



## General Excavation Report

**Duluth Transit Authority Bus Garage  
2402 West Michigan Street  
Duluth, MN 55807**

**Project No. 11488045**

332 West Superior Street  
Suite 600  
Duluth, Minnesota 55802  
Phone: 218-722-3915

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# Minnesota Pollution Control Agency

## General Excavation Report Worksheet

Guidance Document 3-02

Complete the worksheet below to document excavation and treatment of petroleum contaminated soil removed **prior to** a Site Investigation and/or during tank removals and/or upgrades. If soil is excavated as an MPCA-approved corrective action **after** a Site Investigation is conducted, complete Guidance Document 3-02a *Corrective Action Excavation Report Worksheet*. Conduct excavations in accordance with Guidance Document 3-01 *Excavation of Petroleum Contaminated Soil*. Please type or print clearly. Do not revise or delete text or questions from this report form.

The excavation worksheet 3-02 deadline is 10 months from the date of receipt of the MPCA “Petroleum Storage Tank Release Investigation and Corrective Action” letter. MPCA staff may establish a shorter deadline for high priority sites.

### PART I: BACKGROUND

A. Site: Duluth Transit Authority Bus Garage

B. Tank Owner/Operator: *Duluth Transit Authority (Contact: Jim Caywood)*

**MPCA Site ID#: LEAK0021425**

Mailing Address:

Street: *2402 West Michigan Street*

City, Zip: *Duluth, 55806*

County: *St. Louis*

Street/Box: *2402 West Michigan Street*

City, Zip: *Duluth, 55806*

Telephone: *(218) 623-4332*

C. Excavating Contractor: *Twin Ports Environmental Construction (TPEC)*

Contact: *Kevin Lund*

Telephone: *(218) 343-3312*

Tank Contractor Certification Number: *695*

D. Consultant: *MSA Professional Services, Inc.*

Contact: *Jeff Anderson*

Street/Box: *332 W. Superior Street, Suite 600*

City, Zip: *Duluth, 55802*

Telephone: *(218) 499-3175*

E. Others on-site during site work (e.g., fire marshal, local officials, MPCA staff, etc.): *Erica Klingfus, MSA; Jeff Brandon, MPCA; Martin Bevis, Barr Engineering*

F. Site Location Information: Attach Guidance Document 1-03a *Spatial Data Reporting Form* if it has not already been submitted or will not be submitted as part of Guidance Document 4-06 *Investigation Report Form*.

**Note:** If person other than tank owner and/or operator is conducting the cleanup, provide name, address, and relationship to site on a separate attached sheet.

## PART II: DATES

A. Date release reported to MPCA: 12/22/2020

B. Dates site work performed (tanks removed, piping removed, soil excavation, soil borings, etc.):

Work Performed	Date
<i>Two 20,000-gallon steel diesel underground storage tanks (USTs), one 20,000-gallon steel fuel oil #2 UST and associated piping were removed from the Duluth Transit Authority bus garage property located at 2402 West Michigan Street in Duluth, Minnesota by Twin Ports Environmental Construction (TPEC). The three tanks were located in a single tank basin on the northeast side of the bus garage building. The fuel oil tank was located on the north side adjacent to Michigan Street, and the two manifolded diesel tanks (used for fueling buses) were located to the south. Dispensers were located inside the bus garage, and were not removed as they have been connected to the new above ground storage tank (AST) system. The site location is depicted on the attached <b>Figure 1</b>. A tank system change in status form is included in <b>Appendix E</b>.</i>	12/21/2020-12/22/2020

*Approximately 600 gallons of fuel were removed from the tanks by OSI prior to the initiation of tank removal activities. The tanks were found to be in good condition at the time of removal. The fuel oil tank was removed on December 21, 2020 and the two diesel tanks were removed on December 22, 2020.*

*After the tanks were removed from the tank basin, soil samples were collected from both ends of each tank and the sidewalls of the excavation for field screening. Samples collected from the bottom of the tank basin were also submitted under chain of custody for laboratory analysis of petroleum volatile organic compounds (PVOCs) and diesel range organics (DRO).*

*Samples were collected and screened in the field with a photoionization detector (PID). Soil screening readings from samples collected beneath the northernmost and center tanks ranged from 0.0 to 1.1 parts per million (ppm) with no odors or staining observed. Petroleum odors and soil staining were observed beneath the southernmost tank, with PID readings of 116.7 ppm and 396.7 ppm detected in soil samples collected beneath the tank. Based on the PID readings greater than 10 ppm and the petroleum odors observed in the soils surrounding the third tank, a release was reported to the Minnesota Duty Officer on December 22, 2020. Site features,*

including the soil sampling locations are shown on the attached **Figure 2** and photos of the tank removal activities are provided in **Appendix D**.

### PART III: SITE AND RELEASE INFORMATION

A. Describe the land use and pertinent geographic features within 1,000 feet of the site.  
(i.e. residential property, industrial, wetlands, etc.)

*The site is a commercial property (bus garage) in a commercial/industrial area of Duluth, Minnesota. Topography in the area is relatively flat, with slight downhill slopes to the east/northeast. Miller Creek runs beneath the bus garage and to the northeast, approximately 145 feet southeast of the tank basin, emptying into the Duluth Harbor of Lake Superior approximately 1,105 feet east of the site.*

B. Provide the following information for all tanks removed and any remaining at the site:

**Table 1.**

Tank #	Tank ** Material	UST or AST	Capacity (gallons)	Contents (product type)	Year install ed	Tank Status*	Condition of Tank
001	S	UST	20,000	Fuel Oil	1981	Removed (12/21/2020)	Good
002	S	UST	20,000	Diesel	1981	Removed (12/22/2020)	Good
003	S	UST	20,000	Diesel	1981	Removed (12/22/2020)	Good
004	F	UST	2,000	Used or waste oil	1981	Closed In-Place (Unknown)	Unknown
005	S	UST	1,000	E-10	1981	Removed (Unknown)	Unknown
006	Unk.	AST	1,500	Gasoline blends (E1-E49)	2014	Active	Unknown
1001	S	AST	20,000	Diesel	2020	Active	New
1002	S	AST	20,000	Diesel	2020	Active	New
1003	S	AST	5,000	Fuel oil #2	2020	Active	New
MH17 30	Unk.	AST	1,000	Used oil	1999	Active	Unknown

\*Indicate: removed (date), abandoned in place (date), or currently used, upgraded tank, installation of new tank. \*\* F for fiberglass or S for Steel

Notes:

Piping Material (check all that apply): ☒ Steel, ☐ Fiberglass, ☒ Flexible Plastic, ☐ Copper, ☐ Other

- C. Describe the location and status of the other components of the tank system(s) (i.e., transfer locations, valves, piping and dispensers) for those tanks listed above.

*Steel piping connected the two diesel tanks within the basin, flexible plastic piping ran from the tank basin to the dispenser area/heating system components located inside the garage. Dispensers remain in place as they were connected to the new ASTs installed at the site. All other residual components of the UST system (including piping, vent and fill pipes, etc.) were removed during tank removal activities.*

- D. Identify the source(s) of the release or contamination encountered. Only check those options that were verified, if source is unknown check Other and describe:

☐ Piping, ☐ Tank, ☐ Dispenser, ☐ Pump/Turbine, ☐ Delivery Problem, ☒ Other

*The source of the release is unknown.*

- E. Identify the cause of the release (tank and/or piping).

Check all that apply: ☐ Corrosion, ☐ Install Problem, ☐ Spill, ☒ Unknown,  
☐ Mechanical or Physical Damage, ☐ Other

*Soil contamination was identified beneath the southernmost UST, however, the tank was observed to be in good condition upon removal and did not appear to be the direct source of the release.*

- F. Identify the method the release was detected.

Check all that apply: ☒ Removal, ☐ Line Leak Detection, ☐ Tank Leak Detection,  
☒ Visual/Olfactory, ☒ Site Assessment, ☐ Other

- G. Identify any surface soil contamination. *No surface soil contamination was observed at the site.*

- H. What was the volume of the release? (if known): *Unknown* gallons

- I. Historic contamination present (unknown origin?). ☐ Yes, ☒ No

- J. When did the release occur? (if known): *Unknown*

- K. Describe source of on-site drinking water. *Drinking water at the site is obtained from the City of Duluth municipal water supply. The City of Duluth obtains its water from Lake Superior, from an intake pipe located off the mouth of the Lester River, well over a mile from the site.*

- L. Has the site ever, at any point had an E-85 tank? ☐ Yes, ☒ No

#### **PART IV: EXCAVATION INFORMATION**

- A. Dimensions of excavation(s): Length *60'* Width *36'* Depth *16'*

- B. Original tank backfill material (sand, gravel, etc.), if applicable: *Sand*

- C. Native soil type (clay, sand, etc.): *Silty sand*

- D. Quantity of contaminated soil removed for treatment (cubic yards): *No soil was removed from the site.*

(Indicate on the site map where the petroleum contaminated soil was excavated)

How many cubic yards of the removed soil was petroleum saturated? *No soils were removed from the site.*

(Indicate on the site map where the petroleum saturated soil was excavated)

[**Note:** If the volume removed is more than allowed in Guidance Document 3-01 *Excavation of Petroleum Contaminated Soil*, please document MPCA staff approval.]

- E. Were new tanks and/or piping and dispensers installed? (yes/no) If yes, what volume of contaminated soil was excavated to accommodate the installation of the new tanks and piping?

*No new USTs or piping were installed at the site. ASTs (two 20,000-gallon diesel fuel ASTs and one 5,000-gallon fuel oil #2 AST) were installed in November 2020 to replace the UST system prior to removal.*

- F. If contaminated soil was removed to accommodate the installation of new tanks and/or piping, show your calculations for the amount of soil removal allowed using Table 3 in Guidance Document 3-01 *Excavation of Petroleum Contaminated Soil*.

*No soils were removed from the site.*

- G. Was ground water encountered or a suspected perched water layer or was there evidence of a seasonally high ground water table (i.e. mottling)? (yes/no) At what depth?

*Groundwater was encountered within the tank basin at approximately 15 feet bgs.*

- H. If ground water was not encountered during the excavation, what is the expected depth of ground water? *Not applicable, groundwater was encountered.*

- I. Additional investigation to determine the need for a Limited Site Investigation is necessary at sites with sandy or silty sandy soil, a water table within 25 feet of the ground surface, and visual or other evidence of soil remaining contamination. See Table 2 in Guidance Document 3-01 *Excavation of Petroleum Contaminated Soil*. If a soil boring is necessary, describe the soil screening and analytical results. Attach the boring logs and laboratory results to this report.

- J. If no soil boring was performed, explain.

*Site work was limited to tank removal and sampling activities performed on December 21-22, 2020.*

- K. If ground water was encountered or if a soil boring was conducted, was there evidence of ground water contamination? (yes/no) Describe this evidence of contamination, e.g., free product (specify thickness), product sheen, ground water in contact with petroleum contaminated soil, water analytical results, etc. **Note:** If you observe free product, contact MPCA staff immediately, as outlined in Guidance Document 2-02 *Free Product: Evaluation and Recovery*.

*Based on the level of groundwater observed within the tank basin during removal activities, contaminated soils beneath one of the tanks appeared to be in contact with groundwater.*

L. Was bedrock encountered in the excavation? ( ☐yes/ ☒no) At what depth?

M. Were other unique conditions associated with this site? (☐yes/ ☒no) If so, explain.

## PART V: SAMPLING INFORMATION

- A. Briefly describe the field screening methods used to distinguish contaminated from uncontaminated soil:

*Screening samples were collected using the field screening procedures described in the MPCA Guidance Document c-prp4-04 "Soil sample collection and analysis procedures". Screening samples were collected from beneath the tanks at intervals prescribed in MPCA Guidance Document c-prp3-01 "Excavation of petroleum-contaminated soil and tank removal sampling", visually inspected for sheen or staining and placed into a clean plastic bag. Headspace readings from the sample were collected using a PID to determine if volatile organic compounds were present. Samples were also collected for laboratory analysis.*

*Soil screening samples were also collected from the tank basin sidewalls, but not at the intervals prescribed in MPCA Guidance Document c-prp3-01 "Excavation of petroleum-contaminated soil and tank removal sampling" due to soil sloughing and the undermining risk on the southern excavation sidewall near the AST.*

- B. List soil vapor headspace analysis results collected during excavation of tanks, lines and dispensers, valves, and transfer locations. (i.e., soils left in place when excavation is complete). Code the samples with sampling depths in parentheses as follows: sidewall samples S-1 (8 feet), S-2 (4 feet), etc.; bottom samples B-1 (13 feet), B-2 (14 feet), removed soil R-1 (4 feet), R-1 (8 feet), etc.; stockpile samples SP-1, etc; line samples L-1, L2, etc.; transfer locations T-1 (4 feet), T-1 (8 feet), etc.; dispensers D-1 (4 feet), etc. **Be sure the sample codes correspond with the site map in part VI, below.**

Sample Code	Soil Type	Reading ppm	Sample Code	Soil Type	Reading ppm
B-1 (16')	Fine silty sand	0.2	S-1 (8')	Fine silty sand	0.0
B-2 (16')	Fine silty sand	0.3	S-2 (8')	Fine silty sand	0.0
B-3 (16')	Fine silty sand	0.0	S-3 (8')	Fine silty sand	0.0
B-4 (16')	Fine silty sand	1.1	S-4 (8')	Fine silty sand	1.7
B-5 (16')	Fine silty sand	396.7	S-5 (8')	Fine silty sand	1.3
B-6 (16')	Fine silty sand	116.7	S-6 (8')	Fine silty sand	1.1
			S-7 (8')	Sandy gravel	42.7



- C. Was the “removed soil” placed back into the excavation basin? (☒yes/ ☐no)  
If no, please complete Part VIII: Soil Treatment Information section. If yes, a Limited Site Investigation is necessary (see Guidance Document 4-01 *Soil and Ground Water Assessments Performed during Site Investigations*).

D. Briefly describe the soil analytical sampling and handling procedures used:

*Please see **Appendix C**. Soil samples were collected from beneath the tanks using clean, dedicated nitrile gloves and placed into dedicated glassware, placed in a cooler on ice and submitted under chain-of-custody to Pace Analytical Services in Minneapolis, Minnesota. Soil samples were analyzed for PVOCs and DRO. Laboratory analytical results and chain-of-custody are included in **Appendix B**.*

- E. List below all soil sample analytical results from bottom and side wall samples collected after excavation of tanks, lines and dispensers, valves, and transfer locations (i.e., soils left in place when excavation is complete). Code the samples with sampling depths in parentheses as follows: sidewall samples S-1 (8 feet), S-2 (4 feet), etc.; bottom samples B-1 (13 feet), B-2 (14 feet), removed soil R-1 (4 feet), R-1 (8 feet), etc.; stockpile samples SP-1, etc; line samples L-1, L2, etc.; transfer locations T-1 (4 feet), T-1 (8 feet), etc.; dispensers D-1 (4 feet), etc.; **Be sure the sample codes correspond to the site map required in part VI.**

Sample Code	GRO/ DRO	Benzene mg/kg	Ethyl- benzene mg/kg	Toluene Mg/kg	Xylene mg/kg	MTBE mg/kg	Lead mg/kg
B-1 (16')	NA/<11.5	<0.020	<0.050	<0.050	<0.150	<0.050	NA
B-2 (16')	NA/<11.8	<0.020	<0.050	<0.050	<0.150	<0.050	NA
B-3 (16')	NA/<12.2	<0.020	<0.050	<0.050	<0.150	<0.050	NA
B-4 (16')	NA/<11.8	<0.020	<0.050	<0.050	<0.150	<0.050	NA
B-5 (16')	NA/ <b>1,820</b>	<0.040	<0.100	<0.100	<b>2.28</b>	<0.100	NA
B-6 (16')	NA/ <b>105</b>	<0.020	<0.050	<0.050	<0.150	<0.050	NA

**Note:** Attach copies of laboratory reports and chain of custody forms.

NA – Not analyzed

## PART VI: FIGURES

Attach the following figures to this report:

1. Site location map.
2. Site map(s) drawn to scale illustrating the following:
  - a. Location of all present and former tanks, piping, and dispensers;
  - b. Location of surface soil contamination
  - c. Location of other structures (buildings, canopies, etc.);
  - d. Adjacent city, township, or county roadways;

- e. Dimensions of excavation(s), including contour lines (maximum 2-foot contour intervals) to represent the depths of the final excavation(s);
- f. Location of soil screening samples (e.g. R-1), soil analytical samples (e.g., S-1 or B-1), and any soil borings (e.g., SB-1). Also, attach all boring logs.
- g. North arrow, bar scale and map legend.
- h. Provide location of any on-site water wells. If on-site water wells exist, please provide well logs and/or construction diagrams.
- i. Locations of new tanks, piping and dispensers, if installed.

## PART VII: CONCLUSIONS AND RECOMMENDATIONS

Recommendation for site:

☐ site closure

☒ additional investigation

Justify the recommendations for the site. If no further action is necessary, the MPCA staff will review this report following notification of soil treatment.

*Based on field observations and analytical results, it appears that a release has occurred at this site and that additional investigation is justified to determine the extent and magnitude of soil, potential groundwater and soil-gas contamination originating from the release. The site has been assigned MPCA Leak Site number LS0021425 and additional evaluation of the site is recommended in the form of a Limited Site Investigation (LSI) following procedures prescribed in MPCA protocols and guidance documents.*

## PART VIII: SOIL TREATMENT INFORMATION

- A. Soil treatment method used (thermal, land application, composting, other). If you choose "other" specify treatment method: *No soils were removed from the site for treatment.*
- B. Location of treatment site/facility: *N/A*
- C. Date MPCA approved soil treatment (if thermal treatment was used, indicate date that the MPCA-permitted thermal treatment facility agreed to accept soil): *N/A*
- D. Identify the location of stockpiled contaminated soil:  
*N/A*

## PART IX: CONSULTANT (OR OTHER) PREPARING THIS REPORT

*By signing this document, I/we acknowledge that we are submitting this document on behalf of and as agents of the responsible person or volunteer for this leak site. I/we acknowledge that if information in this document is inaccurate or incomplete, it will delay the completion of remediation and may harm the environment and may result in reduction of reimbursement awards. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leak site that if this document is determined to contain a false material statement, representation, or certification, or if it omits material information, the responsible person or volunteer may be found to be in violation of Minn. Stat. § 115.075 (1994) or Minn. 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.*

### **MPCA staff are instructed to reject unsigned excavation reports or if the report form has been altered.**

Name and Title:

Signature:

Date signed:

Erica Klingfus  
Environmental Scientist



01/26/2021

Jeffrey K. Anderson, P.E.  
Team Leader



01/26/2021

Company and mailing address:

MSA Professional Services, Inc.  
332 W. Superior Street, Suite 600  
Duluth, MN 55802

Telephone

(218) 499-3175

Fax:

If additional investigation is not necessary, please mail this form and all necessary attachments to the MPCA project manager. If additional investigation is necessary, include this form as an appendix to Guidance Document 4-06 *Investigation Report Form*. **MPCA staff will not review excavation reports indicating a limited site investigation is necessary unless the limited site investigation has been completed.**

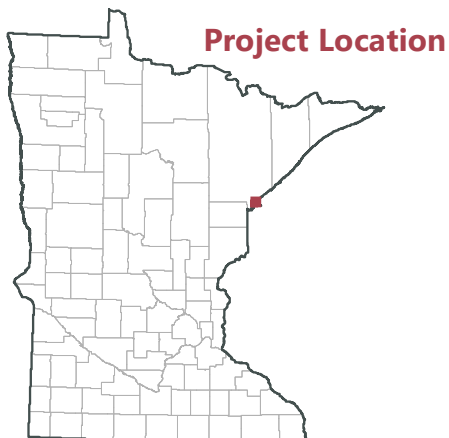
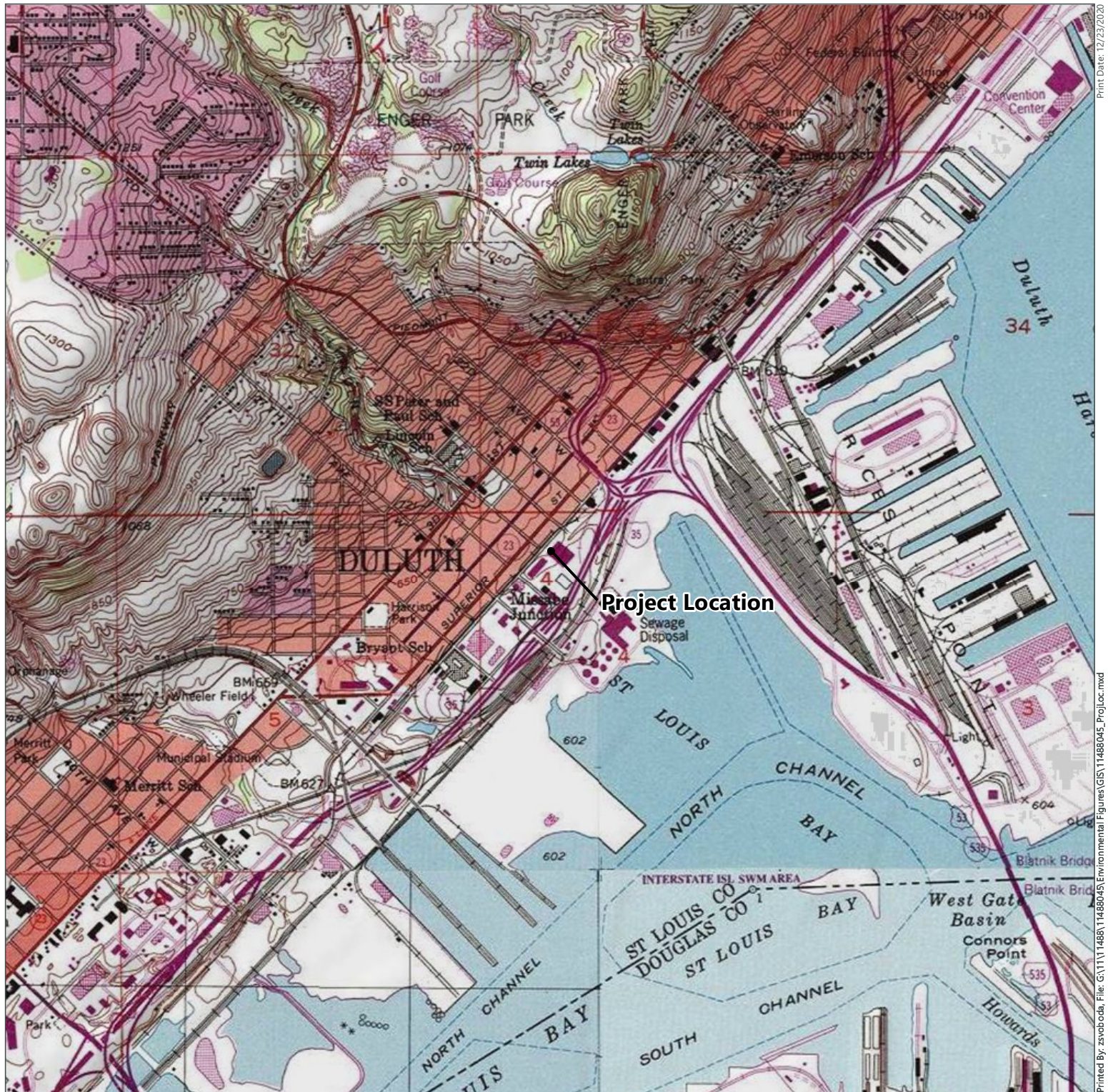
### ***Web pages and phone numbers***

MPCA staff	<a href="http://pca.state.mn.us/pca/staff/index.cfm">http://pca.state.mn.us/pca/staff/index.cfm</a>
MPCA toll free	<b>1-800-657-3864</b>
Petroleum Remediation Program web page	<a href="http://www.pca.state.mn.us/programs/lust_p.html">http://www.pca.state.mn.us/programs/lust_p.html</a>
MPCA Infor. Request	<a href="http://www.pca.state.mn.us/about/inforequest.html">http://www.pca.state.mn.us/about/inforequest.html</a>
MPCA Petroleum Brownfields Program	<a href="http://www.pca.state.mn.us/programs/vpic_p.html">http://www.pca.state.mn.us/programs/vpic_p.html</a>
PetroFund Web Page	<a href="http://www.state.mn.us/cgi-bin/portal/mn/jsp/content.do?id=-536881377&amp;agency=Commerce">http://www.state.mn.us/cgi-bin/portal/mn/jsp/content.do?id=-536881377&amp;agency=Commerce</a>
PetroFund Phone	<b>651-297-1119, or 1-800-638-0418</b>
<b>State Duty Officer</b>	<b>651-649-5451 or 1-800-422-0798</b>

Upon request, this document can be made available in other formats, including Braille, large print and audio tape. TTY users call 651/282-5332 or 1-800-657-3864 (voice/TTY).

**FIGURES**





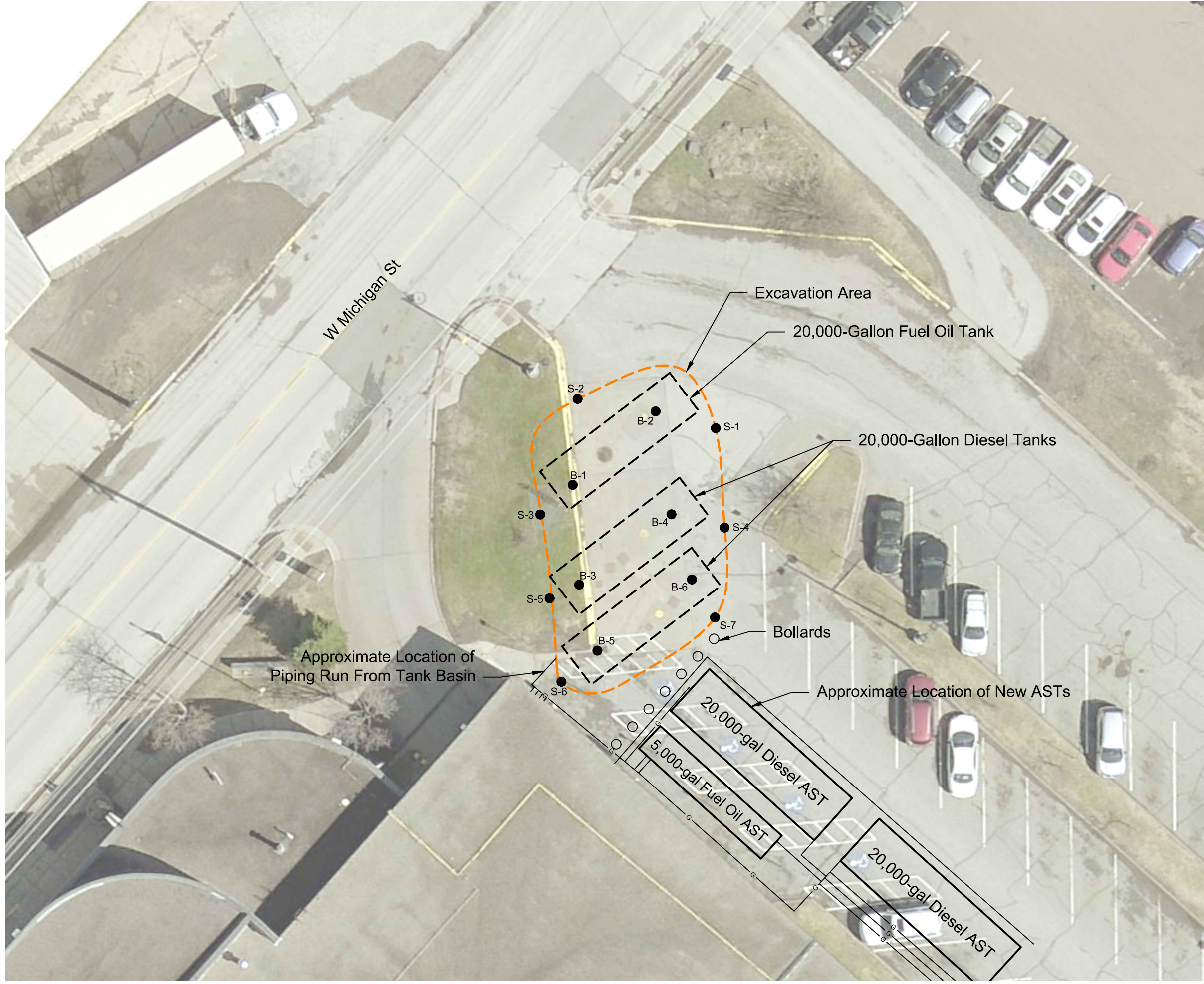
0 1,000 2,000 Feet



**Figure 1**  
**Project Location**

2402 West Michigan Street  
Duluth, St. Louis County,  
Minnesota





# Figure 2

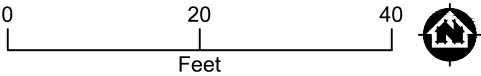
## SITE PLAN VIEW

2402 West Michigan Street  
Duluth, St. Louis County,  
Minnesota

### LEGEND

- B-1 ● Tank Basin Bottom Sample Location
- S-1 ● Tank Basin Sidewall Sample Location

No sidewall sample able to be collected from south excavation sidewall due to sloughing/proximity to bollards



**APPENDIX A**  
**GUIDANCE DOCUMENT 1-03A**  
**SPATIAL DATA REPORTING FORM**



## **Petroleum Remediation Program**

Minnesota Pollution Control Agency

[http://www.pca.state.mn.us/programs/lust\\_p.html](http://www.pca.state.mn.us/programs/lust_p.html)

### **Spatial Data Reporting Form**

Guidance Document 1-03a

(For complete instructions, see Guidance Document 1-03.)

#### **Part 1. Background**

Has a site location data point been submitted for this site (circle/highlight)? YES or NO

*If yes, you do not need to complete Part 2 of this form but should complete Part 3 if there are additional site features to report. This form can be submitted electronically if desired (e.g., as an e-mail attachment to the project manager).*

MPCA Site ID: LEAK0021425

Site Name: Duluth Transit Authority Bus Garage

Data Collection Date: 01/14/2021

Name of Person Who Collected Data: Erica Klingfus

Organization Name: MSA Professional Services, Inc.

Organization Type: Consulting Company

#### **Part 2. Site Location (use one of the three spatial data reporting formats provided)**

Point Description: Site Location

Collection Method: Google Earth

Datum (circle/highlight): **WGS84** NAD83

1) Longitude (dd mm ss.ss): 92 07 38.81

Latitude (dd mm ss.ss): 46 45 48.10

2) Longitude (dd.dddddd):

Latitude (dd.dddddd):

3) UTM - X (Easting):

UTM - Y (Northing):

UTM Zone:



### Part 3. Other Site Features

Point Description:

Collection Method:

Datum (circle/highlight): WGS84 NAD83

1) Longitude (dd mm ss.ss):

Latitude (dd mm ss.ss):

2) Longitude (dd.ddddddd):

Latitude (dd.ddddddd):

3) UTM - X (Easting):

UTM - Y (Northing):

UTM Zone:

Point Description:

Collection Method:

Datum (circle/highlight): WGS84 NAD83

1) Longitude (dd mm ss.ss):

Latitude (dd mm ss.ss):

2) Longitude (dd.ddddddd):

Latitude (dd.ddddddd):

3) UTM - X (Easting):

UTM - Y (Northing):

UTM Zone:

Point Description:

Collection Method:

Datum (circle/highlight): WGS84 NAD83

1) Longitude (dd mm ss.ss):

Latitude (dd mm ss.ss):

2) Longitude (dd.ddddddd):

Latitude (dd.ddddddd):

3) UTM - X (Easting):

UTM - Y (Northing):

UTM Zone:

Point Description:

Collection Method:

Datum (circle/highlight): WGS84 NAD83

1) Longitude (dd mm ss.ss):

Latitude (dd mm ss.ss):

2) Longitude (dd.ddddddd):

Latitude (dd.ddddddd):

3) UTM - X (Easting):

UTM - Y (Northing):

UTM Zone:

Point Description:

Collection Method:

Datum (circle/highlight): WGS84 NAD83

1) Longitude (dd mm ss.ss):

Latitude (dd mm ss.ss):

2) Longitude (dd.ddddddd):

Latitude (dd.ddddddd):

3) UTM - X (Easting):

UTM - Y (Northing):

UTM Zone:

**APPENDIX B**  
**LABORATORY ANALYTICAL REPORT**

January 11, 2021

Mark Davidson  
MSA Professional Services  
332 W. Superior St. #600  
Duluth, MN 55802

RE: Project: 11488045 DTA UST Removal  
Pace Project No.: 10543451

Dear Mark Davidson:

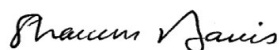
Enclosed are the analytical results for sample(s) received by the laboratory on December 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Shawn Davis  
shawn.davis@pacelabs.com  
612-607-6378  
Project Manager

Enclosures

cc: Erica Klingfus, MSA Professional Services



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 11488045 DTA UST Removal  
Pace Project No.: 10543451

### Pace Analytical Services - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414  
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab  
A2LA Certification #: 2926.01\*  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009\*  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014\*  
Arkansas DW Certification #: MN00064  
Arkansas WW Certification #: 88-0680  
California Certification #: 2929  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605\*  
Georgia Certification #: 959  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: AI-03086\*  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064\*  
Maryland Certification #: 322  
Massachusetts DWP Certification #: via MN 027-053-137  
Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137\*  
Minnesota Dept of Ag Certification #: via MN 027-053-137  
Minnesota Petrofund Certification #: 1240\*

Mississippi Certification #: MN00064  
Missouri Certification #: 10100  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081\*  
New Jersey Certification #: MN002  
New York Certification #: 11647\*  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507\*  
Oregon Primary Certification #: MN300001  
Oregon Secondary Certification #: MN200001\*  
Pennsylvania Certification #: 68-00563\*  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192\*  
Utah Certification #: MN00064\*  
Vermont Certification #: VT-027053137  
Virginia Certification #: 460163\*  
Washington Certification #: C486\*  
West Virginia DEP Certification #: 382  
West Virginia DW Certification #: 9952 C  
Wisconsin Certification #: 999407970  
Wyoming UST Certification #: via A2LA 2926.01  
USDA Permit #: P330-19-00208  
\*Please Note: Applicable air certifications are denoted with an asterisk (\*).

### Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302  
Florida/NELAP Certification #: E87948  
Illinois Certification #: 200050  
Kentucky UST Certification #: 82  
Louisiana Certification #: 04168  
Minnesota Certification #: 055-999-334  
New York Certification #: 12064  
North Dakota Certification #: R-150

Virginia VELAP ID: 460263  
South Carolina Certification #: 83006001  
Texas Certification #: T104704529-14-1  
Wisconsin Certification #: 405132750  
Wisconsin DATCP Certification #: 105-444  
USDA Soil Permit #: P330-16-00157  
Federal Fish & Wildlife Permit #: LE51774A-0

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10543451001	B-1 (16')	Solid	12/21/20 14:30	12/28/20 08:50
10543451002	B-2 (16')	Solid	12/21/20 14:40	12/28/20 08:50
10543451003	B-3 (16')	Solid	12/22/20 09:20	12/28/20 08:50
10543451004	B-4 (16')	Solid	12/22/20 09:30	12/28/20 08:50
10543451005	B-5 (16')	Solid	12/22/20 12:20	12/28/20 08:50
10543451006	B-6 (16')	Solid	12/22/20 12:30	12/28/20 08:50
10543451007	Trip Blank	Solid		12/28/20 08:50

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10543451001	B-1 (16')	WI MOD DRO	JVM	2	PASI-M
		ASTM D2974	RD1	1	PASI-M
		EPA 8260	MDS	11	PASI-G
10543451002	B-2 (16')	WI MOD DRO	JVM	2	PASI-M
		ASTM D2974	RD1	1	PASI-M
		EPA 8260	MDS	11	PASI-G
10543451003	B-3 (16')	WI MOD DRO	JVM	2	PASI-M
		ASTM D2974	RD1	1	PASI-M
		EPA 8260	MDS	11	PASI-G
10543451004	B-4 (16')	WI MOD DRO	JVM	2	PASI-M
		ASTM D2974	RD1	1	PASI-M
		EPA 8260	MDS	11	PASI-G
10543451005	B-5 (16')	WI MOD DRO	JVM	2	PASI-M
		ASTM D2974	RD1	1	PASI-M
		EPA 8260	MDS	11	PASI-G
10543451006	B-6 (16')	WI MOD DRO	JVM	2	PASI-M
		ASTM D2974	RD1	1	PASI-M
		EPA 8260	MDS	11	PASI-G
10543451007	Trip Blank	EPA 8260	MDS	11	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-M = Pace Analytical Services - Minneapolis

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

---

**Date:** January 11, 2021

VOCs were analyzed by 8260D.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 11488045 DTA UST Removal  
Pace Project No.: 10543451

---

**Method:** WI MOD DRO  
**Description:** WIDRO GCS  
**Client:** MSA MN/WI  
**Date:** January 11, 2021

### General Information:

6 samples were analyzed for WI MOD DRO by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

Analyte Comments:

QC Batch: 717853

D5: The sample was re-weighed into a new container because the sample weight in the original container exceeded the method specifications.

- B-1 (16') (Lab ID: 10543451001)
  - n-Triacontane (S)
- B-2 (16') (Lab ID: 10543451002)
  - n-Triacontane (S)
- B-3 (16') (Lab ID: 10543451003)
  - n-Triacontane (S)
- B-4 (16') (Lab ID: 10543451004)
  - n-Triacontane (S)

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## PROJECT NARRATIVE

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

---

**Method:** WI MOD DRO

**Description:** WIDRO GCS

**Client:** MSA MN/WI

**Date:** January 11, 2021

Analyte Comments:

QC Batch: 717853

D5: The sample was re-weighed into a new container because the sample weight in the original container exceeded the method specifications.

- B-5 (16') (Lab ID: 10543451005)
  - n-Triacontane (S)
- B-6 (16') (Lab ID: 10543451006)
  - n-Triacontane (S)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 11488045 DTA UST Removal  
Pace Project No.: 10543451

---

**Method:** EPA 8260  
**Description:** 8260 MSV Med Level Normal List  
**Client:** MSA MN/WI  
**Date:** January 11, 2021

### General Information:

7 samples were analyzed for EPA 8260 by Pace Analytical Services Green Bay. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 5035/5030B with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

Analyte Comments:

QC Batch: 374922

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- B-5 (16') (Lab ID: 10543451005)
- Toluene-d8 (S)

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

**Sample: B-1 (16')** **Lab ID: 10543451001** Collected: 12/21/20 14:30 Received: 12/28/20 08:50 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>WIDRO GCS</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis									
WDRO C10-C28	ND	mg/kg	11.5	3.1	1	12/28/20 13:45	12/30/20 19:17		
<b>Surrogates</b>									
n-Triacontane (S)	89	%	50-150		1	12/28/20 13:45	12/30/20 19:17	638-68-6	D5
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis									
Percent Moisture	<b>15.3</b>	%	0.10	0.10	1		01/04/21 15:16		N2
<b>8260 MSV Med Level Normal List</b> Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay									
1,2,4-Trimethylbenzene	ND	ug/kg	50.0	14.9	1	12/30/20 07:45	12/30/20 13:56	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	50.0	16.1	1	12/30/20 07:45	12/30/20 13:56	108-67-8	
Benzene	ND	ug/kg	20.0	11.9	1	12/30/20 07:45	12/30/20 13:56	71-43-2	
Ethylbenzene	ND	ug/kg	50.0	11.9	1	12/30/20 07:45	12/30/20 13:56	100-41-4	
Methyl-tert-butyl ether	ND	ug/kg	50.0	14.7	1	12/30/20 07:45	12/30/20 13:56	1634-04-4	
Naphthalene	ND	ug/kg	250	15.6	1	12/30/20 07:45	12/30/20 13:56	91-20-3	
Toluene	ND	ug/kg	50.0	12.6	1	12/30/20 07:45	12/30/20 13:56	108-88-3	
Xylene (Total)	ND	ug/kg	150	36.1	1	12/30/20 07:45	12/30/20 13:56	1330-20-7	
<b>Surrogates</b>									
Toluene-d8 (S)	96	%	56-140		1	12/30/20 07:45	12/30/20 13:56	2037-26-5	
4-Bromofluorobenzene (S)	101	%	52-137		1	12/30/20 07:45	12/30/20 13:56	460-00-4	
1,2-Dichlorobenzene-d4 (S)	101	%	50-150		1	12/30/20 07:45	12/30/20 13:56	2199-69-1	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

**Sample: B-2 (16')** **Lab ID: 10543451002** Collected: 12/21/20 14:40 Received: 12/28/20 08:50 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>WIDRO GCS</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis									
WDRO C10-C28	ND	mg/kg	11.8	3.1	1	12/28/20 13:45	12/30/20 19:24		
<b>Surrogates</b>									
n-Triacontane (S)	104	%	50-150		1	12/28/20 13:45	12/30/20 19:24	638-68-6	D5
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis									
Percent Moisture	<b>17.4</b>	%	0.10	0.10	1		01/04/21 15:20		N2
<b>8260 MSV Med Level Normal List</b> Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay									
1,2,4-Trimethylbenzene	ND	ug/kg	50.0	14.9	1	12/30/20 07:45	12/30/20 14:16	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	50.0	16.1	1	12/30/20 07:45	12/30/20 14:16	108-67-8	
Benzene	ND	ug/kg	20.0	11.9	1	12/30/20 07:45	12/30/20 14:16	71-43-2	
Ethylbenzene	ND	ug/kg	50.0	11.9	1	12/30/20 07:45	12/30/20 14:16	100-41-4	
Methyl-tert-butyl ether	ND	ug/kg	50.0	14.7	1	12/30/20 07:45	12/30/20 14:16	1634-04-4	
Naphthalene	ND	ug/kg	250	15.6	1	12/30/20 07:45	12/30/20 14:16	91-20-3	
Toluene	ND	ug/kg	50.0	12.6	1	12/30/20 07:45	12/30/20 14:16	108-88-3	
Xylene (Total)	ND	ug/kg	150	36.1	1	12/30/20 07:45	12/30/20 14:16	1330-20-7	
<b>Surrogates</b>									
Toluene-d8 (S)	93	%	56-140		1	12/30/20 07:45	12/30/20 14:16	2037-26-5	
4-Bromofluorobenzene (S)	102	%	52-137		1	12/30/20 07:45	12/30/20 14:16	460-00-4	
1,2-Dichlorobenzene-d4 (S)	98	%	50-150		1	12/30/20 07:45	12/30/20 14:16	2199-69-1	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

**Sample: B-3 (16')** **Lab ID: 10543451003** Collected: 12/22/20 09:20 Received: 12/28/20 08:50 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>WIDRO GCS</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis									
WDRO C10-C28	ND	mg/kg	12.2	3.3	1	12/28/20 13:45	12/30/20 19:31		
<b>Surrogates</b>									
n-Triacontane (S)	92	%	50-150		1	12/28/20 13:45	12/30/20 19:31	638-68-6	D5
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis									
Percent Moisture	<b>18.5</b>	%	0.10	0.10	1		01/04/21 15:23		N2
<b>8260 MSV Med Level Normal List</b> Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay									
1,2,4-Trimethylbenzene	ND	ug/kg	50.0	14.9	1	12/30/20 07:45	12/30/20 14:37	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	50.0	16.1	1	12/30/20 07:45	12/30/20 14:37	108-67-8	
Benzene	ND	ug/kg	20.0	11.9	1	12/30/20 07:45	12/30/20 14:37	71-43-2	
Ethylbenzene	ND	ug/kg	50.0	11.9	1	12/30/20 07:45	12/30/20 14:37	100-41-4	
Methyl-tert-butyl ether	ND	ug/kg	50.0	14.7	1	12/30/20 07:45	12/30/20 14:37	1634-04-4	
Naphthalene	ND	ug/kg	250	15.6	1	12/30/20 07:45	12/30/20 14:37	91-20-3	
Toluene	ND	ug/kg	50.0	12.6	1	12/30/20 07:45	12/30/20 14:37	108-88-3	
Xylene (Total)	ND	ug/kg	150	36.1	1	12/30/20 07:45	12/30/20 14:37	1330-20-7	
<b>Surrogates</b>									
Toluene-d8 (S)	90	%	56-140		1	12/30/20 07:45	12/30/20 14:37	2037-26-5	
4-Bromofluorobenzene (S)	100	%	52-137		1	12/30/20 07:45	12/30/20 14:37	460-00-4	
1,2-Dichlorobenzene-d4 (S)	93	%	50-150		1	12/30/20 07:45	12/30/20 14:37	2199-69-1	

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## ANALYTICAL RESULTS

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

**Sample: B-4 (16')** **Lab ID: 10543451004** Collected: 12/22/20 09:30 Received: 12/28/20 08:50 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>WIDRO GCS</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis									
WDRO C10-C28	ND	mg/kg	11.8	3.1	1	12/28/20 13:45	12/30/20 19:38		
<b>Surrogates</b>									
n-Triacontane (S)	88	%	50-150		1	12/28/20 13:45	12/30/20 19:38	638-68-6	D5
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis									
Percent Moisture	<b>17.5</b>	%	0.10	0.10	1		01/04/21 15:25		N2
<b>8260 MSV Med Level Normal List</b> Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay									
1,2,4-Trimethylbenzene	ND	ug/kg	50.0	14.9	1	12/30/20 07:45	12/30/20 14:57	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	50.0	16.1	1	12/30/20 07:45	12/30/20 14:57	108-67-8	
Benzene	ND	ug/kg	20.0	11.9	1	12/30/20 07:45	12/30/20 14:57	71-43-2	
Ethylbenzene	ND	ug/kg	50.0	11.9	1	12/30/20 07:45	12/30/20 14:57	100-41-4	
Methyl-tert-butyl ether	ND	ug/kg	50.0	14.7	1	12/30/20 07:45	12/30/20 14:57	1634-04-4	
Naphthalene	ND	ug/kg	250	15.6	1	12/30/20 07:45	12/30/20 14:57	91-20-3	
Toluene	ND	ug/kg	50.0	12.6	1	12/30/20 07:45	12/30/20 14:57	108-88-3	
Xylene (Total)	ND	ug/kg	150	36.1	1	12/30/20 07:45	12/30/20 14:57	1330-20-7	
<b>Surrogates</b>									
Toluene-d8 (S)	95	%	56-140		1	12/30/20 07:45	12/30/20 14:57	2037-26-5	
4-Bromofluorobenzene (S)	102	%	52-137		1	12/30/20 07:45	12/30/20 14:57	460-00-4	
1,2-Dichlorobenzene-d4 (S)	95	%	50-150		1	12/30/20 07:45	12/30/20 14:57	2199-69-1	

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## ANALYTICAL RESULTS

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

**Sample: B-5 (16')** **Lab ID: 10543451005** Collected: 12/22/20 12:20 Received: 12/28/20 08:50 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>WIDRO GCS</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis									
WDRO C10-C28	<b>1820</b>	mg/kg	233	62.1	20	12/28/20 13:45	01/02/21 16:56		
<b>Surrogates</b>									
n-Triacontane (S)	86	%	50-150		20	12/28/20 13:45	01/02/21 16:56	638-68-6	D5
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis									
Percent Moisture	<b>16.0</b>	%	0.10	0.10	1		01/04/21 15:28		N2
<b>8260 MSV Med Level Normal List</b> Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay									
1,2,4-Trimethylbenzene	<b>1940</b>	ug/kg	100	29.8	2	12/30/20 07:45	12/30/20 17:57	95-63-6	
1,3,5-Trimethylbenzene	<b>856</b>	ug/kg	100	32.2	2	12/30/20 07:45	12/30/20 17:57	108-67-8	
Benzene	ND	ug/kg	40.0	23.8	2	12/30/20 07:45	12/30/20 17:57	71-43-2	
Ethylbenzene	ND	ug/kg	100	23.8	2	12/30/20 07:45	12/30/20 17:57	100-41-4	
Methyl-tert-butyl ether	ND	ug/kg	100	29.4	2	12/30/20 07:45	12/30/20 17:57	1634-04-4	
Naphthalene	ND	ug/kg	500	31.2	2	12/30/20 07:45	12/30/20 17:57	91-20-3	
Toluene	ND	ug/kg	100	25.2	2	12/30/20 07:45	12/30/20 17:57	108-88-3	
Xylene (Total)	<b>2280</b>	ug/kg	300	72.2	2	12/30/20 07:45	12/30/20 17:57	1330-20-7	
<b>Surrogates</b>									
Toluene-d8 (S)	81	%	56-140		2	12/30/20 07:45	12/30/20 17:57	2037-26-5	D3
4-Bromofluorobenzene (S)	89	%	52-137		2	12/30/20 07:45	12/30/20 17:57	460-00-4	
1,2-Dichlorobenzene-d4 (S)	95	%	50-150		2	12/30/20 07:45	12/30/20 17:57	2199-69-1	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 11488045 DTA UST Removal  
Pace Project No.: 10543451

**Sample: B-6 (16')** **Lab ID: 10543451006** Collected: 12/22/20 12:30 Received: 12/28/20 08:50 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>WIDRO GCS</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis									
WDRO C10-C28	<b>105</b>	mg/kg	11.8	3.1	1	12/28/20 13:45	12/30/20 19:52		
<b>Surrogates</b>									
n-Triacontane (S)	96	%	50-150		1	12/28/20 13:45	12/30/20 19:52	638-68-6	D5
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis									
Percent Moisture	<b>16.7</b>	%	0.10	0.10	1		01/04/21 15:31		N2
<b>8260 MSV Med Level Normal List</b> Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay									
1,2,4-Trimethylbenzene	ND	ug/kg	50.0	14.9	1	12/30/20 07:45	12/30/20 15:17	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	50.0	16.1	1	12/30/20 07:45	12/30/20 15:17	108-67-8	
Benzene	ND	ug/kg	20.0	11.9	1	12/30/20 07:45	12/30/20 15:17	71-43-2	
Ethylbenzene	ND	ug/kg	50.0	11.9	1	12/30/20 07:45	12/30/20 15:17	100-41-4	
Methyl-tert-butyl ether	ND	ug/kg	50.0	14.7	1	12/30/20 07:45	12/30/20 15:17	1634-04-4	
Naphthalene	ND	ug/kg	250	15.6	1	12/30/20 07:45	12/30/20 15:17	91-20-3	
Toluene	ND	ug/kg	50.0	12.6	1	12/30/20 07:45	12/30/20 15:17	108-88-3	
Xylene (Total)	ND	ug/kg	150	36.1	1	12/30/20 07:45	12/30/20 15:17	1330-20-7	
<b>Surrogates</b>									
Toluene-d8 (S)	75	%	56-140		1	12/30/20 07:45	12/30/20 15:17	2037-26-5	
4-Bromofluorobenzene (S)	85	%	52-137		1	12/30/20 07:45	12/30/20 15:17	460-00-4	
1,2-Dichlorobenzene-d4 (S)	81	%	50-150		1	12/30/20 07:45	12/30/20 15:17	2199-69-1	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

**Sample:** Trip Blank **Lab ID:** 10543451007 **Collected:** **Received:** 12/28/20 08:50 **Matrix:** Solid

**Results reported on a "wet-weight" basis**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV Med Level Normal List</b>									
Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B									
Pace Analytical Services - Green Bay									
1,2,4-Trimethylbenzene	ND	ug/kg	50.0	14.9	1	12/30/20 07:45	12/30/20 15:37	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	50.0	16.1	1	12/30/20 07:45	12/30/20 15:37	108-67-8	
Benzene	ND	ug/kg	20.0	11.9	1	12/30/20 07:45	12/30/20 15:37	71-43-2	
Ethylbenzene	ND	ug/kg	50.0	11.9	1	12/30/20 07:45	12/30/20 15:37	100-41-4	
Methyl-tert-butyl ether	ND	ug/kg	50.0	14.7	1	12/30/20 07:45	12/30/20 15:37	1634-04-4	
Naphthalene	ND	ug/kg	250	15.6	1	12/30/20 07:45	12/30/20 15:37	91-20-3	
Toluene	ND	ug/kg	50.0	12.6	1	12/30/20 07:45	12/30/20 15:37	108-88-3	
Xylene (Total)	ND	ug/kg	150	36.1	1	12/30/20 07:45	12/30/20 15:37	1330-20-7	
<b>Surrogates</b>									
Toluene-d8 (S)	89	%	56-140		1	12/30/20 07:45	12/30/20 15:37	2037-26-5	
4-Bromofluorobenzene (S)	98	%	52-137		1	12/30/20 07:45	12/30/20 15:37	460-00-4	
1,2-Dichlorobenzene-d4 (S)	99	%	50-150		1	12/30/20 07:45	12/30/20 15:37	2199-69-1	

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

QC Batch:	718721	Analysis Method:	ASTM D2974
QC Batch Method:	ASTM D2974	Analysis Description:	Dry Weight / %M by ASTM D2974
		Laboratory:	Pace Analytical Services - Minneapolis

Associated Lab Samples: 10543451001, 10543451002, 10543451003, 10543451004, 10543451005, 10543451006

SAMPLE DUPLICATE: 3834865

Parameter	Units	10542982001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.7	9.3	7	30	N2

SAMPLE DUPLICATE: 3834866

Parameter	Units	10543451001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.3	16.8	9	30	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: 11488045 DTA UST Removal  
Pace Project No.: 10543451

QC Batch:	374922	Analysis Method:	EPA 8260
QC Batch Method:	EPA 5035/5030B	Analysis Description:	8260 MSV Med Level Normal List
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 10543451001, 10543451002, 10543451003, 10543451004, 10543451005, 10543451006, 10543451007

METHOD BLANK: 2166133 Matrix: Solid  
Associated Lab Samples: 10543451001, 10543451002, 10543451003, 10543451004, 10543451005, 10543451006, 10543451007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	14.9	12/30/20 09:55	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	16.1	12/30/20 09:55	
Benzene	ug/kg	ND	20.0	11.9	12/30/20 09:55	
Ethylbenzene	ug/kg	ND	50.0	11.9	12/30/20 09:55	
Methyl-tert-butyl ether	ug/kg	ND	50.0	14.7	12/30/20 09:55	
Naphthalene	ug/kg	ND	250	15.6	12/30/20 09:55	
Toluene	ug/kg	ND	50.0	12.6	12/30/20 09:55	
Xylene (Total)	ug/kg	ND	150	36.1	12/30/20 09:55	
1,2-Dichlorobenzene-d4 (S)	%	103	50-150		12/30/20 09:55	
4-Bromofluorobenzene (S)	%	109	52-137		12/30/20 09:55	
Toluene-d8 (S)	%	100	56-140		12/30/20 09:55	

LABORATORY CONTROL SAMPLE: 2166134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/kg	2500	2350	94	70-130	
Ethylbenzene	ug/kg	2500	2530	101	80-120	
Methyl-tert-butyl ether	ug/kg	2500	2480	99	70-130	
Toluene	ug/kg	2500	2440	98	80-120	
Xylene (Total)	ug/kg	7500	7270	97	70-130	
1,2-Dichlorobenzene-d4 (S)	%			97	50-150	
4-Bromofluorobenzene (S)	%			110	52-137	
Toluene-d8 (S)	%			98	56-140	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2166135 2166136

Parameter	Units	10543451003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/kg	ND	1250	1250	1160	1180	92	94	70-130	2	20	
Ethylbenzene	ug/kg	ND	1250	1250	1300	1250	104	100	80-120	4	20	
Methyl-tert-butyl ether	ug/kg	ND	1250	1250	1230	1280	98	103	70-130	4	20	
Toluene	ug/kg	ND	1250	1250	1280	1240	102	99	80-120	3	20	
Xylene (Total)	ug/kg	ND	3750	3750	3940	3710	105	99	70-130	6	20	
1,2-Dichlorobenzene-d4 (S)	%						100	98	50-150			
4-Bromofluorobenzene (S)	%						109	106	52-137			
Toluene-d8 (S)	%						99	99	56-140			

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## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

QC Batch: 717853

Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO

Analysis Description: WIDRO GCS

Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10543451001, 10543451002, 10543451003, 10543451004, 10543451005, 10543451006

METHOD BLANK: 3830835

Matrix: Solid

Associated Lab Samples: 10543451001, 10543451002, 10543451003, 10543451004, 10543451005, 10543451006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	2.7	12/30/20 18:28	
n-Triacontane (S)	%.	93	50-150		12/30/20 18:28	

LABORATORY CONTROL SAMPLE & LCSD: 3830836

3830837

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	72.0	85.5	90	107	70-120	17	20	
n-Triacontane (S)	%.				102	116	50-150			

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## REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### WORKORDER QUALIFIERS

WO: 10543451

[1] VOCs were analyzed by 8260D.

### ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D5 The sample was re-weighed into a new container because the sample weight in the original container exceeded the method specifications.

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11488045 DTA UST Removal

Pace Project No.: 10543451

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10543451001	B-1 (16')	WI MOD DRO	717853	WI MOD DRO	718257
10543451002	B-2 (16')	WI MOD DRO	717853	WI MOD DRO	718257
10543451003	B-3 (16')	WI MOD DRO	717853	WI MOD DRO	718257
10543451004	B-4 (16')	WI MOD DRO	717853	WI MOD DRO	718257
10543451005	B-5 (16')	WI MOD DRO	717853	WI MOD DRO	718257
10543451006	B-6 (16')	WI MOD DRO	717853	WI MOD DRO	718257
10543451001	B-1 (16')	ASTM D2974	718721		
10543451002	B-2 (16')	ASTM D2974	718721		
10543451003	B-3 (16')	ASTM D2974	718721		
10543451004	B-4 (16')	ASTM D2974	718721		
10543451005	B-5 (16')	ASTM D2974	718721		
10543451006	B-6 (16')	ASTM D2974	718721		
10543451001	B-1 (16')	EPA 5035/5030B	374922	EPA 8260	374925
10543451002	B-2 (16')	EPA 5035/5030B	374922	EPA 8260	374925
10543451003	B-3 (16')	EPA 5035/5030B	374922	EPA 8260	374925
10543451004	B-4 (16')	EPA 5035/5030B	374922	EPA 8260	374925
10543451005	B-5 (16')	EPA 5035/5030B	374922	EPA 8260	374925
10543451006	B-6 (16')	EPA 5035/5030B	374922	EPA 8260	374925
10543451007	Trip Blank	EPA 5035/5030B	374922	EPA 8260	374925

## REPORT OF LABORATORY ANALYSIS

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


## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

[illegible]

**WO#: 10543451**




10543451

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		11/22/20	1644		12/22/20	1654	2.4 Y N Y
		12/22/20	1645		12/28/20	1850	2.2 Y Y Y

ORIGINAL	SAMPLER NAME AND SIGNATURE		Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER:					
	SIGNATURE of SAMPLER:					
	DATE Signed (MM/DD/YY):					

**Important Note:** By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

	Document Name: <b>Sample Condition Upon Receipt (SCUR) - MN</b>	Document Revised: 12Aug2020 <b>Page 1 of 1</b>
	Document No.: <b>ENV-FRM-MIN4-0150 Rev.01</b>	Pace Analytical Services - <b>Minneapolis</b>

<b>Sample Condition Upon Receipt</b>	<b>Client Name:</b> <b>MSA</b>	<b>Project #:</b>	<b>WO#: 10543451</b>
<b>Courier:</b> <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Pace <input type="checkbox"/> SpeedDee <input type="checkbox"/> Commercial	<b>PM: SRD</b> <b>Due Date: 01/05/21</b> <b>CLIENT: MSA PROF</b>		
<b>Tracking Number:</b> 677988991444	See Exceptions <input type="checkbox"/> ENV-FRM-MIN4-0142		

<b>Custody Seal on Cooler/Box Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>Seals Intact?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>Biological Tissue Frozen?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
<b>Packing Material:</b> <input type="checkbox"/> Bubble Wrap <input checked="" type="checkbox"/> Bubble Bags <input type="checkbox"/> None <input type="checkbox"/> Other:	<b>Temp Blank?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Thermometer:</b> <input type="checkbox"/> T1(0461) <input checked="" type="checkbox"/> T2(1336) <input type="checkbox"/> T3(0459) <input type="checkbox"/> T4(0254) <input type="checkbox"/> T5(0489)	<b>Type of Ice:</b> <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Blue <input type="checkbox"/> None <input type="checkbox"/> Dry <input type="checkbox"/> Melted	

<b>Did Samples Originate in West Virginia?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>Were All Container Temps Taken?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Temp should be above freezing to 6°C <b>Cooler Temp Read w/temp blank:</b> 2.0 °C	<b>Average Corrected Temp (no temp blank only):</b> °C
<b>Correction Factor:</b> +0.2 <b>Cooler Temp Corrected w/temp blank:</b> 2.2 °C	<input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142 <input type="checkbox"/> 1 Container

**USDA Regulated Soil:** ( ☐ N/A, water sample/Other: )    **Date/Initials of Person Examining Contents:** ED 12/28/20

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☒ No    Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
<b>Chain of Custody Present and Filled Out?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
<b>Chain of Custody Relinquished?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
<b>Sampler Name and/or Signature on COC?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
<b>Samples Arrived within Hold Time?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
<b>Short Hold Time Analysis (&lt;72 hr)?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
<b>Rush Turn Around Time Requested?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
<b>Sufficient Volume?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
<b>Correct Containers Used?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
<b>-Pace Containers Used?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
<b>Containers Intact?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Field Filtered Volume Received for Dissolved Tests?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Is sufficient information available to reconcile the samples to the COC?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: <input type="checkbox"/> See Exception ENV-FRM-MIN4-0142
Matrix: <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	trip blank not on COC
<b>All containers needing acid/base preservation have been checked?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12. Sample #
<b>All containers needing preservation are found to be in compliance with EPA recommendation? (HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, &lt;2pH, NaOH &gt;9 Sulfide, NaOH &gt;10 Cyanide)</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> NaOH <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> Zinc Acetate Positive for Res. <input type="checkbox"/> Yes <input type="checkbox"/> No <b>pH Paper Lot#</b> <input type="checkbox"/> See Exception ENV-FRM-MIN4-0142 Res. Chlorine    0-6 Roll    0-6 Strip    0-14 Strip
<b>Exceptions:</b> <input checked="" type="checkbox"/> VOA Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
<b>Extra labels present on soil VOA or WIDRO containers? Headspace in VOA Vials (greater than 6mm)?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> See Exception ENV-FRM-MIN4-0140
<b>Trip Blank Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): 080320-3 (1)
<b>Trip Blank Custody Seals Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

**Field Data Required?** ☐ Yes ☐ No

**Project Manager Review:** Shawn Davis    **Date:** 12/28/20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: EOD    Page 22 of 25



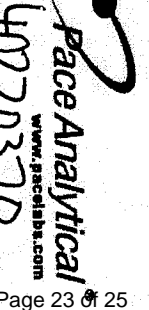
# Internal Transfer Chain of Custody

☐ Samples Pre-Logged into eCOC.

Workorder: 10543451      Workorder Name: 11488045 DTA UST Removal

State Of Origin: MN  
 Cert. Needed: ☐ Yes ☐ No  
 Owner Received Date: 12/28/2020

Results Requested By: 1/12/2021  
 Requested Analysis



Report To: Shawn Davis  
 Pace Analytical Minnesota  
 1700 Elm Street  
 Suite 200  
 Minneapolis, MN 55414  
 Phone 612-607-6378

Subcontract To: Pace Analytical Green Bay  
 1241 Bellevue Street  
 Suite 9  
 Green Bay, WI 54302  
 Phone (920)469-2436

VG9M

Preserved Containers

8260D - PVOC + Napthalene

LAB USE ONLY

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	MeOH	8260D - PVOC + Napthalene	LAB USE ONLY
1	B-1 (16)	PS	12/21/2020 14:30	10543451001	Solid	2	X	001
2	B-2 (16)	PS	12/21/2020 14:40	10543451002	Solid	2	X	002
3	B-3 (16)	PS	12/22/2020 09:20	10543451003	Solid	2	X	003
4	B-4 (16)	PS	12/22/2020 09:30	10543451004	Solid	2	X	004
5	B-5 (16)	PS	12/22/2020 12:20	10543451005	Solid	2	X	005
6	B-6 (16)	PS	12/22/2020 12:30	10543451006	Solid	2	X	006
7	Trip Blank	PS		10543451007	Solid	1	X	007

Comments

Transfers	Released By	Date/Time	Received By	Date/Time	Cooler Temperature on Receipt	°C	Custody Seal	Y or N	Received on Ice	Y or N	Samples Intact	Y or N
1	Shawn Davis	12/21/2020 14:30	Shawn Davis	12/21/2020 14:40	4	13	Y	Y	Y	Y	Y	Y
2	Shawn Davis	12/22/2020 09:20	Shawn Davis	12/22/2020 09:30	4	13	Y	Y	Y	Y	Y	Y
3	Shawn Davis	12/22/2020 12:20	Shawn Davis	12/22/2020 12:30	4	13	Y	Y	Y	Y	Y	Y

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Dry weight will be

# Sample Preservation Receipt Form

Client Name: Pace MN

Project # 40220370

All containers needing preservation have been checked and noted below: ☐ Yes ☒ No ☐ N/A

Lab Lot# of pH paper:

Lab Std #ID of preservation (if pH adjusted):

Initial when completed:

Date/Time:

Pace Analytical Services, LLC  
1241 Bellevue Street, Suite 300  
Green Bay, WI 54304


Page 2 of 2

Pace Lab #	Glass						Plastic				Vials				Jars				General			pH after adjusted				Volume (mL)							
	AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC		GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	
001																																	2.5 / 5 / 10
002																																	2.5 / 5 / 10
003																																	2.5 / 5 / 10
004																																	2.5 / 5 / 10
005																																	2.5 / 5 / 10
006																																	2.5 / 5 / 10
007																																	2.5 / 5 / 10
008																																	2.5 / 5 / 10
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014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																																	2.5 / 5 / 10


Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: \_\_\_\_\_

Headspace in VOA Vials (>6mm) : ☐ Yes ☒ No ☐ N/A \*If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	VG9A	40 mL clear ascorbic	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG5U	100 mL amber glass unpres			VG9D	40 mL clear vial DI	ZPLC	ziploc bag
AG2S	500 mL amber glass H2SO4					GN	
BG3U	250 mL clear glass unpres						

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: <b>Sample Condition Upon Receipt (SCUR)</b>	Document Revised: 26Mar2020
	Document No.: <b>ENV-FRM-GBAY-0014-Rev.00</b>	Author: Pace Green Bay Quality Office

### Sample Condition Upon Receipt Form (SCUR)

**Client Name:** Pace MN
**Project #:** 
**WO#: 40220370**  
  
 40220370

**Courier:** ☐ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☒ **Waltco**  
☐ Client ☐ Pace Other: \_\_\_\_\_

**Tracking #:** 2697927-1

**Custody Seal on Cooler/Box Present:** ☒ yes ☐ no **Seals intact:** ☒ yes ☐ no  
**Custody Seal on Samples Present:** ☐ yes ☒ no **Seals intact:** ☐ yes ☐ no

**Packing Material:** ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_

**Thermometer Used:** SR - 92 **Type of Ice:** Wet Blue Dry None ☒ Samples on ice, cooling process has begun

**Cooler Temperature:** Uncorr: 4 / Corr: 4

**Temp Blank Present:** ☒ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.  
 Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

**Person examining contents:**  
 Date: 12/29/20 /Initials: MM  
 Labeled By Initials: SRK

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>TRWD</u> <span style="float: right;"><u>12/29/20 MM</u></span>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>D80320-3</u>		

**Client Notification/ Resolution:** \_\_\_\_\_ If checked, see attached form for additional comments ☐

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logir

## **APPENDIX C**

### **METHODOLOGIES AND PROCEDURES**

## STORAGE TANK REMOVAL

Tank removals will be completed by a MPCA certified contractor. Tank registration and removal notification will be prepared and submitted to the MPCA by the contractor 15 days prior to initiating the work. Any liquid will be pumped prior to removal, if necessary. Sludge or petroleum product discovered in the tank will be placed in 55- gallon drums. If water is encountered, depending on volume, a polyethylene tank could be provided to store the water removed. This water will require testing and permitting in order to dispose of properly and the testing will determine whether the local wastewater treatment facility will accept the water. The tank(s) will be degassed, piping disconnected, tank(s) opened, sludge removed and containerized, and cleaned. The tank and piping will be removed from the site and transported to the disposal site.

## CONTAMINATION ASSESSMENT DRILLING LOCATIONS

Soil borings will be completed in all likely source areas to define the extent and magnitude of soil contamination and record geologic data in accordance with Guidance Document 4-01 *Soil and Ground Water Assessment Performed During Site Investigations*. Soil borings will be completed to five feet below the water table or, if contamination extended below the groundwater table, to ten feet below the deepest measurable contamination. In order to evaluate site stratigraphy, one boring will extend 20 feet below the water table or to 20 feet below deepest measurable site contamination which ever is deeper. Determining the extent of contamination in the field is supported based on visual evidence, notable odors and /or photoionization detector (PID) readings. The presence of petroleum saturated soil is also evaluated using a petroleum sheen test as described in Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures*.

Geologic descriptions for all soil samples collected are recorded and changes are noted as drilling conditions provided relevant geologic and stratigraphic information. A drilling log is completed for every soil boring. The soil boring logs include the following information:

- Depth to start and finish of each soil sample interval attempted (feet).
- Recovery for each soil sample interval attempted (feet).
- Soil classification in accordance with the 1952 Unified Soil Classification System (USCS).
- Description of grain size, sorting, color, etc.
- Depth of significant changes in material (feet).
- Depth of sampled horizons.
- Approximate location of water table.
- Organic vapor measurements in parts per million (ppm).
- Comments regarding significant geologic, hydrogeologic features or evidence of contamination.
- Date boring started and ended.
- Name of driller and consultant present during drilling.
- Boring identification number.
- Penetration test records, if applicable.
- Ground surface elevation. To establish ground surface elevation, all borings were surveyed.

## SOIL BORING DRILLING TECHNIQUES

### SOIL PROBE SAMPLING

The Geoprobe® is a direct push sampling technique, which eliminates the generation of drill cuttings. A Geoprobe® machine relies on a relatively small amount of static (vehicle) weight combined with percussion as the energy for advancement of a toolstring. Using a Geoprobe® machine, you can drive one-inch diameter by two-foot long, or two-inch diameter by four-foot long, steel tubes into the ground to obtain continuous soil cores or discrete soil samples and groundwater samples. Soil samples are collected from dedicated acetate plastic liners placed inside the sampling tube.



## HOLLOW-STEM AUGER

Hollow-stem auger is the most common and cost-effective method for shallow well installation and soil sample collection in unconsolidated materials. Hollow stem augers are used to a depth of approximately 100 feet. Drill cuttings are pushed up outside of the drill stem as the auger rotates and advances into the soil. Soil samples are collected through the hollow portion of the stem in general accordance with ASTM: D 1586-84. Using this procedure, a two-inch diameter split-barrel sampler is lowered down the hollow stem and driven into the soil by a 140-pound weight falling 30 inches. After an initial set of six inches, the sampler is driven an additional 12 to 18 inches to obtain a representative soil sample and is then retrieved. The number of blows required to drive the sampler the additional 12 inches is known as the penetration resistance or N value. The N value is an index of the relative density of cohesionless soils and the consistency of cohesive soils.

## MUD ROTARY

In the mud rotary method, the borehole is advanced by rapid rotation of a drill bit mounted upon the end of drill rods. The bit cuts and breaks the material at the bottom of the hole into small pieces (cuttings). The cuttings are removed by pumping drilling fluid mixed with bentonite down through the drill rods and bit and up the annulus between the borehole and the drill rods. The drilling fluid also serves to cool the drill bit and stabilize the borehole walls, to prevent the flows of fluids between the borehole and surrounding earth materials, and to reduce cross contamination between aquifers.

All down-hole equipment and tools are completely cleaned prior to each use to avoid cross-contamination. Boreholes that are not completed as wells will be abandoned in accordance with Minnesota Department of Health (MDH) rules (Minn R. ch. 4725).

## MONITORING WELL INSTALLATION

Monitoring wells can be installed using any of the drilling methods described above. Well placement is determined based on contaminant distribution and typically consists of a worst-case well along with lateral and downgradient wells. A minimum of three wells are required to provide groundwater flow estimations. Water table wells are installed so that the screens intersect the water table. If geologic conditions make it difficult to determine actual depth to water, the borehole will be allowed to remain open at least 24 hours to allow water level stabilization or if appropriate, a slightly longer well screen might be used (15-20 feet) to compensate for the water table fluctuations.

All monitoring wells are constructed in accordance with Minnesota Department of Health (MDH) rules. All wells will be properly developed to ensure adequate hydraulic connection with the aquifer and to remove any drilling fluid. Development procedures will be documented. In addition a diagram of major well features (borehole annulus, top and bottom of screen, casing/riser, top and bottom of sand pack, top and bottom of pack seal, grout, surface seal, protective casing etc.) will be prepared. The well materials will also be included such as well screen slot size, sand pack size, casing / borehole diameter. The top of casing for wells will be surveyed (feet, relative to identified datum) to determine groundwater elevations. Each well will be assigned a unique well ID number.

## SOIL CLASSIFICATION

As samples are obtained in the field, they are visually and manually classified by a MSA representative in general accordance with ASTM: D 2488. Representative portions of the samples can be returned to MSA's office in the event there is need for further examination and verification of the field classification. The classification of soil boring samples, soil boring depths, identification of the various strata, the N value, water level information, and pertinent information regarding the method of maintaining and advancing the drill holes are recorded on the boring logs. Charts describing the soil classification procedure, the descriptive terminology, and symbols used on the boring logs are included on the logs.

## SOIL VAPOR SCREENING

Field screening procedures follow the guidelines in MPCA Guidance Document 3-01-*Excavation of Petroleum Contaminated Soil and Tank Removal Sampling* and MPCA Guidance Document 4-04-*Soil Sample Collection and Analysis Procedures*. A properly calibrated photoionization detector (PID) is used for soil vapor screening the soil samples using the headspace method. All field instruments will be maintained and calibrated following a schedule recommended by the manufacturer. MSA uses either a Foxboro Model 128 OVA (FID), a Thermo Environmental Instruments Model 580B OVM (PID), or HNU Model PI 101 (PID). Prior to conducting the vapor screening, the PID is field calibrated for a direct equivalent reading of parts per million (ppm) benzene using a calibration gas consisting of 100ppm isobutylene. With the headspace method, a fresh soil sample is placed in a zip-loc®-type baggie. Once collected and sealed, the headspace samples shall be agitated to break the soil clods and release the vapors, unless the soil is moist and cohesive. Each baggie is be filled approximately 1/3 full with soil, sealed and allowed to equilibrate. After equilibration the PID tip is inserted into the sample baggie. The instrument reading is recorded for each sample.

Headspace samples must be allowed to equilibrate prior to analysis. Minimum equilibration times are dependent upon ambient air temperature and shall conform to the following specifications:

<u>Ambient Air Temp.</u>	<u>Min. Equilibration Time</u>
< 40° F	40 min.
41° F - 55° F	20 min.
56° F - 69° F	10 min.
> 70° F	5 min.

During equilibration, the baggie should be placed in a warm place but out of direct sunlight. Equilibration times can be reduced to 10 minutes if samples are placed in a 70° F water bath or under the direct heat in a running vehicle.

Soil screening will be completed frequently enough to verify the need for additional sampling, borings or soil removal (or at least one soil vapor analysis for each 10 cubic yards of soil removed). Samples will be collected from borings, tank excavation and remedial excavations, as necessary. After the excavation is complete, soil will be screened from the bottom and sidewalls of the excavation. All sample locations will be documented on a scaled map with the depth and location of each sample identified. Minimum requirements for documenting organic vapor field screening are as follows:

- Record weather conditions, including outside temperature, temperature where samples are stored during equilibration, and general weather conditions (i.e., sunny, partly cloudy, light rain, windy, blizzard, etc.).
- Record instrument data, including make and model, date of last factory calibration, type of calibration gas and concentration used to check calibration, date and time of last field calibration, lamp energy in Ev, instrument gain setting (if applicable), erratic readings (if applicable), and field repairs (if applicable).
- Record field observations for each sample, including maximum concentration of each sample, relative moisture, noticeable odors, stains, and instrument quenching.

## GROUNDWATER LEVEL MEASUREMENTS

Water levels are identified and measured in each boring if water is present. Soils are inspected for evidence of a fluctuating water table and a seasonable high water table. If soil borings are performed in clay or silt and appear unsaturated, one boring will be left open for at least 6 hours to confirm that groundwater had not been encountered.

Groundwater level measurements from temporary and/or permanent wells are made using an electric measuring tape equipped with a probe that emits a signal when in contact with water. Measurements are obtained by lowering the probe into a well or boring and then recording the depth of the probe when the electronic signal is emitted. Measurements are referenced to the top of the well or the ground surface and recorded to the nearest 0.01 feet. The manufacturer's reported accuracy, depending on the make and model of the instrument, generally is 0.04 feet.

## SAMPLE COLLECTION

### SOIL SAMPLES

Soil samples collected for laboratory analysis are obtained from native soil using clean stainless steel sampling equipment and disposable nitrile gloves. Soil samples collected for laboratory analysis are weighed and placed into glass jars with teflon-lined lids supplied by the laboratory. The sample containers are labeled and placed into an ice-filled cooler for transport to the laboratory. Soil samples will be collected in the location and frequency mandated by the MPCA Guidance Documents 3-01 *Excavation of Petroleum Contaminated Soil and Tank Removal Sampling* or 4-01 *Soil and Ground Water Assessments Performed during Site Investigations*. Sidewall and floor samples will be collected after removing one foot of exposed soil to ensure the collection of a fresh sample. All soil samples will

be collected in accordance with MPCA Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures*.

Samples are collected as follows:

- Approximately 30 grams of soil are transferred to the sample jar using a clean plastic syringe to obtain the sample and weighing the sample on a scale.
- For samples requiring preservation (e.g GRO, BETX), the laboratory supplied pre-measured 25-mL ‘Purge and Trap Grade’ methanol is also transferred to the jar.
- The sample jar is capped. Methanol preserved samples will be slightly agitated to coat the soil particles with methanol.
- The jar is returned to the cooler with ice until delivered to the laboratory.
- One additional jar is filled and submitted for percent solids analysis with the corresponding sample.

For soils sampled for:

- Percent Solids
- RCRA Metals
- Polynuclear aromatic hydrocarbons (PAHs)
- Polychlorinated biphenyls (PCBs)

Soil samples are to be placed on ice, but do not need to be field preserved with methanol. The soil sample collection procedure for these analyses is as follows, using one jar per analysis.

- A soil sample will be transferred from the sampling tool (i.e., acetate liner, split-spoon or backhoe bucket) using clean stainless steel sampling equipment and disposable nitrile gloves into a stainless steel bowl to be homogenized.
- An adequate volume of soil will be transferred using the stainless steel equipment into an appropriate, clean, laboratory-supplied jar.
- The soil is packed into the jar with a nitrile-gloved hand to minimize headspace. However, if there is not enough soil for all required analyses an attempt will be made to place as much soil as possible into the jars for other analyses.
- The jar is sealed with a Teflon-lined cover.
- The sample is placed in a cooler with ice.
- The procedure is repeated until samples are collected for all required analyses and/or duplicates.
- Field personnel will decide which samples are to be laboratory analyzed based upon field instrument readings and other field observations, such as petroleum odor and soil staining. Only the samples that will be laboratory analyzed are left in the cooler.

All soil-sampling procedures for samples to be tested for VOCs will be consistent with EPA method 5035.



## GROUNDWATER SAMPLES

Groundwater sample collection can be preformed using a variety of methods and collection procedures follow Guidance Document 4-05 *Ground Water Sample Collection and Analysis Procedures*

Groundwater screening samples can be collected through the hydraulic probe. A slotted 4-foot stainless steel retractable screen or temporary 5 to 10-foot PVC well screen is used to retrieve water samples. The screen is placed so that the water table approximately intersects the middle of the screen. The groundwater sample is collected by drawing water up (with a Geoprobe pump) through new plastic tubing, the tip of which is set within the submerged slotted interval. New plastic tubing is used for each sample collected. Groundwater samples are collected directly from the tubing into laboratory sample containers. Groundwater samples are collected after removing approximately 2 liters (corresponding to approximately 10 “well” volumes) of groundwater to produce sediment-free water.

Groundwater samples can be collected through the HydroPunch II. The HydroPunch is driven into the aquifer by the drill rig, ahead of the hollow-stem augers. The tool utilizes an airtight and watertight sealed intake screen and sample chamber, which is isolated from the surrounding environment as the tool is advanced. The shape and smooth surface of the tool prevents the downward transport of contamination as the tool is advanced. As the soil is displaced, it compacts into the walls of the hole. This produces a very tight annular seal around the tool, enabling it to collect a discrete sample from a specific depth. When the desired depth is reached, the tool is opened by pulling back on the body of the tool. Soil friction holds the drive cone in place as the body moves back. Once the O-ring seal between the drive cone and the body of the tool is broken, groundwater flows from the surrounding formation into the sample chamber. As the tool is pulled upward, increased hydrostatic head within the tool closes a low and upper check valve, which retains the sample within the body of the HydroPunch. Once at the surface, the HydroPunch is inverted and the sample is decanted through a top discharge valve and tubing. New plastic tubing and a new screen with the HydroPunch are used for each groundwater sample collected. Decontamination of the HydroPunch is conducted after each sample is collected. The body and drive case is scrubbed with non-phosphate detergent solution and an inert brush. The tool is rinsed with organic-free tap water.

Permanent and temporary monitoring wells can be sampled using dedicated disposable bailer equipped with a bottom-closing ball check valve or by mechanical pumping using a low-flow peristaltic pump to draw water to the surface. With the bailer, a new retrieval line is used for each sampling point. The bailer is submerged just below the groundwater table and brought to the surface, without touching any other potentially contaminated surface. Water within the bailer is transferred quickly into the sample container while minimizing turbulence and exposure to the atmosphere. The low-flow pumping method draws the water up through new plastic tubing, the tip of which is set within the submerged zone. New bailers or tubing are used for each sample collected. Groundwater samples are collected directly into laboratory sample containers from the tubing. Only laboratory supplied sampling containers and preservative are used for groundwater samples. All chemical preservations are added by the lab before sampling.

Independent of which groundwater sample extraction method is used; water quality measurements (temperature, dissolved oxygen, specific conductance, pH, oxidation-reduction potential, and salinity, dissolved oxygen percent) are recorded using the Hydrolab Quanta G, a down-hole probe. The probe is set at the midpoint of the screened interval. Well water flows past the probe during measurement through a circulator, which continuously supplies a fresh sample to all sensors. When changes with time become negligible, it is assumed that the instruments readings have stabilized and are recorded. In addition to measuring ground water quality conditions in the field the following general procedures are followed while filling sample containers:

- Sample containers are not opened until they are filled.
- The area surrounding sample collection is kept as clean as possible to minimize the potential for contamination of samples.
- Samples are collected upwind from possible airborne contamination and shielded from the wind.
- A clean pair of gloves is used at each new sampling point.

## DECONTAMINATION PROCEDURES

Proper equipment decontamination procedures are followed to minimize the potential for cross-contamination between sampling points and maintain data quality. The level of equipment decontamination required typically depends on the following:

- The type, concentration, sorption and limits of detection of analytes being sampled,
- The risk of equipment coming into contact with contamination during storage and transport,
- Regulatory objectives and requirements, and
- The level of quality assurance/quality control procedures required.

All equipment contacting an unclean surface is properly decontaminated after contact. Examples of equipment that required decontamination included: water level instruments, split-barrel samplers, well purging devices, soil samplers, and spatulas.

Guidelines have been established by ASTM Method D 5088-90 for the Decontamination of Field Equipment Used at Nonradioactive Waste Sites. The minimum decontamination procedures recommended by ASTM are as follows:

- Wash sample contact equipment with a non-phosphate detergent solution (i.e., Alconox).
- Thoroughly rinse the equipment with organic-free tap water.

The more rigorous decontamination procedures recommended by ASTM are as follows:

- Wash the equipment with a non-phosphate detergent solution and scrub with an inert brush. For internal mechanisms and tubing, circulate the detergent solution through the equipment.
- Thoroughly rinse the equipment with organic-free tap water.
- For organic sampling, rinse the equipment with an organic desorbing agent (e.g., pesticide grade isopropanol, acetone, methanol or hexane). For inorganic sampling, rinse with inorganic desorbing agent (e.g., dilute hydrochloric or nitric acid solution).
- Rinse with organic-free tap water followed by rinse with deionized reagent grade organic free water.
- Place the equipment in an inert container or wrap in clean aluminum foil for storage and transport.

Decontamination documentation will be recorded as follows:

- The location where decontamination occurred.
- The individuals performing the decontamination.
- The decontamination procedures, including the wash solution and rinse water used (e.g., tap water and reagent grade water).
- The handling and disposal of decontamination wastewater.

## DOCUMENTATION OF SAMPLING EVENT

All data and documentation procedures will be recorded in a standard field notebook along with standard field forms. Any exceptions to standard procedures will be recorded in the field notebook. Any field conditions that may have had an adverse affect on sampling procedures will also be recorded in the field notebook. Proper equipment decontamination procedures were followed to minimize the potential for cross-contamination between sampling points and maintain data quality.

## SAMPLE PRESERVATION, HANDLING AND TRANSPORT

Sample preservation is conducted according to the procedures set forth by each laboratory's sample preservation requirements. All samples are placed immediately after collection in an insulated cooler containing ice and water slurry. The cooler is then taken directly to the laboratory or shipped next day air following completion of sample collection via MSA personnel. The cooler temperature is recorded upon receipt at the laboratory to verify that samples were kept refrigerated at approximately 4 degrees Celsius.

## CHAIN OF CUSTODY

Following the collection of samples, paperwork is completed to document the method and location of collections, sampling personnel, type of sample, and other information. This documentation includes, but is not limited to: chain-of-custody, custody seals, field notebooks, air bills, and sample identification matrix form.

Laboratory custody will conform to procedures established by the contracted laboratory. These procedures include:

- Designation of a sample custodian.
- Correct completion by the custodian of the chain-of-custody record (including documentation of sample condition upon receipt).
- Laboratory sampling tracking and documentation procedures.
- Secure sample storage (of the appropriate environment--refrigerated, dry, etc.).
- Proper data logging and documentation procedures including custody of all original laboratory records.

## SAMPLE PACKAGING AND SHIPPING

The sampling packaging and shipping procedures are based on EPA specifications, as well as Department of Transportation regulation (49 CFR). The procedures vary according to the sample concentration and matrix and are designed to provide optimum protection of samples and the public. All samples are shipped within 48 hours of collection or before 50 percent of the holding time had elapsed. Shipping containers are insulated, durable, and water tight. Bagged samples are cushioned within the shipping containers packing material.

## SAMPLE DUPLICATES, FIELD BLANKS AND TRIP BLANKS

### REPLICATE (DUPLICATE) SAMPLES

A field duplicate is collected to determine variability in the sampling procedure. Field duplicates are collected with each batch of ten or fewer groundwater or surface water samples. The duplicate samples are collected and handled using the same procedures, but are labeled as separate samples. The initial sample is collected first by filling all the sample containers. The duplicate sample is then collected by filling all its sample containers.

### FIELD BLANKS, TRIP BLANKS AND DUPLICATES

#### FIELD BLANKS

A field blank is reagent grade water processed through the sampling equipment. It has the same field preparation and preservation requirements as the samples to determine if field-cleaning procedures are adequate. Field blanks should be collected at the midpoint of the sampling event. A minimum of one field blank is collected per sampling event with a frequency of one for every ten samples. A methanol field blank will also be collected if soil VOCs are included in the sample shipment. Equipment blanks are collected for surface water and groundwater samples.

#### Trip Blanks

The trip blank is reagent grade volatile free water from the laboratory, which accompanies the VOC sample containers to the field and back to the laboratory. The purpose of the trip blank is to determine if samples have been contaminated with VOCs before or during sampling or shipping. A trip blank is included with each VOC sample shipment.

### Duplicates

One field duplicate for this sampling set from each matrix for the standard DRO, PAH, lead and arsenic analysis will be collected to determine variability in the sampling procedure. Field duplicates will also be collected with each batch of ten or fewer groundwater or surface water samples. The duplicate samples will be collected and handled using the same procedures, but are labeled as separate samples. The initial sample is collected first by filling all sample containers. The duplicate sample is the collected by filling all its sample containers.

### Spikes

The laboratory will perform surrogate spikes for each organic analysis completed. For some projects, a matrix spike/matrix spike duplicate will be submitted to the required analysis. These spikes are used to demonstrate the ability of the laboratory to generate acceptable accuracy and precision with the method. When a matrix spike / matrix spike duplicate is submitted, the required information identified on the MPCA Laboratory Data Checklist Fact Sheet dated May 1998 will be included on the final laboratory report.

## INVESTIGATION-DERIVED WASTE

As a general practice, all soil cuttings, decontamination wastewater, and monitoring well development water generated during the investigation are collected in drums approved by the Minnesota Department of Transportation and temporarily stored on-site. Decontamination wastewater, if allowed, will be splashed on the ground surface. Excess purged ground water and well development water will either be splashed on the ground surface or, if suspected to be contaminated, disposed of off-site after analytical results are received. Excess soil cuttings removed from the soil borings are disposed either on or off-site depending on the suspected contamination conditions and the current state or regulatory guidelines. Disposable PPE (e.g., gloves, tyvek) will be containerized using polyethylene bags and disposed in a waste receptacle.

## POTENTIAL RECEPTOR SURVEY

Included with the soil, groundwater and air sample collection, a receptor risk assessment is performed. The purpose of the survey is to identify potential receptors and evaluate the risk associated with each receptor. The survey includes three parts: Water Well Receptor Survey, Surface Water Receptor Survey and A Vapor Receptor Survey.

### WATER WELL SURVEY

A survey was conducted to identify possible water supply wells that may be at risk from the petroleum release and to provide information regarding the geology and groundwater use near the release site. For the water well survey, the following was completed:

- A walking survey and/or a post card survey of properties are conducted within 500 feet of the edges of the plume to locate all water supply wells and possible off-site petroleum contamination.
- The addresses of the properties within 500 feet of the plume were provided to the city engineer to confirm the status of water supply wells to those addresses.
- A well record search is use to collect information to area water supply wells within 1 mile of the plume.
- The site is evaluated to determine location relative to Drinking Water Supply Management Areas / Source Water Assessment Areas.

## SURFACE WATER RECEPTOR SURVEY

The proximity of the release to surrounding surface water (including wetlands) is evaluated. The survey is used to identify surface water within ¼ mile of the site and surface features within a 500 foot radius (e.g. ditches, drain tiles, storm sewers, etc.). The surface water survey will be used to plan sample locations.

## VAPOR RISK ASSESSMENT AND SURVEY

A utility vapor survey is conducted as follows:

- Site utilities are marked prior to site activities. During the initial site investigation, the risk to site utilities was evaluated based on PID readings and proximity to of utilities to the former UST basin.

Basement surveys are conducted as follows:

- An interview with the building owner is conducted to determine any history of petroleum odors.
- The site basement was checked using a MicroMax Four Gas monitor and a PID. Vapor readings are recorded in ambient air to assess air quality.
- Basement sewer drains, corners and areas of poor air circulation were checked for vapor.

## CONTAMINATED SOIL EXCAVATION STORAGE AND TREATMENT

Prior to implementation of excavation activities, a plan for the storage of all disturbed and/or removed contaminated soil material will be prepared and a treatment options will be identified. All soil removed will be field screened and separated based on field screening criteria identified in MPCA Guidance Documents 3-01 *Excavation of Petroleum Contaminated Soil and Tank Removal Sampling*. Excavated waste and soil that will be temporarily stored prior to treatment or transport off site will be placed on an impermeable surface and covered with plastic. The plastic will be anchored with clean soil or other suitable means. Soil sampling will be completed according to methods outlined in the sections above. Waste disposal permitting must be completed before soils are removed from the site.



## **APPENDIX D**

### **PHOTOGRAPHIC REFERENCE**



**Photographic Log**  
**Duluth Transit Authority Garage**  
2402 West Michigan Street, Duluth, MN 55806  
MSA Project No. 11488045



*Excavating tank basin – looking south.*



*Excavating tank basin – looking north.*



*View of second and third tanks in tank basin during removal.*



*AST area behind bollards.*





*Removal of tank #1.*



*Removal of tank #2.*



*Excavation after removal of two tanks. Groundwater visible in tank basin, along with remaining tank.*



*View of piping – steel and flexible piping.*





*Removal of tank #3.*



*Removal of tank #3.*



*Excavation being backfilled following tank removals.*

**APPENDIX E**  
**CHANGE IN STATUS FORM**



520 Lafayette Road North  
St. Paul, MN 55155-4194

# UST notification form

## Underground Storage Tanks (UST) Program

Installation, closure, tanks, piping, dispensers

Doc Type: Permitting Registration Form

Notify the Minnesota Pollution Control Agency (MPCA) **within 30 days after** bringing tank system into use. Keep a copy for your records. **Incomplete forms will be returned. Guidance on pages 5-6.**

### Use this form for:

- Installation or replacement of tank, piping, or dispensers
- Removals or permanent closures

**Submittal:** To submit this form, save it to your computer and send to the MPCA, using the submit button at the end of the form; or attach it to an email message, using "Notification form" as the subject line to [undergroundtanks.pca@state.mn.us](mailto:undergroundtanks.pca@state.mn.us). Ensure all necessary signatures are acquired. Email the completed document to those who need to sign and certify it. Complete the Site assessor/sampler section for permanent closures, removals, or product change to a non-regulated substance. **All questions with an asterisk(\*) are required fields.**

### Site information

\*Site name: Duluth Transit Authority Site number (if known): TS0005289

\*Address: 2402 West Michigan Street

\*City: Duluth State: MN \*Zip code: 55806 \*County: St Louis

\*Contact name: \_\_\_\_\_ \*Phone: \_\_\_\_\_

\*Email address: \_\_\_\_\_

Is this site located on Native American lands? ☐ Yes ☒ No Is this the initial notification for this site? ☐ Yes ☒ No

Type of facility: ☐ Service station ☐ Government ☐ Education ☐ Industry/Factory ☐ Auto dealer ☐ Utility

☐ Bulk plant ☐ Resort ☐ Office building ☒ Other (specify): Transportation

### Owner information

\*Name: \_\_\_\_\_

\*Address: \_\_\_\_\_

\*City: \_\_\_\_\_ \*State: \_\_\_\_\_ \*Zip code: \_\_\_\_\_

\*Contact name: \_\_\_\_\_ \*Phone: \_\_\_\_\_

\*Email address: \_\_\_\_\_

### A. Action (Enter date [mm/dd/yyyy] of action under tank number)

1. Tank number <i>See Guidance – page 5</i>	001	002	003	
2. Install new tank				
3. Install new piping				
4. Install new tank and piping				
5. Install new dispenser				
6. Change tank information				
7. Change piping, pump, or dispenser information				
8. Current tank status <i>See Guidance – page 5</i>	Status: Removed Date: 12/22/2020	Status: Removed Date: 12/22/2020	Status: Removed Date: 12/22/2020	Status: Date:
9. If tank has been removed, list tank sludge disposal company and Hazardous Waste Generator ID#	OSI	OSI	OSI	

## B. Tank information

1. Tank number <i>See Guidance – page 5</i>	001	002	003	
2. Capacity	Gallons: 20,000	Gallons: 20,000	Gallons: 20,000	Gallons:
3. Stored substance <i>See Guidance – page 5</i>	Type: Fuel oil #2 (light) Specify:	Type: Diesel, Petroleum Specify:	Type: Diesel, Petroleum Specify:	Type Select from list: Specify:
4. Compartmental tank only <i>See Guidance – page 5</i>				
Compartment 1	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:
Compartment 2	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:
Compartment 3	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:	Gallons: Type: Select from list: Specify:
5. Special use	<input checked="" type="checkbox"/> Heating only	<input type="checkbox"/> Heating only	<input type="checkbox"/> Heating only	<input type="checkbox"/> Heating only
6. Tank type <i>See Guidance – page 5</i>	Type: STIP3,SingleWalled Specify:	Type: STIP3,SingleWalled Specify:	Type: STIP3,SingleWalled Specify:	Type Select from list: Specify:
7. Tank manufacturer				
8. Tank model				
9. Tank corrosion protection <i>See Guidance – page 5</i>	Sacrificial anode	Sacrificial anode	Sacrificial anode	Select from the list:
10. Spill bucket containment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
11. Spill bucket manufacturer and model				
12. Spill bucket – single wall or double wall	<input checked="" type="checkbox"/> Single <input type="checkbox"/> Double	<input checked="" type="checkbox"/> Single <input type="checkbox"/> Double	<input checked="" type="checkbox"/> Single <input type="checkbox"/> Double	<input type="checkbox"/> Single <input type="checkbox"/> Double
13. Overfill prevention type <i>See Guidance – page 5</i>	Fill pipe flapper valve	Fill pipe flapper valve	Fill pipe flapper valve	Select from list:
14. Overfill equipment manufacturer and model				
15. Stage 1 vapor recovery for gasoline tanks	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
16. Stage 1 vapor recovery	<input type="checkbox"/> 2 point <input type="checkbox"/> Coax	<input type="checkbox"/> 2 point <input type="checkbox"/> Coax	<input type="checkbox"/> 2 point <input type="checkbox"/> Coax	<input type="checkbox"/> 2 point <input type="checkbox"/> Coax
17. Primary method of tank release detection <i>See Guidance – page 5</i>	Auto tank gauging (ATG)	Auto tank gauging (ATG)	Auto tank gauging (ATG)	Select from list:
18. Automatic tank gauge manufacturer and model				
19. Automatic tank gauge probe model				
20. Tank interstitial sensor manufacturer and model				

### C. Piping, pump, and dispenser information:

1. Tank number <i>See Guidance – page 5</i>	001	002	003	
2. Piping type <i>See Guidance – page 5</i>	Type: Copper <i>Specify:</i>	Type: FlexNonmetallic, Sglwall <i>Specify:</i>	Type: FlexNonmetallic, Sglwall <i>Specify:</i>	Type: Select from list: <i>Specify:</i>
3. Piping manufacturer and model				
4. Pipe sealant/adhesive manufacturer and model				
5. Flexible connector manufacturer and model				
6. Shear valve manufacturer and model				
7. Shear valve dual pop-it	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
8. Piping corrosion protection <i>See Guidance – page 6</i>	Not needed	Not needed	Not needed	Select from list:
9. Primary method of piping release detection <i>See Guidance – page 6</i>	3yr tightness testing	3yr tightness testing	3yr tightness testing	Select from list:
10. Line leak detector manufacturer & model				
11. Piping interstitial sensor manufacturer & model				
12. Dispensing type <i>See Guidance – page 6</i>	Other suction pump	Submersible pump	Submersible pump	Select from list:
13. Submersible pump containment <i>See Guidance – page 6</i>	Type: None <i>Specify:</i>	Type: None <i>Specify:</i>	Type: None <i>Specify:</i>	Type: Select from list: <i>Specify:</i>
14. STP containment manufacturer and model				
15. Submersible turbine pump manufacturer and model				
16. Suction pump manufacturer and model				
17. Dispenser manufacturer and model				
18. Dispenser containment <i>See Guidance – page 6</i>	Type: Select from list: <i>Specify:</i>	Type: Select from list: <i>Specify:</i>	Type: Select from list: <i>Specify:</i>	Type: Select from list: <i>Specify:</i>
19. Break-away manufacturer and model				
20. Swivel manufacturer and model				
21. Nozzle manufacturer and model				
22. Hose manufacturer and model				

**Comments:**



## Certification

### Complete the following steps to complete the certification:

1. The Tank supervisor and contractor should complete the applicable section below, save the form, and forward on to Owner to certify.
2. Complete the Site assessor/sampler section if applicable. Save the form and forward to the Site assessor to complete their section if needed.
3. Once the Contractor and Supervisor have certified the document and the Site assessor/sampler information is completed (if required), the Owner should complete the applicable section and click the submit button. The signatures are needed for the form to be accepted.

### Tank contractor

I certify that all work was performed as specified by the manufacturer's instructions; that all work was performed according to the applicable codes of practice in Minn. R. ch. 7150.0205; that all work was performed according to applicable state and federal regulations, including this chapter; and that I am in compliance with contractor certification requirements imposed by Minn. R. ch. 7105.

By typing my name below, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing this form.

☒ I agree

☒ I agree

#### Licensed tank supervisor on site during tank work:

\*Name: Kevin J Lund

(This document has been electronically signed.)

\*Title: President

\*Date (mm/dd/yyyy): 12-24-2020

\*MPCA supervisor #: 3444

#### Licensed tank contractor or authorized representative:

\*Name: TPEC

(This document has been electronically signed.)

\*Title: Licensed Contractor

\*Date (mm/dd/yyyy): 12-24-2020

\*MPCA contractor #: 695

### Site assessor/sampler (if applicable)

Minn. R. 7150.0420 requires a site assessment be conducted at the removal or closure in place of regulated USTs or if the product stored is changed from a regulated to non-regulated substance. Please complete the following information to identify who conducted the site assessment. Contamination must be reported. State Duty Officer: 1-800-422-0798 or 651-649-5451.

Name: Erica Klingfus Title: Environmental Scientist  
Date (mm/dd/yyyy): 12/30/20

Company name: MSA Professional Services

Mailing address: 332 W. Superior Street, Suite 600

City: Duluth State: MN Zip code: 55802

Contact name: Jeffrey K. Anderson Email address: jkanderson@msa-ps.com

### Tank owner

I certify that the information submitted is accurate and complete to the best of my knowledge; that installation of tanks, piping, and dispensers is according to Minn. R. ch. 7150.0100 and 7150.0205, including secondary containment of new and replacement tanks, piping, and dispensers; and that all tanks and piping have release detection according to Minn. R. ch. 7150.0300 to 7150.0340. I advise that the information submitted is accurate and complete to the best of my knowledge; that the permanent closure of tank systems and change in status to storage of non-regulated substances is according to Minn. R. ch. 7150.0410 (for owners purchasing tanks after March 1, 2008, only). I certify that all tank operators, including lessees, have read this chapter and have sufficient knowledge in the operation and maintenance of underground storage tank systems.

By typing my name below, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing this form.

☐ I agree

#### Owner or authorized representative

\*Name:

(This document has been electronically signed.)

\*Title:

\*Date (mm/dd/yyyy):

Submit

Reset