

# Site Investigation Field Procedures Workplan

Keller Property  
102 Water Street  
Marinette, Wisconsin

January 29, 2015  
by METCO  
WDNR File Reference #: 02-38-560993  
PECFA Claim #: 54143-9999-02



*Excellence through experience™*

This document was prepared by:

A handwritten signature in black ink, appearing to read "Jason T. Powell", written over a horizontal line.

Jason T. Powell  
Staff Scientist

A handwritten signature in black ink, appearing to read "Ronald J. Anderson", written over a horizontal line.

Ronald J. Anderson, P.G.  
Senior Hydrogeologist/Project Manager



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January 29, 2015

WDNR BRRTS#: 02-38-560993  
PECFA Claim #: 54143-9999-02

Ken Keller  
309 Ogden Street  
Marinette, WI 54143

Dear Mr. Keller,

Enclosed is our "Site Investigation Field Procedures Workplan" concerning the Keller Property site in Marinette, Wisconsin. This document outlines the procedures and the methods used to conduct such an investigation.

A copy of this workplan will be sent to the Wisconsin Department of Natural Resources for review.

We appreciate the opportunity to be of service to you on this project. Should you have any questions or require additional information, do not hesitate to contact our La Crosse office.

Sincerely,

Jason T. Powell  
Staff Scientist

C: Beth Erdman – WDNR

METCO

709 Gillette St., Suite 3  
La Crosse, WI 54603  
Phone: (608) 781-8879

# Invoice

Date	Invoice #
1/29/2015	16007

<b>Bill To</b>
Tom Manske 15980 Corwell Ct. Brookfield, WI 53005

<b>Site Info</b>
Silverstein Property (former) 7808 W. Congress St. Milwaukee, WI 53218 PECFA #53218-5332-08-A BRRTS #03-41-001415

<b>Terms</b>	<b>Due Date</b>	<b>Account #</b>	<b>JOB TYPE</b>
Net 10	2/8/2015		Agent Status

Date	Qty.	Service Item	Description	Price	Amount
1/16/2015	1	7/RC05	Regulatory Correspondence - NR700 Reporting	122.80	122.80
1/29/2015	1	28/S105	Standardized Invoice - Synergy, Invoice #16007	16.80	16.80

<b>Total</b>	\$139.60
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<b>Balance Due</b>	\$139.60
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**Site Investigation Field Procedures Workplan - METCO  
Keller Property**

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**LIST OF ACRONYMS**

**AST** - Aboveground Storage Tank  
**ASTM** - American Society for Testing and Materials  
**Cd** - Cadmium  
**DOT** - Department of Transportation  
**DRO** - Diesel Range Organics  
**ES** - Enforcement Standards  
**gpm** - gallons per minute  
**GRO** - Gasoline Range Organics  
**HNU** - brand name for Photoionization Detector  
**ID** - inside-diameter  
**LAST** - Leaking Aboveground Storage Tank  
**LUST** - Leaking Underground Storage Tank  
**MSL** - Mean Sea Level  
**MTBE** - Methyl-tert-butyl ether  
**MW** - Monitoring Well  
**NIOSH** - National Institute for Occupational Safety & Health  
**NR** - Natural Resources  
**OD** - outside-diameter  
**PAH** - Polynuclear Aromatic Hydrocarbons  
**PAL** - Preventive Action Limits  
**Pb** - Lead  
**PECFA** - Petroleum Environmental Cleanup Fund  
**PID** - Photoionization Detector  
**POTW** - Publicly Owned Treatment Works  
**ppb ug/kg** - parts per billion  
**ppm mg/kg** - parts per million  
**psi** - pounds per square inch  
**PVC** - Polyvinyl Chloride  
**PVOC** - Petroleum Volatile Organic Compounds  
**RAP** - Remedial Action Plan  
**scfm** - standard cubic feet per minute  
**SVE** - Soil Vapor Extraction  
**USCS** - Unified Soil Classification System  
**USGS** - United States Geological Survey  
**UST** - Underground Storage Tank  
**VOC** - Volatile Organic Compounds  
**WDNR** - Wisconsin Department of Natural Resources  
**WPDES** - Wisconsin Pollutant Discharge Elimination System

## **Site Investigation Field Procedures Workplan – METCO Keller Property**

### **OBJECTIVES**

#### **Requirements of the WDNR**

A Site Investigation is required by the Wisconsin Department of Natural Resources (WDNR) by authority of Section 292.11 of the Wisconsin Statutes. According to the WDNR, any soil that tests over 10 ppm Gasoline Range Organics (GRO) or Diesel Range Organics (DRO) requires an investigation. Any soil that tests over the Chapter NR720 Groundwater RCLs, Direct Contact RCLs, or Soil Saturation Values an investigation and possible remediation. Any groundwater that tests over the Preventive Action Limits (PAL) or Enforcement Standards (ES) for compounds listed in Chapter NR140 of the Wisconsin Statutes requires an investigation and possible remediation. For a further explanation of WDNR rules and regulations, see Appendix D.

#### **Requirements of the PECFA Program**

According to rules adopted in May 2006, the maximum allowable cost for an initial Site Investigation shall be no more than \$20,000 unless pre-approved by PECFA. All consultant and commodity service costs must not exceed the PECFA Usual and Customary Charges.

#### **Purpose of Document**

This document briefly outlines all methods and procedures used by METCO personnel concerning "Site Investigations". These guidelines are strictly followed unless changed by managing personnel, site conditions, or project situations. All changes will be clearly noted.

All work conducted by METCO is undertaken in accordance with approved methods and regulations of the WDNR Bureau for Remediation and Redevelopment.

This document is site specific and will always be on-site during the project.

**Site Investigation Field Procedures Workplan – METCO  
Keller Property**

**INTRODUCTION**

**Site Name**

Keller Property

**Site Address**

102 Water Street  
Marinette, Wisconsin

**Legal Description**

NE ¼, NE ¼, Section 8, Township 30 North, Range 24 East, Marinette County

**Contact or Client**

Ken Keller  
309 Ogden Street  
Marinette, WI 54143  
(715) 923-0449

**WDNR Project Manager**

Beth Erdman  
Wisconsin Department of Natural Resources  
625 East County Road Y, Suite 700  
Oshkosh, WI 54901  
(920) 303-5410

**Consultant**

METCO  
Ronald J. Anderson, P.G.  
Jason T. Powell  
709 Gillette Street, Suite 3  
La Crosse, WI 54603  
(608) 781-8879

## Site Investigation Field Procedures Workplan – METCO Keller Property

### SITE BACKGROUND

#### Facility

A bulk petroleum storage facility operated on the property from at least 1895 until approximately 1980. Standard Oil Company operated the facility until 1961 and American Oil Company operated the facility from 1961 until 1980. The property was owned by a trucking company from 1980 until 1984. Keller Construction has owned the property since 1984.

On August 21, 2013, Stantec Environmental completed eight soil borings (SB1 thru SB8) at the subject property during a Phase 2 Environmental Site Assessment (P2ESA). One soil sample was collected from each boring for VOC and SVOC analysis. Temporary monitoring wells (TW1 thru TW4) were installed in four of the borings with groundwater samples collected for VOC and SVOC analysis. Petroleum contamination was detected in all eight of the soil samples submitted for laboratory analysis. Petroleum compounds were detected in two of the groundwater samples with a NR140 PAL exceedance noted for Benzene (0.77 ppb) in TW2. The petroleum contamination was subsequently reported to the WDNR, who then required that a site investigation be completed.

The nearest known LUST/ERP site is Bud's Service (BRRS# 03-38-001853), which is located 600 feet to the east of the subject property. At this time, we do not suspect that this site is impacting or being impacted by the subject property.

#### Potential Risks and Impacts

The subject property and surrounding properties are all served by the City of Marinette municipal water. The City of Marinette draws its municipal water supply from Green Bay. Numerous non-potable, private wells still remain within the city limits. However, the city does not have any documentation of any private wells within 1,200 feet of the subject property.

METCO is not currently aware of any other impacts, receptors, risks, or local problems associated with the subject property.

### SITE CONDITIONS

#### Topography

According to the USGS Hydrologic Atlas, Marinette is located in the southern portion of the Menominee-Oconto-Peshtigo River Basin. This area is characterized by an irregular rolling landscape consisting of an uneven cover of glacial deposits overlying an eroded bedrock surface.



## **Site Investigation Field Procedures Workplan – METCO Keller Property**

The elevation of the site is approximately 585 feet above Mean Sea Level (MSL). See Appendix A for site location.

### **Geology**

Native unconsolidated materials in this area generally consist of sand with peat present in some areas. The unconsolidated materials are underlain by limestone bedrock at approximately 75 to 100 feet below ground surface.

### **Hydrology**

The nearest surface water is the Menominee River, which exists approximately 250 feet to the northeast and south of the subject property.

### **Hydrogeology**

Groundwater is estimated to exist at approximately 5-8 feet below ground surface in this area. Groundwater flow direction is expected to be toward the northeast.

## **SCOPE OF WORK**

### **Site Investigation**

An investigation consists of collecting samples of soil and groundwater for analysis by a laboratory for compounds related to petroleum products. The WDNR requires that the investigation determine the degree and extent of contaminants in these mediums, which is commonly referred to as “defining the contaminant plume”. Further background information will also be collected to assist in the investigation.

### **Geoprobe Project**

METCO has proposed a 1-2 day Geoprobe Project. We propose 15 to 20 borings to 8-10 feet with soil and groundwater sampling. The Geoprobe will be used to collect soil samples at various depths in order to determine the general extent of contaminants in the subsurface environment.

The goal of the Geoprobe Project is to complete the following:

1. Determine general subsurface geotechnical characteristics.
2. Determine general extent of the contaminants in the unconsolidated deposits.

## **Site Investigation Field Procedures Workplan – METCO Keller Property**

3. Determine the general extent of contaminants in groundwater, if applicable.
4. Determine if contaminants have migrated to competent rock, if applicable.

This data will either completely define the extent of contamination or be used to guide the Drilling Project if required.

### **Drilling Project (if required)**

METCO has proposed 6 to 10 boreholes to be completed on/off site. METCO has also proposed 5 to 8 monitoring wells to be installed on/off site. Based on the results of the Geoprobe project, we will be able to determine how many monitoring wells will need to be installed.

The goal of the Drilling Project is to complete the following:

1. Collect a soil sample for field analysis every 2.5 feet of boring.
2. Collect at least two soil samples for laboratory analysis in every boring.
3. Verify, through sampling, the horizontal and vertical extent of soil contamination, including smear zones.
4. Install monitoring wells in an arrangement that fully defines the horizontal and vertical extent of groundwater contamination.
5. Develop the monitoring wells.
6. Collect at least two rounds of groundwater samples from the monitoring wells.
7. If conditions warrant, perform slug tests on at least one monitoring well.

### **Report Preparation**

The final report, prepared by METCO, will include background information, observations, procedures, methods, field data, laboratory analysis, site maps, data analysis, risk assessment, conclusions, and recommendations concerning all activities conducted for this project. This report will be submitted to the client and the WDNR for review and discussion.

## **METCO PROCEDURES AND METHODS**

### **Geoprobe**

The Geoprobe consists of a truck mounted, hydraulically driven unit that

## Site Investigation Field Procedures Workplan – METCO Keller Property

advances 1-inch diameter, 3 or 4-foot long, stainless steel rods into the subsurface. At desired depths, either a soil or water sample can be collected.

A 4-foot or 5-foot long, ½ or 1-inch diameter soil sampler is advanced to the sampling location. At desired depths, a soil sample is collected and brought to the surface for analysis.

All Geoprobe holes are properly abandoned to ground level using bentonite clay and a surface seal.

### Drilling

Drilling is conducted with a truck mounted auger drill rig. To penetrate any unconsolidated materials, work is conducted in accordance with ASTM D-1452 "Soil Investigation and Sampling by Auger Boring". If bedrock is encountered and cannot be penetrated with auger boring, an accepted air-rotary drilling procedure will be used.

Sampling unconsolidated materials is done in accordance with ASTM D-1586 "Penetration Tests and Split-Barrel Sampling of Soils" using a 2-inch outside diameter (O.D.), 2.5 foot split spoon sampler. Using this procedure, a split spoon sampler is driven into the soil by a 140-pound weight falling 30-inches, and a soil sample collected.

All borings are properly abandoned to ground level using bentonite clay.

### HNU Screening

Each of the samples, for headspace analysis, are placed in a clean, clear, plastic Ziploc bag. These containers are to be filled ¼ full. All containers are the same size and filled to the same volume. The containers are then sealed.

Once collected and sealed, samples are shaken for 30 seconds to break apart soil clods. They are then allowed to establish headspace. The following table is used to determine headspace equilibration time.

Outside temperature    Time to establish headspace

- <40 deg. F    40 minutes
- 41-55 deg. F    20 minutes
- 56-69 deg. F    10 minutes
- >70 deg. F    5 minutes

## Site Investigation Field Procedures Workplan – METCO Keller Property

To take readings, the HNU probe is inserted into the plastic bag halfway between the sample and the highest meter response recorded. The samples are screened with a MODEL DL-102 HNU Meter equipped with a 10.6 eV lamp. Metered calibration is done at the beginning of each workday. Other notes taken are as follows:

1. Temperature and weather conditions.
2. Date of last factory calibration.
3. Field calibration gas used and concentration.
4. Date and time of last calibration.
5. Instrument gain setting.
6. Erratic instrument readings.
7. Cleaning or repairs performed in the field.
8. Sample moisture (saturated, wet, moist, damp, dry).
9. Petroleum odors or staining of samples.
10. Any instrument quenching.
11. Other relevant information.

### Monitoring Wells

Groundwater monitoring well installations are completed under the direction of a METCO hydrogeologist and in accordance with Wisconsin Department of Natural Resources Chapter NR141, "Groundwater Monitoring Well Requirements." The monitoring wells are constructed of flush-threaded, two-inch inside diameter schedule 40 or 80 polyvinyl chloride (PVC) piping. Ten-foot well screens with 0.010-inch slots are installed approximately 5 to 6 feet into the watertable. A uniform washed sand is installed around the well screens to serve as a filter pack. Granular bentonite is used above the filter pack to provide a surface seal. Steel, locking protective well casings are cemented in at each well. Any variances from NR141 will be reported to the WDNR.

Each well is developed by alternately surging and purging with a clean polyethylene bailer for 20 to 30 minutes to remove fines from the well screen, after which ten well volumes are removed using a submersible pump.

Groundwater level measurements are obtained using an electronic water level indicator. All measurements are recorded to the nearest 0.01-foot. The probe is thoroughly washed between measurements.

## **Site Investigation Field Procedures Workplan – METCO Keller Property**

At least two rounds of samples are collected using a bottom loading, disposable, polyethylene bailer and disposable polyethylene cord. Approximately four well volumes are purged from each well before collecting samples.

Depending on site conditions and groundwater sampling results, slug tests may be conducted on two or three of the monitoring wells to determine hydrogeologic parameters (hydraulic conductivity, transmissivity, and flow velocity). During the slug test, groundwater in a monitoring well is displaced using a solid plastic slug, while water levels are recorded using a transducer and data logger. Water levels are recorded until the water level in the well returns to equilibrium. Slug test data is evaluated using the Bouwer and Rice method.

### **Well Elevation Survey**

All wells are surveyed to the nearest 0.01-foot MSL by a qualified surveying company.

### **Sample Analysis**

Environmental samples are collected to minimize both soil disturbance and exposure of the sample to the air.

Field observations such as soil characteristics, petroleum odors, product sheens, and staining associated with the samples are continuously noted throughout sampling.

The amount of sample taken, the size of the container used, and the type of sample preservation used, will depend on the laboratory contracted and for which parameters the soil samples are analyzed. See Appendix C for LUST Sample Guidelines.

All collected samples are stored in a cooler that maintains a temperature of, at most, 4 degrees Celsius. The coolers are accompanied by a complete chain of custody and are delivered to the laboratory within two days of sampling.

The WDNR document, "LUST Analytical and Quality Assurance Guidance, July 1993" is referenced in determining what parameters in which the soil and water samples will be analyzed, and the amount of duplicates/blanks required.

### **Quality Assurance/Quality Control/Waste Management**

All drilling and sampling equipment advanced into the subsurface is cleaned between sampling locations. This consists of washing with a biodegradable

## Site Investigation Field Procedures Workplan – METCO Keller Property

Alconox solution and rinsing with potable water. Wash and rinse water are disposed of atop an isolated area of asphalt for evaporation or discharged into a local storm sewer.

Drill cuttings, field screened as being contaminated, are contained in 55-gallon DOT barrels, characterized, and properly disposed of by METCO and/or client.

Development and purge waters are contained in 55 gallon DOT barrels, characterized, and properly disposed of by METCO and/or the client. Disposal options will depend on the amount of water, type of contaminants, and concentration of contaminants. All wastewater contaminants and disposal activities are recorded with complete documentation submitted to the WDNR.

### Variations

We are not aware of any variations needed at this time.

## SCHEDULE FOR INVESTIGATION PROJECT

The following is a checklist of activities that have been, or will be completed, concerning the Site Investigation, along with an estimated time frame. A typical Site Investigation takes approximately 2 to 6 months. The investigation may take up to 12 months if bedrock or groundwater is contaminated.

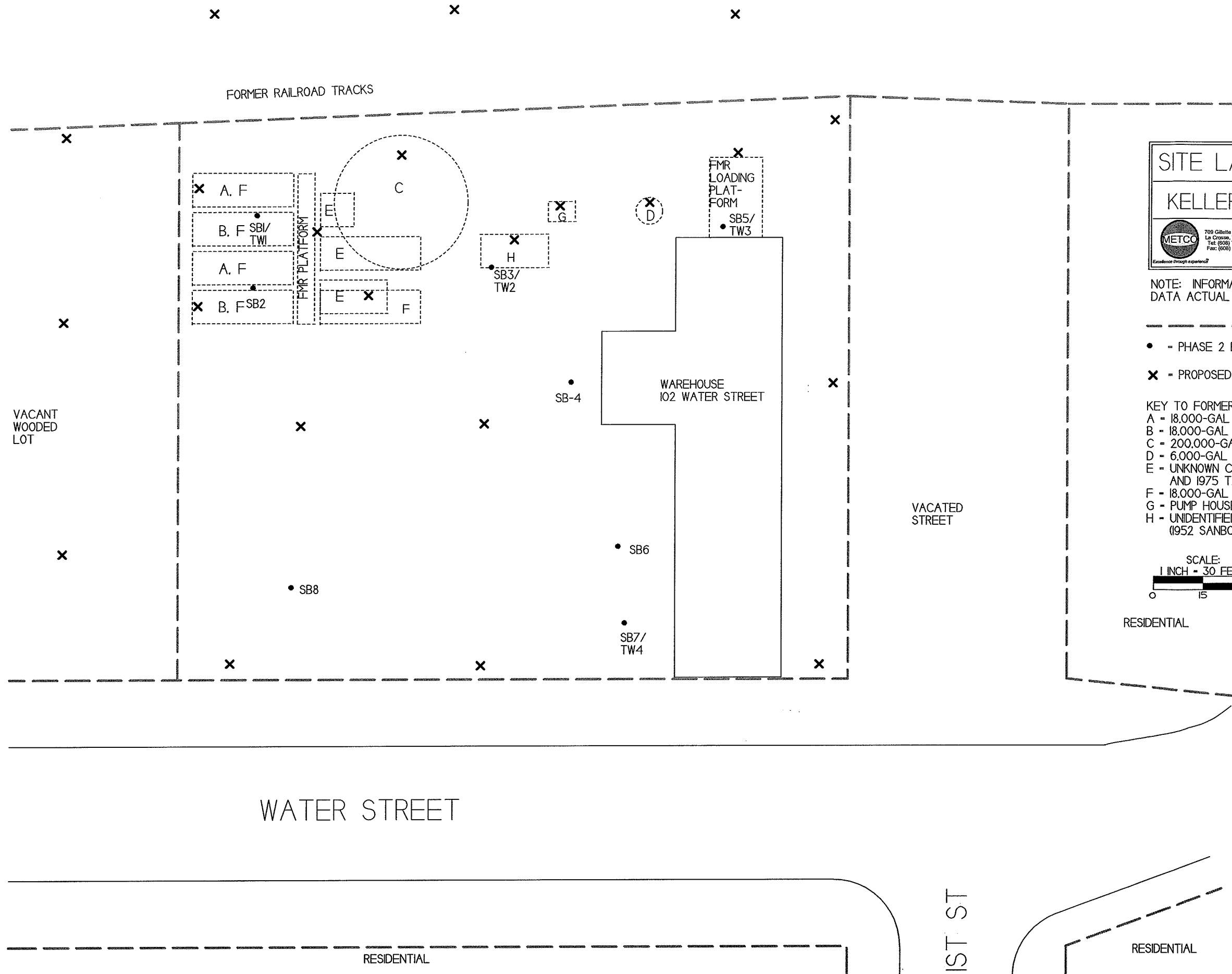
- 1) METCO submits a Site Investigation Project proposal to client (done).
- 2) Proposal acceptance by client. METCO notifies the WDNR that a consultant has been contracted (done).
- 3) Client obtains PECFA Packet and Site Eligibility Letter from PECFA (done).
- 4) METCO submits a Site Investigation Field Procedures Workplan to client and WDNR for review and approval (1/29/15).
- 5) METCO conducts Geoprobe Project (2-4 weeks). More than one field mobilization may be needed to complete project depending on complexity of the site and project (1 month to receive lab results).
- 6) Depending on the results of the investigation, METCO prepares a brief summary report or final report and sends copies to client and WDNR (2 months after lab results are received).


**NOTE: If groundwater is found to be impacted or suspected of being impacted by released contaminants, the WDNR will require a Drilling Project with monitoring wells.**

- 7) METCO conducts Drilling Project (2 months). More than one field mobilization may be needed to complete project depending on complexity

## Site Investigation Field Procedures Workplan – METCO Keller Property

- of the site and project (1 month to receive lab results).
- 8) METCO develops/surveys the installed monitoring wells and collects. Round 1 groundwater samples for laboratory analysis (1 month to receive lab results).
  - 9) METCO collects Round 2 groundwater samples for laboratory analysis (1 month to receive lab results).
  - 10) METCO completes any additional work that is needed, such as slug tests (1 month).
  - 11) METCO prepares a Site Investigation report that contains all collected data and submits to the client and WDNR (3-6 months).
  - 12) If no further investigation work is required, METCO will apply for “site closure” with the WDNR. Upon closure, METCO will complete the PECFA Application and submit for reimbursement (reimbursement takes 3 to 6 months).
  - 13) If further investigation and/or remediation is required METCO will provide further assistance.

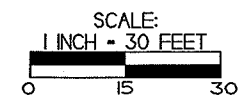


SITE LAYOUT MAP	
KELLER PROPERTY	
 <small>709 Gillette St. Suite 3 La Crosse, WI 54603 Tel: (608) 781-8879 Fax: (608) 781-8893</small>	<small>MARINETTE, WISCONSIN</small> <small>DRAWN BY: ED DATE: 04/22/2015</small>

NOTE: INFORMATION BASED ON AVAILABLE DATA ACTUAL CONDITIONS MAY DIFFER

- PROPERTY LINE
- - PHASE 2 ESA SOIL BORING LOCATION
- X - PROPOSED GEOPROBE BORING LOCATION

- KEY TO FORMER ASTS
- A - 18,000-GAL GASOLINE (1921 SANBORN MAP)
  - B - 18,000-GAL KEROSENE (1921 SANBORN MAP)
  - C - 200,000-GAL GASOLINE (1921 AND 1952 SANBORN MAP)
  - D - 6,000-GAL LUBRICATING OIL (1921 AND 1935 SANBORN MAP)
  - E - UNKNOWN CONTENTS (1969 AERIAL PHOTO AND 1975 TAX ASSESSORS RECORDS)
  - F - 18,000-GAL GASOLINE TANK (1952 SANBORN MAP)
  - G - PUMP HOUSE (1952 SANBORN MAP)
  - H - UNIDENTIFIED STRUCTURE/ POSSIBLE LOADING RACK (1952 SANBORN MAP)



RESIDENTIAL

WATER STREET

RESIDENTIAL

1ST ST

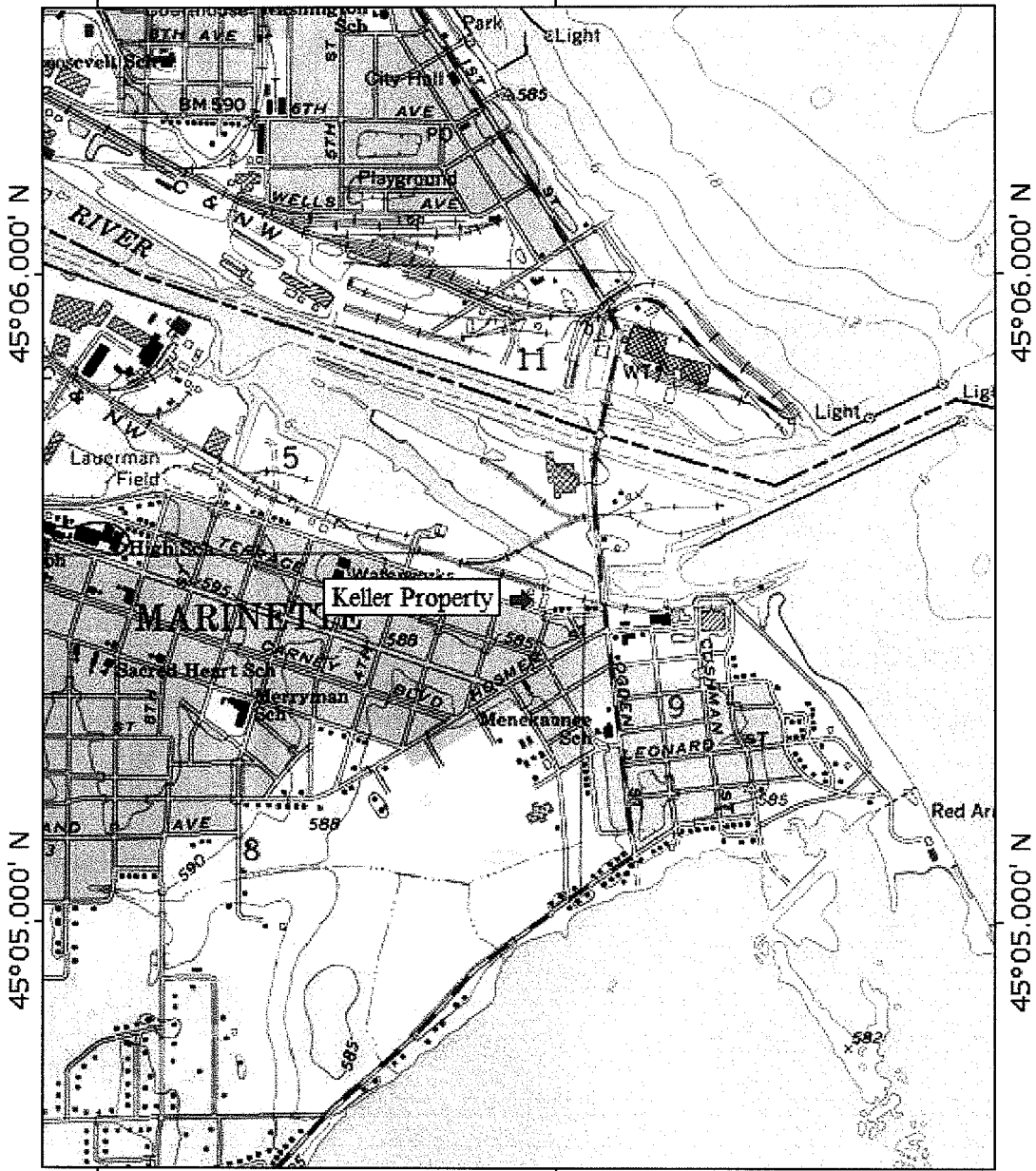
RESIDENTIAL



**Site Investigation Field Procedures Workplan – METCO  
Keller Property**

**APPENDIX A/SITE MAPS**

TOPO! map printed on 01/23/15 from "Wisconsin.tpo" and "Untitled.tpg"  
87°37.000' W WGS84 87°36.000' W



87°37.000' W WGS84 87°36.000' W  
0 5 1 MILE  
0 1000 FEET 0 500 1000 METERS



Printed from TOPO! ©2001 National Geographic Holdings (www.topo.com)

B.1.a LOCATION MAP
CONTOUR INTERVAL 5 FEET
KELLER PROPERTY – MARINETTE, WI
SEAMLESS USGS TOPOGRAPHIC MAPS ON CD-ROM

**Site Investigation Field Procedures Workplan – METCO  
Keller Property**

**APPENDIX B/INVESTIGATION CHECKLIST**

SITE INVESTIGATION CHECKLIST  
Revised February 1992 PUBL-SW-115

This checklist was prepared by the Department of Natural Resources. It lists the necessary information to include in a site investigation report, for investigations conducted in accordance with guidelines prepared by the Emergency and Remedial Response Section, of the Bureau of Solid and Hazardous Waste Management, Wisconsin DNR. Sites include those where actions are conducted under the LUST, Spills and Environmental Repair programs. If some of this information is not submitted the report should clearly state why it is omitted. More complete information regarding site investigations is available in the Department's "Guidance on Conducting Environmental Response Actions".

The purpose of the site investigation is to 1) define the extent and degree of contamination and 2) to provide a basis for choosing a remedial action alternative. The narrative portion of the investigation report should clearly address these goals.

The Department strongly recommends that the site investigation report follow the sequence of information listed here. This will allow for a quick completeness check and more timely review of submittals. Incomplete reports will not be reviewed until all the necessary information has been received. The following information should be included in the site investigation, (as appropriate to each case):

I. INTRODUCTION/COVER LETTER

- \_\_\_ 1. Project title
- \_\_\_ 2. Purpose of report and desired department action
- \_\_\_ 3. Client(s)
- \_\_\_ 4. Author(s), with signatures
- \_\_\_ 5. Scope of Services
- \_\_\_ 6. Dates the work was performed
- \_\_\_ 7. Date of report
- \_\_\_ 8. Subcontractors employed by the consultant

II. GENERAL and BACKGROUND INFORMATION

1. General Information

A. Identify the owner/operator and/or person(s) responsible: (include all applicable)

- \_\_\_ 1. name
- \_\_\_ 2. address
- \_\_\_ 3. day phone number
- \_\_\_ 4. contact person (name)
- \_\_\_ 5. address
- \_\_\_ 6. phone number
- \_\_\_ 7. verification of ownership: photocopy of deed or exact legal description of property

B. Specify the site of contamination:

- \_\_\_ 1. name
- \_\_\_ 2. phone number
- \_\_\_ 3. specific location (street corner, miles from an intersection, etc)
  - \_\_\_ a. legal address (street address if applicable, do not supply just a P.O. Box #)
  - \_\_\_ b. location of impacted properties by latitude and longitude, to an accuracy of seconds, at a minimum (preferred method) or State Plane coordinate system
  - \_\_\_ c. location of impacted properties by quarter, quarter, section, township, range, civil township, county, or other locational criteria if site(s) are not within the Public Land Survey system
- \_\_\_ 4. type of operation: gas station, tank farm, private residence, manufacturer, etc.

C. Site Location Maps

- \_\_\_ 1. General Location Map
  - \_\_\_ locate on a USGS topographic base map (include quadrangle name, series and scale)
  - \_\_\_ locate on a plat map, if applicable
- \_\_\_ 2. Local Base Map: the map must be drawn to scale and include the following items. Other features may also be needed:
  - \_\_\_ a. bar scale
  - \_\_\_ b. North arrow
  - \_\_\_ c. legend
  - \_\_\_ d. location of benchmark used
  - \_\_\_ e. origin of horizontal grid system

3. Including Site Specific Features: more than one map may be appropriate, use the local map for the base map (These maps may be used for several purposes.)

- \_\_\_ a. location of discharge on site or facility, for example, the location of (former) tank and pump islands and piping
- \_\_\_ b. location of all buildings on site
- \_\_\_ c. locations of public utilities, appropriately marked
- \_\_\_ d. property boundaries
- \_\_\_ e. location of all soil borings and wells (monitoring wells and potable wells)
- \_\_\_ f. location of soil vapor points
- \_\_\_ g. locations of where field screenings and lab confirmation samples were taken
- \_\_\_ h. nearby/neighborhood structures and private wells (within 1200 feet)
- \_\_\_ i. any nearby surface waters (within map scale)
- \_\_\_ j. roads and paved areas, and other access areas
- \_\_\_ k. known and potential sources of contamination
- \_\_\_ l. known and potential receptors
- \_\_\_ m. limits of excavation

2. Site Background

A. General Site Information

- \_\_\_ 1. site description, including features like:
  - \_\_\_ - number of tanks/containers
  - \_\_\_ - volume/size of tanks/containers
  - \_\_\_ - tank/container contents, past and present
  - \_\_\_ - tank/container age, installation dates
  - \_\_\_ - tank/container construction materials
  - \_\_\_ - presence and type of leak detection
  - \_\_\_ - presence and type of secondary containment
- \_\_\_ 2. general site construction history
- \_\_\_ 3. any past reports of spills, or other incidents
- \_\_\_ 4. periods of nonoperation
- \_\_\_ 5. proximity of sensitive sites such as schools, homes, private or public wells, etc.

B. Description of Discharge Incident

- \_\_\_ 1. type of hazardous substances discharged, known or suspected (released, spilled, lost, etc.)
- \_\_\_ 2. approximate amounts discharged
- \_\_\_ 3. location of impact
- \_\_\_ 4. dates of discharge
- \_\_\_ 5. local problems associated with discharge, e.g. vapors in homes, well contamination, etc.
- \_\_\_ 6. known receptors

C. Impacts

- \_\_\_ 1. existing impacts to human health, safety, welfare and the environment
- \_\_\_ 2. any impacts to adjacent or nearby buildings, wells or other structures
- \_\_\_ 3. names and addresses of owners of adjacent properties, if those properties have been adversely impacted by the hazardous substance discharge

D. Past Activities, Monitoring and Testing

- \_\_\_ 1. dates of site activities, duration and type and potential amounts of discharges
- \_\_\_ 2. description of emergency actions taken and of interim actions taken, including dates
- \_\_\_ 3. record of activities conducted at the site which had potential to cause contamination
- \_\_\_ 4. inventory record system data
- \_\_\_ 5. summary of monitoring results, including:
  - \_\_\_ - product monitoring records according to ILHR 10
  - \_\_\_ - groundwater monitoring
  - \_\_\_ - surface water monitoring
  - \_\_\_ - soil monitoring
  - \_\_\_ - sediment monitoring
  - \_\_\_ - atmospheric monitoring
- \_\_\_ 6. records of testing, repair, removal or replacement, including dates
- \_\_\_ 7. tank/container/line integrity testing
  - \_\_\_ method
  - \_\_\_ testing firm
  - \_\_\_ dates
  - \_\_\_ results

E. Hazardous Waste Generation

- \_\_\_ 1. hazardous waste manifest
- \_\_\_ 2. was hazardous waste ever generated or stored on site?

- F. Description of Tank/Container and Soil Removal Activities
- 1. description of soil conditions in the area of the tank/container excavation or in area of discharge
  - 2. volume of (contaminated) soils removed from the excavation
  - 3. location of stockpiled contaminated soils
  - 4. type of impermeable base for stockpiled soils
  - 5. type of impermeable cover for stockpiled soils
  - 6. if excavation was backfilled, what was used as fill?
  - 7. final deposition of soil excavated, where and how were they used? (daily cover, backfill on/off site, roasted, buried, etc.)
  - 8. condition of tanks, lines, pumps (corrosion, visible leaks, etc?)
  - 9. product (other than petroleum) or waste delivery or storage systems

- G. Land Use Information
- 1. current and past land uses of site and neighboring properties
  - 2. description of zoning of property and adjacent properties

3. Environmental Analysis

- A. Site Historical Significance
- 1. impacts or potential impacts to significant historical or archeological features due to any response activities or the discharge itself
  - 2. presence of buildings greater than 50 years old on or next to discharge site

- B. Presence of "Sensitive" Environmental Receptors
- 1. wildlife habitat
  - 2. state or federal threatened or endangered species
  - 3. sensitive or unique ecosystems or species
  - 4. areas of special natural resource interest
  - 5. other surface waters and wetlands, as appropriate

- C. Geology (use maps as appropriate)
- 1. geologic origin, nature and distribution of bedrock
  - 2. geologic origin, nature and distribution of overlying soils
  - 3. thicknesses of various strata (consolidated and unconsolidated)
  - 4. depth to bedrock
  - 5. geophysical characteristics
  - 6. soil types and texture
  - 7. soil descriptions to include:
    - structure
    - mottling
    - voids
    - layering
    - lenses
    - geologic origin
    - Unified Soil System Classification
    - grain size distribution, if applicable
    - evidence of secondary permeability
    - odor, if evident
    - staining, if evident
  - 8. bedrock descriptions, if impacted:
    - rock type
    - grain size
    - bedding thickness
    - presence of fractures
    - orientation of fractures
    - sedimentary structures
    - secondary porosity/solutional features
    - other
  - 9. topography
  - 10. site hydrology, including
    - intermittent and ephemeral streams,
    - drain tile systems,
    - surface waters
    - wetlands
    - location of floodway and floodplain (this may be best located on a site map)

- D. Hydrogeology
- 1. depth to water table
  - 2. flow directions, seasonal variations

- \_\_\_ 3. horizontal and vertical gradients
- \_\_\_ 4. hydraulic characteristics: (define as field test results or non-field estimates)
  - \_\_\_ hydraulic conductivity, variation
  - \_\_\_ transmissivity
  - \_\_\_ storativity
- \_\_\_ 5. aquifer definition:
  - \_\_\_ size
  - \_\_\_ use
  - \_\_\_ presence of aquitards
- \_\_\_ 6. local and regional recharge or discharge area(s)
- \_\_\_ 7. potentiometric surface
- \_\_\_ 8. location, seasonal variation of groundwater divides
- \_\_\_ 9. location and extent of perched groundwater
- \_\_\_ 10. local and regional groundwater quality
- \_\_\_ 11. hydraulic connection between aquifers
- \_\_\_ 12. saturated thickness of aquifer
- \_\_\_ 13. estimates of flow volume passing below the discharge site/facility (include calculations in the appendices)
- \_\_\_ 14. drillers logs which indicated any abnormal drilling difficulties
- \_\_\_ 15. isoconcentration maps
- \_\_\_ 16. other

III. RESULTS

1. Contaminant Migration Pathway and Receptor Assessment

A. Potential Vapor and Product Migration Pathways (include depth of burial and construction material)

- \_\_\_ 1. sewer lines
- \_\_\_ 2. storm sewers
- \_\_\_ 3. buried power cables
- \_\_\_ 4. buried telephone lines
- \_\_\_ 5. tile lines
- \_\_\_ 6. more permeable soil lenses
- \_\_\_ 7. water lines
- \_\_\_ 8. road beds
- \_\_\_ 9. foundations
- \_\_\_ 10. other

B. Potential Receptors of Contamination (description of impacts or potential impacts, if applicable)

- \_\_\_ 1. buildings on site
- \_\_\_ 2. neighboring basements/buildings
- \_\_\_ 3. nearby wells (locations must be provided on a map)
- \_\_\_ 4. nearby surface waters, including wetlands
- \_\_\_ 5. critical habitats
- \_\_\_ 6. endangered species
- \_\_\_ 7. outstanding resource waters
- \_\_\_ 8. exceptional resource waters
- \_\_\_ 9. sensitive or unique ecosystems
- \_\_\_ 10. other

C. Potential Health Impacts

- \_\_\_ 1. danger of explosion
- \_\_\_ 2. contaminated private wells
- \_\_\_ 3. contaminated public water supply wells
- \_\_\_ 4. exposure to vapors
- \_\_\_ 5. dermal exposure
- \_\_\_ 6. other

2. Sampling and Analysis Results (figures and tables should be used, but general trends and the overall evaluation should be in narrative form) Provide units of measurement for all results. Describe or provide the following information for each media impacted:

A. soil chemistry results, per parameter, per location

- \_\_\_ 1. field screening results with locations identified
- \_\_\_ 2. laboratory (confirmation) sample results with locations identified
- \_\_\_ 3. any indication of contamination of soils encountered (staining, odor, etc.)

B. groundwater sample results, per parameter, per well, over time

- \_\_\_ 1. laboratory results
- \_\_\_ 2. trends analysis

- \_\_\_ 3. compliance evaluation with NR 140 groundwater standards, if applicable
- C. soil vapor results (define type of survey used)
  - \_\_\_ 1. by parameter
  - \_\_\_ 2. per location
- D. sampling results from other media impacted by the discharge
  - \_\_\_ 1. parameters
  - \_\_\_ 2. locations
- 3. Sampling Methods Used (for each media impacted, lists provided for soil and groundwater only)
  - A. Soils:
    - \_\_\_ 1. description of sample collection method
    - \_\_\_ 2. field screening or analytical instrument type used
      - \_\_\_ lamp strength
      - \_\_\_ calibration
      - \_\_\_ operating procedure
    - \_\_\_ 3. sample container
    - \_\_\_ 4. temperature at which the sample was collected
    - \_\_\_ 5. time allowed for PID or FID samples to achieve at least 70° F, and location
  - B. Groundwater
    - \_\_\_ 1. method and instruments used to obtain sample
    - \_\_\_ 2. any indication of contamination noticed in field
    - \_\_\_ 3. whether the well was purged or not, why and how, and amount removed
    - \_\_\_ 4. drilling method used
    - \_\_\_ 5. monitoring well construction features
    - \_\_\_ 6. abandonment methods
      - \_\_\_ a. boreholes
      - \_\_\_ b. monitoring wells
      - \_\_\_ c. excavations
    - \_\_\_ 7. survey methods
    - \_\_\_ 8. sample container size
    - \_\_\_ 9. sample description
      - \_\_\_ - turbid
      - \_\_\_ - clear
      - \_\_\_ - sheen
      - \_\_\_ - free product
    - \_\_\_ 10. other
  - C. Vapors/Ambient Air
    - \_\_\_ 1. description of sample collection method
    - \_\_\_ 2. field screening, if conducted
    - \_\_\_ 3. sample container
- 4. Quality Control and Quality Assurance
  - A. General QA/QC (for all media impacted)
    - \_\_\_ 1. name and address of laboratory
    - \_\_\_ 2. laboratory certification number
    - \_\_\_ 3. number of blanks, with results:
      - \_\_\_ - field blanks
      - \_\_\_ - trip blanks
      - \_\_\_ - lab spikes
      - \_\_\_ - split samples
      - \_\_\_ - replicate spikes
    - \_\_\_ 4. name and training of person collecting the samples (including certification, if applicable)
  - B. Field Instrument Quality Control (for all media impacted)
    - \_\_\_ 1. instrument make, model and lamp energy
    - \_\_\_ 2. limitations of field screening instruments
      - \_\_\_ - temperature changes
      - \_\_\_ - humidity changes
      - \_\_\_ - other
    - \_\_\_ 3. any repairs to the instrument
    - \_\_\_ 4. field instrument calibration measures conducted
    - \_\_\_ 5. time and frequency or schedule of field instrument calibration
    - \_\_\_ 6. composition of the calibration gas used (calibration product ?)
    - \_\_\_ 7. calibration curves used
    - \_\_\_ 8. correction factor if one was used



- \_\_\_ 9. results of any calibration checks
- \_\_\_ 10. time of day and ambient temperature when calibrations, calibration curves or calibration checks were completed
- \_\_\_ 11. time and temperature that samples were equilibrated if the outside temperature is below 60°F at the time of field analysis

C. Field Sampling and Transportation Quality Control and Assurance (for all media impacted)

- \_\_\_ 1. sample type
- \_\_\_ 2. sample location and associated field and laboratory identification
- \_\_\_ 3. sampling technique used
- \_\_\_ 4. sampling techniques used to minimize exposure of samples to the atmosphere
- \_\_\_ 5. date and time of sampling
- \_\_\_ 6. field preservation performed
- \_\_\_ 7. date and time of preservation or extraction
- \_\_\_ 8. decontamination procedures used during the site investigation
- \_\_\_ 9. deviations from standard operating procedures
- \_\_\_ 10. shipping time and technique

D. Laboratory Receipt and Analysis (for all media impacted)

- \_\_\_ 1. chain of custody forms (4400-151)
- \_\_\_ 2. time and date of receipt of samples by the laboratory
- \_\_\_ 3. sample condition on receipt by the laboratory including
  - the temperature of the samples and
  - whether the samples were properly sealed
- \_\_\_ 4. time and date of analysis
- \_\_\_ 5. method of analysis
- \_\_\_ 6. laboratory detection limit
- \_\_\_ 7. sample results with units of measurement
- \_\_\_ 8. accuracy and precision of replicate spikes
- \_\_\_ 9. results or percent recovery of matrix spikes with every batch of samples not to exceed eight hours

5. Investigative Wastes (for all media impacted, to include but which is not limited to contaminated water from excavations, borings, purge water, rinse waters from decontamination procedures, extra sample)

- \_\_\_ A. analytical results (hazardous determination, if listed?)
- \_\_\_ B. ultimate disposal
- \_\_\_ C. other

IV. SUMMARY AND EVALUATION OF RESULTS (Analysis of Degree and Extent of Contamination)

- \_\_\_ 1. degree and extent of soil contamination
- \_\_\_ 2. degree and extent of groundwater contamination
- \_\_\_ 3. degree and extent of contamination of other media impacted
- \_\_\_ 4. known or potential impacts to receptors, such as water supply wells
- \_\_\_ 4. vapor migration potential
- \_\_\_ 5. impacts from seepage into basements, utility lines, surface waters
- \_\_\_ 6. difficulties experienced during the investigation
- \_\_\_ 7. unanticipated or questionable results
- \_\_\_ 8. details needing emphasis

V. CONCLUSIONS

- \_\_\_ source and type of release defined
- \_\_\_ soil and groundwater contamination adequately defined?
- \_\_\_ further study needed
- \_\_\_ further remediation needed
- \_\_\_ known or potential impacts from the release defined?
- \_\_\_ clean site, ready for case closure
- \_\_\_ other

VI. RECOMMENDATIONS

- \_\_\_ 1. Investigation Incomplete
  - \_\_\_ continued monitoring
  - \_\_\_ additional investigation
- \_\_\_ 2. Remedial Action Alternatives (provide description of alternatives) e.g.:
  - \_\_\_ remediation method (to be) used for contaminated soil

- soil removal, treatment and disposal
- soil venting
- product recovery
- groundwater extraction and treatment
- insitu biological treatment
- other actions (define)

- 3. Other
  - work plans for further action
  - construction proposals for further action
  - pilot study, other treatability studies
  - schedules for further actions
  - required permits
    - air quality
    - wastewater discharge

VII. FIGURES

- 1. Site Maps
  - - location maps (regional and local)
  - - water table and/or potentiometric surface maps
  - - isoconcentration maps
  - - surface water depth maps
  - - bedrock and soil type and distribution maps
- 2. Flow Cross Sections
- 3. Extent of Contamination in Soil
- 4. Extent of Contamination in Groundwater (Isoconcentration)
- 5. Locations of Potential Receptors
- 6. Geologic Cross-Sections
  - a. geologic setting
  - b. boring location
  - c. soil classification
  - d. analytical sampling
  - e. monitoring well locations
  - f. water table
  - g. extent of contaminant plume
  - h. concentrations at referenced date and point
  - i. sampling intervals (for soil and groundwater)
  - j. of excavation walls showing location of field screening and/or analytical results, as appropriate
- 7. Photographs (NO black and white photocopies)

VIII. TABLES

- 1. Groundwater Chemistry Results
- 2. Soil Chemistry Results
- 3. Analytical Methods Used
- 4. Standards for Comparison and Compliance Determinations (Tables with compliance standards should be combined with analytical results for comparison)
- 5. Geologic and Hydrogeologic Results
- 6. Groundwater Elevations
- 7. Screening Results
- 8. Other

IX. APPENDICES (up to the author)

- 1. Table giving data for compounds found, such as:  
Chemical formula, Molecular weight, Ionic potential, Solubility,  
Vapor pressure, Henry's Law Constant, Kow
- 2. References used to support methods or provide standards methods, including previous reports
- 3. All raw data
- 4. All documentation on forms: (DNR form number)
  - a. soil boring logs (4400-122)
  - b. monitoring well construction logs (4400-113A)
  - c. soil boring/well abandonment forms (3300-5B)
  - d. chain of custody forms
  - e. lab/chemistry results
  - f. groundwater monitoring well information form (4400-89)
  - g. monitoring well development form (4400-113B)
- 5. Variances (for well construction, hazardous waste storage requirements, etc.)

- 6. Well logs of all impacted wells and potentially impacted wells within 1200' of the discharge site (locate wells on a map)
- 7. All calculations and assumptions
- 8. Landfill receipts for disposed soil
- 9. Regional hydrogeological information references used

Other information that may be needed includes:

- access
- public information plan
- health and safety plan

**Site Investigation Field Procedures Workplan – METCO  
Keller Property**

**APPENDIX C/LUST SAMPLING GUIDELINES**

LUST and Petroleum Analytical and QA Guidance  
July 1993 Revision

Petroleum Substance Discharged	Analysis of Samples Collected for UST Tank Closure Assessments	Solid Waste Program Requirements for Soils to be landfilled <sup>5</sup>	Site Investigation, Pretreatment and Posttreatment Sample Analysis <sup>11</sup>
Regular Gasoline	GRO <sup>2</sup>	Free Liquids <sup>6</sup> GRO Benzene <sup>7</sup> Pb <sup>7</sup> Haz. Waste Deter. <sup>8</sup>	GRO VOC/PVOC <sup>15</sup> Pb <sup>12</sup>
Unleaded Gasoline; Grades 80 100, and 100 LL (Low Lead) Aviation Fuel	GRO <sup>2</sup>	Free Liquids <sup>6</sup> GRO Benzene <sup>7</sup> Pb <sup>7</sup> Haz. Waste Deter. <sup>8</sup>	GRO PVOC
Diesel; Jet Fuels; and No's 1, 2, and 4 Fuel Oil	DRO <sup>3</sup>	Free Liquids <sup>6</sup> DRO Benzene <sup>7</sup> Haz. Waste Deter. <sup>8</sup>	DRO <sup>3</sup> PVOC PAH <sup>13 14</sup>
Crude Oil; Lubricating Oils; No. 6 Fuel Oil	DRO <sup>3</sup>	Free Liquids <sup>6</sup> DRO Haz. Waste Deter. <sup>8</sup>	DRO <sup>3</sup> PAH <sup>13 14</sup>
Unknown Petroleum	GRO <sup>7</sup> and DRO <sup>3 4</sup>	Free Liquids <sup>6</sup> GRO and DRO Pb, Cd <sup>7</sup> Haz. Waste Deter. <sup>8</sup> CN <sup>19</sup> S <sup>2 10</sup>	GRO and DRO <sup>3 4</sup> VOC/PVOC <sup>15</sup> PAH <sup>13 14</sup> Pb, Cd <sup>12</sup>
Waste Oil	DRO <sup>3</sup>	Free Liquids <sup>6</sup> DRO Pb, Cd <sup>7</sup> Haz. Waste Deter. <sup>8</sup> CN <sup>19</sup> S <sup>2 10</sup>	DRO <sup>3</sup> VOC/PVOC <sup>15</sup> PAH <sup>13 14</sup> PCBs <sup>16</sup> Pb, Cd <sup>12</sup>

Abbreviations:

GRO - Gasoline Range Organics, Determined by the Wisconsin Modified GRO Method

DRO - Diesel Range Organics, Determined by the Wisconsin Modified DRO Method

VOC - Volatile Organic Compounds (See Section 11.1 for a list of VOC compounds)

PVOC - Petroleum Organic Compounds ( See Section 11.2 for a list of PVOC compounds)

PAH - Polynuclear Aromatic Hydrocarbons (See Section 11.3 for a list of the PAH compounds)

PCBs - Polychlorinated Biphenyls

Pb - Lead

**SYNERGY ENVIRONMENTAL LAB – Sample Bottle Requirements**

**TABLE 1  
SAMPLE & PRESERVATION REQUIREMENTS FOR WATER and  
DRINKING WATER SAMPLES**

Test	Original Sample Container	Preserved	Holding Time to Analysis
<b>WET CHEMISTRY</b>			
Alkalinity SM2320B/EPA 310.2	250 mL HDPE	4°C	14 days
Ammonia EPA 350.1	250 mL HDPE	4°C, pH<2 with H <sub>2</sub> SO <sub>4</sub>	28 days
BOD, cBOD SM5210B	500 ml HDPE	4°C	48 hrs.
COD EPA 410.4	500 ml HDPE	4°C, pH<2 with H <sub>2</sub> SO <sub>4</sub>	28 days
Chloride EPA 300.0/EPA 325.2	250 mL HDPE	4°C	28 days
Cyanide SW846 9012A/SM4500-CN-C	1000 mL HDPE	4°C, pH>12 with NaOH	14 days
Flashpoint SW846 1010	250 mL HDPE	4°C	28 days
Fluoride EPA 300.0	250 mL HDPE	4°C	28 days
Hardness SW846 6010B	250 mL HDPE	4°C, pH<2 with HNO <sub>3</sub>	180 days
TKN EPA 351.2	1 Liter HDPE	4°C, pH<2 with H <sub>2</sub> SO <sub>4</sub>	28 days
Nitrate EPA 300.0	250 mL HDPE	4°C	48 hours
Nitrate+Nitrite EPA 300.0	250 mL HDPE	4°C, pH<2 with H <sub>2</sub> SO <sub>4</sub>	28 days
Nitrite EPA 300.0	250 mL HDPE	4°C	48 hours
Oil & Grease EPA 1664	1 Liter Glass	4°C, pH<2 with H <sub>2</sub> SO <sub>4</sub>	28 days
Organic Carbon SW846 9060/ EPA 415.1	40 ml Glass	4°C, pH<2 with H <sub>2</sub> SO <sub>4</sub> or HCL	28 days
Phenol, Total EPA 420.1	1 Liter Glass	4°C, pH<2 with H <sub>2</sub> SO <sub>4</sub>	28 days
Phosphorus, Total EPA 365.3	250 mL HDPE	4°C, pH<2 with H <sub>2</sub> SO <sub>4</sub>	28 days
Sulfate EPA 300.0	250 mL HDPE	4°C	28 days
Total Dissolved Solids EPA 160.1	250 ml HDPE	4°C	7 days
Total Solids EPA 160.3	250 ml HDPE	4°C	7 days
Total Suspended Solids EPA 160.2	250 mL HDPE	4°C	7 days
<b>METALS</b>			
Metals	250 mL HDPE	4°C, pH<2 with HNO <sub>3</sub>	6 months
Mercury SW8467470/EPA 245.1	250 mL HDPE	4°C, pH<2 with HNO <sub>3</sub>	28 days
<b>ORGANICS</b>			
Semivolatiles SW846 8270C	1 Liter amber glass, collect 2 for one of the samples submitted .	4°C	7 days extr. 40 days following extr
PAH SW846 8270C	1 Liter amber glass, collect 2 for one of the samples submitted	4°C	7 days extr. 40 days following extr
PCB SW846 8082	1 Liter amber glass, collect 2 for one of the samples submitted.	4°C	7 days extr. 40 days following extr
DRO, Modified DNR Sep 95	1 Liter amber glass with Teflon lined cap	4°C, 5 mL 50% HCl	7 days extr. 40 days following extr
VOC'S SW846 8260B/EPA524.2	(3) 40 mL glass vials with Teflon lined septum caps	4°C, 0.5 mL 50% HCl, No Headspace	14 days
GRO/VOC	(4) 40 mL glass vials with Teflon lined septum caps	4°C, 0.5 mL 50% HCl prior to adding sample to jar	14 days
GRO, Modified DNR Sep 95	(2) 40 mL glass vials with Teflon lined septum caps	4°C, 0.5 mL 50% HCl prior to adding sample to jar	14 days
GRO/PVOC	(2) 40 mL glass vials with Teflon lined septum caps	4°C, 0.5 mL 50% HCl prior to adding sample to jar	14 days
PVOC	(2) 40 mL glass vials with Teflon lined septum caps	4°C, 0.5 mL 50% HCl prior to adding sample to jar	14 days

**All samples are to be cooled to 4°C until tested.  
HDPE = High Density Polyethylene.**

**SYNERGY ENVIRONMENTAL LAB – Sample Bottle Requirements**

**TABLE 2  
SAMPLE & PRESERVATION REQUIREMENTS FOR SOIL SAMPLES**

Test	Original Sample Container	Preserved	Holding Times from Date and Time of Collection			
			Solvent Addition	Shipping	Extraction	Analysis
<b>METALS</b>						
Metals	2 oz glass or soil cup	4°C	NA	NA	NA	180 days
Mercury SW846 7471	2 oz glass or soil cup	4°C	NA	NA	NA	28 days
Chromium Hexavalent SM3500-Cr	2 oz glass or soil cup	4°C	NA	NA	NA	24 hours
<b>ORGANICS</b>						
Any combinations of GRO, VOC, PVOC	1- tared VOC vial with 10 mls methanol, 13 grams of soil collected with syringe	4°C, 1:1 with methanol	Immediately	4 days	21 days	21 days
DRO, Modified	1- tared VOC vial, 13 grams of soil collected with syringe jar	4°C, Hexane	10 days	4 days	47 days	47 days
PAH, SW846 8270C	2 oz glass untared	4°C	NA	NA	14 days	40 days
Semivolatile SW846 8270C	2 oz glass untared	4°C	NA	NA	14 days	40 days
PCB SW846 8082	2 oz glass untared	4°C	NA	NA	14 days	40 days

**All samples are to be cooled to 4°C until tested.**

**Site Investigation Field Procedures Workplan – METCO  
Keller Property**

**APPENDIX D/WDNR DOCUMENTS**



Residential setting. Not-To-Exceed D-C RCLs from web-calculator at: [http://epa-prgs.orri.gov/cgi-bin/chemicals/csl\\_search](http://epa-prgs.orri.gov/cgi-bin/chemicals/csl_search) (Chicago as climatic zone).  
 Exceed D-C RCL defaults to 100,000 mg/kg if web-calculator result or Csat exceeds 10% by weight (the ceiling limit concentration defined in EPA RSL Users Guide).  
 Basis: ca = cancer; nc = non-cancer; Csat = soil saturation concentration; ceiling = 10%.

Not-to-

Background threshold values are non-outlier trace element maximum levels in Wisconsin surface soils from the USGS Report at: <http://pubs.usgs.gov/sir/2011/5202>.

1. Enter data in yellow cells. Numeric-only values under "INPUT Site Data." For ND, use detection limit. Do not type '-', 'NA' nor 'space bar.' Leave purple cells 'as is.'
2. After completing data entry, click "Get Summary" in Row 872. [Click to go there...](#)

(Contaminants not in the provided list can be added starting at Row 860.)

Find ... Contaminant	CAS Number	NC RCL (mg/kg)	D-C RCL (mg/kg)	Not-To-Exceed D-C RCL (mg/kg)	Basis	Background Threshold Value (mg/kg)	INPUT Site Data (mg/kg)	Comparison / Hazard Index / Cumulative Cancer Risk		
								Flag-E Individual Exceedance	Hazard Quotient (HQ) from Data	Cancer Risk (CR) from Data  Target CR used: 1.00E-06
Benzene	71-43-2	111.000	1,490	1,490	ca					
Ethylbenzene	100-41-4	4,220.000	7,470	7,470	ca					
Toluene	108-88-3	5,300.000		818.000	Csat					
Xylenes	1330-20-7	890.000		258.000	Csat					
Methyl tert-Butyl Ether (MTBE)	1634-04-4	23,800.000	59.400	59.400	ca					
Dichloroethane, 1,2-	107-06-2	46.700	.608	.608	ca					
Dibromoethane, 1,2-	106-93-4	107.000	.047	.047	ca					
Trichloroethylene	79-01-6	8.050	1.260	1.260	ca					
Tetrachloroethylene	127-18-4	115.000	30.700	30.700	ca					
Vinyl Chloride	75-01-4	93.300	.067	.067	ca					
Dichloroethylene, 1,1-	75-35-4	342.000		342.000	nc					
Dichloroethylene, 1,2-trans-	156-60-5	1,560.000		1,560.000	nc					
Dichloroethylene, 1,2-cis-	156-59-2	156.000		156.000	nc					
Trichloroethane, 1,1,1-	71-55-6	12,300.000		840.000	Csat					
Carbon Tetrachloride	56-23-5	137.000	.854	.854	ca					
Trimethylbenzene, 1,2,4-	95-63-6	89.800		89.800	nc					
Trimethylbenzene, 1,3,5-	108-67-8	782.000		182.000	Csat					
Naphthalene	91-20-3	188.000	5.150	5.150	ca					
Benzo[a]pyrene	50-32-8		.015	.015	ca					
Acenaphthene	83-32-9	3,440.000		3,440.000	nc					
Acenaphthylene	208-96-8									
Anthracene	120-12-7	17,200.000		17,200.000	nc					
Benzo[a]anthracene	56-55-3		.148	.148	ca					
Benzo[b]fluoranthene	205-82-3		.377	.377	ca					
Benzo[k]fluoranthene	205-99-2		.148	.148	ca					
Benzo[g,h,i]perylene	191-24-2									
Benzo[k]fluoranthene	207-08-9		1.480	1.480	ca					
Chrysene	218-01-9		14.800	14.800	ca					
Dibenz[a,h]anthracene	53-70-3		.015	.015	ca					
Dibenzo[a,e]pyrene	192-65-4		.038	.038	ca					
Dimethylbenz[a]anthracene, 7,12-	57-97-6		4.31E-04	4.31E-04	ca					
Fluoranthene	206-44-0	2,290.000		2,290.000	nc					
Fluorene	86-73-7	2,290.000		2,290.000	nc					
Indeno[1,2,3-cd]pyrene	193-39-5		.148	.148	ca					
Methylnaphthalene, 1-	90-12-0	4,010.000	15.600	15.600	ca					
Methylnaphthalene, 2-	91-57-6	229.000		229.000	nc					
Nitropyrene, 4-	57835-92-4		.377	.377	ca					
Perylene	198-55-0									
Phenanthrene	85-01-8									
Pyrene	129-00-0	1,720.000		1,720.000	nc					
Aluminum	7429-90-5	77,500.000		77,500.000	nc	28,721				
Arsenic, inorganic	7440-38-2	34.300	.613	.613	ca	8				
Barium	7440-39-3	15,300.000		15,300.000	nc	364				
Beryllium and compounds	7440-41-7	156.000	1,580.000	156.000	nc					
Cadmium (Diet)	7440-43-9	.70.000	2,110.000	.70.000	nc	1				
Calcium	7440-70-2					14,536				
Chromium(VI)	18540-29-9	234.000	.293	.293	ca					
Chromium(III), Insoluble Salts	16065-83-1	117,000.000		100,000.000	ceiling					
Chromium, Total	7440-47-3					44				
Cobalt	7440-48-4	23.400	422.000	23.400	nc	22				
Copper	7440-50-8	3,130.000		3,130.000	nc	35				
Mercury (elemental)	7439-97-6	14.700		3.130	Csat					
Iron	7439-89-6	54,800.000		54,800.000	nc	34,313				
Magnesium	7439-95-4					8,290				
Lead and Compounds	7439-92-1	400.000		400.000	nc	52				

Click to Clear  
INPUT Site Data  
Entries  
(Column H)

Click to go there...

**Residual Contaminant Levels Protective of Groundwater Quality**  
 (Soil-to-Groundwater Scenario Results from: [http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl\\_search](http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search))

Find ...	NR 140 CAS	Fed MCL (ug/l) (If Red, MCL>ES)	NR 140 ES (ug/l)	RCL-gw (mg/kg) DF=1	Use 2, or input the calculated site-specific DF →	2.00	INPUT NUMERIC SOIL Site Data Max (mg/kg)	Flag E = Individual Exceedance!	Type BRRTS No. Here (If Known). Assess groundwater data separately.
NR140 Substance									
Acetochlor	34256-82-1	-	, 7.	, 0.0056			, 0.0111		
Acetone	67-64-1	-	9,000.	, 1.8383			, 3.6766		
Alachlor	15972-60-8	, 2.	, 2.	, 0.0017			, 0.0033		
Aldicarb	116-06-3	, 3.	, 10.	, 0.0025			, 0.005		
Aluminum	7429-90-5	-	, 200.	, 300.			, 600.		
Antimony	7440-36-0	, 6.	, 6.	, 0.271			, 0.542		
Anthracene	120-12-7	-	3,000.	, 98.8636			, 197.7273		
Arsenic	7440-38-2	, 10.	, 10.	, 0.292			, 0.584		
Atrazine, total chlorinated residues	1912-24-9	, 3.	, 3.	, 0.002			, 0.0039		
Barium	7440-39-3	2,000.	2,000.	, 82.4			, 164.8		
Bentazon	25057-89-0	-	, 300.	, 0.0657			, 0.1314		
Benzene	71-43-2	, 5.	, 5.	, 0.0026			, 0.0051		
Benzo(a)pyrene (PAH)	50-32-8	, 0.2	, 0.2	, 0.235			, 0.47		
Benzo(b)fluoranthene (PAH)	205-99-2	-	, 0.2	, 0.2397			, 0.4793		
Beryllium	7440-41-7	, 4.	, 4.	, 3.16			, 6.32		
Boron	7440-42-8	-	1,000.	, 3.208			, 6.416		
Bromodichloromethane (THM)	75-27-4	, 80.	, 0.6	, 0.0002			, 0.0003		
Bromoform (THM)	75-25-2	, 80.	, 4.4	, 0.0012			, 0.0023		
Bromomethane	74-83-9	-	, 10.	, 0.0025			, 0.0051		
Butylate	2008-41-5	-	, 400.	, 0.3887			, 0.7773		
Cadmium	7440-43-9	, 5.	, 5.	, 0.376			, 0.752		
Carbaryl	63-25-2	-	, 40.	, 0.0363			, 0.0726		
Carbofuran	1563-66-2	, 40.	, 40.	, 0.0156			, 0.0312		
Carbon disulfide	75-15-0	-	1,000.	, 0.2959			, 0.5919		
Carbon tetrachloride	56-23-5	, 5.	, 5.	, 0.0019			, 0.0039		
Chloramben	133-90-4	-	, 150.	, 0.0364			, 0.0729		
Chlorodifluoromethane	75-45-6	-	7,000.	, 2.8942			, 5.7885		
Chloroethane	75-00-3	-	, 400.	, 0.1133			, 0.2266		
Chloroform (THM)	67-66-3	, 80.	, 6.	, 0.0017			, 0.0033		
Chlorpyrifos	2921-88-2	-	, 2.	, 0.0294			, 0.0588		
Chloromethane	74-87-3	-	, 30.	, 0.0078			, 0.0155		
Chromium (total)	7440-47-3	, 100.	, 100.	180,000. No Cr-VI		360,000. If no Cr-VI			Re-assess if Cr-VI present
Chrysene (PAH)	218-01-9	-	, 0.2	, 0.0723			, 0.1446		
Cobalt	7440-48-4	-	, 40.	, 1.8037			, 3.6073		
Copper	7440-50-8	1,300.	1,300.	, 45.8			, 91.6		
Cyanazine	21725-46-2	-	, 1.	, 0.0005			, 0.0009		
Cyanide, free	57-12-5	, 200.	, 200.	, 2.02			, 4.04		
Dacthal (DCPA)	1861-32-1	-	, 70.	, 0.0852			, 0.1705		
1,2-Dibromoethane	106-93-4	, 0.05	, 0.05	1.41E-05			2.82E-05		
Dibromochloromethane (THM)	124-48-1	, 80.	, 60.	, 0.016			, 0.032		
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	, 0.2	, 0.2	8.64E-05			, 0.0002		
Dibutyl phthalate	84-74-2	-	1,000.	, 2.5194			, 5.0388		
Dicamba	1918-00-9	-	, 300.	, 0.0776			, 0.1553		
1,2-Dichlorobenzene	95-50-1	, 600.	, 600.	, 0.584			, 1.168		
1,3-Dichlorobenzene	541-73-1	-	, 600.	, 0.5764			, 1.1528		
1,4-Dichlorobenzene	106-46-7	, 75.	, 75.	, 0.072			, 0.144		
Dichlorodifluoromethane	75-71-8	-	1,000.	, 1.5431			, 3.0863		
1,1-Dichloroethane	75-34-3	-	, 850.	, 0.2414			, 0.4828		
1,2-Dichloroethane	107-06-2	, 5.	, 5.	, 0.0014			, 0.0028		
1,1-Dichloroethylene	75-35-4	, 7.	, 7.	, 0.0025			, 0.005		
1,2-Dichloroethylene (cis)	156-59-2	, 70.	, 70.	, 0.0206			, 0.0412		
1,2-Dichloroethylene (trans)	156-60-5	, 100.	, 100.	, 0.0294			, 0.0588		
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7	, 70.	, 70.	, 0.0181			, 0.0362		
1,2-Dichloropropane	78-87-5	, 5.	, 5.	, 0.0017			, 0.0033		
1,3-Dichloropropane (phthalate) (Tributyl)	542-75-6	-	, 0.4	, 0.0001			, 0.0003		
Di (2-ethylhexyl) phthalate	117-81-7	, 6.	, 6.	, 1.44			, 2.88		
Dimethoate	60-51-5	-	, 2.	, 0.0005			, 0.0009		
2,4-Dinitrotoluene	121-14-2	-	, 0.05	6.75E-05			, 0.0001		
2,6-Dinitrotoluene	606-20-2	-	, 0.05	6.88E-05			, 0.0001		
Dinitrotoluene, Total Residues	25321-14-6	-	, 0.05	6.88E-05			, 0.0001		
Dinoseb	88-85-7	, 7.	, 7.	, 0.0615			, 0.123		
1,4-Dioxane (p-dioxane)	123-91-1	-	, 3.	, 0.0006			, 0.0012		
Dioxin (2,3,7,8-TCDD)	1746-01-6	3.00E-05	3.00E-05	1.50E-05			3.00E-05		
Endrin	72-20-8	, 2.	, 2.	, 0.0808			, 0.1616		
EPTC	759-94-4	-	, 250.	, 0.132			, 0.264		

Click here to Clear  
(Column K) Site  
Entries

**Residual Contaminant Levels Protective of Groundwater Quality**  
 (Soil-to-Groundwater Scenario Results from: [http://epa-prgs.ornl.gov/cgi-bin/chemicals/cst\\_search](http://epa-prgs.ornl.gov/cgi-bin/chemicals/cst_search))

NR140 Substance	NR 140 CAS	Fed MCL (ug/l) (If Red, MCL>ES)	NR 140 ES (ug/l)	RCL-gw (mg/kg) DF=1	Use 2, or input the calculated site-specific DF →	2.00	INPUT NUMERIC SOIL Site Data Max (mg/kg)	Flag E - Individual Exceedance
Ethylbenzene	100-41-4	,700.	,700.	, 0.785			, 1.57	
Ethyl Ether (Diethyl Ether)	60-29-7	-	1,000.	, 0.2239			, 0.4478	
Ethylene glycol	107-21-1	-	14,000.	, 2.8279			, 5.6559	
Fluoranthene	206-44-0	-	,400.	,44.4389			,88.8778	
Fluorene (PAH)	86-73-7	-	,400.	, 7.4014			,14.8027	
Fluoride	7782-41-4	4,000.	4,000.	,601.			1,202.	
Fluorotrichloromethane	75-69-4	-	3,490.	, 2.2379			, 4.4758	
Formaldehyde	50-00-0	-	1,000.	, 0.202			, 0.404	
Heptachlor	76-44-8	, 0.4	, 0.4	, 0.0331			, 0.0662	
Heptachlor epoxide	1024-57-3	, 0.2	, 0.2	, 0.0041			, 0.0082	
Hexachlorobenzene	118-74-1	, 1.	, 1.	, 0.0126			, 0.0252	
n-Hexane	110-54-3	-	,600.	, 4.2222			, 8.4444	
Lead	7439-92-1	, 15.	, 15.	, 13.5			, 27.	
Lindane	58-89-9	, 0.2	, 0.2	, 0.0012			, 0.0023	
Manganese	7439-96-5	-	,300.	,19.6074			,39.2148	
Mercury	7439-97-6	, 2.	, 2.	, 0.104			, 0.208	
Methanol	67-56-1	-	5,000.	, 1.01			, 2.02	
Methoxychlor	72-43-5	, 40.	, 40.	, 2.16			, 4.32	
Methylene chloride	75-09-2	, 5.	, 5.	, 0.0013			, 0.0026	
Methyl ethyl ketone (MEK)	78-93-3	-	4,000.	, 0.833			, 1.6661	
Methyl isobutyl ketone (MIBK)	108-10-1	-	,500.	, 0.1133			, 0.2266	
Methyl tert-butyl ether (MTBE)	1634-04-4	-	,60.	, 0.0135			, 0.027	
Metolachlor/s-Metolachlor	51218-45-2	-	,100.	, 0.1178			, 0.2356	
Metribuzin	21087-64-9	-	,70.	, 0.0214			, 0.0427	
Molybdenum	7439-98-7	-	,40.	, 0.8096			, 1.6192	
Monochlorobenzene	108-90-7	,100.	,100.	, 0.0679			, 0.1358	
Naphthalene	91-20-3	-	,100.	, 0.3291			, 0.6582	
Nickel	7440-02-0	-	,100.	, 6.5306			,13.0612	
N-Nitrosodiphenylamine (NDPA)	86-30-6	-	, 7.	, 0.0382			, 0.0764	
Pentachlorophenol (PCP)	87-86-5	, 1.	, 1.	, 0.0101			, 0.0202	
Phenol	108-95-2	-	2,000.	, 1.1473			, 2.2946	
Picloram	1918-02-1	,500.	,500.	, 0.139			, 0.278	
Polychlorinated biphenyls (PCBs)	1336-36-3	, 0.5	, 0.03	, 0.0047			, 0.0094	
Prometon	1610-18-0	-	,100.	, 0.0474			, 0.0949	
Propazine	139-40-2	-	,10.	, 0.0089			, 0.0178	
Pyrene (PAH)	129-00-0	-	,250.	, 27.0661			,54.1322	
Pyridine	110-86-1	-	,10.	, 0.0034			, 0.0069	
Selenium	7782-49-2	, 50.	, 50.	, 0.26			, 0.52	
Silver	7440-22-4	-	,50.	, 0.425			, 0.85	
Simazine	122-34-9	, 4.	, 4.	, 0.002			, 0.0039	
Styrene	100-42-5	,100.	,100.	, 0.11			, 0.22	
Tertiary Butyl Alcohol (TBA)	75-65-0	-	,12.	, 0.0025			, 0.0049	
1,1,1,2-Tetrachloroethane	630-20-6	-	,70.	, 0.0267			, 0.0534	
1,1,2,2-Tetrachloroethane	79-34-5	-	, 0.2	, 7.82E-05			, 0.0002	
Tetrachloroethylene (PCE)	127-18-4	, 5.	, 5.	, 0.0023			, 0.0045	
Tetrahydrofuran	109-99-9	-	,50.	, 0.0111			, 0.0222	
Thallium	7440-28-0	, 2.	, 2.	, 0.142			, 0.284	
Toluene	108-88-3	1,000.	,800.	, 0.5536			, 1.1072	
Toxaphene	8001-35-2	, 3.	, 3.	, 0.464			, 0.928	
1,2,4-Trichlorobenzene	120-82-1	, 70.	, 70.	, 0.204			, 0.408	
1,1,1-Trichloroethane	71-55-6	,200.	,200.	, 0.0701			, 0.1402	
1,1,2-Trichloroethane	79-00-5	, 5.	, 5.	, 0.0016			, 0.0032	
Trichloroethylene (TCE)	79-01-6	, 5.	, 5.	, 0.0018			, 0.0036	
2,4,6-Trinitrophenol (TNP)	93-72-1	, 50.	, 50.	, 0.0275			, 0.055	
1,2,3-Trichloropropane	96-18-4	-	,60.	, 0.0259			, 0.0519	
Trifluralin	1582-09-8	-	, 7.5	, 0.2474			, 0.4948	
Triethylamine (TEA) and 1,3,5-triazine	95-63-6 / 108-67-8	-	,480.	, 0.691			, 1.3821	
Vanadium	7440-62-2	-	,30.	, 30.			, 60.	
Vinyl chloride	75-01-4	, 2.	, 0.2	, 6.90E-05			, 0.0001	
Xylenes (m-, o-, p- combined)	1330-20-7	10,000.	2,000.	, 1.97			, 3.94	

Type BRRTS No. Here (if known). Assess groundwater data separately.

# Site-specific

## Resident Screening Levels (RSL) for Soil

ca=Cancer, nc=Noncancer, ca\* (Where nc SL < 100 x ca SL)  
 ca\*\* (Where nc SL < 10 x ca SL), max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat,  
 Smax=Soil SL exceeds ceiling limit and has been substituted with the max value (see User's Guide),  
 Ssat=Soil inhalation SL exceeds csat and has been substituted with the csat

Chemical	Volatilization		Soil Concentration (mg/kg)	Particulate Emission Factor (m <sup>3</sup> /kg)	Ingestion SL (mg/kg)	Dermal SL (mg/kg)	Inhalation SL (mg/kg)	Carcinogenic SL (mg/kg)	Ingestion SL (mg/kg)	Dermal SL (mg/kg)	Inhalation SL (mg/kg)
	Factor (m <sup>3</sup> /kg)	Saturation									
Benzene	5.49E+03	1.82E+03	1.56E+09	1.16E+01	-	-	1.71E+00	1.49E+00	3.13E+02	-	1.72E+02
Cadmium (Diet)	-	-	1.56E+09	-	-	-	2.11E+03	2.11E+03	7.82E+01	6.98E+02	1.63E+04
Carbon Tetrachloride	2.32E+03	4.58E+02	1.56E+09	9.15E+00	-	-	9.42E-01	8.54E-01	3.13E+02	-	2.42E+02
Dibromomethane, 1,2-	1.34E+04	1.34E+03	1.56E+09	3.20E-01	-	-	5.45E-02	4.65E-02	7.04E+02	-	1.26E+02
Dichloroethane, 1,2-	7.11E+03	2.98E+03	1.56E+09	7.04E+00	-	-	6.65E-01	6.08E-01	4.69E+02	-	5.19E+01
Dichloroethylene, 1,1-	1.80E+03	1.19E+03	1.56E+09	-	-	-	-	-	3.91E+03	-	3.75E+02
Dichloroethylene, 1,2-cis-	3.88E+03	2.37E+03	1.56E+09	-	-	-	-	-	1.56E+02	-	-
Dichloroethylene, 1,2-trans-	3.90E+03	1.67E+03	1.56E+09	-	-	-	-	-	1.56E+03	-	2.44E+02
Ethylbenzene	8.81E+03	4.80E+02	1.56E+09	5.82E+01	-	-	8.57E+00	7.47E+00	7.82E+03	-	9.18E+03
Lead and Compounds	-	-	1.56E+09	-	-	-	-	-	-	-	-
Methyl tert-Butyl Ether (MTBE)	7.62E+03	8.87E+03	1.56E+09	3.56E+02	-	-	7.13E+01	5.94E+01	-	-	2.38E+04
Acenaphthene	2.19E+05	-	1.56E+09	-	-	-	-	-	4.69E+03	1.29E+04	-
Anthracene	8.13E+05	-	1.56E+09	-	-	-	-	-	2.35E+04	6.45E+04	-
Benz[a]anthracene	-	-	1.56E+09	2.04E-01	5.32E-01	5.32E-01	1.36E+04	1.48E-01	-	-	-
Benz[b]fluoranthene	-	-	1.56E+09	5.34E-01	1.30E+00	1.30E+00	3.45E+04	3.78E-01	-	-	-
Benzofluoranthene	-	-	1.56E+09	2.04E-02	5.32E-02	5.32E-02	1.36E+03	1.48E-02	-	-	-
Benzofluoranthene	-	-	1.56E+09	2.04E-01	5.32E-01	5.32E-01	1.36E+04	1.48E-01	-	-	-
Chrysene	-	-	1.56E+09	2.04E+00	5.32E+00	5.32E+00	1.36E+04	1.48E+00	-	-	-
Dibenz[a,h]anthracene	-	-	1.56E+09	2.04E+01	5.32E+01	5.32E+01	1.36E+05	1.48E+01	-	-	-
Dibenz[ghi]perylene	-	-	1.56E+09	2.04E-02	5.32E-02	5.32E-02	1.25E+03	1.48E-02	-	-	-
Dimethylbenz(a)anthracene, 7,12-	-	-	1.56E+09	5.34E-02	1.30E-01	1.30E-01	3.45E+03	3.78E-02	-	-	-
Fluoranthene	-	-	1.56E+09	5.97E-04	1.55E-03	1.55E-03	2.11E+01	4.31E-04	-	-	-
Fluorene	4.37E+05	-	1.56E+09	-	-	-	-	-	3.13E+03	8.59E+03	-
Indeno[1,2,3-cd]pyrene	-	-	1.56E+09	2.04E-01	5.32E-01	5.32E-01	1.36E+04	1.48E-01	-	-	-
Methylnaphthalene, 1-	9.11E+04	-	1.56E+09	2.21E+01	5.36E+01	5.36E+01	-	1.56E+01	-	-	-
Methylnaphthalene, 2-	9.01E+04	-	1.56E+09	-	-	-	-	-	3.13E+02	8.59E+02	-
Naphthalene	7.20E+04	-	1.56E+09	-	-	-	5.15E+00	5.15E+00	1.56E+03	4.30E+03	2.25E+02

# Site-specific

## Resident Screening Levels (RSL) for Soil

ca=Cancer, nc=Noncancer, ca\* (Where nc SL < 100 x ca SL),  
 ca\*\* (Where nc SL < 10 x ca SL), max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat.  
 Smax=Soil SL exceeds ceiling limit and has been substituted with the max value (see User's Guide).  
 Ssat=Soil inhalation SL exceeds csat and has been substituted with the csat

Chemical	Volatilization		Soil Saturation		Particulate Emission		Ingestion		Dermal		Inhalation	
	Factor (m <sup>3</sup> /kg)	Saturation Concentration (mg/kg)	Factor (m <sup>3</sup> /kg)	Concentration (mg/kg)	SL TR=1.0E-6 (mg/kg)	SL TR=1.0E-6 (mg/kg)	SL TR=1.0E-6 (mg/kg)	SL TR=1.0E-6 (mg/kg)	SL Child HQ=1 (mg/kg)	SL Child HQ=1 (mg/kg)	SL Child HQ=1 (mg/kg)	SL Child HQ=1 (mg/kg)
Nitropyrene, 4-	-	-	1.56E+09	5.34E-01	1.30E+00	3.45E+04	3.78E-01	-	-	-	-	-
Pyrene	3.70E+06	-	1.56E+09	-	-	-	-	2.35E+03	6.45E+03	-	-	-
Tetrachloroethylene	3.65E+03	1.66E+02	1.56E+09	3.05E+02	-	3.41E+01	3.07E+01	4.69E+02	-	-	-	1.52E+02
Toluene	6.66E+03	8.18E+02	1.56E+09	-	-	-	-	6.26E+03	-	-	-	3.47E+04
Trichloroethane, 1,1,1-	2.56E+03	6.40E+02	1.56E+09	-	-	-	-	1.56E+05	-	-	-	1.34E+04
Trichloroethylene	3.43E+03	6.92E+02	1.56E+09	3.24E+00	-	8.04E-01	6.44E-01	3.91E+01	-	-	-	7.16E+00
Trimethylbenzene, 1,2,4-	1.23E+04	2.19E+02	1.56E+09	-	-	-	-	-	-	-	-	8.98E+01
Trimethylbenzene, 1,3,5-	1.03E+04	1.82E+02	1.56E+09	-	-	-	-	7.82E+02	-	-	-	-
Vinyl Chloride	1.49E+03	3.92E+03	1.56E+09	9.32E-02	-	2.39E-01	6.71E-02	2.35E+02	-	-	-	1.55E+02
Xylenes	9.05E+03	2.58E+02	1.56E+09	-	-	-	-	1.56E+04	-	-	-	9.44E+02

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(22) "Wastewater and sludge storage or treatment lagoon" means a natural or man-made containment structure, constructed primarily of earthen materials for the treatment or storage of wastewater or sludge, which is not a land disposal system.

History: Cr. Register, September, 1985, No. 357, eff. 10-1-85; cr. (1m), am. (7), (17) and (18), Register, October, 1988, No. 394, eff. 11-1-88; am. (6), cr. (20h) and (20m), Register, March, 1994, No. 459, eff. 4-1-94; cr. (1s), (10e), (10s), (20k), r. and rec. (12), (13), Register, August, 1995, No. 476, eff. 9-1-95; cr. (14m), Register, October, 1996, No. 490, eff. 11-1-96; am. (20), Register, December, 1998, No. 516, eff. 1-1-99; correction in (9) made under s. 13.93 (2m) (b) 7., Stats., Register, April, 2001, No. 544; CR 02-134: cr. (1u), (1w), (1y) and (20s) Register June 2003 No. 570, eff. 7-1-03.

## Subchapter II — Groundwater Quality Standards

**NR 140.10 Public health related groundwater standards.** The groundwater quality standards for substances of public health concern are listed in Table 1.

Note: For all substances that have carcinogenic, mutagenic or teratogenic properties or interactive effects, the preventive action limit is 10% of the enforcement standard. The preventive action limit is 20% of the enforcement standard for all other substances that are of public health concern. Enforcement standards and preventive action limits for additional substances will be added to Table I as recommendations are developed pursuant to ss. 160.07, 160.13 and 160.15, Stats.

**Table 1**  
**Public Health Groundwater Quality Standards**

Substance <sup>1</sup>	Enforcement Standard (micrograms per liter – except as noted)	Preventive Action Limit (micrograms per liter – except as noted)
Acetochlor	7	0.7
Acetochlor ethane sulfonic acid + oxanilic acid (Acetochlor – ESA + OXA)	230	46
Acetone	9 mg/l	1.8 mg/l
Alachlor	2	0.2
Alachlor ethane sulfonic acid (Alachlor – ESA)	20	4
Aldicarb	10	2
Aluminum	200	40
Ammonia (as N)	9.7 mg/l	0.97 mg/l
Antimony	6	1.2
Anthracene	3000	600
Arsenic	10	1
Asbestos	7 million fibers per liter (MFL)	0.7 MFL
Atrazine, total chlorinated residues	3 <sup>2</sup>	0.3 <sup>2</sup>
Bacteria, Total Coliform	0 <sup>3</sup>	0 <sup>3</sup>
Barium	2 milligrams/liter (mg/l)	0.4 mg/l
Bentazon	300	60
Benzene	5	0.5
Benzo(b)fluoranthene	0.2	0.02
Benzo(a)pyrene	0.2	0.02
Beryllium	4	0.4
Boron	1000	200
Bromodichloromethane	0.6	0.06
Bromoform	4.4	0.44
Bromomethane	10	1
Butylate	400	80
Cadmium	5	0.5
Carbaryl	40	4
Carbofuran	40	8
Carbon disulfide	1000	200
Carbon tetrachloride	5	0.5
Chloramben	150	30
Chlordane	2	0.2
Chlorodifluoromethane	7 mg/l	0.7 mg/l
Chloroethane	400	80
Chloroform	6	0.6
Chlorpyrifos	2	0.4
Chloromethane	30	3
Chromium (total)	100	10
Chrysene	0.2	0.02

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Table 1 – Continued  
Public Health Groundwater Quality Standards

Substance <sup>1</sup>	Enforcement Standard (micrograms per liter – except as noted)	Preventive Action Limit (micrograms per liter – except as noted)
Cobalt	40	8
Copper	1300	130
Cyanazine	1	0.1
Cyanide, free <sup>4</sup>	200	40
Dacthal	70	14
1,2-Dibromoethane (EDB)	0.05	0.005
Dibromochloromethane	60	6
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.02
Dibutyl phthalate	1000	100
Dicamba	300	60
1,2-Dichlorobenzene	600	60
1,3-Dichlorobenzene	600	120
1,4-Dichlorobenzene	75	15
Dichlorodifluoromethane	1000	200
1,1-Dichloroethane	850	85
1,2-Dichloroethane	5	0.5
1,1-Dichloroethylene	7	0.7
1,2-Dichloroethylene (cis)	70	7
1,2-Dichloroethylene (trans)	100	20
2,4-Dichlorophenoxyacetic Acid (2,4-D)	70	7
1,2-Dichloropropane	5	0.5
1,3-Dichloropropene (cis/trans)	0.4	0.04
Di (2-ethylhexyl) phthalate	6	0.6
Dimethenamid/Dimethenamid-P	50	5
Dimethoate	2	0.4
2,4-Dinitrotoluene	0.05	0.005
2,6-Dinitrotoluene	0.05	0.005
Dinitrotoluene, Total Residues <sup>5</sup>	0.05	0.005
Dinoseb	7	1.4
1,4-Dioxane	3	0.3
Dioxin (2, 3, 7, 8-TCDD)	0.00003	0.000003
Endrin	2	0.4
EPTC	250	50
Ethylbenzene	700	140
Ethyl ether	1000	100
Ethylene glycol	14 mg/l	2.8 mg/l
Fluoranthene	400	80
Fluorene	400	80
Fluoride	4 mg/l	0.8 mg/l
Fluorotrichloromethane	3490	698
Formaldehyde	1000	100
Heptachlor	0.4	0.04
Heptachlor epoxide	0.2	0.02
Hexachlorobenzene	1	0.1
N-Hexane	600	120
Hydrogen sulfide	30	6
Lead	15	1.5
Lindane	0.2	0.02
Manganese	300	60
Mercury	2	0.2

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Table 1 – Continued  
Public Health Groundwater Quality Standards

Substance <sup>1</sup>	Enforcement Standard (micrograms per liter – except as noted)	Preventive Action Limit (micrograms per liter – except as noted)
Methanol	5000	1000
Methoxychlor	40	4
Methylene chloride	5	0.5
Methyl ethyl ketone (MEK)	4 mg/l	0.8 mg/l
Methyl isobutyl ketone (MIBK)	500	50
Methyl tert-butyl ether (MTBE)	60	12
Metolachlor/s–Metolachlor	100	10
Metolachlor ethane sulfonic acid + oxanilic acid (Metolachlor – ESA + OXA)	1.3 mg/l	0.26 mg/l
Metribuzin	70	14
Molybdenum	40	8
Monochlorobenzene	100	20
Naphthalene	100	10
Nickel	100	20
Nitrate (as N)	10 mg/l	2 mg/l
Nitrate + Nitrite (as N)	10 mg/l	2 mg/l
Nitrite (as N)	1 mg/l	0.2 mg/l
N–Nitrosodiphenylamine	7	0.7
Pentachlorophenol (PCP)	1	0.1
Perchlorate	1	0.1
Phenol	2 mg/l	0.4 mg/l
Picloram	500	100
Polychlorinated biphenyls (PCBs)	0.03	0.003
Prometon	100	20
Propazine	10	2
Pyrene	250	50
Pyridine	10	2
Selenium	50	10
Silver	50	10
Simazine	4	0.4
Styrene	100	10
Tertiary Butyl Alcohol (TBA)	12	1.2
1,1,1,2–Tetrachloroethane	70	7
1,1,1,2–Tetrachloroethane	0.2	0.02
Tetrachloroethylene	5	0.5
Tetrahydrofuran	50	10
Thallium	2	0.4
Toluene	800	160
Toxaphene	3	0.3
1,2,4–Trichlorobenzene	70	14
1,1,1–Trichloroethane	200	40
1,1,2–Trichloroethane	5	0.5
Trichloroethylene (TCE)	5	0.5
2,4,5–Trichlorophenoxy–propionic acid (2,4,5–TP)	50	5
1,2,3–Trichloropropane	60	12
Trifluralin	7.5	0.75
Trimethylbenzenes (1,2,4– and 1,3,5– combined)	480	96
Vanadium	30	6



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Table 1 – Continued  
Public Health Groundwater Quality Standards

Substance <sup>1</sup>	Enforcement Standard (micrograms per liter – except as noted)	Preventive Action Limit (micrograms per liter – except as noted)
Vinyl chloride	0.2	0.02
Xylene <sup>6</sup>	2 mg/l	0.4 mg/l

<sup>1</sup> Appendix I contains Chemical Abstract Service (CAS) registry numbers, common synonyms and trade names for most substances listed in Table 1.

<sup>2</sup> Total chlorinated atrazine residues includes parent compound and the following metabolites of health concern: 2-chloro-4-amino-6-isopropylamino-s-triazine (formerly deethylatrazine), 2-chloro-4-amino-6-ethylamino-s-triazine (formerly deisopropylatrazine) and 2-chloro-4,6-diamino-s-triazine (formerly diamino-atrazine).

<sup>3</sup> Total coliform bacteria may not be present in any 100 ml sample using either the membrane filter (MF) technique, the presence-absence (P-A) coliform test, the minimal medium ONPG-MUG (MMO-MUG) test or not present in any 10 ml portion of the 10-tube multiple tube fermentation (MTF) technique.

<sup>4</sup> "Cyanide, free" refers to the simple cyanides (HCN, CN<sup>-</sup>) and/or readily dissociable metal-cyanide complexes. Free cyanide is regulatorily equivalent to cyanide quantified by approved analytical methods for "amenable cyanide" or "available cyanide".

<sup>5</sup> Dinitrotoluene, Total Residues includes the dinitrotoluene (DNT) isomers: 2,3-DNT, 2,4-DNT, 2,5-DNT, 2,6-DNT, 3,4-DNT and 3,5-DNT.

<sup>6</sup> Xylene includes meta-, ortho-, and para-xylene combined.

History: Cr. Register, September, 1985, No. 357, eff. 10-1-85; am. table 1, Register, October, 1988, No. 394, eff. 11-1-88; am. table 1, Register, September, 1990, No. 417, eff. 10-1-90; am. Register, January, 1992, No. 433, eff. 2-1-92; am. Table 1, Register, March, 1994, No. 459, eff. 4-1-94; am. Table 1, Register, August, 1995, No. 476, eff. 9-1-95; am. Table 1, Register, December, 1998, No. 516, eff. 1-1-99; am. Table 1, boron, Register, December, 1998, No. 516, eff. 12-31-99; am. Table 1, Register, March, 2000, No. 531, eff. 4-1-00; CR 03-063: am. Table 1, Register February 2004 No. 578, eff. 3-1-04; CR 02-095: am. Table 1, Register November 2006 No. 611, eff. 12-1-06; reprinted to correct errors in Table 1, Register January 2007 No. 613; CR 07-034: am. Table 1 Register January 2008 No. 625, eff. 2-1-08; CR 09-102: am. Table 1 Register December 2010 No. 660, eff. 1-1-11.

**NR 140.12 Public welfare related groundwater standards.** The groundwater quality standards for substances of public welfare concern are listed in Table 2.

Note: For each substance of public welfare concern, the preventive action limit is 50% of the established enforcement standard.

Table 2  
Public Welfare Groundwater Quality Standards

Substance	Enforcement Standard (milligrams per liter – except as noted)	Preventive Action Limit (milligrams per liter – except as noted)
Chloride	250	125
Color	15 color units	7.5 color units
Foaming agents MBAS (Methylene-Blue Active Substances)	0.5	0.25
Iron	0.3	0.15
Manganese	0.05	0.025
Odor	3 (Threshold Odor No.)	1.5 (Threshold Odor No.)
Sulfate	250	125
Zinc	5	2.5

History: Cr. Register, September, 1985, No. 357, eff. 10-1-85; am. table 2, Register, October, 1990, No. 418, eff. 11-1-90; am. Table 2, Register, March, 1994, No. 459, eff. 4-1-94.

**NR 140.14 Statistical procedures.** (1) If a preventive action limit or an enforcement standard for a substance listed in Table 1 or 2, an alternative concentration limit issued in accordance with s. NR 140.28 or a preventive action limit for an indicator parameter established according to s. NR 140.20 (2) is attained or exceeded at a point of standards application:

(a) The owner or operator of the facility, practice or activity at which a standard is attained or exceeded shall notify the appropriate regulatory agency that a standard has been attained or exceeded; and

(b) The regulatory agency shall require a response in accordance with the rules promulgated under s. 160.21, Stats. No response shall be required if it is demonstrated to the satisfaction of the appropriate regulatory agency that a scientifically valid determination cannot be made that the preventive action limit or enforcement standard for a substance in Table 1 or 2 has been attained or exceeded based on consideration of sampling procedures or laboratory precision and accuracy, at a significance level of 0.05.

(2) The regulatory agency shall use one or more valid statistical procedures to determine if a change in the concentration of a substance has occurred. A significance level of 0.05 shall be used for all tests.

(3) In addition to sub. (2), the following applies when a preventive action limit or enforcement standard is equal to or less than the limit of quantitation:

(a) If a substance is not detected in a sample, the regulatory agency may not consider the preventive action limit or enforcement standard to have been attained or exceeded.

(b) If the preventive action limit or enforcement standard is less than the limit of detection, and the concentration of a substance is reported between the limit of detection and the limit of quantitation, the regulatory agency shall consider the preventive action limit or enforcement standard to be attained or exceeded only if:

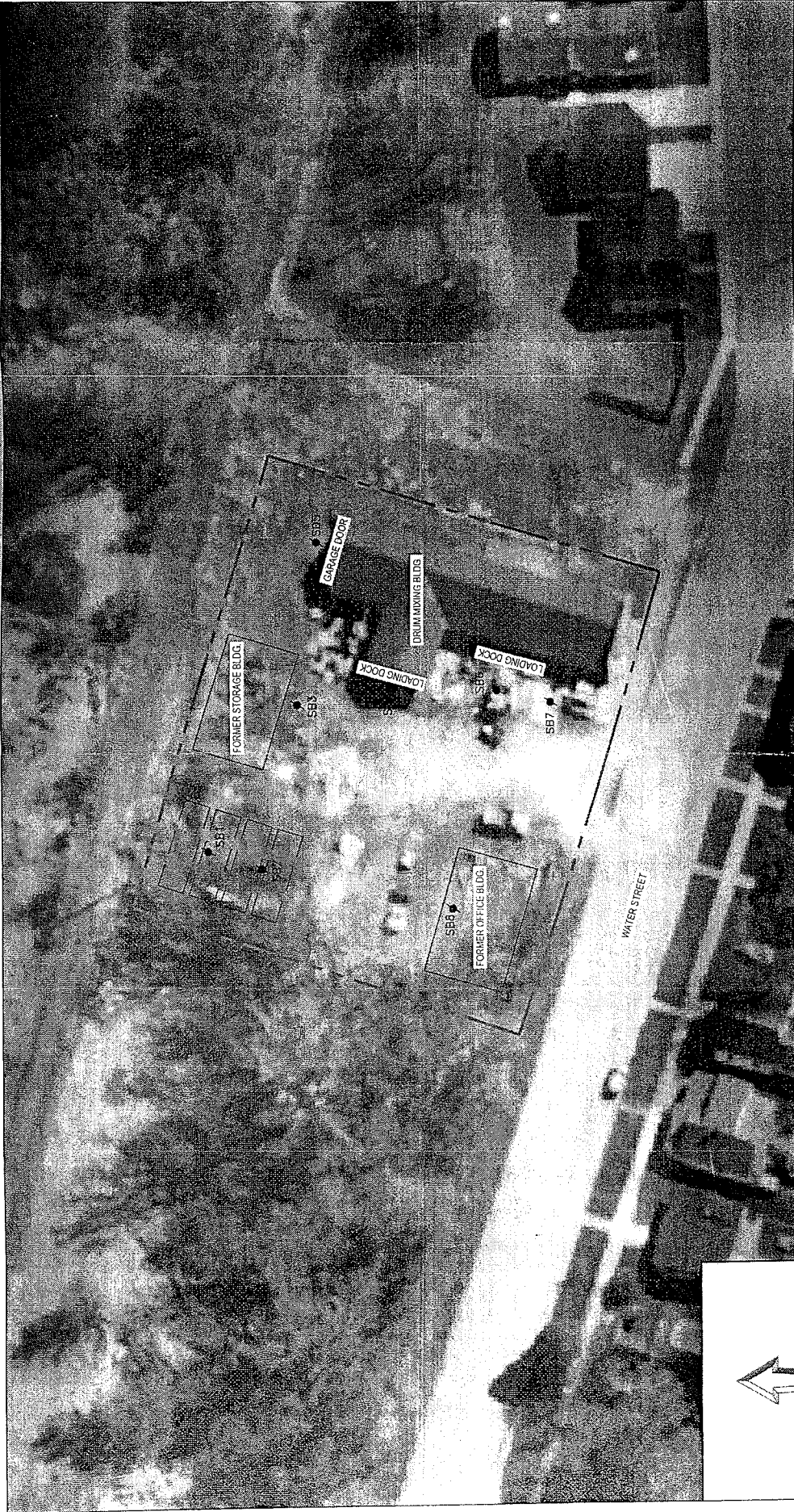
1. The substance has been analytically confirmed to be present in the same sample using an equivalently sensitive analytical method or the same analytical method, and

2. The substance has been statistically confirmed to be present above the preventive action limit or enforcement standard, determined by an appropriate statistical test with sufficient samples at a significance level of 0.05.

(c) If the preventive action limit or enforcement standard is between the limit of detection and the limit of quantitation, the regulatory agency shall consider the preventive action limit or

**Site Investigation Field Procedures Workplan – METCO  
Keller Property**

**APPENDIX E/PROJECT DOCUMENTS**



**Stantec**  
 566 Circle Drive, Green Bay, Wisconsin 54303  
 Phone: 920.831.0505 Fax: 920.832.4444  
 The design and construction services provided by Stantec are intended to be used only for the project and site specifically identified in the contract documents. Stantec does not assume any liability for the use of the design and construction services for any other project or site. PROJECT NUMBER: 1717000003

**DATE:** 08/26/13 | **DRAWN BY:** JTB | **CHECKED BY:** JTB | **PROJECT MANAGER:** LPC

**LEGEND**  
 [---] FORMER HORIZONTAL AST LOCATION  
 [---] APPROXIMATE PROPERTY LINE  
 [SB1] SOIL BORING LOCATION

**SCALE IN FEET**  
 0 20 40

**FORMER PROPERTY DATA FEATURES**  
 DRAWN BY: JTB  
 PROJECT NUMBER: 1717000003



**LEGEND**

- FORMER HORIZONTAL ASST LOCATION
- APPROXIMATE PROPERTY LINE
- ⊗ TW1 TEMPORARY WELL LOCATION



554 Circle Drive, Green Bay, Wisconsin 54104  
 Phone: 800-854-0606 Fax: 920-392-8444

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DATE: 08/26/13 DRAWN BY: JRB PROJECT MANAGER: LPC

**SITE LAYOUT WITH TEMPORARY MONITORING WELL LOCATIONS**

KELLER PROPERTY  
 102 WATER STREET  
 MARINETTE, WISCONSIN

PROJECT NUMBER: 10270604

**Table 1 Soil Field Screening Results, Keller Property, Marinette, Wisconsin**

Boring Number	Sample Number	Sample Depth (feet)	Sample Odor	Sample Description	Date Collected	PID Headspace Analysis		
						Time Collected	Time Analyzed	PID Response (IUI)
SB1	SB1(0-2)	0-2	None	Sand	8/21/2013	930	945	2.8
	SB1(2-4)	2-4	None	Sand	8/21/2013	930	945	3.8
	SB1(4-6)*	4-6	Petro	Sand / Peat	8/21/2013	932	948	397
	SB1(6-8)	6-8	Strong Petro	Peat / Sand	8/21/2013	932	948	>300
	SB1(8-10)	8-10	Strong Petro	Sand	8/21/2013	940	951	>300
	SB1(10-12)	10-12	Strong Petro	Sand	8/21/2013	940	951	>300
SB2	SB2(0-2)	0-2	None	Sand	8/21/2013	1015	1030	3.1
	SB2(2-4)	2-4	None	Sand	8/21/2013	1015	1030	3.3
	SB2(4-6)*	4-6	Petro	Sand / Peat	8/21/2013	1017	1038	111
	SB2(6-8)	6-8	Petro	Sand	8/21/2013	1017	1038	34
	SB2(8-10)	8-10	Slight Petro	Sand	8/21/2013	1020	1040	2
	SB2(10-12)	10-12	Slight Petro	Sand	8/21/2013	1020	1040	1.2
SB3	SB3(0-2)	0-2	None	Sand	8/21/2013	1115	1131	7.6
	SB3(2-4)*	2-4	Strong Petro	Sand	8/21/2013	1115	1131	>300
	SB3(4-6)	4-6	Strong Petro	Sand / Peat	8/21/2013	1117	1135	>300
	SB3(6-8)	6-8	Strong Petro	Sand	8/21/2013	1117	1135	>300
	SB3(8-10)	8-10	Strong Petro	Sand	8/21/2013	1122	1140	>300
	SB3(10-12)	10-12	Strong Petro	Sand	8/21/2013	1122	1140	>300
SB4	SB4(0-2)	0-2	None	Sand	8/21/2013	1201	1215	27
	SB4(2-4)	2-4	Slight Petro	Sand	8/21/2013	1201	1215	10
	SB4(4-6)*	4-6	Strong Petro	Sand / Peat	8/21/2013	1204	1220	>300
	SB4(6-8)	6-8	Strong Petro	Sand	8/21/2013	1204	1220	109
	SB4(8-10)	8-10	Petro	Sand	8/21/2013	1207	1228	52
	SB4(10-12)	10-12	Slight Petro	Sand	8/21/2013	1207	1228	10
SB5	SB5(0-2)	0-2	None	Sand	8/21/2013	1233	1250	7.7
	SB5(2-4)	2-4	Slight Petro	Sand	8/21/2013	1233	1250	4.3
	SB5(4-6)*	4-6	Petro	Sand / Peat	8/21/2013	1235	1255	9.4
	SB5(6-8)	6-8	Strong	Sand	8/21/2013	1235	1255	>300
	SB5(8-10)	8-10	Strong	Sand	8/21/2013	1239	1257	>300
	SB5(10-12)	10-12	Petro	Sand	8/21/2013	1239	1257	24
SB6	SB6(0-2)	0-2	None	Fill	8/21/2013	1307	1323	4
	SB6(2-4)	2-4	None	Sand	8/21/2013	1307	1323	3.4
	SB6(4-6)*	4-6	None	Sand / Peat	8/21/2013	1310	1328	7.5
	SB6(6-8)	6-8	None	Sand	8/21/2013	1310	1328	2.5
	SB6(8-10)	8-10	None	Sand	8/21/2013	1314	1331	2.7
	SB6(10-12)	10-12	None	Sand	8/21/2013	1314	1331	3.2
SB7	SB7(0-2)	0-2	None	Fill / Sand	8/21/2013	1342	1358	2
	SB7(2-4)	2-4	None	Sand	8/21/2013	1342	1358	2.2
	SB7(4-6)*	4-6	None	Sand	8/21/2013	1345	1403	4.2
	SB7(6-8)	6-8	None	Sand	8/21/2013	1345	1403	0.3
	SB7(8-10)	8-10	None	Sand	8/21/2013	1350	1407	0.5
	SB7(10-12)	10-12	None	Sand	8/21/2013	1350	1407	0.3
SB8	SB8(0-2)*	0-2	None	Sand	8/21/2013	1417	1435	2.6
	SB8(2-4)	2-4	None	Sand	8/21/2013	1417	1435	0.8
	SB8(4-6)	4-6	None	Sand / Peat	8/21/2013	1420	1437	0.9
	SB8(6-8)	6-8	None	Peat / Sand	8/21/2013	1420	1437	0.5
	SB8(8-10)	8-10	None	Sand	8/21/2013	1424	1441	0
	SB8(10-12)	10-12	None	Sand	8/21/2013	1424	1441	0

Key:  
 PID = Photoionization Detector  
 IUI = Instruments units as Isobutylene  
 \* = Submitted for laboratory analysis  
 -- = Not Analyzed or Unknown

Table 2a. Soil Sample Volatile Organic Compound Laboratory Results, Kaller Property, Marinette, Wisconsin

Boring Number	Sample Number	Depth (ft)	Soil Description	Estimated Depth to Groundwater Collected (ft)	Date	Acetone	Benzene	Bromomethane	tert-Butylbenzene	sec-Butylbenzene	n-Butylbenzene	Carbon Disulfide	Chloromethane	1,4-Dichlorobenzene	1,1-Dichloroethane	trans-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	p-Propyltoluene	Methylene Chloride	Methyl tert-butyl ether (MTBE)	Naphthalene	n-Propylbenzene	Tetrachloroethene (PCE)	Trichloroethene	Toluene	1,1,1-Trichloroethane (1,1,1-TCA)	Trichloroethene (TCE)	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl Chloride	Total Xylenes		
Section NR 720.11, Wis. Adm. Code RCL for Protection from Direct Contact Risk (Non-Industrial)						63,800	1,490	10,300	183,000	145,000	108,000	738	171,000	3,480	4,720	155,000	211,000	7,470	2,000	NE	NE	NE	NE	NE	NE	NE	NE	1,500	640,000	644	89,800	182,000	NE	4,100
WONR Proposed RCL for Protection from Direct Contact Risk (Non-Industrial)						3693.9	5.1	5.06	NE	NE	NE	583	15.5	144	485.6	41.2	58.8	1,570	NE	NE	NE	NE	NE	NE	NE	NE	1,107.2	340.2	3.6	1,379.3	1,379.3	0.1	3,940	
WONR Proposed RCL for Protection of Groundwater***						200	5.9	<35	<13	58	120	37	<18	<14	<16	<16	<16	48	50	150	30	<13	66	92	<21	<18	24	<19	<7	760	260	<14	177	
S81	S81(4-6)	4-6	Sand	6.5	08/21/13	140	300	<33	<12	<15	39	<23	23	<13	<15	<15	110	23	21	38	<12	200	48	<20	<16	720	<17	<6.5	270	73	<13	840		
S82	S82(4-6)	4-6	Sand	6.5	08/21/13	3000	3400	<760	<260	700	2800	530	<380	<300	<350	<350	7300	1200	1200	800	<380	5000	1900	<450	<380	2100	<400	<150	6500	3800	<300	11100		
S83	S83(2-4)	2-4	Sand	6.5	08/21/13	350	310	<45	48	400	1100	<32	<23	<18	<21	<21	450	1100	1300	62	<17	5100	1500	<27	<23	46	<24	<9.1	12000	3800	<18	8479		
S84	S84(4-6)	4-6	Sand	6.5	08/21/13	220	31	<36	<13	<17	<14	<25	<18	<14	<17	<17	<14	18	18	18	31	<13	170	23	<21	<18	180	<19	<7	130	28	<14	370	
S85	S85(4-6)	4-6	Sand	6.5	08/21/13	250	32	<35	<13	<15	16	<25	<18	<14	<15	<15	<12	<11	<12	<11	26	<11	45	<13	<19	<16	26	<17	<6.2	24	<13	61		
S86	S86(4-6)	4-6	Sand	6.5	08/21/13	<120	5.6	<11	<11	<15	<12	<22	<16	<12	<15	<15	<12	32	<14	21	40	<14	73	30	<23	<19	48	<21	<7.7	150	83	<15	206	
S87	S87(4-6)	4-6	Sand	6.5	08/21/13	170	73	<39	<14	30	59	<27	<19	<15	<18	<18	<18	32	<14	21	40	<14	73	30	<23	<19	48	<21	<7.7	150	83	<15	206	
S88	S88(0-2)	0-2	Sand	6.5	08/21/13	<7700	3800	<1900	<700	5700	18000	<1300	<960	<770	<900	<900	<900	34000	9100	15000	3100	<700	13000	14000	<1200	<960	2100	<1000	<380	34000	<770	56740		
Duplicate S83(2-4)	FD1	2-4	Sand	6.5	08/21/13	<7700	3800	<1900	<700	5700	18000	<1300	<960	<770	<900	<900	<900	34000	9100	15000	3100	<700	13000	14000	<1200	<960	2100	<1000	<380	34000	<770	56740		

Notes: All analyzed samples consist of soil unless otherwise noted. WONR Proposed soil RCL Summary table (May 2012) used to establish RCLs for groundwater protection and direct contact.

XXX = concentrations exceeds section NR 720.09, Wis. Adm. Code (s. NR 720.09, Wis. Adm. Code) residual contaminant level (RCL) for protection from direct contact risk (non-industrial)

XXX = concentrations exceeds WONR proposed RCL for protection from direct contact risk (non-industrial)

XXX = exceeds WONR proposed RCL for protection of groundwater (non-industrial)

- VOC = volatile organic compound
- NE = not analyzed
- "Y" = analyte not detected to a detection limit of x
- "N" = analyte not detected between limit of detection and limit of quantization
- ND = not analyzed
- fg = feet below grade
- Waste = Waste defined as random layers or mixtures of clay, silt, sand, and/or gravel containing coal and clinker fragments.
- Potential waste sample = Potential waste sample
- \*\*\* = dilution factor of 2 used since site investigation is complete and extent of contamination has been defined

Table 2b Soil Sample Semi-Volatile Organic Compound Laboratory Results, Keller Property, Marinette, Wisconsin

Boring Number	Sample Number	Depth (ft)	Soil Description	Estimated Depth to Groundwater (ft)	Date Collected	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benz(a)pyrene	Benz(b)fluoranthene	Benz(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene		
WDNR Proposed RCL for Protection from Direct Contact Risk (Non-Industrial)						3,440,000	478,000	17,200,000	148	15	148	NE	NE	NE	1,480	14,800	15	2,290,000	2,290,000	148	22,100	313,000	5,150	115,000	1,720,000
WDNR Proposed RCL for Protection of Groundwater*** (Non-Industrial)						NE	NE	196,744	NE	NE	NE	NE	NE	NE	NE	NE	NE	88,817.9	14,814.8	NE	NE	NE	658.7	NE	54,472.5
WDNR Proposed RCL for Protection of Groundwater*** (Non-Industrial)						<260	<130	<67	<3.4	<10	<26	<45	<11	<29	<85	<230	<90	<55	<1200	<55	<120	<150	<120	180	480
S81	S81(4-6)	4-6	Sand	6.5	08/21/13	<260	<140	<68	86	120	<26	<45	<11	<29	<57	370	<91	<57	<120	<150	<120	<120	<45	<24	
S82	S82(4-6)	4-6	Sand	6.5	08/21/13	<260	<3000	<1500	<74	<220	<570	<990	<250	<640	<1200	<350	<2000	<1200	<2700	4500	<2700	<2700	<495	<520	
S83	S83(2-4)	2-4	Sand	6.5	08/21/13	<5700	<920	<460	410	<69	<180	<310	<77	<200	<880	3,100	620	<380	4200	2400	5200	3,900	3,600		
S84	S84(4-6)	4-6	Sand	6.5	08/21/13	<1800	<700	<350	490	440	410	240	200	<150	<290	1,600	<470	<290	<650	<760	<650	960	920		
S85	S85(4-6)	4-6	Sand	6.5	08/21/13	<1300	<140	<72	79	<11	270	<48	85	<31	<60	530	<96	<60	<130	<160	<130	300	1,000		
S86	S86(4-6)	4-6	Sand	6.5	08/21/13	<280	<130	<66	34	42	<25	<44	<11	260	<55	280	<88	<55	<120	<140	<120	210	<23		
S87	S87(4-6)	4-6	Sand	6.5	08/21/13	<250	<150	<75	<3.8	<11	<29	<50	<13	<33	<63	260	<100	<63	<140	<160	3100	250	<26		
S88	S88(0-2)	0-2	Sand	6.5	08/21/13	<290	<1600	<780	<39	<120	<300	<520	<130	<340	<650	<180	<1000	<650	53000	130000	45000	14,000	<270		
Duplicate S83(2-4)						FD1	2-4	Sand	6.5	08/21/13															

Notes:

- All analyzed samples consist of soil unless otherwise noted.
- WDNR Proposed soil RCL Summary table (May 2012) used to establish RCLs for groundwater protection and direct contact.
- NE = not established by Wisconsin Administrative Code (Wis. Adm. Code)
- NC = not calculated and/or compound not listed in EPA list of parameters.
- NA = not applicable since NR 720.13 Wis. Adm. Code or suggested RCL exists
- CK = analyte not detected to a detection limit of x
- Y = analyte detected between limit of detection and limit of quantitation
- = not analyzed
- ftg = feet below grade
- \*\*\* = dilution factor of 2 used since site investigation is complete and extent of contamination has been defined
- \*\*\* = Potential waste sample
- \* = Waste sample (Waste defined as random layers or mixtures of clay, silt, sand, and/or gravel containing coal and cinder fragments.)

XXX = concentration exceeds WDNR Proposed RCL for protection from direct contact risk (non-industrial)

XXX = concentration exceeds WDNR proposed RCL for protection of groundwater (non-industrial)

Table 3b Groundwater Sample Semi-Volatile Organic Compound Laboratory Results, Keller Property, Marquette, Wisconsin

Well Number	Date Collected	Phenol	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benz(e)pyrene	Benz(b)fluoranthene	Benz(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene	1,2,4-Trichlorobenzene
NR 140	Preventive Action Limit (µg/l)	400	NE	600	NE	0.02	0.02	0.02	NE	NE	0.03	NE	80	80	NE	NE	NE	10	NE	30	NE
NR 140	Enforcement Standard (µg/l)	2000	NE	3,000	NE	0.2	0.2	0.2	NE	NE	0.2	NE	400	400	NE	NE	NE	100	NE	350	NE
TW1	08/21/13	---	<0.52	<0.52	<0.16	<0.017	<0.042	<0.031	<0.063	<0.019	<0.083	<0.084	<0.27	<0.27	<0.52	0.8	<0.52	<0.52	<0.11	<0.13	<0.00
TW2	08/21/13	---	<0.52	<0.52	<0.15	<0.016	<0.041	<0.031	<0.062	<0.019	<0.082	<0.083	<0.27	<0.27	<0.52	1.8	<0.52	<0.52	<0.11	<0.13	<0.00
TW3	08/21/13	---	<0.52	<0.52	<0.15	<0.016	<0.041	<0.031	<0.062	<0.019	<0.082	<0.083	<0.27	<0.27	<0.52	<0.52	<0.52	<0.52	<0.11	<0.13	<0.00
TW4	08/21/13	---	<0.52	<0.52	<0.16	<0.017	<0.042	<0.031	<0.063	<0.019	<0.083	<0.084	<0.27	<0.27	<0.52	<0.52	<0.52	<0.52	<0.11	<0.13	<0.00
FD2 (TW1)	08/21/13	---	<0.53	<0.53	<0.16	<0.017	<0.042	<0.032	<0.063	<0.019	<0.084	<0.085	<0.25	<0.27	<0.52	0.63	<0.53	<0.53	<0.12	<0.13	<0.00

Notes:  
 - Analyte detected between Limit of Detection and Limit of Quantitation  
 - Concentration detected above Chapter NR 140, Wisconsin Administrative Code (NR 140, Wis. Adm. Code) preventive action limit (PAL)  
 - Concentration detected above NR 140, Wis. Adm. Code enforcement standard (ES)



Table 3a Groundwater Sample Volatile Organic Compound Laboratory Results, Keller Property, Marinette, Wisconsin

Well Number	Date Collected	Detected Volatile Organic Compounds (µg/L)																										
		Benzene	n-Butylbenzene	sec-Butylbenzene	Chloroethane	Dibromochloromethane	1,2-Dichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	p-Isopropylbenzene	Methylene Chloride	Methyl tert-butyl ether (MTBE)	Naphthalene	n-Propylbenzene	Tetrahydrofuran (THF)	Toluene	1,1,1-Trichloroethane (1,1,1-TCA)	1,1,2-Trichloroethane (1,1,2-TCA)	Trichloroethene (TCE)	Trichlorofluoromethane	Total Trimethylbenzene	Vinyl Chloride	Total Xylenes	
NR 140 Preventive Action Limit (µg/l)		0.5	NE	NE	80	6	0.5	85	7	70	70	70	100	700	700	NE	NE	12	10	NE	0.5	160	40	0.5	NE	96	0.02	400
NR 140 Enforcement Standard (µg/l)		5	NE	NE	400	60	5	850	7	70	70	100	700	700	NE	NE	60	100	NE	5	800	200	5	NE	480	0.2	2,000	
TW1	08/21/13	<0.30	2.6	1.1	<0.30	<0.30	<0.30	<0.30	<0.24	<0.30	<0.30	<0.30	<0.30	1.4	1.9	2.1	0.84	<0.40	1.2	2.5	<0.29	<0.30	<0.29	<0.40	<0.30	24.6	<0.18	3.4
TW2	08/21/13	6.77	1.5	0.64	<0.30	<0.30	<0.30	<0.30	<0.24	<0.30	<0.30	<0.30	<0.30	1.8	1.5	1.1	0.57	<0.40	1.1	1.8	<0.29	0.45	<0.29	<0.40	<0.30	14.9	<0.18	7.9
TW3	08/21/13	<0.30	<0.40	<0.30	<0.30	<0.30	<0.30	<0.30	<0.24	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.40	<0.40	<0.40	<0.30	<0.40	<0.29	<0.30	<0.29	<0.40	<0.30	<0.40	<0.18	<0.60
TW4	08/21/13	<0.30	<0.40	<0.30	<0.30	<0.30	<0.30	<0.30	<0.24	<0.30	<0.30	<0.30	<0.30	<0.30	<0.40	<0.40	<0.40	<0.40	<0.30	<0.40	<0.29	<0.30	<0.29	<0.40	<0.30	<0.40	<0.18	<0.60
FDZ (TW4)	08/21/13	<0.30	2.6	1	<0.30	<0.30	<0.30	<0.30	<0.24	<0.30	<0.30	<0.30	<0.30	1.2	1.7	2.2	0.6	<0.40	0.89	2.2	<0.29	<0.30	<0.29	<0.40	<0.30	23.1	<0.18	2.9

Notes:  
 \* = Analyte detected between Limit of Detection and Limit of Quantitation  
 X = Concentration detected above Chapter NR 140, Wisconsin Administrative Code (NR 140, Wis. Adm. Code) preventive action limit (PAL)  
 - = Concentration detected above NR 140, Wis. Adm. Code enforcement standard (ES)

State of Wisconsin  
DEPARTMENT OF NATURAL RESOURCES  
Northeast Region Headquarters  
2984 Shawano Avenue  
Green Bay WI 54313-6727

Scott Walker, Governor  
Cathy Stepp, Secretary  
Telephone 608-268-2621  
Toll Free 1-888-936-7463  
FAX 920-662-5197  
TTY Access via relay - 711



September 19, 2013

Mr. Ken Keller  
309 Ogden Street  
Marinette, WI 54143

Subject: Reported Contamination at **KELLER PROPERTY, 102 Water St, Marinette, WI**  
BRRTS Activity # **02-38-560993**

Dear Mr. Keller:

On September 16, 2013, Jeff Brand from Stantec Consulting Services, Inc., notified the Wisconsin Department of Natural Resources (WDNR) that VOC, PAH, diesel and gasoline contamination had been detected at the site described above.

Based on the information that has been submitted to the WDNR regarding this site, we believe you are responsible for investigating and restoring the environment at the above-described site under Section 292.11, Wisconsin Statutes, known as the hazardous substances spills law.

This letter describes the legal responsibilities of a person who is responsible under Section 292.11, Wis. Stats., explains what you need to do to investigate and clean up the contamination, and provides you with information about cleanups, environmental consultants, possible financial assistance, and working cooperatively with the WDNR or the Department of Agriculture, Trade and Consumer Protection (DATCP).

**Legal Responsibilities:**

Your legal responsibilities are defined both in statute and in administrative codes. The hazardous substances spill law, Section 292.11 (3) Wisconsin Statutes, states:

- **RESPONSIBILITY.** A person who possesses or controls a hazardous substance which is discharged or who causes the discharge of a hazardous substance shall take the actions necessary to restore the environment to the extent practicable and minimize the harmful effects from the discharge to the air, lands, or waters of the state.

Wisconsin Administrative Code chapters NR 700 through NR 749 establish requirements for emergency and interim actions, public information, site investigations, design and operation of remedial action systems, and case closure. Wisconsin Administrative Code chapter NR 140 establishes groundwater standards for contaminants that reach groundwater.

**Steps to Take:**

The longer contamination is left in the environment, the farther it can spread and the more it may cost to clean up. Quick action may lessen damage to your property and neighboring properties and reduce your costs in investigating and cleaning up the contamination. To ensure that your cleanup complies with Wisconsin's laws and administrative codes, you should hire a professional environmental consultant who understands what needs to be done. These are the first steps to take:

1. Within the next **30 days**, by October 18, 2013, you should submit written verification (such as a letter from the consultant) that you have hired an environmental consultant. If you do not take action within this time frame, the WDNR may initiate enforcement action against you.
2. Within the next **60 days**, by November 18, 2013, your consultant should submit a work plan and schedule for the investigation. The consultant must comply with the requirements in the NR 700 Wis. Adm. Code rule series and should adhere to current WDNR technical guidance documents.

In addition, within 30 days of completion of the site investigation, your consultant should submit a Site Investigation Report to the WDNR or other agency with administrative authority. For agrichemicals, your case will be transferred to the Department of Agriculture, Trade and Consumer Protection for oversight.

Sites where discharges to the environment have been reported are entered into the Bureau for Remediation and Redevelopment Tracking System (BRRTS), a version of which appears on the WDNR's internet site. You may view the information related to your site at any time (<http://dnr.wi.gov/botw/SetUpBasicSearchForm.do>) and use the feedback system to alert us to any errors in the data.

If you want a formal written response from the department on a specific submittal, please be aware that a review fee is required in accordance with ch. NR 749, Wis. Adm. Code. If a fee is not submitted with your reports, you should proceed under the advice of your consultant to complete the site investigation and cleanup to maintain your compliance with the spills law and chapters NR 700 through NR 749. **Do not delay the investigation of your site by waiting for an agency response.** We have provided detailed technical guidance to environmental consultants. Your consultant is expected to know our technical procedures and administrative rules and should be able to answer your questions on meeting cleanup requirements.

All correspondence regarding this site should be sent to:

Tauren Beggs  
Remediation and Redevelopment Program  
Wisconsin Department of Natural Resources  
2984 Shawano Ave  
Green Bay, WI 54313-6727  
Tauren.Beggs@Wisconsin.gov

Unless otherwise requested, please send only one hard copy of plans and reports. In addition to the paper copy, an electronic copy may also be submitted to assist the WDNR with site evaluation and discussions. A hard copy of any attachments sent electronically must be submitted for the information to be included in the site file, regardless of size. To speed processing, correspondence should reference the BRRTS and FID numbers (if assigned) shown at the top of this letter.

#### **Site Investigation and Vapor Pathway Analysis**

As you develop the site investigation workplan, we want to remind you to include an assessment of the vapor intrusion pathway. Chapter NR 716, Wisconsin Administrative Code outlines the requirements for investigation of contamination in the environment. Specifically, s. NR 716.11(3)(a) requires that the field investigation determine the "nature, degree and extent, both areal and vertical, of the hazardous substances or environmental pollution in all affected media". In addition, section NR 716.11(5)

specifies that the field investigation include an evaluation of the "pathways for migration of the contamination, including drainage improvements, utility corridors, bedrock and permeable material or soil along which vapors, free product or contaminated water may flow".

In order to ensure the vapor intrusion pathway is evaluated, you will need to include documentation with the Site Investigation Report that explains how the assessment was done. If the pathway is being ruled out, then the report needs to provide the appropriate justification for reaching this conclusion. **If the pathway cannot be ruled out, then investigation and, if appropriate, remedial action must be taken to address the risk presented prior to submitting the site for closure.** The WDNR has developed guidance to help responsible parties and their consultants comply with the requirements described above. The guidance includes a detailed explanation of how to assess the vapor intrusion pathway and provides criteria which identify when an investigation is necessary. The guidance is available at: <http://dnr.wi.gov/files/pdf/pubs/rr/RR800.pdf>.

**Additional Information for Site Owners:**

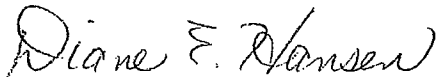
We encourage you to visit our website at <http://dnr.wi.gov/topic/Brownfields/>, where you can find information on selecting a consultant, financial assistance and understanding the cleanup process. You will also find information there about liability clarification letters, post-cleanup liability and more.

Information to help you select a consultant, materials on controlling costs, understanding the cleanup process, and choosing a site cleanup method are enclosed. In addition, *Fact Sheet 2 – Voluntary Party Remediation and Exemption from Liability* is enclosed and provides information on obtaining protection of limited liability under s. 292.15, Wis. Stats.

If you have questions, call Tauren Beggs (920) 662-5178 for more information or visit the RR web site at the address above.

Thank you for your cooperation.

Sincerely,



Diane E. Hansen  
Remediation & Redevelopment Program

- Enclosures:
1. Remediation & Redevelopment Program
  2. CLEAN (Contaminated Lands Environmental Action Network)
  3. Environmental Contamination – The Basics
  4. Selecting an Environmental Consultant
  5. Environmental Services Contractor List
  6. Fact Sheet 2, VPLE

cc: Jeff Brand, Stantec Consulting Services Inc, 1165 Scheuring Rd, De Pere, WI 54115  
Tauren Beggs - DNR, Green Bay

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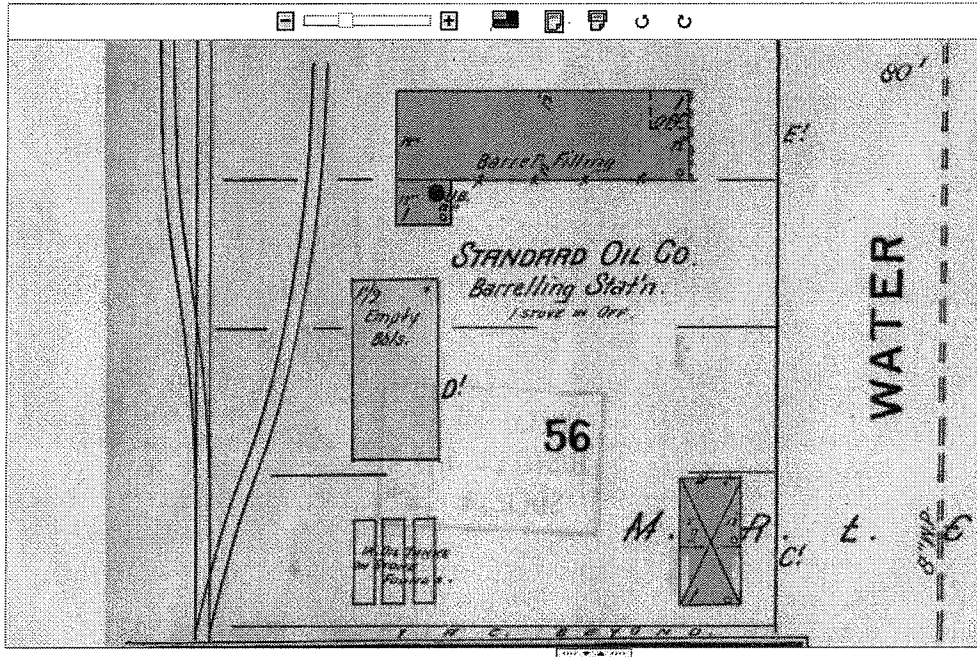
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## Marinette 1895

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### Object Description

**Short Title** Marinette 1895  
**Full Title** Insurance maps of Marinette, Marinette County, Wisconsin May 1895  
**Map Creator** Sanborn-Perris Map Co.  
**Date Original** 1895

**Description** Sanborn Fire Insurance maps are meticulously detailed, large-scale lithographed, color-keyed street maps. Sanborn Maps helped insurance agents in the late 19th and early 20th centuries determine the degree of fire hazard associated with a particular property. Sanborn Fire Insurance maps typically focus on the business districts within communities. Features include street names, street and sidewalk widths, property boundaries, locations of fire hydrants, locations of water and gas mains, and the names of most public buildings, churches and companies. The maps also document the strength of the local fire department and the presence of fire hazards such as blacksmith forges, large baker's ovens or stored kerosene, and the existence of firefighting equipment, cisterns or community water works. Rivers, canals, railroad corridors and similar features are also noted. Each map provides a detailed assessment of the buildings within a district. Assessments include an outline of each building and outbuilding, the size and number of stories of every building, the location of windows and doors, fire walls, and indications of sprinkler systems. They note the nature of the business or businesses which occupied individual buildings, sometimes even particular room uses. They list the type of construction and the composition of building materials including the framing, flooring, and roofing materials.

**Ordering Information** Use the 'Buy a Copy' link just below. If no such link appears there, send an email to [lisa.marine@wisconsinhistory.org](mailto:lisa.marine@wisconsinhistory.org) with the digital identifier at the bottom of this screen for information about ordering a copy.

**State/Province** Wisconsin  
**County** Marinette

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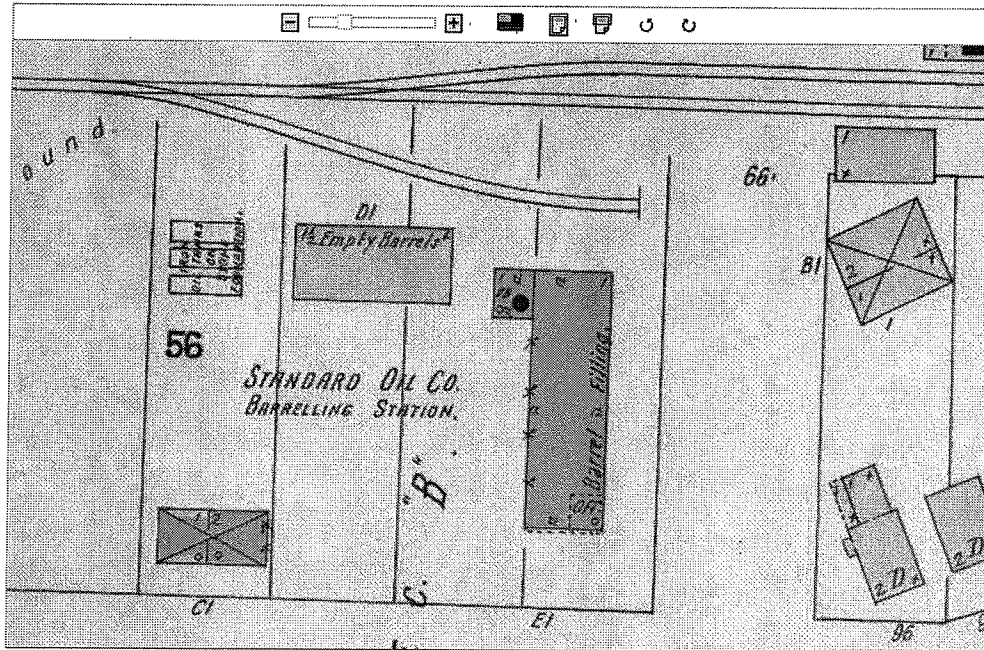
Reference URL Share

## Marinette 1901

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### Object Description

**Short Title** Marinette 1901  
**Full Title** Insurance maps of Marinette, Marinette County, Wisconsin July 1901  
**Map Creator** Sanborn-Perris Map Co.  
**Date Original** 1901

**Description** Sanborn Fire Insurance maps are meticulously detailed, large-scale lithographed, color-keyed street maps. Sanborn Maps helped insurance agents in the late 19th and early 20th centuries determine the degree of fire hazard associated with a particular property. Sanborn Fire Insurance maps typically focus on the business districts within communities. Features include street names, street and sidewalk widths, property boundaries, locations of fire hydrants, locations of water and gas mains, and the names of most public buildings, churches and companies. The maps also document the strength of the local fire department and the presence of fire hazards such as blacksmith forges, large baker's ovens or stored kerosene, and the existence of firefighting equipment, cisterns or community water works. Rivers, canals, railroad corridors and similar features are also noted. Each map provides a detailed assessment of the buildings within a district. Assessments include an outline of each building and outbuilding, the size and number of stories of every building, the location of windows and doors, fire walls, and indications of sprinkler systems. They note the nature of the business or businesses which occupied individual buildings, sometimes even particular room uses. They list the type of construction and the composition of building materials including the framing, flooring, and roofing materials.

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**State/Province** Wisconsin  
**County** Marinette

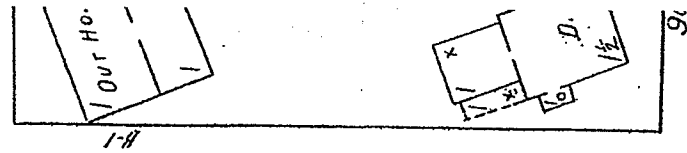
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### Marinette 1901

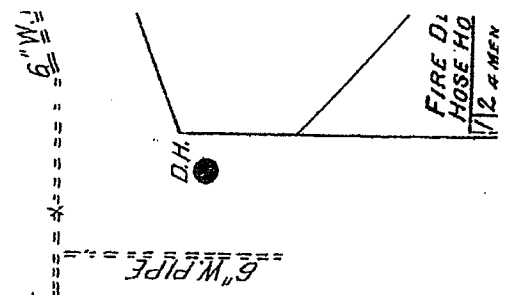
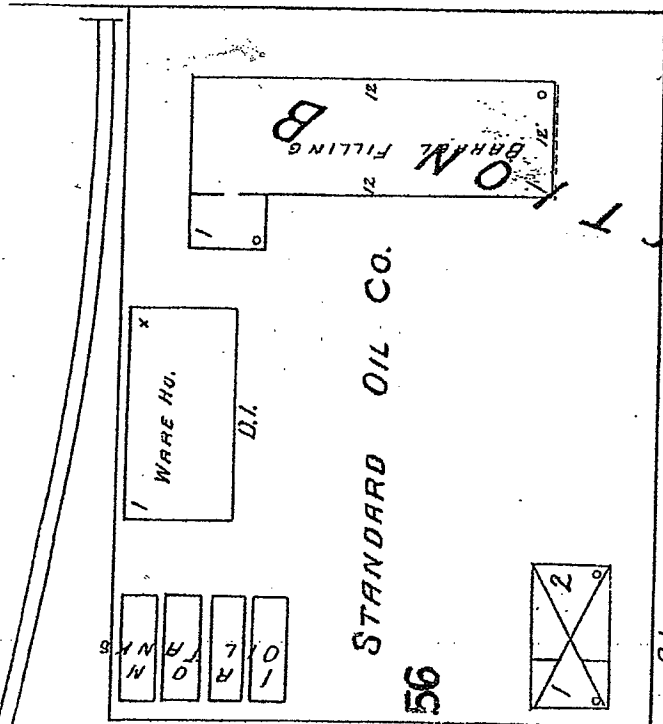
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1910

Rail Road

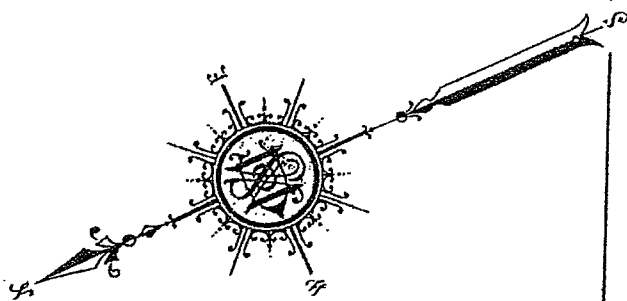


66'



S M C T I O N B

WATER

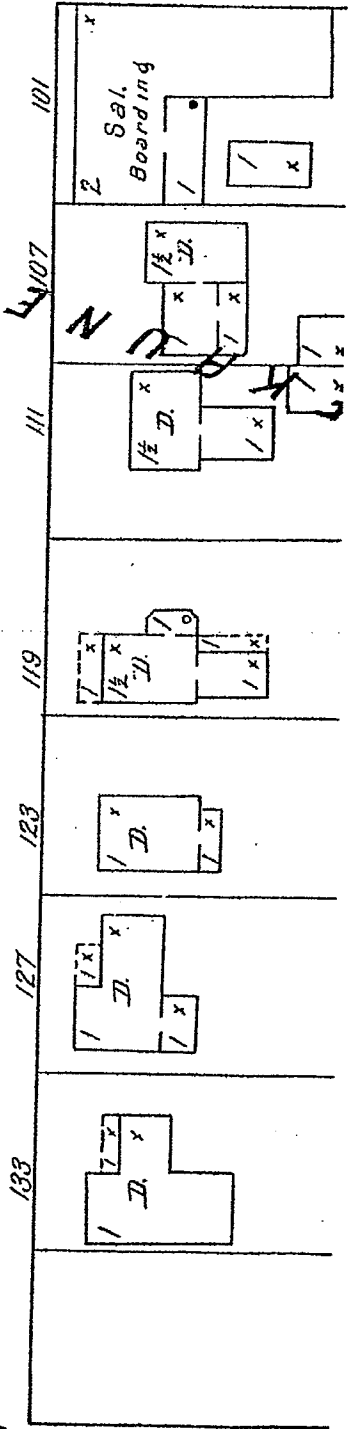


34

8" W.P.I.P.E.

D.H.

66'



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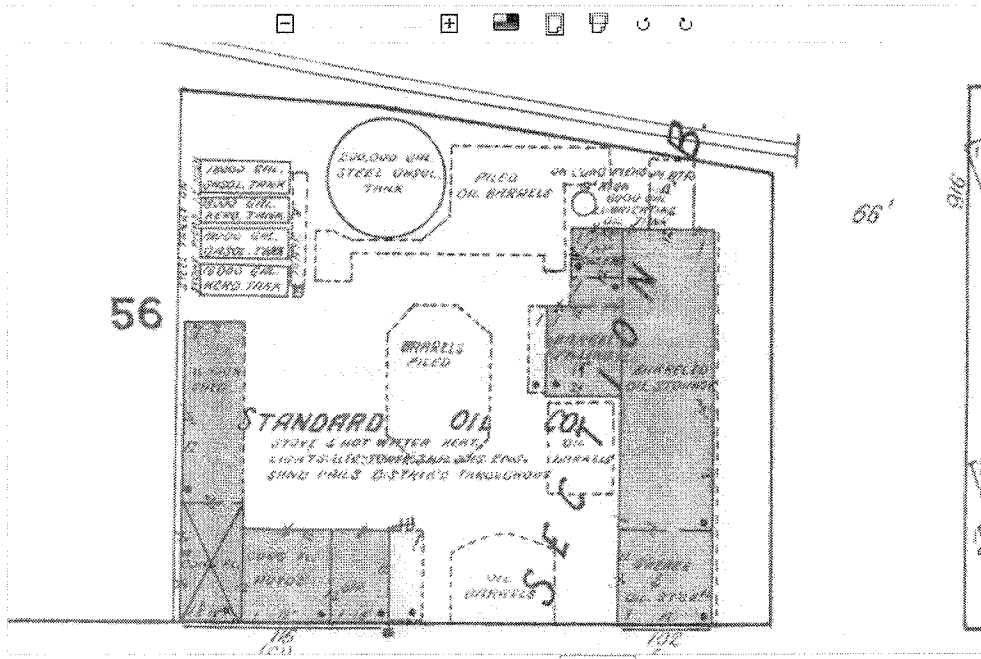
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Sheet 17

Sheet 18

Sheet 19

Sheet 20

Sheet 21

Sheet 22

Sheet 23

Sheet 24

Sheet 25

Sheet 26

#### Object Description

**Short Title** Marinette 1921

**Full Title** Marinette, Marinette County, Wisconsin December 1921

**Map Creator** Sanborn Map Company

**Date Original** 1921

**Description** Sanborn Fire Insurance maps are meticulously detailed, large-scale lithographed, color-keyed street maps. Sanborn Maps helped insurance agents in the late 19th and early 20th centuries determine the degree of fire hazard associated with a particular property. Sanborn Fire Insurance maps typically focus on the business districts within communities. Features include street names, street and sidewalk widths, property boundaries, locations of fire hydrants, locations of water and gas mains, and the names of most public buildings, churches and companies. The maps also document the strength of the local fire department and the presence of fire hazards such as blacksmith forges, large baker's ovens or stored kerosene, and the existence of firefighting equipment, cisterns or community water works. Rivers, canals, railroad corridors and similar features are also noted. Each map provides a detailed assessment of the buildings within a district. Assessments include an outline of each building and outbuilding, the size and number of stories of every building, the location of windows and doors, fire walls, and indications of sprinkler systems. They note the nature of the business or businesses which occupied individual buildings, sometimes even particular room uses. They list the type of construction and the composition of building materials including the framing, flooring, and roofing materials.

**Ordering Information** Use the 'Buy a Copy' link just below. If no such link appears there, send an email to [lisa.marine@wisconsinhistory.org](mailto:lisa.marine@wisconsinhistory.org) with the digital identifier at the bottom of this screen for information about ordering a copy.

**State/Province** Wisconsin



20

2ND ST.

DH

200 WATER

55

MENOMINEE RIVER

56

120

115

102

925

66'

19' SHED

STANDARD OIL CO. OF INDIANA BULK STA. FOWNSHED.

OIL W. HO.

5-18,000 GALS EACH, GASOL. TANKS ON 10' STONE PIERS

ALL STEEL TANKS GASOL. TANK 200,000 GALS

PUMP

6,000 GALS. OIL TANK ON CONCRETE PIERS

WOOD \* 2 1/2" x 4"

911

20

6' W.P. (2015) DH

80'

8" W.P.

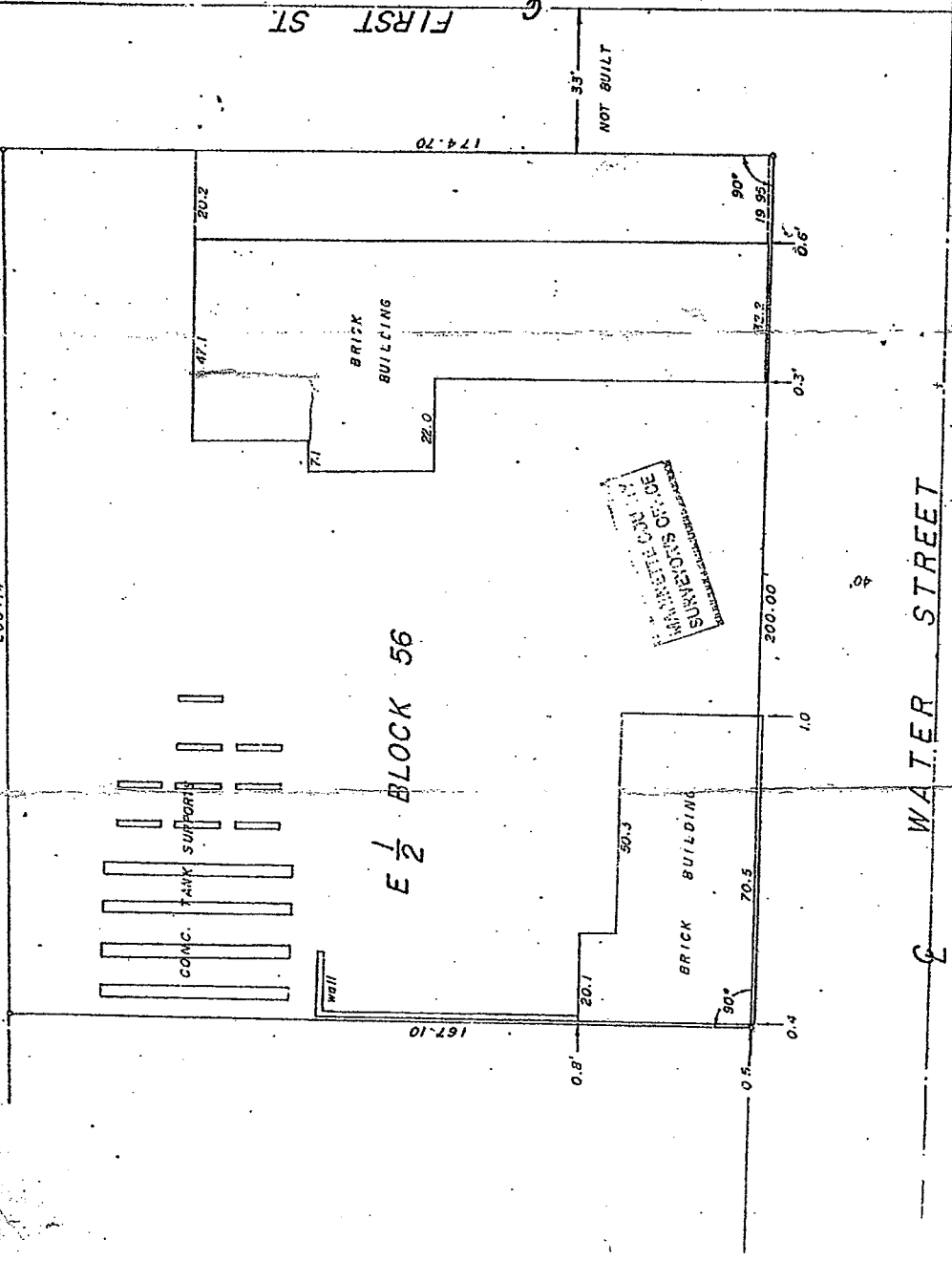
WOOD TRESILE

M E T R

1935 - updated to 1952

R.R. TRACK

200.14



# TAX LISTING DEPARTMENT

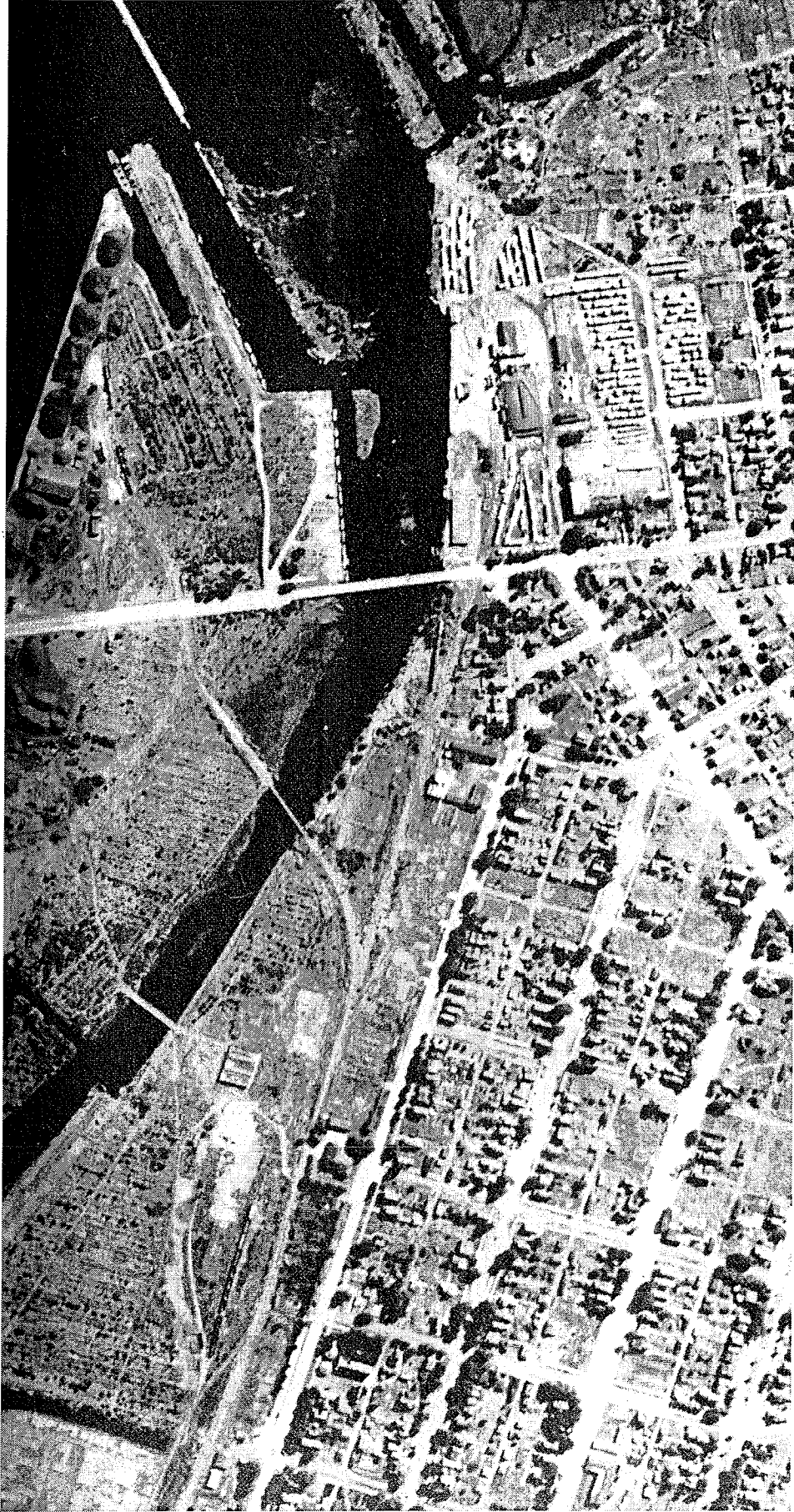
The Eastern 1/2 of BLOCK 56, of Section B of Menominee River Lumber Company's First Addition to the Village of Marinette, in the City of Marinette, beginning at a point at the northeast corner of said BLOCK 56 and running westerly along the south line of said BLOCK 56, 200 feet; thence northwesterly on a line parallel to the east line of said BLOCK 56, 167.10 feet to the R/W of the Chicago & North Western Spur Track; thence easterly parallel to the south line of said BLOCK 56 to the east line of said BLOCK 56; thence southerly along the east line of said BLOCK 56, 174.75 feet to the point of beginning.

SCALE 1"=20'

George E. Johnson  
 Wisconsin Land Surveyor B-00751.  
 1631 15th Ave  
 Menominee, Michigan 49850  
 Sept 17, 1975

I hereby certify that on the 13th day of September, 1975, that I have surveyed the above described property and that the plat is a correct representation of the exterior boundary lines thereof, and that the improvements have been accurately shown.

REVISIONS	
NO.	DATE



Aerial Photo August 28, 1938  
Provided by Wisconsin Historic Aerial Image Finder  
<http://maps.sco.wisc.edu/WHAFinder/#>



Aerial Photo October 23, 1969  
Provided by United States Geologic Survey – Earth Explorer  
<http://earthexplorer.usgs.gov/>



Aerial Photo April 20, 1954  
Provided by United States Geologic Survey – Earth Explorer  
<http://earthexplorer.usgs.gov/>

**Site Investigation Field Procedures Workplan – METCO  
Keller Property**

**APPENDIX F/HEALTH AND SAFETY PLAN**

**SAFETY PLAN INFORMATION**

Code: METCO

METCO Project No: C2374

Company Name: METCO

Contact:

Last Name: Powell

First Name: Jason

Salutation:

P.O. Box

Street: 709 Gillette Street, Suite 3

City: La Crosse

State: WI

Zip Code: 54603-0000

Area code: 608

Phone: 781-8879

Fax: (608)781-8893

**SITE INFORMATION**

Site Name: Keller Property

Site Address: 102 Water Street

Site Address City: Marinette

Site Address State: WI

Site Address Zip Code: 54143

Site Address County: Marinette

WDNR Contact: Beth Erdman

Fire Dept. Contact: Marinette

Project Date: 3/1/2015

Tank Removal Contractor:

General Contractor: METCO

**TANK INFORMATION**

**Tank Sizes\Contents**

Tank 1:	18000	Contents: Gasoline	Age: Removed
Tank 2:	18000	Contents: Gasoline	Age: Removed
Tank 3:	18000	Contents: Kerosene	Age: Removed
Tank 4:	18000	Contents: Kerosene	Age: Removed
Tank 5:	200000	Contents: Gasoline	Age: Removed
Tank 6:	6000	Contents: Lubricating Oil	Age: Removed

**PURPOSE OF ACTIVITY (Check all appropriate)**

New Tank Installation	<input type="checkbox"/>	Tank Closure	<input type="checkbox"/>	Install Tank Leak Detection	<input type="checkbox"/>
Tank/Pipe Removal	<input type="checkbox"/>	Tank\Pipe Repair	<input type="checkbox"/>	Install Spill Protection	<input type="checkbox"/>
Petroleum Release Investigation	<input checked="" type="checkbox"/>	Install Remedial System	<input type="checkbox"/>	Install Overfill Protection	<input type="checkbox"/>
Leak Detection Testing	<input type="checkbox"/>	Install Monitoring Wells	<input type="checkbox"/>	Install Kard System	<input type="checkbox"/>
Other					

Background  Information  Status  Complete  Ir

**TYPE OF SITE**

**SITE HEALTH AND SAFETY PLAN**

**POTENTIAL HEALTH AND SAFETY HAZARDS (check all appropriate)**

- |   |  |   |
|---|--|---|
| Handling/transfer of product: <input type="checkbox"/>    | Heavy Equipment: <input checked="" type="checkbox"/> | Snakes: <input type="checkbox"/>          |
| * Fire  | Noise: <input checked="" type="checkbox"/>           | Insects: <input type="checkbox"/>         |
| * Explosions  | Oxygen Depletion: <input type="checkbox"/>           | Rodents: <input type="checkbox"/>         |
| General Construction: <input checked="" type="checkbox"/> | Excavation: <input type="checkbox"/>                 | Heat: <input checked="" type="checkbox"/> |
| * Electrical Hazards                                      | * Cave-ins   | Cold: <input checked="" type="checkbox"/> |
| * Physical Injury   | * Falls, slips                                       |   |
| Confined Space Entry: <input type="checkbox"/>            | Poisonous plants: <input type="checkbox"/>           |   |
| * Explosions  | Other (Specify):                                     |   |

Description of site-specific hazards (utilities, terrain, etc.):  
Underground utilities and site traffic

**EVALUATION OF CHEMICAL HAZARDS (MSDS sheets attached)**

NAME	PHYSICAL STATE	ROUTE OF ENTRY	OSHA PEL/TLV	SYMPTOMS OF EXPOSURE
1.	Vapor/Liq	Inh/Skin	25-300PPM	Nausea, Irritation
2.				
3. Gasoline	Liquid/Vapor	Inh/Skin	100 PPM	Irritation of eyes, nose and throat
4. Kerosene/Diesel	Liquid/Vapor	Inh/Skin	100 PPM	
5.				

**ON-SITE PERSONNEL RESPONSIBILITIES**

Team Member	Responsibilities
1. Jason Powell	Site Project Management
2. Eric Dahl	Hydrogeologist
3. Jon Jensen	Staff Scientist
4. Jacob Zahn	Hydrogeologist

**METHOD TO CONTROL POTENTIAL HEALTH AND SAFETY HAZARDS**

**MONITORING INSTRUMENTS**

Combustible Gas Indicator:

<b>Action Levels</b>	<b>Action</b>
0-10% LEL No Explosion Hazard	None
<b>Action Levels</b>	<b>Action</b>
Normal: 21%	None
Oxygen Deficient: Less than 21%	Notify Health & Safety Officer
Oxygen Deficient: Less than 19.5%	Evacuate

Photoionization Detector:       Flame Ionization Detector:       Detector Tubes:



SITE HEALTH AND SAFETY PLAN

PERSONAL PROTECTIVE EQUIPMENT

Minimum Requirements

- 1. Hardhat
- 2. Safety glasses\goggles
- 3. Steel toes\shank shoes or boots
- 4. Flame retardant coveralls
- 5. Hearing protection (muffs or ear plugs)

Is additional PPE required?      yes:       no:

Additional Requirements

- |                                      |                          |                        |                          |
|--------------------------------------|--------------------------|------------------------|--------------------------|
| Uncoated tyvek coveralls:            | <input type="checkbox"/> | Full face respirators: | <input type="checkbox"/> |
| Saranex tyvek coveralls:             | <input type="checkbox"/> | * type of cartridge:   | <input type="checkbox"/> |
| Rubber boots:                        | <input type="checkbox"/> | SCBA \ SAR:            | <input type="checkbox"/> |
| Overboots:                           | <input type="checkbox"/> | Other:                 |                          |
| Surgical Inner Gloves:               | <input type="checkbox"/> |                        |                          |
| Butyl Neoprene\nitrile outer gloves: | <input type="checkbox"/> |                        |                          |

Level of protection designated    A:       B:       C:       D:

SITE CONTROL

Work Zones

Support Zone: Beyond a 25' Radius of drilling or excavation and upwind of operation

Contamination Reduction Zone: Between 15 foot and 25 foot Radius of drilling or excavation

Exclusion Zone: Within 15 feet Radius of excavation or machine operation

Site Entry Procedure: Obtain approval and instructions from Project Leader.

Decontaminations Procedures:

Personnel: Remove protective equipment and wash hands prior to eating.

Equipment: Wash with brush and Alconox soap and rinsed with portable water.

Investigation-derived material disposal

Stockpiling: The soils will be placed on and covered with plastic. The client will determine the stockpile location, but will have to be approved by the Project Manager. Soils will be disposed of by the most efficient and cost effective approved method.

DOT drums: Label drums as to content and date filled. Routinely inspect drums for leakage or spills. Place together in area where movement is at a minimum.

Work Limitations: Daylight hours. No eating, drinking, or smoking in the exclusion zone or the contamination reduction zone.

Employee Limitations:

Site Resources

Plan Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

Shower:       Water Supply:

SITE HEALTH AND SAFETY PLAN

CONTINGENCY PLANNING

LOCAL RESOURCES

Phone Number

<b>Ambulance:</b> Marinette	<b>911</b>
<b>Hospital Emergency Room:</b> Bay Area Medical Center	<b>(715) 735-6621</b>
<b>Poison Control Center:</b> Milwaukee	<b>(800) 222-1222</b>
<b>Police</b> Marinette	<b>911</b>
<b>Fire Dept:</b> Marinette	<b>911</b>
<b>Hazardous Waste Response Center:</b>	<b>800-943-0003 Wisconsin</b>
	<b>EPA 800-424-8802</b>

**Location Address:** 102 Water Street, Marinette, WI

EMERGENCY ROUTES (attach maps)

**Hospital:** Bay Area Medical Center (310 Shorel Drive, Marinette, WI 54143) - Travel 500 feet east on Water St to Ogden St, turn right on Ogden St and travel 0.4 miles to W Bay Shore St, turn right on W Bay Shore St and travel 1.3 miles to University Dr, turn right on University Dr and travel 0.2 miles, turn right at hospital entrance and travel 500 feet, hospital will be on right

**Other:**

EMERGENCY PROCEDURES

If an emergency develops at the site, the discoverer will take the following course of action:

- \* Notify the proper emergency service (fire, police, etc.) for assistance.
- \* Notify other personnel on the site. Notify Project Leader.
- \* Contact METCO and the client representative to inform them of the incident as soon as possible.
- \* Prepare a summary report of the incident for METCO and the client representative.

ON-SITE ORGANIZATION

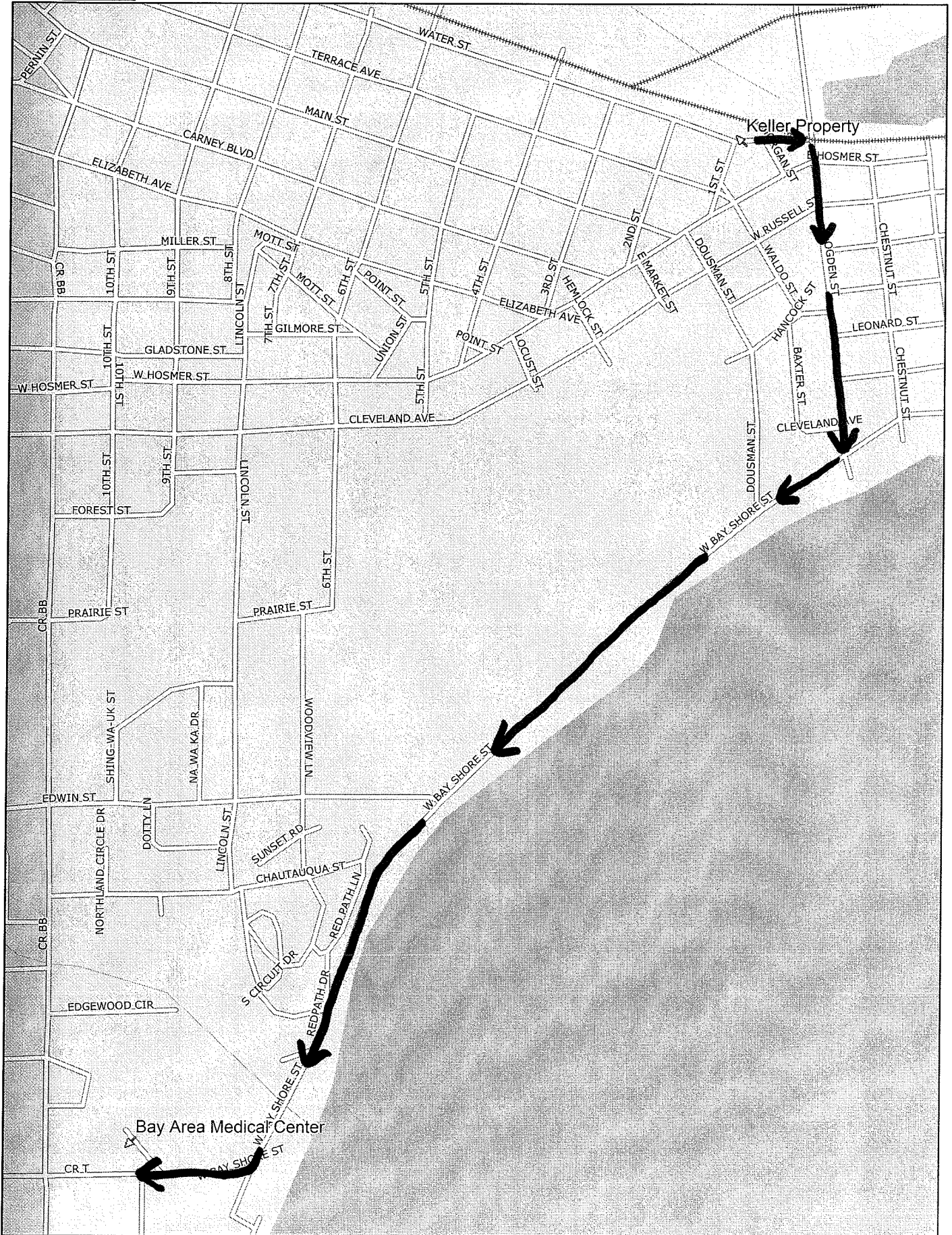
PHONE NUMBERS

<b>METCO Project Leader:</b> Jason Powell	work	608-781-8879
	home	608-526-6108
<b>METCO Safety Officer:</b> Linda Eastman	work	1-800-236-0448
<b>Engineer/Architect Contact:</b>	home	(608)489-2236
<b>Client Contact:</b> Ken Keller		(715) 923-0449
<b>METCO Corporate Contact:</b> Paul Knower	home	(608)489-2659
	work	1-800-236-0448

# **DAILY SAFETY PLAN CHECK**

---

- 1. Hard-hat**
- 2. Visible fire extinguisher**
- 3. Safety glasses**
- 4. Hearing protection**
- 5. No smoking on site**
- 6. Safety data sheet**
- 7. Route to hospital**
- 8. Barricades (cones, flags, fences, vehicle)**
- 9. Emergency phone numbers**
- 10. Know where the job site book is**



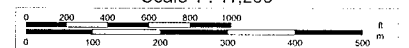
Data use subject to license.

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www.delorme.com



Scale 1 : 11,200



1" = 933.3 ft

Data Zoom 14-2

**Site Investigation Field Procedures Workplan – METCO  
Keller Property**

**APPENDIX G/QUALIFICATIONS**

**Site Investigation Field Procedures Workplan - METCO  
Keller Property**

**Ronald J. Anderson, P.G.**

**Professional Titles**

- Senior Hydrogeologist
- Project Manager

**Credentials**

- Licensed Professional Geologist in Wisconsin
- Licensed Professional Geologist in Minnesota
- Recognized by the State of Wisconsin Department of Natural Resources (Chapter NR712) as a qualified Hydrogeologist
- Certified by State of Wisconsin/DSPS to conduct PECFA-funded LUST projects
- Certified tank closure site assessor (#41861) in Wisconsin
- Member of the Wisconsin Groundwater Association
- Member of the Minnesota Groundwater Association
- Member of the Federation of Environmental Technologist, Inc.
- Member of the Wisconsin Fabricare Institute

**Education**

Includes a BA in Earth Science from the University of Minnesota-Duluth. Applicable courses successfully completed include Hydrogeology, Applied Hydrogeology, Environmental Geology, Geological Field Methods, Geology Field Camp, Geomorphology, Structural Geology, Stratigraphy/Tectonics, Mineralogy/Petrology, Glacial/Quaternary Geology, Geology of North America, Oceanography, General Chemistry, Organic Chemistry, and Environmental Conservation

**Post-Graduate Education**

Includes Personnel Protection and Safety, Conducting Comprehensive Environmental Property Assessments, Groundwater Flow and Well Hydraulics, Effective Techniques for Contaminated Groundwater Treatment, and numerous other continuing education classes and conferences.

**Work Experience**

Includes nine months with the Wisconsin Department of Natural Resources Leaking Underground Storage Tank Program regulating LUST sites and since June 1990, with METCO as a Hydrogeologist and Project Manager. Duties have included: managing, conducting, and reporting tank closure assessments; property assessment, LUST investigations; spill investigations; agricultural chemical investigations, dry cleaning chemical investigations, general geotechnical/environmental investigations; Geoprobe projects (soil, groundwater, soil gas sampling); drilling projects (soil boring and monitoring wells); and remedial projects. Since 1989, METCO has sampled/consulted over 700 environmental sites.

**Site Investigation Field Procedures Workplan - METCO  
Keller Property**

**Jason T. Powell**

**Professional Title**

- Staff Scientist

**Credentials**

- Recognized by the State of Wisconsin Department of Natural Resources (Chapter NR712) as a qualified Scientist.

**Education**

Includes a BS in Groundwater Management from the University of Wisconsin- Stevens Point. Applicable courses successfully completed include Hydrogeology, Applied Hydrogeology, Environmental Geology, Hydrogeology-Groundwater Flow Modeling, Groundwater Management, Structural Geology, Mineralogy, Glacial Geology, Soils, Soil Physics, Hydrology, Geochemistry, Water Chemistry, Organic Chemistry, General Chemistry, Environmental Issues.

**Post-Graduate Education**

40-hour OSHA Hazardous Materials Safety Training course with 8-hour refresher course.

**Work Experience**

With METCO since May 1992 as a Geoprobe Assistant and Geoprobe Operator. In June 1995 to July 1996 as a Environmental Technician. In July 1996 as a Staff Scientist. Duties have included: LUST investigations; general geotechnical/environmental investigations; Geoprobe projects (soil, groundwater sampling); drilling projects (soil boring and monitoring wells); remedial projects (sampling, pilot tests, system operation/maintenance) and project management.

**Site Investigation Field Procedures Workplan - METCO  
Keller Property**

**Eric J. Dahl**

**Professional Title**

- Hydrogeologist

**Credentials**

- Recognized by the State of Wisconsin Department of Natural Resources (Chapter NR712) as a qualified Hydrogeologist.
- Registered through the Wisconsin Department of Safety and Professional Services as a PECFA consultant (#823519).
- Member of the Geological Society of America

**Education**

Includes B.S. in Geology from the University of Wisconsin-Eau Claire. Applicable courses successfully completed include Environmental Geology, Physical Hydrogeology, Chemical Hydrogeology, Computer Modeling in Hydrogeology, Aqueous Geochemistry, Field Geology I and II, Mineralogy and Petrology I and II, Sedimentology and Stratigraphy, Petroleum and Economic Geology, Earth Resources, Earth History, and Structural Geology.

**Post-Graduate Education**

40-hour OSHA Hazardous Materials Safety Training course with 8-hour refresher course.

**Work Experience**

With METCO since November 1999 as a Hydrogeologist. Duties have included: Site Investigations, Phase I and Phase II Environmental Site Assessments, Case Closure Requests/GIS Registry, geoprobe projects (oversight, direction, and sampling), drilling projects/monitoring well installation (oversight, direction, and sampling), soil excavation projects (oversight, direction, and sampling), geoprobe operation, and operation and maintenance of remedial systems.



**Site Investigation Field Procedures Workplan - METCO  
Keller Property**

**Thomas P. Pignet, P.E.**

**Professional Titles**

- Chemical Engineer
- Industrial Engineer

**Credentials**

- Licensed Professional Engineer in Wisconsin

**Education**

Undergraduate: B.S. in Chemical Engineering from the University of Wisconsin. Applicable courses include the standard chemistry curriculum - basic, physical, organic, etc. - plus engineering transport phenomena, chemical unit operations (e.g. separations), fluid mechanics, etc.

**Post-Graduate Education**

Ph.D. in Chemical Engineering from the University of Minnesota - with applicable special training in absorption & catalysis; M.S. in Industrial Engineering from the University of Wisconsin - Milwaukee - with special emphasis on statistical techniques and data analysis. Applicable further training: continuing education, semester-length courses in [1] Understanding Environmental & Safety Regulation; [2] Hazardous & Toxic Waste Management; plus a number of 1-2 day workshops - Fire & Explosion Safety; Small Quantity Generations of Hazardous Waste.

**Work Experience**

Includes ten years as a research chemical engineer with a large chemical manufacturer; one year as process development engineer and demonstration-scale test analyst on a unique coal gasification project; ten years in association with UW-M, teaching and consulting to industry on energy efficiency, waste minimization and productivity improvement. One year working with a small engineering consulting firm on energy, environmental, and process improvement projects, including LUST Investigations and Remediations. With METCO since February 2000. Duties include Remedial Action Plan preparation, pilot test design and performance, remedial systems design and implementation, and general management of METCO's remedial projects.

## **Site Investigation Field Procedures Workplan - METCO Keller Property**

**Jon Jensen**

### **Professional Title**

- Staff Scientist

### **Credentials**

- Registered through the Wisconsin Department of Safety and Professional Services as a PECFA consultant (#1294924 ).

### **Education**

Includes B.S. in Geography with and Environmental Science minor from University of Wisconsin – La Crosse: Applicable courses successfully completed include Interpretation of Aerial Photographs, Intro to GIS, Advanced Remote Sensing, Fundamentals of Cartography, Biogeography, and Conservation of Global Environments.

### **Work Experience**

With METCO since July, 2014 as Staff Scientist. Duties include: soil and groundwater sampling, operation and maintenance of remedial systems, geoprobe projects (oversight, direction, and sampling), site mapping, data reduction and analysis, and reporting.

**Site Investigation Field Procedures Workplan - METCO  
Keller Property**

**Jacob Zahn**

**Professional Title**

- Staff Scientist

**Credentials**

- Registered through the Wisconsin Department of Safety and Professional Services as a PECFA consultant (#1298982).

**Education**

Includes B.S. in Earth Science with Chemistry minor, University of Minnesota, Twin Cities. Applicable courses successfully completed include Field Geology, Analytical Chemistry, Mineralogy, Fluid Mechanics, Geodynamics, Earth Surface Dynamics, Thermodynamics, Sedimentology/Stratigraphy, Petrology, and Organic Chemistry.

**Work Experience**

With METCO since September, 2014 as Staff Scientist. Duties include: soil and groundwater sampling, operation and maintenance of remedial systems, geoprobe projects (oversight, direction, and sampling), site mapping, data reduction and analysis, and reporting.