

ABANDONED & UNCONTROLLED SITES

NAME DAVENPORT, CITY OF
RIVER DR. & GAIN STREET
SITE ASSESSMENT PLAN

OWN DAVENPORT

DATE MAY 1991 -

F.Q. 6

Site Assessment Plan
Leaking Underground Storage Tank
River Drive and Gaines Street
Davenport, Iowa
Project No. 42915055
IDNR LUST #8LTJ72

*This site
needs to
be
investigated*

RECEIVED
JAN 11 1994
IDNR

MAY 31 11 49 AM '91
DEPT. OF
NATURAL RES.

State Department
Washington, D.C.
Office of the Secretary
Department of the Interior
Bureau of Land Management
Washington, D.C.

TABLE OF CONTENTS

1.0 SITE RECONNAISSANCE.....	3
Site History.....	4
Site Conditions.....	6
Utility Conduits.....	6
2.0 SITE SAFETY.....	7
3.0 FREE PRODUCT.....	8
4.0 SOIL BORINGS AND SAMPLING RATIONALE.....	8
Drilling.....	8
Cleaning Procedures.....	10
Borehole Backfill Procedures.....	10
Soil Sampling and Analysis.....	10
5.0 TEMPORARY MONITORING WELLS INSTRUMENTATION RATIONALE...	12
On-Site Temporary Well Placement Rationale.....	12
Flow Direction Wells.....	12
Bracketing Wells.....	13
Off-Site Placement Rationale.....	13
Multiple Installations.....	14
Materials/Construction.....	14
Cleaning Methods.....	15
Development.....	15
Fluid Measurements.....	15
6.0 GROUNDWATER QUALITY CHARACTERIZATION.....	16
Sampling Protocol.....	16
7.0 DATA ANALYSIS AND REPORT PREPARATION.....	17
8.0 SCHEDULE.....	18
APPENDIX 1	
Figure 1 - Site Location Map	
Figure 2 - Boring Location Sketch	
Figure 3 - Photographic Reference Location	
Figure 4 - Boring Log/Monitoring Well Details	
Figure 5 - Request For Analytical Services	
Figure 6 - Chain-of-Custody Record	
Figure 7 - Boring Log MW-1	
Figure 8 - Typical Construction Details	
APPENDIX 2	
ESE Report	
APPENDIX 3	
Photographs	
APPENDIX 4	
Health & Safety Plan	

May 29, 1991

City of Davenport
Planning and Programming
City Hall
226 West 4th Street
Davenport, Iowa 52801

Attention: Mr. Paul S. Burnette
Associate Planner

RE: Site Assessment Plan
Leaking Underground Storage Tank
River Drive and Gaines Street
Davenport, Iowa
Project No. 42915055
IDNR LUST #8LTJ72

Terracon

ENVIRONMENTAL, INC.

4480 48th Avenue Court—Suite 3
Rock Island, Illinois 61201
(309) 788-1500

James A. Cunningham, PE.
John F. Hartwell, P.E.
Robert L. Sholar
David E. Koch
James R. Buckhahn, CET
Russell K. Lovaas, P.E.

Dear Mr. Burnette:

The Iowa Department of Natural Resources (IDNR) has established guidelines outlining the procedure by which suspected leakage from an underground storage tank (UST) shall be assessed. The IDNR Solid Waste Section has requested that a Site Assessment Plan (SAP) be developed consistent with requirements in Iowa Administrative Code 567, Chapter 133. This SAP by Terracon Environmental, Inc. (Terracon) describes the procedures which will be followed as the exploration of the above-referenced site is conducted. This exploration is a multi-task effort intended to develop sufficient geo-environmental data to assess contaminant conditions. Elements of the SAP include the following:

1.0 Site Reconnaissance

- *Site History
- *Site Conditions
- *Utility Conduits

2.0 Site Safety Plan

3.0 Free Product Recovery Contingency Plan

Offices of The Terracon Companies, Inc.

Colorado: Denver, Ft. Collins ■ Iowa: Cedar Falls, Cedar Rapids, Davenport, Des Moines, Storm Lake
Illinois: Bloomington, Naperville, Rock Island ■ Kansas: Lenexa, Topeka, Wichita ■ Minnesota: St. Paul
Missouri: Kansas City ■ Nebraska: Omaha ■ Oklahoma: Oklahoma City, Tulsa

Environmental Engineers and Scientists

QUALITY ENGINEERING SINCE 1965

City of Davenport
May 29, 1991
Project No. 42915055
Page 3

- 4.0 Soil Boring and Sampling Rationale
- 5.0 Monitoring Well Instrumentation Rationale
- 6.0 Water Quality Characterization
 - *Sampling and Analytical Methodologies
- 7.0 Data Analysis and Report Preparation
- 8.0 Scheduling

A description of each of the SAP elements is presented below.

1.0 SITE RECONNAISSANCE - As part of the initial work at the site, a detailed engineering reconnaissance of the suspected leak locale was performed. The locale included the immediate area involved as the suspected source, the tract of land upon which this source is located and the properties adjoining the tract of concern.

The purpose of the reconnaissance was to collect readily available information on spill and site history, and existing subsurface conditions to facilitate the development of a specific remedial approach.

The site of assessment is located approximately three hundred (300) feet south of River Drive and approximately fifty (50) feet east of Gaines Street in Davenport, Iowa. Please refer to Figure 1 of Appendix 1 which depicts the approximate location of the site on an excerpted United States Geological Survey (USGS) topographic map. The property is located approximately six hundred (600) feet north of the Mississippi River.

City of Davenport
May 29, 1991
Project No. 42915055
Page 4

Site History

Mr. Paul Burnette, Associate Planner with the City of Davenport in the Planning and Programming Department was interviewed to acquire pertinent site information. After reviewing a September 1990 Environmental Science and Engineering, Inc. (ESE) Peoria, Illinois closure report for the site, the following was determined:

- Two USTs of approximately five thousand (5,000) and fifteen thousand (15,000) gallon capacity, the contents of which were believed to be fuel oil and waste oil, respectively, were removed in early September 1990. A copy of the ESE report as provided by the City of Davenport is attached as Appendix 2.
- Enviromark of Davenport, Iowa provided excavation, tank removal, backfilling, tank restoration and tank disposal services. Safety Kleen of Davenport, Iowa performed disposal of fluids removed from the USTs.
- Prior to tank removal, approximately seven thousand (7,000) gallons of used water and oil were removed from the eastern fifteen thousand (15,000) gallon UST and disposed of by Safety Kleen. Approximately five thousand (5,000) gallons of fluid was removed from the western five thousand (5,000) gallon capacity UST.
- ESE personnel inspected the removed USTs for the presence of apparent defects. No obvious defects were observed on the fifteen thousand (15,000) gallon UST. Three (3) "holes" were reportedly observed in the five thousand

City of Davenport
May 29, 1991
Project No. 42915055
Page 5

(5,000) gallon UST. Those holes were estimated at less than one (1)-inch diameter each.

- Railroad ties were apparently encountered while excavating and were observed intermixed with fills throughout the excavation sidewalls.
- During UST removal operations, groundwater was observed in the base of the excavation. A visual sheen on the water surface was apparently observed.
- Apparent staining of soils in the excavation sidewalls was observed.
- Laboratory analysis by ESE was performed on a groundwater sample collected from a soil boring located approximately ten (10) feet south of the excavation. Benzene, toluene and xylene (BTX) analysis was not performed on that sample, however, analysis performed indicated total petroleum hydrocarbons present at a concentration of fifty-three (53) milligrams per liter (mg/l).
- The date of installation of the USTs is unknown. Sanborn Map Company, New York, New York fire insurance maps for the City of Davenport dated 1910 and 1956 were viewed at the Terracon office. No symbols or other indications of USTs were observed on the maps. A railroad turntable and roundhouse were identified west of Gaines Street on both maps. Lumber piles were shown at the approximate location of the USTs on the 1910 map, while a tool shed was viewed at the approximate UST locations on the 1956 map.

City of Davenport
May 29, 1991
Project No. 42915055
Page 6

Site Conditions

A site sketch generated from the ESE report, City of Davenport photographs taken during UST removal, construction plans and Terracon site reconnaissance is presented as Figure 2 of Appendix 1. This sketch depicts the locations of the removed USTs, estimated excavation area, previous soil boring location and existing railroad tracks.

Based on the USGS topographic map (Figure 1 of Appendix 1) and the location of the Mississippi River compared to the site of assessment, it is assumed that the local shallow groundwater flow is generally to the south. John O'Donnel Stadium, a baseball park, is located approximately one hundred (100) feet south of the assessment area.

The area of assessment has been constructed as a concrete parking lot since UST removal was performed.

A photographic log of the site and surrounding properties is presented as Appendix 3 and photographic location and orientations are shown on Figure 3 of Appendix 1.

Utility Conduits

Information concerning utility locations acquired during the field reconnaissance is presented in Figure 2 of Appendix 1. The only identified buried utility in the immediate area of the site of assessment is a fifty-four (54)-inch diameter sanitary sewer with a completion depth of approximately fifteen (15) feet. The sewer trench is aligned east-west and

City of Davenport
May 29, 1991
Project No. 42915055
Page 7

Terracon

is estimated to be located approximately fifteen (15) feet south of the excavation.

The field reconnaissance was performed by Terracon using experienced environmental staff. Particular attention was paid to the presence and location of utility conduits on and adjoining the site, as utility trenches and traceways are considered probable potential avenues of contaminant migration.

2.0 SITE SAFETY

Terracon has developed and implemented a comprehensive employee health and safety program. The program is managed by an ABIH certified industrial hygienist. Policies have been developed to assure compliance with the regulatory requirements of OSHA and EPA, as well as guidance from such organizations as the American Conference of Governmental Industrial Hygienists (ACGIH), the National Institute for Occupational Safety and Health (NIOSH), and the Army Corps of Engineers.

This scope of services assumes that Level D personal protective equipment (PPE) is adequate. A health and safety plan will be developed prior to mobilization to affirm these assumptions. An example of a similar plan is included in Appendix 4. Level D PPE includes the use of hard hats, steel-toed rubber boots, safety glasses/goggles, and rubber gloves. If contamination is encountered, personal protective equipment will be upgraded, based on the hazard present. Air monitoring will be conducted, as appropriate.

City of Davenport
May 29, 1991
Project No. 42915055
Page 8

3.0 FREE PRODUCT

It is not known at this time if phase-separated product is present in the immediate vicinity of the UST area. Limited information to date indicates that it may be. If free product is encountered while drilling, boring and well locations may be altered to better assess the extent of the product plume.

If free product is encountered in temporary monitoring wells after sufficient time has been allowed for stabilization, those wells should be completed as permanent wells. A regimen of product purging and collection on site in 55-gallon drums or other suitable containers shall be implemented after stabilized water levels, aquifer characterization and sample collection has been completed. This hand purging by bailing would be accomplished on a regular periodic basis by local personnel at an interval determined to be appropriate after considering the contaminant situation. Monthly reports tabulating volumes of free product and water recovered would be submitted to IDNR. Recovered product and contaminated purge water will be periodically disposed of in an appropriate manner, i.e., subcontract disposal, discharge to a suitable treatment system.

4.0 SOIL BORINGS AND SAMPLING RATIONALE

Drilling

The rig to be used for field exploration employs a hydraulic head for drilling and sampling. Drilling equipment will be 4½-inch I.D. hollow stem augers. We propose to drill a minimum of five (5) fifteen (15)-foot borings to obtain soil samples at locations shown on Figure 2 of Appendix 1.

Terracon

City of Davenport
May 29, 1991
Project No. 42915055
Page 9

Boring locations B-2, B-3, B-4 and B-5 are positioned to provide information for the evaluation of petroleum materials, impacting soils and/or groundwater in the immediate vicinity of the UST Release.

Additional borings will be needed if widespread contamination is found at the above proposed boring locations. These additional boring locations will be determined in the field by the Terracon field engineer/geologist. The rationale for locating additional soil borings shall be to use a radial move out from the apparent source area. The move out distance will be determined in the field but will typically range from 20 to 50 feet, until a property boundary is encountered.

Soil boring B-6 is proposed on John O'Donnel Stadium property and permission to drill on that property should be obtained by the City of Davenport prior to mobilization of drilling equipment. In the event that borings performed at the boundaries of the client's property indicate probable petroleum contamination, a monitoring well will be installed at selected locations to assess the extent of groundwater contamination at the property boundary. An additional mobilization may be required to assess the off-site contamination if permission to perform borings on adjacent properties cannot be readily obtained by the client. It is recommended that the client initially obtain access agreements to drill additional borings on off-site properties and/or right-of-ways within 100 feet of client's property as a contingency measure if a possible secondary mobilization is not desired. Should permission to explore adjoining property not be voluntarily obtainable, the IDNR should be notified for assistance.

City of Davenport
May 29, 1991
Project No. 42915055
Page 10

The final number of soil borings will be determined in the field by the field engineer/geologist according to field photoionization detector (PID) test results from soil samples, as well as visual and olfactory indications of obvious petroleum contamination.

Cleaning Procedures

Drilling equipment and the working end of the drill rig will be cleaned prior to and at the completion of the field exploration with high pressure hot water (HHPW) and Alconox detergent. In addition, downhole drilling equipment will be cleaned by scraping soil adhering from the auger flights and rinsing with potable water before use at each borehole. These cleaning procedures are proposed based on the understanding that levels of effort required exceed normal care but do not absolutely preclude cross-hole contamination. Fluids will not be collected. An on-site water source will be required.

Borehole Backfill Procedures

Upon obtaining stabilized water levels and collection groundwater samples, the boreholes will be backfilled with soil cuttings mixed with bentonite powder. Excess auger cuttings will be left on site for appropriate disposal by the owner. Borings in paved areas will be patched with quickrete.

Soil Sampling and Analysis

The borings will be logged by an experienced Terracon field engineer/geologist based on visual classification and apparent textural properties of the recovered samples. Information will be logged on field forms shown on Figure 4 of Appendix 1. The

City of Davenport
May 29, 1991
Project No. 42915055
Page 11

Terracon field crew will consist of an experienced driller, helper, and field engineer/geologist.

Soil samples for chemical analysis will be obtained using split-barreled samplers. Soil samples will be field screened for organic vapors using a photoionization detector (PID). This device provides a direct reading in parts per million (ppm) benzene equivalents. Upon removal of the sampler from the borehole, approximately five hundred (500) grams of sample will be cut from the total sample and enclosed in a sealed ziploc baggie. After a fifteen (15)-minute stabilization period, the headspace above the soil will be screened using a PID equipped with a 10.2 eV ultraviolet lamp source. The unit will be gas calibrated in accordance with manufacturer's recommendations.

The balance of each sample will be placed in a ziplock baggie, sealed and labeled. The sample will then be placed in cold storage provided by ice or a 12-volt cooling unit powered by the drill rig. Select samples will be submitted for chemical analysis for use in estimating soil remediation boundaries.

Selected soil samples will be submitted to an analytical laboratory under chain-of-custody (COC) procedures for total hydrocarbons as fuel oil and waste oil analyses using OA-2 methodology. Copies of COC documents are attached as Figures 5 and 6 of Appendix 1. We anticipate submitting five (5) soil samples for analytical testing. The soil samples will be kept cool during the field work and shipping periods. The samples selected for analysis will be from sampling intervals exhibiting the highest PID reading in the apparent unsaturated zone. Samples indicating elevated PID readings below the current watertable at the time of assessment may be analyzed to address fluctuating watertable condition. This

City of Davenport
May 29, 1991
Project No. 42915055
Page 12

information will be used to address lateral and vertical contamination of soils.

5.0 TEMPORARY MONITORING WELLS INSTRUMENTATION RATIONALE

On-Site Temporary Well Placement Rationale

Temporary monitoring wells are required at this site to assess the potential impact of petroleum hydrocarbon fuel releases on the shallow groundwater. Each of the five (5) soil borings will be instrumented with PVC well pipe. These locations may be adjusted in the field by the field engineer/ geologist on the basis of field PID readings to avoid placing all the wells in groundwaters having similar contaminant levels. The temporary wells will be positioned with the intent of bracketing the lateral limits of the contamination plume.

Flow Direction Wells

In general, the following rationale will be used to determine the number and location of on-site temporary monitoring wells. Initially, at least three soil borings located in the vicinity of the suspected contaminant source will be completed as temporary monitoring wells for the purpose of determining the predominant hydraulic downgradient flow direction. The precise location of these wells will depend upon such factors as topography, adjoining hydraulic boundaries, utility conduits/trenches, and site use restrictions. These wells should be configured in a triangular pattern with a spacial separation of not less than fifty (50) feet. At least one temporary well should be located in the estimated downgradient direction. These wells shall be referred to as "flow direction" wells.

City of Davenport
May 29, 1991
Project No. 42915055
Page 13

In addition to the "flow direction" wells, at least one (1) temporary well will be located in the suspected contaminant plume (if present). This well will be used to develop and track information on the progress of subsequent remedial operations, if required.

The temporary monitoring well borings will be drilled and set with 4½-inch inside diameter hollow stem augers.

Bracketing Wells

Following determination of the predominant flow direction, additional temporary monitoring wells may be necessary to establish the limits of contamination. Generally, at least one well in the downgradient, upgradient and the right and left lateral edges of the plume are required to "bracket" the typical elliptical shaped plume.

Wells in addition to the minimum number of "bracketing wells" may be required where the plume is abnormally complex in character or configuration, and/or when the plume length is more than 200 to 300 feet or when the plume extends onto adjoining properties.

Off-site Placement Rationale

If off-site contaminant migration is confirmed by on-site boundary wells which have failed to bracket the plume, off-site monitoring wells will be required. The rationale for the requisite number and placement of off property wells will be similar to the rationale described above for on-site "bracketing" wells.

City of Davenport
May 29, 1991
Project No. 42915055
Page 14

Multiple Installations

The placement of monitoring wells will usually involve multiple mobilizations when the following factors are involved.

- * Slow recharge formations (such as clay and silts)
- * Off-property migration where prior access permission and utility clearance have not been received
- * Complex stratigraphy, hydrogeology
- * Substantial interference to well placement due to site use restrictions, traffic or other institutional factors

Materials/Construction

The temporary groundwater monitoring well materials will consist of two (2)-inch, nominal inside-diameter, Schedule 40, flush-jointed, PVC pipe. No solvent glues will be used. One ten (10)-foot section of manufacturer slotted 0.01-inch well screen will be installed at the bottom of each well borehole. Attached to the well screen and extending above ground surface will be a 2-inch, nominal-diameter, solid-stem, riser pipe. Monitoring well construction details will be shown on the borings of the wells. An example of a typical monitoring log is attached as Figure 7 of Appendix 1. Screen positions will be field-determined to generally intersect the current water table near the screen midpoint.

If permanent monitoring wells are required to be installed, well completion will be performed as follows. The borehole annulus will be packed with #3 Muscatine gravel pack or equivalent from the

City of Davenport
May 29, 1991
Project No. 42915055
Page 15

bottom of the hole to a point at least one foot above the slotted well screen. An approximate 2-foot thick bentonite pellet layer will be installed and hydrated in the borehole annulus above the gravel pack. The remaining borehole annulus will be grouted to ground surface with a neat cement/bentonite grout or Volclay grout mixture. The wells will be secured in lockable steel protector pipes with keyed-alike padlocks. Wells installed in drives or parking areas will be terminated at ground level in flush-mount boxes with water-tight, lockable expansion plugs. Figure 8 of Appendix 1 shows the typical construction details for both flush mounted and above-ground protected groundwater monitor wells.

Cleaning Methods

Drilling equipment will be similarly cleaned as previously described for soil sampling in Section 4.0. PVC well materials will be Brainard-Kilman Triloc or equivalent and are ultrasonically cleaned prior to packaging and shipping from the manufacturer. Materials will remain packaged until immediately prior to their use. The well casing will be rinsed with potable water after unpackaging and prior to installation in the borehole. Pre-cleaned disposable single-use polyethylene/PVC bailers will be used at each well location.

Development

Should permanent monitoring wells be required, Terracon will develop the monitoring wells by bailing three (3) standing well casing volumes or by bailing dry once if the wells are slow to recharge.

City of Davenport
May 29, 1991
Project No. 42915055
Page 16

Water level and product thickness measurements will be made at each temporary or permanent well after sufficient time has elapsed to allow stabilization of the water levels inside the wells. An additional site visit may be required if the wells are slow to recharge.

Fluid Measurements

The depth to the static product/water level in the monitoring wells will be measured from the top of the well casing with an electronic interface probe that can detect free product and water levels to an accuracy of $\pm .01$ feet. The ground surface and top of casing elevations will be measured with an engineers level and referenced to a convenient local benchmark. Elevations will be measured to an accuracy of ± 0.1 feet. Information should only be considered accurate to the degree implied by these methods. If more accurate methods are required, a firm specializing in land surveying will need to be retained to perform these activities.

6.0 GROUNDWATER QUALITY CHARACTERIZATION

Sampling Protocol

Groundwater samples will be obtained by single-use disposable PVC/polyethylene bailers following stabilization of purging of at least one (1) standing well volume. Pre-cleaned and sealed bailers are used for each monitoring well to reduce the potential of cross-contamination of the samples. The samples will be kept cool during field work and shipping periods as previously described. The samples will be shipped/transported overnight under COC procedures to an analytical laboratory. An example of the COC form to be

City of Davenport
May 29, 1991
Project No. 42915055
Page 17

completed upon initiation of a sampling event is shown in Figure 6 of Appendix 1.

Parameters of analysis will be BTX using OA-1 methodology. Each temporary monitoring well installed shall be sampled and analyzed at least once during the course of the assessment.

7.0 DATA ANALYSIS AND REPORT PREPARATION

An engineering report will be submitted following completion of the field activities and receipt of the analytical results. The report will address the following:

1. A field procedure and methodology report detailing drilling and sampling procedures utilized in the field exploration. This report will contain boring logs with well details as shown in the attached Figure 7 of Appendix 1. A discussion of topographic relief as tied to USGS and/or local surveys will also be addressed and a topographic map showing the project site will be included for reference, if readily available.
2. Site characterization map will be developed based upon the field information provided by the assessment. The map will show adjoining structures, water wells, utility conduits/trenches, and pertinent hydrogeologic boundaries.
3. The report will contain a series of maps including a groundwater contour map with indicated flow directions as interpolated from field data points and isoconcentration maps or contaminant limit maps of soil and groundwater

City of Davenport
May 29, 1991
Project No. 42915055
Page 18

contamination as estimated from the field data. Plumes will be estimated on the basis of straight line interpolation and/or extrapolation to identify a potential IDNR remediation boundary.

4. At least one stratigraphic cross section will be presented to identify subsurface stratigraphic changes and other impact features such as tank excavations, septic discharge elevations, etc. where applicable.
5. The report will contain a conclusions and recommendations section regarding the impact of the apparent release of petroleum hydrocarbon materials on the site. It will compare contaminant levels against current regulatory guidelines. The report will briefly identify the apparent remedial technology, if required, indicated by field data to date to be applicable to this site.

8.0 SCHEDULE

We anticipate starting the site exploration within fifteen (15) working days after receipt of confirmation of plan approval by IDNR. Our completed engineering report would be submitted within approximately fifteen (15) working days following the receipt of analytical testing results and completion of other field data acquisition such as phased exploration and stabilized water level measurements. Analytical testing is anticipated to require ten (10) to fifteen (15) working days.

City of Davenport
May 29, 1991
Project No. 42915055
Page 19

Terracon

Very truly yours,

TERRACON ENVIRONMENTAL, INC.

Gregg P. Olberts

Gregg P. Olberts
Project Engineer

David E. Koch

David E. Koch
Principal

GPO/DEK/pc2
(15055-01.awp)

Terracon

APPENDIX 1

Figures



NO SCALE



IOWA

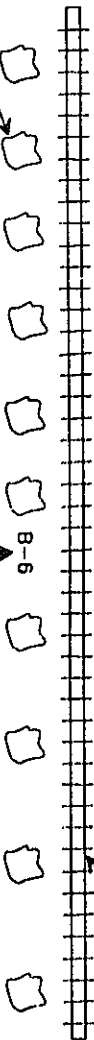
FIGURE 1.
SITE LOCATION MAP
SITE ASSESSMENT PLAN
FOR LEAKING UST SITE
GAINES STREET AND RIVER DRIVE
DAVENPORT, IOWA
PROJECT NO. 42915055

APPROXIMATE
SCALE
0 FEET 20

- LEGEND**
- ▲ PROPOSED SOIL BORING LOCATION
 - △ PREVIOUS SOIL BORING LOCATION
 - BURIED UTILITY LOCATION

N

SHRUBS



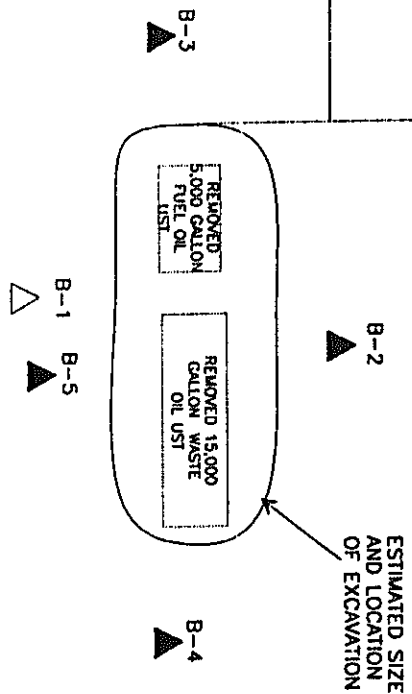
RAILROAD TRACKS

B-6

FIGURE 2.
BORING LOCATION
SKETCH
SITE ASSESSMENT PLAN
FOR LEAKING UST SITE
GAINES STREET AND RIVER DRIVE
DAVENPORT, IOWA
PROJECT NO. 42915055

Terracon

50 FEET
TO GAINES
STREET



54" SANITARY SEWER

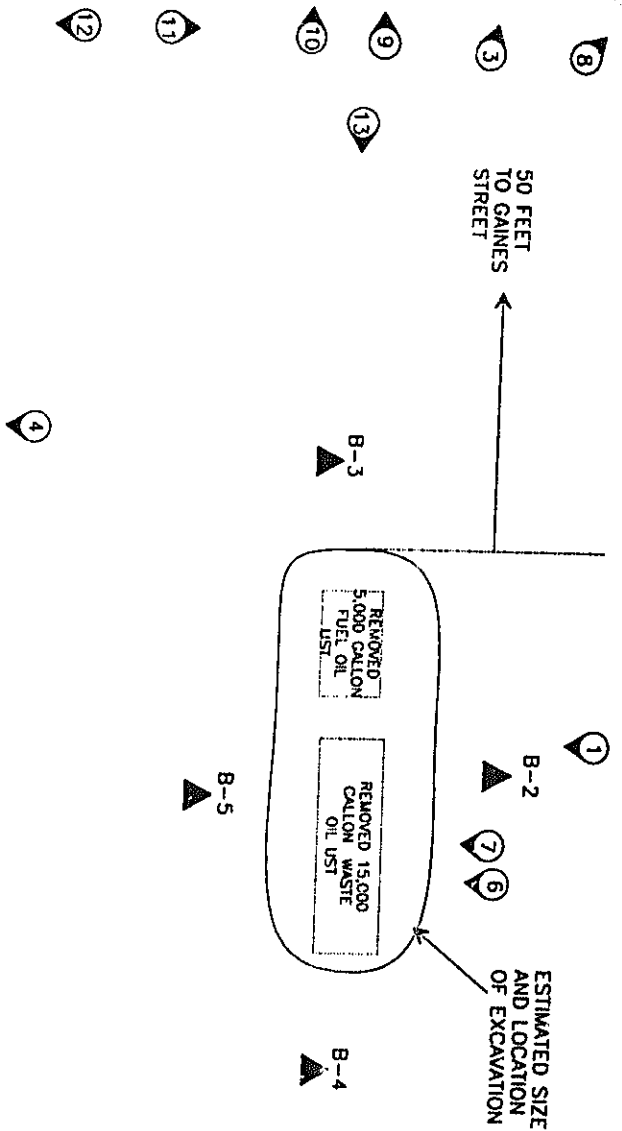
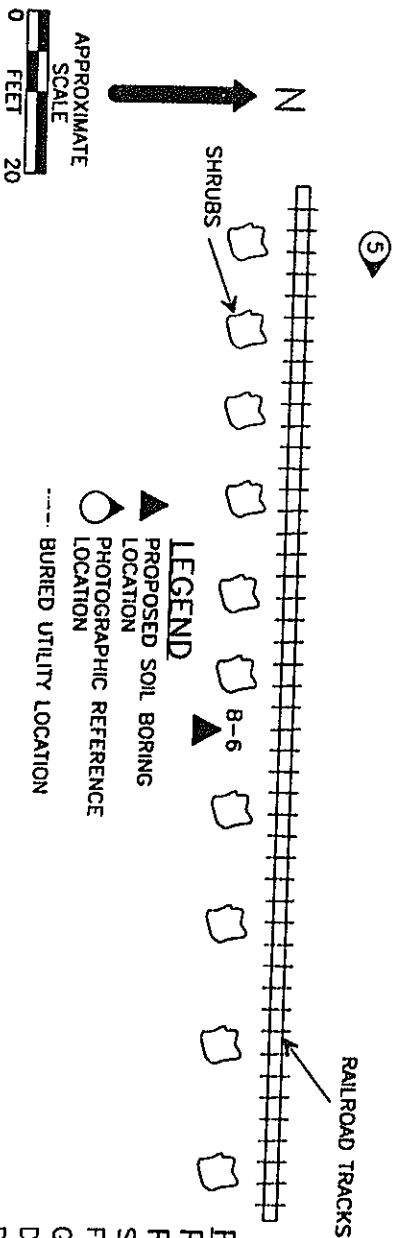


FIGURE 3.
PHOTOGRAPHIC
REFERENCE LOCATION
SITE ASSESSMENT PLAN
FOR LEAKING UST SITE
GAINES STREET AND RIVER DRIVE
DAVENPORT, IOWA
PROJECT NO. 42915055

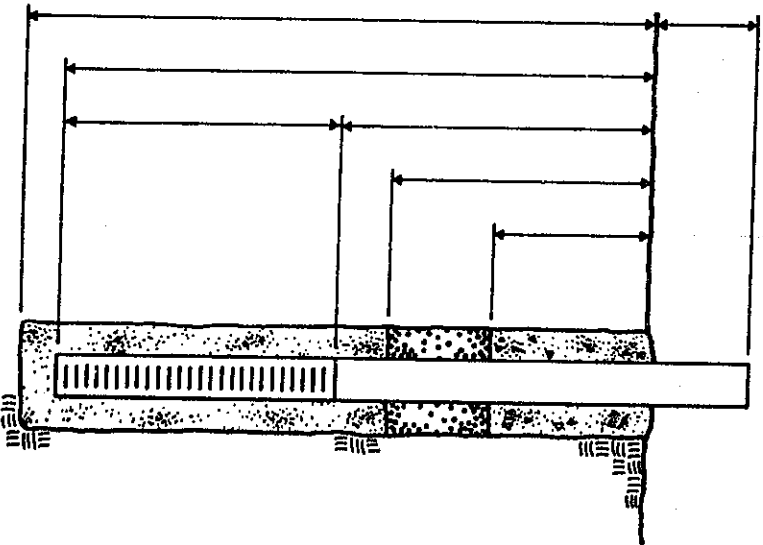
Terracon

BORING ELEVATIONS

Benchmark

Elevation

☐ Assumed ☐ Given



Protective steel cover? ☐ Yes (Lock type _____)

☐ Yes (Lock type: _____)

(Key number.

☐ No

Size and type of well casing

Screen slot size or fabric type

[illegible]

Terracon

DEPARTMENT OF GENERAL SERVICES

CORRECTION

CORRECTION

CONFECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

CORRECTION

FIGURE 5
REQUEST FOR ANALYTICAL SERVICES

From: Terracon Environmental, Inc. **TO:** _____
4480 48th Avenue Court-Suite 3
Rock Island, Illinois 61201
Name: _____ **Name:** _____
309 / 788-1500 **Phone:** _____
FAX: 309-788-1518 **FAX:** _____
Date: _____

Reference Number: _____ **(Show on all labels, correspondence and invoices)**

Analytical Request: **Splits Required:** ☐ No ☐ Yes **Blank Required:** ☐ No ☐ Yes

Type of Material: ☐ Soil ☐ Water ☐ Sludge ☐ Other: _____

Parameter(s): _____

Sampling Points: _____ **Method** _____ ☐ None Specified, Please Advise.

☐ IDNR BTX (OA-1) ☐ IDNR T.H.-GAS (OA-1) ☐ IDNR T.H. DIESEL (OA-2) ☐ ILLINOIS BTEX ☐ OTHER _____

Parameter(s): _____

Sampling Points: _____ **Method** _____ ☐ None Specified, Please Advise.

☐ IDNR BTX (OA-1) ☐ IDNR T.H.-GAS (OA-1) ☐ IDNR T.H. DIESEL (OA-2) ☐ ILLINOIS BTEX ☐ OTHER _____

Parameter(s): _____

Sampling Points: _____ **Method** _____ ☐ None Specified, Please Advise.

☐ IDNR BTX (OA-1) ☐ IDNR T.H.-GAS (OA-1) ☐ IDNR T.H. DIESEL (OA-2) ☐ ILLINOIS BTEX ☐ OTHER _____

Parameter(s): _____

Sampling Points: _____ **Method** _____ ☐ None Specified, Please Advise.

☐ IDNR BTX (OA-1) ☐ IDNR T.H.-GAS (OA-1) ☐ IDNR T.H. DIESEL (OA-2) ☐ ILLINOIS BTEX ☐ OTHER _____

Containers: **Provided By:** ☐ Laboratory **Required Delivery Date:** _____ ☐ Terracon ☐ _____

Shipped By: ☐ FedX ☐ UPS ☐ Pick at Lab ☐ _____

Ship To: Terracon Environmental, Inc.
c/o _____

To Lab: ☐ FedX
☐ Dropoff at Lab
☐ UPS
☐ _____

Attention: _____

Report To: Terracon Environmental, Inc.
4480 48th Avenue Court-Suite 3
Rock Island, Illinois 61201
Attention: _____

Invoice: Same As Report or.....

Reference: _____

REQUEST FOR RESULTS

TO: _____

Name: _____
Phone: _____
FAX: _____

Reference Number: _____ (Show on all fables, correspondence and invoices)

NOTICE#

RESPONSE

DATE REQUEST MADE:

CHAIN - OF - CUSTODY RECORD

Sample Designation _____

Parts _____ of _____

Project _____

Project Number _____

Collector's Signature _____

Telephone: _____

Collector's Address: _____

Sampling Location (Boring #, Well #, Etc.) _____

Date Sampled _____ Time Sampled _____

Sampling Method: ☐ Impeller Pump ☐ Bladder Pump ☐ Bailor ☐ _____

Laboratory of Analysis: ☐ Pace Labs ☐ NET _____

Standard Field Information: _____

Color _____ pH _____ Temperature _____ C/F

Turbidity _____ ☐ Filtered ☐ Unfiltered _____

Container Preservation ☐ Acid ☐ Other _____

Shipping Preservation ☐ Cooled ☐ Other _____

and Size of Containers _____

State: ☐ Solid ☐ Liquid ☐ Gas _____

Other Field Information: _____

Specific Conductance _____

Pre-Development: Yes No: Date _____

Other Information: _____

Sampled for: ☐ IA OA-1 ☐ IA OA-2 ☐ DIESEL ☐ WASTE OIL

☐ ILL BTEX ☐ OTHER: _____

Relinquished By: (Signature)	Received By: (Signature)	Reason	Date	Time
<div>Terracon</div>		<input type="checkbox"/> Transport <input type="checkbox"/> Analysis		

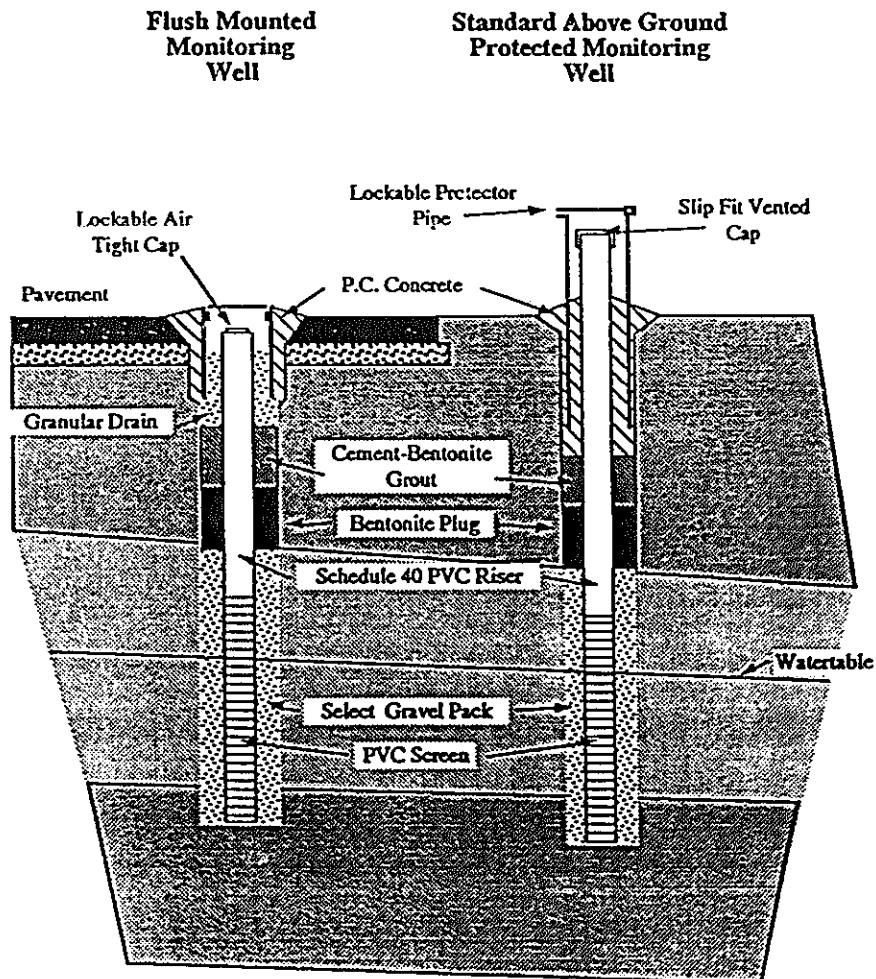
FIGURE 7

LOG OF BORING NO. MW-1										Page 1 of 1	
OWNER/CLIENT Terracon Environmental, Inc.					CONTRACTOR/ENGINEER						
SITE Rock Island, Illinois					PROJECT Monitoring Well Example						
GRAPHIC LOG	DESCRIPTION		WELL DETAIL	DEPTH-ft.	SAMPLES				TESTS		
					USCS SYMBOL	NUMBER	TYPE	RECOVERY-in.	SPT - N BLOWS / FT.	MOISTURE, %	UNCONFINED * STRENGTH-psf
Top of Casing Elevation: 102.5 ft. Ground Surface Elevation: 100.0 ft.											
	LEAN CLAY Dark Brown					HS					
	5.0	95.0			1	SS	18	10			ND
	SANDY LEAN CLAY Brown					HS					
	7.0	93.0			2	SS	18	20			ND
	LEAN CLAY TRACE SAND AND GRAVEL (Glacial Till) Brown and Gray					HS					
	11.0	89.0			3	SS	12	5			ND
	FINE TO MEDIUM SAND Brown					HS					
	12.5	87.5			4	SS	18	15			ND
	LIMESTONE Weathered Brown					HS					
	15.0	85.0									
BOTTOM OF BORING				15							
SOIL AND BEDROCK DESCRIPTIONS ASSIGNED ON THE BASIS OF VISUAL CLASSIFICATION BY THE FIELD CREW											
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.					BOREHOLE DIA.: in. LOCK: WELL DIA.: 2.0 in.						
WATER LEVEL OBSERVATIONS					BORING STARTED						
WL	▽ 11.0'	WD	▽ 9.0'	AB	BORING COMPLETED						
WL					RIG			FOREMAN			
WL	(Comments)				APPROVED			JOB #			

Terracon

ENVIRONMENTAL

FIGURE 8



**Typical Construction Details
for Flush and Above Ground
Monitoring Wells**

Terracon

Terracon

APPENDIX 2

ESE Report

TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION	1
II. UST PREPARATION AND REMOVAL	1
A. GENERAL	1
B. EAST TANK	1
C. WEST TANK	2
III. GROUNDWATER SAMPLING	2
IV. SOIL ANALYSIS	2
V. UST INSPECTION	3
A. EAST TANK	3
B. WEST TANK	3
VI. SITE RESTORATION	3
VII. CONCLUSIONS	3

<u>LIST OF FIGURES</u>	<u>FOLLOWS PAGE</u>
------------------------	---------------------

FIGURE 1	SITE MAP	1
FIGURE 2	SAMPLE LOCATION MAP	2

APPENDICES

APPENDIX A	CLOSURE NOTIFICATION FORM
APPENDIX B	GC-FID SCAN RESULTS
APPENDIX C	GROUNDWATER ANALYSIS RESULTS/CHAIN-OF CUSTODY

I. INTRODUCTION

Environmental Science & Engineering, Inc. (ESE) was retained by the City of Davenport to oversee an Underground Storage Tank (UST) removal of two (2) adjacent underground tanks located north of the railroad tracks and southeast of River Drive and Gaines Street in downtown Davenport. The subject tanks include one 15,000-gallon buried railroad car and one 5,000-gallon fuel tank. This report presents the results of the closure assessment and groundwater sampling for the subject USTs. For reference purposes, the buried railroad car is designated as "east tank" and the fuel tank as "west tank" throughout the report.

II. UST PREPARATION AND REMOVAL

A. General

Prior to conducting on-site work, 30-day notification of the UST removal was given to the Iowa Department of Natural Resources (Appendix A). On August 7, 1990, a sample of the east tank contents was collected and analyzed for the presence of hydrocarbons via a GC-FID Scan. Analytical results detected a diesel fuel pattern as presented in Appendix B. At this time, the fill pipe of the west tank was asphalt covered, preventing access for sampling. On September 4, 1990, work was initiated for the removal of the east tank, west tank and their associated piping. Enviromark of Davenport, Iowa was contracted by the City to perform the excavation, tank removals, backfilling, site restoration and tank disposals. Safety Kleen, also of Davenport, was sub-contracted by Enviromark to help conduct the disposal of the tank's contents. Figure 1 presents a site map of the subject site.

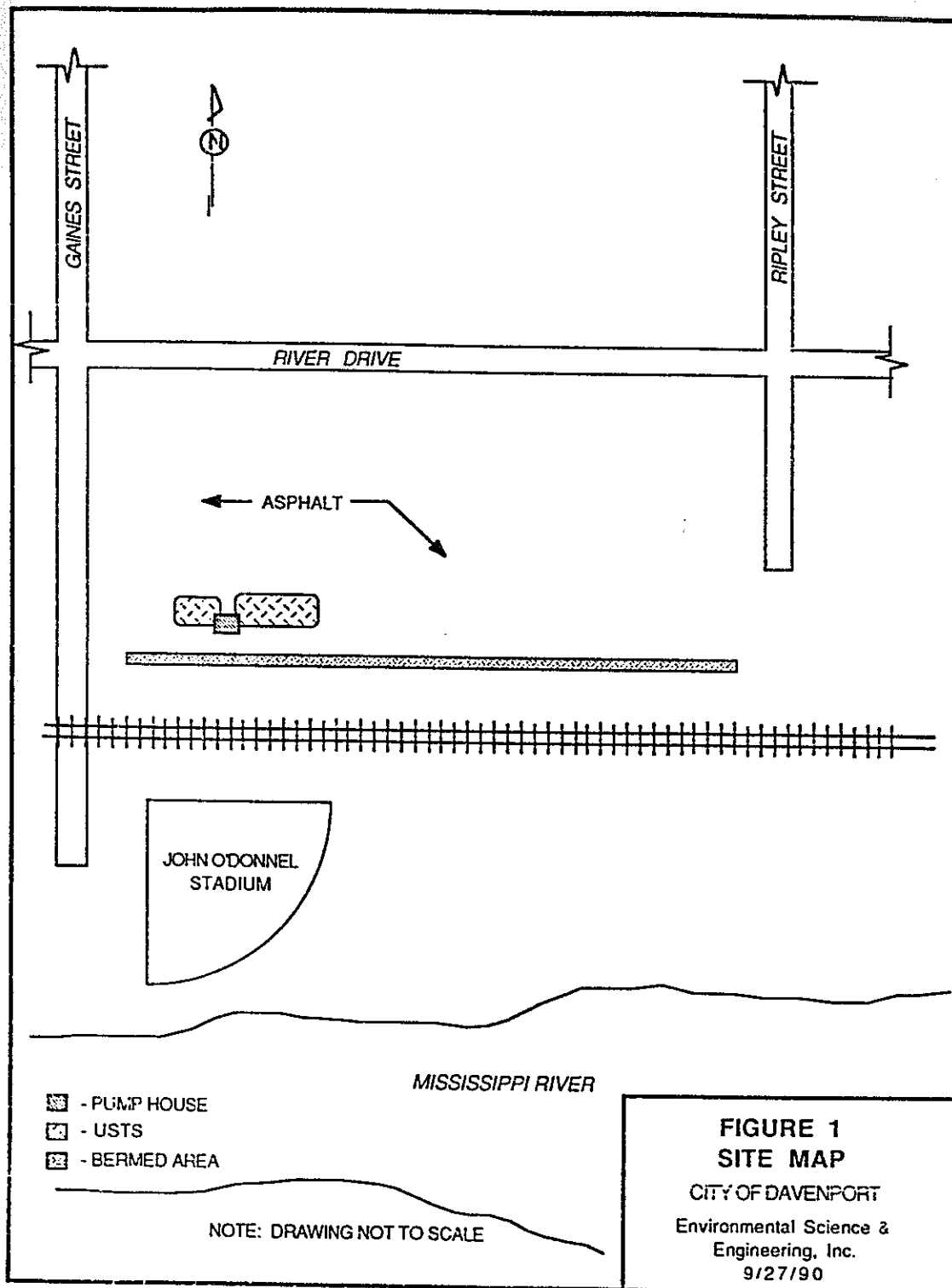
B. East Tank

Work commenced with soil excavation along the north side of the east tank. A backhoe was used to remove asphalt and soil from above the east tank and its piping, exposing two layers of 18" concrete blocks. Upon removal of the concrete blocks, the top of the east railroad car was revealed.

Safety Kleen and Enviromark began the removal process by pumping out the liquids. Approximately 5,800 gallons of oily water and 1,000 gallons of used oil were pumped out of the tank and disposed of at Safety Kleen.

Following content removal, a chain was connected between the backhoe bucket and tank manhole in attempt to lift the tank from the excavation. After several unsuccessful attempts, the backhoe was hooked around the manhole and used to pull the tank out of the excavation.

Upon removal, the tank was placed on a polyethylene sheet east of the excavation. An MSC Vapor Monitor was used to monitor the tank for lower explosive limit (LEL) and oxygen levels. After initially obtaining readings of 21% LEL, CO₂ gas was pumped into the tank to



purge it of vapors. Upon obtaining MSC vapor monitor readings of less than 5% LEL, a cutting torch was used to gain access for cleaning the interior of the tank. The tank was then cut and disposed of at Midwest Steel and Battery, Davenport, Iowa.

C. West Tank

A backhoe was used to remove asphalt and soil from above the west tank, exposing two (2) layers of 18" concrete blocks. Excavation of soils occurred along the north side of the tank to help enable the removal of the UST from the sub-surface.

EnviroMark continued the removal by pumping out what appeared to be water and disposing of it at the City of Davenport Water Pollution Control Plant. Approximately 5,000 gallons (the total tank capacity) were pumped out of the tank.

Following content removal, a cable was connected between the backhoe bucket and tank manhole and used to remove the tank from the excavation. The tank was subsequently placed on a polyethylene sheet, west of the excavation.

An MSC Vapor Monitor was used to monitor the tank for explosive vapors (LEL and O₂). After initially obtaining readings of 24% explosive vapors, CO₂ gas was pumped into the tank to purge it of vapors. Once MSC vapor monitor readings detected 5% or less explosive vapors, a cutting torch was used to gain access for cleaning the interior of the tank. Subsequently, the tank was cut and disposed of at the Midwest Steel and Battery, Davenport, Iowa.

III. GROUNDWATER SAMPLING

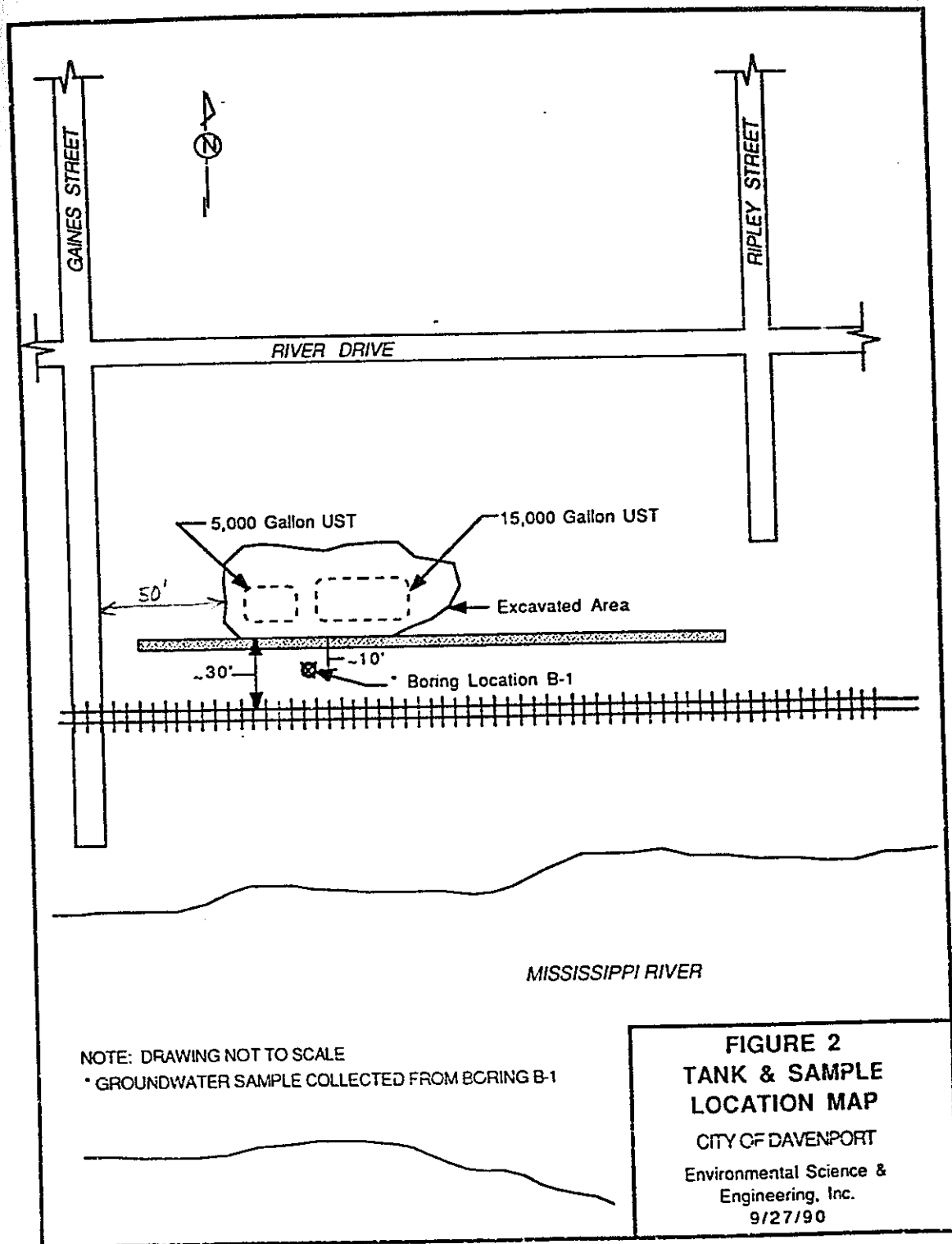
The closure method planned for the subject UST removals was soil sampling; however, due to groundwater being encountered in both the east and west excavations, groundwater sampling was conducted.

Five groundwater samples were collected via a hole bored downgradient of the excavations. The samples were collected in 8-ounce glass jars and shipped to ESE, Inc., Peoria, Illinois laboratory for analysis of total petroleum hydrocarbons. Laboratory analysis results detected a concentration of 53 mg/l (ppm) in the water sample. Please refer to Appendix C for a copy of results.

IV. SOIL ANALYSIS

During the excavation of the soils surrounding the USTs, an apparent visual evidence of a release was observed. Stained soils were hauled from the site and disposed of at the Scott County Landfill in Davenport, Iowa.

Petroleum-like odors and buried railroad ties were observed in both excavations from the surface to approximately thirteen feet below ground level. These odors were also observed in the hole bored south of the USTs. A diagram of the tank positions and sampling locations is presented in Figure 2.



V. UST INSPECTION

A. East Tank

Inspection of the east tank revealed no apparent defects. The tank was 10' x 26', comprised of steel, and had a storage capacity of approximately 15,000 gallons.

Observed soil staining appeared to extend downward to the surface of the shallow aquifer; product was observed on the groundwater surface. Railroad ties were buried throughout the soil in this excavation.

B. West Tank

Inspection of the west tank revealed three small holes, each approximately 0.75 inch diameter. With the exception of these holes, no other apparent defects were observed. The tank measured 8' x 13', comprised of steel, and had a storage capacity of approximately 5,000 gallons.

Buried railroad ties were observed throughout the soils in the west excavation. A slight visual sheen was observed on the groundwater.

VI. SITE RESTORATION

The tank excavation was backfilled to grade with clean sand to minimize the potential safety hazard posed by an open excavation. The backfill material was compacted utilizing the backhoe bucket to prevent any future slumping.

VII. CONCLUSIONS

The presence of buried railroad ties, strong odors and a visual sheen in the east and west tank excavations most likely indicates a residue of creosote and/or heavy fuel oils in this area. Laboratory analytical results of the groundwater sample (53 ppm) indicate the presence of hydrocarbons on-site.

CLOSURE NOTIFICATION FORM

NOTE: Notification of tank closure or a change-in-service must be submitted to the Department at least 30 days prior to the closure activity. Upon receipt of this notification information, the Department will mail detailed closure guidance documents to assist the tank owner in the closure process. Fold form and mail directly with address on reverse side showing.

DATE: August 6, 1990

I. Owner of Tanks or Authorized Representative Owner Name or Name of Authorized Representative <u>City of Davenport</u>					
Street Address <u>226 W. 4th St.</u>			Phone Number <u>(319) 326-7765</u>		
City <u>Davenport</u>		State <u>IA</u>	Zip Code <u>52801</u>		
II. Location of Tank(s) Facility Name or Company Site Identifier, as Applicable <u>Gaines St. & River Drive near pump house</u>					
Street Address and City or State Road, as Applicable					
III. Mo./Day/Yr. of Proposed Closure or Service Change <u>9/9/90</u>					
IV. Method of Tank Closure (Check Only One)					
1) Removal of Tank Assessing Contamination via Collecting Soil Samples for Lab Analysis <input checked="" type="checkbox"/>					
2) Removal of Tank Assessing Contamination Using Vapor Analyzer _____ (Note: Ambient Temperature Must Be Greater Than 40°F)					
3) Tank Closure Assessing Contamination Via Collecting Groundwater Samples for Lab Analysis _____					
4) Abandonment in Place Assessing Contamination via Collecting Soil Samples for Lab Analysis _____					
V. Name and Address of Contractor Doing Work, If Known <u>(will be known 8/21/90)</u>				Phone Number ()	
VI. Description of Underground Storage Tanks (Complete for each tank undergoing closure or service change)					
	Tank No. 1	Tank No. 2	Tank No. 3	Tank No. 4	Tank No. 5
Date of Tank Installation (Mo./Yr.)	<u>unknown</u>	<u>unknown</u>			
Estimated Total Capacity (Gallons)	<u>12,000</u>	<u>12,000</u>			
Substance(s) Stored Throughout Operating Life of Tank (Check All That Apply)	a. Petroleum				
	Diesel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Kerosene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Gasoline (Including Alcohol Blends)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other, Please Specify	<u>unknown</u>			
	b. Hazardous Substance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If Hazardous Substance Stored is other than Petroleum, Complete the Following:					
Please indicate Name of Principal CERCLA Substance (Attach Additional Page As Necessary) OR					
Chemical Abstract Service (CAS) No.					
c. Unknown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VII. Tank Status (Check Only One)	a. Permanent Closure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b. Change-In-Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VIII. Will this closure involve replacement of at least one old tank with a new tank? Yes _____ No <input checked="" type="checkbox"/>					
IX. Signature of Tank Owner <u>Charles Hester by DSS</u>				Date <u>Aug 14, 1990</u>	





Environmental
Science &
Engineering, Inc.

2401 N. Industrial Road
P.O. Box 10000, Ames, IA 50010

Phone (515) 233-4422
Fax (515) 233-4422

An IEPA Contract Laboratory

TO: City of Davenport
226 W. 4th Street
Davenport, IA 52801

REPORT DATE: 9-7-90
DATE REC'D: 8-9-90
PROJECT NO.: 1-0715.003.01

ATTN: Mr. Charles Heston

ESE SAMPLE 900809-28
SAMPLE DATE 8-7-90

DESCRIPTION East Tank
Sample

Flashpoint, °C 30
BTU, BTU/lb 11,800
*GC-FID Scan, mg/l 19,000

*Sample Contained Diesel Fuel.

Report Approved By:

Barbara G. Raya-Hash
Barbara G. Raya-Hash
Manager of Laboratory Operations

Analysis in accordance with procedures itemized in 40 CFR Part 136 and 261.
sae/L:60



Environmental
Science &
Engineering, Inc.

8901 N. Industrial Road
Peoria, Illinois 61615-1589

(309) 692-4422
Fax (309) 692-9364

An IEPA Contract Laboratory

TO: City of Davenport
226 W. 4th Street
Davenport, IA 52801

REPORT DATE: 9-17-90
DATE REC'D: 9-10-90
PROJECT NO.: 1-0715.003.01

ATTN: Mr. Charles Heston

ESE SAMPLE 1074-1
SAMPLE DATE 9-5-90

DESCRIPTION Water Sample

Total Petroleum
Hydrocarbons by FID 53

Diesel Pattern
Results in mg/l (ppm) unless otherwise indicated.

Report Approved By: Barbara G. Raya-Hash
Barbara G. Raya-Hash
Manager of Laboratory Operations

Analysis in accordance with procedures itemized in 40 CFR Part 136 and 261.
sae/L:60

DATE	CITY OF Davenport	PROJECT NAME
APRIL 20 11 00 AM		CITY OF DAV. CLOSURE

ANALYSIS OF THE

SCHE REPORT TO: Wayne Polley

Byrne, Paul J.
Deverport Office

[illegible]

Terracon

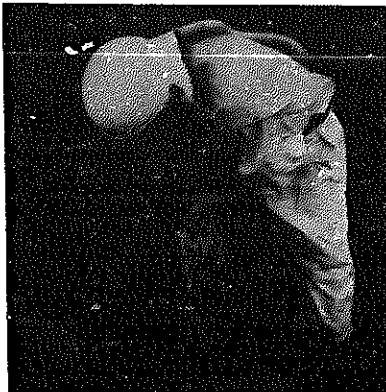
APPENDIX 3

Photographs

Terracon

APPENDIX 4

Health & Safety Plan



EPA Level B Safety Gear

Terracon Environmental, Inc., has formulated standard practices for use during the course of environmental work activities to protect the short- and long-term health of Terracon Environmental employees. These standard practices are presented in written format as "Terracon Environmental, Inc. Safety Policies for Environmental/Hazardous Waste Projects".

Terracon Environmental requires field personnel working on hazardous waste projects to complete 40 hours of health and safety training prior to performing any field work, as prescribed by OSHA (29 CFR 1910.120).

Prior to beginning any project, time is spent researching contaminants by utilizing written and computer generated information. Terracon Environmental uses Hazard Line, a 24-hour computer database providing detailed information on chemical toxicology, exposure levels, physical properties and chemical compatibilities. Information obtained from the research is used to prepare site-specific safety plans.

A medical monitoring plan is in use for Terracon Environmental field personnel. A physical exam is provided for each employee immediately upon hiring as a means of developing baseline data. Depending on the potential for exposure to specific sites, Terracon Environmental may provide entrance or exit physicals for a single site in addition to yearly physicals.

Site safety plans are developed specifically for each individual project and include the following:

- Data on proposed site activities and contaminants is transmitted to the corporate safety officer.
- Following a review, the safety officer issues a site specific safety plan and sets an initial safety level.
- An air surveillance program is developed and real-time monitoring equipment is used to provide immediate measurement. Samples are also taken for laboratory analysis.
- A safety meeting is held prior to each field activity where each Terracon Environmental employee is briefed on the nature of the contaminant, recognizable contamination symptoms, work activities and monitoring.

To: Project Manager
Field Crew

Job:
Date:

Attention - Project Manager

The following must be completed prior to beginning field work:

- [X] - The project manager is responsible for providing this health and safety plan to all on-site personnel.
- [X] - This plan must be discussed with site personnel in a safety briefing.
- [X] - The "Acknowledgement of Instruction" form must be signed by all on-site personnel.
- [X] - Participation in the Terracon medical surveillance program is necessary for all Terracon personnel on-site.
- [X] - The route to and phone number of the nearest hospital or emergency medical clinic must be determined and recorded in this plan.
- [X] - Calibrate the organic vapor monitoring instruments daily prior to use.

The following must be accomplished after completion of field work:

- [X] - Return a signed copy of the "Acknowledgement of Instruction" form to the Safety and Health Manager.
- [X] - Place a copy of this Health and Safety Plan in the project file.
- [X] - If respirator use becomes necessary, replace all cartridges daily.
- [X] - Record breathing zone organic vapor monitor readings (average/maximum) which are representative of employee exposure during various operations on the "Acknowledgement of Instruction" form, in the space provided.

Sent via FAX: ____ Copy(s) of the Site Safety Plan
Sent Previously: ____ Copy(s) of the Site Safety Plan

Thank you,

Gary K. Bradley
Safety and Health Manager
Terracon Environmental, Inc.

HEALTH AND SAFETY PLAN
Hazard Assessment For Low-Level Petroleum Site

Project Name: _____

Location: _____

Project No.: _____

Start Date: _____

This health and safety plan was prepared on the basis of information received from: _____, with
 (client company) (client representative)

Preliminary information indicates that the material(s) indicated below may be present at the site. On the basis of available information, material properties, proposed field activities, anticipated concentrations, and currently acceptable exposure limits, the potential for health effects from exposure is low to negligible.

The use of a real-time organic vapor monitoring instrument (photoionization detector, PID) such as an HNu or OVM will allow site activities to proceed in Level D mod personal protective equipment, with Level C standby, in accordance with standard corporate guidelines. Rubber gloves and boots (where appropriate) shall be used to prevent dermal contact with potentially contaminated site soils/groundwater. Air in the work space (breathing zone) will be periodically monitored throughout the duration of this project.

<u>Material</u>	<u>Anticipated Concentration</u>	<u>Exposure Limit</u>	<u>LEL</u>
Gasoline	potentially saturated soils	300 ppm TLV-TWA 500 ppm STEL	1.3%
Diesel fuel	" " "	*5 mg/M3 TLV-TWA *10 mg/M3 STEL	1.3%
Waste motor oil	" " "	*5 mg/M3 TLV-TWA *10 mg/M3 STEL	n/a
Fuel oil	" " "	*5 mg/M3 TLV-TWA *10mg/M3 STEL	n/a

* Limits for diesel fuel and waste oils are based on concentrations of mineral oil mist in air. Photoionization detectors such as Hnu or OVM read vapor concentrations in parts per million (ppm) and NOT mists in mg/M3. The 90 ppm action level specified for gasoline shall be used as the action level for all petroleum hydrocarbons listed above.

Source of Contaminant Information:

[X] HAZARDLINE Chemical hazard information, attached.

Vapor detection equipment is to be calibrated prior to use, in accordance with manufacturer instructions. The response factors that direct reading instruments have to a given compound is relative to calibration. If the monitoring instruments are not properly calibrated, the estimated concentration readings are invalid.

Indicated exposure limits are for air in the breathing zone and are not applicable to vapor above containerized soil samples. Exposure limits indicated were set by the American Conference of Governmental Industrial Hygienists (ACGIH). The limits established for gasoline were based on potential for lighter fraction petroleum distillates to volatilize into the breathing zone during bulk handling operations (i.e., gasoline tanker loading). The TLV-TWA limit is an 8-hour time-weighted average concentration. The STEL is a 15-minute short-term exposure limit which should never be exceeded.

Contact the Safety and Health Manager at (913) 599-6886 if breathing zone photoionization detector (PID) readings exceed 90 ppm (or TLV Sniffer breathing zone readings exceed 200 ppm) or if conditions at the site are inconsistent with this health and safety plan. The above values were derived from published relative response factors of the HNu and TLV Sniffer to gasoline. A PID reading of 90 ppm (200 ppm with TLV Sniffer) approximates a breathing zone vapor concentration below the TLV-TWA and approximately one-half of the STEL for gasoline.

Benzene, the most significant health hazard found in gasoline, constitutes approximately 1% of the mixture. The remainder is a blend of aromatic and aliphatic hydrocarbons. Gasoline is a potential skin irritant and a central nervous system depressant. Prolonged exposure to vapors may cause headache, nausea, drowsiness and respiratory irritation. Gasoline has excellent warning properties in that the 250 part per billion (ppb) odor threshold is significantly below the TLV of 300 ppm. The other petroleum hydrocarbons listed are of low volatility.

Rubber gloves and boots should be worn to protect skin from irritation and absorption of potentially toxic contaminants. Upgrade to poly laminated disposable Tyvek coveralls if potential clothing saturation conditions develop. Wear appropriate eye protection when performing operations which have the potential to produce flying objects or splashes. Hearing protection should be worn, as necessary. In general, when normal conversation is difficult due to noise levels, hearing protection should be worn.

Do not smoke, eat or chew tobacco while on site. Wash face and hands as soon as possible upon leaving the site. Beware of moderate to high potential for fire if soils saturated with petroleum products are encountered.

Special site health and safety considerations:

(for use by project manager)

Project Number: _____ Project Name: _____

ATTENTION CREW: The following must be completed prior to performing field site operations. The following acknowledgment must be completed as accurately as possible. It is not a waiver. It is the only method used to compile your environmental on-the-job training and experience records. You may obtain, by written request, a copy of your environmental work record from the Safety and Health Manager.

Acknowledgment of Instruction:

I understand that preliminary information indicates this project involves the assessment of potentially contaminated soils and/or groundwater. Potential contamination levels are expected to be low to non-existent. I have read this Health and Safety Plan and have received instructions for procedures to be followed. I understand that if at any time I have questions concerning health and safety precautions at this site, I can call the Safety and Health Manager at (913) 599-6886.

Name: (Please Print) _____ Signature: _____ Date: _____ Hrs.on-site _____

Safety briefing performed by: _____ Date: _____

Level of PPE: ☐ D ☐ Dmod ☐ C

Suspected contaminant(s): ☐ gasoline ☐ diesel
☐ w.oil ☐ fuel oil ☐ none

Air monitoring instrument / readings:

*****HAZARDLINE*****
COPYRIGHT 1987 - OCCUPATIONAL HEALTH SERVICES, INC. Format
Editing By Terracon Environmental, Inc., Content Unchanged

GASOLINE

PERMISSIBLE EXPOSURE LIMIT

300 PPM ACGIH TWA
500 PPM ACGIH STEL

CERCLA HAZARD RATINGS

TOXICITY 3 - IGNITABILITY 3 - REACTIVITY 0 - PERSISTENCE 1

TOXICOLOGY:

GASOLINE IS AN IRRITANT AND CENTRAL NERVOUS SYSTEM DEPRESSANT.
THE THRESHOLD LIMIT VALUE IS BASED ON THE HYDROCARBON CONTENT OF
THE VAPORS.

IHL-MAN TCLO: 900 PPM/1 HR
IHL-MAM LCLO: 30000 PPM/5 MIN

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONCENTRATION
NONE SPECIFIED

SYNONYMS

PETROL, MOTOR SPIRITS, BENZIN, UN 1203, GASOLINE, NATURAL
NATURAL GASOLINE, OHS10340

CAS NUMBER

8006-61-9

REGISTRY TOXIC CHEMICALS NUMBER

LX3300000

FORMULA

C₅H₁₂ TO C₉H₂₀

PHYSICAL DESCRIPTION

CLEAR, VOLATILE LIQUID WITH A CHARACTERISTIC ODOR

CHEMICAL AND PHYSICAL PROPERTIES

MOLECULAR WEIGHT: VARIABLE

BOILING POINT AT 1 ATM, F: 100-400 F

SOLUBILITY IN WATER, G/100 G WATER AT 20C: INSOLUBLE

FLASH POINT, CLOSED CUP, F (OR OPEN CUP IF 0C): -45F

VAPOR PRESSURE @ 20 C, MMHG: VARIABLE

MELTING POINT, F: VARIABLE

UPPER EXPLOSIVE LIMIT IN AIR, % BY VOLUME: 7.6%

LOWER EXPLOSIVE LIMIT IN AIR, % BY VOLUME: 1.4%

AUTOIGNITION TEMPERATURE: 536-853 F

SPECIFIC GRAVITY: 0.72 TO 0.76

VAPOR DENSITY (AIR=1): 3-4

ODOR THRESHOLD: 0.25 PPM

GASOLINE

PERSONAL PROTECTIVE EQUIPMENT

NO NIOSH/OSHA DATA

RECOMMEND PREVENT REPEATED OR PROLONGED SKIN CONTACT

WEAR IMPERVIOUS CLOTHING

WEAR GLOVES

WEAR FACESHIELD (8 INCH MINIMUM)

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED)

NONE SPECIFIED-ADVISE

- CHEMICAL CARTRIDGE RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE WITH A FULL FACE-PIECE
- GAS MASK WITH AN ORGANIC VAPOR CANISTER CHIN-STYLE OR FRONT- OR BACK-MOUNTED CANISTER)
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACE-PIECE, HELMET, OR HOOD
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE

ROUTE OF ENTRY INTO BODY

INHALATION INGESTION SKIN OR EYE CONTACT

SYMPTOMS

CENTRAL NERVOUS SYSTEM DEPRESSION, UNCONSCIOUSNESS, DIZZINESS, RESPIRATORY DISTRESS, EYE IRRITATION, HEADACHE, DYSPNEA, CONVULSIONS, WEIGHT LOSS, ANEMIA, NERVOUSNESS, EXTREMITIES NUMBNESS, HALLUCINATION, WEAKNESS, DERMATITIS, SKIN IRRITATION, NAUSEA, VOMITING, RESPIRATORY IRRITATION, FATIGUE, FEVER, DROWSINESS, COUGHING, WEAKNESS, UNCONSCIOUSNESS, RESPIRATORY DISTRESS, DIZZINESS, EYE IRRITATION

SPECIFIC EMERGENCY PROVISIONS

NO NIOSH/OSHA DATA, ADVISE:

EYE-WASH FOUNTAIN WITHIN IMMEDIATE WORK AREA WHERE EMPLOYEES' EYES MAY BE EXPOSED TO SUBSTANCE.

IF MATERIAL ON FIRE OR INVOLVED IN FIRE:

- * DO NOT EXTINGUISH FIRE UNLESS FLOW CAN BE STOPPED
- * USE WATER IN FLOODING QUANTITIES AS FOG
- * SOLID STREAM OF WATER MAY SPREAD FIRE
- * COOL ALL AFFECTED CONTAINERS WITH FLOODING QUANTITIES OF WATER

DIESEL FUEL NO. 2-D

PERMISSIBLE EXPOSURE LIMIT

MINERAL OIL MIST: 5 MG(MINERAL OIL MIST)/M3 OSHA TWA
5 MG(MINERAL OIL MIST)/M3 ACGIH TWA
10 MG(MINERAL OIL MIST)/M3 ACGIH STEL

HYDROGEN SULFIDE: 20 PPM OSHA ACCEPTABLE CEILING CONC
50 PPM/10 MIN OSHA PEAK
10 PPM ACGIH TWA
15 PPM ACGIH STEL
10 PPM NIOSH RECOMMENDED 10 MIN CEILING

CARCINOGEN STATUS

HUMAN INADEQUATE EVIDENCE; LIMITED ANIMAL EVIDENCE (IARC)

CERCLA HAZARD RATINGS

TOXICITY 3 - IGNITABILITY 2 - REACTIVITY 0 - PERSISTENCE 1

TOXICOLOGY

DIESEL FUEL NO. 2-D IS A SKIN AND MUCOUS MEMBRANE IRRITANT AND A CENTRAL NERVOUS SYSTEM DEPRESSANT. POISONING MAY AFFECT THE LIVER AND KIDNEYS. CHRONIC EXPOSURE FROM TOPICAL CONTACT FROM WASHING HAIR OR HANDS WITH DIESEL OIL HAS RESULTED IN ACUTE OLIGURIC RENAL FAILURE. ASPIRATION MAY OCCUR AND EVEN SMALL AMOUNTS DURING INGESTION OR VOMITING MAY RESULT IN SEVERE PULMONARY IRRITATION, EDEMA AND HEMORRHAGE. THE THRESHOLD LIMIT VALUE WAS ESTABLISHED FOR MINERAL OIL MIST TO PROVIDE A CONSIDERABLE MARGIN OF SAFETY AGAINST EVEN RELATIVELY MINOR CHANGES IN THE LUNGS.

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONCENTRATION
NONE SPECIFIED

RESPIRATOR SELECTION

(UPPER LIMIT DEVICES PERMITTED)
HIGH LEVELS

- TYPE 'C' SUPPLIED-AIR RESPIRATOR WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE WITH A FULL FACE-PIECE, HELMET, OR HOOD OPERATED IN CONTINUOUS-FLOW MODE.
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE

PHYSICAL DESCRIPTION

COLORLESS TO YELLOW-BROWN LIQUID WITH MILD PETROLEUM ODOR

DIESEL FUEL NO. 2-D

CHEMICAL AND PHYSICAL PROPERTIES

MOLECULAR WEIGHT: VARIES

BOILING POINT AT 1 ATM, F: 350-680 F (177-360C)

SOLUBILITY IN WATER, G/100 G WATER AT 20C: INSOLUBLE

FLASH POINT, CLOSED CUP, F (OR OPEN CUP IF 0C): >125 F (>52 C)

VAPOR PRESSURE @ 20 C, MMHG: 1 MMHG

MELTING POINT, F: 0 F (-18 C)

UPPER EXPLOSIVE LIMIT IN AIR, % BY VOLUME: 7.5

LOWER EXPLOSIVE LIMIT IN AIR, % BY VOLUME: 0.6

AUTOIGNITION TEMPERATURE: >475 F (>246 C)

SPECIFIC GRAVITY: 0.87 TO 0.90

VAPOR DENSITY (AIR=1): >1

SYNONYMS

DIESEL OIL; DIESEL FUEL; DIESEL OIL, MEDIUM;

DIESEL OIL NO. 2-D; DIESEL FUEL OIL NO. 2-D;

FUELS, DIESEL, NO. 2; NO. 2 DIESEL FUEL, OHS07100

CAS NUMBER

NONE

REGISTRY TOXIC CHEMICALS NUMBER

68476-34-6

ROUTE OF ENTRY INTO BODY

INHALATION, SKIN ABSORPTION, INGESTION, SKIN OR EYE CONTACT

SYMPTOMS

SKIN IRRITATION, EYE IRRITATION, ERYTHEMA, DERMATITIS,
MUCOUS MEMBRANE IRRITATION, SKIN EDEMA, VESICULATION,
HEADACHE, DIZZINESS, GIDDINESS, ANOREXIA, NAUSEA,
VOMITING, WEAKNESS, INCOORDINATION, STUPOR, DIARRHEA,
ABDOMINAL CRAMPS, COUGHING, DYSPNEA, PULMONARY EDEMA,
PULMONARY HEMORRHAGE, KIDNEY DAMAGE, LIVER DAMAGE,
CENTRAL NERVOUS SYSTEM DEPRESSION

SPECIFIC EMERGENCY PROVISIONS

NO SPECIFIC REQUIREMENT. IF INDICATED BY THE NATURE OF THE
SUBSTANCE AND THE PROBABILITY OF EXPOSURE, PROVIDE AN EYE WASH
AND FACILITIES FOR QUICK DRENCHING OF THE BODY WITHIN THE
IMMEDIATE WORK AREA FOR EMERGENCY USE.

PERSONAL PROTECTIVE EQUIPMENT

NO SPECIFIC REQUIREMENT.

USE APPROPRIATE PROTECTIVE CLOTHING AS INDICATED BY THE
NATURE OF THE CONTAMINANT AND PROBABILITY OF EXPOSURE.

- * DO NOT HANDLE BROKEN PACKAGES WITHOUT PROTECTIVE EQUIPMENT.
- * WASH AWAY ANY MATERIALS WHICH MAY HAVE CONTACTED THE BODY WITH COPIOUS AMOUNTS OF WATER OR SOAP AND WATER.
- * WEAR SELF-CONTAINED BREATHING APPARATUS WHEN FIGHTING FIRES INVOLVING THIS MATERIAL.