# WISCONSIN PUBLIC SERVICE CORPORATION GREEN BAY, WISCONSIN

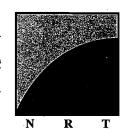
# SEDIMENT SAMPLING WORK PLAN

# FORMER MANUFACTURED GAS PLANT SITE SHEBOYGAN II, WISCONSIN

# **PROJECT NO: 1060**

# AUGUST 31, 1995

Natural Resource Technology





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### SEDIMENT SAMPLING WORK PLAN FORMER MANUFACTURED GAS PLANT SITE SHEBOYGAN II, WISCONSIN

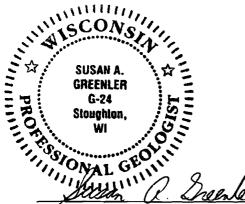
Project No: 1060

**Prepared For:** 

Wisconsin Public Service Corporation P.O. Box 19800 Green Bay, Wisconsin 54307

Prepared by:

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August 31, 1995

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# TABLE OF CONTENTS

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1.0	INTROD	UCTION 1-1
2.0	BACKG	ROUND
	2.1 2.2 2.3	Location2-1Site Ownership and Land Use2-1MGP Operations/Former Facilities2-1
3.0	SCOPE (	OF INVESTIGATION
	3.1 3.2 3.3	Overview3-1Step 1 - Records Search3-1Step 2 - Evaluate the Presence or Absence of Environmental
		Impairment Associated with the Former MGP Site 3-2
		3.3.1Sample Locations3-23.3.2Sample Equipment3-33.3.3Sampling Method3-33.3.4Sample Screening3-43.3.5Laboratory Analysis3-5
4.0	QUALIT	Y ASSURANCE 4-1
	4.1 4.2 4.3	Investigation Procedures4-1Equipment Decontamination4-1Laboratory Quality Assurance4-1
		4.3.1Laboratory Analysis4-14.3.2Sample Identification4-24.3.3Quality Control Samples4-2
	4.4 4.5	Waste Management Plan4-2Health and Safety Plan4-3
5.0	DATA A	NALYSIS AND REPORT PRESENTATION
6.0	SCHEDU	JLE 6-1
7.0	REFERE	NCES

i

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# TABLE OF CONTENTS (Continued)

### **FIGURES**

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Figure 2-1	Site Location Map
Figure 3-1	Proposed Sediment Sampling Transects

# <u>TABLE</u>

 Table 3-1
 Analytical Parameters and Methods

# <u>APPENDIX</u>

Appendix A: NRT Standard Practices - Table of Contents

# 

### **1.0 INTRODUCTION**

Natural Resource Technology, Inc. has been retained by Wisconsin Public Service Corporation (WPSC) to prepare this work plan to complete a Step 2 sediment investigation at the Sheboygan II Former Manufactured Gas Plant (MGP). This sediment sampling work plan has been prepared to evaluate the presence or absence of impacted sediment associated with the MGP site in the Sheboygan River. The work plan has been prepared in accordance with NR 716 and incorporates recommended investigation criteria in WDNR's draft guidance document "Assessing Sediment Quality in Water Bodies Associated with Manufactured Gas Plant Sites" (March 2, 1995). This plan is being submitted for WDNR review and approval prior to commencing field investigative activities. Field activities are planned for implementation in the late summer of 1995.

The sediment sampling project principals include the following:

•	Responsible Party:	Ms. Connie Lawniczak Wisconsin Public Service Corporation 700 North Adams Street, P.O. Box 19002 Green Bay, WI 54307-9002 414/433-1140
•	Consultant:	Mr. Robert Karnauskas/Ms. Susan Greenler Natural Resource Technology, Inc. 23713 W. Paul Rd. Pewaukee, WI 53072 414/523-9000

The objectives of this study include the following:

- Evaluate the presence or absence of environmental impairment of the sediments associated with the former Sheboygan II MGP site;
- Evaluate the characteristics of the river adjacent to the site;
- Evaluate the shoreline outline through time; and,
- Evaluate other industrial activities along the shoreline upstream and downstream from the site.





### 2.0 BACKGROUND

### 2.1 Location

The Sheboygan II MGP site is located at 732 N. Water Street in Sheboygan, Wisconsin on property currently owned by the City of Sheboygan. The former MGP site encompasses approximately 3 acres and is bounded on the north by New York Avenue, on the east by North Water Street, on the south by Center Street, and on the west by the Sheboygan River. The site is approximately 1 mile from Lake Michigan and is located in Section 23, T15N, R23E in Sheboygan County, Wisconsin (Figure 2-1).

### 2.2 Site Ownership and Land Use

Prior to 1922, the property had a variety of owners and eventually became part of the Sheboygan Gas Light Company. The MGP was acquired by WPSC in 1922 during a merger which resulted in the formation of WPSC. In 1966, the property was sold to Heileman Brewery for parking vehicles. Heileman sold the property in 1977, and it has been under ownership of three other non-manufacturing companies until the City of Sheboygan purchased the property in 1985. The property is currently used as a boat dock and RV camping area due to its accessibility to the Sheboygan River.

### 2.3 MGP Operations/Former Facilities

The Sheboygan II MGP operated from 1880 to 1930 and originally used the coal gas production method. As early as 1886 carburetted water gas (CWG) equipment was installed and this production method eventually replaced coal gas. The MGP ceased operation in 1930.

Former MGP-related structures at the site in 1923 included the following:





- Main gas production building and garage;
- Three gas holders (70,000 ft<sup>3</sup>, 200,000 ft<sup>3</sup>, and a small holder);
- Three tar tanks;

- Purifier; and
- Gas Oil Tank.

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### 3.0 SCOPE OF INVESTIGATION

### 3.1 Overview

Limited previous sediment sampling data is available. Although extensive PCB sampling has been conducted in the Sheboygan River, only 15 cores were analyzed for PAHs and none were adjacent to the MGP site. Thus, the proposed sampling plan is based on the following:

- ♦ <u>MGP Size</u> The MGP which operated at this location was medium sized;
- <u>MGP Operational History</u> The MGP operated for at least 50 years;
- <u>Coal Gasification Method</u> Both the coal gasification and the carburetted water gas methods were used at this location. By-products from this method would have included clinkers, carburetted water gas tar/water mixture, coke, and coal tar;
- <u>River Location</u> The location of the MGP operational buildings is adjacent to surface water; and,
- <u>Existing Data</u> MGP impacted soils were found in area of the purifier and tar tanks during the Phase I investigation. In addition, PAH's were present in a sediment sample collected by the WDNR adjacent to the MGP site. Thus, the sediment investigation will target sediments adjacent to and downstream from these areas.

### 3.2 Step 1 - Records Search

A records search will be conducted to complement the historic, hydrologic and geologic information already included in the Phase I investigation report (HSI(1), 1992). Information to be compiled will be that discussed in Section 4.1 through 4.3 of the March 2, 1995 draft guidance and includes:

- Location and configuration of the Sheboygan River shoreline adjacent to and downgradient (south) of the MGP site through time;
- Dredging and filling activities along the shoreline adjacent to the MGP site;





- Location of other industrial activities along the shoreline which have the potential to discharge contaminants similar in character to those associated with MGP operations;
- Documentation or any report of oily sheens or seeps adjacent to the site; and,
- Characteristics of the river adjacent to the site.

Federal and state agencies and databases as well as regional planning commissions will be consulted to obtain historical maps, industry locations, and hydrologic information. This information will be included as part of the sediment sampling investigation report.

# 3.3 Step 2 - Evaluate the Presence or Absence of Environmental Impairment Associated with the Former MGP Site

### 3.3.1 <u>Sample Locations</u>

Five transects will be completed as shown on Figure 3-1. Transects will extend out from shore for an approximate distance of 120 feet, and, in general, will not extend beyond the center of any dredged portion of the river channel. Exact transect length will be determined during the records search and will be based on dredging activities and field observations.

The number of core samples collected along each transect will be based on field observations and PID response of the samples. At a minimum, one core sample will be collected within 20 feet of shore. Additional core samples will be collected until two clean samples have been obtained along a transect. Cores will be collected from the area with the thickest sediments within each third-transect. A background sampling point will be established approximately 125 feet upstream adjacent to New York Avenue.

A sounding pole will be used to establish the depth and thickness of sediments below the water surface. The transect will be divided into thirds and sediment depths will be probed in at least two locations within each third-transect to determine the location of the thickest sediments for



core collection. A transducer will be used to establish the bottom characteristics and to choose an exact sampling location which avoids rocks and other obstructions.

### 3.3.2 Sample Equipment

A Ponar<sup>TM</sup> Grab dredge sampler, and an Ogeechee<sup>TM</sup> sand corer will be used. The dredge sampler will be used to collect samples from the sediment/water interface, which is usually the biologically active zone. The corer will be used to collect samples from below the sediment/water interface, and it has the ability to collect a 4 foot core.

### 3.3.3 Sampling Method

Sediment samples will be collected using the dredge and core samplers off the side of a boat. This will minimize disturbance to the sediment from wading in shallow water to collect samples. NRT will attempt to collect a 3 foot core; however, the actual thickness of the core will be dependent on the consolidation of the sediments and obstructions encountered. Cores will be a maximum of 4 feet in length. A minimum of one and a maximum of four core samples will be collected along each of the five transects, and at the background sampling location previously described. If bottom conditions prohibit core collection, an attempt will be made to collect a dredge sample. Consistent with Section 5.3 of the WDNR March 2, 1995 guidance document, a total of three dredge samples will be collected along each transect.

To locate the transects, two posts will be placed temporarily on-shore and perpendicular to the shoreline. These posts will be visually aligned from the boat to assure that the samples are properly located along the transect line. A measured rope will be staked on the ground and used to determine the exact distances from shore.

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3-3

### 3.3.4 Sample Screening

The cores will be visually inspected for physical characteristics, including color, odor, texture, structure, and presence of oil sheens or visible oils. The core will then be divided into homogeneous segments as follows:

0 - 0.5 ft from core top (approximately): Biologically active and well mixed sediments;

0.5 - 2.5 ft from core top (approximately): Less disturbed sediments; most likely to contain contaminants; and

<u>2.5 ft (approximately) to core bottom</u>: Third homogeneous section; less disturbed, possibly more compacted than layer above.

The number of segments per core will be based on visual inspection of the core. Most cores will likely contain a maximum of two segments. Each segment will be screened for PID response by the headspace method and one sample will be selected from each core for PAH immunoassay analysis. Segment selection for immunoassay testing will be based on PID response and physical characteristics, and will include samples with a wide range of impacts. A minimum of one third of the immunoassay tested soils from the transects, plus the background sample will be submitted for laboratory analysis.

If no PID response or other physical characteristic impacts are apparent, the upper foot of sample will be prepared for total PAH analysis using an immunoassay test kit. If the total PAHs are close to or below detection, no sample from that core will be submitted for laboratory analysis. To maintain flexibility, the above criteria for selecting immunoassay and laboratory samples will be modified if warranted based on field observations. Professional judgement will be used to evaluate the physical characteristics and PID response in selecting samples for quantitative immunoassay and laboratory analyses.





### 3.3.5 Laboratory Analysis

The objective of this sampling plan is to evaluate the presence or absence of MGP related constituents in the sediments. The chemical parameters of interest for this investigation are those which are specifically indicative of MGP related activities. Thus, the samples submitted to a laboratory will be tested for PAHs, BETX, total phenols, cyanide species and TOC. The methods to be used and the anticipated detection limits are shown on Table 3-1.



### 4.0 QUALITY ASSURANCE

### 4.1 Investigation Procedures

NRT has developed numerous technical Standard Practices to provide documentation of the use of widely recognized protocols and standards in the performance of field operations. The list of Standard Practices and source documents are provided in Appendix A. Copies of these standard technical practices for relevant aspects of the field investigation can be provided to the WDNR if review of these practices is necessary for approval of this work plan. NRT's Standard Practice 07-09-01 entitled "Surface Water and Sediment Sampling" contains a section which specifically discusses sediment sampling with a corer (Section 3.3.2).

### 4.2 Equipment Decontamination

Equipment decontamination is addressed in NRT Standard Practice 07-04-05. Sampling equipment (including core and dredge samplers, sampling spatulas, etc.) will be cleaned by washing in Alconox detergent followed by triple rinses with distilled water prior to the collection of each sample. If necessary, an isopropyl alcohol rinse will be performed to remove tar or PAH residues. Decontamination wash and alcohol rinsate will be containerized in drums for future treatment and/or disposal.

### 4.3 Laboratory Quality Assurance

### 4.3.1 Laboratory Analysis

Analysis of environmental media samples will be performed by a laboratory certified by the WDNR under NR 149. Analytical parameters and methods for the different media are listed on Table 3-1.





### 4.3.2 Sample Identification

WPSC is conducting site investigations at each of the former MGP sites. In order to minimize the potential for confusion of data from different sites, the sample identifiers assigned to the Sheboygan II MGP are as follows:

Number Series:	701 through 799
Sediment Sample Prefix:	SD-
Core Locator Suffix:	A, B, C (top, middle, and bottom of core)

Thus, the top portion of the first core sample collected would be labeled as SD-701A. This system will assure that sample results will not be confused with sediments being analyzed at other sites in the WPSC program.

### 4.3.3 Quality Control Samples

Quality Control (QC) samples typically include trip blanks, duplicates and field blanks in order to evaluate the possible introduction of contamination during the sampling process and to verify reproducibility of results. These samples are not required for soil samples under Chapter 716.13(11)(b) and thus none are proposed as part of this sediment sampling plan.

### 4.4 Waste Management Plan

The waste management plan will follow NRT Standard Practice 06-07 for the handling and minimization of wastes. Investigative waste will be containerized in DOT approved drums until disposal arrangements are made. NRT staff will segregate impacted waste based on field screening to reduce the volume of waste which must be treated or disposed of off-site.



### 4.5 Health and Safety Plan

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NRT has developed a separate Health and Safety Plan for personnel working at the Sheboygan II MGP site during all field activities. This plan is a separate document and is available upon request if WDNR review of the document is required. Personnel will read and be familiar with the plan and an on-site health and safety plan briefing will be conducted prior to the commencement of field work.





4-3

### 5.0 DATA ANALYSIS AND REPORT PRESENTATION

Following completion of the field investigation and receipt of analytical results, a report will be prepared which documents all of the sediment sampling activities conducted at the site. The report narrative will follow the format and requirements of NR716.15. The major topics to be addressed include the following:

- Project Objectives
- General Site Information
- Historical Shoreline Information
- Waterbody Characteristics
- ♦ MGP Operations History
- Investigation Results
- Conclusions
- Recommendations

Analytical results will be summarized on tables showing the parameters detected and observed concentrations. As appropriate, these results will be compared with background levels from other portions of the river or other appropriate environmental standards.

Graphical presentations will be used to supplement the report narrative, to clarify complex technical narrative, and to support interpretative conclusions. Drawings will conform to those required in NR716.15(3), will supplement drawings previously presented in the Phase I report, and will illustrate the following:

- River channel detailing the area of investigation;
- Locations of facility boundaries, shoreline, and all field sampling locations;
- Areas of impacts; and



• Isoconcentrations showing the distribution of appropriate parameters.

Other appropriate illustrations which may be appended to the report include historical aerial photographs, maps, and photographs.

All raw data from field collection activities will be included in order to document the work performed. This data will be appended to the report and will include the following:

- Coring logs which classify the sediment soil types observed;
- Field immunoassay test results including quality assurance samples and calibrations;
- Analytical laboratory reports;
- Photoionization detector readings and calibration logs; and,
- Geotechnical laboratory test results.

Appendices will also include relevant analytical data from previous investigations which support interpretations or conclusions.





### 6.0 SCHEDULE

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The project duration will be approximately 14 weeks from WDNR approval of the work plan. This includes:

- ♦ 3 weeks Pre-mobilization;
- ♦ 2 weeks Field investigation;
- 3 weeks Laboratory analysis; and
- 6 weeks Draft and final report preparation.





### 7.0 REFERENCES

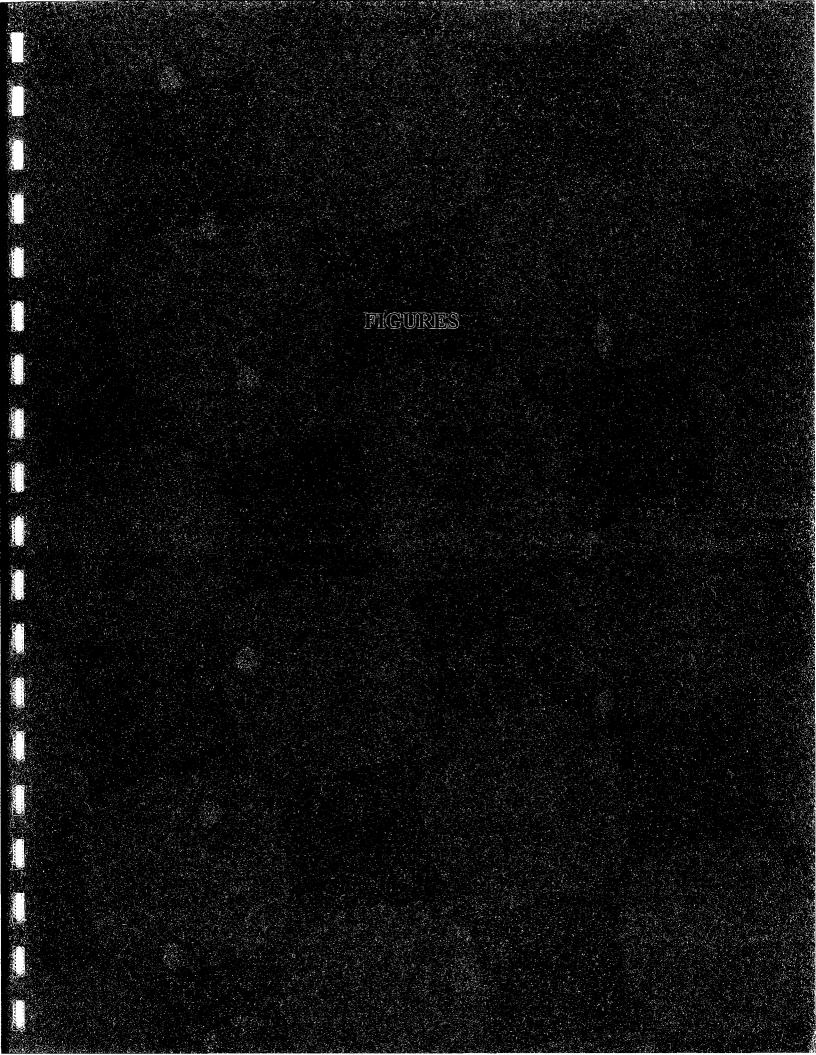
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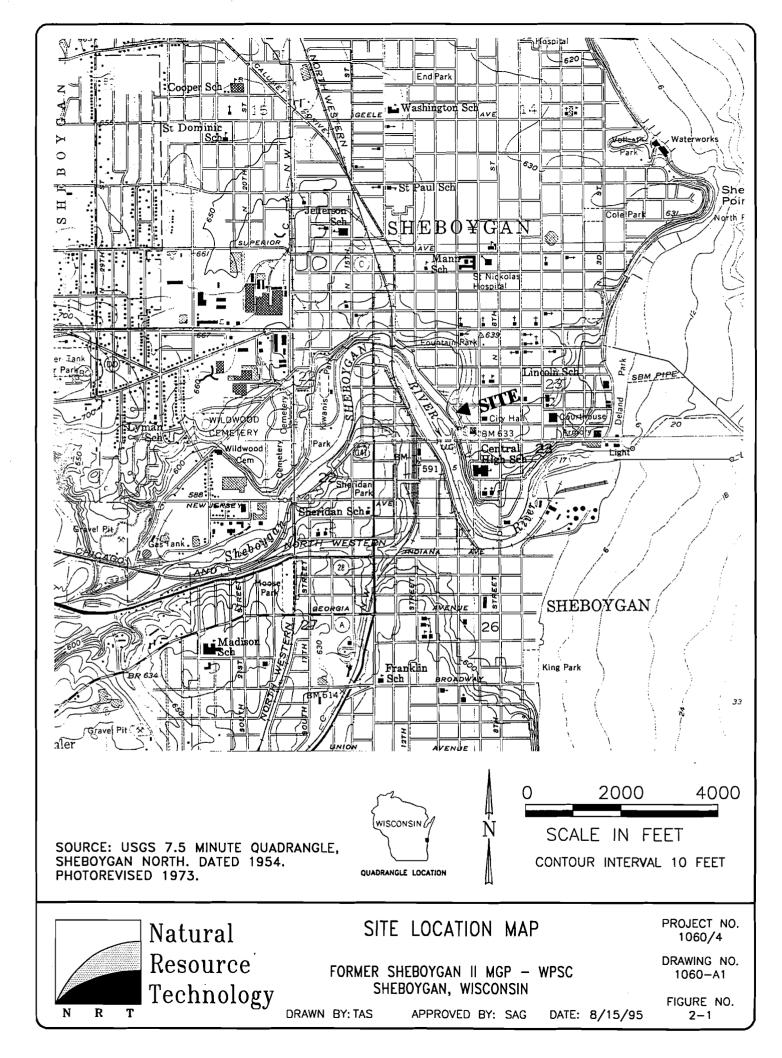
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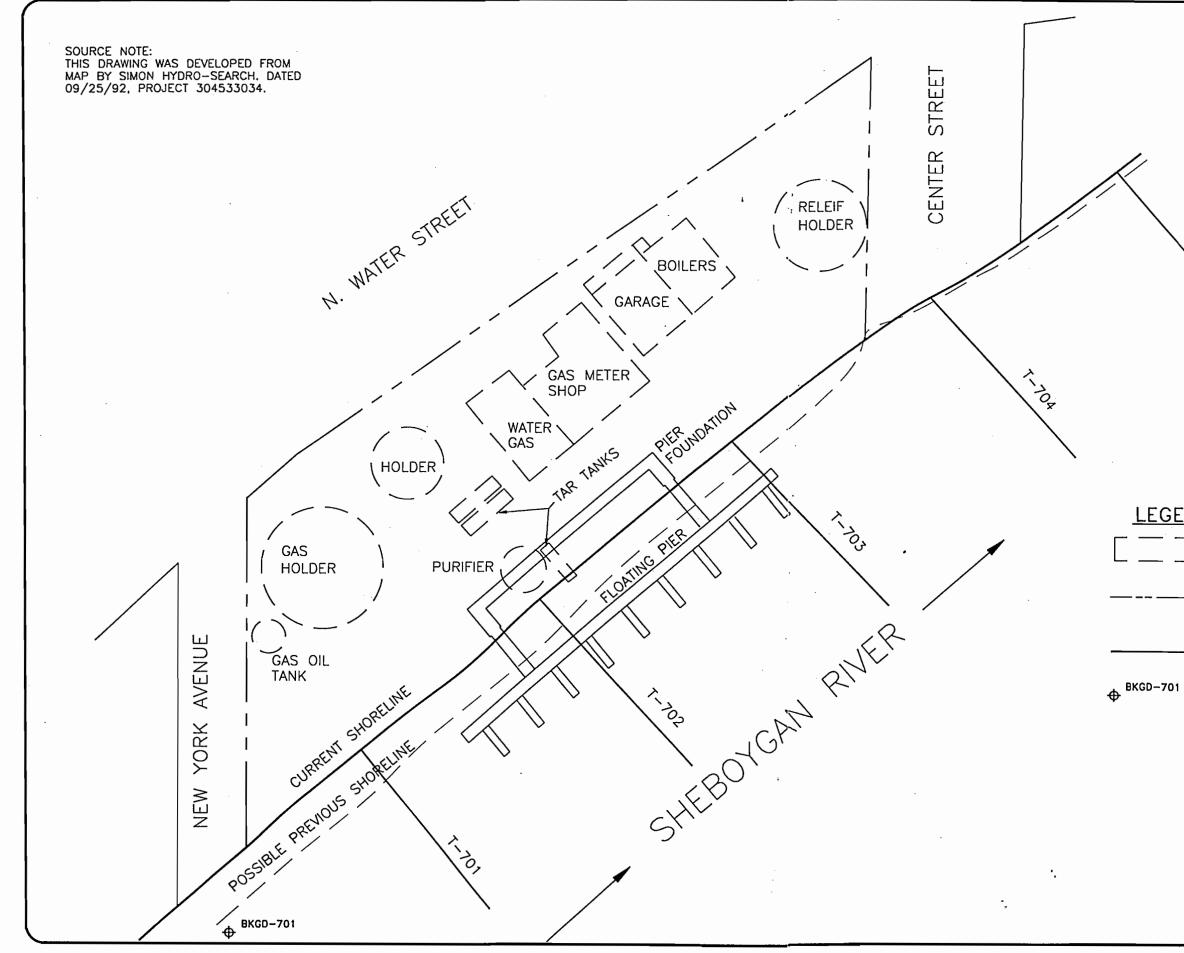




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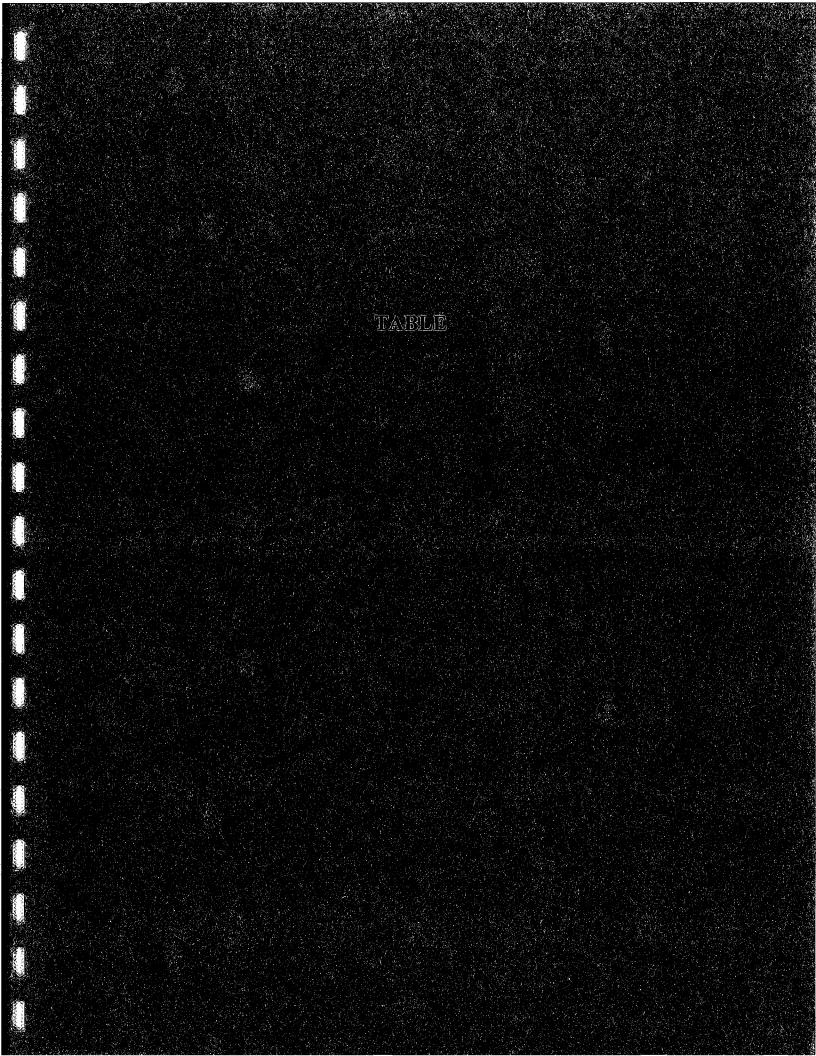
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### TABLE 3-1 SHEBOYGAN II MGP SITE ANALYTICAL PARAMETERS AND METHODS

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Media	Parameter	Analytical Method	Anticipated Detection Limit
Sediment	BETX	USEPA 8020	100 µg/kg
	PAHs	USEPA 8310	50 µg/kg
	Total Phenol	USEPA 420.1	660 µg/kg
	Total Cyanide	USEPA 9010	2.5 mg/kg
	Cyanide Amenable to Chlorination	USEPA 9010	2.5 mg/kg
	ТОС	USEPA 9060	5 mg/kg

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Section:Site InvestigationNumber:07-TCDate:02-18-94Revision:0Page:1 of 7

Eff. Date	Initiator	Apprv'd	

# TABLE OF CONTENTS

<u>PRAC</u>	TICE TIT	<u>'LE</u>	REFERENCE DOCUMENTS
07-01	POLICY	STATEMENT	1
07-02	DATA M	ANAGEMENT	
	07-02-02 07-02-03 07-02-04	General Field Notebooks Photographic Evidence Document Storage and Management Electronic File Management	
07-03	SAMPLE	COLLECTION - GENERAL	
	07-03-02 07-03-03	Sample Identification Sample Location Control Chain of Custody Sample Transportation and Shipping	1, 2, 3 1, 2
07-04	SAMPLI	NG QUALITY CONTROL	
	07-04-02	General Considerations Data Quality Objectives Sample Container Preparation, Preservation a	
	07-04-04	Maximum Hold Times	1, 2, 5 1, 2
07-05	GENERA	AL MONITORING AND SITE SURVEYS	
	07-05-02	Well Integrity Evaluation	1
07-06	SUBSUR	FACE EXPLORATION METHODS	
	07-06-02	Borehole and Excavation Clearance Monitoring Wells-General Monitoring Wells-Drilling Methods	1, 2, 4, 6
		•	

Section: Number: Date: Revision:	Site Investigation 07-TC 02-18-94 0
Page:	2 of 7

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### **REFERENCE DOCUMENTS**

# 07-06 SUBSURFACE EXPLORATION METHODS (Cont'd)

07-06-04	Monitoring Wells-Borehole Requirements 1, 2, 4, 6
07-06-05	Monitoring Wells-Construction Methods 1, 2, 4, 6
07-06-06	Monitoring Wells-Construction Materials 1, 2, 4, 6
07-06-07	Well Development 1, 2, 4, 6
07-06-08	Well Abandonment 1, 2, 4, 6
07-06-09	Ground-Water Sample Collection with the HydroPunch 1
07-06-10	Soil Investigation and Sampling by Auger Methods ASTM D1452
07-06-11	Thin-walled Tube Sampling of Soils ASTM D1587
07-06-12	Diamond Core Drilling for Site Investigation ASTM D2113
07-06-13	Guide for Field Logging of Subsurface Explorations
	of Soil and Rock ASTM D5434

# 07-07 SOIL SAMPLING AND MEASUREMENT PROCEDURES

Soil Sample Description 4
Soil Sampling Procedures 1, 2
Soil Sampling for Microorganisms 1, 2
Measuring Matric Potential in the Vadose Zone
Using Tensiometers ASTM D3404
Pore-Liquid Sampling from the Vadose Zone ASTM D4696
Soil Sampling from the Vadose Zone ASTM D4700
Guide for Comparison of Field Methods for Determining
Hydraulic Conductivity in the Vadose Zone ASTM D5126
Test Method for Infiltration Rate of Soils in Field
Using Double Ring Infiltrometer ASTM D3385
Test Method for Field Measurement of Infiltration Rate
Using a Double Ring Infiltrometer with a Sealed Inner
Ring ASTM D 5093

# 07-08 GROUND-WATER SAMPLING AND MEASUREMENT PROCEDURES

07-08-01	Ground-Water Sampling 1, 2, 4 (ASTM D4448)	), 5
07-08-02	Ground-Water Sampling Using Packers	. 1
07-08-03	Ground-Water Profiling Using Dual Wall Reverse	
	Circulation 1, 9,	
07-08-04	Private Well Sampling and Analysis 1, 2	3, 5
07-08-05	Aquifer Testing/Baildown Tests - General ASTM D4	043

Section:	Site Investigation
Number:	07-TC
Date:	02-18-94
Revision:	0
Page:	3 of 7

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### **<u>REFERENCE DOCUMENTS</u>**

### 07-08 GROUND-WATER SAMPLING AND MEASUREMENT PROCEDURES

07-09		E WATER/SEDIMENT SAMPLING AND REMENT PROCEDURES
	07-08-15	Conductivity in a Nonleaky Confined Aquifer ASTM D5473 Ground-Water Elevation Measurement-Solonist 17, 4 (ASTM D4750)
		Determining the Horizontal and Vertical Hydraulic
		Effects of Partial Penetration of Control Well and
	07-08-16	Test Method (Analytical Procedure) for Analyzing the
	0	Estimating Transmissivity at Control Well ASTM D5472
	07-08-15	Test Method for Determining Specific Capacity and
		Bounded, Nonleaky, Confined Aquifers ASTM D5270
	07-08-14	Determining Transmissivity and Storage Coefficient of
		by the Theis Recovery Method ASTM D5269
	07-08-13	Determining Transmissivity of Nonleaky Confined Aquifers
		Pressure Pulse Technique ASTM D4631
		Permeability Rocks by In-Situ Measurements Using the
	07-08-12	Determining Transmissivity and Storativity of Low
		Constant Head Injection Test ASTM D4630
		Permeability Rocks by In-Situ Measurements Using the
	07-08-11	Determining Transmissivity and Storativity of Low
		Theis Nonequilibrium Method ASTM D4106
	57 00 10	Storage Coefficient of Nonleaky Confined Aquifers by the
	07-08-10	Analytical Procedure for Determining Transmissivity and
		Modified Theis Nonequilibrium Method ASTM D4105
	07-08-09	Analytical Procedure for Determining Transmissivity and Storage Coefficient of Nonleaky Confined Aquifers by the
	07 08 00	Response to Instantaneous Change in Head (Slug Tests) ASTM D4104
		Nonleaky Confined Aquifers by Over-damped Well
	07-08-08	Analytical Procedure for Determining Transmissivity of
	<u> </u>	for Determining Hydraulic Properties of Aquifer Systems ASTM D4050
	07-08-07	Field Procedure for Withdrawal and Injection Well Tests
		in Aquifers ASTM D4044
		(Slug Tests) for Determining Hydraulic Properties
	07-08-06	Field Procedure for Instantaneous Change in Head

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Section:	Site Investigation
Number:	07-TC
Date:	02-18-94
Revision:	0
Page:	4 of 7

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# **REFERENCE DOCUMENTS**

# 07-10 AIR SAMPLING PROCEDURES

	07-10-02 07-10-03 07-10-04	Soil Gas Survey - General1, 3, 4 (ASTM D5314)Soil Gas Survey - AMS Vapor Probe System1, 2, 14Headspace Screening for Volatile Organic Compounds7Bar Hole Survey1Methane Monitoring in Buildings (MSA Model 260)1
07-11	WASTE	SAMPLING 1, 2
07-12	WASTEV	WATER SAMPLING AND MEASUREMENT PROCEDURES 1, 2
07-13	FIELD A	NALYTICAL PROCEDURES
	07-13-02 07-13-03	Equipment Calibration, Operation and Maintenance1, 2Photovac PID11pH Meter12Specific Conductance Meter10
07-14	FIELD P	HYSICAL MEASUREMENTS
	07-14-01	Survey Control (Horizontal and Vertical) 1, 2
07-15	LABORA	ATORY ANALYTICAL PROCEDURES
	07-15-02 07-15-03 07-15-04 07-15-05 07-15-06	Method for Particle Size Analysis of Soils       ASTM D422         Test Method for Amount of Material in Soils Finer       ASTM D1140         Than the No 200 (75-um) Sieve       ASTM D1140         Test Method for Unconfined Compressive Strenght of       Cohesive Soil         Cohesive Soil       ASTM D2166         Test method for Laboratory Determination of Water       ASTM D2166         (Moisture) Content of Soil and Rock       ASTM D2216         Practice for Wet Preparation of Soil Samples for Partical       Size Analysis and Determination of Soil Constants         Size Analysis and Determination of Soil Constants       ASTM D2217         Test Method for Permeability of Granular Soils       ASTM D2434         Test Method for Classification of Soils for Engineering       ASTM D2434
	07-15-08	Purposes (Unified Soil Classification System) ASTM D2487 Practice for Description and Identification of Soils (Visual-Manual Procedure) ASTM D2488

	te Investigation -TC
ite: 02	-18-94
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	Index of Soils ASTM D4318
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07-15-11	Test Method for Permeability of Rocks by Flowing Air ASTM D4525
07-15-12	Test Method for Measurement of Hydraulic Conductivity
	of Saturated Porous Materials Using a Flexible Wall
	Permeameter ASTM D5084

### 07-16 GEOPHYSICAL SURVEYS

07-16-01	Electrical Resistivity Survey .	 	 	 ••	 •	 •	 	•	 •	3
07-16-02	Siesmic Refraction Survey	 	 	 		 •	 			3

### 07-17 GROUND-WATER MODELING

07-17-01 Guide for Application of Ground-water Flow Model to	
a Site-Specific Problem	<b>ASTM D5447</b>
07-17-02 Guide for Comparing Ground-water Flow Model	
Simulations to Site	ASTM D5490
07-17-03 Quality Assurance Procedures	3

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### 07-18 DATA ANALYSIS, REDUCTION AND VALIDATION

V/-10-V1 Data valuation	07-18-01	Data Validation		1	6
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Section:	Site Investigation
Number:	07-TC
Date:	02-18-94
Revision:	0
Page:	6 of 7

5

8

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Section:	Site Investigation
Number:	07-TC
Date:	02-18-94
Revision:	0
Page:	7 of 7
	Number: Date: Revision:

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