



Technical Memorandum

To: Alex Smith, Enbridge Energy
From: Ryan Erickson
Subject: Superior Terminal Line 5 Valve Historical Contamination Response
Date: August 9, 2016
Project: 49161253.35

This memorandum summarizes the environmental response and waste management assistance provided by Barr Engineering (Barr) at the request of Enbridge Energy (Enbridge) associated with historical contamination identified near a Line 5 valve at the Superior Terminal (Terminal) in Superior, Wisconsin (Figure 1).

Background

On July 6, 2016, Enbridge personnel observed free-product on standing water located next to the Line 5 Valve 5-V-5531 (Photos 1 and 2; Figure 2). The standing water/puddle with the product on the surface was approximately 10 feet long and 3 to 6 feet wide. Enbridge estimated that less than 1-gallon of product was observed. The observations were reported to Enbridge and Pipe Line Maintenance (PLM) personnel responded to the site and excavated soil from that location to determine if the product was historical or from an active release. The PLM did not identify an active release during the July 6 and 7 response actions; therefore, the PLM determined that the crude oil was from a historical release. Enbridge Environment was notified about the identified contamination and they requested that Barr assist with the following activities:

- assess and document the environmental site conditions during the response actions and after the completion of remedial activities,
- assist with the coordination of the off-site management of contaminated soil,
- review historical release records to identify the possible contamination source(s), and
- prepare a memorandum summarizing the release response activities and the site environmental conditions upon the completion of cleanup activities.

Historical Release Records

Barr reviewed Enbridge's historical release records and identified a July 15, 1991, 8 barrel crude oil release (LRS#577) approximately 25 feet northeast of the current response area (Figure 2). No Wisconsin Department of Natural Resources (WDNR) release notification records were identified so Enbridge contacted the WDNR about the observed contamination on July 6, 2016 and, at the WDNR's request, Enbridge submitted the WDNR Notification for Hazardous Substance Discharge form on July 8, 2016. Historical release documents and the WDNR notification form are provided in Attachment A.

Field Activities

Barr was onsite on July 6, 2016 to document the remediation activities and the environmental conditions at the Line 5 Valve site. Remediation activities included the recovery of free-product with oil absorbent pads and booms (Photo 1) and the excavation of soil around the Line 5, Valve 5-V-5531 with a hydrovac truck (Photos 1, 3, and 4). The excavation was left open the night of July 6, 2016 to determine whether additional free-product would surface.

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On July 7, 2017, Barr returned to the site to document the environmental conditions in the remedial excavation. Barr field screened 6 soil samples from the excavation sidewalls. Field screening samples were tested for the presence of organic vapors using a 10.6eV photoionization detector (PID). The samples were also inspected for the presence of other potential indicators of crude oil impacts such as odor, discoloration and sheen. The PID readings and physical observations were documented on site investigation field sampling and screening logs (Attachment B). Soil was classified as contaminated if PID headspace readings were greater than 10 parts per million (ppm), or if other physical observations of oil impacts were observed, as outlined in the pending WDNR *Enbridge Superior Terminal Site Investigation and Response Action Plan (SI/RAP)* (2014). Barr collected analytical sidewall sample *L-5 Valve S-1* from the SE corner of the excavation to identify whether residual contamination was present in the direct contact zone. The sample was submitted to the ALS Environmental laboratory in Holland, Michigan for analysis of petroleum volatile organic compound (PVOC), benzene, toluene, ethylbenzene, and xylenes (BTEX), and naphthalene. The laboratory results are summarized in Table 1 and the laboratory report is included in Attachment C.

Excavated contaminated soil was transported to the Superior Terminal Soil Management Area (SMA) contaminated-soil staging area where it was stockpiled until off-site disposal could be arranged. Waste characterization sample *L-5 Valve Stockpile-1* was collected from the contaminated stockpile and submitted to the ALS Environmental laboratory for BTEX and diesel range organics (DRO) analysis as described in the *Waste Disposal Coordination* section below.

Results

The final remedial excavation was approximately 8 feet long by 5 feet wide by 5 feet deep (Photos 3 and 4; Figure 2; Attachment B). The predominant soil type in the excavation sidewalls was clay. The groundwater table was approximately 2 feet below ground surface (bgs) (Photo 5).

Barr collected six field screening soil samples from the final excavation extents (Attachment B). The PID headspace readings were between 2.4 to 5.0 ppm and no other evidence of residual hydrocarbon contamination was observed in the excavation soil samples. A hydrocarbon sheen was observed on the surface of the groundwater within the excavation after it was allowed to sit open overnight (Photo 6). However, no additional free-product was detected.

Barr collected analytical sidewall sample *L-5 Valve-S-1* from 1.5 feet bgs to identify whether contaminants were present in the direct contact zone. The analyte concentrations were below laboratory method detection limits (MDL), below the WDNR Industrial Direct Contact RCL's, below WDNR Groundwater RCL's, and passed the Cumulative Hazard Index criteria (Table 1).

Remedial excavation activities were concluded based on field observations and field screening results and the excavation was backfilled with clean fill upon completion of the pipeline maintenance activities.

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Table 1 Confirmation Soil Sample Analytical Results (all analyte concentrations in mg/kg)

Sample ID	Sample Date	Sample Depth (feet)	1,2,4-Trimethyl benzene	1,3,5-Trimethyl benzene	Benzene	Ethyl benzene	Toluene	Xylenes	Naphthalene
WDNR Groundwater RCLs			1.3793	1.3793	0.0051	0.785	0.5536	1.97	0.3294
WDNR Industrial RCLs			219	182	7.41	37	818	258	26
L-5 Valve S-1	7/7/2016	1.5	<0.0096	<0.021	<0.011	<0.011	<0.016	<0.037	<0.0082

Notes:

The laboratory report is included in Attachment C.

Waste Disposal Coordination

Barr collected analytical waste characterization soil sample *L-5 Stockpile-1* from the contaminated soil stockpile at the SMA (Photo 7) for laboratory analysis at ALS Environmental. The sample was analyzed for DRO and BTEX. The laboratory report was submitted to the VONCO V landfill in Duluth, Minnesota as part of a waste profile application. The application was accepted assigned waste profile #16-079-I. 28.61 tons of contaminated soil were hauled to the landfill on July 20, 2016. The waste profile documents, the waste characterization laboratory report, and the landfill summary report are included in Attachment D.

Conclusions

A small volume of crude oil was observed on the surface of a puddle near the Line 5 Valve 5-V-5531. Based on the subsequent remedial response and excavation, the infrastructure inspection activities, and the location of a nearby historical release, it was determined that the observed free-product was historical and not from an active release. Residual soil contamination was not identified in the final excavation extents through field screening and the analyte sample collected from the direct contact zone had analyte concentrations below the laboratory method detection limits.

All soil that was excavated from the site was disposed of at an off-site landfill facility. Groundwater at the Superior Terminal is monitored by the existing facility-wide groundwater monitoring program, which is conducted at the Superior Terminal as part of the hydrogeologic performance standard established in the approved *SI/RAP* (2014). Enbridge will monitor the condition of the site and, if new evidence of contamination is identified, it will be reported and managed appropriately.

Because residual analyte concentrations are below WDNR direct contact RCL's and groundwater RCL's, Barr believes that further remedial action at the site will not be required by the WDNR and that the site will be added to the Terminal-wide GIS registry.

Attachments:

- Site Photos 1 through 7
- Figure 1 Site Location
- Figure 2 Site Layout
- Attachment A WDNR Reporting Documents and Historical Release Documents
- Attachment B Site Investigation Field Sampling and Screening Log
- Attachment C ALS Laboratory Reports for the Excavation Soil Sample
- Attachment D Waste Disposal Documentation

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Site Photos



Photo 1



Photo 2

Photo 1: The Line 5, Valve 5-V-5531 response area (right side of photo) where free-product was observed. A hydrovac truck and oil absorbent booms and pads are visible in the response area. The eastern wall of Manifold 221 Building is on the left side of the photo. Photo taken facing northwest on July 6, 2016.

Photo 2: Free-product on the surface of standing water to the west of the Line 5, Valve 5-V-5531. Photo taken facing northwest on July 6, 2016.



Photo 3

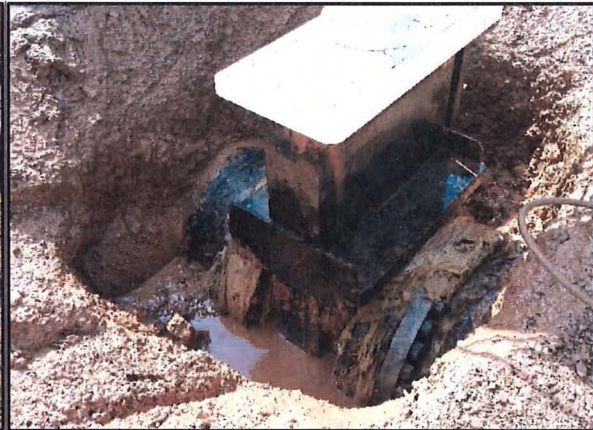


Photo 4

Photo 3: Remedial excavation. Photo taken facing northwest on July 6, 2016.

Photo 4: Remedial excavation. Photo taken facing southeast on July 6, 2016.

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Photo 5



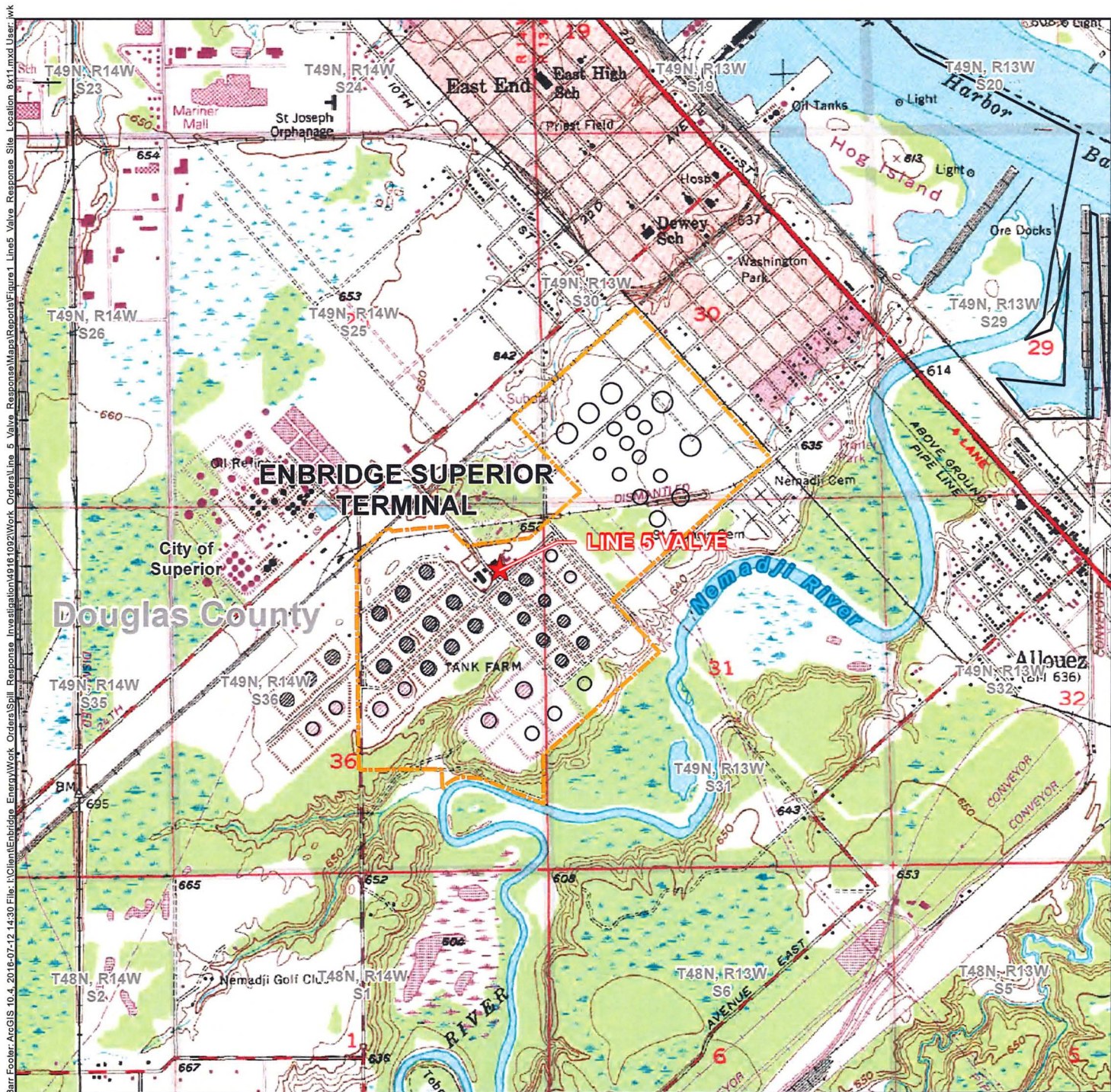
Photo 6

Photo 5: Final extents of the remedial excavation. Groundwater filled the excavation overnight. Photo taken facing east on July 7, 2016.

Photo 6: Light hydrocarbon sheen on groundwater within the excavation. Photo taken on July 7, 2016.



Photo 7: Contaminated soil stockpile in Terminal Soil Management Area. Photo taken on July 7, 2016.



- ★ Site Location
- - - - - Terminal Property Boundary



Feet
1 Inch = 2,000 Feet

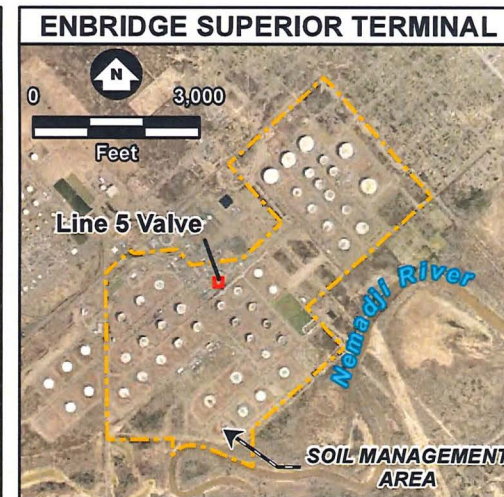
Figure 1






SITE LOCATION
LINE 5 VALVE RESPONSE
SUPERIOR TERMINAL
 Enbridge Energy, L.P.
 Superior, Wisconsin



Barr Footer: ArcGIS 10.4, 2016-07-12 14:30 File: I:\Client\Enbridge_Energy\Work_Orders\line_5_valve_response\Mapa\Reports\Figure1_Line5_Valve_Response_Site_Location_8x11.mxd User: jwk

Barr Footer: ArcGIS 10.4, 2018-07-18 10:33 File: I:\Client\Enbridge_Energy\Work_Orders\Spill_Response_Investigation\19161092\Work_Orders\Line_5_Valve_Response\Mapa\Reports\Figure2_Line5_Valve_Response_SiteLayoutMap_8x11.mxd User: jwk



-  Approximate Historical Release Location
-  Analytical Sample Locations
-  Excavation Extents
-  Pipeline Infrastructure
-  Terminal Property Boundary



Feet
1 Inch = 20 Feet
Douglas County Imagery Circa 2016

Figure 2
**SITE LAYOUT
LINE 5 VALVE RESPONSE
SUPERIOR TERMINAL**
Enbridge Energy, L.P.
Superior, Wisconsin



Attachment A:

**WDNR Reporting Documents and
Historical Release Documents**

Notification For Hazardous Substance Discharge (Non-Emergency Only)

Form 4400-225 (05/12) Page 1 of 2

Emergency Discharges / Spills should be reported via the 24-Hour Hotline: 1-800-943-0003

Notice: Hazardous substance discharges must be reported immediately according to s. 292.11 Wis. Stats. Non-emergency hazardous substance discharges may be reported by telefaxing or e-mailing a completed report to the Department, or calling or visiting a Department office in person. If you choose to notify the Department by telefax or by email, you should use this form to be sure that all necessary information is included. However, use of this form is not mandatory. Under s. 292.99, Wis. Stats., the penalty for violating the reporting requirements of ch. 292 Wis. Stats., shall be no less than \$10 nor more than \$5000 for each violation. Each day of continued violation is a separate offense. It is not the Department's intention to use any personally identifiable information from this form for any purpose other than program administration. However, information submitted on this form may also be made available to requesters under Wisconsin's Open Records Law (ss. 19.31 – 19.39, Wis. Stats.).

Confirmatory laboratory data should be included with this form, to assist the DNR in processing this Hazardous Substance Release Notification.

Complete this form. **TYPE or PRINT LEGIBLY.** NOTIFY appropriate DNR region (see next page) **IMMEDIATELY** upon discovery of a potential release from (**check one**):

- Underground Petroleum Storage Tank System (additional information may be required for Item 6 below)
- Aboveground Petroleum Storage Tank System
- Dry Cleaner Facility
- Other - Describe: Contamination related to a historical crude oil release

ATTN DNR: **R & R Program Associate**

Date DNR Notified: **07/07/2016**

1. Discharge Reported By

Name Alex Smith	Firm Enbridge Energy	Phone No. (include area code) (715) 398-4795
Mailing Address 1320 Grand Ave., Superior, WI 54880		Email Address alex.smith@enbridge.com

2. Site Information

Name of site at which discharge occurred. Include local name of site/business, not responsible party name, unless a residence/vacant property. Enbridge Superior Terminal - Line 5 Valve (5-V-553) response

Location: Include street address, not PO Box. If no street address, describe as precisely as possible, i.e., 1/4 mile NW of CTHs 60 & 123 on E side of CTH 60. Enbridge Energy Superior Terminal 2800 E 21st St. Superior WI, 54880

Municipality: (City, Village, Township) Specify municipality in which the site is located, not mailing address/city.

Superior

County: Douglas	Legal Description: NE 1/4 NE 1/4 Sec 36 Tn 49N Range 14 <input type="radio"/> E <input checked="" type="radio"/> W	WTM: X 362629 Y 692656
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3. Responsible Party (RP) and/or RP Representative

Responsible Party Name: Business or owner name that is responsible for cleanup. If more than one, list all. Attach additional pages as necessary.

Enbridge Energy

- Reported in compliance with s. 292.11(2), Wis. Stats., by a local government exempt from liability under s. 292.11(9)(e), Wis. Stats. For more information see <http://dnr.wi.gov/org/aw/r/lgu/liability.htm>.

Contact Person Name (if different) Alex Smith	Phone Number (715) 398-4795	Email Address alex.smith@enbridge.com	
Mailing Address 1320 Grand Ave., Superior, WI 54880	City Superior	State WI	ZIP Code 54880

Property owner if Different From RP: Business or owner name that is responsible for cleanup. If more than one, list all. Attach additional pages as necessary.

Contact Person Name (if different)	Phone Number	Email Address	
Mailing Address	City	State	ZIP Code

(continued)

4. Hazardous Substance Information

Identify hazardous substance discharged (check all that apply):

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> VOC's | <input type="checkbox"/> Diesel | <input type="checkbox"/> PERC (Dry Cleaners) |
| <input type="checkbox"/> PAH's | <input type="checkbox"/> Fuel Oil | <input type="checkbox"/> RCRA Hazardous Waste |
| <input type="checkbox"/> Metals (specify): _____ | <input type="checkbox"/> Gasoline | <input type="checkbox"/> Leachate |
| <input type="checkbox"/> Arsenic | <input type="checkbox"/> Hydraulic Oil | <input type="checkbox"/> Fertilizer |
| <input type="checkbox"/> Chromium | <input type="checkbox"/> Jet Fuel | <input type="checkbox"/> Pesticide/Herbicide/Insecticide(s) |
| <input type="checkbox"/> Cyanide | <input type="checkbox"/> Mineral Oil | <input checked="" type="checkbox"/> Other (specify): <u>Crude oil</u> |
| <input type="checkbox"/> Lead | <input type="checkbox"/> Waste Oil | <input type="checkbox"/> Unknown |
| <input type="checkbox"/> PCB's | <input type="checkbox"/> Petroleum-Unknown Type | |

5. Impacts to the Environment Information

Enter "K" for known/confirmed or "P" for potential for all that apply.

- | | | |
|---|---|--|
| <input type="checkbox"/> Air Contamination | <input type="checkbox"/> Sanitary Sewer Contamination | <input checked="" type="checkbox"/> Soil Contamination |
| <input type="checkbox"/> Co-Contamination (Petroleum & Non-Petroleum) | <input type="checkbox"/> Contamination in Right of Way | <input type="checkbox"/> Storm Sewer Contamination |
| <input type="checkbox"/> Contamination Within 1 Meter of Bedrock | <input type="checkbox"/> Fire Explosion Threat | <input type="checkbox"/> Surface Water Contamination |
| <input type="checkbox"/> Contaminated Private Well | <input checked="" type="checkbox"/> Free Product | <input type="checkbox"/> Within 100 ft of Private Well |
| <input type="checkbox"/> Contaminated Public Well | <input checked="" type="checkbox"/> Groundwater Contamination | <input type="checkbox"/> Within 1000 ft of Public Well |
| <input type="checkbox"/> Contamination in Fractured Bedrock | <input type="checkbox"/> Off-Site Contamination | |
| | <input type="checkbox"/> Other (specify): _____ | |

Contamination was discovered as a result of:

- | | | |
|--|---|--|
| <input type="checkbox"/> Tank closure assessment | <input checked="" type="checkbox"/> Site assessment | <input type="checkbox"/> Other - Describe: _____ |
| Date <input type="text"/> | Date <u>07/06/2016</u> | Date <input type="text"/> |

Lab results: Lab results will be faxed upon receipt Lab results are attached

Additional Comments: Include a brief description of immediate actions taken to halt the release and contain or cleanup hazardous substances that have been discharged.

Absorbent booms were placed around the area to contain product. Product on the ground surface was soaked up using absorbent padding and a vacuum truck. Soil around the valve where oil was observed was excavated using a hydrovac truck.

6. Federal Energy Act Requirements (Section 9002(d) of the Solid Waste Disposal Act (SWDA))

For all confirmed releases from UST's occurring after 9/30/2007 please provide the following information:

- | | Source | Cause |
|-------------------------------------|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> Tank | <input type="checkbox"/> Spill |
| <input type="checkbox"/> | <input type="checkbox"/> Piping | <input type="checkbox"/> Overfill |
| <input type="checkbox"/> | <input type="checkbox"/> Dispenser | <input type="checkbox"/> Corrosion |
| <input type="checkbox"/> | <input type="checkbox"/> Submersible Turbine Pump | <input type="checkbox"/> Physical or Mechanical Damage |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Delivery Problem | <input type="checkbox"/> Installation Problem |
| | <input type="checkbox"/> Other (specify): _____ | <input type="checkbox"/> Other (does not fit any of above) |
| | | <input type="checkbox"/> Unknown |

Contact information to report non-emergency releases in DNR's five regions are as follows:

Northeast Region (FAX: 920-662-5197); Attention -- R&R Program Associate: DNRRRNER@wisconsin.gov

Brown, Calumet, Door, Fond du Lac (except City of Waupun - see South Central Region), Green Lake, Kewaunee, Manitowoc, Marinette, Marquette, Menominee, Oconto, Outagamie, Shawano, Sheboygan, Waupaca, Waushara, Winnebago counties

Northern Region (FAX: 715-623-6773); Attention -- R&R Program Associate: DNRRRNOR@wisconsin.gov

Ashland, Barron, Bayfield, Burnett, Douglas, Forest, Florence, Iron, Langlade, Lincoln, Oneida, Polk, Price, Rusk, Sawyer, Taylor, Vilas, Washburn counties

South Central Region (FAX: 608-273-5610); Attention -- R&R Program Associate: DNRRRSCR@wisconsin.gov

Columbia, Dane, Dodge, Fond du Lac (City of Waupun only), Grant, Green, Iowa, Jefferson, Lafayette, Richland, Rock, Sauk, Walworth counties

Southeast Region (FAX: 414-263-8550); Attention -- R&R Program Associate: DNRRRSER@wisconsin.gov

Kenosha, Milwaukee, Ozaukee, Racine, Washington, Waukesha counties

West Central Region (FAX: 715-839-6076); Attention -- R&R Program Associate: DNRRRWCR@wisconsin.gov

Adams, Buffalo, Chippewa, Clark, Crawford, Dunn, Eau Claire, Jackson, Juneau, LaCrosse, Marathon, Monroe, Pepin, Pierce, Portage, St. Croix, Trempealeau, Vernon, Wood counties

PERMANENT REPAIR REPORT

Interprovincial Pipe Line Company
 Interprovincial Pipe Line (NW) Ltd.
 Lakehead Pipe Line Company, Inc.

Report No. Central No. 1278-R

(check one) Leak Report Permanent Repair Report

LOCATION	Reporting Office District 3	Date Condition was Discovered 06-27-91	Date of Repair 07-09-91	Report Date 07-15-91	Safety Related Condition Report Required? (LPL Only) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
	Pipe Line Location - Pump Station or Milepost Line 5 Pumproom - Superior			Line No.	Line Size 26"	Special Cost No. 3386	
	Specific Location - footage from a known stationing on route sheet (milepost, air marker, etc.) 22 ft. 4 in. from end of No. 1 manifold building						Route Sheet No. 225
	Quarter	Section	Township	Range	Tract No.	Mendian/County Douglas	Province/State WI
	Property Owner's Name and Address Lakehead Pipe Line Co., Inc.						
	Property Tenant's Name and Address						
	Full Description of Property Damage (attach sketch if necessary)						
	Communications (explain briefly, any request or discussion with owner or tenant concerning damages to property, that may have arisen voluntarily, without investigation on your part).						

LEAK	Classify the Break or Leak		Describe Specific Nature and Cause of Break or Leak			
	<input type="checkbox"/> Longitudinal Weld Failure	<input type="checkbox"/> External Corrosion	There was a small pinhole in the pipe caused by internal corrosion.			
	<input type="checkbox"/> Circumferential Weld Failure	<input checked="" type="checkbox"/> Internal Corrosion				
<input type="checkbox"/> Rock Penetration	<input type="checkbox"/> Other					
Oil Out of Line - cu meters/bbls 8 bbls. 1.3 m³		Oil Recovered - cu meters/bbls 8 bbls.	Net Loss - cu meters/bbls 0	Crude Type	Batch No.	
Discussion of Lost Oil Reinjected into line.						
Name and Address of Person Reporting Leak Craig Goplin				Was Report Fee Paid? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Amount \$

REPAIR	Nature of Repair & Fittings Added to Mainline (attach a detailed sketch - identify upstream & pipe orientation) A 24" LDS sleeve was installed over the pinhole.					
	Nature and Type of Soil Wet Clay		General Condition of Line Excellent		Type and Condition of Existing Coating Hot Dope/Excellent	
	Condition of Trench (icy, standing water, etc.) Wet		Cathodic Protection Potential -1.58		Type and Length of Repair Coating Tapecoat 20 36"	
	If Condition Exists, Describe Type and Depth (i.e. general or localized pitting with depths & lengths)					

LPL PERSONNEL MUST ALSO COMPLETE A CORROSION INSPECTION REPORT **CONFIDENTIAL**

OTHER	Remarks			Was there any stock pipe installed? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
	Development Agency/Client			Individual Contacted		
	Date			Time		
	Report Completed by			Division Manager/General Manager Operations		

FB 6206931

Attachment B:

Site Investigation Field Sampling and Screening Log

Attachment C:

ALS Laboratory Report for Excavation Soil Samples



15-Jul-2016

Ryan Erickson
Barr Engineering Company
4300 MarketPointe Drive
Suite 200
Minneapolis, MN 55435

ALS Group USA, Corp

Date: 15-Jul-16

Client: Barr Engineering Company
Project: Superior Line 5 Valve Response (49161253.35)
Work Order: 1607461

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1607461-01	L-5 Valve S-1	Soil		07/07/16 14:00	07/09/16 10:30	<input type="checkbox"/>
1607461-02	Trip Blank	Soil		07/07/16	07/09/16 10:30	<input type="checkbox"/>

Re: **Superior Line 5 Valve Response (49161253.35)** Work Order: **1607461**

Dear Ryan,

ALS Environmental received 2 samples on 09-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

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

Sincerely,

Electronically approved by: Tom Beamish
Tom Beamish
Client Services Coordinator



Certificate No. WI: 390084510

Report of Laboratory Analysis

ADDRESS: 9382 126th Avenue, Houston, Michigan 49824-2093 | PHONE: (616) 339-4570 | FAX: (616) 339-8129
ALS (AQUA) DIV. 1 QAP Part of the ALS Laboratory Group. A Corporate/Member Company.



www.alsglobal.com

RIGHT SOLUTIONS. RIGHT PARTNER.

Sample Summary Page 1 of 1

ALS Group USA, Corp

Date: 15-Jul-16

Client: Barr Engineering Company
Project: Superior Line 5 Valve Response (49161253.35)
Work Order: 1607461

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS-D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight

ALS Group USA, Corp

Date: 15-Jul-16

Client: Barr Engineering Company
Project: Superior Line 5 Valve Response (49161253.35)
Work Order: 1607461

Case Narrative

Samples for the above noted Work Order were received on 07/09/16. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:
No deviations or anomalies were noted.

Wet Chemistry:
No deviations or anomalies were noted.

ALS Group USA, Corp

Date: 15-Jul-16

Client: Barr Engineering Company
 Project: Superior Line 5 Valve Response (49161253.35)
 Sample ID: L-5 Valve S-1
 Collection Date: 07/07/16 02:00 PM

Work Order: 1607461
 Lab ID: 1607461-01
 Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed	
VOLATILE ORGANIC COMPOUNDS								
		Method: SW8260B		Prep: SW5035 / 7/11/16		Analyst: LSY		
1,2,4-Trimethylbenzene	U		9.6	48	µg/Kg-dry	1	07/14/16 03:27	
1,3,5-Trimethylbenzene	U		21	48	µg/Kg-dry	1	07/14/16 03:27	
Benzene	U		11	48	µg/Kg-dry	1	07/14/16 03:27	
Ethylbenzene	U		11	48	µg/Kg-dry	1	07/14/16 03:27	
m,p-Xylene	U		22	96	µg/Kg-dry	1	07/14/16 03:27	
Naphthalene	U		8.2	160	µg/Kg-dry	1	07/14/16 03:27	
o-Xylene	U		16	48	µg/Kg-dry	1	07/14/16 03:27	
Toluene	U		16	48	µg/Kg-dry	1	07/14/16 03:27	
Xylenes, Total	U		37	140	µg/Kg-dry	1	07/14/16 03:27	
Surr: 1,2-Dichloroethane-d4	08.6		70-130	%REC		1	07/14/16 03:27	
Surr: 4-Bromofluorobenzene	103		70-130	%REC		1	07/14/16 03:27	
Surr: Dibromofluoromethane	88.0		70-130	%REC		1	07/14/16 03:27	
Surr: Toluene-d8	08.0		70-130	%REC		1	07/14/16 03:27	
MOISTURE								
Moisture	23		Method: SW3559C		0.025	0.050 % of sample	1	07/11/16 16:45

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 15-Jul-16

Client: Barr Engineering Company
 Project: Superior Line 5 Valve Response (49161253.35)
 Sample ID: Trip Blank
 Collection Date: 07/07/16

Work Order: 1607461
 Lab ID: 1607461-02
 Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS							
		Method: SW8260B		Prep: SW5035 / 7/11/16		Analyst: LSY	
1,2,4-Trimethylbenzene	U		6.0	30	µg/Kg	1	07/14/16 03:51
1,3,5-Trimethylbenzene	U		13	30	µg/Kg	1	07/14/16 03:51
Benzene	U		6.8	30	µg/Kg	1	07/14/16 03:51
Ethylbenzene	U		7.0	30	µg/Kg	1	07/14/16 03:51
m,p-Xylene	U		13	60	µg/Kg	1	07/14/16 03:51
Naphthalene	U		5.1	100	µg/Kg	1	07/14/16 03:51
o-Xylene	U		9.7	30	µg/Kg	1	07/14/16 03:51
Toluene	U		9.9	30	µg/Kg	1	07/14/16 03:51
Xylenes, Total	U		23	90	µg/Kg	1	07/14/16 03:51
Surr: 1,2-Dichloroethane-d4	09.4		70-130	%REC		1	07/14/16 03:51
Surr: 4-Bromofluorobenzene	105		70-130	%REC		1	07/14/16 03:51
Surr: Dibromofluoromethane	88.0		70-130	%REC		1	07/14/16 03:51
Surr: Toluene-d8	100		70-130	%REC		1	07/14/16 03:51

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 15-Jul-16

Client: Barr Engineering Company
 Work Order: 1607461
 Project: Superior Line 5 Valve Response (49161253.35)

QC BATCH REPORT

Batch ID: 88441	Instrument ID: VMS6	Method: SW8260B
MBLK		
Sample ID: MBLK-88441-88441	Units: µg/Kg-dry	Analysis Date: 07/11/16 03:35 PM
Client ID:	Run ID: VMS6_160711A	SeqNo: 3917872
		Prep Date: 07/11/16
		DF: 1
Analyte	Result	MDL PQL SPK Val
1,2,4-Trimethylbenzene	U	6 30
1,3,5-Trimethylbenzene	U	13 30
Benzene	U	6.8 30
Ethylbenzene	U	7 30
m,p-Xylene	U	13 60
Naphthalene	U	5.1 100
o-Xylene	U	9.7 30
Toluene	U	9.9 30
Xylenes, Total	U	23 90
Surr: 1,2-Dichloroethane-d4	1020	0 0 1000
Surr: 4-Bromofluorobenzene	058.6	0 0 1000
Surr: Dibromofluoromethane	083	0 0 1000
Surr: Toluene-d8	071	0 0 1000
LCS		
Sample ID: LCS-88441-88441	Units: µg/Kg-dry	Analysis Date: 07/11/16 11:40 AM
Client ID:	Run ID: VMS6_160711A	SeqNo: 3917892
		Prep Date: 07/11/16
		DF: 1
Analyte	Result	MDL PQL SPK Val
1,2,4-Trimethylbenzene	934.5	6 30 1000
1,3,5-Trimethylbenzene	952.5	13 30 1000
Benzene	1012	6.8 30 1000
Ethylbenzene	979.5	7 30 1000
m,p-Xylene	1653	13 60 2000
Naphthalene	991	5.1 100 1000
o-Xylene	948	9.7 30 1000
Toluene	996.5	9.9 30 1000
Xylenes, Total	2899	23 90 3000
Surr: 1,2-Dichloroethane-d4	1010	0 0 1000
Surr: 4-Bromofluorobenzene	053.6	0 0 1000
Surr: Dibromofluoromethane	1018	0 0 1000
Surr: Toluene-d8	078.5	0 0 1000

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Company
 Work Order: 1607461
 Project: Superior Line 5 Valve Response (49161253.35)

QC BATCH REPORT

Batch ID: 88441	Instrument ID: VMS6	Method: SW8260B
MS		
Sample ID: 1607429-02A MS	Units: µg/Kg-dry	Analysis Date: 07/13/16 10:23 AM
Client ID:	Run ID: VMS6_160712B	SeqNo: 3920564
		Prep Date: 07/11/16
		DF: 1
Analyte	Result	MDL PQL SPK Val
1,2,4-Trimethylbenzene	1404	8.3 41 1381
1,3,5-Trimethylbenzene	1421	18 41 1381
Benzene	1463	9.4 41 1381
Ethylbenzene	1410	9.7 41 1381
m,p-Xylene	2793	19 83 2762
Naphthalene	1375	7.1 140 1381
o-Xylene	1364	13 41 1381
Toluene	1404	14 41 1381
Xylenes, Total	4157	32 120 4143
Surr: 1,2-Dichloroethane-d4	1390	0 0 1381
Surr: 4-Bromofluorobenzene	1372	0 0 1381
Surr: Dibromofluoromethane	1328	0 0 1381
Surr: Toluene-d8	1308	0 0 1381
MSD		
Sample ID: 1607429-02A MSD	Units: µg/Kg-dry	Analysis Date: 07/13/16 10:48 AM
Client ID:	Run ID: VMS6_160712B	SeqNo: 3920565
		Prep Date: 07/11/16
		DF: 1
Analyte	Result	MDL PQL SPK Val
1,2,4-Trimethylbenzene	1437	8.3 41 1381
1,3,5-Trimethylbenzene	1447	18 41 1381
Benzene	1491	9.4 41 1381
Ethylbenzene	1413	9.7 41 1381
m,p-Xylene	2831	19 83 2762
Naphthalene	1403	7.1 140 1381
o-Xylene	1393	13 41 1381
Toluene	1447	14 41 1381
Xylenes, Total	4224	32 120 4143
Surr: 1,2-Dichloroethane-d4	1384	0 0 1381
Surr: 4-Bromofluorobenzene	1376	0 0 1381
Surr: Dibromofluoromethane	1370	0 0 1381
Surr: Toluene-d8	1344	0 0 1381

The following samples were analyzed in this batch: 1607461-01A 1607461-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Company
 Work Order: 1607461
 Project: Superior Line 5 Valve Response (49161253.35)

QC BATCH REPORT

Batch ID: R191312	Instrument ID: MOIST	Method: SW3550C									
MBLK	Sample ID: WBLKS-R191312	Units: % of sample	Analysis Date: 07/11/16 04:45 PM								
Client ID:	Run ID: MOIST_160711D	SeqNo: 3917869	Prep Date: DF: 1								
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.025	0.050								J
LCS	Sample ID: LCS-R191312	Units: % of sample	Analysis Date: 07/11/16 04:45 PM								
Client ID:	Run ID: MOIST_160711D	SeqNo: 3917868	Prep Date: DF: 1								
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.025	0.050	100	0	100	99.5-100.5	0			
DUP	Sample ID: 1607429-01B DUP	Units: % of sample	Analysis Date: 07/11/16 04:45 PM								
Client ID:	Run ID: MOIST_160711D	SeqNo: 3917858	Prep Date: DF: 1								
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	18.43	0.025	0.050	0	0	0		17.50	4.66	20	
DUP	Sample ID: 1607429-03B DUP	Units: % of sample	Analysis Date: 07/11/16 04:45 PM								
Client ID:	Run ID: MOIST_160711D	SeqNo: 3917859	Prep Date: DF: 1								
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	18.29	0.025	0.050	0	0	0		18.89	3.23	20	

The following samples were analyzed in this batch: 1607461-01B

1607461

Barr Engineering Co. Chain of Custody

Sample Origination State: KS MO WI Other: IA IL IN MI MN ND SD

Ames Ankeny Dubuque Jefferson City Marshalltown Mason City Ottumwa Pella Rockwell Waterloo Waverly West Des Moines

Analysis Requested: Water Soil

CDC Number: **1607461** of **1**

Company: **Barr Engineering Co.** Company: **Barr Engineering**

Address: **325 S Lake Ave SW** Address: **Barr Engineering**

Name: **Pylon Erickson** Name: **← Same**

email: **PEE@barr.com** email: **← Same**

Copy to: **datamgt@barr.com** P.O.:

Project Name: **Superior Line 5 valve** Barr Project No: **49161253.35 001.001**

Location	Start	Stop	Unit (mL, g, etc)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	ANALYSIS REQUESTED		PRESERVATIVE CODE
							Y	N	
1. L-5 valve S-1				7/7/2016	14:00	5			Preservative Code: MTBE + Hydrocarbons
2.									
3. Temp Blank									
4. Trip Blank									
5.									
6.									
7.									
8.									
9.									
10.									

LAB USE ONLY

Requested by: **Michelle Seaman** On Site: **7/7/16** Time: **15:15** Received by: **PEE** Date: **7/7/16**

Barr Proj. Manager: **REE** On Site: **7/7/16** Time: **10:30** Received by: **PEE** Date: **7/7/16**

Barr DQ Manager: **SET** Samples Shipped Via: FedEx Federal Express Sample Other: **AR Bill Number:**

Lab Name: **ALS** Lab Location: **ALS Holland, MI** Lab No: **1607461** Temperature on Receipt: **70** Contain. Seal Intact: Y N Other: **1607461**

Requested Date: **7/7/16** Standard Turn Around Time: **10** Rush: **1607461**

Distribution: White-Original; Accompanying Shipments to Laboratory; Yellow Copy; Includes in Field Documents; Pink Copy; Send to Data Management Administrator.

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Attachment D:

Waste Disposal Documentation

VONCO V, LLC.

Industrial Waste Profile Sheet

PROFILE# _____

Designated Facility: Vonco V, LLC.

Permit #536

A. Generator, Waste Site Location

Name: Enbridge Energy Superior Terminal
 Site Address: 2800 E 21st St
 City, State, Zip: Superior, WI, 54680
 Contact: Alex Smith
 Phone: 715-398-4785
 Fax: 832-352-5511
 County: Douglas

B. Billing

Name: Enbridge Pipelines Limited Partnership, LLC, Accounts Payable
 Site Address: 1100 Louisiana Ave, Ste 3300
 City, State, Zip: Houston, TX 77002
 Contact: Julie O'Brien
 Phone: 715-398-4755
 Fax: 832-352-5511

C. Description of Waste

Name of Waste: Superior Terminal Line 5 Valve Response
 Process Generating Waste: Excavation of soil with hydrocarbon contamination
 Estimated Volume: 30 Cubic Yards
 Frequency: One-time
 Physical State: solid (soil) Color: Reddish brown Free Liquids: no
 Flash Point (°F): N/A pH: Total Solids:

D. Other Comments

This profile will be used to manage soil that has evidence of hydrocarbon contamination that was excavated around a valve at the Enbridge Superior Terminal.

E. Sample Information

Check all that apply:

Laboratory Analysis submitted Material Safety Data Sheet submitted

Laboratory Name: ALS Environmental Sample Date: 07/07/2016 Sample I.D.: L-5 Valve Stockpile-1

F. Generator Certifications

- This waste is not a hazardous waste as defined in Minnesota Rules Chapter 7045 or 40 CFR 261.
- This waste does not contain regulated quantities of PCBs.
- This waste does not contain regulated quantities of herbicides or pesticides.
- This waste does not contain infectious wastes as defined in Minnesota Rules Chapter.
- All information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 Appendix 1 and was obtained by using this or an equivalent sampling method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed.

Generator's Signature: *Alex Smith* Title: Environmental Analyst

Print Name: Alex Smith Date: 7-15-2016

G. Landfill Approval

My approval is based upon the laboratory analysis of a representative sample and/or material safety data sheets submitted by the generator.

Landfill Signature: Date:

Recertification Date:



13-Jul-2016

Ryan Erickson
 Barr Engineering Company
 4300 MarketPointe Drive
 Suite 200
 Minneapolis, MN 55435

Re: Superior Line 5 Valve Response (49161253.35)

Work Order: 1607462

Dear Ryan,

ALS Environmental received 2 samples on 09-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 13.

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

Sincerely,

Tom Beamish

Tom Beamish
 Client Services Coordinator



Certificate No: WI 309084510

Report of Laboratory Analysis

ADDRESS: 3342 12th Avenue, Houston, TX 77004-0005 | PHONE: (916) 300-6994 | FAX: (916) 300-6125
 ALS LABORATORY: A QAP Part of the ALS Laboratory Group, A Computerized Enbridge Limited Company



ALS Group USA, Corp

Date: 13-Jul-16

Client: Barr Engineering Company
 Project: Superior Line 5 Valve Response (49161253.35)
 Work Order: 1607462

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1607462-01	L-5 Valve Stockpile-1	Soil		07/07/16 13:00	07/09/16 10:30	<input type="checkbox"/>
1607462-02	Trip Blank	Soil		07/07/16	07/09/16 10:30	<input type="checkbox"/>

ALS Group USA, Corp

Date: 13-Jul-16

Client: Barr Engineering Company
 Project: Superior Line 5 Valve Response (49161253.35)
 Work Order: 1607462

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
#	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected in the Reporting Limit
O	Sample amount is > 4 times amount spiked
F	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym Description

DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported Description

% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: 13-Jul-16

Client: Barr Engineering Company
Project: Superior Line 5 Valve Response (49161253.35)
Work Order: 1607462

Case Narrative

Samples for the above noted Work Order were received on 07/09/16. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:
 No deviations or anomalies were noted.

Extractable Organics:
 No deviations or anomalies were noted.

Wet Chemistry:
 No deviations or anomalies were noted.

ALS Group USA, Corp

Date: 13-Jul-16

Client: Barr Engineering Company
Project: Superior Line 5 Valve Response (49161253.35)
Sample ID: L-5 Valve Stockpile-1
Collection Date: 07/07/16 01:00 PM

Work Order: 1607462
Lab ID: 1607462-01
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID							
DRO (C10-C28)	290		2.3		mg/Kg-dry	1	07/12/16 11:28
VOLATILE ORGANIC COMPOUNDS							
Benzene	U		8.8		µg/Kg-dry	1	07/11/16 16:53
Ethylbenzene	U		8.1		µg/Kg-dry	1	07/11/16 16:53
m,p-Xylene	150		18		µg/Kg-dry	1	07/11/16 16:53
o-Xylene	62		13		µg/Kg-dry	1	07/11/16 16:53
Toluene	62		13		µg/Kg-dry	1	07/11/16 16:53
Xylenes, Total	210		30		µg/Kg-dry	1	07/11/16 16:53
Surr: 1,2-Dichloroethane-d4	99.8		70-130	%REC		1	07/11/16 16:53
Surr: 4-Bromofluorobenzene	100		70-130	%REC		1	07/11/16 16:53
Surr: Dibromofluoromethane	94.0		70-130	%REC		1	07/11/16 16:53
Surr: Toluene-d8	95.1		70-130	%REC		1	07/11/16 16:53
MOISTURE							
Moisture	13		0.025	0.050	% of sample	1	07/10/16 17:57

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 13-Jul-16

Client: Barr Engineering Company
Project: Superior Line 5 Valve Response (49161253.35)
Sample ID: Trip Blank
Collection Date: 07/07/16

Work Order: 1607462
Lab ID: 1607462-02
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS							
Benzene	U		6.8		µg/Kg	1	07/11/16 17:19
Ethylbenzene	U		7.0		µg/Kg	1	07/11/16 17:19
m,p-Xylene	U		13		µg/Kg	1	07/11/16 17:19
o-Xylene	U		9.7		µg/Kg	1	07/11/16 17:19
Toluene	U		9.9		µg/Kg	1	07/11/16 17:19
Xylenes, Total	U		23		µg/Kg	1	07/11/16 17:19
Surr: 1,2-Dichloroethane-d4	101		70-130	%REC		1	07/11/16 17:19
Surr: 4-Bromofluorobenzene	99.4		70-130	%REC		1	07/11/16 17:19
Surr: Dibromofluoromethane	94.4		70-130	%REC		1	07/11/16 17:19
Surr: Toluene-d8	95.4		70-130	%REC		1	07/11/16 17:19

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 13-Jul-16

Client: Barr Engineering Company
Work Order: 1607462
Project: Superior Line 5 Valve Response (49161253.35)

QC BATCH REPORT

Batch ID: 88409	Instrument ID: GC8	Method: PUBL-SW-141
MBLK Sample ID: DBLKS1-88409-88409 Units: mg/Kg Analysis Date: 07/12/16 10:58 AM		
Client ID:	Run ID: GC8_160712A	SeqNo: 3920275
Prep Date: 07/11/16	DF: 1	
Analyte	Result	MDL PQL SPK Val
DRO (C10-C28)	U	2 5.0
LCS Sample ID: DLCS81-88409-88409 Units: mg/Kg Analysis Date: 07/12/16 10:28 AM		
Client ID:	Run ID: GC8_160712A	SeqNo: 3920274
Prep Date: 07/11/16	DF: 1	
Analyte	Result	MDL PQL SPK Val
DRO (C10-C28)	162.9	2 5.0 200
LCSD Sample ID: DLCS81-88409-88409 Units: mg/Kg Analysis Date: 07/12/16 07:28 PM		
Client ID:	Run ID: GC8_160712A	SeqNo: 3920291
Prep Date: 07/11/16	DF: 1	
Analyte	Result	MDL PQL SPK Val
DRO (C10-C28)	169.6	2 5.0 200

The following samples were analyzed in this batch:

1607462-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Company
 Work Order: 1607462
 Project: Superior Line 5 Valve Response (49161253.35)

QC BATCH REPORT

Batch ID: 88418 Instrument ID: VMS6 Method: SW8260B

MBLK Sample ID: MBLK-88418-88418 Units: µg/Kg-dry Analysis Date: 07/13/16 03:17 PM

Client ID: Run ID: VMS6_160713A SeqNo: 3921527 Prep Date: 07/11/16 DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	6.8	30								
Ethylbenzene	U	7	30								
m,p-Xylene	U	13	60								
o-Xylene	U	9.7	30								
Toluene	U	9.9	30								
Xylenes, Total	U	23	60								
Surr: 1,2-Dichloroethane-d4	1039	0	0	1000	0	104	70-130	0			
Surr: 4-Bromofluorobenzene	949	0	0	1000	0	94.9	70-130	0			
Surr: Dibromofluoromethane	977.6	0	0	1000	0	97.8	70-130	0			
Surr: Toluene-d8	981.6	0	0	1000	0	98.2	70-130	0			

LCS Sample ID: LCS-88418-88418 Units: µg/Kg-dry Analysis Date: 07/13/16 01:59 PM

Client ID: Run ID: VMS6_160713A SeqNo: 3921528 Prep Date: 07/11/16 DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1068	6.8	30	1000	0	107	75-125	0			
Ethylbenzene	1079	7	30	1000	0	108	75-125	0			
m,p-Xylene	2150	13	60	2000	0	108	80-125	0			
o-Xylene	1038	9.7	30	1000	0	104	75-125	0			
Toluene	1086	9.9	30	1000	0	109	70-125	0			
Xylenes, Total	3188	23	60	3000	0	106	75-125	0			
Surr: 1,2-Dichloroethane-d4	900	0	0	1000	0	99	70-130	0			
Surr: 4-Bromofluorobenzene	1005	0	0	1000	0	100	70-130	0			
Surr: Dibromofluoromethane	993	0	0	1000	0	99.3	70-130	0			
Surr: Toluene-d8	982.6	0	0	1000	0	98.2	70-130	0			

MS Sample ID: 1607319-03B MS Units: µg/Kg-dry Analysis Date: 07/13/16 01:04 AM

Client ID: Run ID: VMS5_160712A SeqNo: 3919981 Prep Date: 07/11/16 DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1328	7.7	34	1141	0	116	75-125	0			
Ethylbenzene	1202	8	34	1141	0	111	75-125	0			
m,p-Xylene	2507	15	68	2283	0	112	80-125	0			
o-Xylene	1229	11	34	1141	0	108	75-125	0			
Toluene	1236	11	34	1141	0	108	70-125	0			
Xylenes, Total	3797	26	100	3424	0	111	75-125	0			
Surr: 1,2-Dichloroethane-d4	1161	0	0	1141	0	102	70-130	0			
Surr: 4-Bromofluorobenzene	1169	0	0	1141	0	102	70-130	0			
Surr: Dibromofluoromethane	1165	0	0	1141	0	101	70-130	0			
Surr: Toluene-d8	1089	0	0	1141	0	95.2	70-130	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Company
 Work Order: 1607462
 Project: Superior Line 5 Valve Response (49161253.35)

QC BATCH REPORT

Batch ID: 88418 Instrument ID: VMS6 Method: SW8260B

MS Sample ID: 1607319-09B MS Units: µg/Kg-dry Analysis Date: 07/13/16 12:42 PM

Client ID: Run ID: VMS5_160712B SeqNo: 3921286 Prep Date: 07/11/16 DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1360	8.2	36	1210	0	112	75-125	0			
Ethylbenzene	1251	8.5	36	1210	0	103	75-125	0			
m,p-Xylene	2534	16	73	2420	0	105	80-125	0			
o-Xylene	1211	12	36	1210	0	100	75-125	0			
Toluene	1220	12	36	1210	0	101	70-125	0			
Xylenes, Total	3745	28	110	3630	0	103	75-125	0			
Surr: 1,2-Dichloroethane-d4	1220	0	0	1210	0	101	70-130	0			
Surr: 4-Bromofluorobenzene	1207	0	0	1210	0	99.8	70-130	0			
Surr: Dibromofluoromethane	1249	0	0	1210	0	103	70-130	0			
Surr: Toluene-d8	1113	0	0	1210	0	92	70-130	0			

MSD Sample ID: 1607319-03B MSD Units: µg/Kg-dry Analysis Date: 07/13/16 01:29 AM

Client ID: Run ID: VMS5_160712A SeqNo: 3919982 Prep Date: 07/11/16 DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1332	7.7	34	1141	0	117	75-125	1328	0.343	30	
Ethylbenzene	1256	8	34	1141	0	110	75-125	1262	0.453	30	
m,p-Xylene	2571	15	68	2283	0	113	80-125	2567	0.155	30	
o-Xylene	1221	11	34	1141	0	107	75-125	1229	0.652	30	
Toluene	1226	11	34	1141	0	107	70-125	1236	0.788	30	
Xylenes, Total	3793	26	100	3424	0	111	75-125	3797	0.105	30	
Surr: 1,2-Dichloroethane-d4	1128	0	0	1141	0	98.8	70-130	1161	2.69	30	
Surr: 4-Bromofluorobenzene	1160	0	0	1141	0	101	70-130	1169	1.02	30	
Surr: Dibromofluoromethane	1181	0	0	1141	0	103	70-130	1185	0.338	30	
Surr: Toluene-d8	1003	0	0	1141	0	83.1	70-130	1086	2.18	30	

MSD Sample ID: 1607319-09B MSD Units: µg/Kg-dry Analysis Date: 07/13/16 01:08 PM

Client ID: Run ID: VMS5_160712B SeqNo: 3921287 Prep Date: 07/11/16 DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1434	8.2	36	1210	0	118	75-125	1360	5.28	30	
Ethylbenzene	1367	8.5	36	1210	0	113	75-125	1251	8.83	30	
m,p-Xylene	2770	16	73	2420	0	114	80-125	2534	8.87	30	
o-Xylene	1330	12	36	1210	0	110	75-125	1211	9.33	30	
Toluene	1317	12	36	1210	0	109	70-125	1220	7.68	30	
Xylenes, Total	4099	28	110	3630	0	113	75-125	3745	9.05	30	
Surr: 1,2-Dichloroethane-d4	1201	0	0	1210	0	99.3	70-130	1220	1.62	30	
Surr: 4-Bromofluorobenzene	1226	0	0	1210	0	101	70-130	1207	1.49	30	
Surr: Dibromofluoromethane	1242	0	0	1210	0	103	70-130	1249	0.663	30	
Surr: Toluene-d8	1126	0	0	1210	0	93	70-130	1113	1.14	30	

The following samples were analyzed in this batch: 1607462-01A 1607462-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Company
 Work Order: 1607462
 Project: Superior Line 5 Valve Response (49161253.35)

QC BATCH REPORT

Batch ID: R191232 Instrument ID: MOIST Method: SW3550C

MBLK Sample ID: WBLK-R191232 Units: % of sample Analysis Date: 07/10/16 05:57 PM

Client ID: Run ID: MOIST_160710A SeqNo: 3915421 Prep Date: DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.025	0.050								

LCS Sample ID: LCS-R191232 Units: % of sample Analysis Date: 07/10/16 05:57 PM

Client ID: Run ID: MOIST_160710A SeqNo: 3915420 Prep Date: DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.025	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: 1607319-04A DUP Units: % of sample Analysis Date: 07/10/16 05:57 PM

Client ID: Run ID: MOIST_160710A SeqNo: 3915403 Prep Date: DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	30.16	0.025	0.050	0	0	0	29.07	0.632	20		

DUP Sample ID: 1607319-03A DUP Units: % of sample Analysis Date: 07/10/16 05:57 PM

Client ID: Run ID: MOIST_160710A SeqNo: 3915409 Prep Date: DF: 1

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	6.57	0.025	0.050	0	0	0	6.57	0	20		

The following samples were analyzed in this batch: 1607462-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Barr Engineering Co. Chain of Custody

Sample Originator: [] KS [] MO [] WI [] IL [] IN [] OH [] VA [] NC [] SC [] TN [] KY [] WV [] PA [] NY [] NJ [] DE [] MD [] DC [] VA [] NC [] SC [] TN [] KY [] WV [] PA [] NY [] NJ [] DE [] MD [] DC

Analysis Requested: [] Water [] Soil

Company: Barr Engineering Co. Address: 205 S Lake Ave, Suite 700
 Name: Ryan Erickson
 Email: REE@barr.com
 Project Name: Superior Line 5 Valve Response

Collection Date: 7/7/16 13:00
 Collection Time: 13:00
 Matrix Code: S-6

Field Number: 2111

Field Filtered: Y/N

Preservative Code: BTEX, DRD

Requested Due Date: 07/15/16

Lab Name: ALE Lab Location: Holland, MI

Sample Receipt Checklist

Client Name: **BARRENG-MN** Date/Time Received: **09-Jul-16 10:30**
 Work Order: **1607482** Received by: **KRW**

Checklist completed by *Linda Moringa* 09-Jul-16 Reviewed by: *Tom Diamond* 11-Jul-16
eSignature Date eSignature Date

Matrices: **Soil**
 Carrier name: **FedEx**

Shipping container/cooler in good condition? Yes No Not Present
 Custody seals intact on shipping container/cooler? Yes No Not Present
 Custody seals intact on sample bottles? Yes No Not Present
 Chain of custody present? Yes No
 Chain of custody signed when relinquished and received? Yes No
 Chain of custody agrees with sample labels? Yes No
 Samples in proper container/bottle? Yes No
 Sample containers intact? Yes No
 Sufficient sample volume for indicated test? Yes No
 All samples received within holding time? Yes No
 Container/Temp Blank temperature in compliance? Yes No
 Sample(s) received on ice? Yes No
 Cooler(s)/KCR(s): **5.4/5.4 C** **SR2**
 Date/Time sample(s) sent to storage: **7/9/2016 11:22:31 AM**
 Water - VOA vials have zero headspace? Yes No No VOA vials submitted
 Water - pH acceptable upon receipt? Yes No N/A
 pH adjusted? Yes No N/A
 pH adjusted by:

Login Notes:

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____
 Contacted By: _____ Regarding: _____

Comments:

Corrective Action:

SHIP DATE: 07/11/16
 TO: TOM BEAMISH
 ALS ENVIRONMENTAL
 3352 128TH AVE
 HOLLAND MI 49424



FRU - 09 JUL 10:30A
 PRIORITY OVERNIGHT
 7766 8515 6256
 48424
 GRR



After printing this label, the only step to print your label is to print your barcode on a label printer.
 1. Place the label on a flat surface.
 2. Feed the printed paper into the printer.
 3. Press the print button on your printer to print the barcode portion of this label. Do not touch the barcode.
 4. After printing, the label will be printed on a separate sheet of paper. The barcode portion of this label is not printed on the separate sheet.
 5. The barcode portion of this label is not printed on the separate sheet.
 6. The barcode portion of this label is not printed on the separate sheet.
 7. The barcode portion of this label is not printed on the separate sheet.
 8. The barcode portion of this label is not printed on the separate sheet.
 9. The barcode portion of this label is not printed on the separate sheet.
 10. The barcode portion of this label is not printed on the separate sheet.



Vonco V Waste Management Campus
 100 West Gary Street
 Duluth, MN 55808
 Permit: SW 536

16-079-I SUP Terminal 5 Valve Response

Date	Ticket	Customer	Truck	Material	Tons
07/20/2016	276922	001342 - Enbridge Pipelines LLC	S36747W	Contaminated Soil Tons	16.56
07/20/2016	276940	001342 - Enbridge Pipelines LLC	S36747W	Contaminated Soil Tons	12.05
				Total Tons	28.61
				Total Loads	2