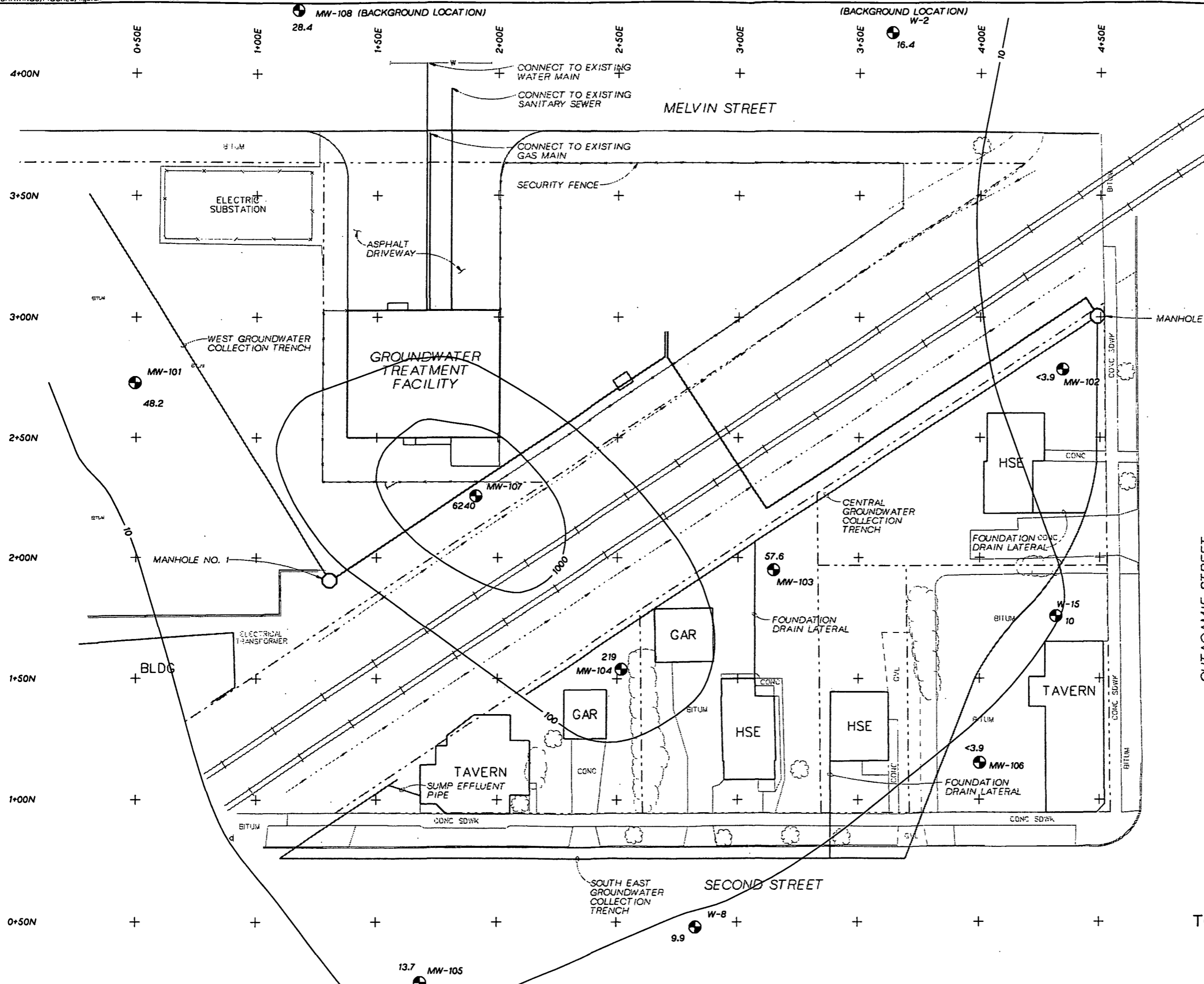
"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"B": Compound was found in blank and in the sample.

"D": Diluted.

"DJ": Diluted and estimated.

***: Laboratory duplicate not within control limits.



- LEGEND**
- FENCE
 - - - APPROXIMATE PROPERTY LINE
 - ☉ TREE
 - ☉ SHRUB LINE
 - CONC CONCRETE PAVEMENT
 - BITUM BITUMINOUS PAVEMENT
 - HSE HOUSE
 - GAR GARAGE
 - ⊕ MONITORING WELL
 - 10 — ISOCONCENTRATION OF CHROMIUM

CHROMIUM
 DNR ES = 100ug/L
 DNR PAL = 10ug/L
 MCL = 100ug/L
 BACKGROUND = 14ug/L
 "<" LESS THAN THE DETECTION LIMIT

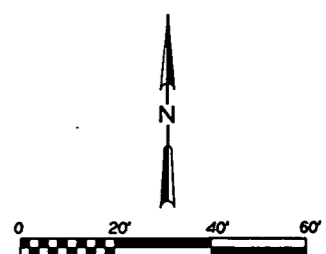


FIGURE A-3
TOTAL CHROMIUM CONCENTRATIONS
 (ug/L) IN GROUNDWATER
 JUNE 1998
 N.W. MAUTHE
CH2MHILL

TABLE A-4
Field Parameter Results
N.W. Mauthe Site

Well ID	February 1997			May 1997			September 1997			December 1997			March 1998			June 1998		
	Temp (°C)	pH	Cond. (µS)	Temp (°C)	pH	Cond. (µS)	Temp (°C)	pH	Cond. (µS)	Temp (°C)	pH	Cond. (µS)	Temp (°C)	pH	Cond. (µS)	Temp (°C)	pH	Cond. (µS)
W-2	6.0	8.00	750	10.1	7.74	NM	14.5	7.01	910	9.5	7.33	820	7.9	7.96	1235	10.2	6.59	1057
W-8	7.5	8.20	1000	10.4	7.30	NM	17.0	7.07	1250	11.2	7.32	1090	7.9	7.34	1590	11.5	6.95	1407
W-15	9.0	8.15	920	10.0	7.66	NM	16.0	7.22	1300	10.4	7.18	1180	8.4	7.70	1450	11.6	6.46	1496
MW-101	8.0	7.12	1400	12.9	7.56	NM	14.0	6.54	1380	11.4	6.64	1390	10.5	7.58	2142	11.5	6.29	2116
MW-102	10.5	8.00	700	10.5	7.47	NM	13.0	6.99	810	8.5	7.23	690	10.2	7.68	1145	10.3	6.97	1046
MW-103	6.0	6.30	700	11.6	7.67	NM	10.5	7.21	1030	9.0	7.43	970	9.4	7.82	1441	9.9	6.24	1356
MW-104	8.0	7.43	1000	12.0	8.00	NM	10.5	7.13	1030	9.6	7.10	1000	8.3	7.94	1378	9.7	6.53	1101
MW-105	7.0	7.70	1600	10.5	7.44	NM	16.0	6.89	2150	12.0	7.04	2050	6.7	7.35	2878	11.1	6.25	2695
MW-106	10.0	7.75	1000	10.1	7.47	NM	15.0	7.19	1310	11.5	7.06	1260	8.7	7.61	1716	11.6	7.11	1604
MW-107	9.0	7.46	650	10.8	7.12	NM	12.5	7.07	700	10.5	7.08	730	10.2	7.87	1081	10.6	7.17	1042
MW-108	10.0	8.10	100	11.4	6.02	NM	12.0	6.51	1160	10.4	6.98	1130	10.2	7.64	1568	10.7	6.54	1525

NM - Not measured.

Volatile Organic Compounds

Volatile organic compounds (VOCs) have been detected in groundwater at the former facility. Since quarterly monitoring began in February 1997, concentrations of trichloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethene, and chloroform in groundwater samples have been detected above Wisconsin DNR standards at MW-101, MW-104, MW-106 and MW-107. During the most recent sampling round in June 1998, these same VOCs, except chloroform, were also detected above standards, but only at MW-107 (see Table A-3). MW-107 is located within the source area of the former facility. VOCs are showing an increasing trend at MW-107 (see Attachment B).

Summary and Recommendations

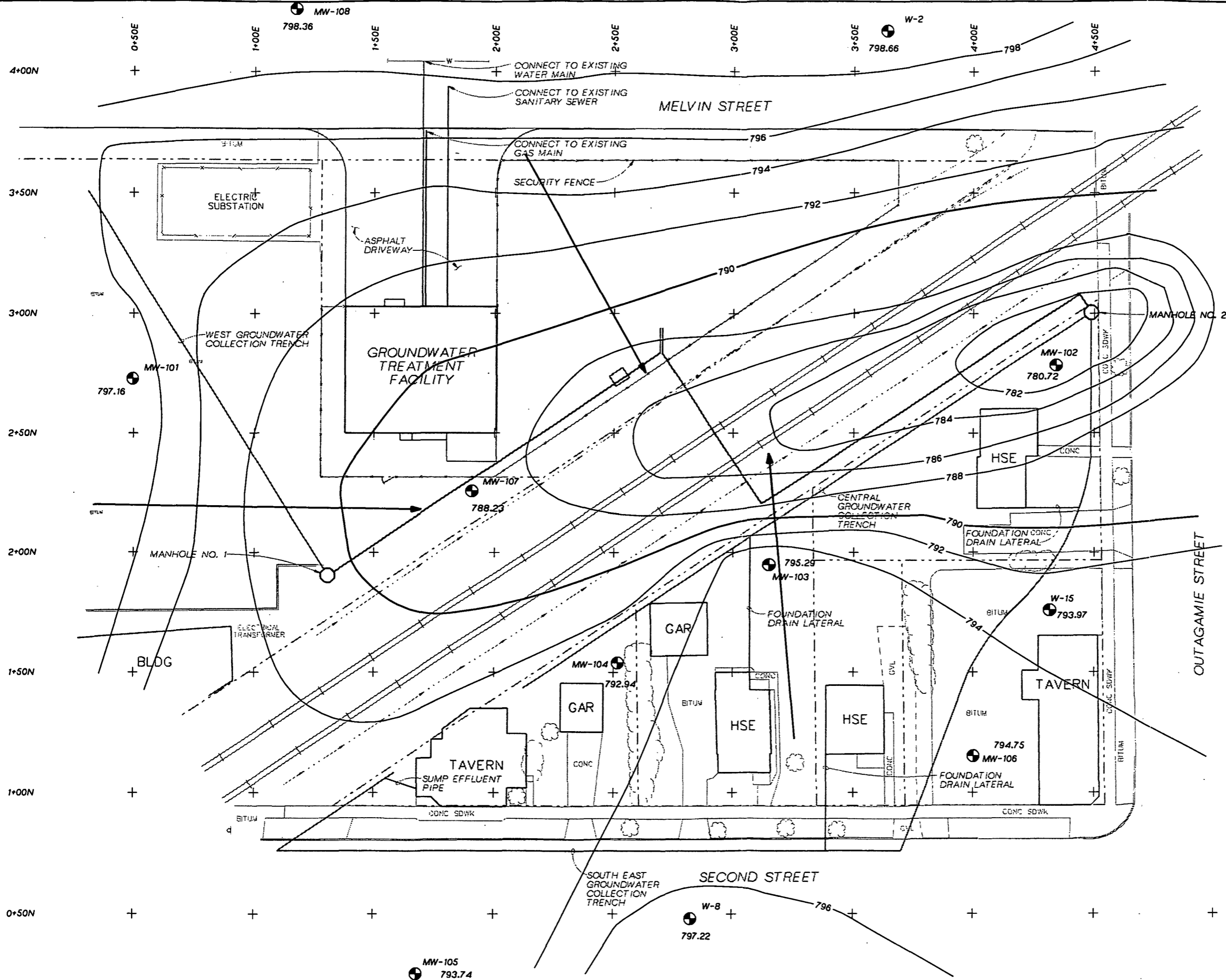
Data collected since February 1997 indicate that capture of affected groundwater is occurring at the site. Concentrations of metals and VOCs are generally decreasing or stable, except at source areas or at areas formerly downgradient of the facility. The current monitoring well network provides both hydraulic and chemical monitoring of the site.

Recommendations for site and performance monitoring include:

- Continued operation of the groundwater collection trench to obtain hydraulic containment
- Continued groundwater monitoring, but reduction from quarterly to semiannual monitoring based on the generally stable to decreasing concentrations
- Removal of copper, zinc, mercury, and cyanide from the sampling requirements because these parameters were below State standards at all monitoring points during the six quarters of sampling
- Calculation of alternative concentration levels for manganese and chromium at the background wells when sufficient rounds of data are available

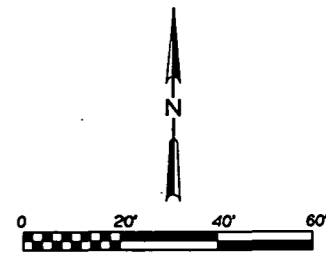
Attachment A
Hydraulic Results
Groundwater Elevation Maps
Groundwater Trend Plots

Groundwater Elevation Maps

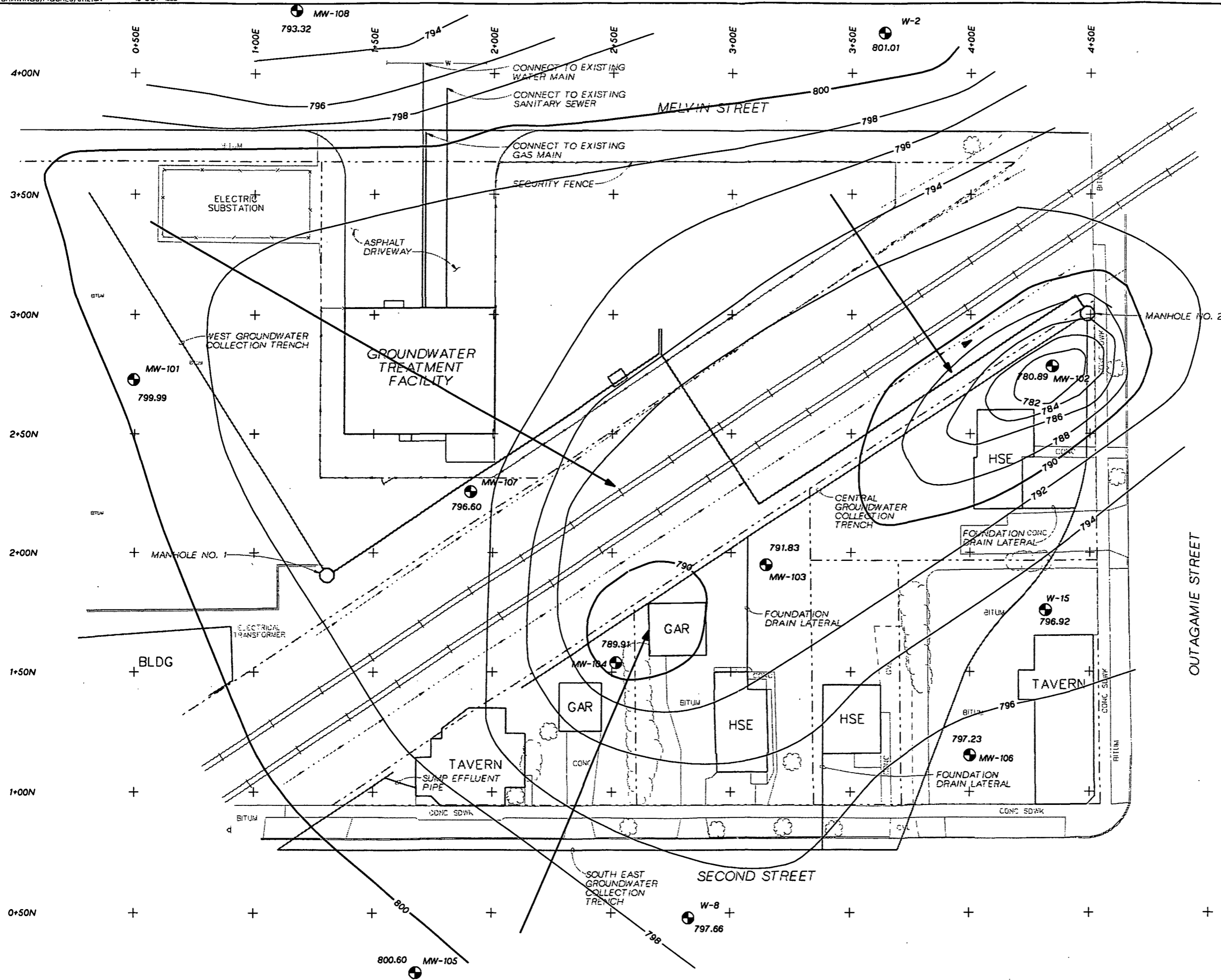


LEGEND

- FENCE
- APPROXIMATE PROPERTY LINE
- TREE
- SHRUB LINE
- CONCRETE PAVEMENT
- BITUMINOUS PAVEMENT
- HSE
- GAR
- MONITORING WELL
- 794 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION

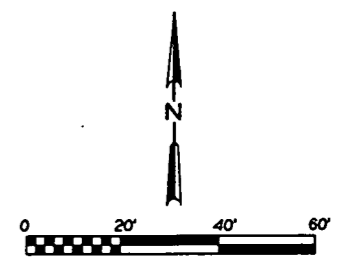


ATTACHMENT A-1
 GROUNDWATER ELEVATION MAP
 FEBRUARY 1997
 N.W. MAUTHE

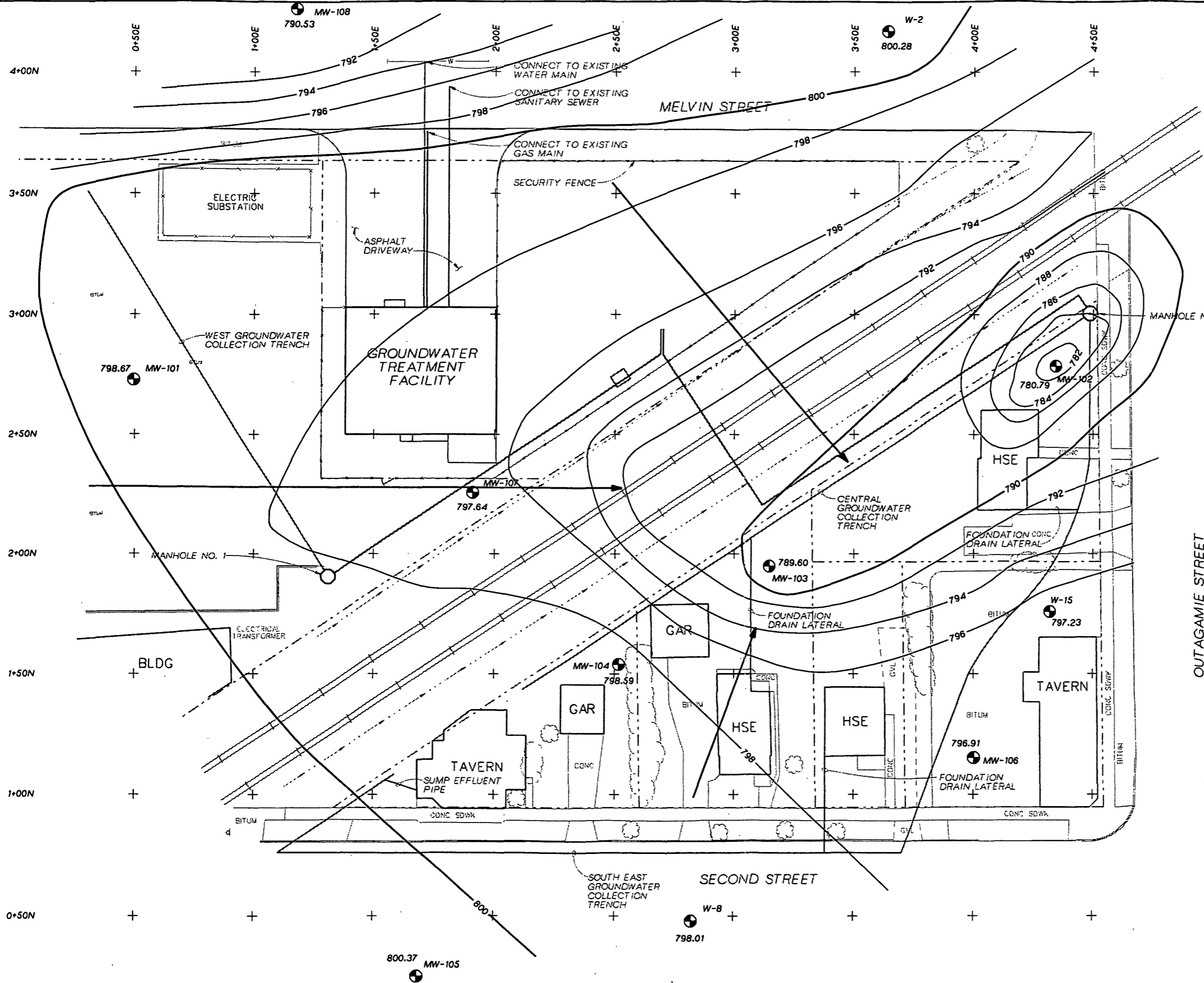


LEGEND

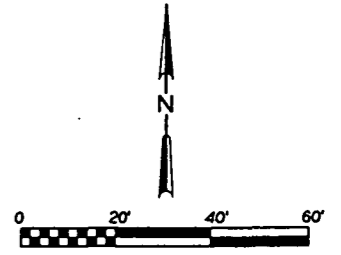
- FENCE
- - - APPROXIMATE PROPERTY LINE
- TREE
- SHRUB LINE
- CONC CONCRETE PAVEMENT
- BITUM BITUMINOUS PAVEMENT
- HSE HOUSE
- GAR GARAGE
- MONITORING WELL
- 794— GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION



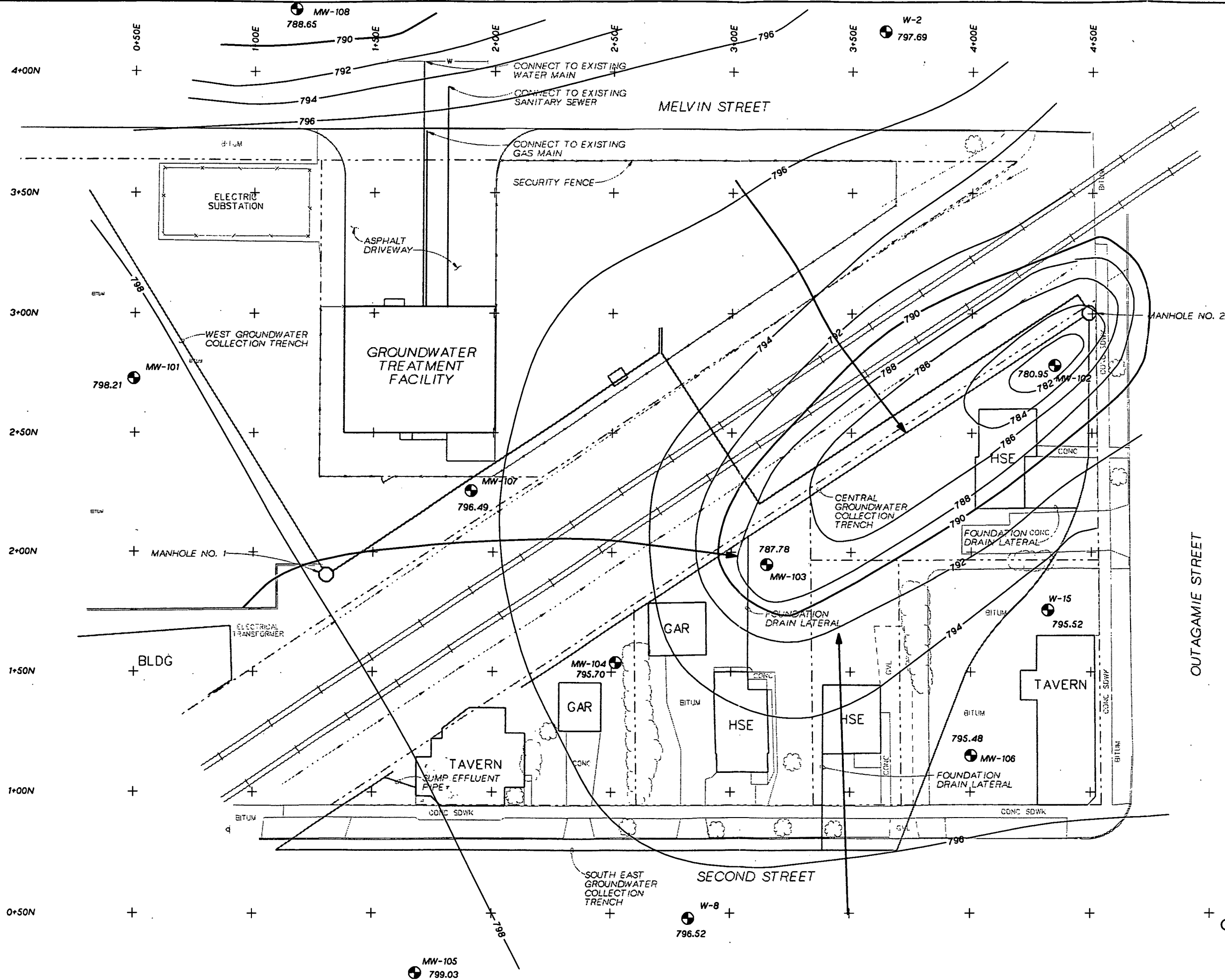
ATTACHMENT A-2
 GROUNDWATER ELEVATION MAP
 MAY 1997
 N.W. MAUTHE



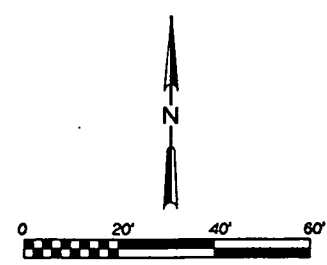
- LEGEND**
- FENCE
 - - - - - APPROXIMATE PROPERTY LINE
 - TREE
 - SHRUB LINE
 - CONC CONCRETE PAVEMENT
 - BITUM BITUMINOUS PAVEMENT
 - HSE HOUSE
 - GAR GARAGE
 - MONITORING WELL
 - 794--- GROUNDWATER ELEVATION CONTOUR
 - GROUNDWATER FLOW DIRECTION



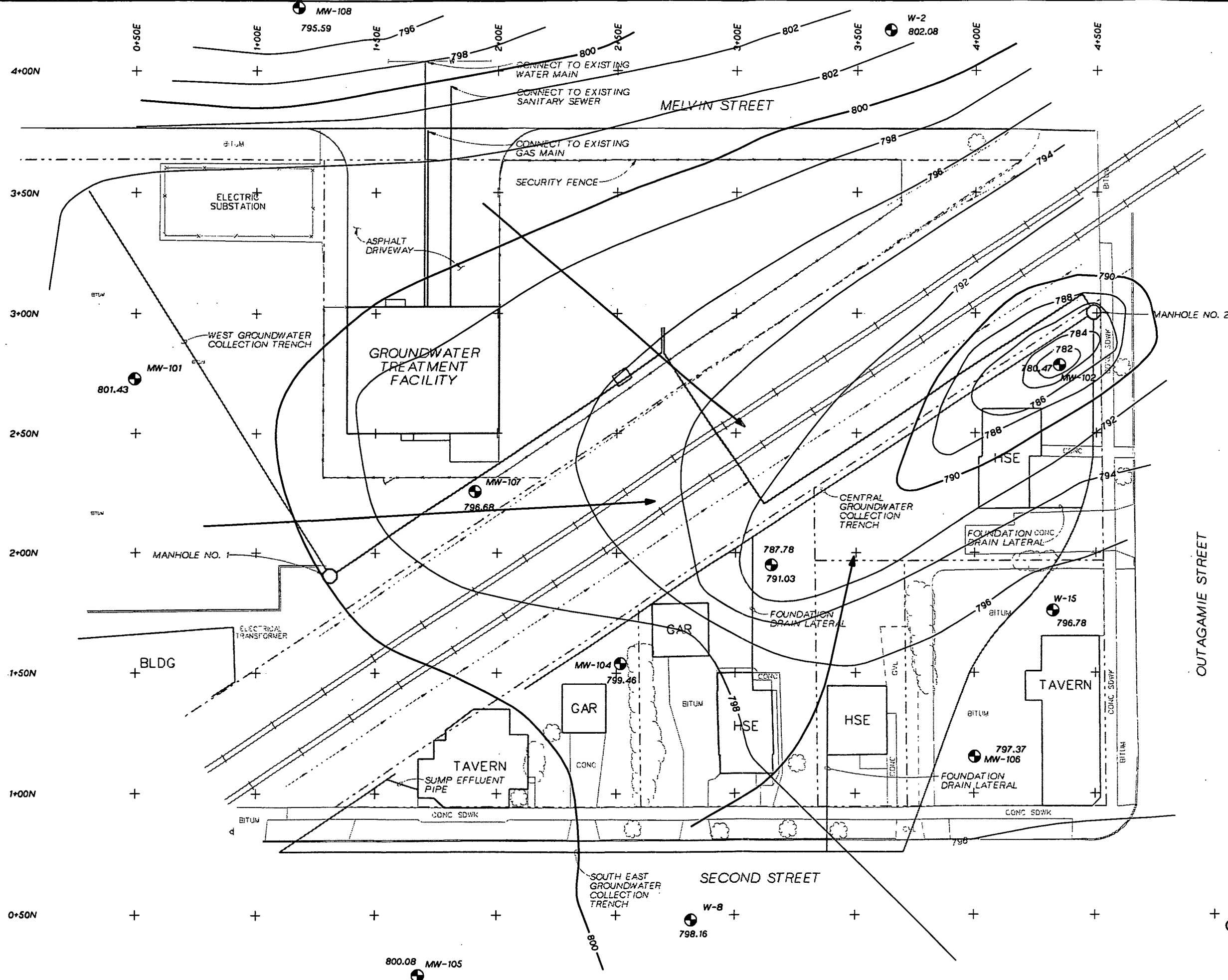
ATTACHMENT A-3
 GROUNDWATER ELEVATION MAP
 SEPTEMBER 1997
 N.W. MAUTHE



- LEGEND**
- FENCE
 - - - APPROXIMATE PROPERTY LINE
 - TREE
 - SHRUB LINE
 - CONC CONCRETE PAVEMENT
 - BITUM BITUMINOUS PAVEMENT
 - HSE HOUSE
 - GAR GARAGE
 - ⊕ MONITORING WELL
 - 794 — GROUNDWATER ELEVATION CONTOURS
 - GROUNDWATER FLOW DIRECTION

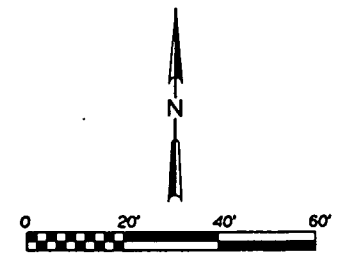


ATTACHMENT A-4
GROUNDWATER ELEVATION MAP
DECEMBER 1997
N.W. MAUTHE



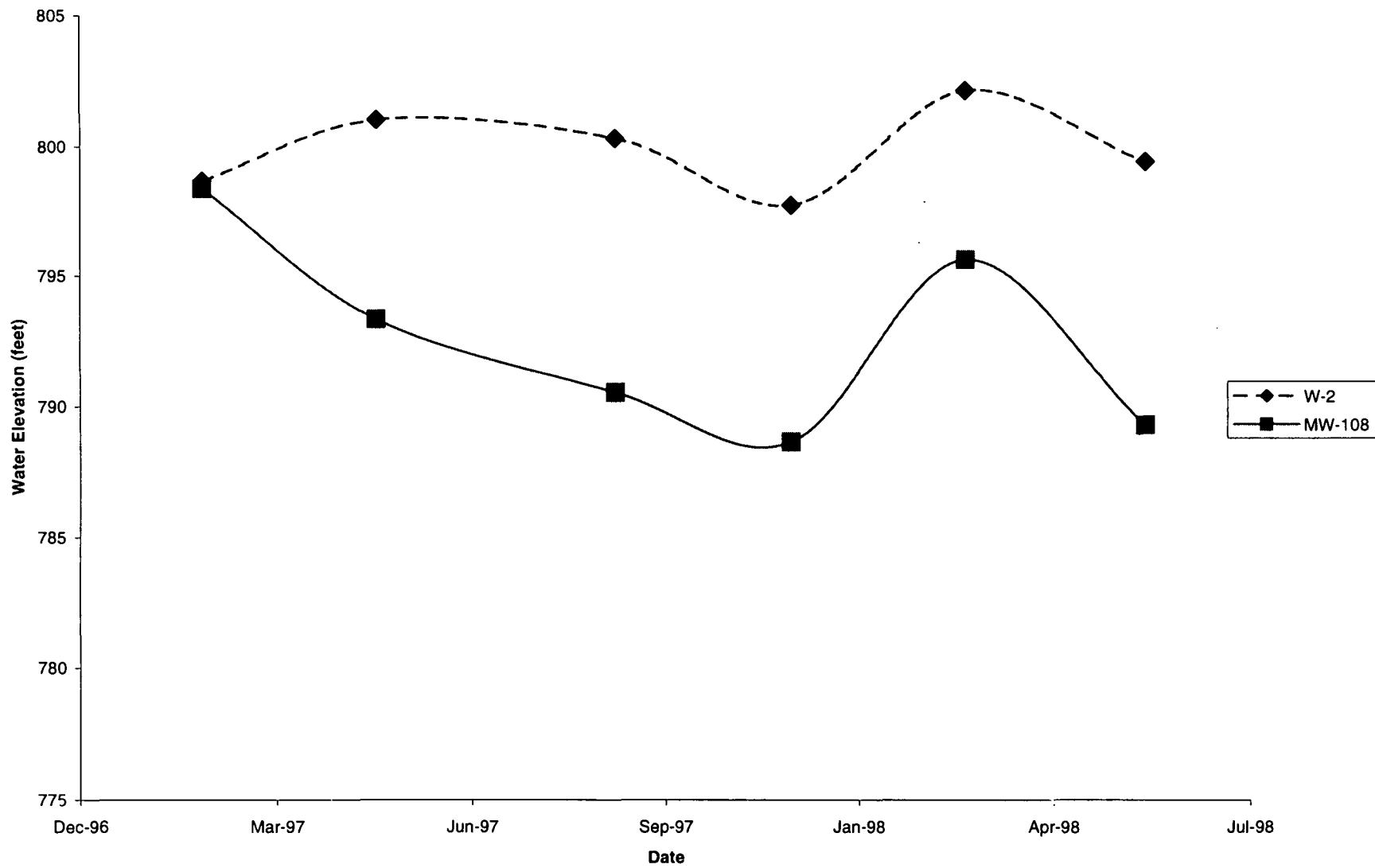
LEGEND

- FENCE
- - - APPROXIMATE PROPERTY LINE
- (Tree symbol) TREE
- (Shrub symbol) SHRUB LINE
- CONC CONCRETE PAVEMENT
- BITUM BITUMINOUS PAVEMENT
- HSE HOUSE
- GAR GARAGE
- (Well symbol) MONITORING WELL
- 794- GROUNDWATER ELEVATION CONTOURS
- GROUNDWATER FLOW DIRECTION

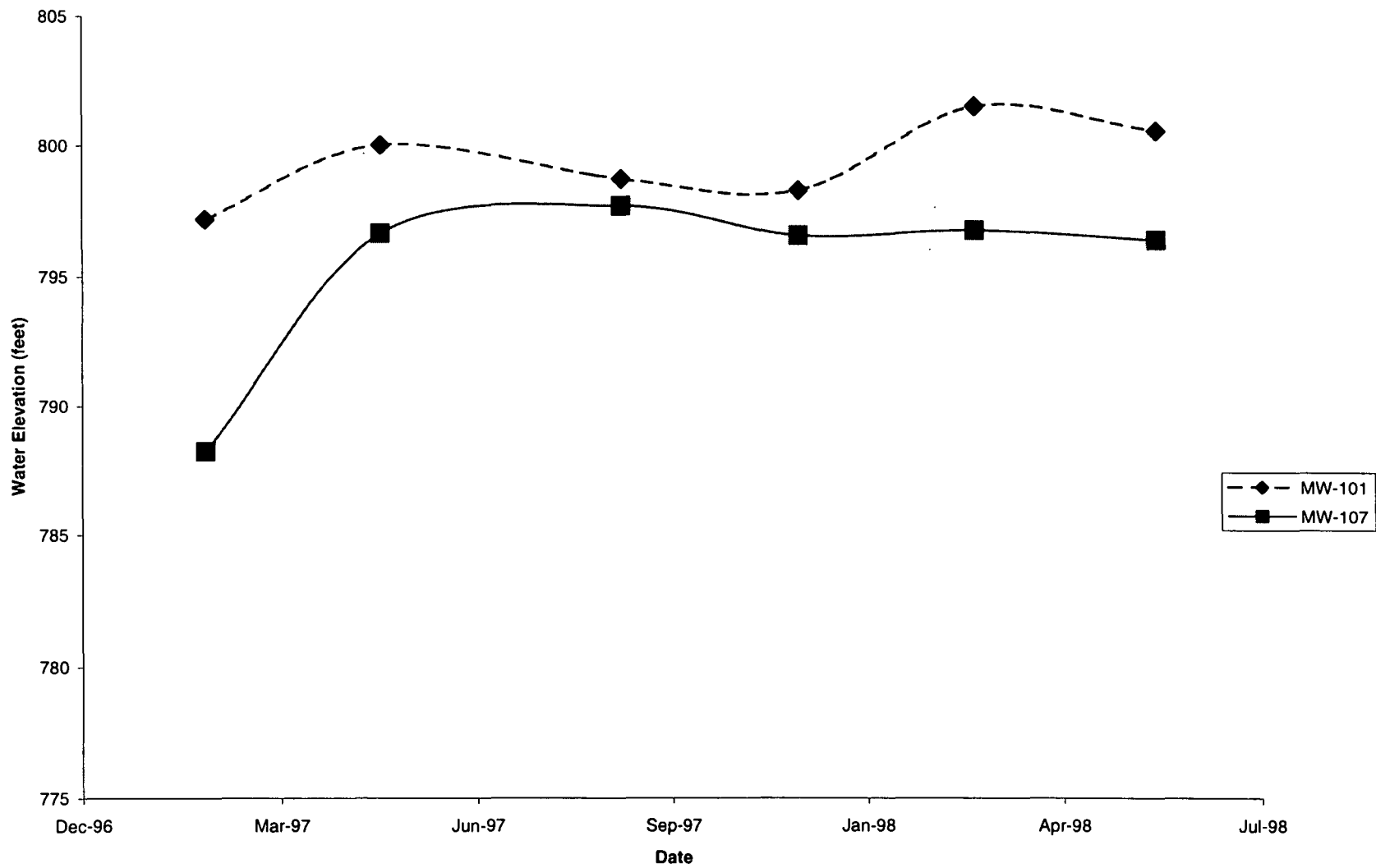


ATTACHMENT A-5
 GROUNDWATER ELEVATION MAP
 MARCH 1998
 N.W. MAUTHE

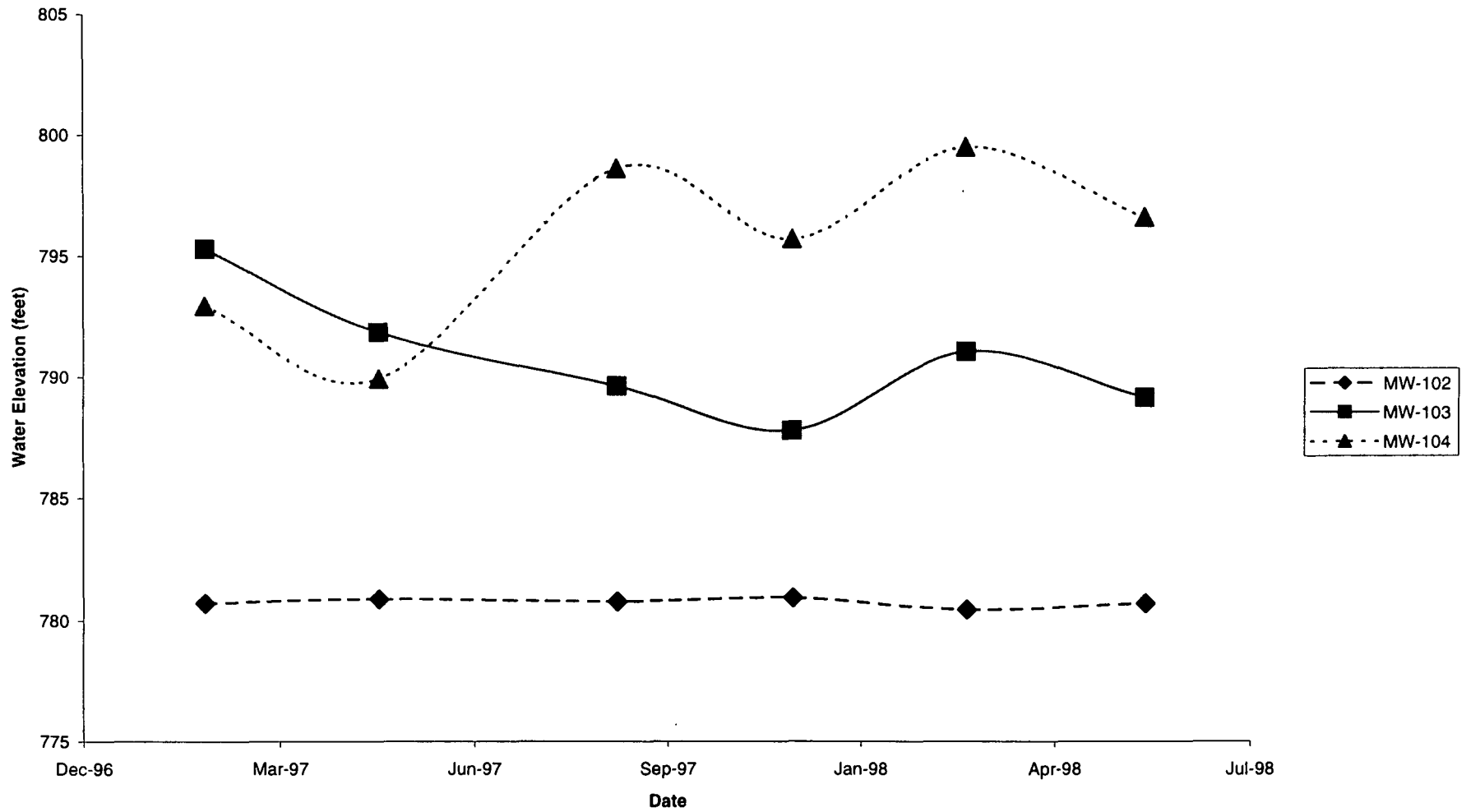
Groundwater Trend Plots



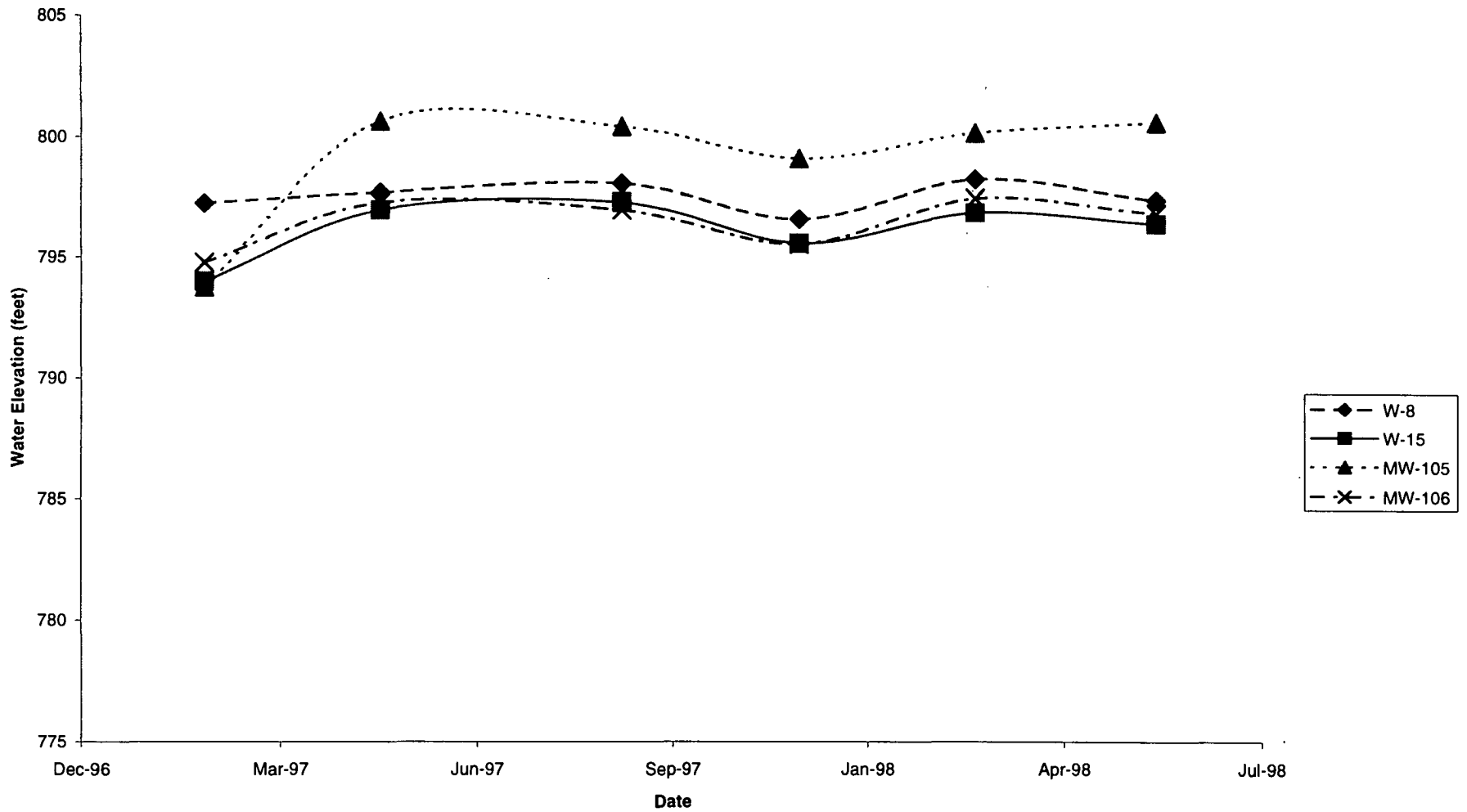
ATTACHMENT A
Groundwater Elevations at Monitoring Wells Located
Upgradient from Site
N.W. Mauthe Site



ATTACHMENT A
 Groundwater Elevations at Monitoring Wells Located along the West Trench and in
 the Source Area
 N.W. Mauthe Site



ATTACHMENT A
Groundwater Elevations at Monitoring Wells Located along the Central Trench
N.W. Mauthe Site



ATTACHMENT A
 Groundwater Elevations in Monitoring Wells Located along the
 Southeast Trench
 N.W. Mauthe Site

Attachment B
Analytical Results
Analytical Summary Tables
Trend Plots

Analytical Summary Tables

ATTACHMENT B

Analytical Results for W-2

N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ⁴ (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	15 =	8.5 =	4.5 B	6.2 =	3.9 U	16.4 =	11.5	100	10	100
Copper	26 =	10 U	9.5 B	9.7 U	9.5 U	18.6 B	26.0	1300	130	100 ⁴
Manganese	460 =	170 =	116 =	133 =	83.8 =	466 =	238	50	25	50 ⁴
Zinc	49 =	30 =	16.9 =	20.4 *	18.6 =	40.8 *	29.3	5000	2500	5000 ⁴
Cadmium	NT	0.43 =	0.27 =	0.13 J	0.08 J	0.31 J	0.24	5	0.5	5
Mercury	NT	0.2 U	0.03 UN	0.06 J	0.007 UJ	0.027 J	0.04	2	0.2	2
Cyanide	NT	NT	3 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	40 U	40 U	40 U	40 U	NA	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	85 U	85 U	85 U	85 U	NA	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	0.5 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	0.4 JB	120 U	0.4	620	124	10000

¹ Average concentration using detected results only.

² Wis. Adm. Code NR 140.10

³ 40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

"**": Laboratory duplicate analyses not within control limits.

ATTACHMENT B

Analytical Results for W-8

N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	17 =	37 =	14.4 =	5.7 =	10.1 =	9.9 =	15.7	100	10	100
Copper	22 =	27 =	14.6 B	9.7 U	15 B	12.6 B	24.5	1300	130	100 ⁴
Manganese	320 =	670 =	338 =	147 =	205 =	264 =	324	50	25	50 ⁴
Zinc	34 =	54 =	31.8 =	17.1 *	21 =	21.6 *	29.9	5000	2500	5000 ⁴
Cadmium	NT	1.6 =	0.45 =	5 J	0.43 J	0.54 J	1.60	5	0.5	5
Mercury	NT	0.2 U	0.11 B	0.07 J	0.007 UJ	0.016 UJ	0.07	2	0.2	2
Cyanide	NT	NT	1 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	NT	0.5 U	40 U	40 U	40 U	40 U	NA	200	40	200
1,1,2-Trichloroethane	NT	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	NT	0.5 U	85 U	85 U	85 U	85 U	NA	850	85	NA
1,1-Dichloroethene	NT	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	NT	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	NT	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	6	0.6	NA
Toluene	NT	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	NT	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	NT	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Xylenes, Total	NT	0.5 U	124 U	0.4 J	0.3 JB	120 U	0.4	620	124	10000

¹ Average concentration using detected results only.

² Wis. Adm. Code NR 140.10

³ 40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

"**": Laboratory duplicate analyses not within control limits.

ATTACHMENT B

Analytical Results for W-15

N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	32 =	5.9 =	13.9 =	5.7 =	3.9 U	10 =	13.5	100	10	100
Copper	52 =	15 =	18.8 B	9.7 B	9.5 U	13.2 B	33.5	1300	130	100 ⁴
Manganese	430 =	97 =	325 =	80.9 =	85.7 =	147 =	194	50	25	50 ⁴
Zinc	88 =	39 =	35.5 =	18.5 *	13.7 =	18.8 *	35.6	5000	2500	5000 ⁴
Cadmium	NT	0.27 =	0.31 =	0.12 J	0.04 UJ	0.11 J	0.20	5	0.5	5
Mercury	NT	0.2 U	0.03 U	0.03 J	0.038 J	0.016 UJ	0.03	2	0.2	2
Cyanide	NT	NT	0.78 U	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	40 U	40 U	40 U	40 U	NA	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	85 U	85 U	85 U	85 U	NA	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	0.5 U	0.22 =	0.6 U	0.6 U	0.6 U	0.6 U	0.2	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	0.5 U	0.5 U	0.304 J	0.5 U	0.5 U	0.5 U	0.3	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	0.4 JB	120 U	0.4	620	124	10000

¹ Average concentration using detected results only.

² Wis. Adm. Code NR 140.10

³ 40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

"**": Laboratory duplicate analyses not within control limits.

ATTACHMENT B
Analytical Results for MW-101
N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	36 =	10 =	11.9 =	12.8 =	20.9 =	48.2 =	23.3	100	10	100
Copper	41 =	11 =	10.7 B	9.7 U	21.6 B	46.8 =	32.9	1300	130	100 ⁴
Manganese	820 =	170 =	145 =	176 =	239 =	604 =	359	50	25	50 ⁴
Zinc	49 =	18 =	18.2 =	20.7 *	32.7 =	75.9 *	35.8	5000	2500	5000 ⁴
Cadmium	NT	0.2 U	0.06 B	0.06 J	0.04 UJ	0.27 J	0.17	5	0.5	5
Mercury	NT	0.2 U	0.03 U	0.05 J	0.007 UJ	0.044 J	0.05	2	0.2	2
Cyanide	NT	NT	1 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	3.03 J	40 U	40 U	40 UJ	3.0	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	0.491 J	85 U	85 U	85 UJ	0.5	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.353 J	0.7 U	0.7 U	0.7 UJ	0.54	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	5	0.5	5
Chloroform	0.5 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 UJ	NA	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 UJ	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 UJ	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	0.5 U	0.5 U	3.31 =	0.5 U	0.5 U	0.5 UJ	3.3	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	120 U	120 UJ	NA	620	124	10000

¹ Average concentration using detected results only.

²Wis. Adm. Code NR 140.10

³40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

"*": Laboratory duplicate analyses not within control limits.

ATTACHMENT B

Analytical Results for MW-102
N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDR ES ² (ug/L)	WDR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	26 =	48 =	3.92 U	3.9 U	3.9 U	3.9 U	37.00	100	10	100
Copper	38 =	77 =	6.9 B	9.7 U	9.5 B	9.8 U	57.5	1300	130	100 ⁴
Manganese	570 =	920 =	302 =	387 =	302 =	318 =	467	50	25	50 ⁴
Zinc	34 =	73 =	8.7 =	10.9 *	7.4 J	9.5 *	23.9	5000	2500	5000 ⁴
Cadmium	NT	0.21 =	0.08 B	0.04 UJ	0.11 J	0.04 J	0.12	5	0.5	5
Mercury	NT	0.2 U	0.03 UN	0.04 J	0.007 UJ	0.018 J	0.03	2	0.2	2
Cyanide	NT	NT	2 B	0.8 U	1.7 U	1.7 U	1.55	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	40 U	40 U	40 U	40 U	NA	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	85 U	85 U	85 U	85 U	NA	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	0.5 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	0.4 JB	120 U	0.4	620	124	10000

¹ Average concentration using detected results only.

² Wis. Adm. Code NR 140.10

³ 40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

*=: The analyte was positively identified and the associated concentration is accurate.

J: The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U: The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ: The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

UN: Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

US: The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

B: Compound was found in blank and in the sample.

JB: Compound was found in one of the associated blanks and the sample result is estimated.

D: Diluted.

DJ: Diluted and estimated.

E: Above calibration curve.

R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

***: Laboratory duplicate analyses not within control limits.

ATTACHMENT B
Analytical Results for MW-103
N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	1300 =	160 =	35.2 =	16.3 =	15.5 =	57.6 =	264.1	100	10	100
Copper	47 =	31 =	13.5 B	9.7 U	9.5 U	27.5 =	35.2	1300	130	100 ⁴
Manganese	800 =	900 =	287 =	84.3 =	83 =	417 =	429	50	25	50 ⁴
Zinc	27 =	29 =	13.7 =	21.4 *	7.5 J	33.7 *	22.1	5000	2500	5000 ⁴
Cadmium	NT	0.2 U	0.06 B	0.04 UJ	0.04 UJ	0.15 J	0.15	5	0.5	5
Mercury	NT	0.2 U	0.03 UN	0.09 J	0.007 UJ	0.02 J	0.06	2	0.2	2
Cyanide	NT	NT	3 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	40 U	40 U	40 U	40 U	NA	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	85 U	85 U	85 U	85 U	NA	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	0.5 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	120 U	120 U	NA	620	124	10000

¹ Average concentration using detected results only.

²Wis. Adm. Code NR 140.10

³40 CFR 141.61 and 141.62

⁴Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

"*": Laboratory duplicate analyses not within control limits.

ATTACHMENT B
Analytical Results for MW-104
N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Aluminum	NT	NT	NT	NT	2290 J	NT	2290	NA	NA	NA
Chromium	5.9 =	6.9 =	35.6 =	61.8 =	66.8 =	219 =	66.0	100	10	100
Copper	15 =	11 =	5 B	9.8 B	9.5 U	9.8 U	13	1300	130	100 ⁴
Manganese	550 =	470 =	235 =	279 =	73.6 =	107 =	285.8	50	25	50 ⁴
Nickel	NT	NT	NT	NT	9.5 UJ	NT	NA	100	20	NA
Zinc	6.9 =	5.2 =	4.74 =	14 *	7.4 J	12.8 *	8.51	5000	2500	5000 ⁴
Arsenic	NT	NT	NT	NT	2 US	NT	NA	50	5	50
Cadmium	NT	0.2 U	0.04 U	0.04 UJ	0.04 UJ	0.04 UJ	NA	5	0.5	5
Lead	NT	NT	NT	NT	3.4 J	NT	3.4	15	1.5	NA
Mercury	NT	0.2 U	0.03 N	0.05 J	0.008 J	0.016 UJ	0.029	2	0.2	2
Cyanide	NT	NT	3 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	0.324 J	1 J	0.8 J	2 J	1.0	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	85 U	0.4 J	85 U	85 U	0.4	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	0.5 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ³	7/20 ³	70/100 ³
Trichloroethene	0.5 U	0.5 U	0.5 U	0.9 =	0.5 U	0.5 U	0.9	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	120 U	120 U	NA	620	124	10000

¹ Average concentration using detected results only.

² Wis. Adm. Code NR 140.10

³ 40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

"*": Laboratory duplicate analyses not within control limits.

ATTACHMENT B

Analytical Results for MW-105

N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	21 =	5 =	29.5 =	15.8 =	30.8 =	13.7 =	19.3	100	10	100
Copper	22 =	10 U	28.3 =	12.5 B	27.6 =	15.3 B	26.0	1300	130	100 ⁴
Manganese	1100 =	120 =	532 =	297 =	518 =	217 =	464	50	25	50 ⁴
Zinc	23 =	12 =	46 =	27.1 *	44 =	22.1 *	29.0	5000	2500	5000 ⁴
Cadmium	NT	0.2 U	0.14 B	0.36 J	0.04 UJ	0.048 J	0.204	5	0.5	5
Mercury	NT	0.2 U	0.03 U	0.03 J	0.064 J	0.016 UJ	0.047	2	0.2	2
Cyanide	NT	NT	1 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	40 U	40 U	40 U	40 U	NA	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	85 U	85 U	85 U	85 U	NA	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	0.5 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	0.4 JB	120 U	0.4	620	124	10000

¹ Average concentration using detected results only.

²Wis. Adm. Code NR 140.10

³40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

"*": Laboratory duplicate analyses not within control limits.

ATTACHMENT B

Analytical Results for MW-106

N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	21 =	40 =	5.5 =	9.2 =	13.4 =	3.9 U	17.82	100	10	100
Copper	24 =	35 =	6.2 B	9.7 B	14.4 B	10.2 B	29.5	1300	130	100 ⁴
Manganese	320 =	590 =	56.9 =	155 =	150 =	10 =	214	50	25	50 ⁴
Zinc	26 =	68 =	35.6 =	18.4 *	18.5 =	10.9 *	29.6	5000	2500	5000 ⁴
Cadmium	NT	0.2 U	0.05 B	0.04 UJ	0.04 R	0.04 UJ	NA	5	0.5	5
Mercury	NT	0.2 U	0.03 U	0.03 J	0.007 UJ	0.016 UJ	0.030	2	0.2	2
Cyanide	NT	NT	1 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	2.73 J	40 U	40 U	40 U	2.7	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	85 U	85 U	85 U	85 U	NA	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	0.5 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	0.5 U	0.5 U	2.99 =	0.5 U	0.5 U	0.5 U	3.0	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	120 U	120 U	NA	620	124	10000

¹ Average concentration using detected results only.

² Wis. Adm. Code NR 140.10

³ 40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

"=": The analyte was positively identified and the associated concentration is accurate.

"J": The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

"U": The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

"*": Laboratory duplicate analyses not within control limits.

ATTACHMENT B

Analytical Results for MW-107
N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	2000 =	3600 =	2670 =	2310 =	11200 J	6240 =	4670	100	10	100
Copper	13 =	10 U	8.1 U	9.7 U	12.1 B	13.8 B	13.0	1300	130	100 ⁴
Manganese	190 =	91 =	59.3 =	48.4 =	68.2 =	161 =	103	50	25	50 ⁴
Zinc	6.9 =	10 =	33.5 =	6.7 *	9.3 J	17.3 *	13.95	5000	2500	5000 ⁴
Cadmium	NT	0.2 U	0.04 U	0.04 UJ	0.04 UJ	0.11 J	0.11	5	0.5	5
Mercury	NT	0.2 U	0.03 U	0.1 J	0.041 J	0.027 J	0.056	2	0.2	2
Cyanide	NT	NT	1 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	81 =	390 =	265 JD	280 E	720 E	340 JD	346	200	40	200
1,1,2-Trichloroethane	0.6 =	3.5 =	2.83 =	3 =	5 =	4 J	3.155	5	0.5	5
1,1-Dichloroethane	11 =	36 =	47.6 JD	56 JD	61 JD	59 JD	45.1	850	85	NA
1,1-Dichloroethene	8.4 =	40 =	22.1 D	23 D	69 D	58 D	36.75	7	0.7	7
Benzene	0.5 U	0.09 =	10 U	10 U	25 U	12 U	0.1	5	0.5	5
Chloroform	0.3 =	1.1 =	12 U	12 U	30 U	15 U	0.7	6	0.6	NA
Toluene	0.5 U	0.34 =	68 U	68 U	68 U	68 J	22.9	343	68.6	1000
Total 1,2-Dichloroethene	0.7 =	3.1 =	2.61 J	3 J	5 J	3 UJ	2.9	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	50 =	420 =	295 D	290 E	620 D	390 D	344.2	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	2480 U	2500 U	17 JB	3100 U	17	620	124	10000

¹ Average concentration using detected results only.

²Wis. Adm. Code NR 140.10

³40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

NT - Not tested

Qualifiers:

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J: The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

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UJ: The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

UN: Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

US: The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

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JB: Compound was found in one of the associated blanks and the sample result is estimated.

D: Diluted.

DJ: Diluted and estimated.

E: Above calibration curve.

R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

***: Laboratory duplicate analyses not within control limits.

ATTACHMENT B

Analytical Results for MW-108

N.W. Mauthe Site

Parameter	Q1 97 2/20/97	Q2 97 5/27/97	Q3 97 9/18/97	Q4 97 12/12/97	Q1 98 3/25/98	Q2 98 6/10/98	Average Conc. ¹	WDNR ES ² (ug/L)	WDNR PAL ² (ug/L)	Fed. MCL ³ (ug/L)
TOTAL METALS (ug/L)										
Chromium	25 =	11 =	27.4 =	5.6 =	9.4 =	28.4 =	17.8	100	10	100
Copper	23 =	13 =	22.4 B	9.7 U	10.4 B	25.5 =	20.5	1300	130	100 ⁴
Manganese	490 =	210 =	462 =	74.8 =	142 =	478 =	309.5	50	25	50 ⁴
Zinc	31 =	15 =	36.6 =	27.9 *	13.8 =	40.5 *	27.5	5000	2500	5000 ⁴
Cadmium	NT	0.2 U	0.14 B	0.04 UJ	0.04 UJ	0.14 J	0.140	5	0.5	5
Mercury	NT	0.2 U	0.03 U	0.03 UJ	0.007 UJ	0.021 J	0.021	2	0.2	2
Cyanide	NT	NT	1 B	0.8 U	1.7 U	1.7 U	NA	200	40	200
VOA (ug/L)										
1,1,1-Trichloroethane	0.5 U	0.5 U	40 U	40 U	40 U	40 U	NA	200	40	200
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
1,1-Dichloroethane	0.5 U	0.5 U	85 U	85 U	85 U	85 U	NA	850	85	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.7 U	0.7 U	0.7 U	0.7 U	NA	7	0.7	7
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Chloroform	0.5 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	6	0.6	NA
Toluene	0.5 U	0.5 U	68 U	68 U	68 U	68 U	NA	343	68.6	1000
Total 1,2-Dichloroethene	0.5 U	0.5 U	7 U	7 U	7 U	7 U	NA	70/100 ⁵	7/20 ⁵	70/100 ⁵
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	5	0.5	5
Xylenes, Total	0.5 U	0.5 U	124 U	120 U	120 U	120 U	NA	620	124	10000

¹ Average concentration using detected results only.

² Wis. Adm. Code NR 140.10

³ 40 CFR 141.61 and 141.62

⁴ Secondary MCLs.

⁵ cis-1,2-dichloroethene/trans-1,2-dichloroethene

NA - Not available

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Qualifiers:

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"UJ": The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate.

"UN": Inorganic spike recovery not acceptable and result was not detected above the reported concentration.

"US": The analyte was not detected above the reported sample quantitation limit. The quantitation limit was determined by the Method of Standard Additions.

"B": Compound was found in blank and in the sample.

"JB": Compound was found in one of the associated blanks and the sample result is estimated.

"D": Diluted.

"DJ": Diluted and estimated.

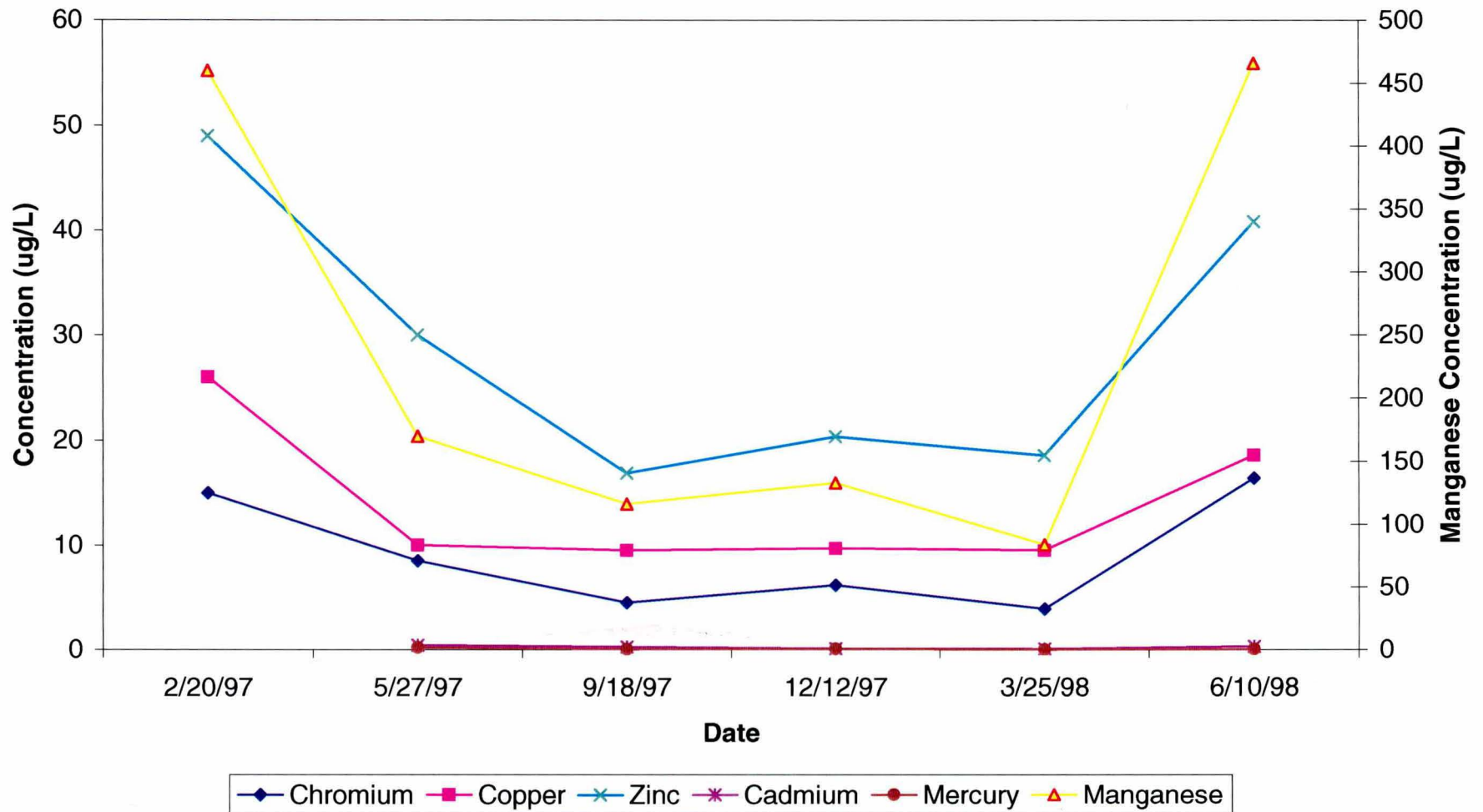
"E": Above calibration curve.

"R": The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

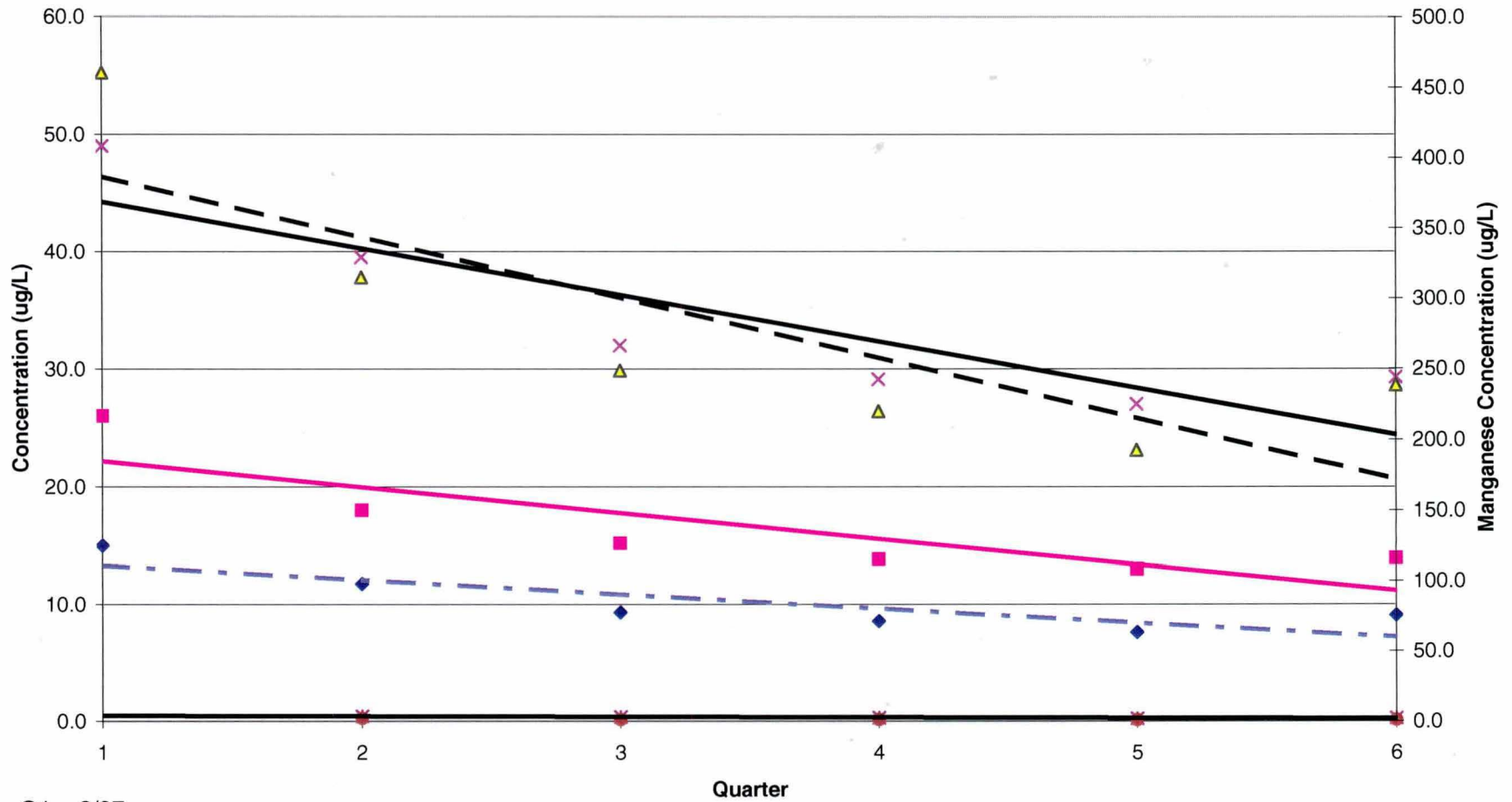
"**": Laboratory duplicate analyses not within control limits.

Trend Plots

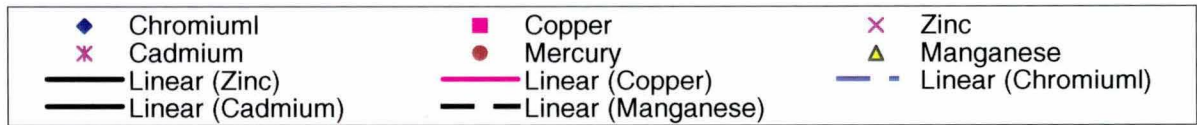
W-2 Concentration versus Time



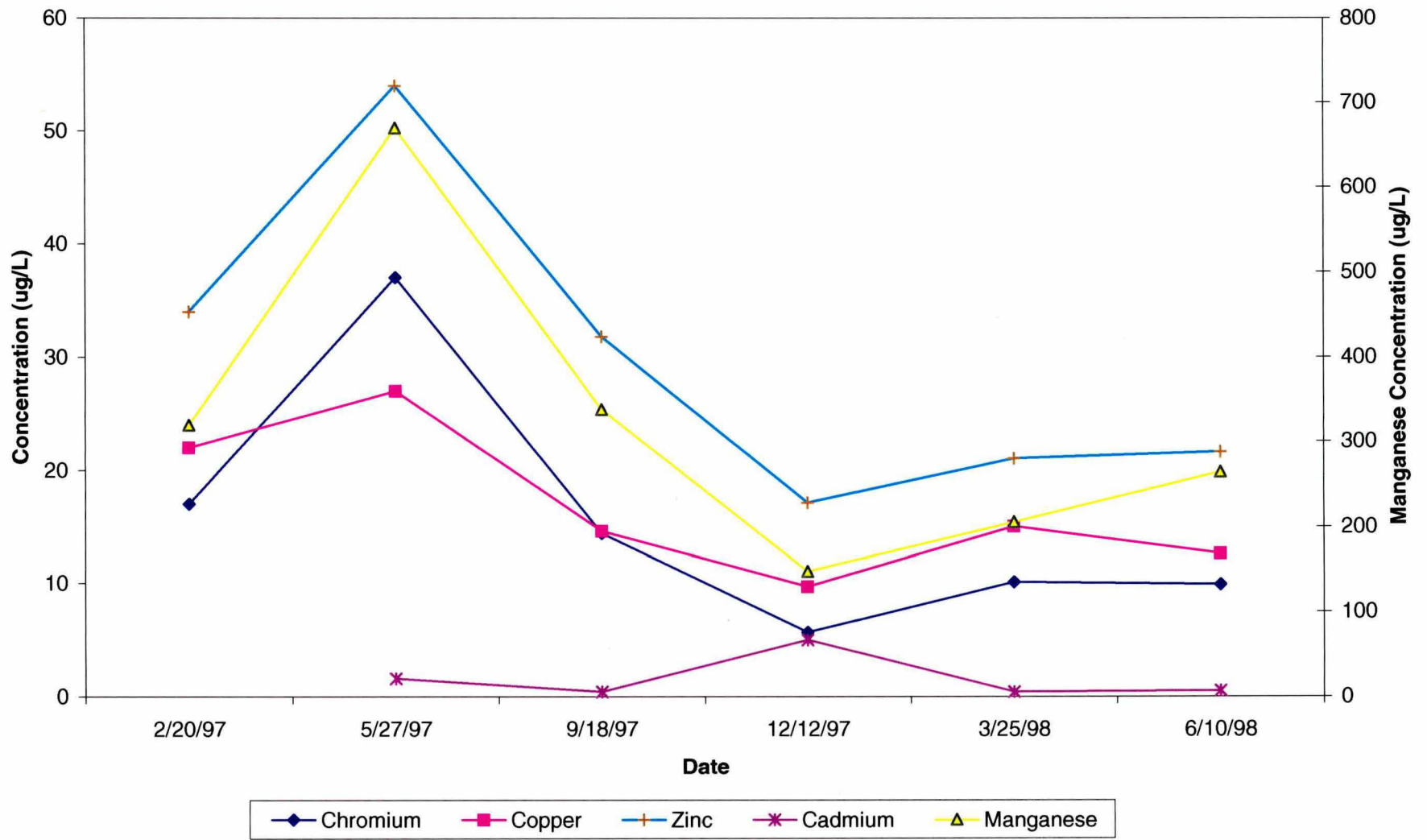
W-2 Moving Average with Linear Regression Trend Lines



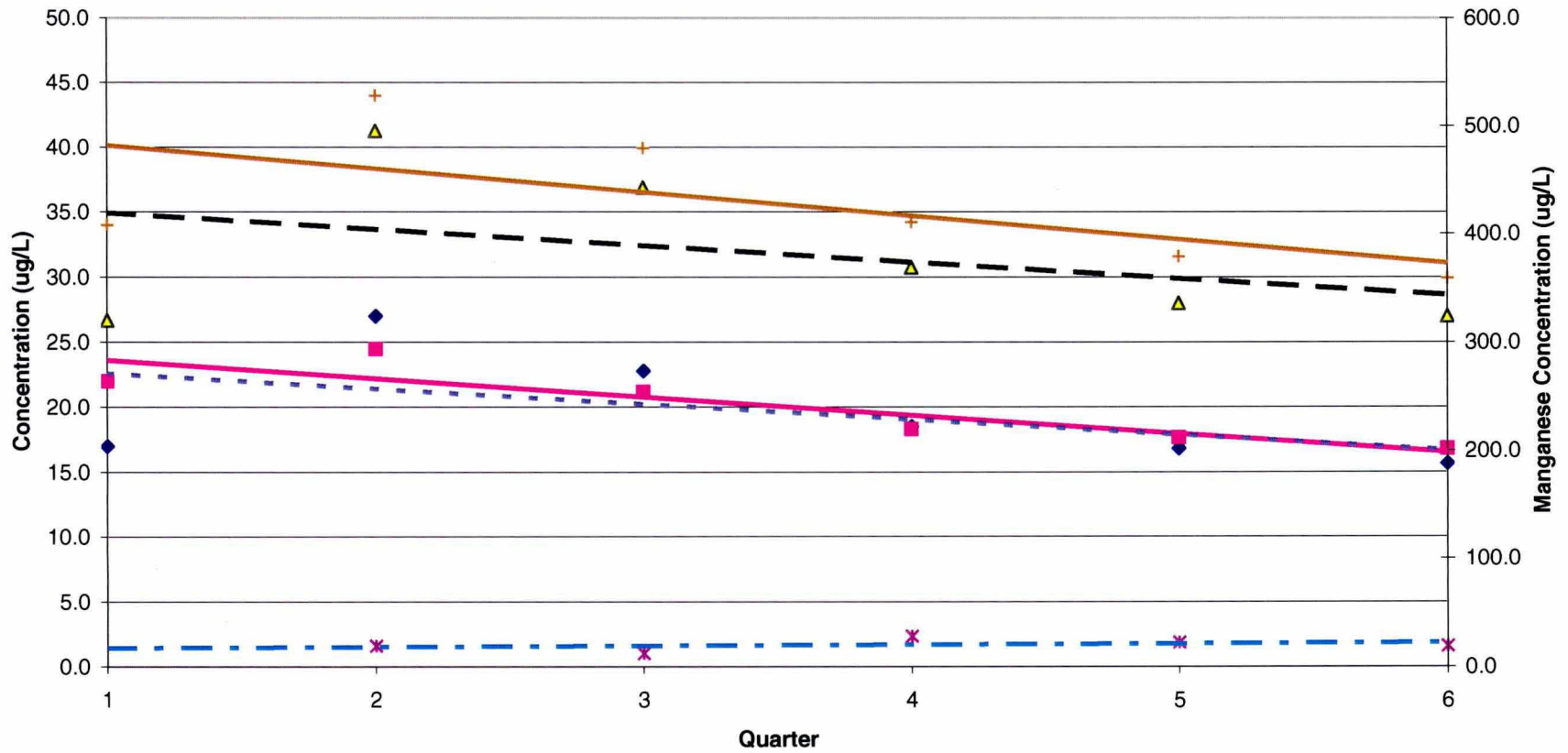
Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



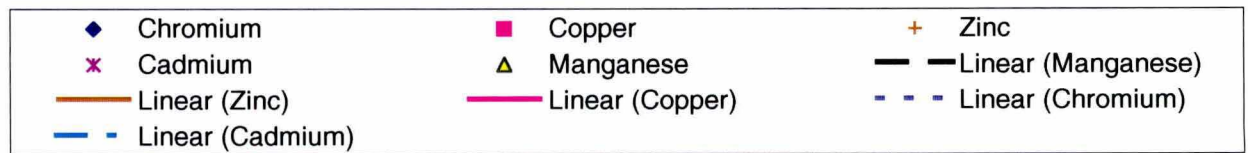
W-8 Concentration vs. Time



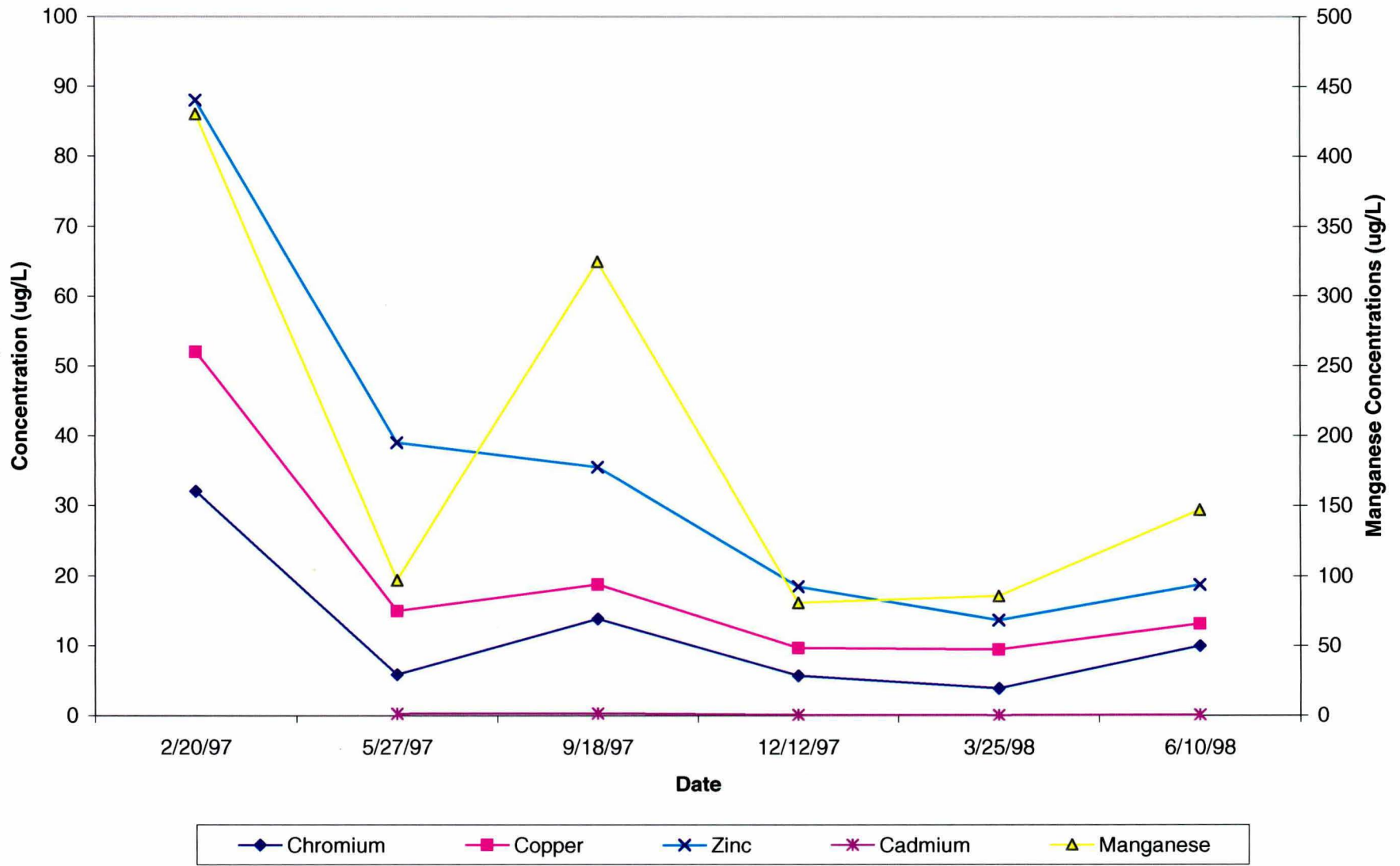
W-8 Moving Averages versus Time



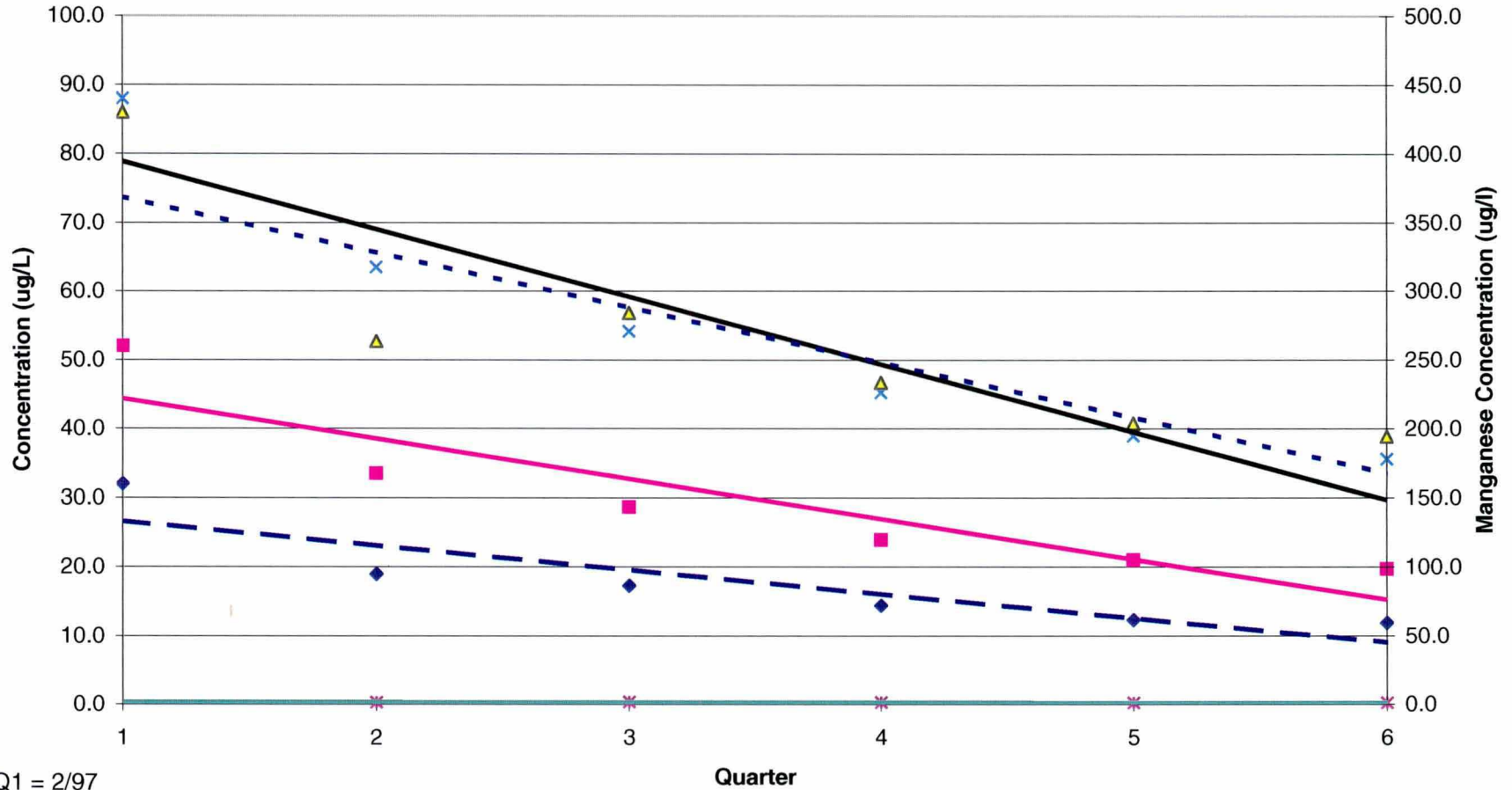
Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



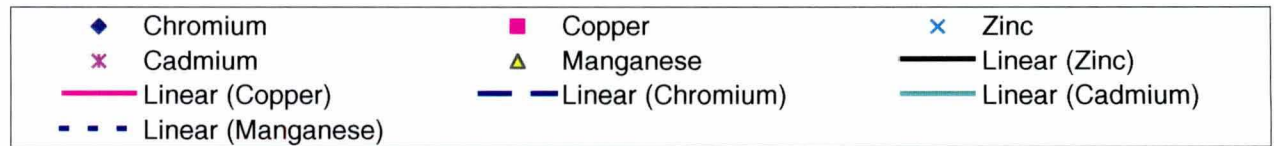
W-15



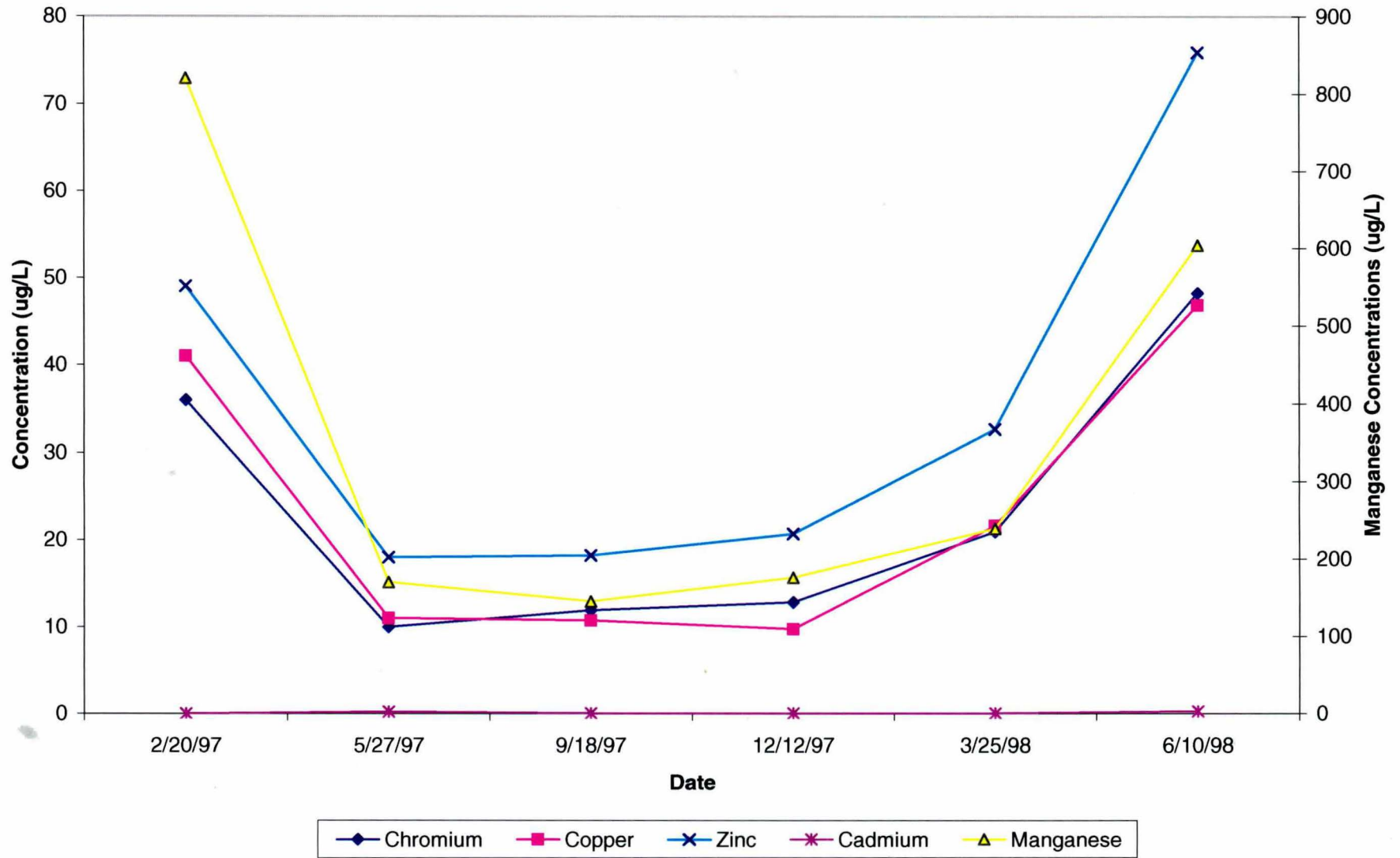
W-15 Moving Averages with Linear Regression Lines



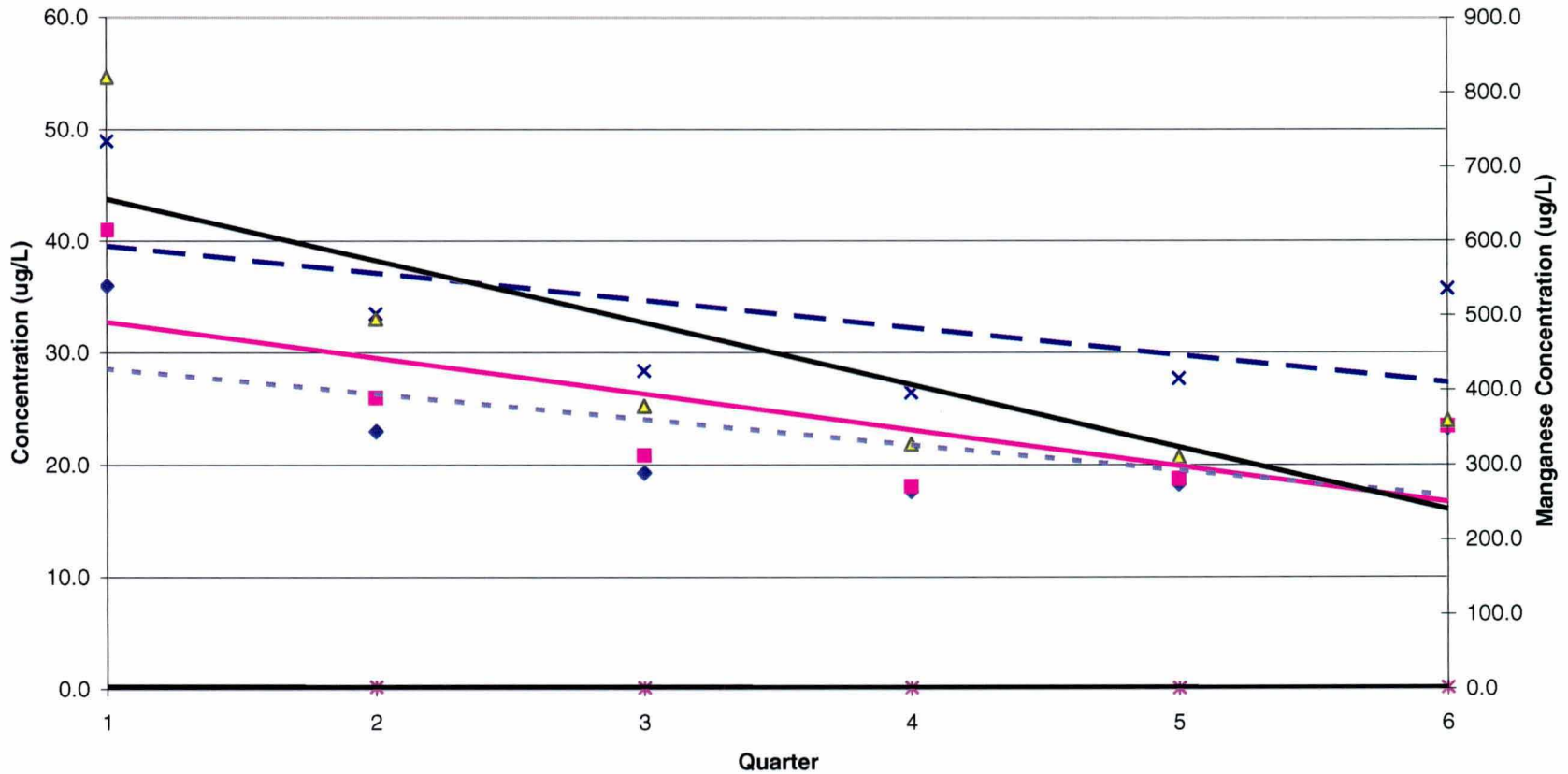
Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



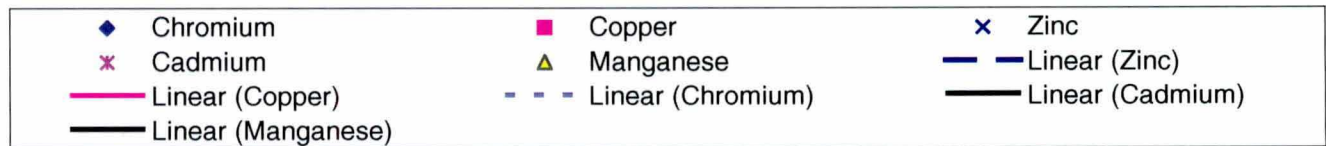
MW-101



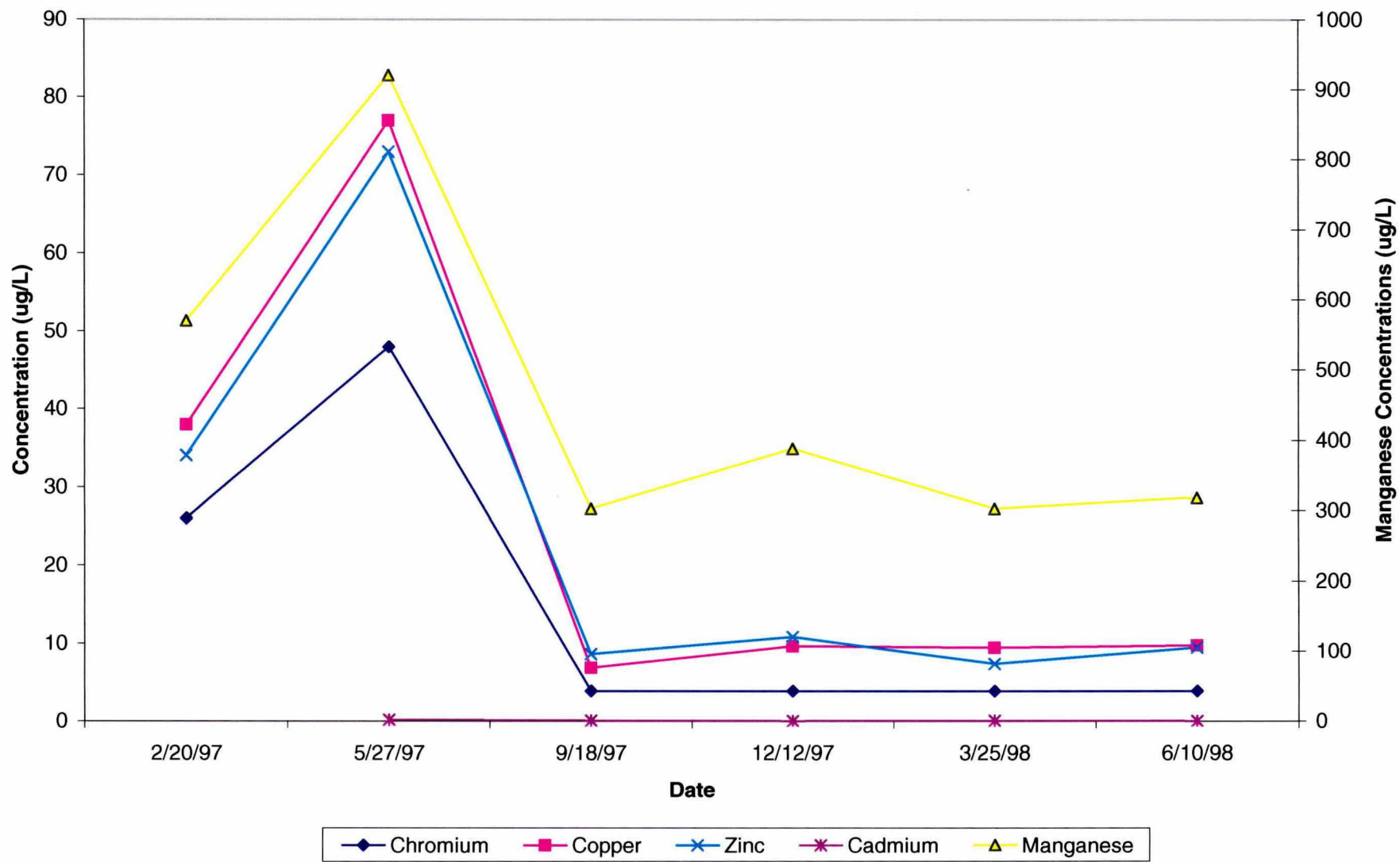
MW-101 Moving Average



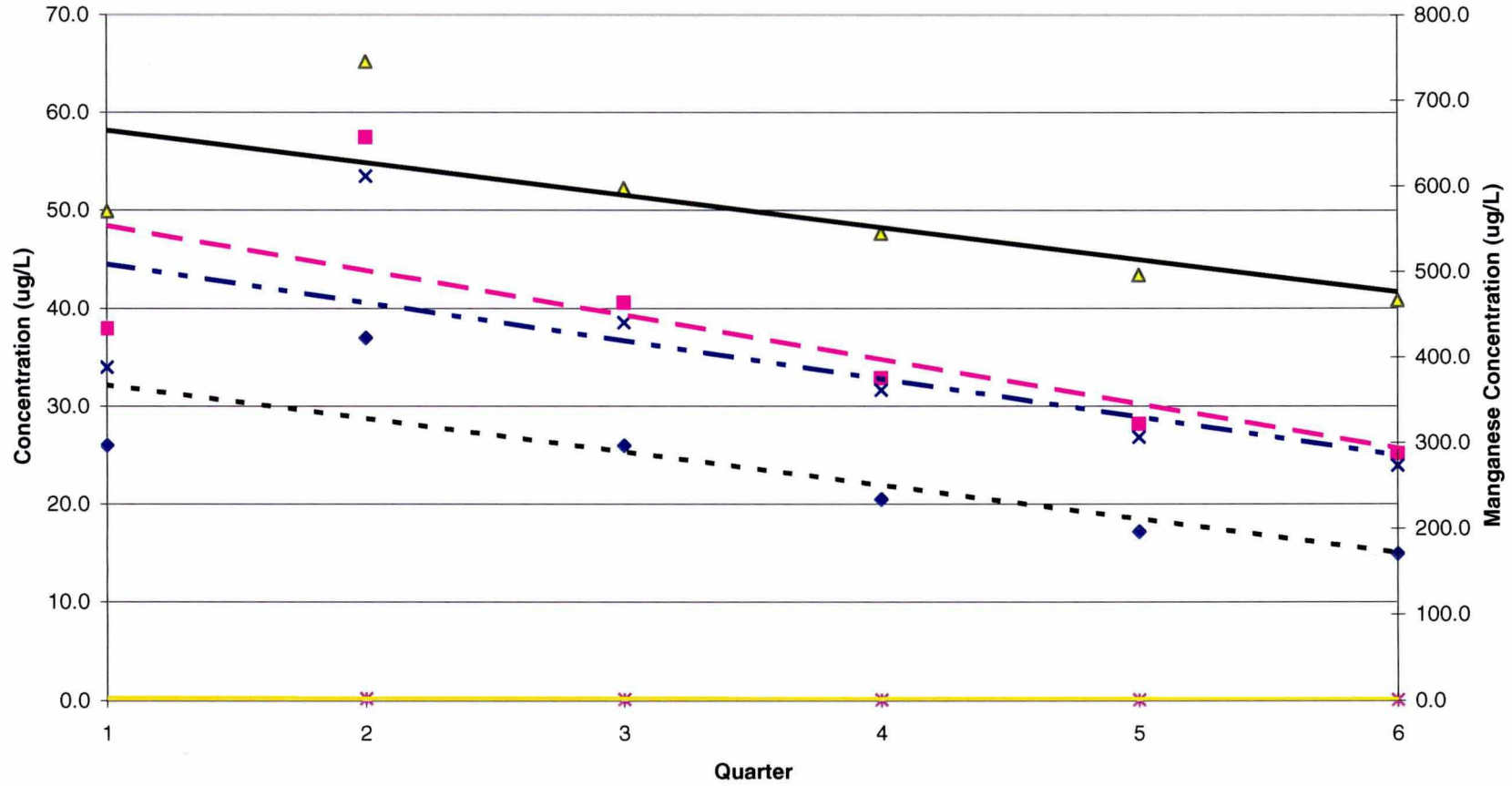
Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



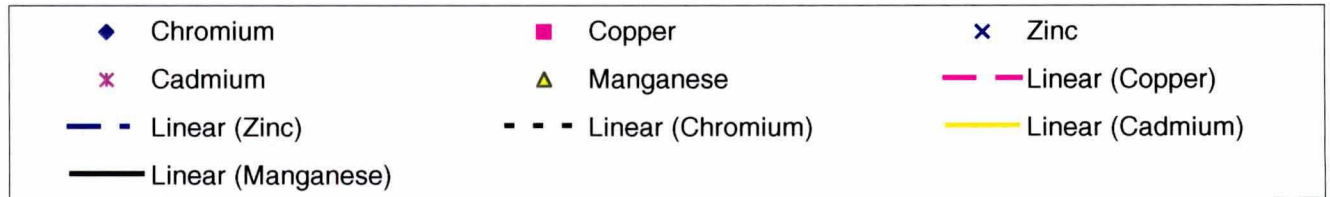
MW-102



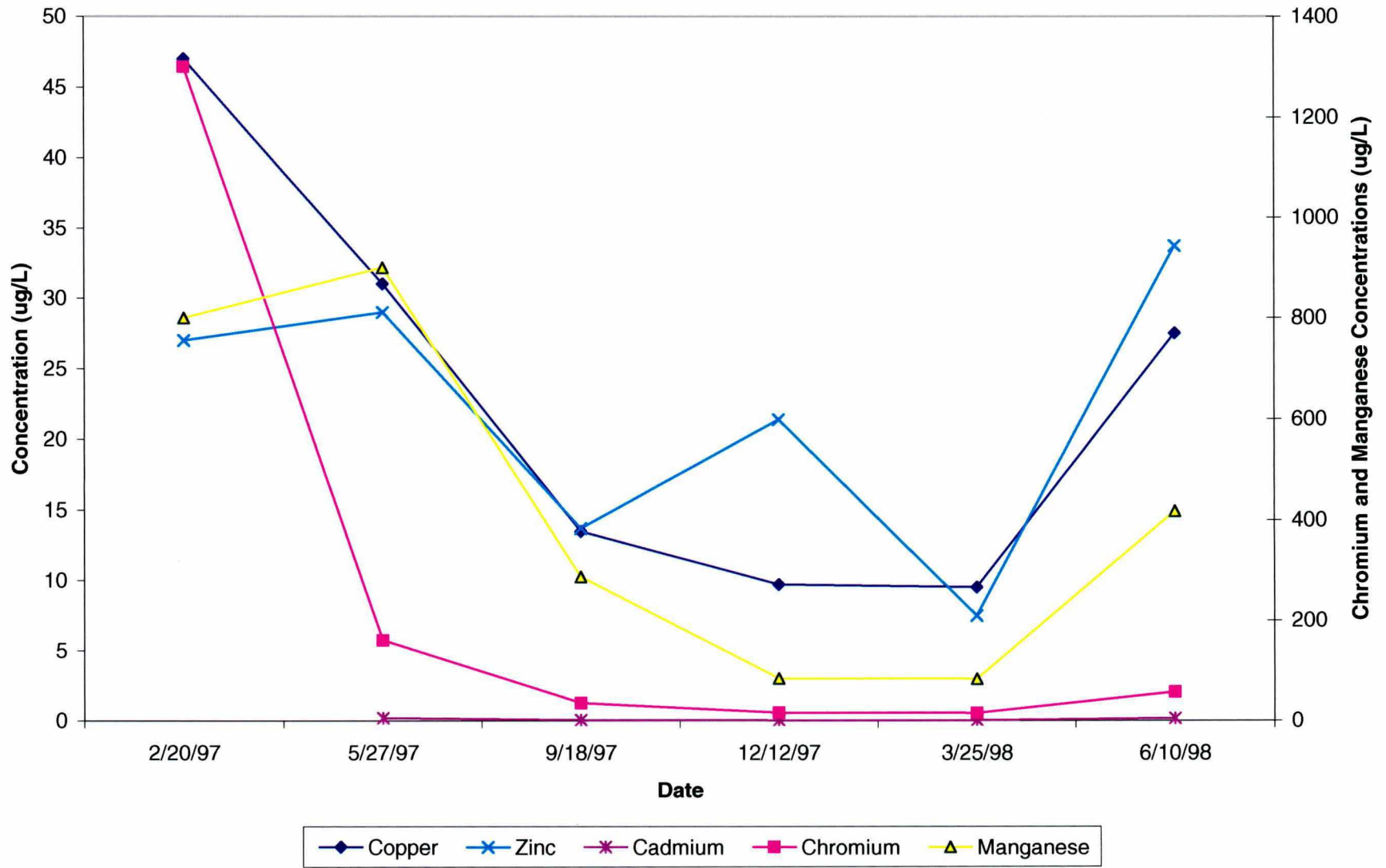
MW-102 Moving Averages with Linear Regression



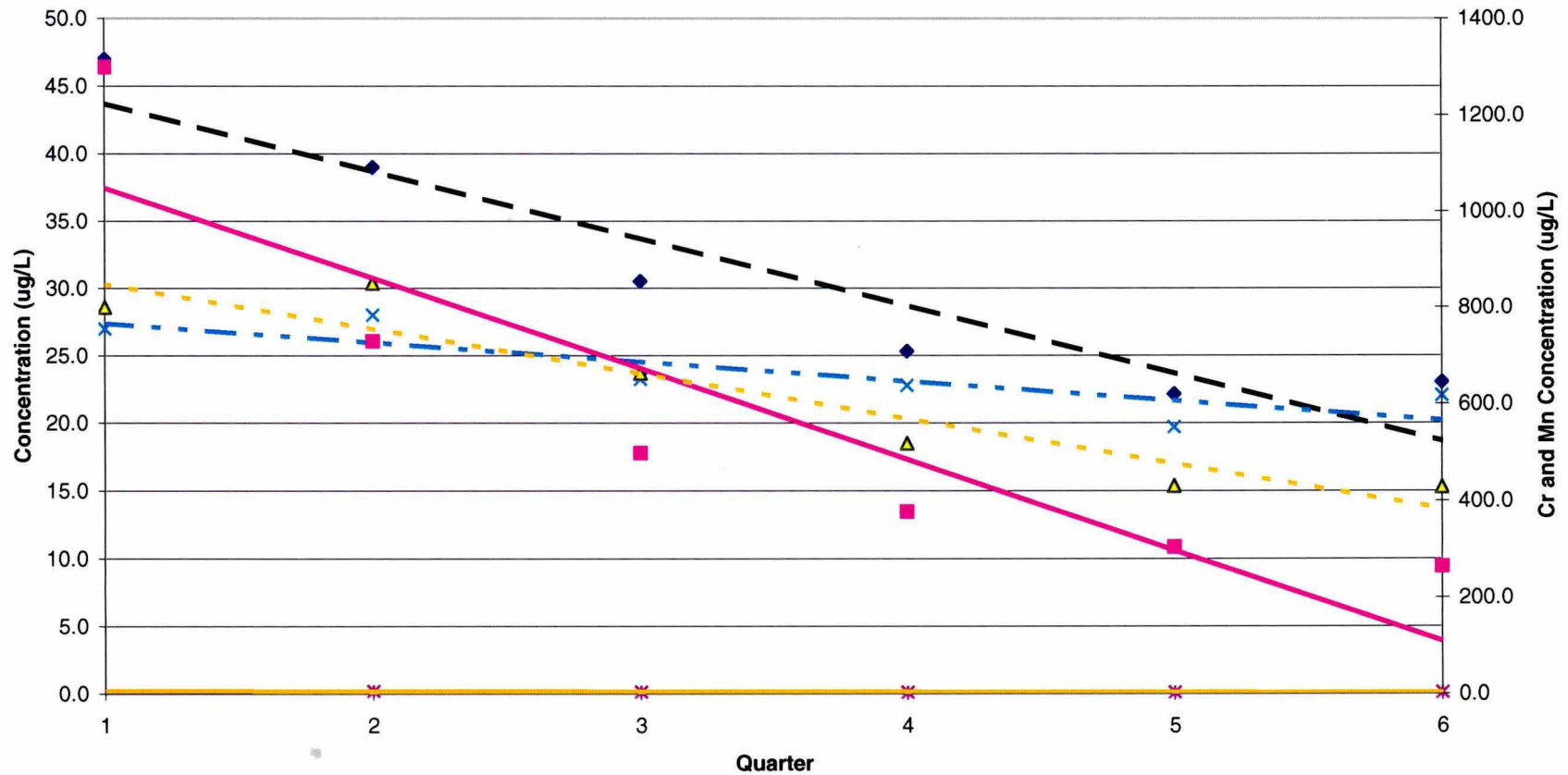
Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



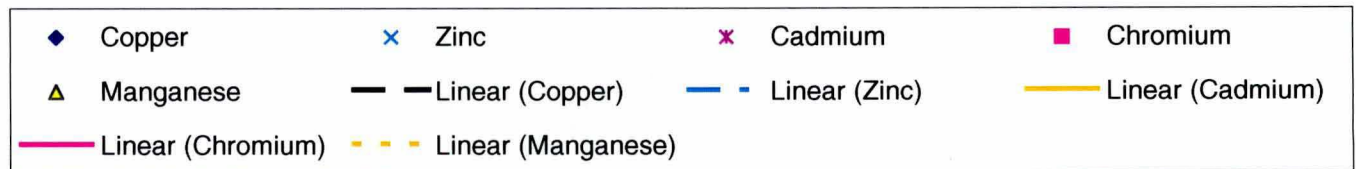
MW-103



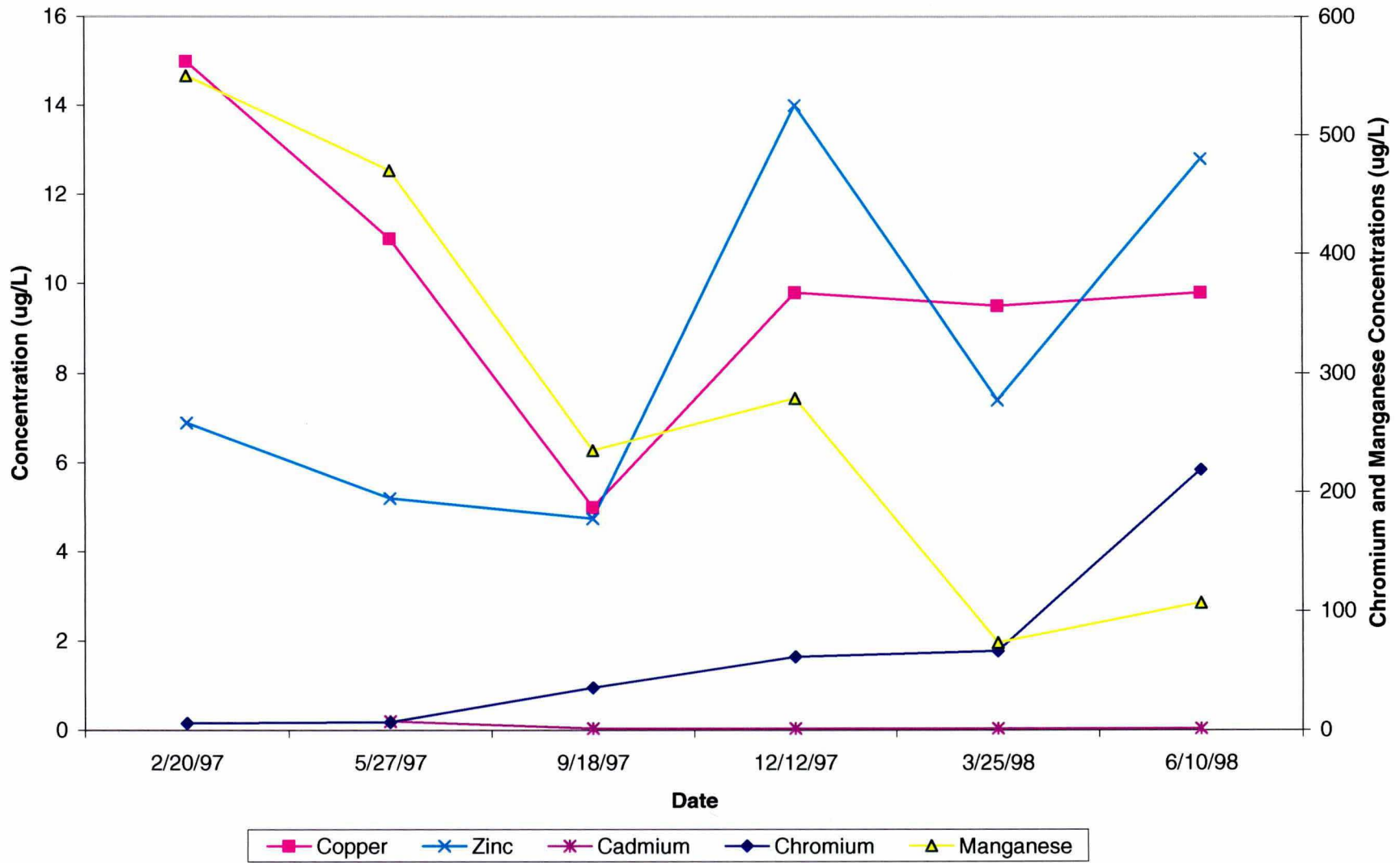
MW-103 Moving Average



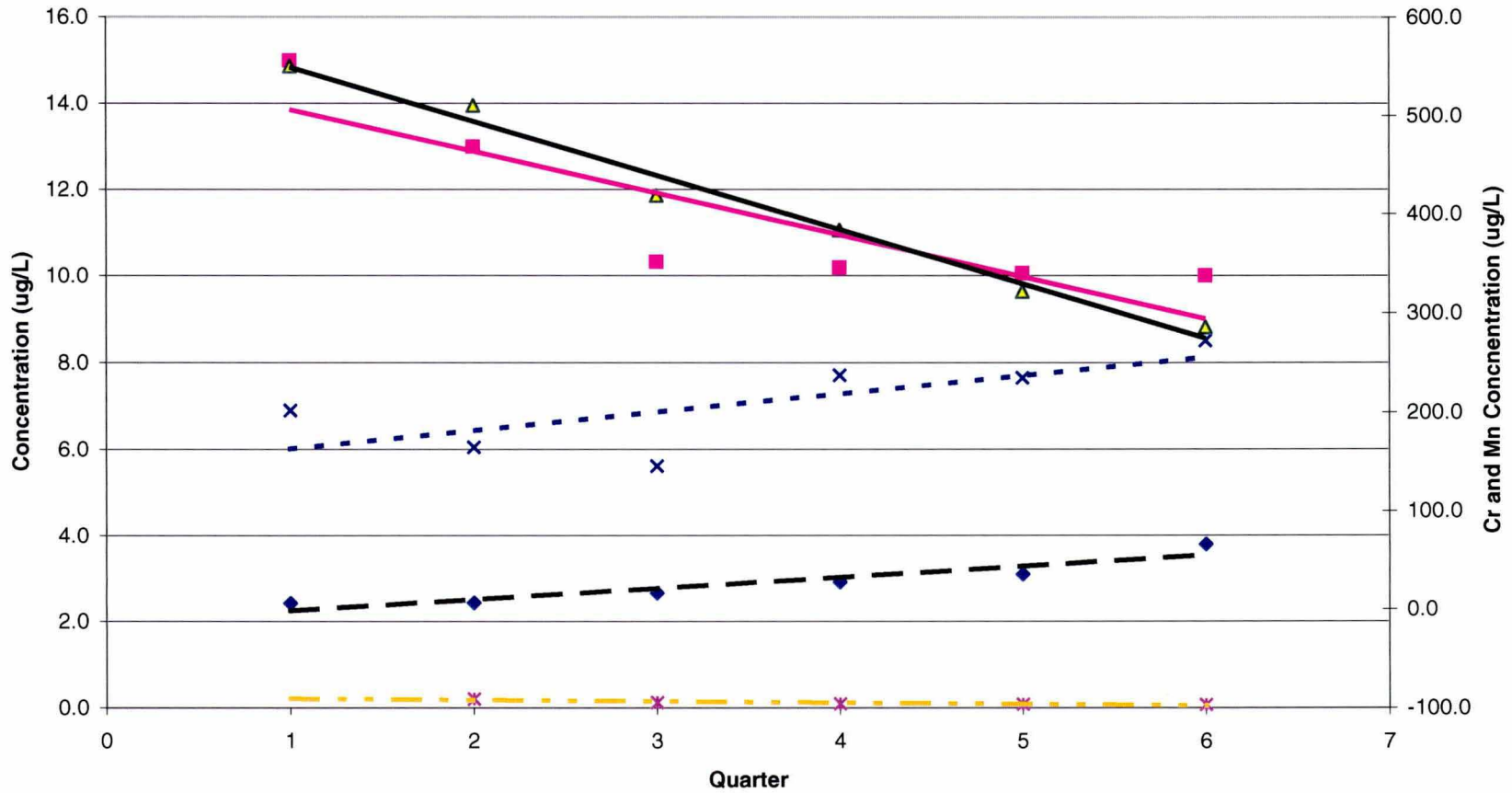
Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



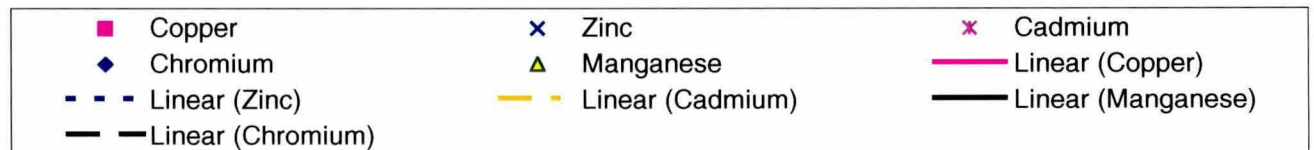
MW-104



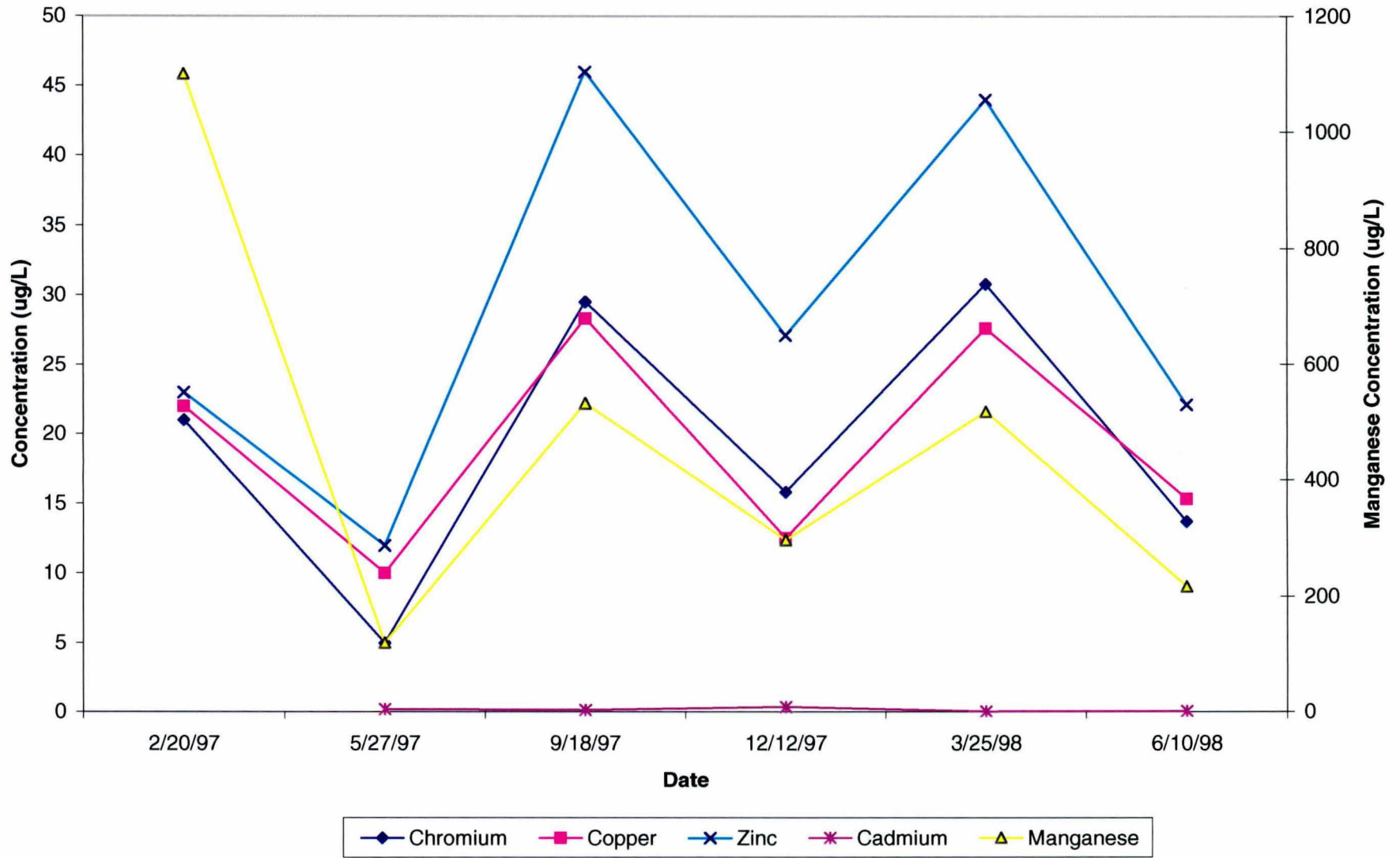
MW-104 Moving Average



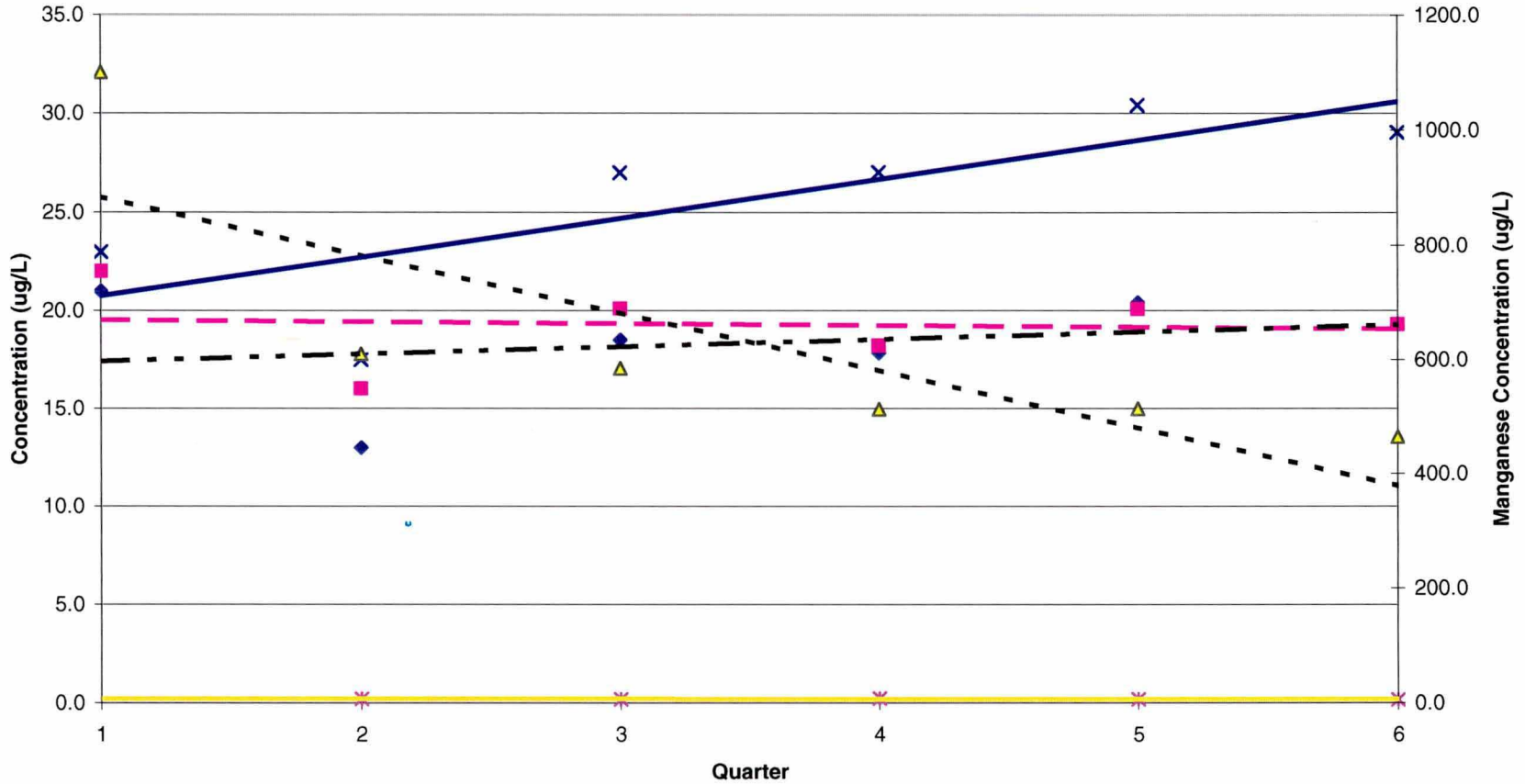
Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



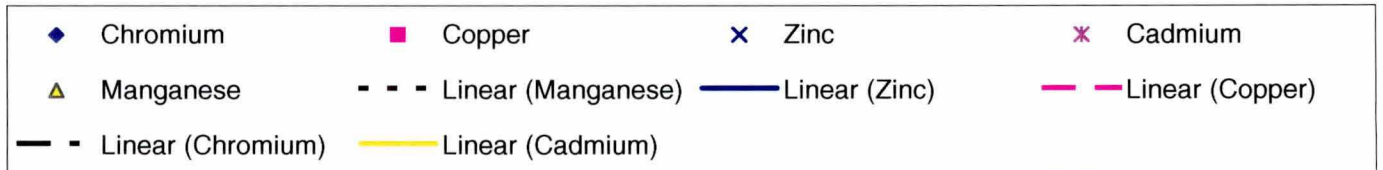
MW-105



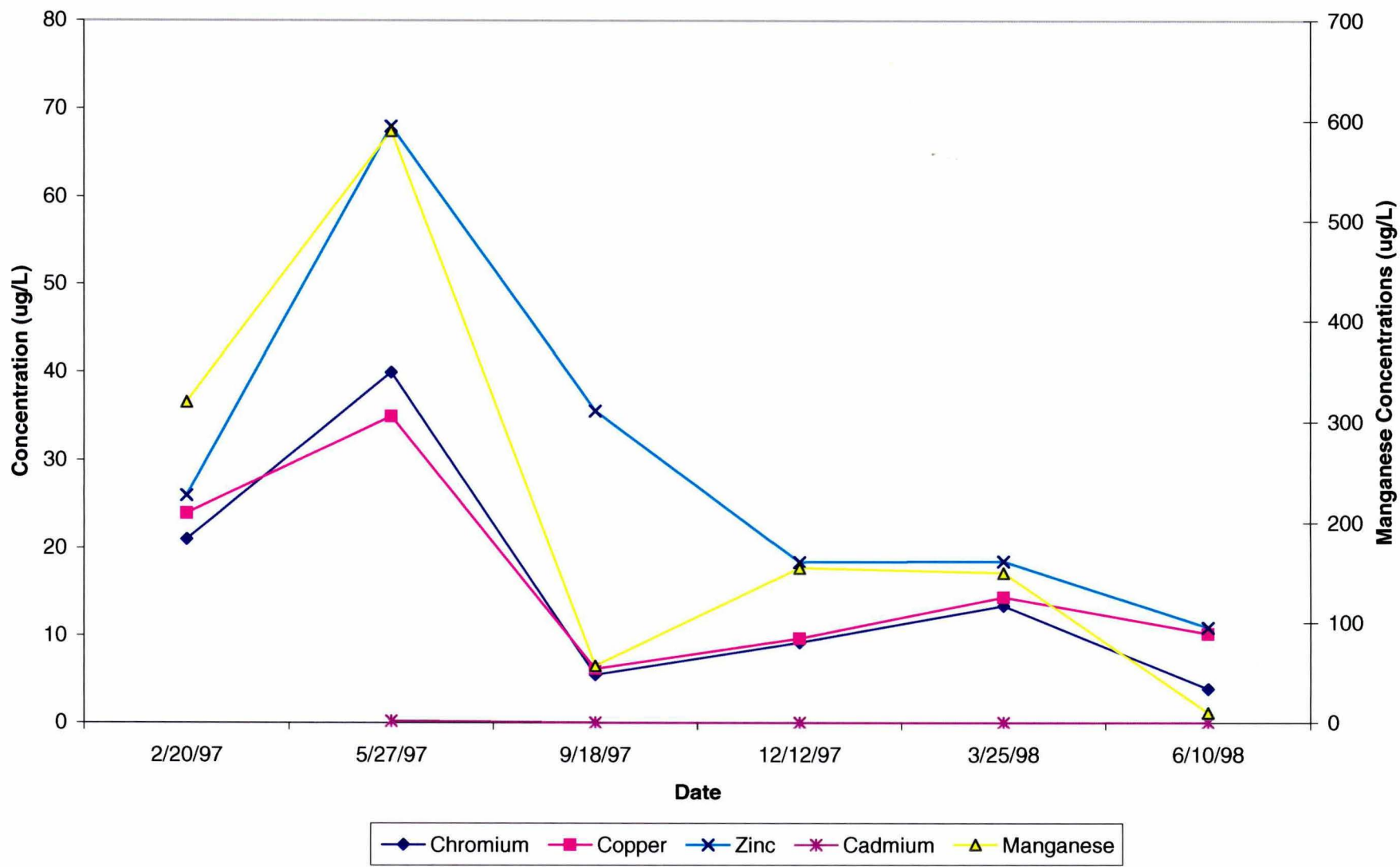
MW-105 Moving Average with Linear Regression



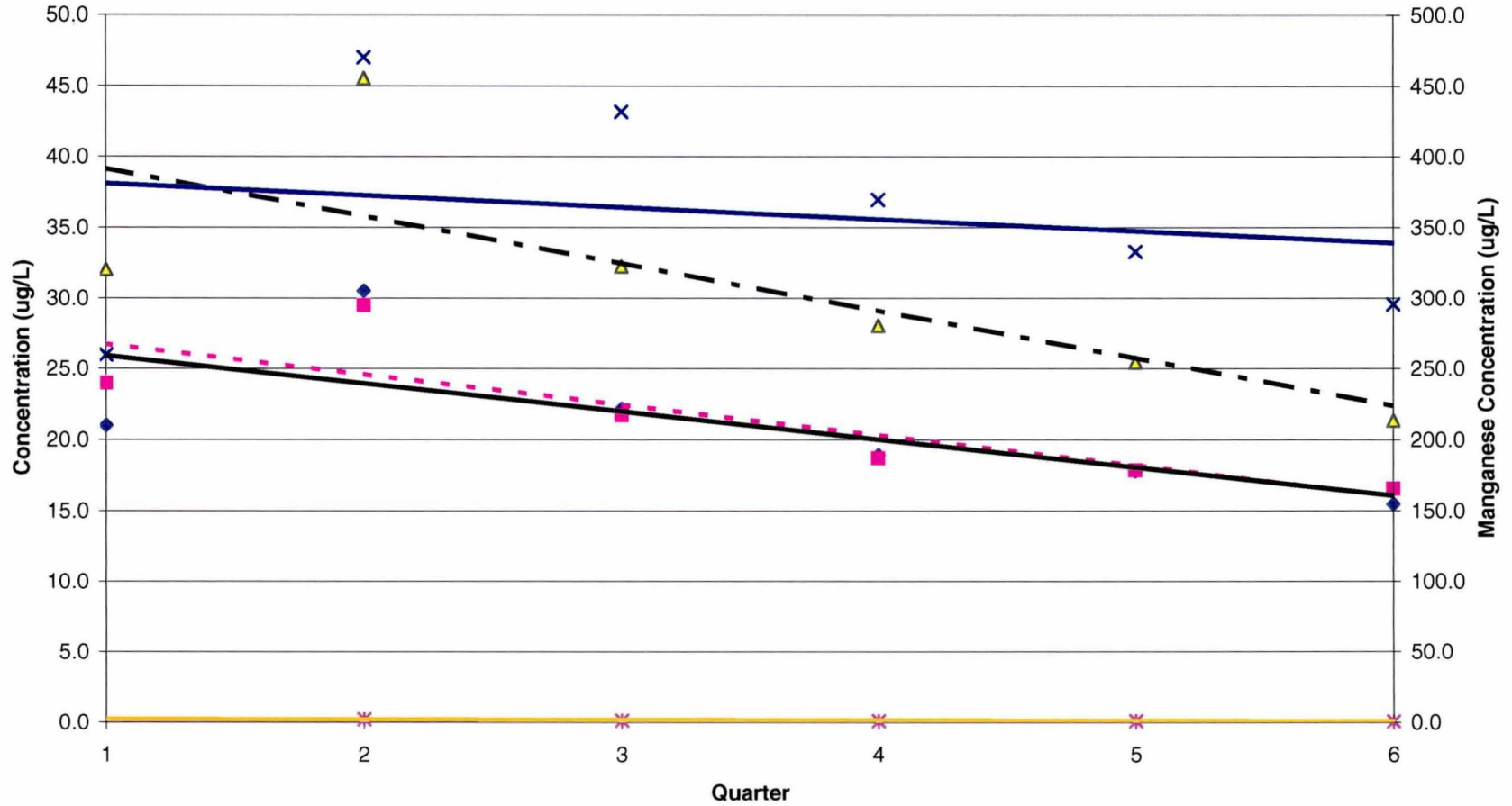
Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



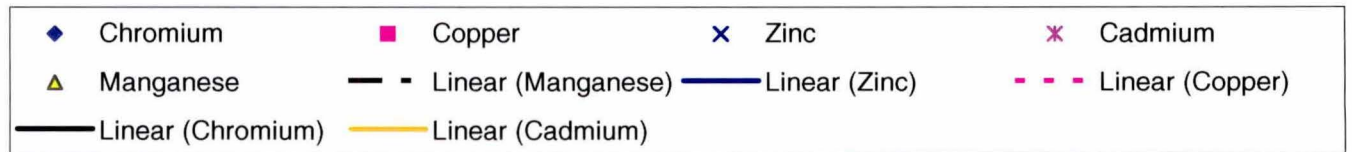
MW-106



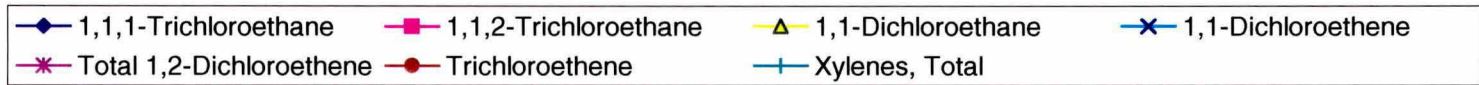
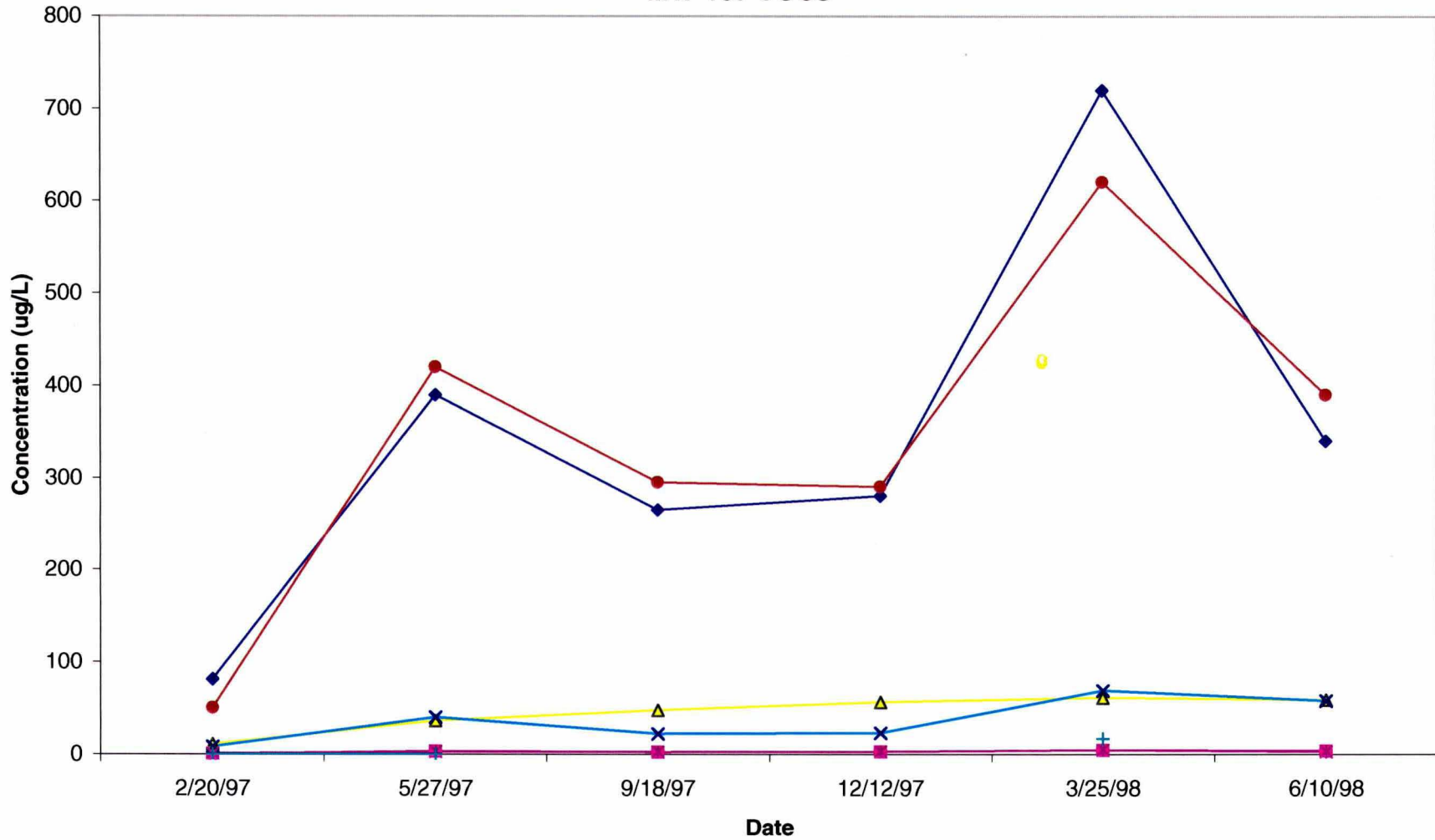
MW-106 Moving Average with Linear Regression



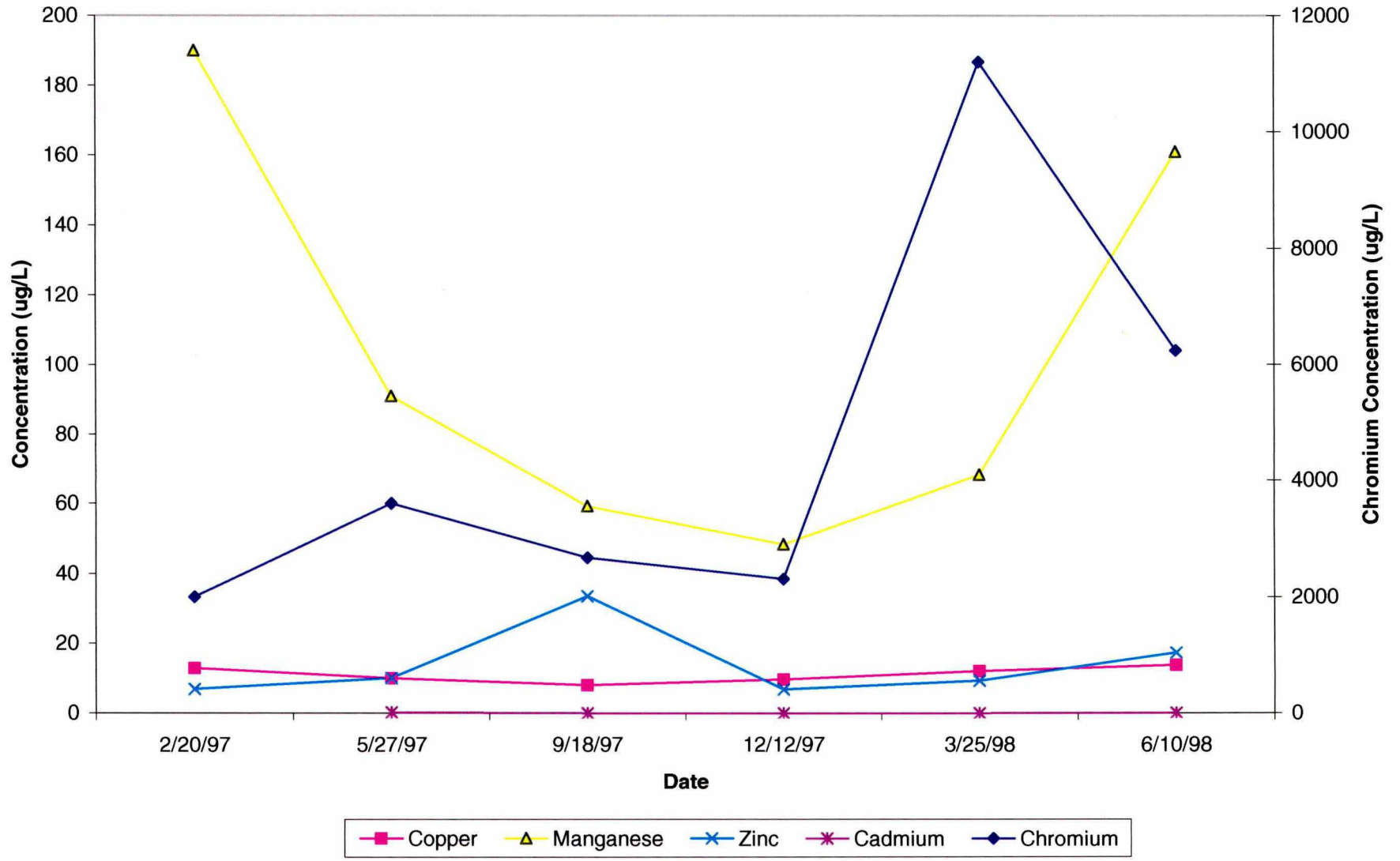
Q1 = 2/97
 Q2= 5/97
 Q3= 9/97
 Q4= 12/97
 Q5= 3/98
 Q6= 6/98



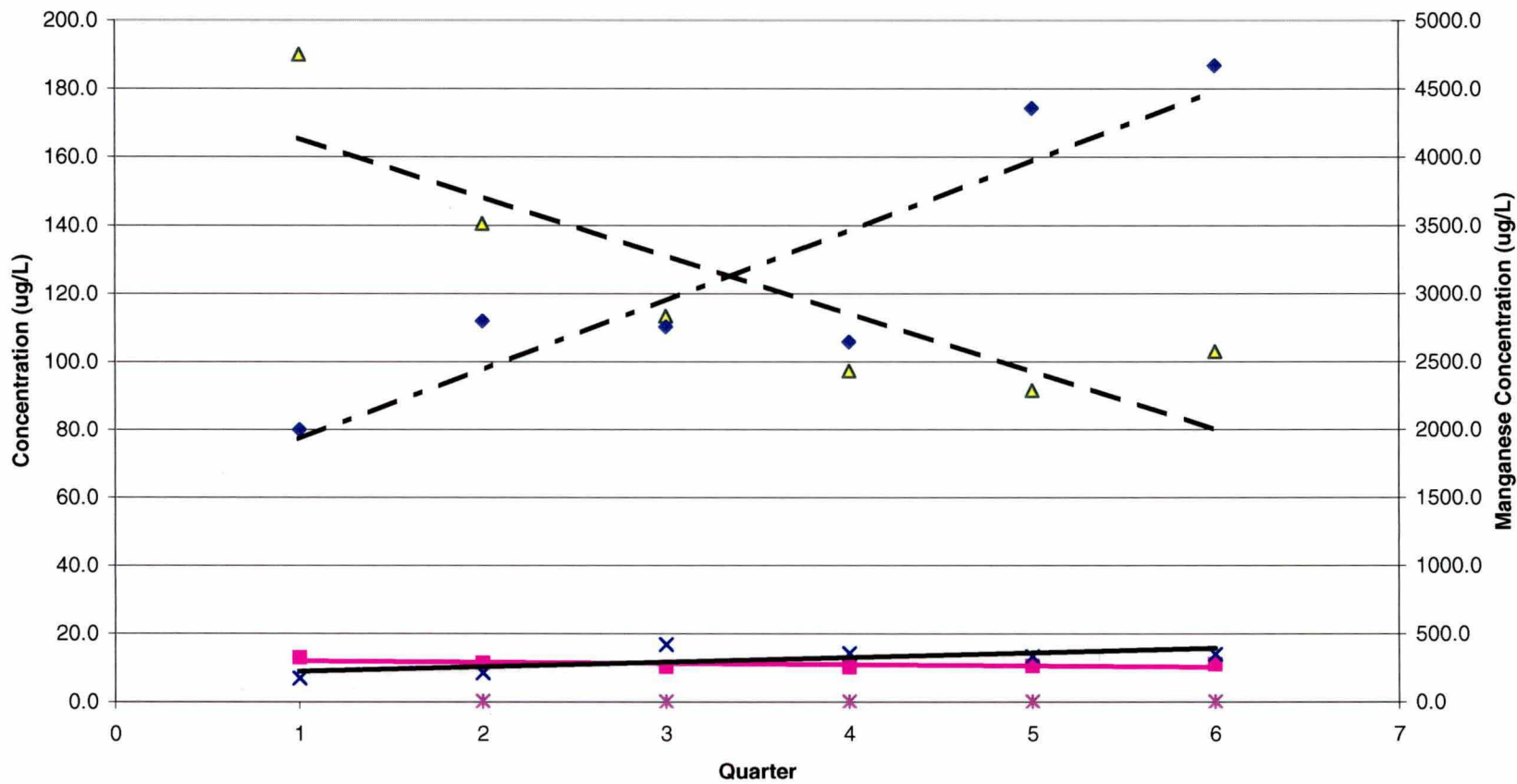
MW-107 VOCs



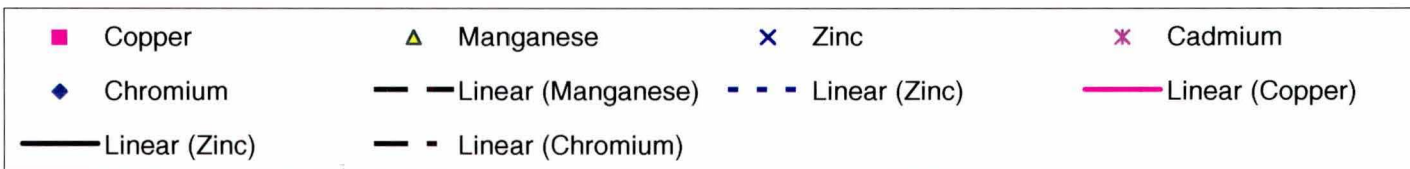
MW-107 Metals



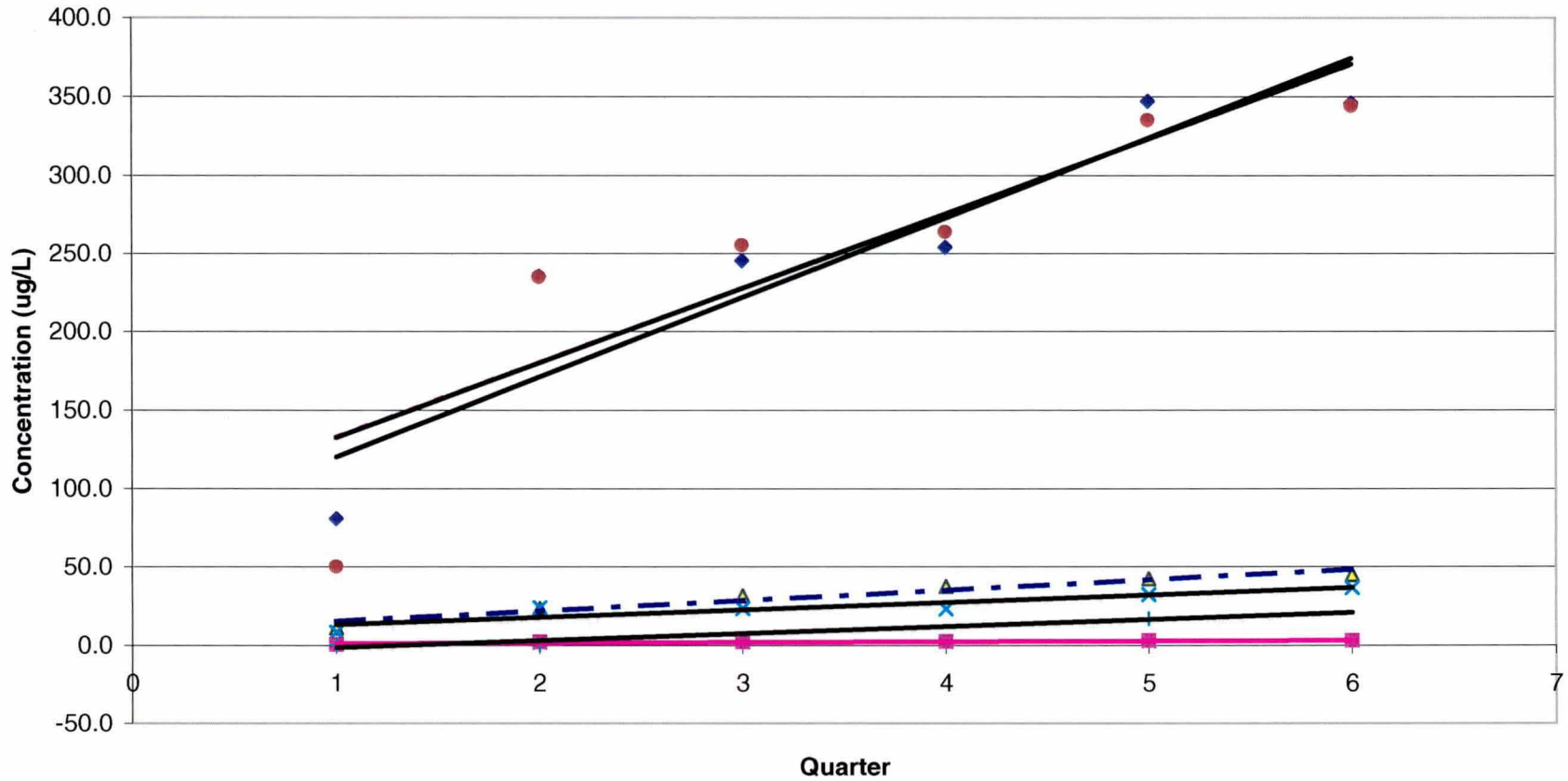
MW-107 Moving Average (Metals)



Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



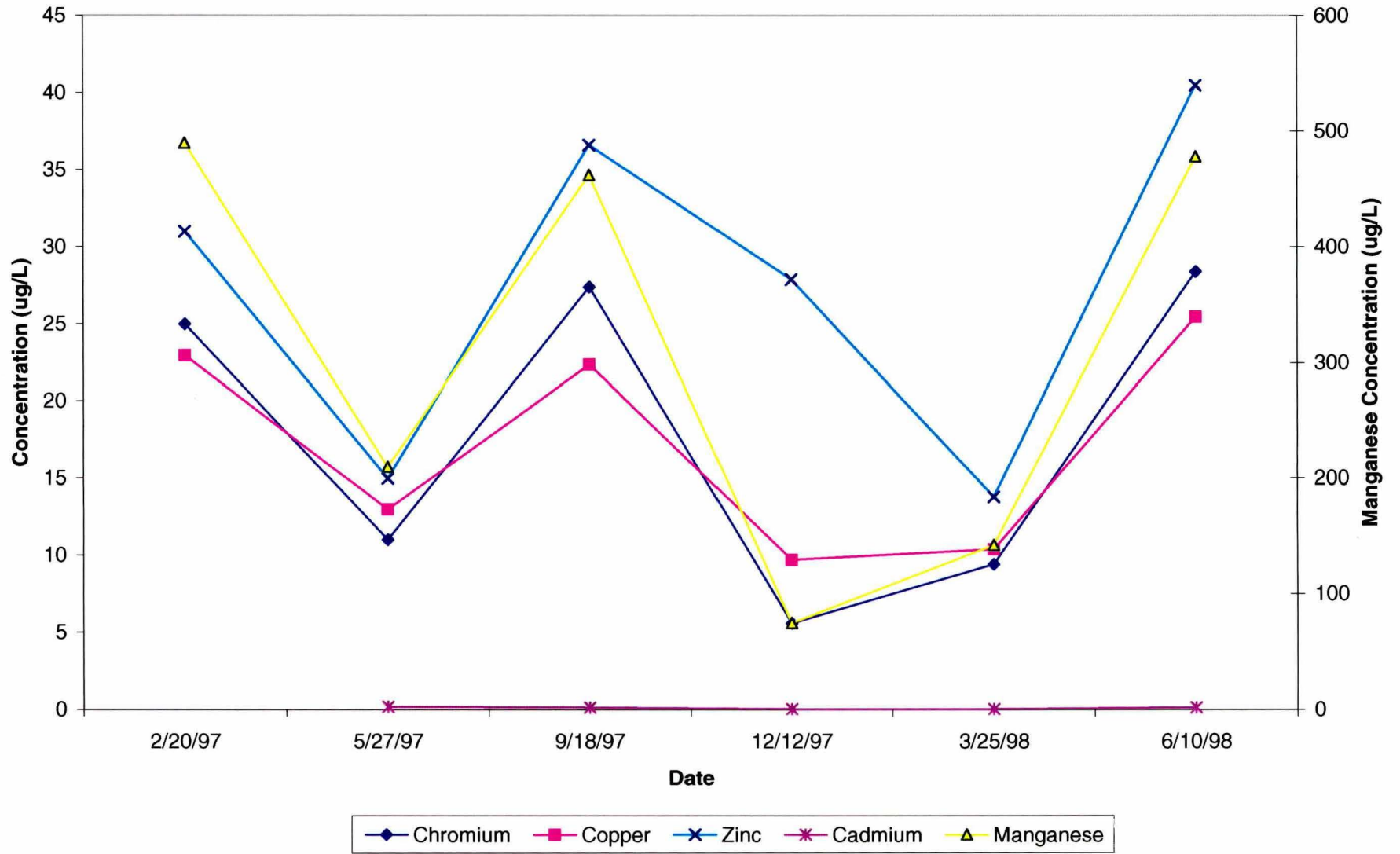
MW-107 Moving Average VOCs



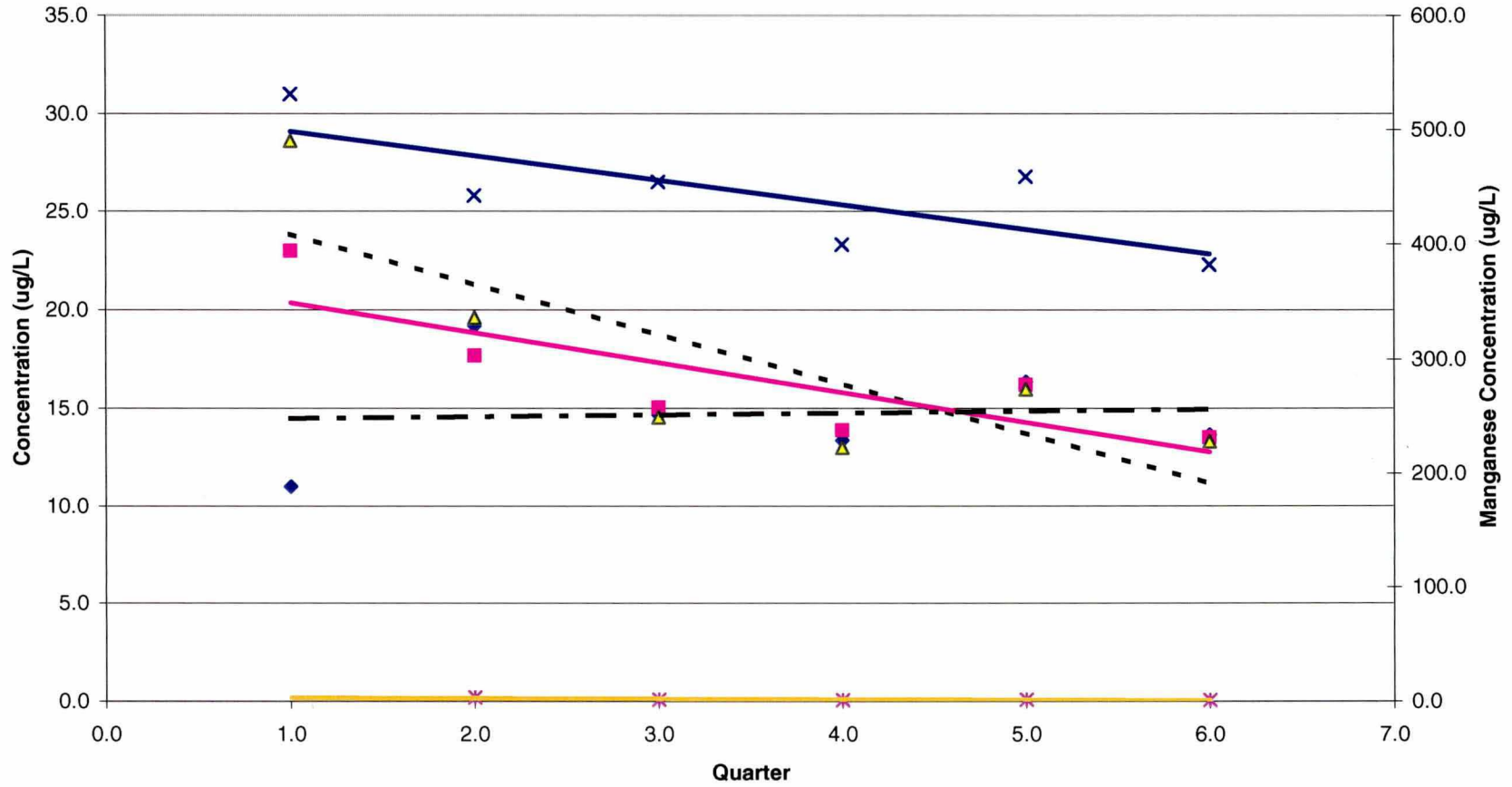
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 Q3= 9/97
 Q4= 12/97
 Q5= 3/98
 Q6= 6/98



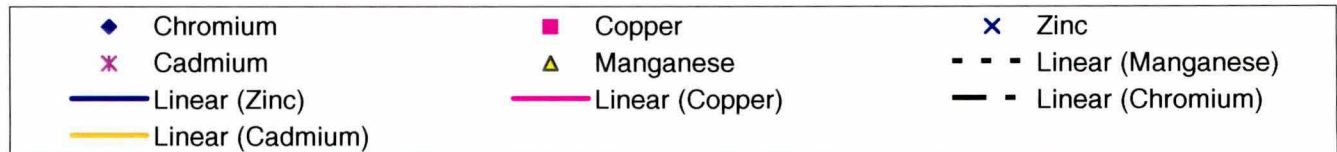
MW-108



MW-108 Moving Average with Linear Regression



Q1 = 2/97
 Q2 = 5/97
 Q3 = 9/97
 Q4 = 12/97
 Q5 = 3/98
 Q6 = 6/98



Attachment C
Data Validation
Data Validation Reports
Chain-of-Custody Forms

Data Validation Reports

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

CH2M HILL/NW MAUTHE/116441.SU.SU

**VOLATILE ORGANIC ANALYSIS
SAMPLE DATA PACKAGE**

PROJECT NO.: 91737.02

SDG: 9712CH

WORKORDER NO.: 971734

QC SUMMARY FORMS

COVER PAGE/NARRATIVE
ORGANIC ANALYSES DATA PACKAGE

Lab Name: EN CHEM LABORATORIES

Contract:

PROJECT No.: 91737.02

SDG: 9712CH

<u>LIMS #</u>	<u>FIELD SAMPLE ID</u>	<u>DATE COLLECTED</u>	<u>DATE RECEIVED</u>
971734-001	MW108_	05/27/97	05/28/97
971734-002	W22_	05/27/97	05/28/97
971734-004	W101_	05/27/97	05/28/97
971734-005	W105_	05/27/97	05/28/97
971734-006	W9_	05/27/97	05/28/97
971734-007	TB01_	05/27/97	05/28/97
971734-008	W102_	05/28/97	05/29/97
971734-009	W15_	05/28/97	05/29/97
971734-010	W106_	05/28/97	05/29/97
971734-011	TB02_	05/28/97	05/29/97
971734-012	W103_	05/28/97	05/29/97
971734-013	W104_	05/28/97	05/29/97
971734-014	W104FR	05/28/97	05/29/97
971734-015	W107_	05/28/97	05/29/97
971734-016	FB01_	05/28/97	05/29/97

Fifteen water samples were received by En Chem Laboratories for analysis.

Sample number 971734-015 was initially analyzed undiluted. Four compounds of interest were detected above the calibration range of the instrument. The sample was analyzed at a 1:50 dilution to bring the value of these compounds within the calibration range. The values for these compounds are reported from the diluted run and are flagged with a "D" qualifier.

Release of the data contained in this data package has been authorized by the Laboratory Manager or Manager's designee, as verified by the following signature.

Glen A. Coder
Signature

Glen A. Coder
Name

Volatile Section Supervisor
Title

6/9/97
Date

ANALYTICAL AND SUPPORTING LABORATORY
QUALITY CONTROL DATA

FOR

CH2MHILL
N.W. Mauthe Superfund Site

SDG # 26227

October 8, 1997

PREPARED FOR:

CH2MHILL
411 East Wisconsin Ave. STE 1600
Milwaukee, WI 53202

PREPARED BY:

Katalyst Analytical Technologies, Inc.
8901 N. Industrial Rd., Suite 100
Peoria. IL 61615

SAMPLE DATA SUMMARY

CASE NARRATIVE - CH2MHILL/M.W. Mauthe Superfund Site

Katalyst Analytical Technologies, Inc., received eleven (11) water samples on 09/13/97 and five (5) water samples on 09/18/97 with custody seals intact, on ice and in good condition. The sample set was designated as one sample delivery batch, 26227, for volatile organic analyses.

Lab ID	EPA Sample ID	Field ID	Date Collected	Date Received
26227*1	C08-40	97ZC08-40	9/11/97	9/13/97
26227*2	C08-39	97ZC08-39	9/11/97	9/13/97
26227*3	C08-50	97ZC08-50	9/11/97	9/13/97
26227*4	C08-47	97ZC08-47	9/11/97	9/13/97
26227*5	C08-43	97ZC08-43	9/11/97	9/13/97
26227*6	C08-41	97ZC08-41	9/11/97	9/13/97
26227*7	C08-46	97ZC08-46	9/11/97	9/13/97
26227*8	C08-36	97ZC08-36	9/12/97	9/13/97
26227*9	C08-45	97ZC08-45	9/12/97	9/13/97
26227*10	C08-35	97ZC08-35	9/12/97	9/13/97
26227*11	C08-48	97ZC08-48	9/12/97	9/13/97
26227*12	C08-53	97ZC08-53	9/18/97	9/19/97
26227*13	C08-54	97ZC08-54	9/18/97	9/19/97
26227*14	C08-51	97ZC08-51	9/18/97	9/19/97
26227*15	C08-52	97ZC08-52	9/18/97	9/19/97
26227*16	852MS	97ZC08-52MS	9/18/97	9/19/97
26227*17	852MSD	97ZC08-52MSD	9/18/97	9/19/97
26227*18	C08-55	97ZC08-55	9/18/97	9/19/97

Volatile Organics Project Summary

These samples were analyzed using on September 22, 1997 and September 24, 1997.

Volatile Organics QC Summary

All chromatograms have been properly labeled and the compound identified.

GC/MS tune acceptance criteria and frequency have been met.

All initial and continuing calibration standards met the acceptance criteria.

All method blanks were clean.

All surrogate spike recoveries were within acceptance criteria.

The associated matrix spike and duplicate was performed on sample C08-52. The matrix spike and duplicate recoveries were within method specified limits.

The laboratory control spike recoveries were within acceptance criteria.

Internal standard area and retention time shift met acceptance criteria.

All holding time acceptance criteria were met for all analyses.

KAT\1001\26227ORG.DOC

ANALYTICAL AND SUPPORTING LABORATORY

QUALITY CONTROL DATA

FOR

CH2MHILL
N.W. Mauthe Superfund Site
Inorganic Data

SDG # 26510

January 6, 1998

PREPARED FOR:

CH2MHILL
411 E. Wisconsin Ave. STE 100
Milwaukee, WI 53202

PREPARED BY:

Katalyst Analytical Technologies, Inc.
8901 N. Industrial Rd., Suite 100
Peoria. IL 61615

U. S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: KATALYST ANALYTICAL TECH

Contract:

Lab Code: KAT

Case No.:

SAS No.:

SDG.No.: 26510

SOW No. 3/90

EPA Sample No.	Lab Sample ID
ZR0501	26510*14
ZR0502	26510*13
ZR0502	RP*26510*13
ZR0503	26510*10
ZR0504	26510*1
ZR0504	RP*26510*1
ZR0504SD	SPM2*26510*1
ZR0504S	SPM1*26510*1
ZR0505	26510*11
ZR0506	26510*6
ZR0507	26510*4
ZR0508	26510*9
ZR0509	26510*7
ZR0510	26510*2
ZR0512	26510*8
ZR0513	26510*15
ZR0514	26510*3
ZR0516	26510*12

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes, were raw data generated before application of background corrections? Yes/No NO

Comments: See attached case narrative

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Christopher M. Ohland Name: Christopher M. Ohland

Date: January 6, 1998 Title: Project Manager

CASE NARRATIVE

CASE NARRATIVE - CH2MHILL/M.W. Mauthe Superfund Site

Katalyst Analytical Technologies, Inc., received fourteen (14) water samples on 12/13/97 custody seals intact, on ice and in good condition, except both cyanide samples for field sample 98ZR0507 (KAT lab ID 26510*4) required additional NaOH preservative at login to achieve a sample pH greater than 10. The chromium sample for field sample 98ZR0516 (KAT lab ID 26510*12) was not field preserved. Nitric acid was added until the pH was less than 2. The sample set was designated as one sample delivery batch, 26227, for metals, and cyanide analyses.

Lab ID	EPA Sample ID	Field ID	Date Collected	Date Received
26510*1	ZR0504	98ZR0504	12/12/97	12/13/97
26510*2	ZR0510	98ZR0510	12/12/97	12/13/97
26510*3	ZR0514	98ZR0514	12/12/97	12/13/97
26510*4	ZR0507	98ZR0507	12/12/97	12/13/97
26510*6	ZR0506	98ZR0506	12/11/97	12/13/97
26510*7	ZR0509	98ZR0509	12/11/97	12/13/97
26510*8	ZR0512	98ZR0512	12/11/97	12/13/97
26510*9	ZR0508	98ZR0508	12/12/97	12/13/97
26510*10	ZR0503	98ZR0503	12/12/97	12/13/97
26510*11	ZR0505	98ZR0505	12/12/97	12/13/97
26510*12	ZR0516	98ZR0516	12/12/97	12/13/97
26510*13	ZR0502	98ZR0502	12/12/97	12/13/97
26510*14	ZR0501	98ZR0501	12/12/97	12/13/97
26510*15	ZR0513	98ZR0513	12/12/97	12/13/97

Metals/Cyanide Project Summary

These samples were analyzed 12/16/97 through 12/17/97.

Metals/Cyanide QC Summary

Holding time acceptance criteria were met.

Initial and continuing calibration acceptance criteria were met.

Preparation blanks were free of contamination at the acceptance criteria.

The matrix spike recovery acceptance criteria were met.

Laboratory duplicate acceptance criteria were met, except for zinc in samples ZR0502 and ZR0504. The %RPD results for zinc exceed acceptance criteria. The samples were re-digested and analyzed with similar results.

The laboratory control sample met acceptance criteria.

ICP serial dilution acceptance criteria were met.

IDLs for cadmium, chromium, and zinc are not determined. Method detection limits are provided for these compounds.

GFAA post digestion spike acceptance criteria were met, except for cadmium samples ZR0502, ZR0506, ZR0508 and ZR0513. These analyses were conducted using the method of standard additions.

CLP Forms

The CLP Form 3 (Blanks) only allow reporting of concentrations to 1 decimal place. Because the IDL values for cadmium and mercury are less than 0.0 the results are shown as 0.0. In each case the blank concentration is less than the IDL.

In order to achieve the required reporting limits for zinc the sample digestates for zinc are prepared with 100 mLs initial sample volume and concentrated to 20 mLs final sample volume. All field samples and batch QC samples (blanks, spikes, dups, LCSs) are prepared in the same way. Initial and continuing calibration blanks are not concentrated. As a result, zinc concentrations shown on Form 3 (Blanks) report preparation blanks at 1.7 U reflecting the 5X concentration step and calibration blanks at 8.5 U.

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000004

Regional Transmittal Form

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE:

SUBJECT: Review of Data
Received for Review on July 27, 1998

FROM: Stephen L. Ostrodka, Chief (HSRL-5J) *per Steve Ostrodka*
Superfund Technical Support Section *Michael J. Bynum*
8/7/98

TO: Data User: CH2M Hill

We have reviewed the data for the following case:

SITE NAME: D. W. Mauthe (WI)

CASE NUMBER: 98ZROS SDG NUMBER: 36881

Number and Type of Samples: 14 (Water) Organic

Sample Numbers: 98ZROS 17-30

Laboratory: Katalyst Hrs. for Review: 7 hrs H.D. *with*

Following are our findings:

The data are acceptable and usable with the qualifications described in the attached narrative.

Michael J. Bynum

CC: Cecilia Moore
Region 5 TPO
Mail Code: SM-5J

NARRATIVE

LABORATORY: Katalyst
SITE: N. W. Mauthe (WI)

CASE: 98ZR05
SDG: 26881

The samples (98ZR0517 - 98ZR0530) were collected on 03/24-25/98. The laboratory received fourteen (14) water samples on 03/25-26/98 in good condition for the list of selected volatile analytes following the EPA Method 524.2.

Sample 98ZR0520 was used as the matrix spike/spike duplicates. The Laboratory Control Samples LCS01, LCS02 and LCS03 were also analyzed with the samples of this data set to comply with the requirement of the SAS.

None of the samples in this data set were identified as the field duplicates. Samples 98ZR0529 and 98ZR0530 were identified as the field blank and trip blank, respectively.

The samples were analyzed within the holding time of fourteen (14) days for the preserved water samples. The data package were received at EPA Region V 87 working days after the last samples were collected.

The reviewer's narrative and data qualifiers are noted in the following pages.

Reviewed by: Steffanie Tobin (Lockheed/ESAT)
Date: July 29, 1998

NARRATIVE

LABORATORY: Katalyst
SITE: N. W. Mauthe (WI)

CASE: 98ZR05
SDG: 26881

Below is a summary of the out-of-control audits and the possible effect on the data for this case.

1. HOLDING TIME

The laboratory received fourteen (14) water samples (98ZR0517 - 98ZR0530) on 03/25-26/98 in good condition for the list of selected volatile analytes following the EPA Method 524.2. The data package were received at EPA Region V 87 working days after the last samples were collected (the data package is due within 20 working according to the SAS). No qualification is recommended.

2. GC/MS TUNING PERFORMANCE

GC/MS tuning complied with the mass list and ion abundance criteria for BFB. All samples were analyzed within the twelve (12) hour periods for instrument performance checks.

3. CALIBRATION

Initial and continuing calibration standards of VOA samples were evaluated for the Target Compounds List (TCLs) and outliers were recorded on the outlier forms included as a part of this narrative.

4. METHOD BLANK

VBLK01, VBLK02 and VBLK03 are the method blanks. VBLK01 is clean. VBLK02 contains xylene at 0.3 $\mu\text{g/L}$ and VBLK03 contains xylene at 0.4 $\mu\text{g/L}$. Xylene is not a common laboratory contaminant. The presence of xylene in the samples associated with VBLK02 and VBLK03 is flagged as non-detected (U) when the sample results are less than 5X the blank results. Please, refer to Form IVS VOA for the list of associated samples.

Reviewed by: Steffanie Tobin (Lockheed/ESAT)

Date: July 29, 1998

NARRATIVE

LABORATORY: Katalyst
SITE: N. W. Mauthe (WI)

CASE: 98ZR05
SDG: 26881

5. SYSTEM MONITORING COMPOUND AND SURROGATE RECOVERY

Bromofluorobenzene and 1,2-dichlorobenzene-d, were used as the system monitoring compounds. The system monitoring compound recoveries for the samples were within the QC limits; therefore, the results are acceptable.

6. MATRIX SPIKE/SPIKE DUPLICATES

Sample 98ZR0520 was used as the matrix spike/spike duplicates. The Laboratory Control Samples (LCS) LCS01, LCS02 and LCS03 were also analyzed with the samples of this data set to comply with the requirement of the SAS.

The spike recoveries and RPDs for the spikes were within the QC limits. The recoveries for the LCS were within the QC limits. Therefore, the results are acceptable.

7. FIELD BLANK AND FIELD DUPLICATE

None of the samples in this data set were identified as the field duplicates. Samples 98ZR0529 and 98ZR0530 were identified as the field blank and trip blank, respectively. Sample 98ZR0529 contains chloroform and toluene at 0.5 $\mu\text{g/L}$. Sample 98ZR0530 is clean. The sample results are not qualified based on the field blank or trip blank.

8. INTERNAL STANDARDS

Fluorobenzene was used as the internal standard compound. The internal standard retention times and area counts for the VOA fraction were within the QC limits; therefore, the results are acceptable.

Reviewed by: Steffanie Tobin (Lockheed/ESAT)
Date: July 29, 1998

NARRATIVE

LABORATORY: Katalyst
SITE: N. W. Mauthe (WI)

CASE: 98ZR05
SDG: 26881

9.COMPOUND IDENTIFICATION

The target compounds for the VOA fraction was properly identified.

10.COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

The VOA Target Compounds (TCLs) were properly quantitated; therefore, the data are acceptable. The CRQLs were adjusted to reflect all sample dilutions.

11.SYSTEM PERFORMANCE

GC/MS baseline indicated acceptable performance.

12.ADDITIONAL INFORMATION

The results of 1,1-Dichloroethene, 1,1,1-Trichloroethane, and Trichloroethene for sample ZR0523 were quatitated out side the calibration range. For any analyte that exceeded the calibration range in the original sample analysis; the results of the diluted analysis should be considered the sample's analyte concentration.

Reviewed by: Steffanie Tobin (Lockheed/ESAT)
Date: July 29, 1998

Regional Transmittal Form

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: 08-05-98

SUBJECT: Review of Data
Received for Review on July 27, 1998

FROM: Stephen L. Ostrodka, Chief (HSRL-5J)
Superfund Technical Support Section /LF.

TO: Data User: CH2MHill

We have reviewed the data for the following case:

SITE NAME: N. W. Mautho (WI)

CASE NUMBER: 982R05 SDG NUMBER: 26881

Number and Type of Samples: 1 (water) Inorganic

Sample Numbers: 982R05 32

Laboratory: Katalyst Hrs. for Review: 1.0

Following are our findings:

All or results are acceptable.

L. Finzel

08-05-98

CC: Cecilia Moore
Region 5 TPO
Mail Code: SM-5J

Case: 98ZR05
Site: N.W. Mauthe

SDG: 26881
Laboratory: Katalyst

The laboratory's portion of this case contains 1 water sample analyzed for hexavalent chromium.

Evidential Audit: All forms, raw data, chain-of-custody and the sample tag were present in the case. No DC-1 form was provided, nor was there an airbill or inventory sheet.

Qualifiers: The result is acceptable.

Reviewed by: J. Ganz

Date: July 30, 1998

Regional Transmittal Form

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE:

SUBJECT: Review of Data
Received for Review on July 27, 1998

FROM: Stephen L. Ostrodka, Chief (HSRL-5J)
Superfund Technical Support Section

TO: Data User: CH2MHill

We have reviewed the data for the following case:

SITE NAME: N. W. Maunthe (WI)

CASE NUMBER: 982R05 SDG NUMBER: 26881

Number and Type of Samples: 15 (water) Inorganic

Sample Numbers: 982R0517-29, 3231

Laboratory: Katalyst Hrs. for Review: 8.5 + 1
+1

Following are our findings:

All TCP results are usable with the qualifications described in the attached narrative.

The CFMA Cd result on 2R0522 is unusable (R) because raw data was not provided to verify the Cd result.

All other CFMA data are usable (see attached narrative for qualifications).

CC: Cecilia Moore
Region 5 TPO
Mail Code: SM-5J

L. FINKELBERG

08-13-98

Case: 98ZR05
Site: N.W. Mauthe

SDG: 26881
Laboratory: Katalyst

The laboratory's portion of this case contains 15 low-level water samples analyzed for cyanide and some or all of the following metals: aluminum, arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel, and zinc. The following narrative lists the out-of-control audits and their possible effect on the sample results.

Non-detect results listed on forms 5 and 6 were reported as 0.000 U; if the "U" qualifier is used the values must be reported to the detection limit.

Evidential Audit: All raw data documents were copies with no indication as to the location of the originals. A copy of the chain-of-custody form was included; however, no airbill, DC-1 form, or custody seals were provided with this case. Sample tags were included for all samples except ZR0533. The documents were paginated, but no inventory sheet was completed by the laboratory.

ICP Analyses: The matrix spike recoveries for Al (131.5% and 151.4%) indicate a high bias, and all Al data are estimated (J).

The Cr raw result for ZR0523 exceeded the linear range of the instrument; this result is estimated (J).

The matrix spike recoveries for Ni (84.7% and 83.6%) and the Ni LCS recovery (88.7%) indicate a low bias; the Ni results on ZR0520 and ZR0532 are estimated (UJ) due to a possible elevated detection limit. An "N" flag was added to form 5 by the reviewer.

Sample ZR0529 is a field blank and was found to contain Zn (1.9 ug/l). Zn results on ZR0518-520, 523, and 532 are estimated (J) due to contamination.

According to the case narrative, the ICP digests were concentrated 5-fold, and the reported results were adjusted appropriately. The IDLs for Al and Zn were also appropriately adjusted by a factor of five. The IDLs for Cr, Cu, Mn, and Ni were not adjusted; it is not known whether the reported IDLs are pre-concentration or post-concentration values. The laboratory was contacted but did not provide this information; the response was merely that the values on form 10 are the IDLs or MDLs. If the values on form 10 are post-concentration values, then the sample results must be reduced by a factor of 5 from the raw data. This was done; however, the calibration blank results on form 3 must then reflect pre-concentration IDLs/MDLs in order to be consistent. If the values on form 10 are pre-concentration values, then all non-detect results for samples and preparation blanks must be reduced by a factor of 5 in order to be consistent.

Reviewed by J. Ganz

Date: July 29, 1998

Case: 98ZR05
Site: N.W. Mauthe

SDG: 26881
Laboratory: Katalyst

GFAA Analyses: Raw data was not provided to verify the Cd result on ZR0522; this result is unusable (R). Raw data was also not provided to verify the first CCB result for Cd. Thus, the sample and QC data bracketed by this blank are not valid and are affected by an unknown bias. Results affected are those for samples ZR0532, ZR0520, ZR0517, the preparation blank, LCS, matrix spike, matrix spike duplicate, and native duplicate. The Cd duplicate difference was greater than the MDL, and all Cd data are estimated (J) due to poor precision. "*" flags were added to the results on forms 1 and 6 by the reviewer. The calibration blank registered a negative response for Cd (-0.14 and -0.07 ug/l), and Cd on ZR0518, 521, 525, 527, and 528 are also affected by a low bias. Calculation of the ZR0519 Cd result by MSA yielded a value of -0.66 ug/l and the MSA concentrations indicated heavy interference; however, the result was reported as 0.04 U. This sample should have been diluted and reanalyzed. This result remains qualified as stated above.

The calibration blank contained Pb (1.6 ug/l); Pb on ZR0520 and ZR0532 are estimated (J) due to contamination.

Other Qualifiers: Samples ZR0527 and ZR0528 are field duplicates; the Hg duplicate difference was greater than the MDL, and all Hg data are estimated (J) due to poor precision. The calibration blank registered a negative response for Hg (-0.072 ug/l), and Hg on ZR0517, 518, 520-528, and 532 are also affected by a low bias.

Samples ZR0532 and 533 are field duplicates showing good correlation for Cr; Cr was the only element for which ZR0533 was analyzed.

All CN data are acceptable.

Reviewed by J. Ganz

Date: July 29, 1998

Regional Transmittal Form

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE:
SUBJECT: Review of Data
Received for Review on July 27, 1998
FROM: Stephen L. Ostrodka, Chief (ESRL-5J) *for Steve Ostrodka*
Superfund Technical Support Section *Richard J. Spink*
8/7/98
TO: Data User: CH2 M Hill

We have reviewed the data for the following case:

SITE NAME: N. W. Mauthe (W1)
CASE NUMBER: 982R05 SDG NUMBER: 27127
Number and Type of Samples: 14 (water) Organic
Sample Numbers: 982R05 34-44, 46-48
Laboratory: Katalyst Hrs. for Review: 7 hrs ^{work} + 1

Following are our findings:

the data are usable and acceptable with the qualifications described in the attached narrative.
Richard J. Spink

CC: Cecilia Moore
Region 5 TPO
Mail Code: SM-5J

NARRATIVE

LABORATORY: Katalyst
SITE: N. W. Mauthe (WI)

CASE: 98ZR05
SDG: 27127

The samples (98ZR0534 - 98ZR0544, 98ZR0546 - 98ZR0548) were collected on 06/09-10/98. The laboratory received fourteen (14) water samples on 06/11/98 in good condition for the list of selected volatile analytes following the EPA Method 524.2.

Sample 98ZR0537 was used as the matrix spike/spike duplicates. The Laboratory Control Samples LCS01 and LCS02 were also analyzed with the samples of this data set to comply with the requirement of the SAS.

None of the samples in this data set were identified as the field duplicates. Samples 98ZR0546 and 98ZR0548 were identified as the field blank and trip blank, respectively.

The samples were analyzed within the holding time of fourteen (14) days for the preserved water samples. The data package were received at EPA Region V 27 working days after the last samples were collected.

The reviewer's narrative and data qualifiers are noted in the following pages.

Reviewed by: Steffanie Tobin (Lockheed/ESAT)
Date: July 29, 1998

NARRATIVE

LABORATORY: Katalyst
SITE: N. W. Mauthe (WI)

CASE: 98ZR05
SDG: 27127

Below is a summary of the out-of-control audits and the possible effect on the data for this case.

1. HOLDING TIME

The laboratory received fourteen (14) water samples (98ZR0534 - 98ZR0544, 98ZR0546 - 98ZR0548) on 06/11/98 in good condition for the list of selected volatile analytes following the EPA Method 524.2. The data package were received at EPA Region V 27 working days after the last samples were collected (the data package is due within 20 working days according to the SAS). No qualification is recommended.

2. GC/MS TUNING PERFORMANCE

GC/MS tuning complied with the mass list and ion abundance criteria for BFB. All samples were analyzed within the twelve (12) hour periods for instrument performance checks.

3. CALIBRATION

Initial and continuing calibration standards of VOA samples were evaluated for the Target Compounds List (TCLs) and outliers were recorded on the outlier forms included as a part of this narrative.

4. METHOD BLANK

VBLK01 and VBLK02 are the method blanks. VBLK01 contains benzene at 0.3 $\mu\text{g/L}$, TCE at 0.4 $\mu\text{g/L}$ and toluene at 0.4 $\mu\text{g/L}$. VBLK02 is clean. Benzene, TCE and toluene are not common laboratory contaminants. The presence of Benzene, TCE and toluene in the samples associated with VBLK01 is flagged as non-detected (U) when the sample results are less than 5X the blank results. Please, refer to Form IVs VOA for the list of associated samples.

Reviewed by: Steffanie Tobin (Lockheed/ESAT)

Date: July 29, 1998

NARRATIVE

LABORATORY: Katalyst
SITE: N. W. Mauthe (WI)

CASE: 98ZR05
SDG: 27127

5.SYSTEM MONITORING COMPOUND AND SURROGATE RECOVERY

Bromofluorobenzene and 1,2-dichlorobenzene-d, were used as the system monitoring compounds. The system monitoring compound recoveries for the samples were within the QC limits; therefore, the results are acceptable.

6.MATRIX SPIKE/SPIKE DUPLICATES

Sample 98ZR0537 was used as the matrix spike/spike duplicates. The Laboratory Control Samples LCS01 and LCS02 were also analyzed with the samples of this data set to comply with the requirement of the SAS.

The spike recoveries and RPDs for the spikes were within the QC limits. The recoveries for the LCS were within the QC limits. Therefore, the results are acceptable.

7.FIELD BLANK AND FIELD DUPLICATE

None of the samples in this data set were identified as the field duplicates. Samples 98ZR0546 and 98ZR0548 were identified as the field blank and trip blank, respectively. Both QC blanks are clean.

8.INTERNAL STANDARDS

Fluorobenzene was used as the internal standard compound. The IS recovery for 98ZR0534, 98ZR0540 and LCS01 were below the 80% QC limit. The positive results for the above samples are flagged as estimated (J) and non-detected (UJ).

9.COMPOUND IDENTIFICATION

The target compounds for the VOA fraction was properly

Reviewed by: Steffanie Tobin (Lockheed/ESAT)

Date: July 29, 1998

NARRATIVE

LABORATORY: Katalyst
SITE: N. W. Mauthe (WI)

CASE: 98ZR05
SDG: 27127

identified.

10.COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

The VOA Target Compounds (TCLs) were properly quantitated; therefore, the data are acceptable. The CRQLs were adjusted to reflect all sample dilutions.

11.SYSTEM PERFORMANCE

GC/MS baseline indicated acceptable performance.

12.ADDITIONAL INFORMATION

The results of 1,1-Dichloroethene, 1,1,1-Trichloroethane, and Trichloroethene for sample ZR0540 were quantitated outside the calibration range. For any analyte that exceeded the calibration range in the original sample analysis; the results of the diluted analysis should be considered the sample's analyte concentration.

Reviewed by: Steffanie Tobin (Lockheed/ESAT)
Date: July 29, 1998

Chain-of-Custody Forms



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

1. Project Code 97ZC08	Account Code	2. Region No. II	Sampling Co. Cham Hill	4. Date Shipped	Carrier L.B. Courier
Regional Information		3. Sampler (Name) Jill Webster		Airbill Number	
Non-Superfund Program		3. Sampler Signature <i>Jill Webster</i>		5. Ship To En Chem of Green Bay, WI	
Site Name Manthe		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> Early Action <input type="checkbox"/> SI <input type="checkbox"/> Long-Term Action <input type="checkbox"/> FS		ATTN:	
City, State Appleton, WI	Site Spill ID LB 69	<input type="checkbox"/> PRP <input type="checkbox"/> CLEM <input type="checkbox"/> ESI <input type="checkbox"/> RD	<input checked="" type="checkbox"/> RA		
		<input type="checkbox"/> ST <input type="checkbox"/> PA <input type="checkbox"/> RI <input type="checkbox"/> O&M	<input type="checkbox"/> OIL <input type="checkbox"/> NPLD		
		<input type="checkbox"/> FED <input type="checkbox"/> REM <input type="checkbox"/> OIL <input type="checkbox"/> NPLD			

6. Matrix (Enter in Column A)
- Surface Water
 - Ground Water
 - Leachate
 - Field QC
 - Soil/Sediment
 - Oil
 - Waste
 - Other (Specify in Column A)
7. Preservative (Enter in Column D)
- HCl
 - HNO3
 - NAHSO4
 - H2SO4
 - NAOH
 - Ice Only
 - Other (Specify in Column D)
 - Not Preserved

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. --Not a QC Sample
STA No. S01	97ZC08-003	2	Low	Grab	5 Cyanide	5-029365	W-15	2-19-97 16:30	JAW	
				2	metals (total)	5-029303				
				2	metals (total)	5-029364				
				1	VOA	5-029362				
				1	VOA	5-029361				
				1	VOA	5-029363				
S02	97ZC08-009	2	Low	Grab	5 Cyanide	5-029231	W106	2-19-97 17:00	JAW	
				2	Metals (total)	5-029230				
				2	Metals (total)	5-029229				
				1	VOA	5-029228				
				1	VOA	5-029227				

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>Jill Webster</i>	Chain of Custody Seal Number(s) 41489 41490
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>Jill Webster</i>	Date/Time 2-19-97 18:30	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks Is custody seal intact? Y/N/none	

DISTRIBUTION: White - Region Copy
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Pink - Lab Copy for Return to Data User**

EPA Form 9110-3

SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS
SEE REVERSE FOR PURPOSE CODE DEFINITIONS

**Data User means the organization which contracted the laboratory services

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

972008

Case No.

1. Project Code 972008		Account Code		2. Region No. II	Sampling Co. CH2M Hill	4. Date Shipped	Carrier L.B. Courier	6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved
Regional Information				3. Sampler (Name) Jill Webster		Airbill Number			
Non-Superfund Program				3. Sampler Signature Jill Webster		5. Ship To L.B. En Chem of Green Bay, WI			
Site Name Manthe		City, State Appleton, WI		Site Spill ID Log L.B.		3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED Early Action <input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM SI <input type="checkbox"/> ESI <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST Long-Term Action <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RALB <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		ATTN:	

STA. NO.	Sample Numbers (From Labels)	A	B	C	D	E	F	G	H	I	J
		Matrix (from Box 6) Other:	Conc.: Low Med High	Sample Type Comp./ Grab	Preservative (from Box 7) Other:						
SO3	972008-011	2	low	Grab	5	Cyanide	5-029243	W-108	2-19-97 1530	JAW	
					2	Metals (total)	5-029242				
					2	Metals (total)	5-029241				
					1	VOA	5-029238, 5-029239, 5-029240				
RO1	972008-013	2	low	Grab	5	Cyanide	5-029331	FB-01	2-19-97 1800	JAW	B
					2	Metals (total)	5-029333				
					2	Metals (total)	5-029332				
					1	VOA	5-029337, 5-029329, 5-029330				
RO2	972008-014	2	low	Grab	1	VOA	5-029335, 5-029337, 5-029338	TD-01	2-19-97 1912		B

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures Derek N. Pugh	Chain of Custody Seal Number(s) 41489 41490
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) Jill Webster	Date/Time 2-20-97 8:30	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? Y/N/none

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EPA Form 9110-3

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**Data User means the organization which contracted the laboratory services

52255

A21-0127 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

972C08

Case No.

1. Project Code 972C08	Account Code	2. Region No. I	Sampling Co. Cram Hill	4. Date Shipped	Carrier L.B. Courier
Regional Information		3. Sampler (Name) Jill Webster		Airbill Number	
Non-Superfund Program		3. Sampler Signature J Webster		5. Ship To L.B. En Chem of Green Bay, WI	
Site Name Maunthe		3. Purpose*		ATTN:	
City, State Appleton, WI	Site Spill ID L9 L.B.	<input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED	<input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM	<input type="checkbox"/> SI <input type="checkbox"/> ESI <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST	<input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD

6. Matrix (Enter in Column A)	7. Preservative (Enter in Column D)
1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate PE=Perform. eval. --Not a QC Sample
	Other:			Other:						
308 972C08-008	2	Low	Grab	5	Cyanide	5-029323	W-105	2-19-97 18:00	JW	
				2	Metals (total)	5-029322				
				2	Metals total	5-029321				
				1	VOA	5-029319				
				1	VOA	5-029320				
				1	VOA	5-029318				
003 972C08-022	2	Low	Grab	5	Cyanide	5-029250	W-108 Dup	2-19-97 18:30		D for 972C08-011
				2	Metals (total)	5-029327				
				2	Metals (total)	5-029326				
				1	VOA	5-029247, 5-029248, 5-029249				

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures Derek H. Cogle	Chain of Custody Seal Number(s) 41489, 41490
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) Jill Webster	Date/Time 2-19-97 18:30	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks Is custody seal intact? Y/N/none	

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**Data User means the organization who contracted the laboratory services

52253

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

972008

Case No.

1. Project Code 972008	Account Code	2. Region No. V	Sampling Co. CHAM Hill	4. Date Shipped	Carrier Courier
Regional Information		3. Sampler (Name) Jill Webster		Airbill Number	
Non-Superfund Program		3. Sampler Signature Jill Webster		5. Ship To L.B. En Chem of Green Bay, WI	
Site Name Maunthe		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> SI <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> RI <input checked="" type="checkbox"/> RA <input type="checkbox"/> ST <input type="checkbox"/> REM <input type="checkbox"/> OIL <input type="checkbox"/> O&M <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> NPLD		ATTN:	
City, State Appleton, WI	Site Spill ID 69 d.B.				

6. Matrix (Enter in Column A)

- Surface Water
- Ground Water
- Leachate
- Field QC
- Soil/Sediment
- Oil
- Waste
- Other (Specify in Column A)

7. Preservative (Enter in Column D)

- HCl
- HNO3
- NAHSO4
- H2SO4
- NAOH
- Ice Only
- Other (Specify in Column D)
- Not Preserved

STA NO.
505
↓
506
↓
507
↓

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. --Not a QC Sample
	Other:			Other:						
972008-001	2	Low	Grab	5	Cyanide	5-029355	W-2	2-20-97 11:00	JAW	
↓	↓	↓	↓	2	Metals (total)	5-029354, 5-029301	↓	↓	↓	
↓	↓	↓	↓	1	VOA	5-029357, 5-029352, 5-029351	↓	↓	↓	
972008-007	2	Low	Grab	5	Cyanide	5-029317	W-104	2-20-97 10:00	JW	
↓	↓	↓	↓	2	Metals (total)	5-029316, 5-029316	↓	↓	↓	
↓	↓	↓	↓	1	VOA	5-029312, 5-029313, 5-029314	↓	↓	↓	
972008-002	2	Low	Grab	5	Cyanide	5-029360	W-8	2-20-97 11:40	STW	
↓	↓	↓	↓	2	Metals (total)	5-029359, 5-029302	↓	↓	↓	
↓	↓	↓	↓	1	VOA	5-029358, 5-029357, 5-029356	↓	↓	↓	

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 41493, 41494
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) Jill Webster	Date/Time 2-20-97 18:00	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks Is custody seal intact? Y/N/none	

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EPA Form 9110-3

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*SEE REVERSE FOR PURPOSE CODE DEFINITIONS

**Data User means the organization which contracted the laboratory services

52258

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97208

Case No.

1. Project Code 97208	Account Code	2. Region No. IV	Sampling Co. Cham Hill	4. Date Shipped	Carrier Courier																								
Regional Information		3. Sampler (Name) Jill Webster		Airbill Number																									
Non-Superfund Program		3. Sampler Signature Jill Webster		5. Ship To L.B. En Chem of Green Bay, WI																									
Site Name Maunthe		3. Purpose*		ATTN:																									
City, State Appleton, WI		<table border="0"> <tr> <td>Lead</td> <td>Early Action</td> <td>SI</td> <td>Long-Term Action</td> </tr> <tr> <td><input checked="" type="checkbox"/> SF</td> <td><input type="checkbox"/> CLEM</td> <td>ESI</td> <td>FS</td> </tr> <tr> <td><input type="checkbox"/> PRP</td> <td><input type="checkbox"/> PA</td> <td>RI</td> <td>RD</td> </tr> <tr> <td><input type="checkbox"/> ST</td> <td><input type="checkbox"/> REM</td> <td>OIL</td> <td><input checked="" type="checkbox"/> RA</td> </tr> <tr> <td><input type="checkbox"/> FED</td> <td></td> <td>UST</td> <td>O&M</td> </tr> <tr> <td></td> <td></td> <td></td> <td>NPLD</td> </tr> </table>				Lead	Early Action	SI	Long-Term Action	<input checked="" type="checkbox"/> SF	<input type="checkbox"/> CLEM	ESI	FS	<input type="checkbox"/> PRP	<input type="checkbox"/> PA	RI	RD	<input type="checkbox"/> ST	<input type="checkbox"/> REM	OIL	<input checked="" type="checkbox"/> RA	<input type="checkbox"/> FED		UST	O&M				NPLD
Lead	Early Action	SI	Long-Term Action																										
<input checked="" type="checkbox"/> SF	<input type="checkbox"/> CLEM	ESI	FS																										
<input type="checkbox"/> PRP	<input type="checkbox"/> PA	RI	RD																										
<input type="checkbox"/> ST	<input type="checkbox"/> REM	OIL	<input checked="" type="checkbox"/> RA																										
<input type="checkbox"/> FED		UST	O&M																										
			NPLD																										
Site Spill ID L.B. 69																													

6. Matrix (Enter in Column A)
- Surface Water
 - Ground Water
 - Leachate
 - Field QC
 - Soil/Sediment
 - Oil
 - Waste
 - Other (Specify in Column A)

7. Preservative (Enter in Column D)
- HCl
 - HNO3
 - NAHSO4
 - H2SO4
 - NaOH
 - Ice Only
 - Other (Specify in Column D)
 - Not Preserved

STA. No.	Sample Numbers (From Labels)	A	B	C	D	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. =Not a QC Sample
		Matrix (from Box 6) Other:	Conc.: Low Med High	Sample Type Comp./ Grab	Preservative (from Box 7) Other:						
S08	97208-005	2	Low	Grab	5	Cyanide	5-029307	W-102	2-20-97 13:15	JRW	
	↓	↓	↓	↓	2	Metals (total)	5-029306, 5-029305	↓	↓	↓	
	↓	↓	↓	↓	1	VOA	5-029373, 5-029372, 5-029371	↓	↓	↓	
S09	97208-006	2	Low	Grab	5	Cyanide	5-029375	W-103	2-20-97 15:00	JRW	
	↓	↓	↓	↓	2	Metals total	5-029311, 5-029374	↓	↓	↓	
	↓	↓	↓	↓	1	VOA	5-029309, 5-029308, 5-029310	↓	↓	↓	
S10	97208-004	2	Low	Grab	5	Cyanide	5-029370	W-101	2-20-97 9:15	JRW	
	↓	↓	↓	↓	2	Metals (total)	5-029304, 5-029369	↓	↓	↓	
	↓	↓	↓	↓	1	VOA	5-029368, 5-029367, 5-029366	↓	↓	↓	

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 41493, 41494
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) Jill Webster	Date/Time 2-20-97 18:00	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? Y/N/none

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EPA Form 9110-3

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**Data User means the organization who contracted the laboratory services

52259

A21-012-7 REV. 3/84



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

1. Project Code 97ZC08	Account Code	2. Region No. IV	Sampling Co. CH2M Hill	4. Date Shipped	Carrier Courier	6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved
Regional Information		3. Sampler (Name) Jill Webster		Airbill Number			
Non-Superfund Program		3. Sampler Signature Jill Webster		5. Ship To En Chem of Green Bay, WI			
Site Name Maunthe		3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> SI <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> RI <input type="checkbox"/> RD <input type="checkbox"/> ST <input type="checkbox"/> REM <input type="checkbox"/> OIL <input checked="" type="checkbox"/> RA <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		ATTN:			
City, State Appleton, WI	Site Spill ID 69						

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. =Not a QC Sample
	Other:			Other:						
97ZC08-010	2	Low	Grab	5	Cyanide	5-029237	W-107	2-20-97 1600	JW	
				2	Metals (total)	5-029236				
				2	Metals total	5-029235				
				1	VOA	5-029234				
				1	VOA	5-029233				
				1	VOA	5-029232				
	2	Low	Grab	5	Cyanide	5-029347	W-107MS	2-20-97 1600		
				2	Metals (total)	5-029346, 5-029345	W-107MS			
				1	VOA	5-029344, 5-029343, 5-029342	W-107ms/msd			
				1	VOA	5-029341, 5-029340, 5-029339	W-107ms/msd			

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 41493, 41494
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) Jill Webster	Date/Time 2-20-97 1800	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? Y/N/none

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Yellow - Data User**
Pink - Lab Copy for Return to Data User**

EPA Form 9110-3

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**Data User means the organization which contracted the laboratory services

52257

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

1. Project Code 97ZC08	Account Code	2. Region No. II	Sampling Co. CH2M Hill	4. Date Shipped	Carrier Courier
Regional Information		3. Sampler (Name) Jill Webster		Airbill Number	
Non-Superfund Program		3. Sampler Signature <i>Jill Webster</i>		5. Ship To En Chem of Green Bay, WI	
Site Name Maunthe		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED <input type="checkbox"/> LEAD <input type="checkbox"/> EARLY ACTION <input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM <input type="checkbox"/> SI <input type="checkbox"/> ESI <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		ATTN:	
City, State Appleton, WI	Site Spill ID 69				

6. Matrix (Enter in Column A)
- Surface Water
 - Ground Water
 - Leachate
 - Field QC
 - Soil/Sediment
 - Oil
 - Waste
 - Other (Specify in Column A)

7. Preservative (Enter in Column D)
- HCl
 - HNO3
 - NAHSO4
 - H2SO4
 - NAOH
 - Ice Only
 - Other (Specify in Column D)
 - Not Preserved

STA No.	Sample Numbers (From Labels)	A	B	C	D	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. =Not a QC Sample
		Matrix (from Box 6) Other:	Conc.: Low Med High	Sample Type Comp./ Grab	Preservative (from Box 7) Other:						
D10	97ZC08-016	2	Low	Grab	5	Cyanide	5-064706	W-101 Dup	2-20-97 9:15	JAW	D for 97ZC08-004
					2	Metals (total)	5-064705, 5-064704				
					1	VOA	5-064703, 5-064702, 5-064701				
R03	97ZC08-017	2	Low	Grab	5	Cyanide	5-064712	FB03	2-20-97 1630	JAW	B
					2	Metals (total)	5-064711, 5-064710				
					1	VOA	5-064709, 5-064708, 5-064707				
R04	97ZC08-018	2	Low	Grab	1	VOA	5-029252, 5-029251	TB02	2-20-97 1800	JAW	B

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 41495, 41496
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>Jill Webster</i>	Date/Time 2-20-97 18:00	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks Is custody seal intact? Y/N/none	

DISTRIBUTION: White - Region Copy Yellow - Data User** EPA Form 9110-3 SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS
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**Data User means the organization who contracted the laboratory services

52355

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.
972008

Case No.

1. Project Code 972008	Account Code	2. Region No. 5	Sampling Co. Cham Hill	4. Date Shipped 2-20-97	Carrier L.B. Courier	
Regional Information		3. Sampler (Name) Derrick Clayton		Airbill Number		
Non-Superfund Program		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> Early Action <input type="checkbox"/> CLEM <input type="checkbox"/> SI <input type="checkbox"/> ES <input type="checkbox"/> ES1 <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		5. Ship To L.B. En Chem of Green Bay, WI		
Site Name Maunthe		Sampler Signature <i>Derrick Clayton</i>		ATTN:		
City, State Appleton, WI	Site Spill ID 69					

6. Matrix (Enter in Column A)
- Surface Water
 - Ground Water
 - Leachate
 - Field QC
 - Soil/Sediment
 - Oil
 - Waste
 - Other (Specify in Column A)
7. Preservative (Enter in Column D)
- HCl
 - HNO3
 - NAHSO4
 - H2SO4
 - NAOH
 - Ice Only
 - Other (Specify in Column D)
 - Not Preserved

STA No.	Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. --Not a QC Sample
S12	972008-014	7	Low	Grab	5	Cyanide	5-029244	Effluent	2-20-97 753	JAW	
					2	Metals (total)	5-029348				
					2	Metals (total)	5-029245				
					2	Hex Chromium	5-029246				
R05	972008-015	7	Low	Grab	5	Cyanide	5-029350	FB-02	2-20-97 753		B
					2	Metals (total)	5-029325	FB-02	2-20-97 753		
					2	Metals (total)	5-029349	FB-02	2-20-97 753		
					2	Hex Chromium	5-029349	FB-02	2-20-97 753		

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 41491 41492
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>Del Webster</i>	Date/Time 2-20-97 753	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks Is custody seal intact? Y / N / none	

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A21-012-7 REV. 3/94

CENTRAL REGIONAL LABORATORY SAMPLE DATA REPORT
ORGANICS/INORGANICS
 THIS FORM IS TO BE USED FOR SAMPLES SENT TO CONTRACT ONLY

CASE NUMBER/SAS NO. 97ZC08 SITE NAME N.W. Manthe, WI LABORATORY En Chem DATE SHIPPED 2/20/97
 SUPERFUND DU NUMBER _____ EPA RPM or OSC (S.M.S)/I(CES) Jon Peterson CERCLIS NUMBER W10083290981 PAGE _____ OF _____
 ACTIVITY NUMBER _____

CRL LOG NUMBER	SAS PACKING LIST NUMBER	WATER OR LIQUIDS														SEDIMENTS OR SOILS									
		Volatile Organic Analysis Organic Scan	Acid-Base Neutral Cpds Organic Scan	Total Metals	Filtered Metals	Color, Odor, Turbidity	Alkalinity	Chloride	Residue, Filterable - TDS	Total Organic Carbon - TOC	Chemical Oxygen Demand - COD	Hardness	Oil & Grease - O & G	Cyanide	Hex Chromium	Volatile Organic Analysis Organic Scan	Acid-Base Neutral Cpds Organic Scan	Total Metals	EP Toxicity Metals	Alkalinity	Chloride	Cyanide	Total Organic Carbon - TOC	Chemical Oxygen Demand - COD	
97ZC08-S01	97ZC08-003	X		X											X										
	S02	X		X											X										
	S03	X		X											X										
	R01	X		X											X										
	R02	X													X										
	S04	X		X											X										
	D03	X		X											X										
	S05	X		X											X										
	S06	X		X											X										
	S07	X		X											X										
	S08	X		X											X										
	S09	X		X											X										
	S10	X		X											X										
	S11	X		X											X										
	D10	X		X											X										
	R03	X		X											X										
	R04	X																							
	S12			X											X	X									
↓	R05	↓		X											X	X									

CH2M
Dalle
Lynn
Dan
Erin

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO: Tom Trainor/EnChem Lab.

PHONE NO.: 414-469-2436

DATE: 02/25 & 26/97

CALL FROM: Dan MacGregor/CH2M HILL

TIME: Various AM

MESSAGE TAKEN BY: Dan MacGregor

PROJECT NO.: 116441.SU.SM

SUBJECT: Mauthe Groundwater Sampling

Called Tom 2/25/97 to have him make a correction to a chain-of-custody (COC) form. The field crew had assigned two separate sampling points the same EPA sample number. I requested Tom change the effluent sample's EPA sample number from 97CZ08-012 to 97CZ08-19.

Tom called back 2/26/97 and told me that the requested change had been made. Tom will send a corrected copy of the COC with the sample receipt letter.

Tom also relayed that several VOC vials were received broken. It appears that the samples froze. Tom stated that only one sample was completely lost, Field Blank 2. I told Tom to proceed and that we could survive with only one field blank. One other sample had two of the three vials break, but Tom did not think this would cause a significant problem. I told Tom to keep me informed regarding any dilution of this sample.

Other topics - The hexachrom analyses are complete with DRAFT results of less than for both the effluent sample and field blank.

EnChem going to Denver - provide list of contacts. EnCore sampler...



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.
97ZCO8

Case No.
97ZCO8

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier	6. Matrix (Enter in Column A)	7. Preservative (Enter in Column D)
Regional Information TGB 102		3. Sampler (Name) Jill Webster		5/28/97	Carrier picked up by En Chem courier		
Non-Superfund Program		3. Sampler Signature <i>Jill Webster</i>		5. Ship To EN CHEM, INC. 1241 BELLEVUE ST. GREEN BAY, WI 54302			
Site Name N.W. MAUTHE		3. Purpose*		ATTN: TOM TRAINOR			
City, State APPLETON, WI		Site Spill ID GG		Long-Term Action		1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	
		Lead <input type="checkbox"/> SF: <input type="checkbox"/> PRP: <input type="checkbox"/> ST: <input type="checkbox"/> FED: <input type="checkbox"/>		Early Action <input type="checkbox"/> CLEM: <input type="checkbox"/> PA: <input type="checkbox"/> REM: <input type="checkbox"/>		1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	
		SI: <input type="checkbox"/> ESI: <input type="checkbox"/> RI: <input type="checkbox"/> OIL: <input type="checkbox"/> UST: <input type="checkbox"/>		FS: <input type="checkbox"/> RD: <input type="checkbox"/> RA: <input checked="" type="checkbox"/> O&M: <input type="checkbox"/> NPLD: <input type="checkbox"/>			

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. =Not a QC Sample
	Other:			Other:						
97ZCO8-29	2	L	G	1	VOCs, select	5-029201 + 209	W-107-2	5-28-97 9:45	JW	
				2	Metals, select	5-029210, 5-029213, 5-029200				
				5	Cyanide, select total	5-027948, 5-027949				
97ZCO8-32	2	L	G	1	VOCs, select	5-027936 + 938	FB01-2	5-28-97 15:00		B
				2	Metals, select	5-027939	FB01-2	5-28-97		B
				5	Cyanide, total	5-027941	FB01-2	5-28-97		B

Shipment for SAS Complete? <input checked="" type="checkbox"/> Y / <input type="checkbox"/> N	Page 1 of 1	Sample(s) to be Used for Laboratory QC 97ZCO8-29, MS/MSD Box	Additional Sampler Signatures	Chain of Custody Seal Number(s) 49035, 49036
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>Jill Webster</i>	Date/Time 5/28/97 4:28	Received by: (Signature) <i>Tom Trainor</i>	Date/Time 5:28/97 4:20	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? Y / N / none	

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A21-012-7 REV. 3/94

50903



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.
97ZCO8

Case No.
97ZCO8

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier
		5	CHAM HILL	5/28/97	picked up by En Chem courier
Regional Information		Sampler (Name)		Airbill Number	
TGB 102		Regina Bayer		N/A	
Non-Superfund Program		Sampler Signature		5. Ship To	
		Regina Bayer		EN CHEM, INC 1241 BELLEVUE ST. GREEN BAY, WI 54302	
Site Name		3. Purpose*		ATTN: TOM TRAINOR	
N.W. MAUTHF		<input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED			
City, State	Site Spill ID	<input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM			
APPLETON, WI	GG	<input type="checkbox"/> SI <input type="checkbox"/> ESI <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST			
		<input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD			

6. Matrix (Enter in Column A)	7. Preservative (Enter in Column D)
1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier
	Other:			Other:						B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. =Not a QC Sample
97ZCO8-25	2	L	G	1	VOCs, select	5-027668	7670, 671	W-103-2	5/28/97 10:30	RB
				2	Metals, select	5-027673				
				5	Cyanide, total	5-027674				
26				1	VOCs	5-027675, 901, 902	W-104-2	13:30		
				2	Metals	5-027904				
				5	Cyanide	5-027905				
31				1	VOCs	5-027930 → 932	W-104-2FR	13:50		D
				2	Metals	5-027934				
				5	Cyanide	5-027935				

Shipment for SAS Complete? (Y/N)	Page	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)
Y	2 of 2			49033, 49034

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Regina Bayer	5/28/97 4:20	Tom Trainor			
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks Is custody seal intact? Y/N/none	

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United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

015
97ZC08

1. Project Code	Account Code	2. Region No. 5	3. Sampling Co. CHAM HILL	4. Date Shipped 5/28/97	Carrier picked up by En Chem courier	6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved
Regional Information TGB102		Sampler (Name) Regina Bayer		Airbill Number N/A			
Non-Superfund Program		Sampler Signature Regina Bayer		5. Ship To EN CHEM, INC 1241 BELLEVUE ST. GREEN BAY, WI 54302			
Site Name N. W. MAUTHE		3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED Early Action <input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM SI <input type="checkbox"/> ESI <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST Long-Term Action <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		ATTN: TOM TRAINOR			
City, State APPLETON, WI		Site Spill ID 65					

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. =Not a QC Sample
	Other.			Other.						
97ZC08-24	2	L	G	1	VOCs, select	5-027663 → 665	W-102-2	5/28/97 14:30	RB	
↓				12	Metals, select	5-027667	↓	↓		
↓				25	Cyanide, total	5-027669	↓	↓		
22				1	VOCs	5-027651 → 653	W-15-2	11:15		
↓				2	metals	5-027655	↓	↓		
↓				5	cyanide	5-027656	↓	↓		
28				1	VOCs	5-027912 → 914	W-106-2	12:00		
↓				2	metal	5-027916	↓	↓		
↓				5	cyanide	5-027917	↓	↓		
↓				1	VOCs	5-027946 → 945	TR02-2	11:00		B

Shipment for SAS Complete? (Y/N)	Page 1 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 49033, 49034
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) Regina Bayer	Date/Time 5/28/97 4:20	Received by: (Signature) Tom Trainor	Date/Time 5/28/97 4:30	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? Y / N / none	

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United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

97ZC08

1. Project Code	Account Code	2. Region No. 5	Sampling Co. CHAM HILL	4. Date Shipped 5/28/97	Carrier Picked up by En Chem courier	6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved
Regional Information TGB 102		3. Sampler (Name) Regina Bayer		Airbill Number N/A			
Non-Superfund Program		3. Sampler Signature Regina Bayer		5. Ship To EN CHEM, INC. 1241 BELLEVUE ST GREEN BAY, WI 54302			
Site Name N.W. MAUTHE		3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> Early Action <input type="checkbox"/> CLEM <input type="checkbox"/> SI <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> REM <input type="checkbox"/> RI <input type="checkbox"/> RD <input type="checkbox"/> ST <input type="checkbox"/> OIL <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> NPLD		ATTN: TOM TRAINOR			

Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. eval. -Not a QC Sample
	97ZC08-27	2	L	G	1	VOCs, select	5-027906 → 908	W-105-2	5/27/97 16:20	RB
↓	↓	↓	↓	2	metals, select	5-027909	↓	↓	↓	
↓	↓	↓	↓	5	Cyanide, total	5-027911	↓	↓	↓	
21	↓	↓	↓	1	VOCs	5-027645 → 7647	W-8-2	16:40	↓	
↓	↓	↓	↓	2	metal	5-027648	↓	↓	↓	
↓	↓	↓	↓	5	cyanide	5-027650	↓	↓	↓	
-33	↓	↓	↓	1	VOCs	5-027942 → 944943	TBΦ1-2	17:00	↓	B

Shipment for SAS Complete? (Y/N)	Page 2 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 49031, 49032
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) Regina Bayer	Date/Time 5/28/97 9:15	Received by: (Signature) M. M. M. M. M.	Date/Time 5-28-97 9:15	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? Y / N / none	

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50901

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.
97ZC08

Case No.
124r
~~97ZC08~~

1. Project Code	Account Code	2. Region No. 5	Sampling Co. CHAM HILL	4. Date Shipped 5/28/97	Carrier picked up by En Chem courier
Regional Information TGB 102		Sampler (Name) Regina Bayer		Airbill Number N/A	
Non-Superfund Program		Sampler Signature Regina Bayer		5. Ship To EN CHEM, INC. 1241 BELLEVUE ST. GREEN BAY, WI 54302	
Site Name N.W. MAUTHE		3. Purpose*		ATTN: TOM TRAINOR	
City, State APPLETON, WI		Site Spill ID 66			

6. Matrix (Enter in Column A)	7. Preservative (Enter in Column D)
1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E (Analysis)	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank S=Spike D=Duplicate R=Rinsate PE=Perform. oval. =Not a QC Sample
97ZC08-80	2	L	G	1	VOCs, select	5-027924-926	MW108-2	5/27/97 12:30	RB.	
				2	Metals, select	5-027927				
				5	Cyanide, total	5-027929				
-20				1	VOCs	5-027639-641	W-2-2	14:00		
				2	Metals	5-027642				
				5	Cyanide	5-027644				
35				2	Total Chromium	5-029225	Outfall 001	14:45		
23				1	VOCs	5-027657-659	W-101-2	15:30		
				2	metals	5-027660				
				5	Cyanide	5-027662				

Shipment for SAS Complete? (Y/N)	Page 1 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 49031, 49032
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) Regina Bayer	Date/Time 5/28/97 9:15	Received by: (Signature) Tom Trainor	Date/Time 5-28-97 9:15	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? Y / N / none	

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United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	3. Sampling Co. CHAM HILL	4. Date Shipped 9/12/97	Carrier FED EX	6. Date Received--Received by:		
		3. Sampler (Name) DAVID L. SHEKOSKI		4. Airbill Number 4075742392		Laboratory Contract Number	Unit Price	
		3. Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST ANALYTICAL 8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615		7. Transfer to:		Date Received
		3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED Early Action <input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM SI <input type="checkbox"/> ESI <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST Long-Term Action <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		5. Ship To		7. Transfer to:		Date Received

Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time-Sample Collection	I Sampler Initials	J High Phases		
										Solids	Water-Miscible Liq.	Water-Immisc. Liq.
97ZC08-40	L	L	GRAB	1	SELECT VOCs	5-076526 → 528	W-15-3	7/11/97 17:03	DS			
↓				2	SELECT METALS	5-076529	↓	↓	↓			
↓				5	CYANIDE	5-076531	↓	↓	↓			
97ZC08-39				1	SELECT VOCs	5-076532, 536, 534	MW106-3	16:50	DS			
↓				2	SELECT METALS	5-076537	↓	↓	↓			
↓				5	CYANIDE	5-076539	↓	↓	↓			
97ZC08-50				1	SELECT VOCs	5-076597 → 599	MW106-3FR	16:50	DS			
↓				2	SELECT METALS	5-076580 5-075281	↓	↓	↓			
↓				5	CYANIDE	5-075283	↓	↓	↓			
97ZC08-47	B	L	GRAB	6	TOTAL CHROMIUM	5-076589	OUTFAL001-3	19:23	DS			

Shipment for SAS Complete? (Y/N)	Page 1 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 49101, 49102
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 9/12/97 15:02	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date/Time 9/19/97 11:25	Remarks	Is custody seal intact? Y/N/none

000168

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United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	3. Sampling Co. CHAM HILL	4. Date Shipped 9/12/97	Carrier 102 FED-EX FEDEX	6. Date Received--Received by:	
		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 4075442392		Laboratory Contract Number	Unit Price
		Sampler Signature 		5. Ship To KATALYST ANALYTICAL 8901 N. INDUSTRIAL RD. STE 100 PEORIA, IL 61615		7. Transfer to:	Date Received
		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> SI <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> RI <input checked="" type="checkbox"/> RA <input type="checkbox"/> ST <input type="checkbox"/> REM <input type="checkbox"/> OIL <input type="checkbox"/> O&M <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> NPLD		ATTN: CHRIS OHLAND		Received by	
				Contract Number		Price	

Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
										Solids	Water-Miscible Liq.	Water-Immisc. Liq.
97ZC08-43	L	L	GRAB	1	SELECT VOCs	5-076553 → 555	MW101-3	9/11/97 11:18	LOP			
↓				2	SELECT METALS	5-076556	↓	↓	↓			
↓				5	CYANIDE	5-076564	↓	↓	↓			
97ZC08-41				1	SELECT VOCs	5-076540 → 542	MW107-3	11:33	LOP			
↓				2	SELECT METALS	5-076543	↓	↓	↓			
↓				5	CYANIDE	5-076545	↓	↓	↓			
97ZC08-46				1	SELECT METALS VOCs	5-076571 → 573	MW-108-3	12:59	LOP			
↓				2	SELECT METALS	5-076574	↓	↓	↓			
↓				5	CYANIDE	5-076576	↓	↓	↓			

Shipment for SAS Complete? (Y/N)	Page 2 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures 	Chain of Custody Seal Number(s) 49101, 49102
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) 	Date/Time 9/12/97 15:02	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) 	Date/Time 9/13/97 11:28	Remarks Is custody seal intact? Y / N / none	

000169

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A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	Sampling Co. CHAM HILL	4. Date Shipped 9/12/97	Carrier FED EX	6. Date Received--Received by:		
		Sampler (Name) PATRICK ALLEN		Airbill Number 4075742392		Laboratory Contract Number	Unit Price	
		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST ANALYTICAL 8901 N. INDUSTRIAL ROAD STE. 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:		Date Received
		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> EARLY ACTION <input type="checkbox"/> SI <input type="checkbox"/> LONG-TERM ACTION <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> CLEM <input type="checkbox"/> ESI <input type="checkbox"/> RD <input type="checkbox"/> ST <input type="checkbox"/> PA <input type="checkbox"/> RI <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> FED <input type="checkbox"/> REM <input type="checkbox"/> OIL <input type="checkbox"/> NPLD <input type="checkbox"/> UST				Received by		Contract Number

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
	Other:			Other:						Solids	Water-Miscible Liq.	Water-Immisc. Liq.
97ZC08-36	2	L	GRAB	1	SELECT VOCs	5-076501 → 503	W-8-3	9/12/97 11:23	PA			
↓				2	SELECT METALS	5-076504	↓	↓	↓			
↓				5	CYANIDE	5-076506	↓	↓	↓			
97ZC08-45				1	SELECT VOCs	5-076565 → 567	FB-01-3	9/12/97 10:15	PA			
↓				2	SELECT METALS	5-076568	↓	↓	↓			
↓				5	CYANIDE	5-076570	↓	↓	↓			
97ZC08-35				1	SELECT VOCs	5-076507 → 509	MW105-3	9/12/97 11:32	PA			
↓				2	SELECT METALS	5-076510	↓	↓	↓			
↓				5	CYANIDE	5-076513	↓	↓	↓			
97ZC08-48	8	L	GRAB	1	VOCs	5-076592, 591	TE01-3		PA			

Shipment for SAS Complete? (Y/N)	Page of	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 49105, 49106
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 9/12/97 14:44	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date/Time 9/13/97 11:25	Remarks Is custody seal intact? Y / N / none	

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A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

97ZC08

Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	3. Sampling Co. CHARM HILL	4. Date Shipped 9/18/97	Carrier FED EX	6. Date Received--Received by:		
		Sampler (Name) DAVID L. SHEROSKI		Airbill Number 4075742381		Laboratory Contract Number	Unit Price	
		Sampler Signature 		5. Ship To KATALYST ANALYTICAL 8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615		7. Transfer to:		Date Received
		3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED Early Action <input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM Long-Term Action <input type="checkbox"/> SI <input type="checkbox"/> ESI <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		ATTN: CHRIS OHLAND		Received by		Contract Number

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/ Year/Time Sample Collection	I Sampler Initials	J High Phases		
	Other:			Other:						Solids	Water- Miscible Liq.	Water- Immisc Liq.
97ZC08-53	R	L	GRAB	1	SELECT VOCs	5-075556-558	MW-102-3	9/18/97 13:00	CS			
				2	SELECT METALS	5-075559						
				5	CYANIDE	5-075560						
97ZC08-54				1	SELECT VOCs	5-075541, 540, 543	MW-103-3	10:48	DB			
				2	SELECT METALS	5-075544						
				5	CYANIDE	5-075545						
97ZC08-51				1	SELECT VOCs	5-075534 → 536	W-2-3	17:52	CS			
				2	SELECT METALS	5-075537						
				5	CYANIDE	5-075538						

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures 	Chain of Custody Seal Number(s) 49056, 49057
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) 	Date/Time 9/18/97 18:05	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) 	Date/Time 9/19/97 08:45	Remarks Is custody seal intact? <input checked="" type="checkbox"/> Y / none	

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50030

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No. **97ZC08** Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	Sampling Co. CHARM HILL	4. Date Shipped 9/18/97	Carrier FED EX	6. Date Received--Received by:																																		
		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 4075742370		Laboratory Contract Number	Unit Price																																	
		Sampler Signature 		5. Ship To KATALYST ANALYTICAL 8901 N. INDUSTRIAL RD. STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:		Date Received																																
		3. Purpose* <table border="0"> <tr> <td>Lead</td> <td>SF</td> <td>Early Action</td> <td>CLEM</td> <td>SI</td> <td>Long-Term Action</td> <td>FS</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>ESI</td> <td><input type="checkbox"/></td> <td>RD</td> </tr> <tr> <td></td> <td>PRP</td> <td></td> <td>PA</td> <td>RI</td> <td><input checked="" type="checkbox"/></td> <td>RA</td> </tr> <tr> <td></td> <td>ST</td> <td></td> <td>REM</td> <td>OIL</td> <td></td> <td>O&M</td> </tr> <tr> <td></td> <td>FED</td> <td></td> <td></td> <td>UST</td> <td></td> <td>NPLD</td> </tr> </table>		Lead	SF	Early Action	CLEM	SI	Long-Term Action	FS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ESI	<input type="checkbox"/>	RD		PRP		PA	RI	<input checked="" type="checkbox"/>	RA		ST		REM	OIL		O&M		FED			UST		NPLD	Received by	
Lead	SF	Early Action	CLEM	SI	Long-Term Action	FS																																		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ESI	<input type="checkbox"/>	RD																																		
	PRP		PA	RI	<input checked="" type="checkbox"/>	RA																																		
	ST		REM	OIL		O&M																																		
	FED			UST		NPLD																																		

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
	Other (K/A)	Other	Solids	Water-Miscible Liq.						Water-Immisible Liq.		
97ZC08-52	2	L	GRAB	1	SELECT VOCs	5-075552, 554, 563, 565, 568 → 570	MW-104-3	9/18/97 10:24	DS			
↓	↓	↓	↓	2	SELECT METALS	5-075555, 573, 575	↓	↓				
↓	↓	↓	↓	5	CYANIDE	5-075561, 574, 576	↓	↓				
97ZC08-55	8	↓	↓	1	SELECT VOCs	5-075577, 578	FB-02-3	- -	CS			

Shipment for SAS Complete? (Y/N)	Page 1 of 1	Sample(s) to be Used for Laboratory QC 97ZC08-52 (MS/MSD)	Additional Sampler Signatures 	Chain of Custody Seal Number(s) 49058, 49059
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) 	Date/Time 9/18/97 18:11	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) 	Date/Time 9/19/97 08:45	Remarks Is custody seal intact? Y / N / none	

0901722

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50931

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Special Analytical Services
Packing List/Chain of Custody

SAS NO. 98ZR05
CASE NO.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	Sampling Co. CHAM HILL	4. Date Shipped 12/12/97	Carrier FED EX	6. Date Received-Received by:	
		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 800640976398		Laboratory Contract Number	Unit Price
		Sampler Signature 		5. Ship To KATALYST 8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:	Date Received

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc. Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
	Other:			Other:						Solids	Water: Miscible Liq	Water: Immisc Liq
51049 98ZR05-08	2	L	G	1	SELECT VOCs	5-075307-309	MW-101-4	12/12/97 0930	LS			
				2	SELECT METALS	5-075310						
				5	CYANIDE	5-075311, 336						
510 98ZR05-03				1	SELECT VOCs	5-075622-624	W-2-4	1350				
				2	SELECT METALS	5-075625						
				5	CYANIDE	5-075626, 329						

Shipment for SAS Complete? (Y/N)	Page 2 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures 	Chain of Custody Seal Number(s) 181528, 181600
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) 	Date/Time 12/12/97 15:02	Received by: (Signature) Fed-EP	Relinquished by: (Signature) Fed-EP	Date/Time 12/12/97 09:45	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) 	Date/Time 12/12/97 09:45	Remarks Is custody seal intact? (Y/N/none)	DUPLICATE

000217

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United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packing List/Chain of Custody

SAS No.

Case No.

98ZR05

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	3. Sampling Co. CHAM HILL	4. Date Shipped 12/13/97	Carrier FEDEX	6. Date Received--Received by:																									
		Sampler (Name) DAVID L. SIEKOSKI		Airbill Number 800640976413		Laboratory Contract Number	Unit Price																								
		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615 ATTN: CHRIS ONLAND		7. Transfer to:	Date Received																								
3. Purpose*				Received by																											
<table border="0"> <tr> <td>Lead</td> <td>Early Action</td> <td>SI</td> <td>Long-Term Action</td> </tr> <tr> <td><input checked="" type="checkbox"/> SF</td> <td><input type="checkbox"/> CLEM</td> <td>ESI</td> <td>FS</td> </tr> <tr> <td><input type="checkbox"/> PRP</td> <td><input type="checkbox"/> PA</td> <td>RI</td> <td>RD</td> </tr> <tr> <td><input type="checkbox"/> ST</td> <td><input type="checkbox"/> REM</td> <td>OIL</td> <td><input checked="" type="checkbox"/> RA</td> </tr> <tr> <td><input type="checkbox"/> FED</td> <td></td> <td>UST</td> <td>O&M</td> </tr> <tr> <td></td> <td></td> <td></td> <td>NPLD</td> </tr> </table>				Lead	Early Action	SI	Long-Term Action	<input checked="" type="checkbox"/> SF	<input type="checkbox"/> CLEM	ESI	FS	<input type="checkbox"/> PRP	<input type="checkbox"/> PA	RI	RD	<input type="checkbox"/> ST	<input type="checkbox"/> REM	OIL	<input checked="" type="checkbox"/> RA	<input type="checkbox"/> FED		UST	O&M				NPLD	Contract Number			
Lead	Early Action	SI	Long-Term Action																												
<input checked="" type="checkbox"/> SF	<input type="checkbox"/> CLEM	ESI	FS																												
<input type="checkbox"/> PRP	<input type="checkbox"/> PA	RI	RD																												
<input type="checkbox"/> ST	<input type="checkbox"/> REM	OIL	<input checked="" type="checkbox"/> RA																												
<input type="checkbox"/> FED		UST	O&M																												
			NPLD																												
				Price																											

Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc. Low Med High	C Sample Type Comp./Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
										Solids	Water-Miscible Lq.	Water-Imms Lq.
98ZR05-04	2	L	G	1	SELECT VOCs	5-075673-675; 660-665	MW-104-4	12/12/97 0800	DS			
				2	SELECT METALS	5-075673, 648						
				5	CYANIDE	5-075341, 342, 671, 689						
98ZR05-10				1	SELECT VOCs	5-075312, 313, 686	MW-107-4	1330				
				2	SELECT METALS	5-075314						
				5	CYANIDE	5-075688, 339						
98ZR05-14				1	SELECT VOCs	5-075323-325	MW-107-4FR	1335				
				2	SELECT METALS	5-075322						
				5	CYANIDE	5-075320, 340						

Shipment for SAS Complete? (Y/N)	Page 1 of 2	Sample(s) to be Used for Laboratory QC 98ZR05-04	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 181586, 181587
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 12/13/97 15:05	Received by: (Signature) Fed-ef	Relinquished by: (Signature) Fed-ef	Date/Time 12/13/97 09:45	Received by: (Signature) <i>[Signature]</i>
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date/Time 12/13/97 09:45	Remarks Is custody seal intact? Y / N / none	

000218

DUPLICATE

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Pink - Lab Copy for Return to Data User**
EPA Form 9110-3
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**Data User means the organization which contracted the laboratory services

52387

A21-012-7 REV. 3/94



Special Analytical Services
Packing List/Chain of Custody

SAS NO.

Case No.

98ZR05

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	3. Sampling Co. CHAM HILL	4. Date Shipped 12/12/97	Carrier FED EX	6. Date Received--Received by:		
		3. Sampler (Name) DAVID L. SIEKOSKI		4. Airbill Number 800640976398		Laboratory Contract Number	Unit Price	
		3. Purpose Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED Early Action: <input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM Long-Term Action: <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		5. Ship To KATALYST 8901 N. INDUSTRIAL RD. STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:		Date Received
				Received by		Contract Number		Price

Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc. Low Med High	C Sample Type/Comp./Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
										Solids	Water, Miscible Lq.	Water, Immis. Lq.
510 46 98ZR05-06	2	L	G	1	SELECT VOCs	5-075678-680	MW-105-4	12/11/97 14:30	CS			
				2	SELECT METALS	5-075677						
				5	CYANIDE	5-075676, 330						
47 98ZR05-09				1	SELECT VOCs	5-075632-634	MW-106-4	14:45				
				2	SELECT METALS	5-075635						
				5	CYANIDE	5-075636, 334						
48 98ZR05-12				1	SELECT VOCs	5-075315-317	FB-01-4	15:30				
				2	SELECT METALS	5-075318						
				5	CYANIDE	5-075319, 337						

Shipment for SAS Complete? (Y/N)	Page 1 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s) 181588, 181600
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
<i>[Signature]</i>	12/12/97 15:02	<i>[Signature]</i>	<i>[Signature]</i>	12/12/97 09:45	<i>[Signature]</i>
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? Y/N/none
		<i>[Signature]</i>	12/12/97 09:45		

000219

A21-012-7 REV. 3/84

DUPLICATE

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United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packing List/Chain of Custody

SAS NO.

98ZR05

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. No. Preserved	2. Region No. 5	Sampling Co. CHAM HILL	4. Date Shipped 12/12/97	Carrier FEDEX	6. Date Received-Received by:	
		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 800640976413		Laboratory Contract Number	Unit Price
		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL ROAD PEORIA, IL 61615 STE 100		7. Transfer to:	Date Received
3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED <input type="checkbox"/> Lead <input type="checkbox"/> Early Action <input type="checkbox"/> CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM <input type="checkbox"/> SI <input type="checkbox"/> ES <input type="checkbox"/> RI <input type="checkbox"/> OIL <input type="checkbox"/> UST <input type="checkbox"/> Long-Term Action <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		Received by		Contract Number		Price	

Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
										Solids	Water: Miscible Liq	Water: Immiscible Liq
10 #4 98ZR05-07	2	L	G	1	SELECT VOCs	5-075681-683	W-15-4	12/12/97 1120	DL			
				2	SELECT METALS	5-075685, 333 684						
				5	CYANIDE	5-075685, 333						
45 98ZR05-11				1	SELECT VOCs	5-075637, 638	TB-01-4	-				

Shipment for SAS Complete? (Y/N)	Page 2 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 181586, 181587
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 12/12/97 15:05	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 12/12/97 09:45	Received by: (Signature) <i>[Signature]</i>
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date/Time 12/12/97 09:45	Remarks Is custody seal intact? Y/N / none	

000220

A21-012-F REV. 3/94

DUPLICATE

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52389



United States Environmental Protection Agency
Contract Laboratory Program

**Special Analytical Services
Packing List/Chain of Custody**

SAS No.

98ZR05

Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAQH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	3. Sampling Co. CH2M HILL	4. Date Shipped 12/12/97	Carrier FEDEX	6. Date Received--Received by:	
		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 800640976402		Laboratory Contract Number	Unit Price
		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> SI <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> RI <input type="checkbox"/> RD <input type="checkbox"/> ST <input type="checkbox"/> REM <input type="checkbox"/> OIL <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> NPLD		5. Ship To KATALYST 8901 N. INDUSTRIAL BLVD ROAD STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:	

Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp./Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
										Solids	Water-Miscible Lq.	Water-Immisc Lq.
98ZR05-05	2	L	G	1	SELECT VOCs	5-075627-629	W-8-4	12/12/97 1140	178			
				2	SELECT METALS	5-075630						
				5	CYANIDE	5-075631, 632						
98ZR05-16	8			6	SELECT TOTAL Cr	5-075649	OUTFALL 001-4	0750				
98ZR05-02	2			2	SELECT METALS	5-075669	MW-103-4	1205				
				5	CYANIDE	5-075666, 328						
				1	SELECT VOCs	5-075667, 668, 670						
98ZR05-01				1	SELECT VOCs	5-075616-618	MW-102-4	1130				
				2	SELECT METALS	5-075620						
				5	CYANIDE	5-075621, 338						

Shipment for SAS Complete? (Y/N)	Page 1 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)
			<i>[Signature]</i>	181585, 181599

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
<i>[Signature]</i>	12/12/97 15:10	<i>[Signature]</i>	<i>[Signature]</i>	12/12/97 09:45	<i>[Signature]</i>
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks Is custody seal intact? Y/N/none	
		<i>[Signature]</i>	12/12/97 09:45		

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52290

A21-012-7 REV. 2/94

DUPLICATE



98ZR05

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	Sampling Co. CH2M HILL	4. Date Shipped 12/13/97	Carrier FEDEX	6. Date Received-Received by: 		
		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 800640776402		Laboratory Contract Number 	Unit Price 	
		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> SI <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> RI <input type="checkbox"/> RD <input type="checkbox"/> ST <input type="checkbox"/> REM <input type="checkbox"/> OIL <input checked="" type="checkbox"/> RA <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		5. Ship To KATALYST 8901 N. INDUSTRIAL ROAD STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to: 	Date Received 	

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc. Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
	Other:			Other:						Solids	Water-Miscible Lq.	Water-Immisc Lq.
6511MS 98ZR05-13	2	L	G	1	SELECT VOCS	5-075642-644	MW-108-4	12/13/97 1108	DS			
	↓	↓	↓	2	SELECT METALS	5-075647	↓	↓	↓			
	↓	↓	↓	5	CYANIDE	5-075646, 335	↓	↓	↓			

Shipment for SAS Complete? (Y/N)	Page 2 of 3	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)
			<i>[Signature]</i>	181585, 181599

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
<i>[Signature]</i>	12/13/97 15:10	Fed-EX	Fed-EX	12/13/97 09:45	<i>[Signature]</i>
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks Is custody seal intact? Y/N / none	
		<i>[Signature]</i>	12/13/97 09:45		

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United States Environmental Protection Agency
Contract Laboratory Program

Sper Analytical Services
Packaging List/Chain of Custody

SAS No.

98ZRO5

Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	3. Sampling Co. CHAM HILL	4. Date Shipped 3/25/98	Carrier FED EX	6. Date Received--Received by:																			
		Sampler (Name) DAVID L. SHEROSKI		Airbill Number 2092293195		Laboratory Contract Number	Unit Price																		
		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:		Date Received																	
		3. Purpose* <table border="0"> <tr> <td>Lead</td> <td>Early Action</td> <td><input type="checkbox"/> SI</td> <td>Long-Term Acid</td> </tr> <tr> <td><input checked="" type="checkbox"/> SF</td> <td><input type="checkbox"/> CLEM</td> <td><input type="checkbox"/> ESI</td> <td><input type="checkbox"/> FS</td> </tr> <tr> <td><input type="checkbox"/> PRP</td> <td><input type="checkbox"/> PA</td> <td><input type="checkbox"/> RI</td> <td><input type="checkbox"/> RD</td> </tr> <tr> <td><input type="checkbox"/> ST</td> <td><input type="checkbox"/> REM</td> <td><input type="checkbox"/> OIL</td> <td><input checked="" type="checkbox"/> RA</td> </tr> <tr> <td><input type="checkbox"/> FED</td> <td><input type="checkbox"/> UST</td> <td><input type="checkbox"/> O&M</td> <td><input type="checkbox"/> NPLD</td> </tr> </table>		Lead	Early Action	<input type="checkbox"/> SI	Long-Term Acid	<input checked="" type="checkbox"/> SF	<input type="checkbox"/> CLEM	<input type="checkbox"/> ESI	<input type="checkbox"/> FS	<input type="checkbox"/> PRP	<input type="checkbox"/> PA	<input type="checkbox"/> RI	<input type="checkbox"/> RD	<input type="checkbox"/> ST	<input type="checkbox"/> REM	<input type="checkbox"/> OIL	<input checked="" type="checkbox"/> RA	<input type="checkbox"/> FED	<input type="checkbox"/> UST	<input type="checkbox"/> O&M	<input type="checkbox"/> NPLD	Received by	
Lead	Early Action	<input type="checkbox"/> SI	Long-Term Acid																						
<input checked="" type="checkbox"/> SF	<input type="checkbox"/> CLEM	<input type="checkbox"/> ESI	<input type="checkbox"/> FS																						
<input type="checkbox"/> PRP	<input type="checkbox"/> PA	<input type="checkbox"/> RI	<input type="checkbox"/> RD																						
<input type="checkbox"/> ST	<input type="checkbox"/> REM	<input type="checkbox"/> OIL	<input checked="" type="checkbox"/> RA																						
<input type="checkbox"/> FED	<input type="checkbox"/> UST	<input type="checkbox"/> O&M	<input type="checkbox"/> NPLD																						

18702

6

7

8

1

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
	Other:			Other:						Solids	Water-Miscible Liq.	Water-Imm. Liq.
98ZRO5-17	2	L	G	1	SELECT VOCs	5-076605 → 607	MW-101-5	3/24/98 11:00	DS			
				2	SELECT METALS	5-076608						
				5	CYANIDE	5-076609						
98ZRO5-23				1	SELECT VOCs	5-076637 → 639	MW-107-5	1155				
				2	SELECT METALS	5-076640						
				5	CYANIDE	5-076641						
98ZRO5-19				1	SELECT VOCs	5-076615 → 617	MW-103-5	1650				
				2	SELECT METALS	5-076618						
				5	CYANIDE	5-076619						
90ZRO5-30				1	SELECT VOCs	5-076675, 676	TB-01-5	N/A N/A				

Shipment for SAS Complete? (Y/N)	Page 1 of 3	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>Michael & Hinton</i>	Chain of Custody Seal Number(s) 49055, 49081
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CHAIN OF CUSTODY RECORD

000297

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 3/25/98 1335	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>Chris Ohland</i>	Date/Time 3/26/98 12:30p	Remarks Is custody seal intact? (Y)N / none 49055, 49081	

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DUPLICATE 52723

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packlist/Chain of Custody

SAS No.

98ZR05

Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	Sampling Co. CHAM HILL	4. Date Shipped 3/25/98	Carrier FEDEX	6. Date Received--Received by:	
		Sampler (Name) DIVIO L. SHEKOSKI		Airbill Number 2092293195		Laboratory Contract Number	Unit Price
		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL RD. STE 100 PEORIA, IL 61615		7. Transfer to:	Date Received
3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> ES <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> RI <input checked="" type="checkbox"/> RA <input type="checkbox"/> ST <input type="checkbox"/> REM <input type="checkbox"/> OIL <input type="checkbox"/> O&M <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> NPLD				ATTN: CHRIS OHLAND		Received by	
						Contract Number	Price

18908

13

14

5

Sample Numbers (From Labels)	A Matrix (From Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (From Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection:	I Sampler Initials	J High Phases		
										Solids	Water-Miscible Lq	Water-Immisc Lq
98ZR05-24	2	1	G	1	SELECT VOCs	5-076642 → 644	MW-108-5	3/25/98 1350	1711			
				2	SELECT METALS	5-076645						
				5	CYANIDE	5-076646						
98ZR05-22				1	SELECT VOCs	5-076632 → 634	MW-106-5	1505				
				2	SELECT METALS	5-076635						
				5	CYANIDE	5-076636						
98ZR05-20				1	SELECT VOCs	5-076620 → 622, 685 → 690	MW-104-5	1630				
				2	SELECT METALS	5-076601, 602, 623						
				5	CYANIDE	5-076624, 691						

Shipment for SAS Complete? (Y/N)	Page 2 of 3	Sample(s) to be Used for Laboratory QC 98ZR05-20	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 49055, 49081
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 3/25/98 1335	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>Chris Ohland</i>	Date/Time 3/24/98 12:30p	Remarks Is custody seal intact? (Y) N / none 49055, 49081	

18908

A21-012-7 REV. 3/94

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**Data User means the organization which contracted the laboratory services

DUPLICATE 52725



United States Environmental Protection Agency
Contract Laboratory Program

Speci' Analytical Services
Packing List/Chain of Custody

SAS No.

98ZR05

Case No.

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	3. Sampling Co. CHAM HILL	4. Date Shipped 3/25/98	Carrier FEDEX	6. Date Received--Received by:	
		Sampler (Name) DAVID L SHEKOSKI		Airbill Number 2092293206		Laboratory Contract Number	Unit Price
		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL RD. STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:	Date Received
3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> SI <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> RI <input type="checkbox"/> RD <input type="checkbox"/> ST <input type="checkbox"/> REM <input type="checkbox"/> OIL <input checked="" type="checkbox"/> RA <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> O&M <input type="checkbox"/> NPLD						Contract Number	Price

Sample Numbers (From Labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
										Solids	Water-Miscible Lq.	Water-Immns Lq.
98ZR05-27	2	L	G	1	SELECT VOCs	5-076660-662	W-15-5	3/25/98 0915	LS			
				2	SELECT METALS	5-076663						
				5	CYANIDE	5-076664						
98ZR05-28				2	SELECT METALS	5-076668	W-15-5FR	0921				
				1	SELECT VOCs	5-076665 → 667						
				5	CYANIDE	5-076669						
98ZR05-21				1	SELECT VOCs	5-076626 → 628	NW-105-5	1015				
				2	SELECT METALS	5-076629						
				5	CYANIDE	5-076630						

Shipment for SAS Complete? (Y/N)	Page 1 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 49075, 49076
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 3/25/98 1345	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>Chris Ohland</i>	Date/Time 3/24/98 1215p	Remarks Is custody seal intact? <input checked="" type="checkbox"/> N / none	49075, 49076

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DUPLICATE 52726

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packaging List/Chain of Custody

SAS No.

Case No.

987205

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	Sampling Co. CH2MHILL	4. Date Shipped 3/25/98	Carrier FED EX	6. Date Received--Received by:																			
		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 2092293195		Laboratory Contract Number	Unit Price																		
		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:		Date Received																	
		3. Purpose* <table border="0"> <tr> <td>Lead</td> <td>Early Action</td> <td>SI</td> <td>Long-Term Action</td> </tr> <tr> <td><input checked="" type="checkbox"/> SF</td> <td><input type="checkbox"/> CLEM</td> <td>ESI</td> <td><input type="checkbox"/> FS</td> </tr> <tr> <td><input type="checkbox"/> PRP</td> <td><input type="checkbox"/> PA</td> <td>RI</td> <td><input checked="" type="checkbox"/> RA</td> </tr> <tr> <td><input type="checkbox"/> ST</td> <td><input type="checkbox"/> REM</td> <td>OIL</td> <td><input type="checkbox"/> O&M</td> </tr> <tr> <td><input type="checkbox"/> FED</td> <td></td> <td>UST</td> <td><input type="checkbox"/> NPLD</td> </tr> </table>		Lead	Early Action	SI	Long-Term Action	<input checked="" type="checkbox"/> SF	<input type="checkbox"/> CLEM	ESI	<input type="checkbox"/> FS	<input type="checkbox"/> PRP	<input type="checkbox"/> PA	RI	<input checked="" type="checkbox"/> RA	<input type="checkbox"/> ST	<input type="checkbox"/> REM	OIL	<input type="checkbox"/> O&M	<input type="checkbox"/> FED		UST	<input type="checkbox"/> NPLD	Received by	
Lead	Early Action	SI	Long-Term Action																						
<input checked="" type="checkbox"/> SF	<input type="checkbox"/> CLEM	ESI	<input type="checkbox"/> FS																						
<input type="checkbox"/> PRP	<input type="checkbox"/> PA	RI	<input checked="" type="checkbox"/> RA																						
<input type="checkbox"/> ST	<input type="checkbox"/> REM	OIL	<input type="checkbox"/> O&M																						
<input type="checkbox"/> FED		UST	<input type="checkbox"/> NPLD																						

18992
2662

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
	Other:									Solids	Water-Miscible Lq.	Water-Immns Lq.
98ER05-27	2	L	G	1	SELECT VOCs	5-076670 → 672	FB-01-05	3/25/98 1255	[Signature]			
				2	SELECT METALS	5-076673						
				5	CYANIDE	5-076674						

DUPLICATE

Shipment for SAS Complete? (Y/N)	Page 3 of 3	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 49055, 49081
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 3/25/98 1335	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) Chris Ohland	Date/Time 3/26/98 12:30p	Remarks Is custody seal intact? (Y) N / none 49055, 49081	

000275

A21-012-7 REV. 3/94

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DUPLICATE 52727



United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packaging List/Chain of Custody

SAS No.

Case No.

78ZRO5

1. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	2. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved	2. Region No. 5	Sampling Co. CHARM HILL	4. Date Shipped 3/25/98	Carrier FLEDEX	6. Date Received--Received by:	
		Sampler (Name) DAVID L. SIEKOSKI		Airbill Number 2092293206		Laboratory Contract Number	Unit Price
		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL RD S7E 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND		7. Transfer to:	Date Received
		3. Purpose* <input checked="" type="checkbox"/> SF <input type="checkbox"/> Early Action <input type="checkbox"/> SI <input type="checkbox"/> Long-Term Action <input type="checkbox"/> PRP <input type="checkbox"/> CLEM <input type="checkbox"/> ES1 <input type="checkbox"/> FS <input type="checkbox"/> ST <input type="checkbox"/> PA <input type="checkbox"/> RI <input checked="" type="checkbox"/> RD <input type="checkbox"/> FED <input type="checkbox"/> REM <input type="checkbox"/> OIL <input checked="" type="checkbox"/> RA <input type="checkbox"/> <input type="checkbox"/> UST <input type="checkbox"/> O&M <input type="checkbox"/> NPLD		Contract Number		Price	

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J High Phases		
	Other:			Other:						Solids	Water-Miscible Lq.	Water-Immns Lq.
78ZRO5-25	2	L	G	1	SELECT VOCs	5-076647 → 649	W-2-5	3/25/98 0936	DLV			
				2	SELECT METALS	5-076650						
				5	CYANIDE	5-076651						
78ZRO5-18				1	SELECT VOCs	5-076610 → 612	11W-102-5	0950				
				2	SELECT METALS	5-076613						
				5	CYANIDE	5-076614						
78ZRO5-26				1	SELECT VOCs	5-076657 → 659	W-8-5	1240				
				2	SELECT METALS	5-076655						
				5	CYANIDE	5-076654						

Shipment for SAS Complete? (Y/N)	Page 2 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 49075, 49076
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 3/25/98 1345	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time 3/24/98 12:15p	Remarks Is custody seal intact? (Y) N / none	49075, 49076

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DUPLICATE 52757

A21-012-7 REV. 3/94



United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packing List/Chain of Custody

SAS No.

Case No.

98ZR05

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier	6. Matrix (Enter in Column A)	7. Preservative (Enter in Column D)
Regional Information		Sampler (Name)		Airbill Number			
Non-Superfund Program		Sampler Signature		5. Ship To			
Site Name		3. Purpose*		KATALYST			
City, State		Site Spill ID		8901 N. INDUSTRIAL RD		1. Surface Water	
APPLETON, WI		66		STE 100		2. Ground Water	
				PEORIA, IL 61615		3. Leachate	
				ATTN: CHRIS OHLAND		4. Field QC	
						5. Soil/Sediment	
						6. Oil	
						7. Waste	
						8. Other (Specify in Column A)	
						N. Not Preserved	

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/ Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier
	Other:			Other:						B=Blank D=Duplicate R=Rinsate PE=Perform. eval. - =Not a QC Sample
98ZR05-43	2	L	G	1	SELECT VOCs	5-200947 → 949	W-8-6	6/9/98 1519	OU	
				2	SELECT METALS	5-200950				
				5	CYANIDE	5-200696				
98ZR05-41				1	SELECT VOCs	5-200937 → 939	MW-108-6	1620		
				2	SELECT METALS	5-200940				
				5	CYANIDE	5-200941				

Shipment for SAS Complete? (Y/N)	Page	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)
	2 of 2		<i>Patricia M...</i>	145501, 145502

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
<i>Patricia M...</i>	6/10/98 1412				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? (Y/N/none)
		<i>David M...</i>	6-11-98 10:45		(Y)

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United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packing List/Chain of Custody

SAS No.

98ZR05

Case No.

1. Project Code	Account Code	2. Region No. 5	Sampling Co. CHAM HILL	4. Date Shipped 6/10/98	Carrier FED EX	6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved
Regional Information TGB 102		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 805938322675			
Non-Superfund Program		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND			
Site Name N.W. MAUTHE		3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> ES <input type="checkbox"/> FS <input type="checkbox"/> RD <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> NPLD Early Action <input type="checkbox"/> PA <input type="checkbox"/> OIL <input type="checkbox"/> UST					
City, State APPLETON, WI	Site Spill ID 66						

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time - Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank D=Duplicate R=Rinsate PE=Perform. eval. - =Not a QC Sample
	Other:			Other:						
98ZR05-36	2	L	G	1	SELECT VOCs	5-200911 → 913	MW-103-6	6/9/98 1400	025	
				2	SELECT METALS	5-200914				
				5	CYANIDE	5-200915				
902R05-47				1	SELECT VOCs	5-200708 → 710	MW-103FR-6	1405		D
				2	SELECT METALS	5-200711				
				5	CYANIDE	5-200712				
98ZR05-46				1	SELECT VOCs	5-200703 → 705	FB-01-06	1130		B
				2	SELECT METALS	5-200706				
				5	CYANIDE	5-200707				

27127
*1
*2
*3

Shipment for SAS Complete? (Y/N)	Page 1 of 2	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures <i>[Signature]</i>	Chain of Custody Seal Number(s) 145503, 145504
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CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 6/10/98 1409	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date/Time 6-11-98 10:20	Remarks Is custody seal intact? <input checked="" type="checkbox"/> N / none	

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United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packing List/Chain of Custody

SAS No.
98ZR05

Case No.

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier	6. Matrix (Enter in Column A)	7. Preservative (Enter in Column D)
Regional Information		5	CHARM HILL	6/10/98	FED EX		
T6B102		3. Sampler (Name)		Airbill Number			
Non-Superfund Program		DAVID L. SHEKOSKI		805838322675			
Site Name		3. Purpose*		5. Ship To		1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved
N.W. MAUTHE		Lead	Early Action	SI	FS		
City, State		PRP	PA	RI	RA		
APPLETON, WI		ST	REM	OIL	O&M		
Site Spill ID		FED	UST	NPLD	ATTN: CHRIS OHLAND		

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier
98ZR05-39	2	L	G	1	SELECT VOCs	5-200927 → 929	MW-106-6	6/10/98 0925	DOJ	
				2	SELECT METALS	5-200930				
				5	CYANIDE	5-200931				
98ZR05-42				1	SELECT VOCs	5-200942 → 944	W-2-6	1050		
				2	SELECT METALS	5-200943				
				5	CYANIDE	5-200946				

Shipment for SAS Complete? (Y/N)	Page	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)
	2 of 2		<i>Chris Ohland</i>	145503 145504

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
<i>DOJ</i>	6/10/98 1409				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? (Y) N / none
		<i>David L. Shekoski</i>	6-11-98 10:20		(Y)

000170

A21-012-7 REV. 3/94

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United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packaging and Chain of Custody

SAS No.

Case No.

98ZR05

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier	6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. NaOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved
Regional Information		Sampler (Name)		Airbill Number			
Non-Superfund Program		Sampler Signature		5. Ship To			
Site Name		3. Purpose*		KATALYST			
City, State		Site Spill ID		8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615			
APPLETON, WI		GG		ATTN: CHRIS OHLAND			

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank D=Duplicate R=Rinsate PE=Perform. eval. -Not a QC Sample
	Other:			Other:						
98ZR05-40	2	L	G	1	SELECT VOCs	5-200932 → 934	MW-107-6	6/10/98 1140	OS	
				2	SELECT METALS	5-200935				
				5	CYANIDE	5-200936				
98ZR05-35				1	SELECT VOCs	5-200901 → 903	MW-102-6	1105		
				2	SELECT METALS	5-200904				
				5	CYANIDE	5-200905				
98ZR05-34				1	SELECT VOCs	5-200906 → 908	MW-101-6	1040		
				2	SELECT METALS	5-200909				
				5	CYANIDE	5-200910				
98ZR05-48				1	SELECT VOCs	5-200713 714	TB-101-6	N/A N/A		B
Shipment for SAS Complete? (Y/N)		Page		Sample(s) to be Used for Laboratory QC		Additional Sampler Signatures		Chain of Custody Seal Number(s)		
		1 of 1				<i>Chris Ohland</i>		145505, 145506		

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
<i>Chris Ohland</i>	6/10/98 1402				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	Is custody seal intact? (Y/N/none)
		<i>David Felber</i>	6-11-98 10:35		Y

000122

A21-012-7 REV. 3/94

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53012



United States Environmental Protection Agency
Contract Laboratory Program

Special Analytical Services
Packing List/Chain of Custody

SAS No.

Case No.

98ZR05

1. Project Code	Account Code	2. Region No. 5	3. Sampling Co. CHAM HILL	4. Date Shipped 6/10/98	Carrier FEDEX	6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other (Specify in Column A)	7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NAHSO4 4. H2SO4 5. NAOH 6. Ice Only 7. Other (Specify in Column D) N. Not Preserved.
Regional Information TGB102		Sampler (Name) DAVID L. SHEKOSKI		Airbill Number 805838322664			
Non-Superfund Program		Sampler Signature <i>[Signature]</i>		5. Ship To KATALYST 8901 N. INDUSTRIAL RD STE 100 PEORIA, IL 61615 ATTN: CHRIS OHLAND			
Site Name N.W. MAUTHE		3. Purpose* Lead <input checked="" type="checkbox"/> SF <input type="checkbox"/> CLEM <input type="checkbox"/> ESI <input type="checkbox"/> FS <input type="checkbox"/> PRP <input type="checkbox"/> PA <input type="checkbox"/> RI <input checked="" type="checkbox"/> RA <input type="checkbox"/> O&M <input type="checkbox"/> ST <input type="checkbox"/> REM <input type="checkbox"/> OIL <input type="checkbox"/> O&M <input type="checkbox"/> FED <input type="checkbox"/> UST <input type="checkbox"/> NPLD					
City, State APPLETON, WI		Site Spill ID GG					

Sample Numbers (From Labels)	A Matrix (from Box 6)	B Conc.: Low Med High	C Sample Type Comp./ Grab	D Preservative (from Box 7)	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier B=Blank D=Duplicate R=Rinsate PE=Perform. eval. -Not a QC Sample
	Other:			Other:						
98ZR05-38	2	L	G	1	SELECT VOCs	5-200921 → 923	MW-105-6	6/9/98 1506	104	
				2	SELECT METALS	5-200924				
				5	CYANIDE	5-200925				
98ZR05-44				1	SELECT VOCs	5-200697 → 699	W-15-6	1450		
				2	SELECT METALS	5-200700				
				5	CYANIDE	5-200701				
98ZR05-37				1	SELECT VOCs	5-200916, 917, 919, 716 → 721	MW-104-6	1412		
				2	SELECT METALS	5-200726, 727, 919				
				5	CYANIDE	5-200728, 729, 920				
98ZR05-45				2	TOTAL CHROMIUM	5-200702	OUT FALL-001-6	6/10/98 0725		
Shipment for SAS Complete? (Y/N)		Page 1 of 2	Sample(s) to be Used for Laboratory QC 98ZR05-37			Additional Sampler Signatures <i>[Signature]</i>		Chain of Custody Seal Number(s) 145501, 145502		

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 6/10/98 1412	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date/Time 6-11-98 10:45	Remarks Is custody seal intact? <input checked="" type="checkbox"/> N / none	

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**Data User means the organization which contracted the laboratory services

53022

A21-012-7 REV. 3/94

27127

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Appendix B
City of Appleton POTW
Industrial User Permit



DEPARTMENT OF UTILITIES

WASTEWATER DIVISION • CENTRAL BUILDING MAINTENANCE DIVISION

2006 East Newberry Street • Appleton, WI 54915

414/832-5945 • 414/832-5514 • FAX 414/832-5949

INDUSTRIAL USER PERMIT TRANSMITTAL LETTER

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Cathy Barnett,
Mauthe Site Project Manager
CH2M HILL
411 East Wisconsin Avenue, Suite 1600
Milwaukee, Wisconsin 53202

as Authorized Representative for Discharger: USEPA Region 5, Chicago, Illinois

**RE: Issuance of Industrial User Permit to USEPA Region 5 / N. W. Mauthe Superfund Site
By the City of Appleton.
Permit No. 97 - 21.**

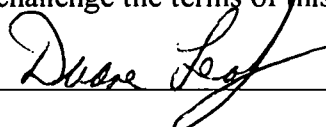
Dear Ms. Barnett:

Your application for an industrial user pretreatment permit has been reviewed and processed in accordance with section 20.4.

The enclosed permit, 97 - 21, covers the wastewater discharged from the facility located at 725 South Outagamie Street into the City of Appleton sewer system. All discharges from this facility and actions and reports relating thereto shall be in accordance with the terms and conditions of this permit.

If you wish to appeal or challenge any conditions imposed in this permit, a petition shall be filed for modification or reissuance of this permit in accordance with the requirements of section 20-108, within 20 days of your receipt of this correspondence. Pursuant to section 20-108, failure to petition for reconsideration of the permit within the allotted time is deemed a waiver by the permittee of his right to challenge the terms of this permit.

By: _____


Duane Leaf
Director of Utilities

Issued this 30th day of April, 1997

COVER PAGE

Permit No. 97 - 21

INDUSTRIAL USER (WASTEWATER DISCHARGE) PERMIT

In accordance with the provisions of Division 4 and 5, Article III, Chapter 20, Utilities, City of Appleton Ordinance,

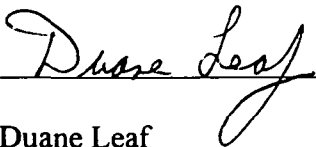
**N. W. Mauthe Superfund Site
c/o United States Environmental Protection Agency Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604**

is hereby authorized to discharge industrial wastewater from the above identified facility and through the outfalls identified herein into the City of Appleton sewer system in accordance with the conditions set forth in this permit. Compliance with this permit does not relieve the permittee of its obligation to comply with any or all applicable pretreatment regulations, standards or requirements under local, State, and Federal laws, including any such regulations, standards, requirements, or laws that may become effective during the terms of this permit.

Noncompliance with any terms or condition of this permit shall constitute a violation of the Chapter 20, Utilities, City of Appleton Ordinance.

This permit shall become effective on the date of signature and shall expire at midnight on **May 31, 2000**.

If the permittee wishes to continue to discharge after the expiration date of this permit, an application must be filed for a renewal permit in accordance with the requirements of Section 20-132, Chapter 20, Utilities, City of Appleton Ordinance, a minimum of 90 days prior to the expiration date.

By: 
Duane Leaf
Director of Utilities

Issued this **30 th** day of **April 1997**

INTRODUCTION

Discharges from the outfall(s) regulated by this permit are subject to the local limits established by the City of Appleton in Section 20-83, Chapter 20, Utilities. These requirements are set forth in Part 1 of this permit.

PART 1 - EFFLUENT LIMITATIONS

A. Outfall(s) Description

Outfall 001 is located in the pretreatment building constructed solely to remediate groundwater collected from the property located at 725 South Outagamie Street. This property, the former N. W. Mauthe plating company, is now a USEPA designated Superfund site. Discharged wastewater from this facility is not related to any current production activities and only represents contaminated groundwater remediation efforts at the site. As such, groundwater is collected and treated for discharge on a batch-wise basis only. There is no continuous, unmonitored, wastestream entering the sanitary sewer outfall at this facility.

This outfall enters the City sewer system at manhole 30 - 14 on Melvin Street between the intersections of Douglas Street and Outagamie Street.

B. Effluent Limitations for pH

Outfall 001

- (1) The pH of the permittee's discharge shall be greater than 5.0 s.u. and less than 12.4 s.u. at all times.

C. Effluent Limitations

(1) Outfall 001

Applicable Categorical Pretreatment Standards

<u>Parameter</u>	<u>Daily maximum (mg/l)</u>	<u>Monthly average (mg/l)</u>
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(THIS OUTFALL IS NOT REGULATED BY CATEGORICAL PRETREATMENT STANDARDS)

Discharge from this site is not associated with any current production activity.

Applicable Local Limits

<u>Parameter :</u>	<u>Daily Maximum :</u>	<u>(mg/L or as noted) :</u>
Aluminum, total	70.0	
Arsenic, total	1.0	
Cadmium, total	0.3	
Chromium, total	7.0	
Chromium, hexavalent	4.5	
Copper, total	3.5	
Cyanide, total	1.0	
Lead, total	2.0	
Mercury, total	2.0	µg / L
Nickel, total	2.0	
Zinc, total	10.0	

The discharge from **Outfall 001** shall comply with Sections 20-81 and 20-83, Chapter 20, Utilities; and PART 5 - PROHIBITIONS contained in this permit.

PART 2 - MONITORING REQUIREMENTS

A. Outfall 001

Samples shall be collected at **Outfall 001**.

<u>Sample Parameter (units)</u>	<u>Sample Frequency</u>	<u>Sample Type</u>	<u>Analytical Method¹</u>
<i>(PROCESS COMPLIANCE PARAMETERS)</i>			
Flow (gpd)	during discharge	Meter ²	
pH ³ (s.u.)	during discharge	Meter	
Chromium, total (mg/l)	1/quarter	FPC ⁴	200.7, 218.1, 218.2 or 218.3
Chromium, hexavalent (mg/l)	during discharge	Grab ⁵	218.4

(LOCAL LIMIT COMPLIANCE PARAMETERS)

Aluminum, total (mg/L)	1/year ⁶	FPC	202.1, or 202.2
Arsenic, total (mg/L)	1/year	FPC	206.2, 206.3, 206.4, or 206.5
Cadmium, total (mg/L)	1/year	FPC	200.7, 213.1 or 213.2
Chromium, total (mg/L)	1/year	FPC	200.7, 218.1, 218.2 or 218.3
Chromium, hexavalent (mg/L)	1/year	FPC	218.4
Copper, total (mg/L)	1/year	FPC	200.7, 220.1 or 220.2
Cyanide, total (mg/L)	1/year	Grab	335.1 or 335.2
Lead, total (mg/L)	1/year	FPC	200.7, 239.1 or 239.2
Mercury, total (µg/L)	1/year	FPC	245.1 or 245.2
Nickel, total (mg/L)	1/year	FPC	200.7, 249.1 or 249.2
Zinc, total (mg/L)	1/year	FPC	200.7, 289.1 or 289.2

¹ These analytical methods are set forth in 40 CFR Part 136 or references cited in that regulation.

² Daily flows are to be recorded from the permittee's flow meter. This data will be submitted monthly to the Pretreatment Coordinator. The flow meter shall be calibrated annually to ensure its accuracy.

³ Daily high, low, and average pH values will be recorded, with any excursions beyond the limits set in the permit noted with an explanation of the cause of the excursion. This data will be submitted monthly to the Pretreatment Coordinator.

(Part 2: Monitoring Requirements Cont.)

- ⁴ Flow Proportional Composite (FPC): the Director of Utilities may waive flow proportional composite sampling techniques for the permittee that demonstrates that flow proportional composite sampling is infeasible. In such cases time proportional sampling or grab sampling may be utilized.
 - ⁵ Composite samples are not appropriate for these parameters; grab samples must be used for hexavalent chromium, pH, and cyanide.
 - ⁶ The permittee shall monitor at least once during the period January 1 through June 30 for the pollutants listed in Part 1, Section C of this permit. This monitoring report is due July 15.
-
- B.** Monitoring shall represent production activities and discharges normally occurring during the reporting period.
 - C.** All equipment used for sampling and analysis must be routinely calibrated, inspected and maintained to ensure their accuracy. Monitoring points shall not be changed without notification to and the approval of the Director of Utilities.
 - D.** All handling and preservation of collected samples and laboratory analyses of samples shall be performed in accordance with 40 CFR Part 136, Table II or ch. NR 219, Wis. Admin. Code unless other sampling and analytical techniques are approved by the Department of Natural Resources and specified in the monitoring conditions of this permit.
 - E.** All laboratory analyses of all required monitoring shall be performed in accordance with procedures and techniques set forth in 40 CFR part 136. Alternatively, laboratory analyses shall be performed by laboratories certified by the Department of Natural Resources under ch. NR 149, Wis. Admin. Code.
 - F.** The permittee shall measure pH continuously when required by the Director of Utilities. When pH is measured otherwise, the permittee shall use either a portable pH meter or a grab sample free of acidic or alkaline preservatives.

PART 3 - (RESERVED)

PART 4 - REPORTING REQUIREMENTS

A. Report on Compliance with Categorical Pretreatment Standard

If the permittee is subject to a categorical pretreatment standard, the permittee shall submit a ninety (90) day report to the Director of Utilities including information described below. If the permittee is subject to equivalent mass or concentration limits, then the permittee shall include a reasonable measure of the permittee's long term production rate. If the permittee's categorical pretreatment standards are expressed in production based standards, the permittee shall report the user's actual production during the sampling period.

- (1) Information showing the measured average daily and maximum daily flow, in gallons per day, to the POTW from regulated process streams and other streams, as necessary, to allow use of the combined wastestream formula set out in 40 CFR 403.6 (e).
- (2) The categorical pretreatment standard applicable to each regulated process.
 - (a) The results of sampling and analysis identifying the nature and concentration, and/or mass, where required by the standard or by the Director of Utilities, of regulated pollutants in the discharge from each regulated process. Instantaneous, daily maximum, and long-term average concentrations, or mass where required, shall be reported.
- (3) A statement, reviewed by the user's authorized representative and certified by a qualified professional, indicating whether pretreatment standards are being met on a consistent basis, and if not, whether additional operation and maintenance (O & M) and/or additional pretreatment is required to meet the pretreatment standards and requirements.

The report shall be submitted ninety (90) days after final compliance with the applicable categorical pretreatment standard.

B. Periodic Compliance Reports

During the months of June and December, unless required more frequently in the pretreatment standard or by the Director of Utilities, the permittee shall report the results of all sampling required in Part 2 A. of this permit. If the permittee is subject to equivalent mass or concentration limits, the report shall include a reasonable measure of the industrial user's long term production rate. If the permittee's categorical pretreatment standards are expressed in production based standards, the permittee shall report the actual production during the sampling period. If the permittee monitors a pollutant more frequently than required by this permit, then the permittee shall also report the results of this monitoring to the Director of Utilities. The report shall be submitted no later than July 15 for the June report and no later than January 15 for the December report.

(Part 4: Reporting Requirements Cont.)

C. Report of Violation and Resampling

If the results of the permittee's wastewater analysis indicates that a violation of this permit has occurred, the permittee must:

- (1) Inform the Director of Utilities of the violation within twenty-four (24) hours; and
- (2) Repeat the sampling and pollutant analysis and submit, in writing, the results of this second analysis within thirty (30) days of the first violation.

D. Report of Upsets, Spills, Slugs and other Emergencies

The permittee shall notify the Director of Utilities immediately of an upset, spill or other slug that has a reasonable potential to cause a violation of a pretreatment standard or has the potential to upset the POTW. The report shall contain the following information:

- (1) location, date and time of discharge
- (2) character and volume of discharge
- (3) containment or corrective action taken by permittee

Within five days of the report required above, the user shall submit a written report to the Director of Utilities describing the cause of the discharge, the duration of the discharge, and the measures to be taken to prevent similar discharges in the future.

E. Report of Changed Discharge

The permittee shall promptly notify the Director of Utilities in advance of any substantial change in the volume or character of pollutants in its discharge, including the listed or characteristic hazardous wastes for which the permittee has submitted initial notification.

(Part 4: Report Requirements Cont.)

F. Report of Hazardous Waste Discharge

The permittee shall notify the Director of Utilities, in writing, of any discharge in to the POTW of a substance which, if otherwise disposed of, would be a hazardous waste. A hazardous waste is:

- (1) Any amount of a substance that would be considered an acute hazardous waste according to 40 CFR 261.30(d) and 261.33(e) or s. NR 605.09(1) (d) or (3) (b), Wis. Admin. Code; or
- (2) Substances that:
 - (a) If otherwise disposed of would be considered hazardous waste under 40 CFR part 261 or ch. NR 605, and
 - (b) are discharged in quantities of fifteen (15) kilograms or more per month.

The report shall contain the following information:

- (1) name of the hazardous waste
- (2) the hazardous waste number
- (3) whether the discharge is continuous, batch or other;
- (4) a certification that the industrial user has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined to be economically practical. If the permittee discharges more than one hundred (100) kilograms of wastes described in (2) (a) above, the report shall contain the following additional information:
 - (a) an identification of the hazardous constituents in the waste
 - (b) an estimation of the mass and concentration of such constituents in the wastestream discharged during each month
 - (c) an estimation of the mass and concentration of such constituents in the wastestream expected to be discharged during the following twelve (12) months.

The report shall be submitted no later than one hundred eighty (180) days after the commencement of the discharge or no later than ninety (90) days after new federal or state regulations define as a hazardous waste, substances that the user discharges in quantities that make the user subject to this section. This report need only be submitted once. Any reports of changed conditions should be submitted according to the requirements outlined in PART 3, Section E of this permit. If other reports required by the Director of Utilities contain the information required in the Hazardous Waste Report, then the Hazardous Waste Report is not required.

(Part 4: Reporting Requirements Cont.)

G. Sampling and Analyses Reporting

Records of sampling and analyses required for reports in this permit shall include:

- (1) The date, exact place, time, and methods of sampling or measurements, and sample preservation techniques or procedures;
- (2) Who performed the sampling or measurements;
- (3) The date(s) analyses were performed;
- (4) Who performed the analyses;
- (5) The analytical techniques or methods used; and
- (6) The results of such analyses

H. Report of Flow Meter Calibration

A statement from a qualified professional verifying that the flow meter has been calibrated shall be submitted with the Periodic Compliance Report for period ending in June or December, annually.

I. NR 101 Report

If the permittee is subject to NR 101 reporting requirements by the Department of Natural Resources, a copy of the annual NR 101 report shall be sent to the Director of Utilities.

J. Signatory Requirement

All applications, reports, or information submitted to the Director of Utilities must contain the following certification statement and be signed as required in Section 20-106, Chapter 20, Utilities.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

(Part 4: Reporting Requirements Cont.)

K. Reporting Address

All reports required by this permit shall be submitted to the Pretreatment Coordinator at the following address:

**City of Appleton
Pretreatment Coordinator
2006 East Newberry Street
Appleton, WI 54915**

PART 5 - PROHIBITIONS

A. General Prohibitions

Pass Through and Interference

The permittee shall not introduce or cause to be introduced into the City of Appleton sewer system any pollutant or wastewater which causes pass through or interference. This general prohibition applies to all users of the sewer system whether or not they are subject to categorical pretreatment standards or any other National, State, or local pretreatment standards or requirements.

Pass through is the discharge of pollutants through the POTW to waters of the state in quantities or concentrations which, alone or in conjunction with the discharge or discharges from other sources, causes a violation or increases the magnitude or duration of a violation of any requirement of the POTW's WPDES permit.

Interference is the inhibition or disruption of a POTW's sewer system, treatment processes, or operations by a discharge which, alone or in conjunction with the discharge or discharges from other sources, causes a violation or increases the magnitude or duration of a violation of any requirement of the POTW's WPDES permit, including the impairment of the use or disposal of POTW sludge under chs. 144 and 147, Stats.

B. Specific Prohibitions

The permittee shall not introduce or cause to be introduced into the City of Appleton sewer system any of the following substances, pollutants, or wastewater:

- (1) Pollutants which create a fire or explosive hazard in the POTW, including, but not limited to, wastestreams with a closed-cup flashpoint of less than 140 °F (60°C) using the test method specified in 40 CFR 261.21;
- (2) Pollutants that will cause corrosive structural damage to the sewerage system, including but not limited to discharges with a pH lower than 5.0 s.u. or higher than 12.4 s.u.

(Part 5: Prohibitions Cont.)

- (3) Solid or viscous substances in amounts which will cause obstruction of the flow in the sewerage system or otherwise interfere with the operation of the POTW resulting in interference;
- (4) Pollutants, including oxygen-demanding pollutants (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which, either singly or by interaction with other pollutants, will cause interference with the POTW;
- (5) Wastewater having a temperature greater than 150 °F (65° C), or which will inhibit biological activity in the treatment plant resulting in interference, but in no case wastewater which causes the temperature at the introduction into the treatment plant to exceed 104 °F (40 °C);
- (6) Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in concentrations greater than twenty-five (25) mg/L;
- (7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in quantity that may cause acute worker health and safety problems;
- (8) Trucked or hauled pollutants, except at discharge points designated by the Director of Utilities in accordance with Section 20-94, Chapter 20, Utilities.
- (9) Noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair;
- (10) Wastewater which imparts color which cannot be removed by the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions, which consequently imparts color to the treatment plant's effluent.
- (11) Wastewater containing any radioactive wastes or isotopes except in compliance with applicable State and Federal regulations;
- (12) Storm water, surface water, ground water, artesian well water, roof runoff, subsurface drainage, swimming pool drainage, condensate, deionized water, noncontact cooling water, and unpolluted wastewater, unless specifically authorized by the Director of Utilities;
- (13) Sludges, screenings, or other residues from the pretreatment of industrial wastes;
- (14) Medical wastes, except as specifically authorized by the Director of Utilities in a wastewater discharge permit;

(Part 5: Prohibitions Cont.)

- (15) Wastewater causing, alone or in conjunction with other sources, the treatment plant's effluent to fail a toxicity test;
- (16) Detergents, surface-active agents, or other substances which may cause excessive foaming in the POTW;
- (17) Fats, oils, or greases of animal or vegetable origin in concentrations greater than one hundred (100) mg/L;
- (18) Wastewater causing two readings on an explosion hazard meter at the point of discharge into the POTW, or at any point in the POTW, of more than five percent (5%) or any single reading over ten percent (10%) of the Lower Explosive Limit of the meter; or
- (19) Wastewater containing any garbage that has not been ground by household type or other suitable garbage grinders.

Pollutants, substances, or wastewater prohibited by this section of the permit shall not be processed or stored in such a manner that they could be discharge to the POTW.

C. Dilution Prohibition

The permittee shall not increase the use of potable or process water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in this permit. The Director of Utilities may impose mass limitations on permittees which are using dilution to meet applicable pretreatment standards or requirements, or in other cases where the imposition of mass limitations is appropriate.

D. Bypass Prohibition

A bypass is the intentional diversion of wastes from any portion of a permittee's treatment facility. For the purposes of this section, severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

- (1) Bypass is prohibited, and the Director of Utilities may take enforcement action against a permittee for a bypass, unless
 - (a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(Part 5: Prohibitions Cont.)

- (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance;
 - (c) The permittee submitted notices as required under paragraph (d) of this section.
- (2) The permittee may allow bypass to occur which does not cause effluent limitations to be exceeded, but only if it is also for essential maintenance to assure efficient operation.
- (3) Notification of bypass:
- (a) Anticipated bypass. If the permittee knows in advance of the need for bypass, it shall submit prior written notice, at least ten (10) days before the date of the bypass, to the Director of Utilities.
 - (b) Unanticipated bypass. The permittee shall orally notify the Director of Utilities within twenty-four (24) hours from the time the permittee becomes aware of the bypass. A written notice shall also be provided within five (5) days of the time the permittee becomes aware of the bypass.

This written report shall specify:

- (I) A description of the bypass, its cause, and its duration, including exact dates and times;
- (ii) Whether the bypass has been corrected; and
- (iii) The steps being taken or to be taken to reduce eliminate and prevent a reoccurrence of the bypass.

PART 6 - GENERAL CONDITIONS

A. Compliance With All Local, State and Federal Requirements

Compliance with this permit does not relieve the permittee from its obligations regarding compliance with any and all applicable local, State and Federal pretreatment standards and requirements including any such standards or requirements that may become effective during the term of this permit.

B. Compliance with Categorical Pretreatment Standards

All industrial users, except new sources, shall comply with the applicable categorical pretreatment standards within three (3) years from the effective date of the standard or within a shorter period if specified in the applicable standard. A direct discharger which becomes an industrial user after promulgation of an applicable categorical pretreatment standard may not be considered a new source unless it falls within the definition of a "new source" contained in Section 20-69, Chapter 20, Utilities.

C. Combined Wastestreams

Alternative Limit Calculations

When wastewater subject to a categorical pretreatment standard is mixed with wastewater not regulated by the same standard, the Director of Utilities shall impose an alternate limit using the combined wastestream formula found in 40 CFR 403.6 (e).

Where a treated regulated process wastestream is combined prior to treatment with wastewaters other than those generated by the regulated process, the permittee may monitor either the segregated process wastestream or the combined wastestream for the purpose of determining compliance with applicable pretreatment standards. If the permittee chooses to monitor the segregated process wastestream, it shall apply the applicable categorical pretreatment standard. If the permittee chooses to monitor the combined wastestream, it shall apply an alternative discharge limit calculated using the combined wastestream formula as provided in this section. The permittee may change monitoring points only after receiving approval from the Director of Utilities.

D. Slug Control Plans

At least once every two years, the Director of Utilities will evaluate the permittee's need for a plan to control slug discharges. A slug discharge is any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or non-customary batch discharge. If the Director of Utilities decides that a slug control plan is needed, the permittee shall submit, at a minimum, the following information:

- (1) A description of discharge practices, including non-routine batch discharges;

(Part 6: General Conditions Cont.)

- (2) A description of stored chemicals
- (3) Procedures for immediately notifying the POTW of slug discharges, including any discharge that would violate a prohibition under Section 20-81, Chapter 20, Utilities
- (4) If necessary, procedures to prevent adverse impact from accidental spills, including inspection and maintenance of storage area, handling and transfer of materials, loading and unloading operations, control of plant site run-off, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents), and/or measures and equipment necessary for emergency response.

E. Proper Disposal of Pretreatment Sludges

The permittee shall dispose of sludges generated by wastewater treatment sludges according to all applicable local, state and federal requirements.

F. Duty to Comply

The permittee shall comply with all conditions of this permit. Failure to comply with the requirements of this permit may be grounds for enforcement action as outlined in Division 10 of Article III; Chapter 20, Utilities, City of Appleton Ordinance.

G. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact to the public treatment plant or the environment resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

H. Duty to Provide Information

The permittee shall furnish to the Director of Utilities any information requested to determine whether cause exists for modifying, revoking and reissuing this permit or to determine compliance with this permit. This information shall be furnished within ten (10) days of the request.

I. Property Rights

This permit does not create nor convey any property rights of any sort.

(Part 6: General Conditions Cont.)

J. Permit Modifications

This wastewater discharge permit may be modified to incorporate new or revised Federal, State or local pretreatment standards or requirements or for any other good causes including, but not limited to, those listed in Section 20-109, Chapter 20, Utilities.

K. Permit Transfer

This wastewater discharge permit is issued to the permittee for specific processes and operations at a specific location. If a person is seeking a transfer of the permit, that person must make application to the Director of Utilities prior to becoming the owner or operator of the facility. The permit transfer must comply with Section 20-110, Chapter 20, Utilities. If an owner or operator changes without prior approval of the Director of Utilities, then this permit is void.

L. Permit Termination

This wastewater discharge permit may be terminated for good cause, including, but not limited to those listed in Section 20-111, Chapter 20, Utilities.

M. Permit Appeal Process

The permittee may petition the Director of Utilities to reconsider the terms of this permit within twenty (20) days of its issuance in accordance with Section 20-108, Chapter 20, Utilities.

N. Permit Reissuance

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must submit an application for a new permit at least ninety (90) days before the expiration date of this permit.

O. Continuation of Expired Permits

An expired permit will continue to be effective and enforceable until the permit is reissued if:

- (1) The permittee has submitted a complete permit application at least ninety (90) days prior to the expiration date of the user's existing permit.
- (2) The failure to reissue the permit, prior to expiration of the previous permit, is not due to any act or failure to act on the part of the permittee.

(Part 6: General Conditions Cont.)

P. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes but is not limited to: effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures.

Q. Monitoring Location

The permittee shall not change the monitoring location of the discharge without the prior approval of the Director of Utilities. The Director of Utilities shall ensure that any change in the permittee's monitoring location will not allow the user to substitute dilution for adequate treatment.

R. Inspection and Entry

The permittee shall allow the Director of Utilities, or an authorized representative to enter the permittee's premises for the purposes of inspection, sampling or record access.

S. Record-keeping Requirements

- (1) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart records for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application.

This period may be extended by request of the Director of Utilities.

- (2) All records that pertain to matters that are the subject of special orders or any other enforcement of litigation activities shall be retained by the permittee until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

T. Falsifying Information

Knowingly making any false statement on any report or other document required by this permit or knowingly rendering any monitoring device or method inaccurate, is a crime and may result in the referral of the permittee by the Director of Utilities to the proper authorities for criminal sanctions and/or civil penalties.

PART 7 - ENFORCEMENT AND PENALTIES

A. Annual Publication

A list of all industrial users which were in significant noncompliance at any time during the twelve (12) previous months shall be published at least annually by the Director of Utilities in the largest daily newspaper within its service area. For the purposes of this provision, a permittee is in significant noncompliance if its violation meets one or more of the following criteria:

- (1) Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of wastewater measurements taken during a six- (6-) month period exceed the daily maximum limit for the same pollutant parameter by any amount;
- (2) Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of wastewater measurements taken for each pollutant parameter during a six-(6) month period equals or exceeds the product of the daily maximum limit or the average limit multiplied by the applicable criteria (1.4) for BOD, TSS, fats, oils and grease, and (1.2) for all other pollutants except pH;
- (3) Any other discharge violation that the Director of Utilities believes has caused, alone or in combination with other discharges, interference or pass through, including endangering the health of POTW personnel or the general public;
- (4) Any discharge of pollutants that has imminent endangerment to the public or to the environment, or has resulted in the Director of Utilities exercise of its emergency authority to halt or prevent such a discharge;
- (5) Failure to meet, within ninety (90) days of the scheduled date, a compliance schedule milestone contained in a wastewater discharge permit or enforcement order for starting construction, completing construction, or attaining final compliance;
- (6) Failure to provide within thirty (30) days after the due date, any required reports, including baseline monitoring reports, reports on compliance with categorical pretreatment standard deadlines, periodic self-monitoring reports, and reports on compliance with compliance schedules;
- (7) Failure to accurately report noncompliance; or
- (8) Any other violation(s) which the Director of Utilities determines will adversely affect the operation or implementation of the local pretreatment program.

(Part 7: Enforcement and Penalties Cont.)

B. Civil Liability

Nothing in this permit shall be construed to relieve the permittee from civil penalties for noncompliance under Section 20-187, Chapter 20, Utilities or State or Federal laws or regulations.

C. Penalties for Violations of Permit Conditions

- (1) Section 20-187, Chapter 20, Utilities, provides that any person who violates a permit condition shall be liable to the City of Appleton for a maximum civil penalty of ten thousand dollars (\$10,000.00) per violation, per day.
- (2) Any person who willfully or negligently violates permit conditions may be subject to prosecution under the criminal laws of the State of Wisconsin or the United States, in addition to actions for civil remedies.

Appendix C
Monthly Discharge Reports



CH2MHILL

CH2M HILL
411 E. Wisconsin Avenue
Suite 1600
Milwaukee, WI
53202-4421
Mailing address:
P.O. Box 2090
Milwaukee, WI
53201-2090
Tel 414.272.2426
Fax 414.272.4408

October 9, 1998
141695.MS.03.01

Ms. Jessica Garratt
Pretreatment Coordinator - City of Appleton
Department of Utilities - Wastewater Division
2006 E. Newberry St.
Appleton, WI 54915-2758

Dear Ms. Garratt:

Subject: N.W. Mauthe Superfund Site Groundwater Treatment Facility September Monthly Report
WA 007-RARA-056G, Contract No. 68-W6-0025

Please find enclosed a copy of the September Monthly Discharge Monitoring Report for the Groundwater Treatment System at the N.W. Mauthe Superfund Site located at 725 S. Outagamie Street in Appleton. This document is being submitted in accordance with the City of Appleton Industrial User Permit No. 97-21 issued for the site on April 30, 1997.

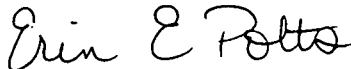
The POTW has designated the treatment system discharge as Outfall 001. The permit requires a monthly submittal of the total flow and the minimum, maximum and average pH values for each discharge event. The analytical monitoring results for these discharge events will be submitted to the POTW with the December biannual compliance report.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions or need additional information, please call me or Dan MacGregor in our Milwaukee office at (414) 272-2426.

Sincerely,

CH2M HILL



Erin E. Potts
Site Manager

mo_let17.doc
enclosure

c: Jon Peterson/U.S. EPA Region 5
Stephen Nathan/U.S. EPA Region 5
Peggy Hendrixson/U.S. EPA Region 5
Ike Johnson/CH2M HILL MKE

John Fleissner/CH2M HILL MKE
Cherie Wilson/CH2M HILL MKE
Cathy Barnett/CH2M HILL STL
Dan MacGregor/CH2M HILL MKE

**City of Appleton
 Monthly Discharge Monitoring Report
 N.W. Mauthe Groundwater Treatment Plant Effluent
 September-98**

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
9/2/98	3,176	8.44	8.22	8.32
9/4/98	3,094	8.04	7.98	8.01
9/11/98	3,147	8.40	8.23	8.31
9/12/98	3,179	8.21	8.10	8.15
9/14/98	3,181	8.14	8.10	8.12
9/16/98	3,111	7.94	8.14	8.03
9/17/98	3,162	8.18	8.06	8.12
9/22/98	3,176	8.16	8.04	8.10
9/23/98	3,113	8.10	8.00	8.05
9/30/98	3,165	8.76	8.48	8.60
9/30/98	3,074	8.64	8.50	8.56

Monthly Total 34,578 gallons

**City of Appleton
 Monthly Discharge Monitoring Report
 N.W. Mauthe Groundwater Treatment Plant Effluent
 August-98**

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
8/3/98	3,165	8.16	8.16	8.16
8/9/98	3,140	8.15	8.15	8.15
8/10/98	3,165	8.10	8.10	8.10
8/12/98	3,166	8.10	8.10	8.10
8/17/98	3,127	8.14	8.14	8.14
8/22/98	2,965	8.18	8.18	8.18
8/23/98	3,133	8.14	8.14	8.14
8/27/98	3,080	8.45	8.25	8.34
8/30/98	3,092	8.28	8.10	8.18

Monthly Total 28,033 gallons

**City of Appleton
 Monthly Discharge Monitoring Report
 N.W. Mauthe Groundwater Treatment Plant Effluent
 July-98**

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
7/1/98	2,899	8.16	7.99	8.07
7/2/98	3,137	8.18	7.96	8.06
7/3/98	3,163	8.20	8.10	8.15
7/5/98	3,160	8.22	8.11	8.16
7/6/98	3,090	8.24	8.16	8.20
7/6/98	3,190	8.21	8.09	8.15
7/7/98	3,112	8.22	8.11	8.16
7/9/98	3,156	8.21	8.09	8.15
7/10/98	3,169	8.16	8.03	8.09
7/13/98	3,123	8.10	8.03	8.06
7/14/98	2,837	8.12	8.01	8.06
7/17/98	3,181	8.14	8.07	8.10
7/20/98	3,166	8.16	8.08	8.12
7/24/98	3,192	8.12	7.99	8.05
7/30/98	2,488	8.24	8.21	8.22
7/31/98	3,081	8.14	8.14	8.14

Monthly Total 49,144 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
June-98

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
6/2/98	3,127	8.04	8.02	8.03
6/4/98	3,118	8.06	7.99	8.02
6/6/98	3,168	8.08	8.00	8.04
6/8/98	3,167	8.08	7.98	8.03
6/10/98	3,152	8.10	8.01	8.05
6/14/98	3,110	8.11	7.99	8.05
6/15/98	3,126	8.08	8.00	8.04
6/16/98	3,062	8.12	8.04	8.08
6/16/98	3,083	8.22	8.06	8.13
6/22/98	3,045	8.30	8.12	8.20
6/22/98	3,130	8.26	8.16	8.21
6/25/98	3,074	8.22	8.04	8.12
6/26/98	3,220	8.18	7.99	8.07
6/26/98	2,950	8.20	8.10	8.15
6/28/98	3,129	8.14	8.01	8.07
6/28/98	3,085	8.26	8.10	8.17
6/28/98	3,043	8.16	7.98	8.06
6/29/98	3,254	8.18	8.00	8.08
6/29/98	3,106	8.16	7.98	8.06
6/30/98	2,912	8.24	8.12	8.18
6/30/98	3,087	8.18	8.00	8.08
6/30/98	3,232	8.22	8.10	8.16

Monthly Total 68,380 gallons

**City of Appleton
 Monthly Discharge Monitoring Report
 N.W. Mauthe Groundwater Treatment Plant Effluent
 May-98**

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
5/3/98	3,111	8.18	8.11	8.14
5/4/98	3,200	8.18	8.11	8.14
5/5/98	3,083	8.22	8.18	8.20
5/5/98	3,132	8.09	7.97	8.03
5/6/98	3,144	8.08	8.00	8.04
5/7/98	3,143	8.04	8.00	8.02
5/10/98	3,191	8.02	7.99	8.00
5/11/98	2,994	8.06	7.98	8.02
5/13/98	3,178	8.06	8.05	8.05
5/14/98	3,018	8.07	8.04	8.05
5/14/98	3,098	8.10	8.00	8.05
5/15/98	3,148	8.10	7.98	8.04
5/18/98	3,139	8.10	8.00	8.05
5/21/98	3,084	8.18	8.11	8.14
5/24/98	3,148	8.10	8.00	8.05
5/26/98	3,120	8.16	8.02	8.08
5/28/98	3,243	8.14	8.00	8.06
5/29/98	3,158	8.31	8.20	8.25

Monthly Total 56,332 gallons

**City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
April-98**

Discharge Date	Discharge Volumen (gallons)	Maximum pH	Minimum pH	Average pH
4/1/98	3,118	8.33	8.15	8.23
4/1/98	3,026	8.16	8.05	8.10
4/1/98	3,109	8.12	8.01	8.06
4/2/98	3,155	8.10	8.00	8.05
4/2/98	3,126	8.06	8.00	8.03
4/2/98	3,014	8.10	8.08	8.09
4/2/98	3,156	8.18	8.00	8.08
4/3/98	3,078	8.10	8.01	8.05
4/3/98	3,007	8.08	7.98	8.03
4/3/98	3,060	8.15	8.00	8.07
4/4/98	3,016	8.18	8.02	8.09
4/4/98	3,018	8.08	7.96	8.02
4/4/98	3,124	8.16	8.01	8.08
4/5/98	2,981	8.12	7.99	8.05
4/5/98	2,995	8.15	8.01	8.07
4/5/98	3,063	8.20	8.10	8.15
4/6/98	3,134	8.16	8.09	8.12
4/6/98	3,071	8.18	8.08	8.13
4/6/98	3,147	8.06	8.00	8.03
4/6/98	3,010	8.08	8.00	8.04
4/7/98	3,015	8.16	8.06	8.11
4/7/98	3,020	8.04	7.98	8.01
4/7/98	3,161	8.12	8.02	8.07
4/7/98	3,022	8.08	8.07	8.07
4/8/98	3,055	8.06	8.04	8.05
4/8/98	3,160	8.10	8.00	8.05
4/9/98	3,148	8.10	8.08	8.09
4/10/98	3,104	8.32	8.18	8.24
4/12/98	3,149	8.44	8.28	8.35
4/13/98	3,136	8.36	8.26	8.31
4/13/98	3,170	8.28	8.18	8.23
4/14/98	3,151	8.18	8.02	8.09
4/16/98	3,368	8.16	8.06	8.11
4/17/98	3,082	8.16	8.02	8.08
4/17/98	3,086	8.08	7.98	8.03
4/18/98	3,044	8.10	8.00	8.05
4/18/98	3,104	8.08	8.00	8.04
4/18/98	3,050	8.10	8.05	8.07
4/18/98	2,987	8.11	8.01	8.06
4/19/98	3,035	8.12	8.04	8.08
4/19/98	3,078	8.08	7.99	8.03
4/19/98	3,186	8.12	8.01	8.06
4/20/98	3,119	8.16	8.01	8.08
4/20/98	3,027	8.18	8.10	8.14

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
April-98

4/21/98	3,278	8.09	7.88	7.97
4/21/98	2,978	8.10	7.92	8.00
4/22/98	3,129	8.16	8.00	8.07
4/23/98	3,125	8.20	8.07	8.13
4/25/98	3,049	8.10	8.00	8.05
4/26/98	3,195	8.16	8.01	8.08
4/26/98	3,155	8.18	8.13	8.15
4/27/98	3,165	8.22	8.10	8.16
4/29/98	3,158	8.18	8.13	8.15
4/30/98	3,143	8.21	8.15	8.18

Monthly Total 167,240 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
March-98

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
3/1/98	3,111	8.32	8.28	8.30
3/1/98	3,102	8.28	8.20	8.24
3/2/98	3,170	8.32	8.22	8.27
3/3/98	3,166	8.28	8.21	8.24
3/4/98	3,060	8.33	8.18	8.25
3/4/98	3,142	8.20	8.15	8.17
3/5/98	3,143	8.22	8.20	8.21
3/7/98	3,185	8.20	8.15	8.17
3/8/98	3,069	8.22	8.15	8.18
3/10/98	3,168	8.21	8.13	8.17
3/11/98	2,941	8.25	8.20	8.22
3/11/98	3,152	8.30	8.20	8.25
3/12/98	3,199	8.20	8.00	8.09
3/17/98	3,162	8.21	8.20	8.20
3/18/98	3,174	8.30	8.22	8.26
3/19/98	3,148	8.20	8.11	8.15
3/20/98	3,154	8.18	8.15	8.16
3/22/98	2,928	8.20	8.10	8.15
3/23/98	3,202	8.26	8.18	8.22
3/23/98	3,046	8.30	8.18	8.24
3/24/98	3,164	8.15	8.04	8.09
3/25/98	3,140	8.20	8.08	8.14
3/26/98	3,070	8.22	8.16	8.19
3/27/98	3,326	8.20	8.18	8.19
3/27/98	3,040	8.30	8.18	8.24
3/28/98	3,107	8.18	8.00	8.08
3/28/98	3,070	8.22	8.15	8.18
3/28/98	3,200	8.31	8.21	8.26
3/29/98	3,017	8.18	8.06	8.12
3/29/98	3,087	8.22	8.10	8.16
3/30/98	3,150	8.30	8.18	8.24
3/31/98	3,080	8.28	8.20	8.24
3/31/98	3,045	8.22	8.16	8.19

Monthly Total 102,918 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
February-98

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
2/4/98	3,181	8.32	8.04	8.16
2/7/98	3,186	8.21	8.10	8.15
2/11/98	3,186	8.32	8.05	8.16
2/13/98	3,217	8.30	8.21	8.25
2/14/98	3,159	8.22	8.10	8.16
2/15/98	3,148	8.32	8.27	8.29
2/18/98	3,268	8.30	8.20	8.25
2/19/98	3,145	8.28	8.12	8.19
2/19/98	3,071	8.29	8.20	8.24
2/20/98	3,237	8.40	8.28	8.34
2/21/98	3,162	8.28	8.18	8.23
2/21/98	3,132	8.18	7.95	8.05
2/21/98	3,164	8.30	8.20	8.25
2/23/98	3,186	8.32	8.20	8.26
2/24/98	3,233	8.38	8.22	8.29
2/25/98	2,974	8.30	8.16	8.22
2/25/98	3,160	8.22	8.02	8.11
2/26/98	3,173	8.24	8.18	8.21
2/27/98	3,161	8.32	8.22	8.27
2/28/98	3,151	8.29	8.22	8.25

Monthly Total 63,294 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
January-98

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
1/3/98	3187	8.82	8.77	8.79
1/4/98	3178	8.75	8.70	8.72
1/12/98	3172	8.20	8.11	8.15
1/16/98	3,163	8.10	8.09	8.09
1/19/98	3,180	8.14	8.10	8.12
1/28/98	3,176	8.28	8.10	8.18

Monthly Total 19,056 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
December-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
12/1/97	3,181	8.65	8.25	8.41
12/10/97	3,197	8.90	8.79	8.84
12/12/97	3,187	8.79	8.61	8.69
12/24/97	3,185	8.75	8.70	8.72
12/26/97	3,167	8.80	8.78	8.79

Monthly Total 15,917 gallons

**City of Appleton
 Monthly Discharge Monitoring Report
 N.W. Mauthe Groundwater Treatment Plant Effluent
 November-97**

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
11/5/97	3,182	8.05	7.99	8.02
11/10/97	3,174	8.10	8.00	8.05
11/11/97	3,465	10.48	10.30	10.38
11/17/97	3,227	9.99	9.99	9.99
11/22/97	3,129	8.80	8.64	8.71

Monthly Total 16,177 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
October-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
10/1/97	3,150	8.20	8.00	8.09
10/3/97	3,177	8.21	8.00	8.09
10/8/97	2,933	8.22	8.10	8.16
10/13/97	3,188	8.21	8.17	8.19
10/16/97	3,204	8.20	7.98	8.08
10/21/97	3,119	8.27	7.97	8.09
10/22/97	3,184	8.22	8.01	8.10
10/23/97	3,163	8.02	8.00	8.01
10/29/97	3,168	8.03	7.95	7.99

Monthly Total 28,286 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
September-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
9/2/97	6,654			
9/3/97	6,655			
9/4/97	6,924			
9/4/97	7,005			
9/5/97	7,044			
9/7/97	7,068			
9/9/97	3,202	8.30	7.80	7.98
9/10/97	3,204	8.27	7.91	8.05
9/11/97	3,152	8.36	7.92	8.09
9/14/97	3,147	8.28	7.86	8.02
9/17/97	3,140	8.42	8.02	8.18
9/19/97	3,153	8.40	7.98	8.14
9/20/97	3,141	8.30	7.80	7.98
9/23/97	3,145	8.24	8.26	8.25
9/24/97	3,143	8.22	8.20	8.21
9/26/97	3,146	8.18	8.06	8.12
9/29/97	3,139	8.12	8.00	8.06

Monthly Total 76,062 gallons

Note: The treatment system was bypassed from August 29 through September 7, 1997. The untreated water was analyzed for hexavalent chromium using an on-site Hach Kit Analysis and by En-Chem Laboratories for total chromium. The analytical results were issued in a separate report to the City of Appleton on September 29, 1997.

Table 1
August/September Bypass Event
N.W. Mauthe Groundwater Treatment Plant Effluent

Discharge Date	Discharge Volume (gallons)	Effluent Hexavalent Chromium (mg/L)	Effluent Total Chromium (mg/L)	Effluent Total Chromium (mg/L) Duplicates
8/29/97	6,654	2.00	1.90	NA
9/2/97	6,654	3.60	5.20	NA
9/3/97	6,655	2.70	3.80	NA
9/4/97	6,924	1.30	2.10	2.10
9/4/97	7,005	1.00	1.10	1.20
9/5/97	7,044	1.00	0.83	0.83
9/7/97	7,068	1.00	1.50	1.50

Total Volume Bypassed 48,004 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
August-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
8/1/97	2,665	8.38	8.29	8.33
8/4/97	3,171	8.48	8.12	8.26
8/6/97	3,173	8.20	7.88	8.01
8/10/97	3,142	8.29	7.95	8.09
8/13/97	3,059	8.22	8.00	8.10
8/15/97	3,144	8.38	8.01	8.16
8/17/97	3,149	8.30	8.01	8.13
8/29/97	6,654			

Monthly Total 28,157 gallons

Note: The system was shut-down on August 18, 1997. The treatment system was bypassed and discharge of untreated water began on August 29, 1997. The untreated water was analyzed for hexavalent chromium using an on-site Hach Kit Analysis and by En-Chem Laboratories for total chromium, at the request of Jessica Garratt, Pretreatment Coordinator for the City of Appleton. A separate report will be issued to present the results of these analyses to the City of Appleton.

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
July-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
7/1/97	3,256	8.08	7.54	7.73
7/2/97	3,096	8.18	7.98	8.07
7/2/97	3,103	8.13	7.98	8.05
7/3/97	3,119	8.12	7.97	8.04
7/5/97	3,096	8.45	8.15	8.27
7/6/97	3,156	8.12	7.90	8.00
7/6/97	3,141	8.20	7.95	8.06
7/8/97	3,144	8.04	7.90	7.96
7/9/97	3,143	8.05	7.90	7.97
7/10/97	3,162	8.10	8.00	8.05
7/11/97	3,150	8.12	8.04	8.08
7/12/97	3,130	8.10	8.00	8.05
7/13/97	3,138	8.17	7.97	8.06
7/14/97	3,143	8.11	7.93	8.01
7/16/97	3,129	8.12	8.00	8.06
7/16/97	2,955	8.15	8.02	8.08
7/17/97	3,110	8.10	8.02	8.06
7/18/97	3,146	8.19	8.00	8.08
7/20/97	3,134	8.16	8.00	8.07
7/21/97	3,155	8.20	8.08	8.14
7/22/97	3,169	8.12	8.00	8.06
7/24/97	3,161	8.00	7.95	7.97
7/27/97	3,165	8.27	7.90	8.05
7/28/97	3,134	8.40	8.20	8.29
7/29/97	3,152	8.36	8.10	8.21

Monthly Total 78,387 gallons

**City of Appleton
 Monthly Discharge Monitoring Report
 N.W. Mauthe Groundwater Treatment Plant Effluent
 June-97**

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
6/2/97	3,118	8.70	8.18	8.37
6/4/97	3,097	8.66	8.26	8.42
6/6/97	3,093	8.70	8.33	8.48
6/7/97	3,080	8.66	8.17	8.35
6/8/97	3,018	8.64	8.22	8.38
6/9/97	3,152	8.58	8.18	8.34
6/9/97	3,055	8.74	8.16	8.36
6/11/97	3,111	8.66	8.10	8.30
6/13/97	3,085	8.69	8.24	8.41
6/15/97	3,030	8.70	8.28	8.44
6/17/97	3,004	8.69	8.23	8.40
6/17/97	3,073	8.65	8.20	8.37
6/19/97	3,033	8.60	8.12	8.30
6/22/97	3,153	8.60	8.38	8.48
6/22/97	2,782	8.77	8.40	8.55
6/23/97	2,859	8.68	8.13	8.32
6/23/97	3,046	8.62	8.50	8.56
6/24/97	3,079	8.69	8.53	8.60
6/24/97	3,017	8.16	8.00	8.07
6/25/97	3,004	8.61	8.27	8.41
6/25/97	3,050	8.58	8.30	8.42
6/26/97	3,127	8.40	8.00	8.16
6/28/97	3,027	8.70	8.20	8.38
6/29/97	3,013	8.40	8.00	8.16
6/30/97	3,090	8.15	8.10	8.12

Monthly Total 76,196 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
May-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
5/2/97	3,127	8.50	8.30	8.39
5/2/97	3,223	8.60	8.42	8.50
5/2/97	3,090	8.62	8.40	8.50
5/3/97	3,160	9.02	8.66	8.80
5/3/97	3,136	8.96	8.44	8.63
5/4/97	3,166	8.80	8.34	8.51
5/5/97	3,276	8.70	8.18	8.37
5/5/97	3,032	8.72	8.33	8.48
5/6/97	3,157	8.71	8.19	8.38
5/6/97	3,129	8.80	8.40	8.56
5/7/97	3,158	8.40	8.54	8.46
5/8/97	3,002	8.40	8.54	8.46
5/9/97	3,147	8.40	8.60	8.49
5/10/97	3,161	8.40	8.54	8.46
5/12/97	3,164	8.66	8.15	8.33
5/12/97	3,162	8.65	8.02	8.23
5/13/97	3,190	8.70	8.40	8.52
5/14/97	3,166	8.68	8.30	8.45
5/15/97	3,164	8.55	8.20	8.34
5/18/97	3,144	8.49	8.01	8.19
5/19/97	3,150	8.48	8.11	8.26
5/21/97	3,156	8.55	8.22	8.35
5/22/97	3,166	8.60	8.18	8.34
5/25/97	3,144	8.61	8.17	8.34
5/27/97	3,148	8.62	8.20	8.36
5/28/97	3,030	8.61	8.21	8.37
5/29/97	3,230	8.70	8.44	8.55
5/31/97	3,034	8.65	8.17	8.35

Monthly Total 88,012 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
April-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
4/2/97	3,210	8.35	8.30	8.32
4/2/97	3,110	8.36	8.32	8.34
4/3/97	3,420	8.38	8.30	8.34
4/4/97	2,916	8.40	8.30	8.35
4/4/97	3,032	8.38	8.34	8.36
4/5/97	3,060	8.44	8.30	8.36
4/5/97	3,379	8.42	8.32	8.37
4/6/97	3,161	8.42	8.30	8.36
4/6/97	3,032	8.40	8.30	8.35
4/7/97	3,280	8.44	8.32	8.38
4/7/97	3,174	8.50	8.34	8.41
4/8/97	3,145	8.48	8.30	8.38
4/8/97	3,195	8.42	8.33	8.37
4/9/97	3,086	8.40	8.30	8.35
4/10/97	3,120	8.42	8.30	8.36
4/11/97	3,154	8.38	8.26	8.32
4/12/97	3,185	8.40	8.24	8.31
4/13/97	3,163	8.42	8.30	8.36
4/14/97	3,134	8.44	8.34	8.39
4/15/97	3,057	8.42	8.30	8.36
4/17/97	3,217	8.50	8.40	8.45
4/18/97	3,142	8.40	8.20	8.29
4/20/97	3,164	8.30	8.05	8.16
4/21/97	3,144	8.48	8.40	8.44
4/23/97	3,236	8.35	8.16	8.24
4/24/97	3,075	8.27	7.61	7.83
4/26/97	3,119	8.40	8.02	8.17
4/27/97	3,170	8.38	8.18	8.27

Monthly Total gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
March-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
3/3/97	3,178	8.38	8.00	8.15
3/3/97	3,194	8.42	7.98	8.15
3/4/97	3,185	8.40	8.30	8.35
3/6/97	3,186	8.40	8.20	8.29
3/8/97	3,185	8.26	8.12	8.18
3/10/97	3,177	8.38	7.98	8.14
3/11/97	3,178	8.38	8.02	8.16
3/12/97	3,174	8.38	7.98	8.14
3/12/97	3,187	8.33	8.19	8.25
3/13/97	3,105	8.44	7.78	8.00
3/15/97	3,171	8.22	7.55	7.77
3/16/97	3,165	8.40	7.80	8.00
3/17/97	3,143	8.60	7.80	8.04
3/19/97	3,190	8.62	7.86	8.09
3/20/97	3,226	8.55	7.68	7.93
3/21/97	3,120	8.60	7.80	8.04
3/22/97	3,163	8.80	7.90	8.15
3/22/97	3,237	8.80	8.00	8.24
3/22/97	3,096	8.33	8.33	8.33
3/23/97	3,162	8.80	7.90	8.15
3/23/97	3,178	8.40	8.26	8.32
3/24/97	3,185	8.48	8.41	8.44
3/25/97	3,159	8.32	8.31	8.31
3/26/97	3,163	8.32	8.30	8.31
3/27/97	3,155	8.34	8.28	8.31
3/28/97	3,145	8.32	8.32	8.32
3/28/97	3,053	8.26	8.12	8.18
3/29/97	3,242	8.36	8.32	8.34
3/29/97	3,085	8.40	8.26	8.32
3/29/97	3,157	8.33	8.26	8.29
3/30/97	3,158	8.40	8.30	8.35
3/31/97	3,146	8.38	8.30	8.34
3/31/97	3,151	8.36	8.35	8.35
3/31/97	3,197	8.26	8.19	8.22

Monthly Total 107,596 gallons

City of Appleton
Monthly Discharge Monitoring Report
N.W. Mauthe Groundwater Treatment Plant Effluent
February-97

Discharge Date	Discharge Volume (gallons)	Maximum pH	Minimum pH	Average pH
2/24/97	3,100	8.06	8.05	8.05
2/24/97	3,139	8.60	8.10	8.28
2/24/97	3,119	8.68	8.11	8.31
2/25/97	3,249	8.67	8.13	8.32
2/25/97	3,194	8.66	8.11	8.30
2/25/97	3,194	8.68	8.10	8.30
2/28/97	3,180	8.70	8.40	8.52

Monthly Total 22,175 gallons

Note: This report only includes the February data collected after the startup period. Data prior to the startup period is included in the Startup Report submitted to the City of Appleton on March 6, 1997.

Appendix D
Biannual Reports



CH2MHILL

CH2M HILL
411 E. Wisconsin Avenue
Suite 1600
Milwaukee, WI
53202-4421
Mailing address:
P.O. Box 2090
Milwaukee, WI
53201-2090
Tel 414.272.2426
Fax 414.272.4408

July 14, 1997
116441.PP.PM

Ms. Jessica Garratt
Pretreatment Coordinator - City of Appleton
Department of Utilities - Wastewater Division
2006 E. Newberry St.
Appleton, WI 54915-2758

Dear Ms. Garratt:

Subject: N.W. Mauthe Superfund Site Groundwater Treatment Facility Biannual Report

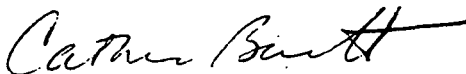
Please find enclosed a copy of the June Biannual Report for the Groundwater Treatment System at the N.W. Mauthe Superfund Site located at 725 S. Outagamie Street in Appleton. This document is being submitted in accordance with Permit No. 97-21 issued for the site wastewater discharge on April 30, 1997.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions or need additional information, please call me or Erin Potts in our Milwaukee office at (414) 272-2426.

Sincerely,

CH2M HILL



Catherine Barnett, P.E.
Site Manager

bian_let.doc
Enclosure

c: Jon Peterson/U.S. EPA Region 5
Stephen Nathan/U.S. EPA Region 5
Peggy Hendrixson/U.S. EPA Region 5
Alpheus Sloan III/CH2M HILL MKE

Ike Johnson/CH2M HILL MKE
John Fleissner/CH2M HILL MKE
Gail Gill/CH2M HILL MKE
Erin Potts/CH2M HILL MKE

Biannual Discharge Monitoring Report

Groundwater Treatment System

**N.W. Mauthe
City of Appleton, Wisconsin**

Submitted by

CH2MHILL

July 14, 1997

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Introduction

This report provides the permit required daily, quarterly and yearly discharge monitoring results for the N. W. Mauthe Groundwater Pretreatment System from January 1, 1997, through June 30, 1997.

This report also includes data collected during the treatment plant startup period which occurred from January 15 to February 19, 1997. The startup period data was submitted previously in the Startup Report dated March 4, 1997.

Permit Monitoring and Reporting Requirements

The City of Appleton POTW Industrial User Permit (Permit No. 97-21) requires monitoring of the treatment system effluent in order to verify compliance. The POTW has designated the treatment system discharge as Outfall 001. Outfall 001 enters the City sewer at Manhole 30-14 on Melvin Street, between the intersections of Douglas Street and Outagamie Street. The permit monitoring requirements and discharge limits are shown in Table 1.

TABLE 1
Outfall 001 Discharge Permit Monitoring Requirements
Process Compliance and Local Limit Compliance Parameters

Sample Parameter	Frequency	Limits
Flow (gpd)	During Discharge	NA
pH (s.u.)	During Discharge	5.0-12.4
Chromium, Total (mg/L)	1/quarter	7.0
Chromium, Hexavalent (mg/L)	During Discharge	4.5
Aluminum, Total (mg/L)	1/year	70.0
Arsenic, Total (mg/L)	1/year	1.0
Cadmium, Total (mg/L)	1/year	0.3
Chromium, Total (mg/L)	1/year	7.0
Chromium, Hexavalent (mg/L)	1/year	4.5
Copper, Total (mg/L)	1/year	3.5
Cyanide, Total (mg/L)	1/year	1.0
Lead, Total (mg/L)	1/year	2.0
Mercury, Total (µg/L)	1/year	2.0
Nickel, Total (mg/L)	1/year	2.0
Zinc, Total (mg/L)	1/year	10.0

NA - Not Applicable, No Limit.

Sample Analyses and Monitoring Results

Monitoring the treatment system includes collecting discharge data for: 1) each discharge event; and 2) quarterly and yearly analyses. The discharge event monitoring includes the collection of flow, pH and hexavalent chromium data for each batch discharged. The quarterly and yearly discharge monitoring includes the collection of samples for off-site laboratory analyses of aluminum, arsenic, cadmium, total chromium, hexavalent chromium, copper, cyanide, lead, mercury, nickel and zinc.

Discharge Event Data

The City of Appleton permit requires that a record be kept for the total flow discharged and the minimum and maximum pH values for each discharge event. The discharge flow is measured by a magnetic flow meter which is calibrated yearly. The calibration report for the flow meter is included as Appendix A. The pH data is measured by dual pH probes located in the reaction tank. The flow and pH data are continuously recorded on a strip chart located at the MCC. The flow and pH data are also recorded for each discharge event on the operator's daily log sheets.

An influent (storage tank) and effluent (reaction tank effluent during decant step) sample were required to be collected for each and every batch processed during startup. After the startup period ended, the samples were only collected on the effluent. The startup samples were analyzed for hexavalent chromium using the on-site *Hach* colorimetric test kit and for total chromium using an off-site laboratory. Samples collected after the startup period were analyzed for hexavalent chromium. The effluent pH data ranged from 7.55 to 9.02 (s.u.). The effluent hexavalent chromium concentration ranged from 0 to 0.1 mg/L. The effluent total chromium concentration ranged from 0.007 to 1.6 mg/L. The discharge event data obtained during the reporting period from January to June 1997 are included in Appendix B.

Quarterly and Yearly Analytical Data

Two effluent samples were collected during two separate effluent monitoring events on February 20, and May 27, 1997. The sample collected on February 20 was analyzed for aluminum, arsenic, cadmium, total chromium, hexavalent chromium, copper, cyanide, lead, mercury, nickel and zinc (satisfying the yearly and quarterly requirements). The sample collected on May 27 was analyzed for total chromium (satisfying the quarterly requirements). The quarterly and yearly discharge data obtained during the reporting period from January to June 1997 are summarized in Table 3. The complete laboratory analytical results are included in Appendix C.

TABLE 3
Quarterly and Yearly Analytical Data

Sampling Event	Sample Date	Analysis Date	Result (ug/L)	Analysis Method
<i>Yearly</i>				
Aluminum	2/20/97	3/4/97	<20	EPA 200.7
Arsenic	2/20/97	3/4/97	<3.0	EPA 206.2
Cadmium	2/20/97	3/4/97	<0.50	EPA 200.7
Chromium, Total	2/20/97	3/4/97	40	EPA 200.7
Chromium, Hexavalent	2/20/97	2/20/97	<10	EPA 218.4
Copper	2/20/97	3/4/97	<10	EPA 200.7
Cyanide	2/20/97	2/27/97	<0.010	EPA 335.4
Lead	2/20/97	3/4/97	<5.0	EPA 200.7
Mercury	2/20/97	3/4/97	<0.20	EPA 200.7
Nickel	2/20/97	3/4/97	<5.0	EPA 200.7
Zinc	2/20/97	3/4/97	5.1	EPA 200.7
<i>Quarterly</i> ¹				
Chromium, Total	5/27/97	6/11/97	260	EPA 200.7

¹The yearly total chromium sample collected on 2/20/97 also meets the requirements for the first quarterly monitoring sample.

Appendix A
Magnetic Flow Meter Calibration Report

BAILEY/FISCHER & PORTER CO.
Warminster Pa.

MAGNETIC FLOW METER CALIBRATION

TEST REPORT

Serial No.:96W045423 Date: 2 OCT 1996
Meter Size : 3.000 inch Model No.:10D1475SN1
Max Flow: 250.000 GPM Sp. Gr. : 1.000
Cal Factor 805.1 GPM

<u>Run #</u>	<u>Actual GPM</u>	<u>Indicated GPM</u>	<u>Diff % RATE</u>
01	520.752	521.471	+.138
02	260.823	260.741	-.031
03	77.645	77.658	+.018

All Flowmeters are hydraulically calibrated in accordance with MIL-STD-45662A, ISO 9001 and are traceable to the NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Calibrated with : 50XM/7.5HZ @ 60 Hz System Zero adjust +0.00 Hz.

Hydraulic test performed by :WW

EQUIPMENT USED :
E3222 THERMOMETER
E3072 4H FREQ. COUNTER

Customer's Tag number : _____
FLOW LOOPS DIGITAL REV 4-080296 08:03:15 0 3 37

Appendix B
Discharge Event Data

Appendix B
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
January 1, 1997 - June 30, 1997

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L	Influent Total Chromium Concentration mg/L	Effluent Total Chromium Concentration mg/L
011597A	1/15/97	1775	8.50	8.50	8.50	1.6	0	1.90	0.007
011597B	1/15/97	2600	7.80	7.80	7.80	1.6	0	1.60	0.011
011697A	1/16/97	2600	8.80	8.80	8.80	1.8	0	0.01	1.600
011797A	1/17/97	2600	8.90	8.90	8.90	1.6	0	1.50	0.045
011897A	1/18/97	2600	8.80	8.80	8.80	1.6	0	1.40	0.094
011997A	1/19/97	2600	8.20	8.20	8.20	1.4	0	1.30	0.081
012097A	1/20/97	2600	8.45	8.00	8.17	1.3	0	1.40	0.069
012097B	1/20/97	2600	8.30	7.90	8.06	1.1	0	1.20	0.066
012197A	1/21/97	2600	8.68	8.18	8.36	1.1	0	1.10	0.050
012197B	1/21/97	2600	8.57	8.13	8.30	1.0	0	0.98	0.056
012197C	1/21/97	2600	8.52	8.01	8.19	1.0	0	0.95	0.053
012297A	1/22/97	2600	8.53	8.01	8.20	1.0	0	0.88	0.082
012297B	1/22/97	2600	8.53	7.97	8.17	1.0	0	0.92	0.062
012297C	1/22/97	2600	8.56	8.01	8.20	1.0	0	0.93	0.063
012297D	1/22/97	2600	8.56	8.01	8.20	1.0	0	1.00	0.080
012397A	1/23/97	2600	8.56	8.01	8.20	1.1	0	1.10	0.091
012397B	1/23/97	2600	8.63	8.08	8.27	1.2	0	1.10	0.091
012397C	1/23/97	2600	8.76	8.12	8.33	1.2	0	1.10	0.130
012497A	1/24/97	2600	8.79	8.11	8.33	1.5	0	1.90	0.070
012497B	1/24/97	2600	8.82	8.13	8.35	1.5	0	1.80	0.120
012597A	1/25/97	2600	8.62	8.05	8.25	2.2	0	2.00	0.028
012697A	1/26/97	2600	8.79	8.09	8.31	2.4	0	2.20	0.120
012797A	1/27/97	2600	8.75	8.08	8.30	2.3	0	2.30	0.075
012897A	1/28/97	2600	8.63	8.04	8.24	2.6	0	2.30	0.097
012997A	1/29/97	2600	8.67	8.13	8.32	2.4	0	2.30	0.110
013097A	1/30/97	2600	8.63	8.13	8.31	2.7	0	2.80	0.110
013197A	1/31/97	2600	8.53	8.01	8.20	2.8	0	3.00	0.036
013197B	1/31/97	2600	8.69	8.03	8.25	2.9	0	2.80	0.270
021197A	2/11/97	2600	8.45	8.10	8.24	2.4	0	1.90	1.100
021197B	2/11/97	2600	8.47	8.10	8.25	2.2	0	1.80	0.170
021297A	2/12/97	2600	8.54	8.11	8.27	1.8	0	2.30	0.074
021297B	2/12/97	2600	8.58	8.10	8.28	1.8	0	1.90	0.110
021497A	2/14/97	2600	8.60	8.06	8.25	1.9	0	1.90	0.210
021997A	2/19/97	2600	8.24	7.98	8.09	1.1	0	0.95	0.015
022097A	2/20/97	3100	8.11	8.09	8.10	0.9	0		0.040
022497A	2/24/97	3100	8.05	8.06	8.05	0.8	0		
022497B	2/24/97	3139	8.60	8.10	8.28		0		
022497C	2/24/97	3119	8.68	8.11	8.31		0		
022597A	2/25/97	3249	8.67	8.13	8.32		0		
022597B	2/25/97	3194	8.66	8.11	8.30		0		
022597C	2/25/97	3194	8.68	8.10	8.30		0		
022897A	2/28/97	3180	8.70	8.40	8.52		0		
030197A	3/1/97	3056	8.68	8.41	8.52		0		
030397A	3/3/97	3178	8.38	8.00	8.15	0.8	0		
030397B	3/3/97	3194	8.42	7.98	8.15		0		

Appendix B
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
January 1, 1997 - June 30, 1997

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L	Influent Total Chromium Concentration mg/L	Effluent Total Chromium Concentration mg/L
030497A	3/4/97	3185	8.40	8.30	8.35		0		
030697A	3/6/97	3186	8.40	8.20	8.29	1.0	0		
030897A	3/8/97	3185	8.26	8.12	8.18		0		
031097A	3/10/97	3177	8.38	7.98	8.14	1.5	0		
031197A	3/11/97	3178	8.38	8.02	8.16		0		
031297A	3/12/97	3174	8.38	7.98	8.14		0		
031297B	3/12/97	3187	8.33	8.19	8.25		0		
031397A	3/13/97	3105	8.44	7.78	8.00		0		
031597A	3/15/97	3171	8.22	7.55	7.77		0		
031697A	3/16/97	3165	8.40	7.80	8.00	1.2	0		
031797A	3/17/97	3143	8.60	7.80	8.04		0		
031997A	3/19/97	3190	8.62	7.86	8.09		0		
032097A	3/20/97	3226	8.55	7.68	7.93		0		
032197A	3/21/97	3120	8.60	7.80	8.04		0		
032297A	3/22/97	3163	8.80	7.90	8.15		0		
032297B	3/22/97	3237	8.80	8.00	8.24		0		
032297C	3/22/97	3096	8.33	8.33	8.33		0		
032397A	3/23/97	3162	8.80	7.90	8.15	0.9	0		
032397B	3/23/97	3178	8.40	8.26	8.32		0		
032497A	3/24/97	3185	8.48	8.41	8.44		0		
032597A	3/25/97	3159	8.32	8.31	8.31		0		
032697A	3/26/97	3163	8.30	8.32	8.31		0		
032797A	3/27/97	3155	8.28	8.34	8.31		0		
032897A	3/28/97	3145	8.32	8.32	8.32		0		
032897B	3/28/97	3053	8.26	8.12	8.18		0		
032997A	3/29/97	3242	8.36	8.32	8.34	1.2	0		
032997B	3/29/97	3085	8.40	8.26	8.32		0		
032997C	3/29/97	3157	8.33	8.26	8.29		0		
033097A	3/30/97	3158	8.40	8.30	8.35		0		
033197A	3/31/97	3146	8.38	8.30	8.34		0		
033197B	3/31/97	3151	8.36	8.35	8.35		0		
033197C	3/31/97	3197	8.26	8.19	8.22		0		
040197A	4/1/97	3185	8.36	8.36	8.36		0		
040197B	4/1/97	3341	8.36	8.32	8.34		0		
040197C	4/1/97	2986	8.33	8.26	8.29		0		
040297A	4/2/97	3210	8.35	8.30	8.32		0		
040297B	4/2/97	3110	8.36	8.32	8.34		0		
040397A	4/3/97	3420	8.38	8.30	8.34		0		
040497A	4/4/97	2916	8.40	8.30	8.35		0		
040497B	4/4/97	3032	8.38	8.34	8.36		0		
040597A	4/5/97	3060	8.44	8.30	8.36		0		
040597B	4/5/97	3379	8.42	8.32	8.37		0		
040697A	4/6/97	3161	8.42	8.30	8.36	1.1	0		
040697B	4/6/97	3032	8.40	8.30	8.35		0		
040797A	4/7/97	3280	8.44	8.32	8.38		0		

Appendix B
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
January 1, 1997 - June 30, 1997

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L	Influent Total Chromium Concentration mg/L	Effluent Total Chromium Concentration mg/L
040797B	4/7/97	3174	8.50	8.34	8.41		0		
040897A	4/8/97	3145	8.48	8.30	8.38		0		
040897B	4/8/97	3195	8.42	8.33	8.37		0		
040997A	4/9/97	3086	8.40	8.30	8.35	1.2	0		
041097A	4/10/97	3120	8.42	8.30	8.36		0		
041197A	4/11/97	3154	8.38	8.26	8.32		0		
041297A	4/12/97	3185	8.40	8.24	8.31		0		
041397A	4/13/97	3163	8.42	8.30	8.36		0		
041497A	4/14/97	3134	8.44	8.34	8.39		0		
041597A	4/15/97	3057	8.42	8.30	8.36		0		
041797A	4/17/97	3217	8.50	8.40	8.45		0		
041897A	4/18/97	3142	8.40	8.20	8.29		0		
042097A	4/20/97	3164	8.30	8.05	8.16		0		
042197A	4/21/97	3144	8.48	8.40	8.44		0		
042397A	4/23/97	3236	8.35	8.16	8.24		0		
042497A	4/24/97	3075	8.27	7.61	7.83		0		
042697A	4/26/97	3119	8.40	8.02	8.17		0		
042797A	4/27/97	3170	8.38	8.18	8.27	1.1	0		
050297A	5/2/97	3127	8.50	8.30	8.39	1.1	0		
050297B	5/2/97	3223	8.60	8.42	8.50		0		
050297C	5/2/97	3090	8.62	8.40	8.50		0		
050397A	5/3/97	3160	9.02	8.66	8.80		0		
050397B	5/3/97	3136	8.96	8.44	8.63		0		
050497A	5/4/97	3166	8.80	8.34	8.51		0		
050597A	5/5/97	3276	8.70	8.18	8.37		0		
050597B	5/5/97	3032	8.72	8.33	8.48		0		
050697A	5/6/97	3157	8.71	8.19	8.38		0		
050697B	5/6/97	3129	8.80	8.40	8.56		0		
050797A	5/7/97	3158	8.40	8.54	8.46	1.1	0		
050897A	5/8/97	3002	8.40	8.54	8.46		0		
050997A	5/9/97	3147	8.40	8.60	8.49		0		
051097A	5/10/97	3161	8.40	8.54	8.46		0		
051297A	5/12/97	3164	8.66	8.15	8.33		0		
051297B	5/12/97	3162	8.65	8.02	8.23		0		
051397A	5/13/97	3190	8.70	8.40	8.52	1.2	0		
051497A	5/14/97	3166	8.68	8.30	8.45		0		
051597A	5/15/97	3164	8.55	8.20	8.34		0		
051897A	5/18/97	3144	8.49	8.01	8.19		0		
051997A	5/19/97	3150	8.48	8.11	8.26		0		
052197A	5/21/97	3156	8.55	8.22	8.35	1.1	0		
052297A	5/22/97	3166	8.60	8.18	8.34		0		
052597A	5/25/97	3144	8.61	8.17	8.34	1.0	0		
052797A	5/27/97	3148	8.62	8.20	8.36		0		0.26
052897A	5/28/97	3030	8.61	8.21	8.37		0		
052997A	5/29/97	3230	8.70	8.44	8.55	1.1	0		

Appendix B
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
January 1, 1997 - June 30, 1997

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L	Influent Total Chromium Concentration mg/L	Effluent Total Chromium Concentration mg/L
053197A	5/31/97	3034	8.65	8.17	8.35		0		
060197A	6/1/97	3130	8.60	8.22	8.37		0		
060297A	6/2/97	3118	8.70	8.18	8.37		0		
060497A	6/4/97	3097	8.66	8.26	8.42		0		
060697A	6/6/97	3093	8.70	8.33	8.48	1.2	0		
060797A	6/7/97	3080	8.66	8.17	8.35		0		
060897A	6/8/97	3018	8.64	8.22	8.38		0		
060997A	6/9/97	3152	8.58	8.18	8.34		0		
060997B	6/9/97	3055	8.74	8.16	8.36		0		
061197A	6/11/97	3111	8.66	8.10	8.30		0		
061397A	6/13/97	3085	8.69	8.24	8.41	1.2	0		
061597A	6/15/97	3030	8.70	8.28	8.44		0		
061797A	6/17/97	3004	8.69	8.23	8.40	1.3	0		
061797B	6/17/97	3073	8.65	8.20	8.37		0.1		
061997A	6/19/97	3033	8.60	8.12	8.30		0.1		
062297A	6/22/97	3153	8.60	8.38	8.48		0		
062297B	6/22/97	2782	8.77	8.40	8.55		0.1		
062397A	6/23/97	2859	8.68	8.13	8.32	1.2	0.1		
062397B	6/23/97	3046	8.62	8.50	8.56		0.1		
062497A	6/24/97	3079	8.69	8.53	8.60		0.1		
062497B	6/24/97	3017	8.16	8.00	8.07		0		
062597A	6/25/97	3004	8.61	8.27	8.41		0		
062597B	6/25/97	3050	8.58	8.30	8.42		0		
062697A	6/26/97	3127	8.40	8.00	8.16		0		
062897A	6/28/97	3027	8.70	8.20	8.38		0		
062997A	6/29/97	3013	8.40	8.00	8.16		0		
063097A	6/30/97	3090	8.15	8.10	8.12		0		

Appendix C
Laboratory Analytical Data

- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU	Submitter # : 1107.00
Project Number : 91737.02	Submitter : CH2M HILL
Lab Sample Number : 970440-003	Report Date : 3/6/97
Station ID : EFFLUENT	Collection Date : 2/20/97
WI DNR LAB ID : 113138520	Matrix Type : PROCESSWATER

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Aluminum	< 20	20	ug/L	R	3/4/97	EPA 200.7	EPA 200.7
Arsenic	< 3.0	3.0	ug/L		3/4/97	EPA 206.2	EPA 206.2
Cadmium	< 0.50	0.50	ug/L		3/4/97	EPA 200.7	EPA 200.7
Chromium	.40	3.0	ug/L		3/4/97	EPA 200.7	EPA 200.7
Chromium, hexavalent	< 10	10	ug/L		2/20/97	EPA 218.4	EPA 218.4
Copper	< 10	10	ug/L		3/4/97	EPA 200.7	EPA 200.7
Lead	< 5.0	5.0	ug/L		3/4/97	EPA 200.7	EPA 200.7
Mercury	< 0.20	0.20	ug/L		3/4/97	EPA 245.1	EPA 245.1
Nickel	< 5.0	5.0	ug/L		3/4/97	EPA 200.7	EPA 200.7
Zinc	5.1	2.0	ug/L	R	3/4/97	EPA 200.7	EPA 200.7
Cyanide, total	< 0.010	0.010	mg/L		2/27/97	EPA 335.4	EPA 335.4

- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU

Submitter # : 1107.00

Project Number : 91737.02

Submitter : CH2M HILL

Lab Sample Number : 970440-004

Report Date : 3/6/97

Station ID : FB2

Collection Date : 2/20/97

WI DNR LAB ID : 113138520

Matrix Type : PROCESSWATER

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Aluminum	< 20	20	ug/L	R	3/4/97	EPA 200.7	EPA 200.7
Arsenic	< 3.0	3.0	ug/L		3/4/97	EPA 206.2	EPA 206.2
Cadmium	< 0.50	0.50	ug/L		3/4/97	EPA 200.7	EPA 200.7
Chromium	< 3.0	3.0	ug/L		3/4/97	EPA 200.7	EPA 200.7
Chromium, hexavalent	< 10	10	ug/L		2/20/97	EPA 218.4	EPA 218.4
Copper	< 10	10	ug/L		3/4/97	EPA 200.7	EPA 200.7
Lead	< 5.0	5.0	ug/L		3/4/97	EPA 200.7	EPA 200.7
Mercury	< 0.20	0.20	ug/L		3/4/97	EPA 245.1	EPA 245.1
Nickel	< 5.0	5.0	ug/L		3/4/97	EPA 200.7	EPA 200.7
Zinc	< 2.0	2.0	ug/L	R	3/4/97	EPA 200.7	EPA 200.7
Cyanide, total	< 0.010	0.010	mg/L		2/27/97	EPA 335.4	EPA 335.4

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1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU

Submitter # : 1107.00

Project Number : 91737.02

Submitter : CH2M HILL

Lab Sample Number : 971734-003

Report Date : 6/17/97

Station ID : OUTFALL 001

Collection Date : 5/27/97

WI DNR LAB ID : 113138520

Matrix Type : GROUNDWATER

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	260	3.0	ug/L		6/11/97	EPA 200.7	EPA 200.7

Data Qualifier Sheet

- D Analyte value from diluted analysis.
- J Qualitative mass spectral evidence of analyte present: concentration is less than the reporting limit.
- R Data reported are based on the Method Detection Limit (MDL). The value in the EQL column is the laboratory MDL.



CH2MHILL

January 14, 1998
141695.MS.03.01

Ms. Jessica Garratt
Pretreatment Coordinator - City of Appleton
Department of Utilities - Wastewater Division
2006 E. Newberry St.
Appleton, WI 54915-2758

Dear Ms. Garratt:

Subject: N.W. Mauthe Superfund Site Groundwater Treatment Facility Biannual Report
WA 007-RARA-056G, Contract No. 68-W6-0025

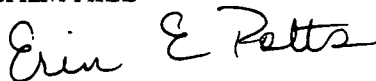
Please find enclosed a copy of the December Biannual Report for the Groundwater Treatment System at the N.W. Mauthe Superfund Site located at 725 S. Outagamie Street in Appleton. This document is being submitted in accordance with Permit No. 97-21 issued for the site wastewater discharge on April 30, 1997.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions or need additional information, please call me or Dan MacGregor in our Milwaukee office at (414) 272-2426.

Sincerely,

CH2M HILL



Erin E. Potts
Site Manager

bian_let2.doc

Enclosure

c: Jon Peterson/U.S. EPA Region 5
Stephen Nathan/U.S. EPA Region 5
Peggy Hendrixson/U.S. EPA Region 5
Ike Johnson/CH2M HILL MKE

John Fleissner/CH2M HILL MKE
Cherie Wilson/CH2M HILL MKE
Cathy Barnett/CH2M HILL MKE
Dan MacGregor/CH2M HILL

Biannual Discharge Monitoring Report

Groundwater Treatment System

**N.W. Mauthe
City of Appleton, Wisconsin**

Submitted by

CH2MHILL

January, 1998

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Introduction

This report provides the permit required daily, quarterly and yearly discharge monitoring results for the N. W. Mauthe Groundwater Pretreatment System from July 1, 1997, through December 31, 1997.

Permit Monitoring and Reporting Requirements

The City of Appleton POTW Industrial User Permit (Permit No. 97-21) requires monitoring of the treatment system effluent in order to verify compliance. The POTW has designated the treatment system discharge as Outfall 001. Outfall 001 enters the City sewer at Manhole 30-14 on Melvin Street, between the intersections of Douglas Street and Outagamie Street. The permit monitoring requirements and discharge limits are shown in Table 1.

TABLE 1
Outfall 001 Discharge Permit Monitoring Requirements
Process Compliance and Local Limit Compliance Parameters

Sample Parameter	Frequency	Limits
Flow (gpd)	During Discharge	NA
pH (s.u.)	During Discharge	5.0-12.4
Chromium, Total (mg/L)	1/quarter	7.0
Chromium, Hexavalent (mg/L)	During Discharge	4.5
Aluminum, Total (mg/L)	1/year	70.0
Arsenic, Total (mg/L)	1/year	1.0
Cadmium, Total (mg/L)	1/year	0.3
Chromium, Total (mg/L)	1/year	7.0
Chromium, Hexavalent (mg/L)	1/year	4.5
Copper, Total (mg/L)	1/year	3.5
Cyanide, Total (mg/L)	1/year	1.0
Lead, Total (mg/L)	1/year	2.0
Mercury, Total (µg/L)	1/year	2.0
Nickel, Total (mg/L)	1/year	2.0
Zinc, Total (mg/L)	1/year	10.0

NA - Not Applicable, No Limit.

Sample Analyses and Monitoring Results

Monitoring the treatment system includes collecting discharge data for: 1) each discharge event; and 2) quarterly and yearly analyses. The discharge event monitoring includes the collection of flow, pH and hexavalent chromium data for each batch discharged. The quarterly and yearly discharge monitoring includes the collection of samples for off-site

laboratory analyses of aluminum, arsenic, cadmium, total chromium, hexavalent chromium, copper, cyanide, lead, mercury, nickel and zinc.

Discharge Event Data

The City of Appleton permit requires that a record be kept for the total flow discharged and the minimum and maximum pH values for each discharge event. The discharge flow is measured by a magnetic flow meter which is calibrated yearly. The calibration report for the flow meter was included in the biannual report submitted in July 1997. The pH data is measured by dual pH probes located in the reaction tank. The flow and pH data are continuously recorded on a strip chart located at the MCC. The flow and pH data are also recorded for each discharge event on the operator's daily log sheets and reported to the City of Appleton with the monthly discharge monitoring reports.

An effluent (reaction tank effluent during decant step) sample was required to be collected for each and every batch processed during startup. The samples were analyzed for hexavalent chromium using the on-site *Hach* colorimetric test kit. The effluent pH data ranged from 7.8 to 10.5 (s.u.). The effluent hexavalent chromium concentration ranged from 0 to 3.6 mg/L. The discharge event data obtained during the reporting period from July to December 1997 are included in Appendix A.

Analytical Data

The City of Appleton permit requires the collection of quarterly and yearly monitoring data. Two quarterly effluent samples were collected in September and December. In addition seven daily effluent and four duplicate daily effluent samples were collected during a bypass period in which groundwater was discharged without treatment in August and September. The analytical results from the bypass period were submitted in a separate report to the City of Appleton in September. The yearly event analytical data were included in the biannual report submitted in July 1997.

The two quarterly samples collected were analyzed for total chromium by Katalyst Analytical Technologies Inc. and the bypass period samples collected were analyzed for total chromium by En-Chem, Inc. The quarterly event and bypass period analytical results obtained during the reporting period from July to December 1997 are summarized in Table 2. The effluent total chromium concentrations for this reporting period ranged from 0.279 to 5.2 mg/L. The laboratory analytical results are included in Appendix B. This data has not been validated by the U.S. EPA as of the date of this report. Validation of the data should not alter the results obtained.

TABLE 2
Analytical Data Summary

Sampling Event	Sample Date	Analysis Date	Result (mg/L)	Duplicate Result (mg/L)	Analysis Method
<i>Quarterly</i>					
Chromium, Total	9/11/97	9/18/97	0.557	NA	EPA 200.7
Chromium, Total	12/12/97	12/16/97	0.279	NA	EPA 200.7
<i>Bypass Event</i>					
Chromium, Total	8/29/97	9/25/97	1.90	NA	EPA 200.7
Chromium, Total	9/2/97	9/25/97	5.20	NA	EPA 200.7
Chromium, Total	9/3/97	9/25/97	3.80	NA	EPA 200.7
Chromium, Total	9/4/97	9/25/97	2.10	2.10	EPA 200.7
Chromium, Total	9/4/97	9/25/97	1.10	1.20	EPA 200.7
Chromium, Total	9/5/97	9/25/97	0.83	0.83	EPA 200.7
Chromium, Total	9/7/97	9/25/97	1.50	1.50	EPA 200.7

Appendix A
Discharge Event Data

Appendix A
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
July 1, 1997 - December 31, 1997

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L
070297A	7/2/97	3096	8.18	7.98	8.07	1.2	0.1
070297B	7/2/97	3103	8.13	7.98	8.05		0.1
070397A	7/3/97	3119	8.12	7.97	8.04		0.1
070597A	7/5/97	3096	8.45	8.15	8.27		0.1
070697A	7/6/97	3156	8.12	7.90	8.00		0.1
070697B	7/6/97	3141	8.20	7.95	8.06		0.1
070897A	7/8/97	3144	8.04	7.90	7.96	1.2	0
070997A	7/9/97	3143	8.05	7.90	7.97		0
071097A	7/10/97	3162	8.10	8.00	8.05		0
071197A	7/11/97	3150	8.12	8.04	8.08		0
071297A	7/12/97	3130	8.10	8.00	8.05		0
071397A	7/13/97	3138	8.17	7.97	8.06		0
071497A	7/14/97	3143	8.11	7.93	8.01	1.2	0
071697A	7/16/97	3129	8.12	8.00	8.06		0
071697B	7/16/97	2955	8.15	8.02	8.08		0
071797A	7/17/97	3110	8.10	8.02	8.06		0
071897A	7/18/97	3146	8.19	8.00	8.08		0
072097A	7/20/97	3134	8.16	8.00	8.07		0
072197A	7/21/97	3155	8.20	8.08	8.14	1.2	0
072297A	7/22/97	3169	8.12	8.00	8.06		0
072497A	7/24/97	3161	8.00	7.95	7.97		0
072797A	7/27/97	3165	8.27	7.90	8.05		0
072897A	7/28/97	3134	8.40	8.20	8.29	1.4	0
072997A	7/29/97	3152	8.36	8.10	8.21		0
080197A	8/1/97	2665	8.38	8.29	8.33		0
080497A	8/4/97	3171	8.48	8.12	8.26	1.4	0
080697A	8/6/97	3173	8.20	7.88	8.01		0
081097A	8/10/97	3142	8.29	7.95	8.09		0
081397A	8/13/97	3059	8.22	8.00	8.10	1.3	0
081597A	8/15/97	3144	8.38	8.01	8.16		0
081797A	8/17/97	3149	8.30	8.01	8.13		0
082997A	8/29/97	6654				2.0	2.0
090297A	9/2/97	6654				3.6	3.6
090397A	9/3/97	6655				2.7	2.7
090497A	9/4/97	6924				1.3	1.3
090497B	9/4/97	7005				1.0	1.0
090497C	9/4/97	2703					0
090597A	9/5/97	7044				1.0	1.0
090797A	9/7/97	7068				1.0	1.0
090997A	9/9/97	3202	8.30	7.80	7.98	1.5	0
091097A	9/10/97	3204	8.27	7.91	8.05		0
091197A	9/11/97	3152	8.36	7.92	8.09		0.1
091497A	9/14/97	3147	8.28	7.86	8.02		0
091797A	9/17/97	3140	8.42	8.02	8.18	1.4	0
091997A	9/19/97	3153	8.40	7.98	8.14		0
092097A	9/20/97	3141	8.30	7.80	7.98		0
092397A	9/23/97	3145	8.24	8.26	8.25		0
092497A	9/24/97	3143	8.22	8.20	8.21		0

Appendix A
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
July 1, 1997 - December 31, 1997

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L
092697A	9/26/97	3146	8.18	8.06	8.12		0
092997A	9/29/97	3139	8.12	8.00	8.06		0
100197A	10/1/97	3150	8.20	8.00	8.09	1.3	0
100397A	10/3/97	3177	8.21	8.00	8.09		0
100897A	10/8/97	2933	8.22	8.10	8.16	1.4	0
101397A	10/13/97	3188	8.21	8.17	8.19		0
101697A	10/16/97	3204	8.20	7.98	8.08	1.3	0
102197A	10/21/97	3119	8.27	7.97	8.09		0
102297A	10/22/97	3184	8.22	8.01	8.10	1.4	0
102397A	10/23/97	3163	8.02	8.00	8.01		0
102997A	10/29/97	3168	8.03	7.95	7.99	1.4	0
110597A	11/5/97	3182	8.05	7.99	8.02	1.3	0
111097A	11/10/97	3174	8.10	8.00	8.05		0
111197A	11/11/97	3465	10.48	10.30	10.38		0
111797A	11/17/97	3227	9.99	9.99	9.99		0
112297A	11/22/97	3129	8.80	8.64	8.71	1.0	0
120197A	12/1/97	3181	8.65	8.25	8.41		0
121097A	12/10/97	3197	8.90	8.79	8.84	1.0	0
121297A	12/12/97	3187	8.79	8.61	8.69		0
122497A	12/24/97	3185	8.75	8.70	8.72	1.0	0
122697A	12/26/97	3167	8.80	8.78	8.79		0

Note: The treatment plant was bypassed and untreated groundwater was discharged from August 29, 1997 to September 9, 1997. A complete description of this event was reported to the City of Appleton in September 1997.

Appendix B
Laboratory Analytical Data

U.S. EPA - CLP

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

CO8-47

Lab Name: KATALYST ANALYTICAL TECH

Contract:

Lab Code: KAT

Case No.:

SAS No.:

SDG No.: 26227

Matrix (soil/water): WATER

Lab Sample ID: 26227*4

Level (low/med): LOW

Date Received: 09/13/97

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium	557.00			P
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				
7440-42-8	Boron				
7439-98-7	Molybdenum				

Color Before: BROWN

Clarity Before: CLOUDY

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

ZR0516

Lab Name: KATALYST ANALYTICAL TECH

Contract:

Lab Code: KAT

Case No.:

SAS No.:

SDG No.: 26510

Matrix (soil/water): WATER

Lab Sample ID: 26510*12

Level (low/med): LOW

Date Received: 12/13/97

Solids: .0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium	279			P
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				
7440-42-8	Boron				
7439-98-7	Molybdenum				

Color Before: COLORLESS

Clarity Before: CLOUDY

Texture:

Color After: COLORLESS

Clarity After: CLOUDY

Artifacts:

Comments:

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU	Submitter : CH2M HILL
Project Number : 91737.02	Report Date : 9/26/97
Station ID : ST0829A	Collection Date : 8/29/97
Lab Sample Number : 973540-001	Matrix Type : WATER
Lab Project Number : 973540	WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	1900	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU

Submitter : CH2M HILL

Project Number : 91737.02

Report Date : 9/26/97

Station ID : ST0902A

Collection Date : 9/2/97

Lab Sample Number : 973540-002

Matrix Type : WATER

Lab Project Number : 973540

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	LOD	LQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	5200	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU **Submitter :** CH2M HILL
Project Number : 91737.02 **Report Date :** 9/26/97
Station ID : ST0903A **Collection Date :** 9/3/97
Lab Sample Number : 973540-003 **Matrix Type :** WATER
Lab Project Number : 973540 **WI DNR LAB ID :** 113138520

Inorganic Results

Test	Result	LOD	LQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	3800	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU **Submitter :** CH2M HILL
Project Number : 91737.02 **Report Date :** 9/26/97
Station ID : ST904A **Collection Date :** 9/4/97
Lab Sample Number : 973478-001 **Matrix Type :** WATER
Lab Project Number : 973478 **WI DNR LAB ID :** 113138520

Inorganic Results

Test	Result	LOD	LQR	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	2100	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU

Submitter : CH2M HILL

Project Number : 91737.02

Report Date : 9/26/97

Station ID : ST904A DUP

Collection Date : 9/4/97

Lab Sample Number : 973478-002

Matrix Type : WATER

Lab Project Number : 973478

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	2100	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU

Submitter : CH2M HILL

Project Number : 91737.02

Report Date : 9/26/97

Station ID : ST904B

Collection Date : 9/4/97

Lab Sample Number : 973478-003

Matrix Type : WATER

Lab Project Number : 973478

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	1100	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU

Submitter : CH2M HILL

Project Number : 91737.02

Report Date : 9/26/97

Station ID : ST904B DUP

Collection Date : 9/4/97

Lab Sample Number : 973478-004

Matrix Type : WATER

Lab Project Number : 973478

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	LOD	LQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	1200	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU	Submitter : CH2M HILL
Project Number : 91737.02	Report Date : 9/26/97
Station ID : ST905A	Collection Date : 9/5/97
Lab Sample Number : 973478-005	Matrix Type : WATER
Lab Project Number : 973478	WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	830	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU **Submitter :** CH2M HILL
Project Number : 91737.02 **Report Date :** 9/26/97
Station ID : ST905A DUP **Collection Date :** 9/5/97
Lab Sample Number : 973478-006 **Matrix Type :** WATER
Lab Project Number : 973478 **WI DNR LAB ID :** 113138520

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	830	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU

Submitter : CH2M HILL

Project Number : 91737.02

Report Date : 9/26/97

Station ID : ST907A

Collection Date : 9/7/97

Lab Sample Number : 973478-007

Matrix Type : WATER

Lab Project Number : 973478

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	1500	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7

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- Analytical Report -

Project Name : NW MAUTHE/116441.SU.SU

Submitter : CH2M HILL

Project Number : 91737.02

Report Date : 9/26/97

Station ID : ST907A DUP

Collection Date : 9/7/97

Lab Sample Number : 973478-008

Matrix Type : WATER

Lab Project Number : 973478

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Chromium	1500	2.6	8.3		ug/L		9/25/97	EPA 200.7	EPA 200.7



CH2M HILL
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53202-4421
Mailing address:
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July 14, 1998
141695.MS.03.01

Ms. Jessica Garratt
Pretreatment Coordinator - City of Appleton
Department of Utilities - Wastewater Division
2006 E. Newberry St.
Appleton, WI 54915-2758

Dear Ms. Garratt:

Subject: N.W. Mauthe Superfund Site Groundwater Treatment Facility Biannual Report
WA 007-RARA-056G, Contract No. 68-W6-0025

Please find enclosed a copy of the June Biannual Report for the Groundwater Treatment System at the N.W. Mauthe Superfund Site located at 725 S. Outagamie Street in Appleton. This document is being submitted in accordance with Permit No. 97-21 issued for the site wastewater discharge on April 30, 1997.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions or need additional information, please call me or Dan MacGregor in our Milwaukee office at (414) 272-2426.

Sincerely,

CH2M HILL

Erin E. Potts
Site Manager

bian_let3.doc
Enclosure

c: Jon Peterson/U.S. EPA Region 5
Stephen Nathan/U.S. EPA Region 5
Peggy Hendrixson/U.S. EPA Region 5
Ike Johnson/CH2M HILL MKE

John Fleissner/CH2M HILL MKE
Cherie Wilson/CH2M HILL MKE
Cathy Barnett/CH2M HILL MKE
Dan MacGregor/CH2M HILL

Biannual Discharge Monitoring Report

Groundwater Treatment System

**N.W. Mauthe
City of Appleton, Wisconsin**

Submitted by

CH2MHILL

July, 1998

Section	Page
Introduction	1
Permit Monitoring and Reporting Requirements	1
Sample Analyses and Monitoring Results	1
Discharge Event Data	2
Analytical Data	2

Appendix A - Discharge Event Data
 Appendix B - Laboratory Analytical Data

Tables	On or Follows Page
1 Outfall 001 Discharge Permit Monitoring Requirements	1
2 Analytical Data Summary	2

Introduction

This report provides the permit required daily, quarterly and yearly discharge monitoring results for the N. W. Mauthe Groundwater Pretreatment System from January 1, 1998, through June 30, 1998.

Permit Monitoring and Reporting Requirements

The City of Appleton POTW Industrial User Permit (Permit No. 97-21) requires monitoring of the treatment system effluent in order to verify compliance. The POTW has designated the treatment system discharge as Outfall 001. Outfall 001 enters the City sewer at Manhole 30-14 on Melvin Street, between the intersections of Douglas Street and Outagamie Street. The permit monitoring requirements and discharge limits are shown in Table 1.

TABLE 1
Outfall 001 Discharge Permit Monitoring Requirements
Process Compliance and Local Limit Compliance Parameters

Sample Parameter	Frequency	Limits
Flow (gpd)	During Discharge	NA
pH (s.u.)	During Discharge	5.0-12.4
Chromium, Total (mg/L)	1/quarter	7.0
Chromium, Hexavalent (mg/L)	During Discharge	4.5
Aluminum, Total (mg/L)	1/year	70.0
Arsenic, Total (mg/L)	1/year	1.0
Cadmium, Total (mg/L)	1/year	0.3
Chromium, Total (mg/L)	1/year	7.0
Chromium, Hexavalent (mg/L)	1/year	4.5
Copper, Total (mg/L)	1/year	3.5
Cyanide, Total (mg/L)	1/year	1.0
Lead, Total (mg/L)	1/year	2.0
Mercury, Total (µg/L)	1/year	2.0
Nickel, Total (mg/L)	1/year	2.0
Zinc, Total (mg/L)	1/year	10.0

NA - Not Applicable, No Limit.

Sample Analyses and Monitoring Results

Monitoring the treatment system includes collecting discharge data for: 1) each discharge event; and 2) quarterly and yearly analyses. The discharge event monitoring includes the collection of flow, pH and hexavalent chromium data for each batch discharged. The quarterly and yearly discharge monitoring includes the collection of samples for off-site

laboratory analyses of aluminum, arsenic, cadmium, total chromium, hexavalent chromium, copper, cyanide, lead, mercury, nickel and zinc.

Discharge Event Data

The City of Appleton permit requires that a record be kept for the total flow discharged and the minimum and maximum pH values for each discharge event. The discharge flow is measured by a magnetic flow meter which does not require calibration. A letter documenting the manufacturer's recommendations regarding calibration was sent to the City of Appleton in June 1998. The pH data is measured by dual pH probes located in the reaction tank. The flow and pH data are continuously recorded on a strip chart located at the MCC. The flow and pH data are also recorded for each discharge event on the operator's daily log sheets and reported to the City of Appleton with the monthly discharge monitoring reports. The effluent pH data ranged from 7.97 to 8.79 (s.u.).

An effluent (reaction tank effluent during decant step) sample is required to be collected for every batch processed. The samples are analyzed for hexavalent chromium using an on-site *Hach* colorimetric test kit. The effluent hexavalent chromium concentration was consistently 0 mg/L. The discharge event data obtained during the reporting period from January to June 1998 are included in Appendix A.

Analytical Data

The City of Appleton permit requires the collection of quarterly and yearly monitoring data. Two quarterly effluent samples were collected in March and June. The yearly monitoring data was collected in March.

The analytical samples collected were analyzed by Katalyst Analytical Technologies Inc. The analytical results obtained during the reporting period from January to July 1998 are summarized in Table 2. The effluent total chromium concentrations for this reporting period ranged from 63.7 to 78.4 ug/L. The laboratory analytical results are included in Appendix B. This data has not been validated by the U.S. EPA as of the date of this report. Validation of the data should not alter the results obtained.

TABLE 2
Quarterly and Yearly Analytical Data

Sampling Event	Sample Date	Analysis Date	Result (ug/L)	Duplicate Result (ug/L)	Analysis Method
<i>Yearly</i>					
Aluminum	3/24/98	4/1/98	<15.2	NA	EPA 200.7
Arsenic	3/24/98	4/1/98	<2.0	NA	EPA 206.2
Cadmium	3/24/98	4/1/98	<0.04	NA	EPA 213.2
Chromium, Total	3/24/98	4/9/98	63.7	69.0	EPA 200.7
Chromium, Hexavalent	3/24/98	3/25/98	100	NA	EPA SW-846 7196
Copper	3/24/98	4/9/98	<9.5	NA	EPA 200.7
Cyanide	3/24/98	4/1/98	<1.7	NA	EPA 335.2

TABLE 2
Quarterly and Yearly Analytical Data

Sampling Event	Sample Date	Analysis Date	Result (ug/L)	Duplicate Result (ug/L)	Analysis Method
Lead	3/24/98	4/1/98	<0.6	NA	EPA 239.2
Mercury	3/24/98	4/1/98	<0.015	NA	EPA 245.1
Nickel	3/24/98	4/9/98	<9.5	NA	EPA 200.7
Zinc	3/24/98	4/9/98	4.6	NA	EPA 200.7
<i>Quarterly</i>					
Chromium, Total	6/10/98	6/18/98	78.4	NA	EPA 200.7

The yearly total chromium sample collected on 3/24/98 also meets the requirements for the first quarterly monitoring sample.

NA – Not applicable, no duplicate sample obtained.

Appendix A
Discharge Event Data

Appendix A
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
January 1, 1998 - June 30, 1998

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L
010398A	1/3/98	3187	8.82	8.77	8.79		0
010498A	1/4/98	3178	8.75	8.70	8.72		0
011298A	1/12/98	3172	8.20	8.11	8.15		0
011698A	1/16/98	3163	8.10	8.09	8.09		0
011998A	1/19/98	3180	8.14	8.10	8.12		0
012898A	1/28/98	3176	8.28	8.10	8.18	1	0
020498A	2/4/98	3181	8.32	8.04	8.16	1.4	0
020798A	2/7/98	3186	8.21	8.10	8.15		0
021198A	2/11/98	3186	8.32	8.05	8.16	1.4	0
021398A	2/13/98	3217	8.30	8.21	8.25		0
021498A	2/14/98	3159	8.22	8.10	8.16		0
021598A	2/15/98	3148	8.32	8.27	8.29		0
021898A	2/18/98	3268	8.30	8.20	8.25	1.4	0
021998A	2/19/98	3145	8.28	8.12	8.19		0
021998B	2/19/98	3071	8.29	8.20	8.24		0
022098A	2/20/98	3237	8.40	8.28	8.34	0.8	0
022198A	2/21/98	3162	8.28	8.18	8.23		0
022198B	2/21/98	3132	8.18	7.95	8.05		0
022198C	2/21/98	3164	8.30	8.20	8.25		0
022398A	2/23/98	3186	8.32	8.20	8.26		0
022498A	2/24/98	3233	8.38	8.22	8.29		0
022598A	2/25/98	2974	8.30	8.16	8.22	0.8	0
022598B	2/25/98	3160	8.22	8.02	8.11	0.6	0
022698A	2/26/98	3173	8.24	8.18	8.21		0
022798A	2/27/98	3161	8.32	8.22	8.27	1.2	0
022898A	2/28/98	3151	8.29	8.22	8.25		0
030198A	3/1/98	3111	8.32	8.28	8.30		0
030198B	3/1/98	3102	8.28	8.20	8.24		0
030298A	3/2/98	3170	8.32	8.22	8.27		0
030398A	3/3/98	3166	8.28	8.21	8.24		0
030498A	3/4/98	3060	8.33	8.18	8.25	1.3	0
030498B	3/4/98	3142	8.20	8.15	8.17		0
030598A	3/5/98	3143	8.22	8.20	8.21		0
030798A	3/7/98	3185	8.20	8.15	8.17		0
030898A	3/8/98	3069	8.22	8.15	8.18		0
031098A	3/10/98	3168	8.21	8.13	8.17		0
031198A	3/11/98	2941	8.25	8.20	8.22	1.3	0
031198B	3/11/98	3152	8.30	8.20	8.25		0
031298A	3/12/98	3199	8.20	8.00	8.09		0
031798A	3/17/98	3162	8.21	8.20	8.20		0
031898A	3/18/98	3174	8.30	8.22	8.26	1.3	0
031998A	3/19/98	3148	8.20	8.11	8.15		0
032098A	3/20/98	3154	8.18	8.15	8.16		0
032298A	3/22/98	2928	8.20	8.10	8.15		0
032398A	3/23/98	3202	8.26	8.18	8.22		0
032398B	3/23/98	3046	8.30	8.18	8.24		0
032498A	3/24/98	3164	8.15	8.04	8.09		0
032598A	3/25/98	3140	8.20	8.08	8.14		0

Appendix A
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
January 1, 1998 - June 30, 1998

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L
032698A	3/26/98	3070	8.22	8.16	8.19	1.3	0
032798A	3/27/98	3326	8.20	8.18	8.19		0
032798B	3/27/98	3040	8.30	8.18	8.24		0
032898A	3/28/98	3107	8.18	8.00	8.08		0
032898B	3/28/98	3070	8.22	8.15	8.18		0
032898C	3/28/98	3200	8.31	8.21	8.26		0
032998A	3/29/98	3017	8.18	8.06	8.12		0
032998B	3/29/98	3087	8.22	8.10	8.16		0
033098A	3/30/98	3150	8.30	8.18	8.24		0
033198A	3/31/98	3080	8.28	8.20	8.24		0
033198B	3/31/98	3045	8.22	8.16	8.19		0
040198A	4/1/98	3118	8.33	8.15	8.23	0.8	0
040198B	4/1/98	3026	8.16	8.05	8.10		0
040198C	4/1/98	3109	8.12	8.01	8.06		0
040298A	4/2/98	3155	8.10	8.00	8.05		0
040298B	4/2/98	3126	8.06	8.00	8.03		0
040298C	4/2/98	3014	8.10	8.08	8.09		0
040298D	4/2/98	3156	8.18	8.00	8.08		0
040398A	4/3/98	3078	8.10	8.01	8.05		0
040398B	4/3/98	3007	8.08	7.98	8.03		0
040398C	4/3/98	3060	8.15	8.00	8.07		0
040498A	4/4/98	3016	8.18	8.02	8.09		0
040498B	4/4/98	3018	8.08	7.96	8.02		0
040498C	4/4/98	3124	8.16	8.01	8.08		0
040598A	4/5/98	2981	8.12	7.99	8.05		0
040598B	4/5/98	2995	8.15	8.01	8.07		0
040598C	4/5/98	3063	8.20	8.10	8.15		0
040698A	4/6/98	3134	8.16	8.09	8.12		0
040698B	4/6/98	3071	8.18	8.08	8.13		0
040698C	4/6/98	3147	8.06	8.00	8.03		0
040698D	4/6/98	3010	8.08	8.00	8.04		0
040798A	4/7/98	3015	8.16	8.06	8.11		0
040798B	4/7/98	3020	8.04	7.98	8.01		0
040798C	4/7/98	3161	8.12	8.02	8.07		0
040798D	4/7/98	3022	8.08	8.07	8.07		0
040898A	4/8/98	3055	8.06	8.04	8.05	0.8	0
040898B	4/8/98	3160	8.10	8.00	8.05		0
040998A	4/9/98	3148	8.10	8.08	8.09		0
041098A	4/10/98	3104	8.32	8.18	8.24		0
041298A	4/12/98	3149	8.44	8.28	8.35		0
041398A	4/13/98	3136	8.36	8.26	8.31		0
041398B	4/13/98	3170	8.28	8.18	8.23		0
041498A	4/14/98	3151	8.18	8.02	8.09		0
041598A	4/15/98					1.3	
041698A	4/16/98	3368	8.16	8.06	8.11		0
041798A	4/17/98	3082	8.16	8.02	8.08		0
041798B	4/17/98	3086	8.08	7.98	8.03		0
041898A	4/18/98	3044	8.10	8.00	8.05		0

Appendix A
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
January 1, 1998 - June 30, 1998

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L
041898B	4/18/98	3104	8.08	8.00	8.04		0
041898C	4/18/98	3050	8.10	8.05	8.07		0
041898D	4/18/98	2987	8.11	8.01	8.06		0
041998A	4/19/98	3035	8.12	8.04	8.08		0.0
041998B	4/19/98	3078	8.08	7.99	8.03		0
041998C	4/19/98	3186	8.12	8.01	8.06		0
042098A	4/20/98	3119	8.16	8.01	8.08		0
042098B	4/20/98	3027	8.18	8.10	8.14		0.0
042198A	4/21/98	3278	8.09	7.88	7.97		0
042198B	4/21/98	2978	8.10	7.92	8.00		0.0
042298A	4/22/98	3129	8.16	8.00	8.07		0.0
042398A	4/23/98	3125	8.20	8.07	8.13	1.3	0
042598A	4/25/98	3049	8.10	8.00	8.05		0
042698A	4/26/98	3195	8.16	8.01	8.08		0
042698B	4/26/98	3155	8.18	8.13	8.15		0
042798A	4/27/98	3165	8.22	8.10	8.16		0
042998A	4/29/98	3158	8.18	8.13	8.15	1.3	0
043098A	4/30/98	3143	8.21	8.15	8.18		0
050398A	5/3/98	3111	8.18	8.11	8.14		0
050498A	5/4/98	3200	8.18	8.11	8.14		0
050598A	5/5/98	3083	8.22	8.18	8.20		0
050598B	5/5/98	3132	8.09	7.97	8.03		0
050698A	5/6/98	3144	8.08	8.00	8.04	1.3	0
050798A	5/7/98	3143	8.04	8.00	8.02		0
051098A	5/10/98	3191	8.02	7.99	8.00		0
051198A	5/11/98	2994	8.06	7.98	8.02		0
051398A	5/13/98	3178	8.06	8.05	8.05		0
051498A	5/14/98	3018	8.07	8.04	8.05		0
051498B	5/14/98	3098	8.10	8.00	8.05		0
051598A	5/15/98	3148	8.10	7.98	8.04		0
051898A	5/18/98	3139	8.10	8.00	8.05		0
052098A	5/20/98					1.3	
052198A	5/21/98	3084	8.18	8.11	8.14		0
052498A	5/24/98	3148	8.10	8.00	8.05		0
052698A	5/26/98	3120	8.16	8.02	8.08		0
052798A	5/27/98					1.4	
052898A	5/28/98	3243	8.14	8.00	8.06		0
052998A	5/29/98	3158	8.31	8.20	8.25		0
060298A	6/2/98	3127	8.04	8.02	8.03		0
060398A	6/3/98					1.3	
060498A	6/4/98	3118	8.06	7.99	8.02		0
060698A	6/6/98	3168	8.08	8.00	8.04		0
060898A	6/8/98	3167	8.08	7.98	8.03		0
061098A	6/10/98	3152	8.10	8.01	8.05	1.4	0
061498A	6/14/98	3110	8.11	7.99	8.05		0
061598A	6/15/98	3126	8.08	8.00	8.04		0
061698A	6/16/98	3062	8.12	8.04	8.08		0
061698B	6/16/98	3083	8.22	8.06	8.13		0

Appendix A
Discharge Event Data
N.W. Mauthe Groundwater Treatment Plant Effluent
January 1, 1998 - June 30, 1998

Batch Number	Discharge Date	Discharge Volume gallons	pH probe value 1	pH probe value 2	Average pH	Influent Hexavalent Chromium Concentration mg/L	Effluent Hexavalent Chromium Concentration mg/L
061798A	6/17/98					1.2	
062298A	6/22/98	3045	8.30	8.12	8.20		0
062298B	6/22/98	3130	8.26	8.16	8.21		0
062498A	6/24/98					1.2	
062598A	6/25/98	3074	8.22	8.04	8.12		0
062698A	6/26/98	3220	8.18	7.99	8.07		0
062698B	6/26/98	2950	8.20	8.10	8.15		0
062898A	6/28/98	3129	8.14	8.01	8.07		0
062898B	6/28/98	3085	8.26	8.10	8.17		0
062898C	6/28/98	3043	8.16	7.98	8.06		0
062998A	6/29/98	3254	8.18	8.00	8.08		0
062998B	6/29/98	3106	8.16	7.98	8.06		0
063098A	6/30/98	2912	8.24	8.12	8.18		0
063098B	6/30/98	3087	8.18	8.00	8.08		0
063098C	6/30/98	3232	8.22	8.10	8.16		0

Appendix B
Laboratory Analytical Data

U.S. EPA - CLP

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

ZR0532

Lab Name: KATALYST ANALYTICAL TECH

Contract:

Lab Code: KAT

Case No.:

SAS No.:

SDG No.: 26881

Matrix (soil/water): WATER

Lab Sample ID: 26881*1

Level (low/med): LOW

Date Received: 03/25/98

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15.2	B		P
7440-36-0	Antimony				
7440-38-2	Arsenic	2.0	U	S	F
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium	0.04	U		F
7440-70-2	Calcium				
7440-47-3	Chromium	63.7			P
7440-48-4	Cobalt				
7440-50-8	Copper	9.5	U		P
7439-89-6	Iron				
7439-92-1	Lead	0.6	U		F
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury	0.015	B		AV
7440-02-0	Nickel	9.5	U		P
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc	4.6			P
57-12-5	Cyanide	1.7	U		C

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

ZR0532

Lab Name: KATALYST ANALYTICAL TECH Contract:

Lab Code: KAT Case No.: SAS No.: SDG No.: 26881

Matrix (soil/water): WATER Lab Sample ID: 26881*1

Level (low/medium): LOW Date Received: 03/25/98

% Solids: 0.0

Concentration Units (mg/L or mg/kg dry weight): MG/L

Analyte	Concentration	C	Q	M
Hexavalent Chromium	0.10	U		

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

ZR0533

Lab Name: KATALYST ANALYTICAL TECH

Contract:

Lab Code: KAT

Case No.:

SAS No.:

SDG No.: 26881

Matrix (soil/water): WATER

Lab Sample ID: 26881*2

Level (low/med): LOW

Date Received: 03/26/98

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium	69.0			P
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

ZR0545

Lab Name: KATALYST ANALYTICAL TECH

Contract:

Lab Code: KAT

Case No.:

SAS No.:

SDG No.: 27127

Matrix (soil/water): WATER

Lab Sample ID: 27127*7

Level (low/med): LOW

Date Received: 06/11/98

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium	78.4			P
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				
7440-42-8	Boron				
7439-98-7	Molybdenum				

Color Before: BROWN

Clarity Before: CLOUDY

Texture:

Color After: BROWN

Clarity After: CLOUDY

Artifacts:

Comments:

Appendix E
**Treatment System
Operations Log Forms**

**Appendix C
Daily Log Sheet
Groundwater Pretreatment System
N.W. Mauthe Superfund Site**

Week of: _____

Parameter	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
pH and Flow Data							
Inspect discharge flow meter and pH/flow recorder							
Effluent flow totalizer value (gal) [after each discharge event]							
High pH value [during each discharge event]							
Low pH value [during each discharge event]							
Average pH value [during each discharge event]							
Clean pH probes [weekly]							
Calibrate pH meter [weekly]							
Onsite Analytical Data							
Reaction tank effluent hexachrome concentration (mg/L) [during each discharge event]							
Storage tank hexachrome concentration (mg/L) [weekly]							
Reaction tank TSS (mg/L) [weekly]							
Storage tank TSS (mg/L) [as necessary]							
Chemical Feed System Information							
Nitrogen tank pressure (psi) [daily]							
Nitrogen tank discharge pressure (psi) [daily]							
Ferrous sulfate drum weight (lbs) [weekly]							
Caustic drum weight (lbs) [weekly]							

Appendix C
Weekly Log Sheet
Groundwater Pretreatment System
N.W. Mauthe Superfund Site

Month of: _____

Week:				
Observation Date:				
Parameter				
Manhole Sump No. 1				
Water depth (ft)				
Water color/clarity				
Manhole Sump No. 2				
Water depth (ft)				
Water color/clarity				
Storage Tank (As Necessary)				
Water depth (ft)				
Water color/clarity				
Mixer appearance/condition				
Ultrasonic Level Meter appearance/condition				
Reaction Tank Feed Pump				
Pump operating pressure (psi)				
Pump appearance/ performance				
Reaction Tank				
Depth of sludge (ft)				
Diffuser appearance/ performance				
Mixer appearance/condition				
Ultrasonic Level Meter appearance/condition				
Chemical Feed Systems				
Condition/color of ferrous sulfate solution				
Condition of pH probes				
Pumps (2) appearance/ performance				
Sludge Transfer Pump				
Pump operating pressure (psi)				
Pump appearance/ performance				
Sludge Tank				
Depth of Sludge (ft)				
Sludge Tanker Truck Feed Pump (As Necessary)				
Pump operating pressure (psi)				
Pump appearance/ performance				

All chromium analysis by Hach field test methods.

* Sample during discharge of treated batch to POTW (at discharge pipe sample port).

**Facility Alarm Response Log Sheet
Groundwater Pretreatment System
N.W. Mauthe Superfund Site**

Page: _____ of _____

Operator Name: _____

Date: _____

Time of Alarm: _____

Arrival Time: _____

Departure Time: _____

Alarm Message (i.e. computer voice recording):

Onsite Alarm Indicators (i.e. Manhole Pump 1 alarm light on, PLC flashing "SYSTEM SHUTDOWN"):

Activities Performed (to address alarm condition):

Notification Required (i.e. call CH2M HILL, call City of Appleton):

Persons Notified and When (name, date and time of contact):

Problem Areas and Recommended Solutions (i.e. false alarm because of ..., could be fixed by ...):

**Operator Daily Log Sheet
Groundwater Pretreatment System
N.W. Mauthe Superfund Site**

Page: _____ of _____

Operator Name: _____

Date: _____

Arrival Time: _____

Departure Time: _____

Activities Performed: (i.e. discharged batch, sampled, cleaned pH probes, etc.)

Problem Areas and Recommended Solutions: (i.e. caustic leaking, pump leaking oil, etc.)

Problems Resolved: (i.e. fixed leak, replaced pipe fittings, etc.)

Appendix F
**Equipment Maintenance
Schedule Summary**

McMAHON ASSOCIATES, INC.

ENGINEERS ■ ARCHITECTS
SCIENTISTS ■ SURVEYORS

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Mailing Address: P.O. Box 1025 Neenah, WI 54957-1025
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October 24, 1997

Ms. Erin Potts
CH2M Hill
P.O. Box 2090
Milwaukee, WI 53201-2090

Re: Maintenance Schedule
N.W. Mauthe Site, Appleton, Wisconsin
McM. No. 1350-97418.03

Dear Erin:

This letter will serve to document the Midwest Contract Operations maintenance preventative maintenance schedule for the equipment at the N.W. Mauthe Remediation building, Appleton, Wisconsin.

This letter was derived from the "N.W. Mauthe Superfund Site Groundwater Treatment Facility Appleton, Wisconsin Operation and Maintenance Manual, Volume 1", prepared by R.E. Wright Environmental, Inc., Middletown, Pennsylvania.

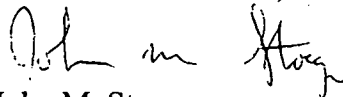
At this time we are still sorting through Dave Wink's maintenance records to provide you with preventative maintenance activities performed at the site prior to October 1, 1997.

Operation and maintenance records, in the form of site logs and work orders, will be kept on-site for your review.

If you should have any further questions, please feel free to call me at (920)751-4200.

Very truly yours,

McMahon Associates, Inc.



John M. Stoeger
Environmental Specialist

JMS:blm

MAINTENANCE SCHEDULE

N.W. Mauthe Site
Appleton, Wisconsin

Equipment Name	O/M Procedure	Service Interval					
		Daily	Weekly	Monthly	Qtrly.	Annually	As Needed
Top Mounted Mixers	Check Gearbox Oil Level			X			
	Change Gearbox Oil (Initial)			X			
	Change Oil Gearbox					X	
	Grease Input Bearings			X			
Chemical Metering Pumps	Check Physical Operating Conditions				X		X
	Change Cartridge Valves						X
	Check for Filter Leaks				X		
	Clean Pumps				X		
Submersible Pumps	Check Current (Ammeter Fluctuation)	X					
	Measure Insulation Resistance			X			
	Replace Mechanical Seal					X	
	Replace Oil Filter Plug Gasket					X	
	Change Lubricating Oil					X	
	Replace O-Ring					X	
Double Diaphragm Pumps	Fill Lubricator Oil						X
	Drain Filter						X
	Observe for Uneven Operation	X					
Air Compressor	Monitor Gauges	X					
	Check Safety Valve Operation		X				
	Inspect Air Filter			X			
	Change Oil Filter						X
	Change Lubricator Separator					X	
Unit Heaters	Inspect Fan Belt and Lint Guard		X				
	Check Motor Lubrication		X				
	Oil Motor					X	

MAINTENANCE SCHEDULE

Equipment Name	O/M Procedure	Service Interval					
		Daily	Weekly	Monthly	Qtrly.	Annually	As Needed
Air Conditioner	Clean Air Filter			X			
	Clean Outdoor Coil			X			
	Check Base Pan			X			
Water Heater	Drain 1 to 2 quarts water from tank			X			
	Check relief valve					X	
Safety Shower	Test			X			
Ceiling Fans	Clean Blades						X

Appendix G
**Emergency System Shutdown
Incident Communications**



DEPARTMENT OF UTILITIES

WASTEWATER DIVISION • CENTRAL BUILDING MAINTENANCE DIVISION

2006 East Newberry Street • Appleton, WI 54915

414/832-5945 • 414/832-5514 • FAX 414/832-5949

September 16, 1997

Erin E. Potts
Site Manager, N.W. Mauthe Superfund Site
CH2MHILL
P. O. Box 2090
Milwaukee, WI 53201 - 2090

RE: Non-Compliance with Permit Requirements for "Bypass-of-Treatment" at Mauthe Groundwater Remediation Site

Dear Ms. Potts:

I just received the August discharge report for the N.W. Mauthe Superfund Site in Appleton (dated September 11, 1997, received in my office September 15, 1997). My last contact with your staff regarding the *possibility of bypassing pretreatment facilities* was at 8:10 a.m. on August 29, 1997 when I spoke with Chris Liethen. Ms. Liethen informed me of a ball valve failure on the treatment vessel discharge outlet and that the wet well levels were climbing. We had quite a lengthy discussion on this system failure and my concern that an automated system failure should never preclude manual operation alternatives. Ms. Liethen explained that manual treatment did not seem possible at this point due to some confusion on the responsibilities of the subcontractor maintaining the site.

We agreed that the worst case would be groundwater from this Superfund remediation site backing-up into the area homes because of this mechanical breakdown. All of the positive steps in establishing credibility and goodwill with the area residents would be jeopardized. I reiterated that my first preference would be for the subcontractor or CH2MHILL staff to handle manual batch treatment of the groundwater collecting and NOT BYPASS during this time. However, if there were no other alternatives the groundwater should come to the POTW instead of residential basements.

The following points were made:

- ▶ 1. Conduct in-house testing and for Cr+6 with split samples to go to a certified laboratory for Cr, total, analyses to corroborate compliance with Local Limits for Chromium during bypass event. [Your report states this has been / is being complied with.]
- ▶ 2. Provide written report on problem, start of bypass, and the return to normal treatment operation (*this requirement is standard permit criteria and is fully detailed in the Industrial User Permit # 97 - 21, p. 13 of 19: NOTIFICATION OF BYPASS*) [This has not been complied with.]

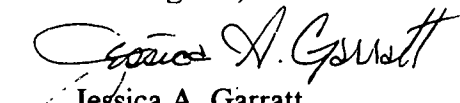
p. 2 / September 16, 1997 Letter to E. Potts: Mauthe Site treatment bypass

- ▶ 3. Develop a contingency plan to handle automated systems' failures in the future to maintain treatment capabilities for this batch system at all times. This is now a required corrective action for this facility. ***A Manual Operation Mode Action Plan*** must be submitted to this office within thirty (30) days of the date of this letter. A letter documenting SITE OPERATOR training for Manual Plant Operation has been conducted will be required no later than December 31, 1997. It was never assumed that a groundwater remediation site where there are no production process wastestreams and where all handling is completely contained and the treatment chemistry is essentially fundamental; that you would have any need to bypass with the exception of facility wide power failures.

Your August report indicated that you initiated bypassing on August 29; the day I spoke with Ms. Liethen. Your report makes no notification that you have corrected the problem with the valve or returned to appropriate treatment operations. I realize this was an unanticipated failure with a facility so new and so well planned. That makes this more frustrating to see a lack of diligence in following-up this event with adequate reporting and assurances that this won't cause treatment bypass in the future. Systems do fail, regardless of the level of contingency planning. In this case it was a failure that should not have lead to bypassing since no continuous flow comes from this facility. The fact that this is an EPA designated Superfund remediation site requires even more diligent efforts to comply with environmental safeguards.

If you have any questions regarding my concerns please contact me at (920) 832 - 5945.

Best regards,


Jessica A. Garratt
Pretreatment Coordinator
Laboratory Manager

c: D. Leaf, Director of Utilities
J. Peterson / USEPA Region V



CH2MHILL

CH2M HILL
411 E. Wisconsin Avenue
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53202-4421
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53201-2090
Tel 414.272.2426
Fax 414.272.4408

October 1, 1997

141695.PP.01.04.01

Mr. Jon Peterson
Work Assignment Manager (SR-6J)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

Dear Mr. Peterson:

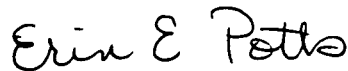
Subject: N.W. Mauthe Groundwater Treatment Facility
Bypass Discharge Report
Contract No. 68-W6-0025, WA No. 007-RARA-056G

Please find enclosed a copy of a letter to Jessica Garratt, Pretreatment Coordinator - City of Appleton summarizing the analytical results from the Bypass discharges from the Groundwater Treatment Facility at the N.W. Mauthe Site, in Outagamie County, Wisconsin. I faxed this letter to the City of Appleton yesterday afternoon and received a reply today. The reply, which states the report is more than sufficient for reporting the discharges, is also enclosed.

Please do not hesitate to contact me at 1-414-272-1052 ext. 348 if you have any questions.

Sincerely,

CH2M HILL



Erin E. Potts
Site Manager

Enclosures

c: Stephen Nathan, PO/U.S. EPA, Region 5 (w/o enclosures)
Peggy Hendrixson, CO/U.S. EPA, Region 5 (w/o enclosures)
Alpheus Sloan III, PM/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee
Cathy Barnett, RTL/CH2M HILL, Milwaukee
Ike Johnson, APM-OPNS/CH2M HILL, Milwaukee
John Fleissner, QAM/CH2M HILL, Milwaukee
Library, Milwaukee



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September 29, 1997

141695.MS.03.01

Ms. Jessica Garratt
Pretreatment Coordinator - City of Appleton
Department of Utilities - Wastewater Division
2006 E. Newberry St.
Appleton, WI 54915-2758

Dear Ms. Garratt:

Subject: N.W. Mauthe Superfund Site Groundwater Treatment Facility
August/September Bypass Discharge Results
WA 007-RARA-056G, Contract No. 68-W6-0025

Introduction

This letter is written for the purpose of documenting the August/September Bypass Discharge Results for the Groundwater Treatment System at the N.W. Mauthe Superfund Site located at 725 S. Outagamie Street in Appleton. This document is being submitted to record the analytical results obtained for the groundwater which was discharged without treatment or "bypassed" during August and September 1997 when the groundwater treatment plant was not functioning as the result of a mechanical failure.

Background

The automatic flow control valve on the discharge pipe of the reaction tank failed, requiring use of the upstream manual ball valve to control the discharge of the reaction tank contents. When the automatic control valve was removed for repair on August 18, 1997 the valve's electronic signal to the PLC caused a system failure thereby shutting down the automatic control system. A temporary shut-down of the system is acceptable, however, the length of repair time required for the valve, coupled with rain events led to high water conditions in the groundwater collection trenches necessitating prompt action. The two options identified to resolve this problem (temporarily until the control valve was repaired) were as follows: 1) operate the entire plant manually, or 2) directly discharge the contents of the storage tank without treatment, provided the tanks contents did not exceed the City of Appleton discharge permit limits. CH2M HILL determined that manual operation of the treatment plant was not an appropriate option for two reasons:

- 1) there was a problem in the programming of the adjustable frequency drive of the reaction tank mixer which prohibited the mixer from being operated manually
- 2) the influent chromium concentrations have consistently been below the discharge permit limits

For these reasons it was determined that the most responsive solution was to directly discharge the groundwater from the storage tank without treatment. A telephone conversation with Chris Liethen/CH2M HILL on August 29, 1997 led to the understanding that the City of Appleton would allow bypass of the treatment system provided the batches discharged were sampled for hexavalent and total chromium.

Ms. Jessica Garratt
Page 2
September 29, 1997

141695.MS.03.01

Analytical Results

Each batch of untreated water was sampled and analyzed for hexavalent chromium using an on-site Hach Kit Analysis and for total chromium by En-Chem Laboratories, Inc. Four duplicate samples were also collected for the total chromium analysis. The analytical results obtained for the untreated batches are shown in Table 1. The results show that the permit limits for chromium (total chromium, 7.0 mg/L and hexavalent chromium, 4.5 mg/L) were not exceeded.

Repairs/Adjustments to the Treatment Plant

The actuator on the automatic flow control valve was replaced and the PLC program re-written by CH2M HILL on September 9, 1997. The PLC program was re-written to allow for a system over-ride of the valve failure, allowing the system to begin treating water in automatic mode again (eliminating the previous problems associated with the inability to operate the plant manually). The mixer on the reaction tank will be re-wired to allow manual operation. An addendum to the Operation and Maintenance Manual will be written to provide step-by-step instructions to operate the plant in a completely manual mode (i.e. without assistance from the PLC).

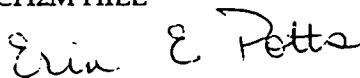
Required Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions or need additional information, please call me or Cathy Barnett in our Milwaukee office at (414) 272-2426.

Sincerely,

CH2M HILL



Erin E. Potts
Site Manager

bypass_let.doc
enclosure

c: Jon Peterson/U.S. EPA Region 5
Stephen Nathan/U.S. EPA Region 5
Peggy Hendrixson/U.S. EPA Region 5
Alpheus Sloan III/CH2M HILL MKE

Ike Johnson/CH2M HILL MKE
John Fleissner/CH2M HILL MKE
Cherie Wilson/CH2M HILL MKE
Cathy Barnett/CH2M HILL MKE

Table 1
August/September Bypass Event
N.W. Mauthe Groundwater Treatment Plant Effluent

Discharge Date	Discharge Volume (gallons)	Effluent Hexavalent Chromium (mg/L)	Effluent Total Chromium (mg/L)	Effluent Total Chromium (mg/L) Duplicates
8/29/97	6,654	2.00	1.90	NA
9/2/97	6,654	3.60	5.20	NA
9/3/97	6,655	2.70	3.80	NA
9/4/97	6,924	1.30	2.10	2.10
9/4/97	7,005	1.00	1.10	1.20
9/5/97	7,044	1.00	0.83	0.83
9/7/97	7,068	1.00	1.50	1.50

Total Volume Bypassed 48,004 gallons



CH2MHILL

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Tel 414.272.2426

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October 20, 1997

141695.MS.03.01

Ms. Jessica Garratt
Pretreatment Coordinator - City of Appleton
Department of Utilities - Wastewater Division
2006 E. Newberry St.
Appleton, WI 54915-2758

Dear Ms. Garratt:

Subject: N.W. Mauthe Superfund Site Groundwater Treatment Facility
Manual Operation Mode Action Plan
WA 007-RARA-056G, Contract No. 68-W6-0025

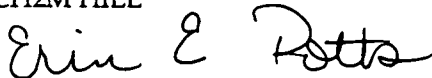
Please find enclosed a copy of the Manual Operation Mode Action Plan for the Groundwater Treatment System at the N.W. Mauthe Superfund Site located at 725 S. Outagamie Street in Appleton. This document is being submitted in partial response to a letter of non-compliance received on September 19, 1997 from the City of Appleton in regards to Industrial User Permit No. 97-21 issued for the site on April 30, 1997.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions or need additional information, please call me or Cathy Barnett in our Milwaukee office at (414) 272-2426.

Sincerely,

CH2M HILL





Site Manager

o&m_plan_let.doc
enclosure

cc: Jon Peterson/U.S. EPA Region 5
Stephen Nathan/U.S. EPA Region 5
Peggy Hendrixson/U.S. EPA Region 5
Cathy Barnett/CH2M HILL MKE

Ike Johnson/CH2M HILL MKE
John Fleissner/CH2M HILL MKE
Cherie Wilson/CH2M HILL MKE

N.W. Mauthe Groundwater Treatment Facility

Manual Operation Mode Action Plan

PREPARED FOR: Jessica Garratt/City of Appleton POTW
Industrial User Discharge Permit No. 97-21

PREPARED BY: Erin Potts/CH2M HILL

PROJECT NO: 141695
WA No. 007-RARA-056G, Contract No. 68-W6-0025

DATE: October 20, 1997

Purpose

This memorandum is for the purpose of identifying the steps required to operate the treatment plant manually. The N.W. Mauthe Groundwater Treatment Facility is typically operated in automatic mode controlled primarily by the PLC program which is designed to automatically treat each batch of groundwater as the groundwater enters the treatment plant. However, equipment or PLC failures may require the treatment plant to be operated in a manual mode. Step-by-step instructions for operating the treatment facility in a manual mode are provided in the following sections. Additional information regarding the operation of the treatment facility can be found in CH2M HILL's Operation and Maintenance (O&M) Manual and the Manufacturer's Equipment O&M Manuals. This memorandum is intended only to supplement these O&M Manuals.

Batch Treatment Process

The batch treatment process consists of eight steps as summarized in Table 1 below. A detailed description of the operator activities required for each step in the batch cycle follows.

TABLE 1
Batch Process Operation

Step in Cycle	Description	Estimated Time (min)
Decant	Treated water from the previous batch is discharged to the City of Appleton POTW.	60-120
Fill	The reaction tank is filled with water from the storage tank.	30-700 (depends upon the reaction tank feed pump flow rate)

TABLE 1
 Batch Process Operation

Step in Cycle	Description	Estimated Time (min)
Ferrous Sulfate Addition	Ferrous sulfate is added to the reaction tank and the mixer in the reaction tank is turned on. The amount of ferrous sulfate added is dictated by the amount of influent hexavalent chromium.	15-20
Caustic Addition	Caustic (sodium hydroxide) is added to the reaction tank until a desired pH (typically 8.5) is reached.	15-20
Aeration	During the same time as the caustic addition step, the reaction tank is aerated to convert (oxidize) any remaining ferrous iron to ferric iron.	15-20
Flocculation	After the caustic addition/aeration step the mixer is slowed to a flocculation speed. The flocculation step causes the precipitates to agglomerate and thereby improves settling.	20-30
Settling	Once the flocculation is complete, the mixer is turned off and the suspended particles settle out of the bulk liquid and into the sludge holding area at the bottom of the reaction tank.	120-240
Sludge Withdrawal	Occasional removal of a portion of the reaction tank sludge is required. Sludge is pumped from the reaction tank to the sludge tank using the sludge transfer pump.	Operator Choice - dependent upon volume of sludge withdrawal required

Decant

The decant step is typically controlled by an automatic flow control valve on the discharge pipe. The automatic flow control valve consists of a ball valve and an electronic actuator. To operate the ball valve manually:

1. Disable the actuator at the MCC by opening the circuit at switch No. 29 on the MCC panel
2. Remove the actuator (See the Manufacturer's Equipment O&M manual Chapter 13 for instructions on installation and removal of the actuator)
3. Replace the ball valve stem/handle (removed when actuator is installed)

To decant the reaction tank:

1. Open the ball valve and allow the water to discharge
2. Collect a sample for hexavalent chromium analysis
3. Record the pH of the sample or of the reaction tank just prior to discharge
4. Record the flow meter reading after the discharge is complete
5. Close the ball valve prior to the FILL Step

Fill

After the previously treated batch is discharged and the water in the storage tank reaches a minimum of 4 feet, the reaction tank can be filled by turning on the reaction tank feed pump (P-4) as follows:

1. Turn on the reaction tank feed pump by placing the pump in manual mode using the hand switch located on the wall
2. Adjust the air supply to the pump until the desired pumping rate is achieved
3. Turn the pump off after the reaction tank level indicator reaches ~ 4800 gallons

Ferrous Sulfate Addition

The ferrous sulfate addition step consists of the following:

1. Sample the storage tank and analyze for influent hexavalent chromium concentration
2. Calibrate the ferrous sulfate feed pump as outlined in the O&M manual
3. Calculate the required ferrous sulfate volume and pumping time as shown in Attachment A
4. Turn on the reaction tank mixer (M-5) at the local keypad and set the mixing speed to 1660 RPM (~ 95% of maximum speed)
5. Turn on the ferrous sulfate metering pump by placing the pump in manual mode using the hand switch located on the pump, record the time
6. Turn the pump off after the required amount of time has passed (previously calculated in Step 3)
7. Continue mixing for a least 15 minutes
8. Adjust the mixer speed to 1225 RPM (~70% of maximum speed) for the CAUSTIC Step at the local keypad

Caustic Addition/Aeration

The caustic addition/aeration steps consists of the following:

1. Turn on the caustic metering pump by placing the pump in manual mode using the hand switch located on the pump
2. Turn the pump off after a pH of 8.5 has been reached and maintained for 5 minutes (i.e. if a pH of 8.5 is reached and you turn the pump off and the pH drops to 8.0 after 5 minutes, turn the pump back on until a pH of 8.5 is reached again)
3. Activate the air diffuser in the reaction tank by opening the flow control valve on the air compressor line using the hand switch located on the hand railing next to the reaction tank
4. Continue aeration for at least 30 minutes then close the air flow control valve
5. Adjust the mixer speed to 610 RPM (~ 35% of maximum speed) for the FLOCCULATION Step at the local keypad

Flocculation/Settling

The flocculation/settling steps consists of the following:

1. After 30 minutes at flocculation speed shut the mixer off
2. Allow the contents of the reaction tank to settle for a minimum of 120 minutes
3. Proceed to the SLUDGE WITHDRAWAL and/or DECANT step

Sludge Withdrawal

If sludge withdrawal is necessary then perform the following, otherwise proceed to the DECANT step:

1. Turn on the sludge transfer feed pump by placing the pump in manual mode using the hand switch located near the pump
2. Adjust the air supply to the pump until the desired pumping rate is achieved
3. Turn the pump off after the desired sludge level in the reaction tank is reached

Ferrous Sulfate Calculations

To calculate the time required for pumping ferrous sulfate, the following calculations need to be performed:

1. Calculate the volume of ferrous sulfate heptahydrate needed based on the hexavalent chromium concentration in the initial sample and the characteristics of the ferrous sulfate solution
2. Calculate the amount of time required for pumping based on the volume of ferrous sulfate heptahydrate needed and the pump speed

Calculate the Volume Required

The volume of ferrous sulfate heptahydrate required to reduce all hexavalent chromium to trivalent chromium is dependent upon the following factors:

1. amount of hexavalent chromium in the influent
2. specific gravity of the ferrous sulfate heptahydrate solution (from MSDS)
3. concentration of the ferrous sulfate heptahydrate solution (from MSDS)

Using this information in conjunction with a desired safety factor of 2, the amount of ferrous sulfate heptahydrate can be calculated as follows:

$$\frac{0.1564 \times \text{mg/L of hexavalent chromium} \times \text{Safety Factor}}{\text{specific gravity} \times \text{percent concentration (as a decimal)}} = \text{Liters of ferrous sulfate solution}$$

The number 0.1564 is a conversion factor based on the volume of water being treated in the reaction tank.

For example, if you know the following information:

1. influent hexavalent chromium concentration = 3.5 mg/L
2. specific gravity of the ferrous sulfate solution = 1.24
3. concentration of the ferrous sulfate solution = 15%
4. safety factor = 2

$$\text{Then the volume of ferrous sulfate required} = (0.1564 \times 3.5 \times 2) \div (1.24 \times 0.15) = 5.9 \text{ L.}$$

Calculate the Time Required

The amount of time required for pumping is equal to the volume of ferrous sulfate required divided by the pumping rate.

For example, if you know the following:

1. the volume of ferrous sulfate required is 5.9 L
2. the pumping rate has been calibrated to 0.2 L/min

$$\text{Then the amount of time required for pumping} = (5.9) \div (0.200) = 29.5 \text{ minutes.}$$



CH2MHILL

December 30, 1997

141695.MS.03.01

CH2M HILL

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Ms. Jessica Garratt
Pretreatment Coordinator - City of Appleton
Department of Utilities - Wastewater Division
2006 E. Newberry St.
Appleton, WI 54915-2758

Dear Ms. Garratt:

Subject: N.W. Mauthe Superfund Site Groundwater Treatment Facility
Manual Operation Mode Training
WA 007-RARA-056G, Contract No. 68-W6-0025

This letter is to document that site operator training for manual plant operation has been conducted as required in the letter of non-compliance received on September 19, 1997 from the City of Appleton in regards to Industrial User Permit No. 97-21 issued for the site on April 30, 1997. The primary operator John Stoeger and secondary operator Lauri Stenson, both of Midwest Contract Operations, Inc., have received visual on-site training on all aspects of manual operation of the facility with the exception of the reaction tank mixer. The reaction tank mixer required reprogramming to allow for manual operation. After reprogramming the mixer, the primary operator was given verbal training on the use of the reaction tank mixer in manual mode.

A final visual inspection of the operator's ability to manually operate the facility, including the reaction tank mixer, is scheduled for January 7, 1997. If a City of Appleton representative would like to be present during this final inspection please contact CH2M HILL so that arrangements can be made. The final inspection is expected to last no longer than 4 hours.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are

Ms. Jessica Garratt
Page 2
December 30, 1997

141695.MS.03.01

significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions or need additional information, please call me or Dan MacGregor in our Milwaukee office at (414) 272-2426. Dan MacGregor is the assistant project manager and will now be the second local contact as Cathy Barnett has recently transferred to CH2M HILL's St. Louis office.

Sincerely,

CH2M HILL



Erin E. Potts
Site Manager

training_let.doc

c: Jon Peterson/U.S. EPA Region 5
Stephen Nathan/U.S. EPA Region 5
Peggy Hendrixson/U.S. EPA Region 5
Dan MacGregor/CH2M HILL MKE
Ike Johnson/CH2M HILL MKE
John Fleissner/CH2M HILL MKE
Cherie Wilson/CH2M HILL MKE



DEPARTMENT OF UTILITIES

WASTEWATER DIVISION • CENTRAL BUILDING MAINTENANCE DIVISION

2006 East Newberry Street • Appleton, WI 54915

414/832-5945 • 414/832-5514 • FAX 414/832-5949

facsimile
TRANSMITTAL

to: Erin Potts, CH2MHill
fax #: (414) 272 - 4408
re: Bypass Event Report for Mauthe Site: 08/29/97 - 09/07/97 Discharges
date: October 1, 1997
pages: one, including this cover page

Dear Erin:

Sorry I missed your telephone call yesterday. Your facsimile did come in and I appreciate the completeness of your report on this series of discharges as well as the attention you gave to the sampling / testing requirements. The "duplicate-splits" certainly confirm reporting levels for Chromium, total in the wastestream.

This report is more than sufficient; given your already comprehensive reports and assessments of the problems encountered at the N.W. Mauthe Site during this time frame. My staff is beginning to set up compliance monitoring schedules for all of the City's permitted dischargers. Mr. Boerst can expect a telephone call to coordinate a sampling event with City staff. I will talk to you in November or December to set up a site inspection along the lines of our discussion a few weeks ago.

Thank you, Erin, for the quick attention to this matter and the corrective actions that you implemented immediately. I'm much more confident now, that the Mauthe Site can avoid bypass events of this type in the future.

From the Desk of:

Jessica A. Garratt
Pretreatment Coordinator
Laboratory Manager

Appendix H
O & M Cost Summary
(August 1997 through October 1998)

Summary of O & M Costs for the N. W. Mauthe Groundwater Treatment System

August 1997 through October 1998

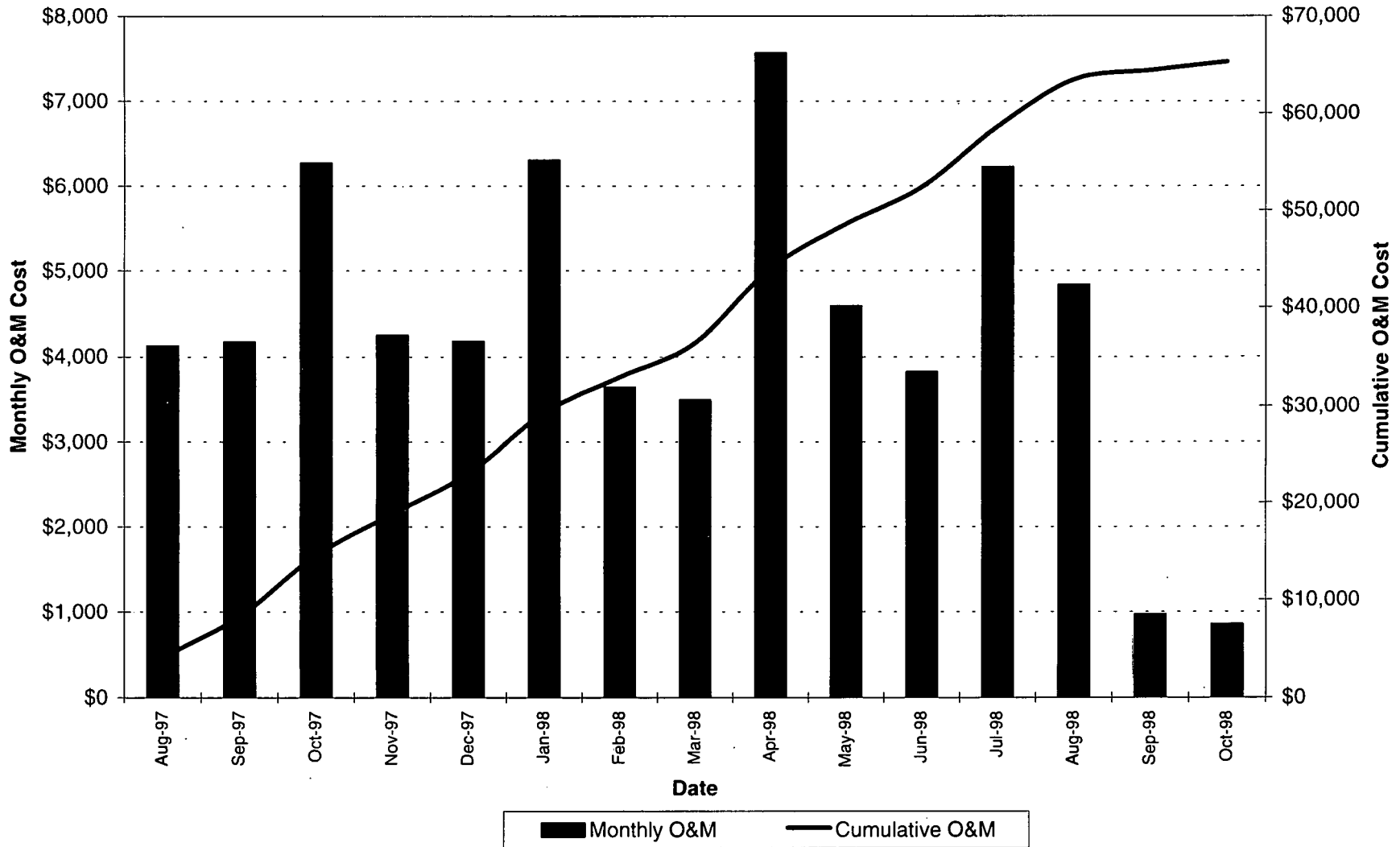
USEPA RAC WA 007-RARA-056G

O & M Cost Category	Aug-97	Sep-97	Oct-97	Nov-97	Dec-97	Jan-98	Feb-98	Mar-98	Apr-98	May-98	Jun-98	Jul-98	Aug-98	Sep-98	Oct-98	Totals
Labor Costs																
Routine Labor ¹	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$2,979	\$784	\$391	\$39,902
Alarm Response Labor ²	\$288	\$550	\$220	\$330	\$495				\$165		\$275	\$165	\$605		\$55	\$3,148
Labor Subtotal	\$3,267	\$3,529	\$3,199	\$3,309	\$3,474	\$2,979	\$2,979	\$2,979	\$3,144	\$2,979	\$3,254	\$3,144	\$3,584	\$784	\$446	\$43,050
Analytical Services																
City Monitoring (Semi-annual)					\$294						\$294					\$588
Quarterly Monitoring (Katalyst)			\$2,666			\$2,931			\$3,064			\$2,931				\$11,592
Analytical Subtotal	\$0	\$0	\$2,666	\$0	\$294	\$2,931	\$0	\$0	\$3,064	\$0	\$294	\$2,931	\$0	\$0	\$0	\$12,180
Chemicals																
Nitrogen Cylinder Rental & Gas ³	\$6.30	\$6.30	\$6.30	\$6.30	\$6.51	\$6.51	\$5.88	\$46.03	\$6.30	\$6.51	\$6.30	\$6.51	\$6.51			\$122
Sodium Hydroxide (55-gal. drums)		\$248								\$248						\$495
Ferrous Sulfate (55-gal. drums)	\$358								\$358				\$358			
Chemicals Subtotal	\$364	\$254	\$6	\$6	\$7	\$7	\$6	\$46	\$364	\$254	\$6	\$7	\$364	\$0	\$0	\$1,690
Utility Services																
Electrical and Natural Gas ⁴	\$340.00	\$340.00	\$340.00	\$340.00	\$340.00	\$340.00	\$343.70	\$465.51	\$354.19	\$205.92	\$233.94	\$107.29	\$186.33	\$159.29	\$175	\$4,271
Telephone ⁵	\$50.00	\$50.00	\$57.72	\$46.47	\$67.35	\$40.04	\$6.73	\$6.73	\$19.83	\$6.38	\$34.50	\$36.47	\$29.34	\$24.75	\$23.10	\$499
Utilities Subtotal	\$390.00	\$390.00	\$397.72	\$386.47	\$407.35	\$380.04	\$350.43	\$472.24	\$374.02	\$212.30	\$268.44	\$143.76	\$215.67	\$184.04	\$198.10	\$4,770.58
City Water and Sewer Fees																
Water Charge				\$84.60			\$84.60			\$84.60			\$84.60			\$338
Sewer Charge				\$19.13		\$6.33	\$19.13			\$17.53			\$17.53			\$80
Storm Water Charge				\$28.65			\$29.57			\$26.96			\$28.51			\$114
Sewer Volume Charge				\$416.07			\$175.71			\$1,009.78			\$538.25			\$2,140
Subtotal City Fees	\$0	\$0	\$0	\$548	\$0	\$6	\$309	\$0	\$0	\$1,139	\$0	\$0	\$669	\$0	\$0	\$2,672
Miscellaneous	\$107.95								\$617.36						\$211.37	\$937
Total O&M Costs	\$4,129	\$4,173	\$6,269	\$4,250	\$4,182	\$6,303	\$3,644	\$3,497	\$7,563	\$4,584	\$3,823	\$6,225	\$4,833	\$968	\$856	\$65,299
Administrative Costs Allowance ⁶ (Monthly and semi-annual reporting, data management, and recordkeeping.)	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$950	\$14,250
Total O&M Including Administration	\$5,079	\$5,123	\$7,219	\$5,200	\$5,132	\$7,253	\$4,594	\$4,447	\$8,513	\$5,534	\$4,773	\$7,175	\$5,783	\$1,918	\$1,806	\$79,549

Notes

- September and October 1998 are calculated and apportioned based on a ratio of 2/3 to 1/3, respectively, applied to the final invoice.
- Alarm response costs were invoiced separately and reflect the "shakedown" nature of operations in 1997 and 1998. Costs also include labor for equipment repair.
- Nitrogen costs for August through October 1997 are assumed for cylinder rental only. Nitrogen costs include both cylinder rental and gas.
- Electrical and gas for August 1997 through January 1998 are assumed as monthly averages based on a total 12-month combined charge of \$4,068 invoiced January 1998.
- Telephone cost is for both Ameritech and AT&T services at the facility.
- Administrative costs are assumed based on 12 hours per month at \$75/hour plus \$50/month for expenses such as postage, computers, xeroxing, and materials.

**O & M Costs for the N. W. Mauthe Site
August 1997 through October 1998
(Excluding the Administrative Cost Allowance)**



Summary of O & M Costs for the N. W. Mauthe Groundwater Treatment System
 Summary Statistics and Component Analysis (Excluding Administrative Cost Allowance)
 USEPA RAC WA 007-RARA-056G

O & M Cost Data			O & M Cost Components					
Date	Total Monthly O&M Costs	Cumulative O&M Costs	Labor	Analytical	Chemicals	Utilities	City Utility Fees	Miscellaneous
August-97	\$4,129	\$4,129	\$3,267	\$0	\$364	\$390	\$0	\$108
September-97	\$4,173	\$8,302	\$3,529	\$0	\$254	\$390	\$0	\$0
October-97	\$6,269	\$14,571	\$3,199	\$2,666	\$6	\$398	\$0	\$0
November-97	\$4,250	\$18,821	\$3,309	\$0	\$6	\$386	\$548	\$0
December-97	\$4,182	\$23,003	\$3,474	\$294	\$7	\$407	\$0	\$0
January-98	\$6,303	\$29,306	\$2,979	\$2,931	\$7	\$380	\$6	\$0
February-98	\$3,644	\$32,950	\$2,979	\$0	\$6	\$350	\$309	\$0
March-98	\$3,497	\$36,447	\$2,979	\$0	\$46	\$472	\$0	\$0
April-98	\$7,563	\$44,010	\$3,144	\$3,064	\$364	\$374	\$0	\$617
May-98	\$4,584	\$48,594	\$2,979	\$0	\$254	\$212	\$1,139	\$0
June-98	\$3,823	\$52,417	\$3,254	\$294	\$6	\$268	\$0	\$0
July-98	\$6,225	\$58,642	\$3,144	\$2,931	\$7	\$144	\$0	\$0
August-98	\$4,833	\$63,475	\$3,584	\$0	\$364	\$216	\$669	\$0
September-98	\$968	\$64,443	\$784	\$0	\$0	\$184	\$0	\$0
October-98	\$856	\$65,299	\$446	\$0	\$0	\$198	\$0	\$211
Total	\$65,299		\$43,050	\$12,180	\$1,690	\$4,771	\$2,672	\$937
Avg. (Excluding Sept. & Oct. 1998)	\$4,883		\$3,217	\$937	\$130	\$338	\$206	\$56
Max (Excluding Sept. & Oct. 1998)	\$7,563		\$3,584	\$3,064	\$364	\$472	\$1,139	\$617
Min (Excluding Sept. & Oct. 1998)	\$3,497		\$2,979	\$0	\$6	\$144	\$0	\$0
Percent of Total O & M			65.9%	18.7%	2.6%	7.3%	4.1%	1.4%

Appendix I
**Groundwater Treatment System
Operational and Functional Certification**

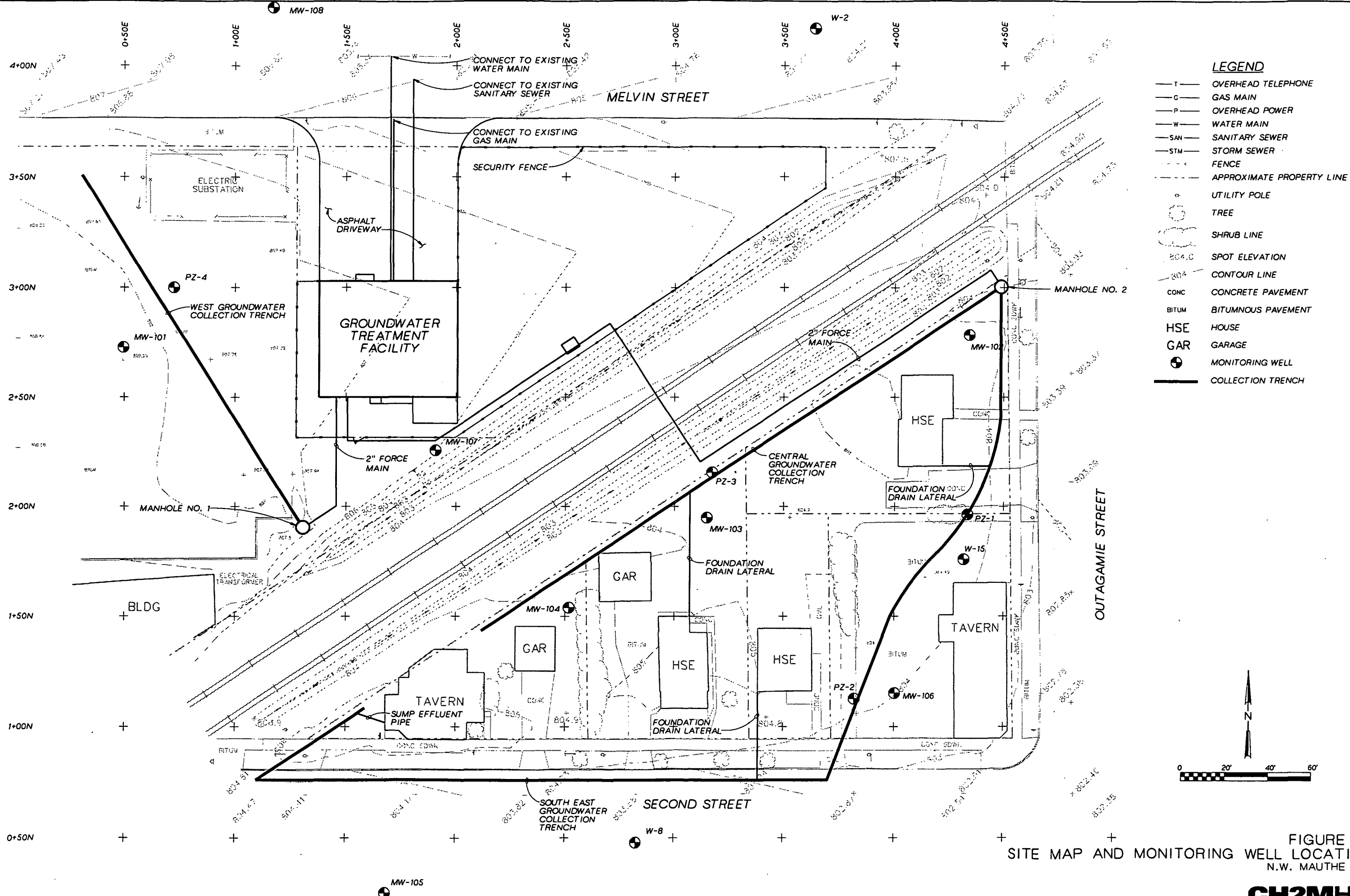
LTRA Operational and Functional Certification
for the
Groundwater Treatment System at the
N.W. Mauthe Site in Appleton, Wisconsin

I certify that I have reviewed the groundwater treatment system design, system startup report, and discharge reports for the Groundwater Treatment System at the N. W. Mauthe site in Appleton, Wisconsin. I certify that, to the best of my knowledge and belief and based on personal review of the relevant design and operations monitoring documents, the Groundwater Treatment System at the N. W. Mauthe site is operational and functional and has achieved the design treatment operations and performance levels sufficient to meet the requirements of the City of Appleton POTW Industrial User Permit (Permit No. 97-21) and the requirements of the U.S. EPA Record of Decision.



John Fleissner, P.E.
License No. E - 21071

Date: 11/24/98



LEGEND

- T — OVERHEAD TELEPHONE
- G — GAS MAIN
- P — OVERHEAD POWER
- W — WATER MAIN
- SAN — SANITARY SEWER
- STM — STORM SEWER
- - - FENCE
- - - APPROXIMATE PROPERTY LINE
- o UTILITY POLE
- o TREE
- o SHRUB LINE
- 804.0 SPOT ELEVATION
- 804 CONTOUR LINE
- CONC CONCRETE PAVEMENT
- BITUM BITUMINOUS PAVEMENT
- HSE HOUSE
- GAR GARAGE
- ⊕ MONITORING WELL
- COLLECTION TRENCH

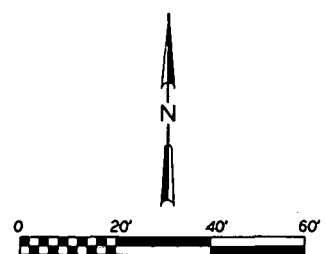


FIGURE A-1
SITE MAP AND MONITORING WELL LOCATIONS
N.W. MAUTHE SITE