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LUST Investigation Field Procedures Workplan

Terry's Kerr McGee (Terry's Towing)
505 North Iowa Street
Dodgeville, Wisconsin

February 18, 2010
by METCO
WDNR File Reference #: 03-25-001108
PECFA Claim #: 53533-9999-05

METCO

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This document was prepared by:

Jason T. Powell
Staff Scientist

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

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1421 State Road 16♦ La Crosse, WI 54601 ♦ 1-800-552-2932 ♦ Fax (608) 781-8893 Email: rona@metcohq.com ♦www.metcohq.com

February 18, 2010

WDNR BRRTS#: 03-25-001108
PECFA Claim #: 53533-9999-05

Terry Bystol
425 Powell Street
Dodgeville, WI 53533

Dear Mr. Bystol,

Enclosed is our "LUST Investigation Field Procedures Workplan" concerning the Terry's Kerr McGee (Terry's Towing) site in Dodgeville, 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: Jeff Ackerman – WDNR

LUST Investigation Field Procedures Workplan - METCO
Terry's Kerr McGee (Terry's Towing)

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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
WDCOMM - Wisconsin Department of Commerce
WDILHR - Wisconsin Department of Industry, Labor, and Human Relations
WDNR - Wisconsin Department of Natural Resources
WPDES - Wisconsin Pollutant Discharge Elimination System

LUST Investigation Field Procedures Workplan - METCO
Terry's Kerr McGee (Terry's Towing)

OBJECTIVES

Requirements of the WDNR

A Leaking Underground Storage Tank (LUST) 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 Soil Cleanup Standards or COMM46/NR746 Table 1/Table 2 Values may require 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 a LUST Investigation shall be no more than $20,000 unless pre-approved by PECFA. All consultant and commodity service costs must not exceed the Wisconsin Department of Commerce Usual and Customary Charges.

Purpose of Document

This document briefly outlines all methods and procedures used by METCO personnel concerning "LUST 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 and Wisconsin Department of Commerce (WDCOMM) Bureau of PECFA.

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

INTRODUCTION

Site Name

Terry's Kerr McGee (Terry's Towing)

Site Address

505 North Iowa Street
Dodgeville, Wisconsin

Legal Description

NW ¼, SW ¼, Section 27, Township 6 North, Range 3 East, Iowa County

Contact or Client

Terry Bystol
425 Powell Street
Dodgeville, WI 53533
(608) 930-2855

WDNR Project Manager

Jeff Ackerman
WDNR South Central Region
3911 Fish Hatchery Road
Madison, WI 54901
(608) 275-3323

Consultant

METCO
Ronald J. Anderson, P.G.
Jason T. Powell
1421 State Road 16
La Crosse, WI 54601
(608) 781-8879

SITE BACKGROUND

Facility

The subject property is currently used as an auto repair and towing business. A gas station operated on this property from the 1960's until the mid-1990's. In 1995, four UST's were removed from the subject property. The removed UST's consisted of a 4,000 gallon leaded gasoline, a 4,000 gallon unleaded gasoline, a 3,000 gallon unleaded gasoline, and one 500 gallon waste oil. To our knowledge, no other tanks have existed or currently exist on the subject property.

On May 28, 1991, Aqua-Tech, Inc. conducted a Phase II Environmental Assessment at the subject property on behalf of the Wisconsin Department of Transportation. During the assessment, three soil borings (KM-1, KM-2, and KM-3) were advanced along the western boundary of the subject property. In each boring one soil sample was collected for Total Petroleum Hydrocarbons (TPH) analysis and one groundwater sample was collected for BTEX analysis. The highest levels of petroleum contamination were detected in soil boring KM-1, which showed 173.7 ppm TPH as gasoline in the soil sample along with NR140 ES exceedances in groundwater for Benzene (25,000 ppb), Toluene (6,300 ppb), Ethylbenzene (4,700 ppb) and Xylenes (14,000 ppb). The soil analytical results from KM-2 and KM-3 showed no detects for TPH, however groundwater analytical results from KM-2 (2.6 ppb Benzene) and KM-3 (91 ppb Benzene) showed NR140 PAL and ES exceedances. The contamination was subsequently reported to the WDNR, who then required that a LUST Investigation be completed.

Numerous LUST, ERP, and Spill sites exist in the City of Dodgeville. The nearest of these include the following:

- Marathon Oil Site #2 (03-25-001085), which is located approximately 300 feet to the south and was closed by the WDNR in 2001.
- Seay Property (03-25-001841), which is located approximately 400 feet to the south and is an open LUST site.
- Wagner Property (02-25-001698), which is located approximately 400 feet to the northwest and was closed by the WDNR in 1999.

It is currently unknown if any of these are influencing or being influenced by the subject property.

Potential Risks and Impacts

The City of Dodgeville has five active municipal wells which provide potable water throughout the city with the nearest well located 3,100 feet southwest of the subject property. Because the city does not keep record of private wells, it

is unknown if any private wells still exist within the city limits. If any private wells do exist, it is presumed that they are used for non-potable purposes. Municipal and private well locations will be further researched during the site investigation.

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, the Dodgeville is located in the northern portion of the Pectonica-Sugar River Basin. This area is characterized by rugged, steep-walled valleys and high relief, a lack of glacial deposits, and streams that have cut deeply into the relatively flat-lying bedrock.

The elevation of the site is approximately 1,180 feet above Mean Sea Level (MSL). See Appendix A for site location.

Geology

Native unconsolidated materials in this area generally range from silty sand to clay. The unconsolidated materials are underlain by dolomite bedrock at approximately 10-15 feet below ground surface.

Hydrology

The nearest surface water is an unnamed stream, which exists approximately 4,800 feet to the southeast of the subject property.

Hydrogeology

Based on nearby LUST sites, the depth to groundwater in this area is estimated to be approximately 5 to 10 feet below ground surface. Groundwater flow direction is expected to be toward the east to southeast.

SCOPE OF WORK

LUST 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 one to two day Geoprobe Project. We propose 8 to10 borings to 10-15 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.
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 4 to 6 boreholes to be completed on/off site. METCO has also proposed 3 to 5 monitoring wells to be installed on/off site. Based on the results of the Geoprobe project, we will know 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/bedrock 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 or WDCOMM for review and discussion.

METCO PROCEDURES AND METHODS

Geoprobe

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

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 HW-101 HNU Meter equipped with a 10.2 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.

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, a slug test may be conducted on one 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 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.

Variances

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

SCHEDULE FOR INVESTIGATION PROJECT

The following is a checklist of activities that have been, or will be completed, concerning the LUST Investigation, along with an estimated time frame. A typical LUST 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 LUST 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 LUST Investigation Field Procedures Workplan to client

and WDNR for review and approval (2/18/10).

5) METCO conducts Geoprobe Project (two-four 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 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).

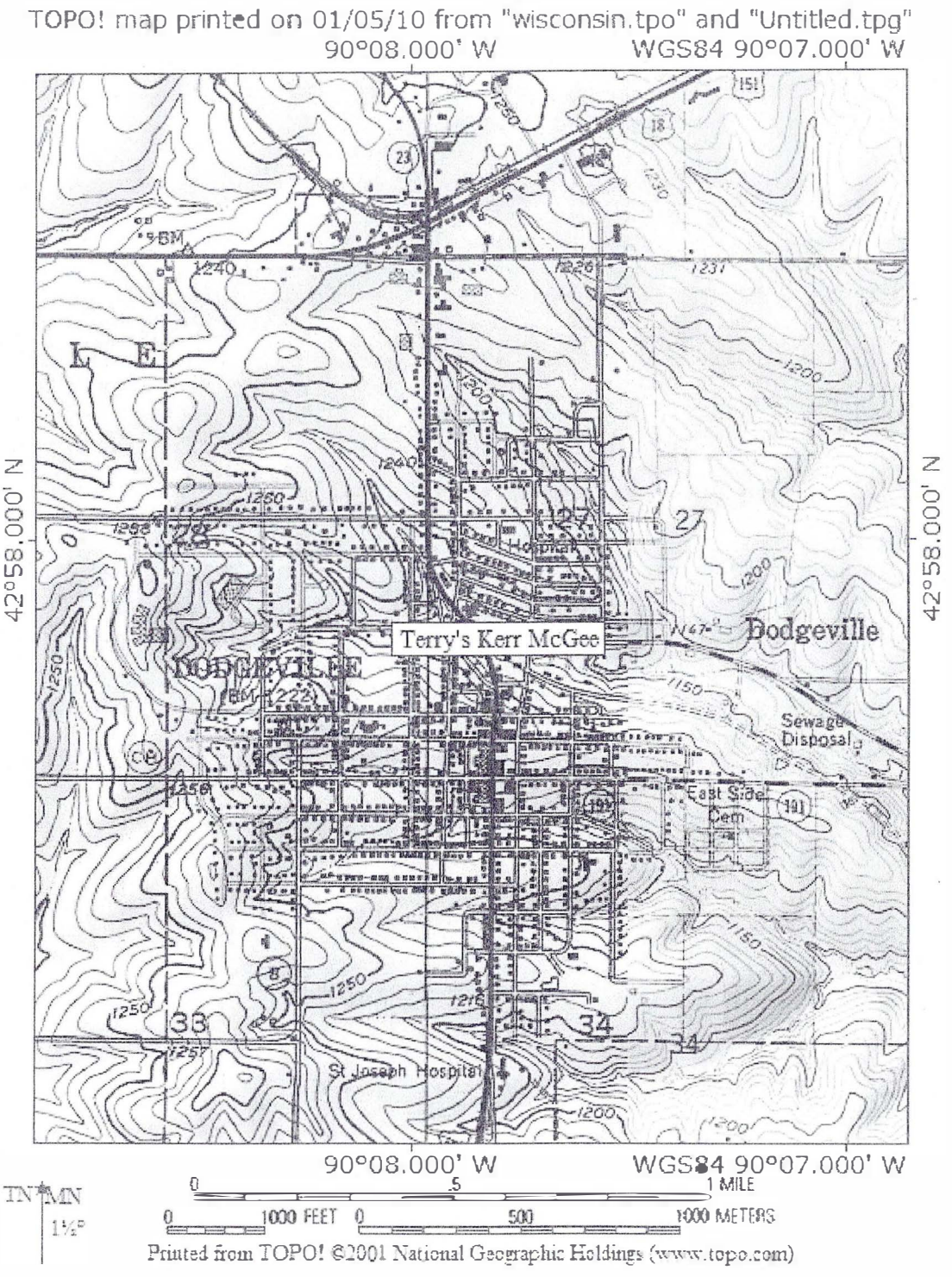
10) METCO completes any additional work that is needed, such as slug tests (1 month).

11) METCO prepares a LUST 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 or WDCOMM. 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.

APPENDIX A/SITE MAPS



SITE LOCATION MAP – CONTOUR INTERVAL 10 FEET
TERRY'S KERR MCGEE – DODGEVILLE, WI
SEAMLESS USGS TOPOGRAPHIC MAPS ON CD-ROM

SITE LAYOUT MAP

TERRY'S KERR MCGEE (TERRY'S TOWING)

METCO
1421 State Road 16
La Crosse, WI 54601
Tel: (608) 781-8879
Fax: (608) 781-8893
Excellence through experience™

DODGEVILLE, WISCONSIN

DRAWN BY: ED

DATE: 1/5/10

NOTE: INFORMATION BASED ON AVAILABLE DATA. ACTUAL CONDITIONS MAY DIFFER

= PROPERTY BOUNDARY

● = PROPOSED GEOPROBE BORING LOCATION

■ = PHASE II ENVIRONMENTAL ASSESSMENT BORING LOCATION (DOT)

SCALE:
1 INCH = 30 FEET
0 15 30

MAIN STREET

EAST CHURCH STREET

PIT ROW AUTO
(FORMERLY TERRY'S TOWING)

PUMP IS.

REMOVED GASOLINE UST'S

KM-2

KM-3

KM-1

REMOVED WASTE OIL UST

NORTH IOWA STREET (STH 23)

SPRING STREET

CITGO STATION
(CLOSED LUST SITE)

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/neighboring 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

APPENDIX C/LUST SAMPLING GUIDELINES

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

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
WET CHEMISTRY			
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_2SO_4	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_2SO_4	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_3	180 days
TKN EPA 351.2	1 Liter HDPE	4°C, pH<2 with H_2SO_4	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_2SO_4	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_2SO_4	28 days
Organic Carbon SW846 9060/ EPA 415.1	40 ml Glass	4°C, pH<2 with H_2SO_4 or HCL	28 days
Phenol, Total EPA 420.1	1 Liter Glass	4°C, pH<2 with H_2SO_4	28 days
Phosphorus, Total EPA 365.3	250 mL HDPE	4°C, pH<2 with H_2SO_4	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
METALS			
Metals	250 mL HDPE	4°C, pH<2 with HNO_3	6 months
Mercury SW8467470/EPA 245.1	250 mL HDPE	4°C, pH<2 with HNO_3	28 days
ORGANICS			
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
METALS						
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
ORGANICS						
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.

APPENDIX D/WDNR DOCUMENTS

HAZARDOUS SUBSTANCE/WASTE RELEASES:

INTERIM SOIL CLEANUP GUIDELINES--PETROLEUM CONTAMINATION

				DNR Closeout Action
BTEX (1)	GRO/DRO	Soil Type (2)	Soils Accessible	Soils Inaccessible or accessible and not technically and economically feasible
<= NR 720	<= 100 ppm	Permeable (K>10 E-6 cm/s)	Close	Close
<= NR 720	<= 250 ppm	Less Permeable (K<=10 E-6 cm/s)	Close	Close
<= NR 720 or > NR 720	> applic. GRO/DRO		Require additional work	Close with consideration of deed instrument according to guidelines

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(1) BTEX: proposed criteria developed in preparation of NR 720:

Benzene	5.5 ug/kg
Toluene	1500 ug/kg
Ethylbenzene	2900 ug/kg
Xylenes	4100 ug/kg
1,2-DCA	4.9 ug/kg

(2) K: Saturated hydraulic conductivity

(b) No soil contamination is present at the site that exceeds any of the soil screening levels in Table 1.

Table 1
Indicators of Residual Petroleum Product in Soil Pores

	Soil Screening Levels (mg/kg)
Benzene	8.5
1,2-DCA	0.6
Ethylbenzene	4.6
Toluene	38
Xylene	42
1,2,4 – Trimethylbenzene	83
1,3,5 – Trimethylbenzene	11
Naphthalene	2.7

(c) There is no soil contamination within 4 feet of the ground surface that exceeds any of the direct contact soil contaminant concentrations for the substances listed in Table 2.

Table 2
Protection of Human Health from Direct Contact with Contaminated Soil

Substance	Soil Contaminant Concentrations (Top 4 ft of the soil) (mg/kg)
Benzene	1.10
1.2-Dichloroethane (DCA)	0.54

(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 recr. (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[1]	Enforcement Standard (micrograms per liter – except as noted)	Preventive Action Limit (micrograms per liter – except as noted)
Acetone	1000	200
Alachlor	2	0.2
Aldicarb	10	2
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[2]	0.3[2]
Bacteria, Total Coliform	0[3]	0[3]
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	960	190
Bromodichloromethane	0.6	0.06
Bromoform	4.4	0.44
Bromomethane	10	1
Butylate	400	80
Cadmium	5	0.5
Carbaryl	960	192
Carbofuran	40	8
Carbon disulfide	1000	200
Carbon tetrachloride	5	0.5
Chloramben	150	30
Chlordane	2	0.2
Chloroethane	400	80
Chloroform	6	0.6
Chloromethane	3	0.3
Chromium	100	10
Chrysene	0.2	0.02
Cobalt	40	8
Copper	1300	130
Cyanazine	1	0.1
Cyanide	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	100	20
Dicamba	300	60
1,2–Dichlorobenzene	600	60
1,3–Dichlorobenzene	1250	125
1,4–Dichlorobenzene	75	15

Table 1 – Continued
Public Health Groundwater Quality Standards

Substance[1]	Enforcement Standard (micrograms per liter – except as noted)	Preventive Action Limit (micrograms per liter – except as noted)
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)	0.2	0.02
Di (2–ethylhexyl) phthalate	6	0.6
Dimethoate	2	0.4
2,4–Dinitrotoluene	0.05	0.005
2,6–Dinitrotoluene	0.05	0.005
Dinoseb	7	1.4
Dioxin (2, 3, 7, 8–TCDD)	0.00003	0.000003
Endrin	2	0.4
EPTC	250	50
Ethylbenzene	700	140
Ethylene glycol	7 mg/l	0.7 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
Mercury	2	0.2
Methanol	5000	1000
Methoxychlor	40	4
Methylene chloride	5	0.5
Methyl ethyl ketone (MEK)	460	90
Methyl isobutyl ketone (MIBK)	500	50
Methyl tert–butyl ether (MTBE)	60	12
Metolachlor	15	1.5
Metribuzin	250	50
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
Phenol	6 mg/l	1.2 mg/l
Picloram	500	100
Polychlorinated biphenyls (PCBs)	0.03	0.003
Prometon	90	18

Table 1 – Continued
Public Health Groundwater Quality Standards

Substance[1]	Enforcement Standard (micrograms per liter – except as noted)	Preventive Action Limit (micrograms per liter – except as noted)
Pyrene	250	50
Pyridine	10	2
Selenium	50	10
Silver	50	10
Simazine	4	0.4
Styrene	100	10
1,1,1,2–Tetrachloroethane	70	7
1,1,2,2–Tetrachloroethane	0.2	0.02
Tetrachloroethylene	5	0.5
Tetrahydrofuran	50	10
Thallium	2	0.4
Toluene	1 mg/l	0.2 mg/l
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
Vinyl chloride	0.2	0.02
Xylene[4]	10 mg/l	1 mg/l

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

[2] 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 diaminoatrazine).

[3] 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.

[4] Xylene includes meta–, ortho–, and para–xylene combined. The preventive action limit has been set at a concentration that is intended to address taste and odor concerns associated with this substance.

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.**

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.)

APPENDIX E/PROJECT DOCUMENTS

AQUA-TECH INC.

July 30, 1991

Mr. John Lewis
Wisconsin Department of Transportation
Office of Environmental Analysis, Room 651
P.O. Box 7916
Madison, WI 53707

Dear Mr. Lewis:

Enclosed is the Phase II Environmental Assessment Report for the Terry's Kerr McGee (Site No. 4), 505 North Iowa Street (State Highway 23), City of Dodgeville, Iowa County, Wisconsin, Department of Transportation Project 5255-04-00 (ATI Project 95643).

If you have any questions regarding this report, please do not hesitate to contact me.

Sincerely,

AQUA-TECH, INC.

Dena M. Hargraves

Dena M. Hargraves
Environmental Technician

DMH/er

Enclosure

140 S. Park Street Port Washington, WI 53074 (414) 284-5746 FAX (414) 284-0243

PHASE II

ENVIRONMENTAL ASSESSMENT REPORT

FOR THE

TERRY'S KERR-MCGEE (SITE NO. 4)

505 NORTH IOWA STREET (STATE HIGHWAY 23)

CITY OF DODGEVILLE

IOWA COUNTY, WISCONSIN

JULY 1991

PREPARED FOR THE

WISCONSIN DEPARTMENT OF TRANSPORTATION

PROJECT 5255-04-00

PREPARED BY
AQUA-TECH, INC.
140 SOUTH PARK STREET
PORT WASHINGTON, WISCONSIN 53074
ATI PROJECT 95643

PHASE II

ENVIRONMENTAL ASSESSMENT REPORT

FOR THE

TERRY'S KERR-MCGEE (SITE NO. 4)

505 NORTH IOWA STREET (STATE HIGHWAY 23)

CITY OF DODGEVILLE

IOWA COUNTY, WISCONSIN

WDOT PROJECT 5255-04-00

Prepared By: Dena M. Hargraves Date: 7/30/91

Dena M. Hargraves
Environmental Technician
Aqua-Tech, Inc.

Reviewed By: Z. Vance Jackson, Jr. Date: 7/31/91

Z. Vance Jackson, Jr.
Hydrogeologist
Aqua-Tech, Inc.

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1.0 SUMMARY

Aqua-Tech, Inc. has completed a Phase II Environmental Assessment for the Terry's Kerr-McGee (Site No. 4) located at 505 North Iowa Street (State Highway 23), Dodgeville, Wisconsin. This assessment was contracted on April 25, 1991, by the Wisconsin Department of Transportation (WDOT), Office of Environmental Analysis under project 5255-04-00.

The purpose of this assessment was to identify possible environmental contamination within the existing WDOT right-of-way which may be associated with three underground petroleum storage tanks located at the site. The assessment included the following:

* Regulatory background review
* Site representative interview
* Reconnaissance inspection
* Three soil borings to a maximum depth of 11.5 feet
* Collection of subsurface soil samples
* Field screening of subsurface soil samples for volatile organic compounds (VOCs) with a photoionization detector (PID)
* Chemical analyses of three subsurface soil samples for total petroleum hydrocarbons (TPH)
* Collection of three groundwater samples
* Field screening of three groundwater samples for VOCs with a PID

* Chemical analyses of the water samples for benzene, toluene, ethylbenzene, and xylenes (BTEX)

Results of this assessment indicate that the soils at this site are contaminated by petroleum products. Field screening of soil samples with a photoionization detector (PID) did indicate the presence of volatile organic compounds above background levels for the site. TPH levels above the 10 mg/kg (ppm) Wisconsin Department of Industry, Labor and Human Relations (WDILHR) remedial action guideline for petroleum contaminated soil were detected by laboratory analysis of soil sample KM-1.

Chemical analyses of groundwater samples collected from the soil borings indicate that groundwater is also contaminated with benzene, toluene, ethylbenzene, and xylenes above the Groundwater Quality Standards outlined in Wisconsin Administrative Code NR 140.10.

Aqua-Tech, Inc. recommends further investigation to determine the extent of contamination. Information gathered during the additional investigation will be used to determine the type of corrective action suitable for this site. Suggested pressure testing of the underground tanks has been scheduled. Contractual agreements should be concluded with the property owner and the additional investigation should be completed prior to initiating construction operations for State Highway 23. The additional investigation should be scheduled in conjunction with that of Marathon Oil No. 2 site (Site No. 5) which is located to the southwest across North Iowa Street.

2.0 SITE DESCRIPTION

2.1 Introduction

This section describes the location and physiographic setting of the site.

2.2 Site Location

The Terry's Kerr-McGee (Site No. 4) site occupies a 0.3 acre parcel of land at 505 North Iowa Street (State Highway 23) in the city of Dodgeville, Iowa County, Wisconsin. The site is part of a commercial/residential area (See Figure 2-1).

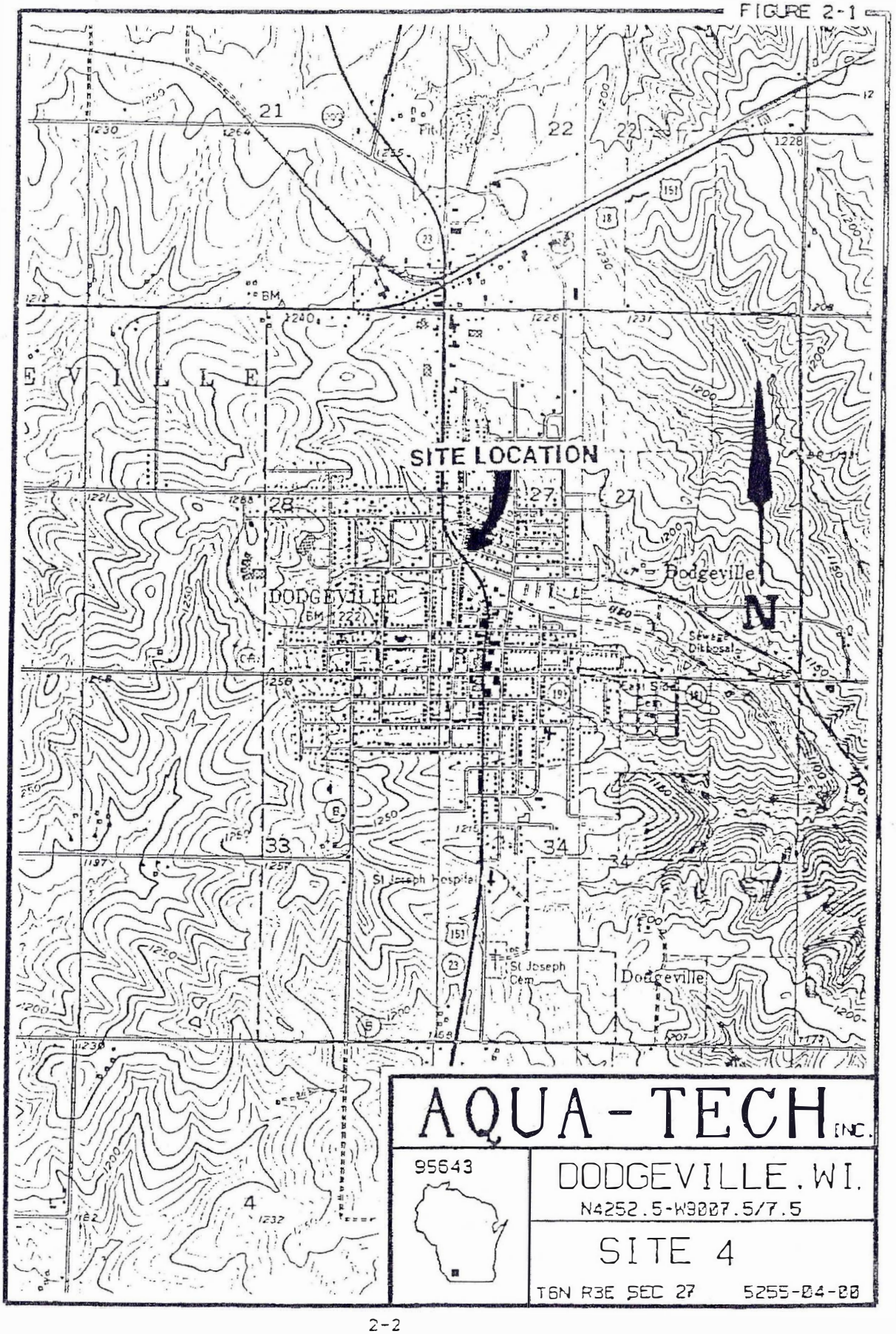
2.3 Site Geology

This site occurs in the Western Uplands Physiographic Province of southwestern Wisconsin. It is in the portion of Wisconsin called the Driftless Area that is not covered by ice transported deposits. The surface geology and physiography of the region have been determined by the differential erosion of bedrock. This erosion has resulted in an intricate dendritic drainage pattern with deep, narrow valleys separated by flat topped ridges.

The Palsgrove, Dubuque, and Fayette silt loam, which are characteristic of the gently rolling to very steep terrain on limestone ridges or on quartzite uplands, are the dominant type of soil at this site. The soils encountered in the test borings consist of silty sand and clay with medium grained sand underlain by tan weathered sandstone.

Bedrock in the area is buried to varying depths by alluvium from several branches of the Pecatonica River. It was encountered in one of the soil borings at

FIGURE 2-1


SITE LOCATION
DODGEVILLE
Dodgeville
St Joseph hospital
St Joseph Cem
Dodgeville
N
AQUA-TECH INC.
95643
DODGEVILLE, WI.
N4252.5-W9807.5/7.5
SITE 4
T6N R3E SEC 27
5255-04-08

a depth of 11.5 feet. Regionally, bedrock consists of Paleozoic age dolomite of the Ordovician system with some sandstone, limestone, and shale of the Galena, Decorah, and Platteville formations which are well exposed in cliffs more than one mile east and west of the site.

Local topography consists of upland ridges and adjacent narrow valleys. Local topography at the site ranges from 6 to 12 percent slope with the ground surface sloping to the east/southeast. Regionally the ground surface slopes to the east in the area.

Groundwater was encountered in all three soil borings completed at this site at depths ranging from 5.9 to 9.0 feet. Based on surface topography, groundwater is believed to be moving in an easterly direction toward the Dodge Branch of the Pecatonica River which is approximately 300 feet east/southeast of the site.

3.0 ASSESSMENT PROCEDURES AND FIELD OBSERVATIONS

3.1 Introduction

This section outlines assessment procedures and field observations for the environmental assessment of Terry's Kerr-McGee (Site No. 4). Individual subsections include information obtained from the regulatory background review, site background review, and reconnaissance inspection.

3.2 Regulatory Background Review

A regulatory review of Terry's Kerr-McGee (Site No. 4) was conducted to ensure that the site and surrounding areas have not been identified as causing or having the potential to cause environmental pollution. Records of solid and liquid waste disposal, spills, and leaks are an indication of whether hazardous materials have been introduced to the subsurface. The following sources were referenced during this review:

* U.S. Environmental Protection Agency CERCLIS List (March 1990)
* U.S. Environmental Protection Agency Facility Index System: Selected Facilities Report List (FINDS) (May 1990)
* Wisconsin Department of Natural Resources (WDNR) Registry of Waste Disposal Sites in Wisconsin (February 1990)
* WDNR Inventory of Sites or Facilities Which May Cause or Threaten to Cause Environmental Pollution (Environmental Repair Program) (July 1987)

* WDNR Statewide Spills and Hazardous Incident Report List, January 1978 to December 1989
* WDNR List of Leaking Underground Storage Tanks (LUST List) (June 1991)
* Wisconsin Department of Industry, Labor and Human Relations (WDILHR) Computer Inventory of Underground Storage Tanks

The Terry's Kerr McGee (Site No. 4) does not appear on any of the above lists.

There are 14 sites within a one mile radius of this site in Iowa County which may cause or threaten to cause environmental pollution to this site. Considering the distance and direction from the project area, the potential contaminant sources are believed to pose a minimal threat to the site. Listings of these sites are included in Appendixes A through D.

Two underground storage tanks at the site are on record in the computer inventory at The Wisconsin Department of Industry, Labor and Human Relations (DILHR) (See Appendix E).

3.3 Site Representative Interview

Interviews are conducted for the purpose of gathering information concerning present and past uses of the Terry's Kerr-McGee (Site No. 4) and the potential environmental impact of these activities. Dena Hargraves of Aqua-Tech, Inc. conducted a personal interview with Mr. Terry Bystol, the site owner, on May 20, 1991.

Dena Hargraves of Aqua-Tech, Inc. conducted a telephone interview with Mr. Keith Halverson on May 24, 1991, a previous site owner.

3.4 Site History

The site has been owned by Mr. Terry Bystol and utilized as a gasoline/repair station since it was purchased from Mr. Keith Halverson in 1976. The mailing address and telephone number for the property owner are:

Mr. Terry Bystol
505 North Iowa Street
Dodgeville, Wisconsin 53533
(608) 935-2401

Mr. Keith Halverson owned the property for approximately 30 years. The gasoline station was built and the tanks were installed in the 1960s. Mr. Emitt Awida, deceased, owned the property prior to 1946.

There are currently three underground storage tanks (USTs) at Terry's Kerr-McGee (Site No. 4). The sizes, contents, and installation dates are summarized in Table 3-1.

TABLE 3-1

UNDERGROUND STORAGE TANKS

TERRY'S KERR-MCGEE (SITE NO. 4)

Size (gallons)	Contents	Installation Date
4,000	empty	1960s
4,000	unleaded gasoline	1960s
3,000	premium unleaded gasoline	1960s

The empty 4,000 gallon underground storage tank previously contained leaded gasoline but was pumped dry when the company discontinued the sale of leaded gasoline. The underground storage tanks are scheduled for pressure testing to determine if the tanks are secure. Safety Kleen picks up the waste oil generated on site.

3.5 Site Reconnaissance Inspection

Dena Hargraves of Aqua-Tech, Inc. conducted a reconnaissance inspection of Terry's Kerr-McGee (Site No. 4) and surrounding area on May 20, 1991. The site reconnaissance inspection included a walk through to observe the physical and surface environmental setting of the site and to determine appropriate sampling locations. Underground tank bed locations, underground and overhead utilities, and site accessibility were taken into consideration.

Reconnaissance Inspection Observations

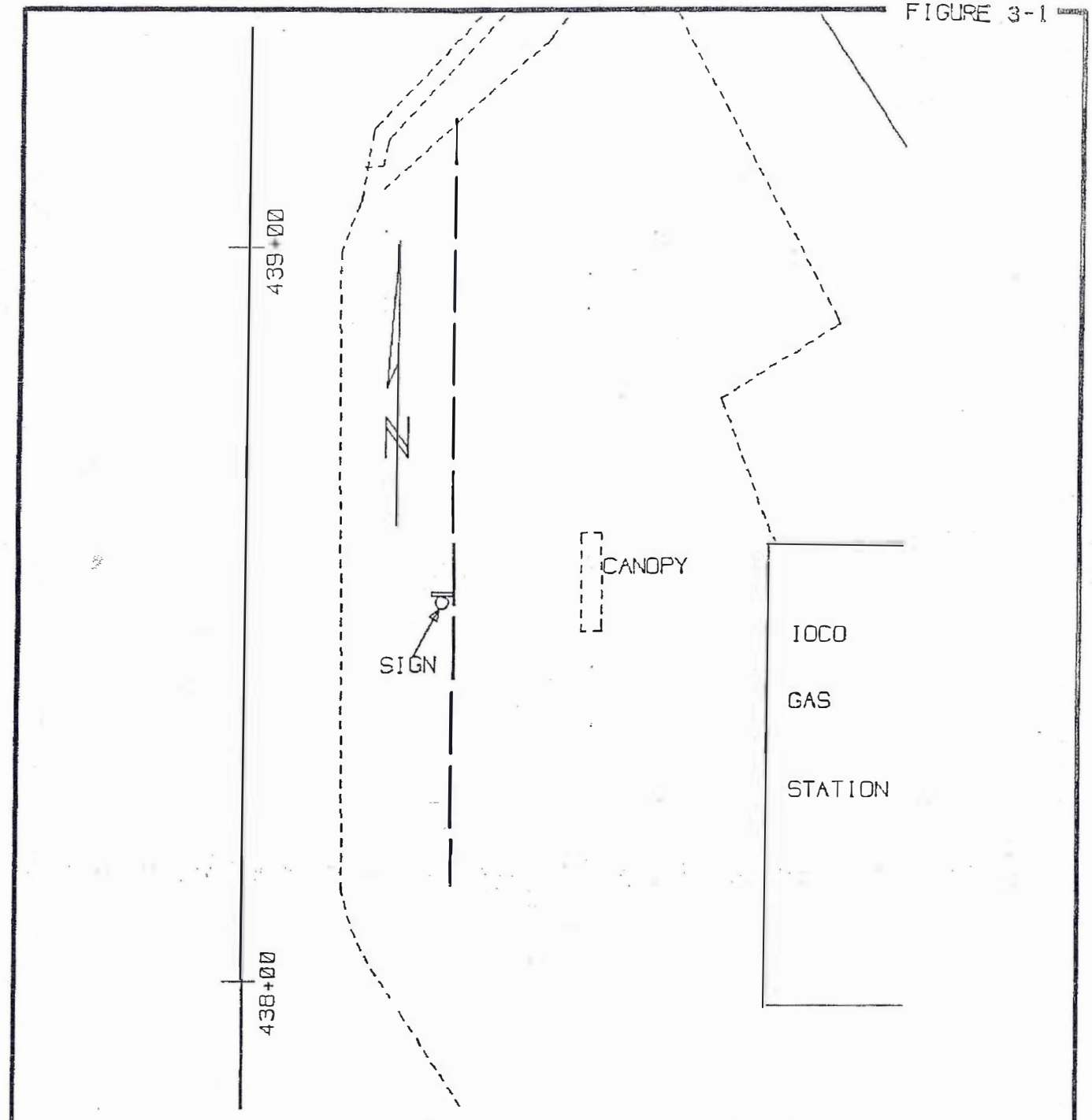
Terry's Kerr-McGee (Site No. 4) is bound on the east by residential property, on the north by Main Street, and then the Old Railroad Coal Storage site (Site No. 2, Aqua-Tech Project 95642). The site is bound on the south by East Spring Street then a vacant lot. The site is bound on the west by North Iowa Street (State Highway 23) and then Al's Small Engine site (Site No. 6, Aqua-Tech Project 95638). The Marathon Oil No. 2 site (Site No. 5, Aqua-Tech Project 95644) is located southwest of the site across North Iowa Street.

The interior of the building was not inspected. The site is serviced by a municipal water supply system.

There are three underground storage tanks at this site. No evidence of spills or leakage of petroleum products or other hazardous substances was noted at the site (e.g., stressed vegetation, stained soil).

Figure 3-1 depicts the site features and the location of the underground storage tanks at the Terry's Kerr-McGee (Site No. 4). Photographs of the site are provided in Appendix F.

FIGURE 3-1



AQUA-TECH INC.		
SCALE: 1"=20'	APP. BY:	DRAWN BY:
DATE: 7/23/91	J.H.	RICHARDSON
SITE NO. 4		
5255-04-00		95643

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 Introduction

This section outlines procedures followed for collecting soil or groundwater samples, maintaining security and integrity of the samples and chemical analysis of the samples.

4.2 Sampling Procedures

Soil samples are collected from the subsurface to determine if soil at the site is contaminated. Likewise, groundwater samples are collected to determine if the groundwater is contaminated at the site.

Soil Sampling Procedures

Subsurface soil samples are collected with a truck-mounted rotary drill equipped with a hollow stem auger and a two inch diameter, 18 inch split spoon sampler. The split spoon sampler is advanced at 18 inch intervals by conventional methods, including the attachment of the sampler to an AW rod and standard 140 pound hammer.

All drilling tools and equipment are high-pressure steam cleaned prior to the start of the sampling work. All sampling tools are also washed with an alconox and reagent water solution between sampling points to prevent cross contamination.

Subsurface soil samples are screened for volatile organic compounds with a photoionization detector (PID) immediately after the split spoon sampling tube is opened. Instrumental readings (PID levels in ppm) and sample descriptions/re-

marks are recorded on a soil profile log at the appropriate depth intervals. Results from this screening survey are used to aid in the selection of samples for laboratory analysis.

The following headspace methodologies are utilized for PID field screening of soil samples:

1. Headspace samples are collected in clean four ounce glass jars.
2. The jars are filled one-half full.
3. Immediately after the headspace sample is packed in the jar, the mouth of the jar is covered with a heavy gauge aluminum foil.
4. Once the headspace sample is sealed, the sample is agitated for at least 30 seconds to break soil clods and release vapors.
5. After the sample is agitated, the sample is allowed to equilibrate for 20 minutes at approximately 70°F out of direct sunlight.
6. Following equilibration, the sample headspace is analyzed by inserting the tip of the PID probe through a single, small hole in the foil seal to a position halfway between the seal and sample surface and then recording the highest instrumental reading.
7. The PID is properly maintenanced and calibrated according to the manufacturer's specifications at the site at least daily before commencing field operations. Results of the calibration are recorded on a calibration log sheet (See Appendix G).

The second sample from each sampling location is a split sample collected from the same two foot depth interval and at the same time that the headspace sample is collected.

After pedologic logging, the sample selected for chemical analyses is tightly packed into a clean, Teflon™ lidded, four ounce jar and cooled to 4^0C for transport to the laboratory.

Groundwater Sampling Procedures

A groundwater sample is collected by inserting a clean disposable polyethylene bailer down the hollow stem augers and transferring the contents into the appropriate container. If the parameter to be tested is BTEX or VOCs, the contents are transferred into 40 ml. glass vials, containing HCL preservative, taking care to ensure no air space is included. The water sample containers are then sealed and cooled to 4^0C for transport to the laboratory.

4.3 Procedures for Abandoning a Borehole

After all necessary soil and groundwater samples are collected at a given borehole, the borehole is completely backfilled with bentonite and abandoned according to procedures outlined in Wisconsin Administrative Code NR 141.25. If field screening revealed the soil samples were contaminated, the cuttings were containerized in a DOT approved container while awaiting approval for disposal at a WDNR approved facility. One 55 gallon drum and one 30 gallon drum remain at the site. Boring abandonment documentation is included in Appendix H.

4.4 Chain of Custody Procedures

This section describes procedures used for sample identification and chain of custody. The purpose of these procedures is to ensure security and integrity of the sample from collection through transportation, storage, and analysis.

Sample identification documents are carefully prepared so that sample identification and chain of custody are maintained and sample disposition is controlled. Sample identification documents include:

* Field Notebooks
* Sample Labels
* Chain of Custody Records

Each sample is labeled, chemically or physically preserved, and sealed immediately after collection. To minimize handling of sampling containers, a label is filled out prior to sample collection. The sample label is completed using waterproof ink and then firmly affixed to the sample container. The sample label provides the following information:

* Location
* Sample Number
* Date and Time of Collection
* Analysis Required
* Name of Sampler

A chain of custody record is fully completed in triplicate by the Aqua-Tech sampler immediately following sample collection (See Appendix I).

Transfer of Custody Shipment

The samples are packed in a cooler and are accompanied by the chain of custody record. When transferring samples, the individuals relinquishing and receiving them sign, date, and note the time on the chain of custody record. This record documents sample custody.

Laboratory Custody Procedures

A designated sample custodian accepts custody of the shipped sample and verifies the sample identification number matches that on the chain of custody record. A copy of the completed chain of custody record is retained by the laboratory until analyses are complete. The record is then transferred to the site file with the analytical results.

5.0 FIELD AND ANALYTICAL RESULTS

5.1 Introduction

This section summarizes results of screening soil samples in the field for volatile organic compounds (VOCs) and chemical analyses of soil samples for total petroleum hydrocarbons (TPH) and groundwater samples for benzene, toluene, ethylbenzene and xylenes.

5.2 Sample Locations

On May 28, 1991, Dena Hargraves of Aqua-Tech, Inc. collected three subsurface soil samples and three groundwater samples from borings completed at Terry's Kerr-McGee (Site No. 4). See Figure 5-1 for boring locations.

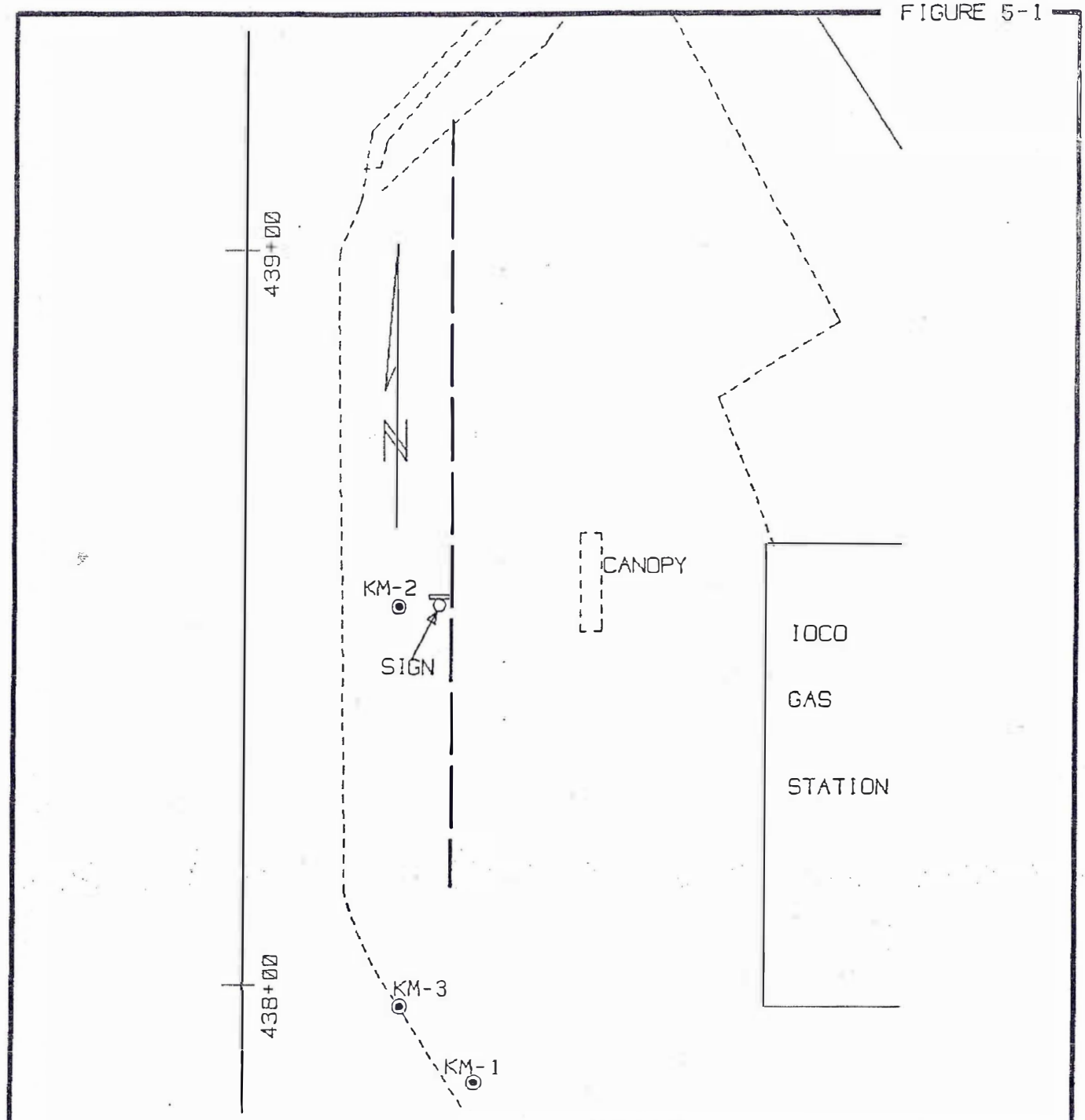
The borings completed at the site are referenced according to the following survey station locations:

Boring	Sample Location	Offset (Feet)
KM-1	437 + 87	Right 33
KM-2	438 + 52	Right 22
KM-3	437 + 97	Right 22

Subsurface soil samples KM-1 and KM-3 were collected as grab samples from the 5.5 to 7.0 foot depth interval. These samples were collected because they were the intervals with the highest PID reading in the borings.

Subsurface soil sample KM-2 was collected as a grab sample from the 7.0 to 8.5 foot depth interval. This sample was collected because it was directly above the water table.

FIGURE 5-1



LEGEND:

⊙-SOIL SAMPLE

AQUA-TECH INC.		
SCALE: 1" = 20'	APP. BY: D.H.	DRAWN BY: RICHARDSON
DATE: 7/23/91		
SITE NO. 4		
5255-04-00		95643

Groundwater samples KMGW-1, KMGW-2, and KMGW-3 were collected at depths of 5.9, 9.0, and 6.0 feet, respectively, to determine if any petroleum products are present in the groundwater at the site.

5.3 Results of Field Screening

A summary of field screening results of subsurface soil samples for VOCs with a photoionization detector (PID) is as follows:

* Subsurface soil samples from boring KM-1, yielded PID readings that ranged from 0 to 100 ppm.
* Subsurface soil samples from borings KM-2 and KM-3, yielded PID readings that ranged from 0 to 16 ppm.
* Groundwater samples from borings KM-1, KM-2, and KM-3 yielded PID readings that ranged from 1 to 32 ppm.

All PID readings relative to depth for each boring completed at Terry's Kerr-McGee (Site No. 4) are recorded on soil profile logs (See Appendix G).

5.4 Analytical Methods Utilized for Chemical Analyses of Samples

The ORTEK Environmental laboratory in Green Bay, Wisconsin analyzed the soil and groundwater samples collected at Terry's Kerr-McGee (Site No. 4) utilizing the California Method and EPA Method 8020, respectively. Each analytical method follows specific quality control (QC) criteria listed in the reference manual describing the method. This includes the selection and calibration of appropriate instruments

and the use of QC samples. Daily performance tests and the demonstration of precision and accuracy in the laboratory are required.

5.5 Results of Chemical Analysis of Aqua-Tech Collected Samples

Soil Samples

Chemical analyses of three soil samples yielded the following results:

* No TPH as kerosene, gasoline, or diesel was identified in soil samples KM-2 and KM-3 at concentrations above the 5.0 mg/kg (ppm) laboratory detection limit.

* A TPH level of 173.7 mg/kg as gasoline was identified in soil sample KM-1. No TPH as kerosene or diesel was identified in soil sample KM-1 at concentrations above the 5.0 mg/kg laboratory detection limit.

Table 5-1 contains complete results of the chemical analyses of the soil samples. All TPH results were calculated on a dry weight basis as required by Wisconsin DILHR. Original laboratory data are provided in Appendix I.

Groundwater Samples

Chemical analyses of three groundwater samples yielded the following results:

* Groundwater sample KMGW-1 is contaminated by benzene (25,000 ug/l), toluene (6,300 ug/l), ethylbenzene (4,700 ug/l), and xylenes

(14,000 ug/l). An elevated laboratory detection limit was necessary due to the high level of compounds present.

* Groundwater sample KMGW-2 had detectable amounts of benzene (2.6 ug/l), toluene (1.3 ug/l), ethylbenzene (1.6 ug/l), and xylenes (4.2 ug/l).

* Groundwater sample KMGW-3 had detectable amounts of benzene (91.0 ug/l) and ethylbenzene (1.6 ug/l). No toluene or xylenes were identified above the 1.0 ug/l and 3.0 ug/l respective laboratory detection limits.

Table 5-2 contains complete results of the chemical analyses of the groundwater samples. Original laboratory data are provided in Appendix I.

TABLE 5-1

RESULTS OF CHEMICAL ANALYSES OF

AQUA-TECH, INC. COLLECTED SOIL SAMPLES FOR

TERRY'S KERR-MCGEE (SITE NO. 4)

DATE SAMPLED: MAY 28, 1991

DATE ANALYZED: JUNE 5, 1991

Parameter	Sample KM-1	Sample KM-2	Sample KM-3	Laboratory Detection Limit
Depth Interval (feet)	5.5-7.0	7.0-8.5	5.5-7.0	---
Total Solids (%)	77.1	73.3	78.9	---
Total Petroleum Hydrocarbons (TPH)* (mg/kg)** +				
as kerosene	ND	ND	ND	5.0
as gasoline	173.7	ND	ND	5.0
as diesel	ND	ND	ND	5.0

ND = Not Detected

* All TPH results reported on a dry weight basis.

** Ten mg/kg (ppm) is the maximum level of petroleum contamination allowed in soil before remediation is required by the Wisconsin Department of Industry, Labor and Human Relations (WDILHR).

\+ The terms "as gasoline", "as diesel", or "as kerosene" do not necessarily indicate the type of petroleum hydrocarbon present. Rather, they indicate the closest standard used to quantitate the sample result.

TABLE 5-2

RESULTS OF CHEMICAL ANALYSES OF

AQUA-TECH, INC. COLLECTED GROUNDWATER SAMPLES FOR

TERRY'S KERR-MCGEE (SITE NO. 4)

DATE SAMPLED: MAY 28, 1991

DATE ANALYZED: JUNE 5, 1991

Parameter	Sample KMGW-1	Laboratory Detection Limit	Sample KMGW-2	Laboratory Detection Limit	Sample KMGW-3	Laboratory Detection Limit
Depth (feet)	5.9	—	9.0	—	6.0	—
Benzene (ug/L)	25,000	200	2.6	1.0	91.0	1.0
Toluene (ug/L)	6,300	200	1.3	1.0	ND	1.0
Ethylbenzene (ug/L)	4,700	200	1.6	1.0	1.6	1.0
Xylenes (ug/L)	14,000	600	4.2	3.0	ND	3.0

ND = Not Detected
ug/L = ppb

6.0 DISCUSSION OF ASSESSMENT RESULTS

6.1 Introduction

This section discusses field observations and analytical data pertaining to observed or potential contamination which may be attributed to the Terry's Kerr-McGee (Site No. 4).

6.2 Site History, Regulatory Review, and Reconnaissance Inspection

The site history failed to produce any evidence of intentional or accidental releases of hazardous materials at the site.

The regulatory review identified 14 sites within a one mile radius of the site which may have a potential to contaminate the Terry's Kerr-McGee (Site No. 4).

U.S. EPA Regulatory Program

The U.S. EPA maintains a computer inventory (FINDS) of facilities regulated under various programs. There are seven sites regulated in the city of Dodgeville that are within a one mile radius of the site. The nearest site is the Iowa County Cooperative Warehouse, 401 North Union Street, approximately 750 feet southeast of the Terry's Kerr-McGee (Site No. 4).

WDNR Registry of Waste Disposal Sites in Wisconsin

The WDNR maintains a list of waste disposal sites in the state. There are two sites in the city of Dodgeville that are within a one mile radius of the site. The nearest site is the city of Dodgeville Waste Disposal site, approximately 2,700 feet southwest of the Terry's Kerr-McGee (Site No. 4).

WDNR Environmental Repair Program

The WDNR maintains an inventory of sites or facilities which may cause or threaten to cause environmental pollution. There is one site in the city of Dodgeville. This site is the city of Dodgeville Municipal Well #3 which is approximately 400 feet west of the Terry's Kerr-McGee (Site No. 4).

WDNR Statewide Spills and Hazardous Incident Report

January 1978 to December 1989

The WDNR maintains a list of spills and hazardous incidents which have occurred in the state since January 1978. There are four reported spills within a one mile radius of the site. The nearest incident is at Jack's Service Center (Site No. 9, ATI #95731), 405 North Iowa Street, approximately 700 feet southeast of Terry's Kerr-McGee (Site No. 4). This spill consisted of 25 gallons of gasoline due to a malfunctioning shut off valve on July 28, 1989.

A reconnaissance inspection of the site and surrounding area failed to identify any signs (stressed vegetation, soil stains) of potential contamination.

6.3 Soil

Field screening of split spoon samples from borings KM-1, KM-2, and KM-3 with a PID suggested the presence of VOCs in excess of background levels.

No TPHs were detected by laboratory analyses in soil samples KM-2 and KM-3. TPH contamination as gasoline (173.7 mg/kg) (ppm) was identified by laboratory analysis of subsurface soil sample KM-1. This value is above the

Wisconsin DILHR remedial action guideline of 10 mg/kg (ppm) for petroleum contaminated soil.

6.4 Groundwater

Groundwater was encountered in borings KM-1, KM-2, and KM-3 at depths of 5.9, 9.0, and 6.0 feet, respectively. Chemical analysis of groundwater sample KMGW-1 collected from boring KM-1 revealed the presence of benzene (25,000 ug/l), toluene (6,300 ug/l), ethylbenzene 4,700 ug/l), and xylenes (14,000 ug/l). These concentrations are well above the Groundwater Quality Enforcement Standards outlined in Wisconsin Administrative Code NR 140.10 (See Table 6-1).

Chemical analyses of groundwater sample KMGW-2 collected from boring KM-2 revealed detectable amounts of benzene (2.6 ug/l), toluene (1.3 ug/l), ethylbenzene (1.6 ug/l), and xylenes (4.2 ug/l). The benzene concentration is above the Preventive Action Limit outlined in Wisconsin Administrative Code NR 140.10.

Chemical analyses of groundwater sample KMGW-3 collected from boring KM-3 revealed detectable amounts of benzene (91.0 ug/l) and ethylbenzene (1.6 ug/l). The benzene concentration is above the Groundwater Quality Enforcement Standards. No toluene or xylenes were identified in groundwater sample KMGW-3 above the 1.0 ug/l and 3.0 ug/l respective laboratory detection limits.

TABLE 6-1

PUBLIC HEALTH GROUNDWATER QUALITY STANDARDS

WISCONSIN ADMINISTRATIVE CODE

CHAPTER N.R. 140 SUBCHAPTER II

GROUNDWATER QUALITY STANDARDS

Substance	Enforcement Standard (micrograms per liter)	Preventive Action (micrograms per liter)
Benzene	5	0.067
Ethylbenzene	1360	272
Toluene	343	68.6
Xylenes	620	124

7.0 RECOMMENDATIONS

After completing the Phase II Environmental Assessment for Terry's Kerr-McGee (Site No. 4), Aqua-Tech, Inc. recommends further investigation to determine the extent of contamination. Information obtained from the additional investigation will be used to determine the type of corrective action suitable for this site. The underground storage tanks are scheduled for pressure testing. Contractual agreements should be concluded with the property owner and the additional investigation should be completed prior initiating construction operations for State Highway 23. The additional investigation should be scheduled in conjunction with that of Marathon Oil No. 2 site (Site No. 5) which is located to the southwest across North Iowa Street.

APPENDIX F/HEALTH AND SAFETY PLAN

SAFETY PLAN INFORMATION

Code: METCO METCO Project No: C1781

Company Name: METCO

Contact:

Last Name: Powell First Name: Jason

Salutation: MR.

P.O. Box Street: 1421 State Road 16

City: La Crosse State WI Zip Code: 54601-0000

Area code: 608 Phone: 781-8879 Fax: (608)781-8893

SITE INFORMATION

Site Name: Terrys Kerr McGee (Terrys Towing)

Site Address: 505 N Iowa Street Site Address City: Dodgeville

Site Address State: WI Site Address Zip Code: 53533 Site Address County: Iowa

WDNR Contact: Jeff Ackerman Fire Dept. Contact: Dodgeville

Project Date: Tank Removal Contractor:

General Contractor: METCO

TANK INFORMATION

Tank Sizes\Contents

Tank 1:	4000	Contents:	Gasoline	Age:	Removed
Tank 2:	4000	Contents:	Gasoline	Age:	Removed
Tank 3:	3000	Contents:	Gasoline	Age:	Removed
Tank 4:	500	Contents:	Waste Oil	Age:	Removed
Tank 5:		Contents:		Age:	
Tank 6:		Contents:		Age:	

PURPOSE OF ACTIVITY (Check all appropriate)

New Tank Installation	☐	Tank Closure	☐	Install Tank Leak Detection	☐
Tank/Pipe Removal	☐	Tank\Pipe Repair	☐	Install Spill Protection	☐
Petroleum Release Investigation	☑	Install Remedial System	☐	Install Overfill Protection	☐
Leak Detection Testing	☐	Install Monotoring Wells	☑	Install Kard System	☐

Other

Backgro ☐ formation st ☑ s Complete ☑ Ir ☐

TYPE OF SITE

SITE HEALTH AND SAFETY PLAN

POTENTAIL HEALTH AND SAFETY HAZARDS (check all appropriate)

Handling\transfer of product: ☐	Heavy Equipment: ☑	Snakes: ☐
* Fire	Noise: ☑	Insects: ☐
* Explosions	Oxygen Depletion: ☐	Rodents: ☐
General Construction: ☑	Excavation ☐	Heat: ☑
* Electrical Hazards	* Cave-ins	Cold: ☑
* Physical Injury	* Falls, slips	
Confined Space Entry: ☐	Poisonous plants: ☐	
* Explosions	Other (Specify):	

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

EVALUATION OF CHEMICAL HAZARDS (MSDS sheets attached)

NAME	PHYSICAL STATE	ROUTE OF ENTRY	OSHA PEL/TL	SYMPTOMS OF EXPOSURE
1.	Vapor/Liq	Inh/Skin	25-300PPM	Nausea, Irritation
2.				
3. Gasoline	Vapor/Liq	Inh/Skin	300 PPM	Nausea, Irritation
4. Diesel	Vapor/Liq	Inh/Skin	300 PPM	Nausea, Irritation
5.	Vapor/Liq	Inh/Skin	300 PPM	Nausea, Irritation

ON-SITE PERSONNEL RESPONSIBILITIES

Team Member	Responsibilities
1. Jason Powell	Site Project Management
2. Eric Dahl	Hydrogeologist
3. Brandon Walker	Environmental Tech
4. Aaron Nichols	Environmental Tech

METHOD TO CONTROL POTENTIAL HEALTH AND SAFETY HAZARDS

MONITORING INSTRUMENTS

Combustible Gas Indicator: ☐

Action Levels		Action
0-10% LEL	No Explosion Hazard	None
Action Levels		Action
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: ☐
Saranex tyvek coveralls: ☐
Rubber boots: ☐
Overboots: ☐
Surgical Inner Gloves: ☐
Butyl Neoprene\nitrile outer gloves: ☐

Full face respirators: ☐
* type of catrridge:
SCBA \ SAR: ☐
Other:

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: ☑

CONTINGENCY PLANNING

LOCAL RESOURCES	Phone Number
Ambulance: Dodgeville	911
Hospital Emergency Room: Upland Hills Health	608-930-8000
Poison Control Center: Madison	(800) 283-281
Police Dodgeville	911
Fire Dept: Dodgeville	911
Hazardous Waste Response Center:	800-943-0003 Wisconsin EPA 800-424-8802

Location Address: 505 N Iowa Street, Dodgeville, WI

EMERGENCY ROUTES (attach maps)

Hospital: Upland Hills Health (800 Compassion Way, Dodgeville, WI 53533) - Travel south on Iowa Street approximately 8 blocks to E Valley Street, turn left on E Valley St and travel 3 blocks, Hospital will be on right

Other:

EMERGENCY PROCEDURES

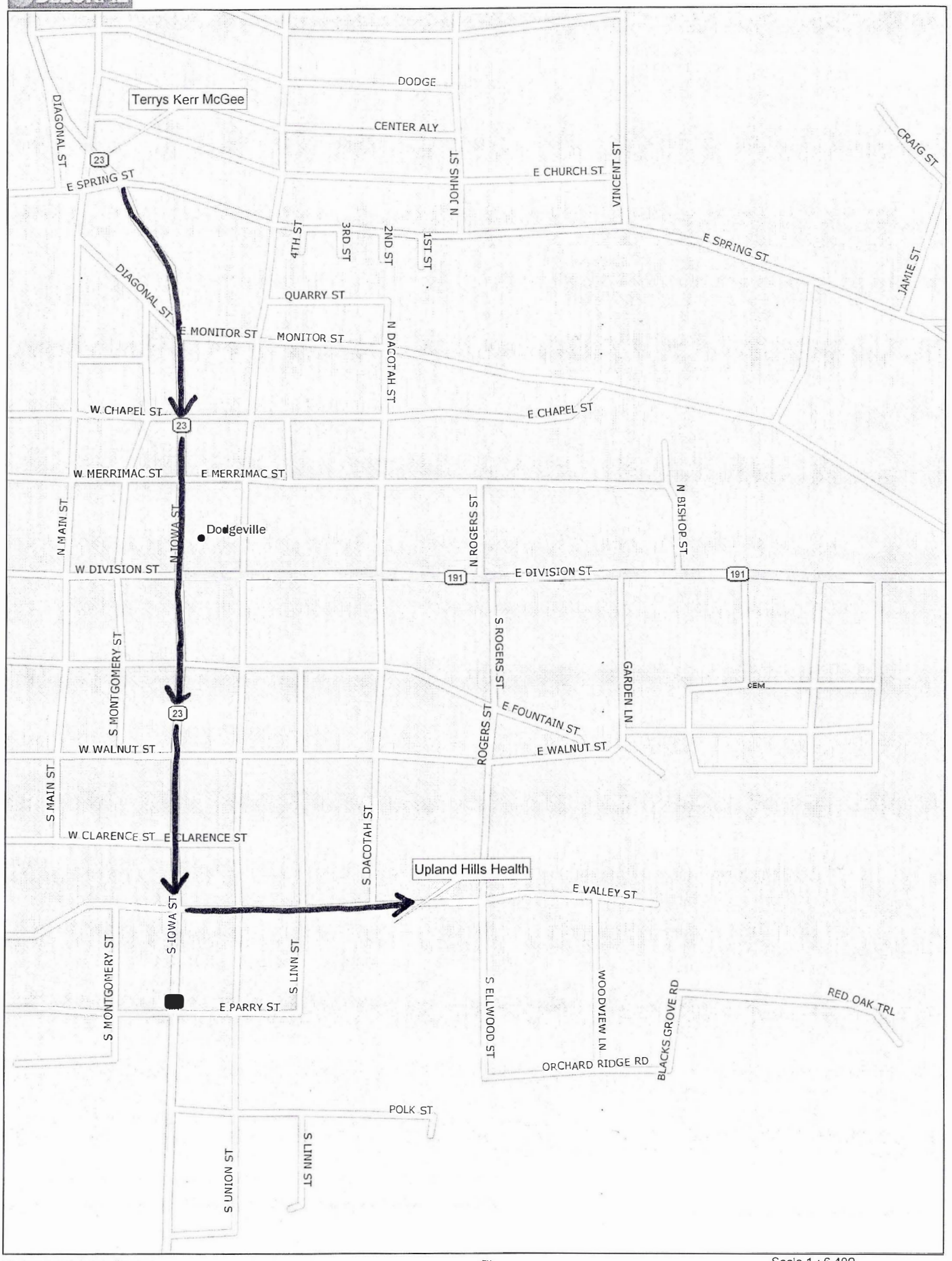
If an emergency develops at the site, the discoverer will take the following course of action:

* 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	
METCO Project Leader: Jason Powell	work	608-781-8879
	home	608-526-6108
METCO Safety Officer: Linda Eastman	work	1-800-236-0448
Engineer/Architect Contact:	home	(608)489-2236
Client Contact: Terry Bystol		(608) 930-2855
METCO Corporate Contact: 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. Emegency phone numbers
10. Know where the job site book is



TN
MN (1.6° W)

Scale 1 : 6,400
1" = 533.3 ft
Data Zoom 15-0

APPENDIX G/QUALIFICATIONS

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/DCOMM 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.

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); and remedial projects (sampling, pilot tests, system operation/maintenance).

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 Commerce 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: LUST investigations, Geoprobe Projects (soil and groundwater sampling), drilling projects (soil borings and monitoring well installation), Geoprobe operation, and remedial projects (sampling and system operation and maintenance).

Brandon A. Walker

Professional Title

- Staff Scientist

Education

Includes B.S. in Geography and a minor in Environmental Studies from the University of Wisconsin- La Crosse. Applicable courses successfully completed include Water Resources, Ecology, Climate Systems, Earth Science, Zoology, Fundamentals of Cartography, Interpretation of Aerial Photography, Global Issues, Urban Geography, Environmental Sociology, and Environmental Studies.

Work Experience

With METCO since April 2007 as a Staff Scientist. Duties have included: soil and groundwater sampling, operation and maintenance of remedial systems, geoprobe projects (oversight, direction, and sampling), site mapping, data reduction and analysis, and reporting.

Aaron K. Nichols

Professional Title

- Staff Scientist

Credentials

- Registered through the Wisconsin Department of Commerce as a PECFA consultant.

Education

Includes B.S. in Geography and a minor in Earth Science from the University of Wisconsin- La Crosse. Applicable courses successfully completed include Cartography, Interpretation of Aerial Photography, Remote Sensing, Soil Morphology, Biogeography, Earth Science, Conservation of Global Environments, Environmental Ethics, Geoarchaeology, and Environmental Studies.

Work Experience

With METCO since June 2007 as a Staff Scientist. Duties have include: groundwater sampling, site mapping, data reduction and analysis, and reporting.