

## Technical Memorandum

**To:** Karl Beaster, Enbridge Energy  
**From:** Ryan Erickson  
**Subject:** Superior Terminal Line 6 Valve (6-UDV-1) Release Response  
**Date:** January 21, 2014  
**Incident Alert #:** 4686  
**Barr Project:** 49161253.02

This memorandum summarizes the field screening, analytical sampling and waste management assistance conducted by Barr Engineering (Barr) at the request of Enbridge Energy (Enbridge) in response to a crude oil release from the Line 6 6-UDV-1 valve (Line 6 valve) which is proximate to the Pump House 6 building within the Enbridge Superior Terminal in Superior, Wisconsin (Figure 1) in October and November of 2013.

### Background and Response Activities

On October 23, 2013, Enbridge personnel observed crude oil on the ground surface near the Line 6, 6-UDV-1 valve located on the west side of the Pump House 6 building (Photo 1; Figure 2). Upon identification, Enbridge personnel immediately responded to the crude oil discovery. Response efforts included: using a vacuum truck and oil absorbent pads to remove free-product and prevent product migration; using a hydro-vacuum (hydrovac) truck to excavate soil around the valve (Photos 1 and 2); and identifying and repairing the source of the release. The observed free-product was contained and valve maintenance and repair excavation activities took place over the next couple weeks (Photos 3 and 4). The soil impacts were originally thought to be historical and related to a July 2000 release in the area. On November 6, 2013, Enbridge determined that the crude oil release was the result of a faulty valve flange. The leak was small and intermittent, and Enbridge estimated the total release volume to be approximately ten gallons based on their field observations.

The discovery of crude oil on the ground surface was reported to Enbridge Environment on October 23, 2013. Enbridge notified the Wisconsin Department of Natural Resources (WDNR) and Incident Alert # 4686 was issued for the release (Attachment A).

Upon the discovery of the release, Enbridge also requested that Barr complete the following activities:

- assess the environmental site conditions
- segregate excavated crude oil impacted soil from unimpacted soil
- identify crude oil impacted water, if present
- assist with the off-site disposal coordination and documentation of contaminated soil and water
- document the residual crude-oil impacts left in place, if applicable

Between October 24 and November 12, 2013, Barr was onsite as needed to carry out the above tasks.

Barr reviewed the the WDNR Bureau for Remediation and Redevelopment Tracking System (BRRTS) online database to identify whether any historical releases had been reported in this location. BRRTS# 0216279246 was identified approximately 50 feet away to the southeast of the current excavation and is associated with a July 2000 release of 1,200 barrels of crude oil (Figure 2).

### Field Methods

Barr was at the Line 6 valve release site as needed during the excavation of contaminated soil and water. Barr field screened excavated soil for the presence of organic vapors using a photoionization detector (PID) and documented other potential indicators of crude oil impacts such as odor, discoloration and sheen (Attachment B). Excavated soil with evidence of crude oil impacts was segregated and transported to the Superior Terminal Soil Management Area (SMA) for storage until it could be characterized and approved for off-site disposal (Photo 5). If a petroleum sheen or free-product were observed on water within the excavation (Photo 6), the water was considered contaminated and was containerized in a tanker trailer until it could be characterized and approved for off-site disposal.

Enbridge contractors excavated soil around the valve to the extent necessary to safely repair the valve. Crude oil impacted soil was generally not removed beyond valve repair excavation limits due to the the presence of above and below ground terminal infrastructure. After repair activities were completed, Barr collected field screening soil samples from the excavation extents to identify whether residual soil impacts were present. Residual soil impacts were considered present if a headspace greater than ten ppm was identified. Where residual soil impacts were identified, and could not be excavated, an analytical soil sample (“2013-Pump House 6-S-1”) was collected to document residual soil impacts. The sample was submitted to Legend Technical Services for laboratory analyses of petroleum volatile organic compounds (PVOCs), minus methyl tert-butyl ether (MTBE) and plus naphthalene. Analytical results were input into

the WDNR Web Calculator to compare analyte detections to groundwater residual contaminant levels (RCL) and industrial direct contact RCL and determine whether the soil passes the Cumulative Hazard Index criteria described in WDNR guidance document PUB-RR-890 (Table 1). The soil sample location is shown on Figure 2 and field screening data is provided in Attachment B. Analytical results are summarized in Table 1 and the laboratory report is provided in Attachment C.

Groundwater accumulated within the Line 6 valve repair excavation (Photo 6). Crude oil and sheen were observed over a significant portion of the water surface during early excavation activities. The product was removed from the water surface by Enbridge personnel with oil absorbent pads. Only trace amounts of sheen were observed on the water surface at the completion of the valve repair activities. The excavation was also dewatered multiple times by Enbridge personnel to enable valve repair activities. The water removed from the excavation was sampled (“Pump House 6-Water-1”), characterized and sent to an approved treatment facility as described in the Waste Disposal Coordination and Documentation section of this memo.

## Results

Crude oil impacted soil and water was encountered within the Line 6 valve repair excavation (Photos 2, 3, 4 and 6). The final repair excavation was approximately 20-feet long by 18-feet across by 8-feet deep (Figure 2; Attachment B). Excavated material consisted of gravel fill, sand fill and clay fill. Crude oil impacted soil within the excavation appeared to be focused around the valve infrastructure. Residual crude oil impacted soil in the final excavation extents appeared to be limited to the southeastern excavation sidewall based on visual observations and field screening results collected on November 11, 2012 (Photo 4). Impacted soil in this location had a petroleum odor and elevated headspace detections: 27.7 parts per million (ppm) from the sidewall and 60 ppm from near a valve conduit. Approximately 200 cubic yards of impacted soil was excavated, as feasible based on infrastructure, and stockpiled in in the terminal SMA (Photo 5).

Analytical sample “2013 Pump House 6-S-1” was collected from the southeast excavation sidewall for laboratory analysis of PVOCs (minus MTBE and plus naphthalene) to document residual soil impacts (Figure 2). Pump House 6-S-1 benzene and naphthalene analyte concentrations were above the groundwater RCL; however, all analyte concentrations were below the direct contact pathway RCL and passed the Cumulative Hazard Index criteria (Table 1).

## Discussion

Analyte concentrations detected within the excavation sidewall soil sample (2013 Pump House 6-S-1) were above the groundwater RCL for benzene (0.025 mg/kg) and naphthalene (0.42 mg/kg) and below the industrial direct contact RCL and passed the Cumulative Hazard Index criteria (Table 1).

Additional excavation of the crude oil impacted soil that was encountered at the base of the Line 6 valve excavation was not possible due to the presence of terminal infrastructure. Following the completion of the valve repair, the excavation was backfilled with clean fill and no residual crude oil impacted soil is exposed at the ground surface.

Only trace amounts of crude oil and sheen were observed on the excavation water surface prior to the backfilling of the excavation.

## Waste Disposal Coordination and Documentation

Barr collected an analytical waste characterization sample from the excavated crude oil impacted soil stockpile (Pump #6-Stockpile-1) for laboratory analysis at Legend Technical Services (Attachment D). The sample was analyzed for diesel range organics (DRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX). A waste profile application with the laboratory results was submitted to the Shamrock Landfill near Cloquet, Minnesota and the soil was accepted under waste profile #CL13-0056. A total of 257.96 tons of crude oil impacted soil was hauled to the landfill in November of 2013. The Shamrock Landfill profile and acceptance documents, the waste characterization laboratory report and the landfill summary report are included in Attachment D.

Barr collected a crude oil impacted water analytical sample (Pump House 6-Water-1) from excavation water containerized in a tanker truck. The sample was submitted to Legend Technical Services for laboratory analysis of DRO and BTEX (Attachment D). The laboratory report was submitted to the Western Lake Superior Sanitary District (WLSSD) water treatment facility in Duluth, Minnesota and the water was accepted for disposal on November 8, 2013 (Attachment D). Enbridge facilitated the transportation and disposal of the Line 6 excavation water at the WLSSD facility.

## Conclusions and Recommendations

Soil and water were impacted as a result of the Line 6 valve release. The impacted soil was excavated to the extent possible; however, crude oil impacted soil was left in place due to the presence of terminal infrastructure. Analyte concentrations in the identified residual crude oil impacted soil did not exceed industrial direct contact RCLs, passed the Cumulative Hazard Index Criteria and have been covered with clean fill material. The fill material and employee-awareness will prevent direct contact exposure.

The groundwater pathway for the Superior Terminal is currently being reviewed by the WDNR on a case by case site-wide basis. If the WDNR agrees that the risk to the groundwater pathway associated with this historical release can be addressed using the site-wide approach, no further response action for groundwater or documentation for the WDNR will be required. Assuming a site-wide GIS registry is established for the terminal, the figures and tables attached to this memo can be used to update the registry.

## Attachments:

Photos	1 through 6
Figure 1	Site Location
Figure 2	Site Layout Map
Table 1	Soil Analytical Data Summary
Attachment A	WDNR Incident Alert
Attachment B	Enbridge Site Investigation Field Sampling and Screening Log
Attachment C	Legend Technical Services Laboratory Report for Excavation Soil Sample
Attachment D	Waste Disposal Documentation

**Photos:**



**Photo 1**



**Photo 2**

**Photo 1:** Line 6 6-UDV-1 valve near the western corner of Pump House 6. The initial release response excavation is visible at the base of the valve.

**Photo 2:** Crude oil impacted soil and water within the Line 6 initial release response excavation.



**Photo 3**



**Photo 4**

**Photo 3:** Line 6 valve hydrovac excavation. Discolored crude oil impacted soil is visible beneath the valve.

**Photo 4:** The final extent of the southeastern edge of the Line 6 valve excavation. Crude oil impacted soil with elevated headspace detections was identified and analytical sample "2013 Pump House 6-S-1" was collected in this location.



Photo 5



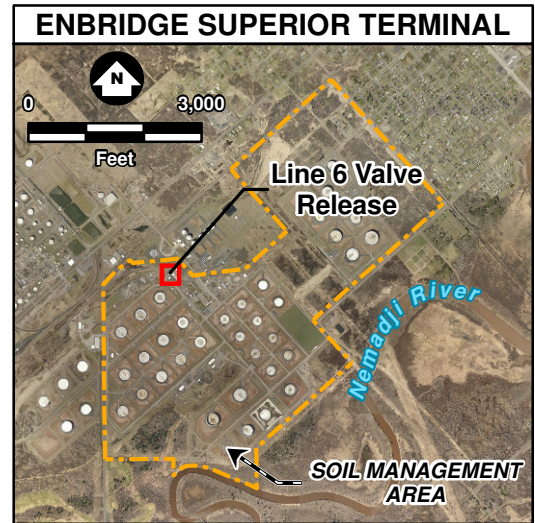
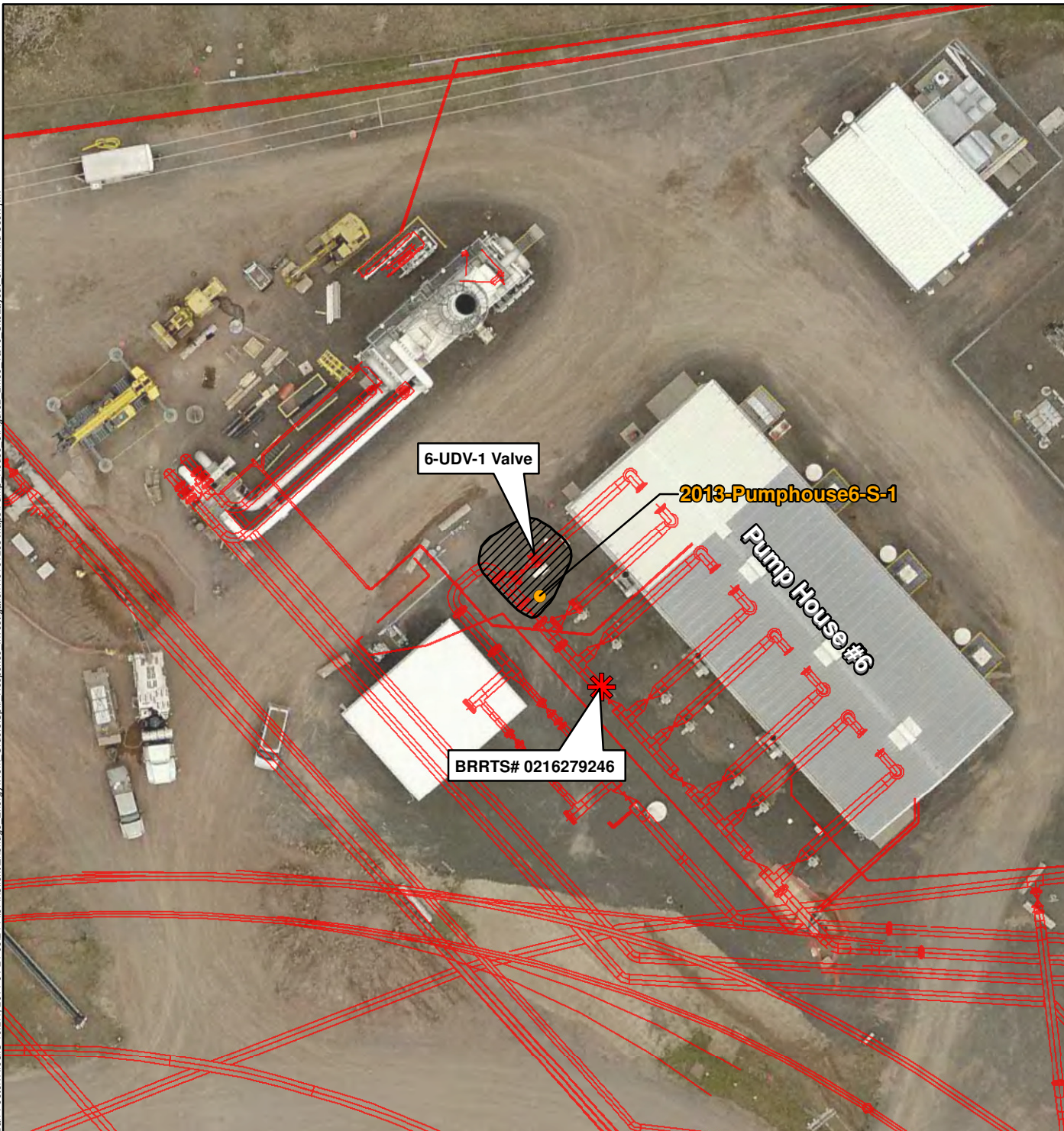
Photo 6

**Photo 5:** Contaminated soil stockpile stored in the soil management area building.

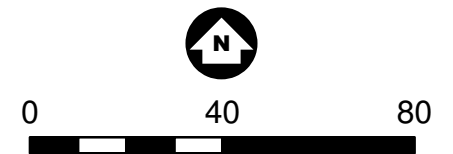
**Photo 6:** Water within the Line 6 valve excavation with a petroleum sheen and trace product on the surface.







- Sample Location
- ✱ Historical Release Location
- ▨ Excavation Extent
- Pipeline Infrastructure
- - - Terminal Property Boundary



Feet  
1 Inch = 40 Feet  
Douglas County Imagery Circa May, 2013

Figure 2

**SITE LAYOUT MAP**  
**LINE 6 VALVE RELEASE**  
**SUPERIOR TERMINAL**  
Enbridge Energy, L.P.  
Superior, Wisconsin



**Table 1**  
**Soil Analytical Data Summary**  
**Line 6 Valve Release**  
**Enbridge Energy Terminal - Superior, Wisconsin**  
**Units, mg/kg (unless otherwise noted)**

Parameter			Solids, percent	1,2,4-Trimethyl benzene	1,3,5-Trimethyl benzene	Benzene	Ethyl benzene	Naphthalene	Toluene	Xylene, total	WDNR RCL Determinations*			
											Exceedance Count	Hazard Index	Cumulative Cancer Risk	Pass or Fail
	<b>Effective Date</b>	<b>Exceedance Key</b>												
<b>Groundwater RCL</b>		<b>Bold</b>		1.3793 TR	1.3793 TR	<b>0.0051</b>	0.785	<b>0.3294</b>	0.5536	1.97 XYL				
<b>Industrial Direct Contact RCL</b>	05/01/2012	No Exceed		219	182	7.41	37	26	818	258	0	1.0	0.00001	Pass
<b>Location</b>	<b>Date</b>	<b>Depth</b>												
Pump House 6-S-1	11/12/2013	3.5 ft	82 %	< 0.0043	< 0.0048	<b>0.025 j</b>	0.027 jb	<b>0.42 j</b>	0.0082 j	0.019 j	0	0.0005	2.0E-08	Pass

\* WDNR RCL Determinations based on guidance criteria described in WDNR document PUB-RR-890. Hazard index is based a cumulative direct contact standard.

XYL - Based on Xylenes (m-, o-, p- combined).

TR - Based on Trimethylbenzenes (1,2,4 - and 1,3,5- combined).

j - Reported value is less than the stated laboratory quantitation limit and is considered an estimated value.

b - Potential false positive value based on blank data validation procedures.

**Attachment A**  
**WDNR Incident Alert**

## Emily Jurgens

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**From:** Karl Beaster <Karl.Beaster@enbridge.com>  
**Sent:** Monday, November 18, 2013 11:30 AM  
**To:** Ryan E. Erickson  
**Subject:** FW: INCIDENT ALERT - [4686] - Pump house 6

FYI.

And can you provide a map of the site location that I can submit to John Sager. Include the GMP coords. Thanks.

### Karl F. Beaster, PG

Environmental Analyst II, LP Environment

#### ENBRIDGE

TEL: 715-398-4754 | CELL: 715-718-1040

1320 Grand Ave, Superior, WI 54880

[www.enbridgeUS.com](http://www.enbridgeUS.com)

Integrity. Safety. Respect.

**From:** Theresa Picton

**Sent:** Wednesday, November 13, 2013 8:42 AM

**To:** Vern Yu; Vernon Ryan; Vik Kohli; Walt Tyrrell; Waren Orr; Wayne Boyko; Wayne Limming; Amy Baxter; Ashley Forrest; Dominic Rozario; Selina Lim; Abby Dorval; Steven Diep; Cindy O'Kelley; Ryan Stahler; Ben Bouska; Jeremy Herd; Neil Cooney; Rose McEaney; Kyle Oraskovich; Hailey McBurney; Kristen Higgins; Glen Whelan; Paula Howard; Chris Mampre; David Weir; Marcella Harder; Allan Cheung; Douglas Rosenberg; Lily Li; Kori Patrick; Bill Timbers; Caroline Seguin; Dan Ferguson; Jerico Perez; Kristyn Springall; Refaul Ferdous; Sandra Hernandez; Charmain Calancia; Marc Orchard; Jessica Farrell; retben.jay.johnson@enbridge.com; Theresa Picton; IT Web Support; Bradley Salo; Steven Dahnke; Kelly Kowalczak; Stacy Soine; Cynthia Clark; Shaun Kavajecz; kaci.lundgren@enbridge.com; Michael Pudleiner; Paula Brostowitz; Emily Moe; Ashley Evans; Nick Compton; Brian Mills; Jim Ramnes; Kim Campbell; Donna Tribe; Craig Sluser; Gee Hagan; Shireen Chaudhary; Jessica Manansala; Ronnie Maglalang; Tamara Wild; Steve Murray; Lindsay Reynolds; Bonnie Andriachuk; Matthew Thompson; Vince Macintyre; Scott Ironside; Don Engen; Chris Martens; Damir Grmek; Monique Berg; Shadie Radmard; Randall Kemp; Adam Pecush; Ingrid Pederson; Mark McTavish; Amy Higgins; Fred De Boer; Anna Warawa; Doug Lawrence; Saheed Akonko; Steven Bott; Shaun Dawe; Larry Heise; Sean Keane; Len LeBlanc; Jackie Lewyk; Jason Pavone; Trevor Place; Garry Sommer; Martha Vega-Smith; Tom Zimmerman; Iouri Ponomarev; Jenny Mi; Luis Torres; Adam Maki; Prema Meiappan; Ryan Dale; Aaron Sutton; Barbara Broderick; Cheng Xing; Collin Taylor; Geoff Vignal; Jen Maynard; Brian Scott; Junfang Lu; Oscar Khazam; Peter Song; Tom Richardson; Tommy Harn; Yvan Hubert; Laura Kennett; Millan Sen; Len Krissa; Ryan Sporns; Gordon Fredine; Cecilia Barrios; Arlene Willick; Juan Mejia; Stephen Wood; Rain Zhu; Wanmin Song; Paola Scholte Mendoza; Francisco Aranguren; Gurwinder Nagra; Johana Gomez; Brian Ellestad; Wade Keller; Duane Evans; Kirk Strachan; Lorna Harron; Rob MacKenzie; Mark Maxwell; Doug Cook; Bersi Alvarado; Olakunle Taiwo; Cristin Mieila; Mohamed Chebaro; Greg Sasaki; Jennifer Morse; Peter Dobson; Suzanne Ward; Phil Perron; Laura Seto; Randy Penney; Wei Liu; Jaqueline Pina; Bill Boorse; Michael Huot; Emils Muehlenbachs; Sandra Gaudet; Andrew Nielsen; Jun Zhang; Karmun Cheng; Kimberly Pierce; Amanda Kulhawy; Ana Kapach; Andrea Daniel; Art Meyer; Casey Lavigne; Catherine Rieck; Chijioke Ukiwe; Darrell Fluet; James Martin; Jeff Liang; Jeremy Ward; Jesus Amundarain; Jonny Tran; Justin Han; Kaitlyn Korol; Laz Itama; Marc Rouleau; Mariangel Rivolta; Mary Banack; Mustafa Al-Nuaimi; Richard Himschoot; Rupal Jajal; Scott Bachand; Simona Voicila; Syed Haider; Yanping Li; Sal Paonessa; Lawrence Jordan; Annie Yu; Seema Taylor; Lisa Anderson; Wilma Pelech; Kevin Underhill; Scott Brummet; Rachael Shetka; Paul Meneghini; Scott Lounsbury; Jeannette Gasser; Joseph Peterson; Joe McGaver; Les Miskolzie; Sara Ploetz; Eric Williams; Jennifer Russell; Shane Yokom; Harold Stark; Jason Arsenault; Karl Beaster; Greg Milne; Neil Reid; Ken Kozyra; Julie O'Brien; Femke Pennings; James Snider; Alina Heydt; Cheryl Urie; Amanda Mitchell; Richard Oleschuk; Paul Turner; Tony Shoberg; Bryan Sederberg; Rhonda O'Leary; Niki Harriman; Amanda MacKay; Kari Hamilton; Daniel Cameron; John Bohrmann; Robert Doherty; David Bareham; Tricia Asbell; James Anklam; Stacy Frerich; Gary St Onge; Heather MacLeod; Michael Eigner; Adam Vehe; Alex Smith; Andrew Orthober; Ashleigh Whitton; Bobby Hahn; Carl Carlson; Curtis Wakulchyk; Dale Gross; Dan Born; Doug Bowes; Erin Sanford; Huajun Lu; Keely Pearson; Kelli

**Enbridge Energy, Limited Partnership**

**Release Information:**

**A. Location**

Superior  
Wisconsin  
USA

**B. Time of Incident**

11/6/2013 12:00 CDT

**C. Leak Details**

Line: 6  
Station: PE  
Mile Post: N/A  
Gathering System: N/A  
Lateral: N/A  
Lateral Description: N/A  
Volume: 0.24 BBLs (0.04 m3)  
Commodity Type: Crude Oil  
Crude Type: N/A

**D. Description of Incident**

On October 23 the Superior PLM noticed what appeared to be oil on the ground near the Line 6 Unit 4 discharge valve at the Superior Terminal. After further investigation and excavation of the area that day, the amount of oil estimated to be within the soil was thought to be less than 10 gallons. At that point, it appeared to be contaminated soil from a historic leak that occurred in July 2000 when a significant volume of crude oil was released in that same area. Cleanup of the soil commenced and the area continued to be monitored. On 11/6/2013 an active leak was confirmed by PLM personnel to be coming from the flange off the L6 Unit 4 discharge valve. The leak was very intermittent and would come and go with a small drop. The volume still within the original estimate of less than 10 gallons. The State of WI was notified on Oct 23 per the external notification requirements. The PLM replaced the bolts and re-tourqued the flange on Nov 11 in conjunction with a previously scheduled shutdown of Line 6. The valve will remain in LOTO and monitored. Further investigation as to the cause of the leak is underway.

**E. Impacts**

Unintentional explosion or fire: None  
Death or Injuries: No  
Estimated costs exceed \$50,000: No  
Water Body (river/stream/wetland/reservoir): None  
Contaminated Soil: Yes  
Wildlife: None

Vegetation: None

**F. Links**

To open the Leak Record, please click on the link below:

<http://lrs.enbridge.com/LRS/LeakDashboard.aspx?LeakID=4686>

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**Attachment B**

**Enbridge Site Investigation Field Sampling and Screening Log**





## **Attachment C**

### **Legend Technical Services Laboratory Report for the Excavation Soil Sample**



88 Empire Drive  
St Paul, MN 55103  
Tel: 651-642-1150  
Fax: 651-642-1239

November 21, 2013

Ms. Andrea Nord  
Barr Engineering Co.  
4700 W 77th St  
Minneapolis, MN 55435

Work Order Number: 1305659  
RE: 49161092

Enclosed are the results of analyses for samples received by the laboratory on 11/13/13. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

WI Accreditation #998022410

Prepared by,  
LEGEND TECHNICAL SERVICES, INC

A handwritten signature in black ink, appearing to read "Bach Pham".

\_\_\_\_\_  
Bach Pham  
Client Manager II  
bpham@legend-group.com

A handwritten signature in blue ink, appearing to read "Samantha Jaworski".

\_\_\_\_\_  
Samantha Jaworski  
Manager, Organics  
sjaworski@legend-group.com

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: [none] Project Manager: Ms. Andrea Nord	Work Order #: 1305659 Date Reported: 11/21/13
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**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2013-Pump House 6-S-1_3.5-3.5	1305659-01	Soil	11/12/13 11:55	11/13/13 09:40

**Shipping Container Information**

**Default Cooler**                      Temperature (°C): 1.2

Received on ice: Yes                      Temperature blank was present                      Received on ice pack: No  
 Received on melt water: No                      Ambient: No                      Acceptable (IH/ISO only): No  
 Custody seals: No

**Case Narrative:**

The dry weight correction and dilution applies to the sample result, MDL, and RL.

Ethylbenzene was present in the method blank between the MDL and RL for the BTEX analysis.

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: [none] Project Manager: Ms. Andrea Nord	Work Order #: 1305659 Date Reported: 11/21/13
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**WI(95) GRO/8015D**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>2013-Pump House 6-S-1_3.5-3.5 (1305659-01) Soil</b> <b>Sampled: 11/12/13 11:55</b> <b>Received: 11/13/13 9:40</b>										
1,2,4-Trimethylbenzene	<0.0043	0.030	0.0043	mg/kg dry	1	B3K1308	11/13/13	11/13/13	WI(95) GRO	
1,3,5-Trimethylbenzene	<0.0048	0.030	0.0048	mg/kg dry	1	"	"	"	"	
<b>Benzene</b>	<b>0.025</b>	0.030	0.0038	mg/kg dry	1	"	"	"	"	J
<b>Ethylbenzene</b>	<b>0.027</b>	0.030	0.0026	mg/kg dry	1	"	"	"	"	B-01, J
<b>Naphthalene</b>	<b>0.42</b>	0.61	0.018	mg/kg dry	1	"	"	"	"	J
<b>Toluene</b>	<b>0.0082</b>	0.030	0.0033	mg/kg dry	1	"	"	"	"	J
<b>Xylenes (total)</b>	<b>0.019</b>	0.091	0.0098	mg/kg dry	1	"	"	"	"	J
<i>Surrogate: 4-Fluorochlorobenzene</i>	<i>91.3</i>			<i>80-150 %</i>		"	"	"	"	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: [none] Project Manager: Ms. Andrea Nord	Work Order #: 1305659 Date Reported: 11/21/13
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**PERCENT SOLIDS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>2013-Pump House 6-S-1_3.5-3.5 (1305659-01) Soil</b> <b>Sampled: 11/12/13 11:55</b> <b>Received: 11/13/13 9:40</b>										
<b>% Solids</b>	<b>82</b>			<b>%</b>	<b>1</b>	<b>B3K1913</b>	<b>11/19/13</b>	<b>11/19/13</b>	<b>% calculation</b>	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: [none] Project Manager: Ms. Andrea Nord	Work Order #: 1305659 Date Reported: 11/21/13
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**WI(95) GRO/8015D - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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**Batch B3K1308 - EPA 5035 Soil (Purge and Trap)**

**Blank (B3K1308-BLK1)**

Prepared & Analyzed: 11/13/13

1,2,4-Trimethylbenzene	< 0.0035	0.025	0.0035	mg/kg wet							
1,3,5-Trimethylbenzene	< 0.0039	0.025	0.0039	mg/kg wet							
Benzene	< 0.0031	0.025	0.0031	mg/kg wet							
Ethylbenzene	0.0111	0.025	0.0022	mg/kg wet							B-02, J
Naphthalene	< 0.015	0.50	0.015	mg/kg wet							
Toluene	< 0.0027	0.025	0.0027	mg/kg wet							
Xylenes (total)	< 0.0080	0.075	0.0080	mg/kg wet							
<i>Surrogate: 4-Fluorochlorobenzene</i>	23.3			ug/L	25.0		93.4	80-150			

**LCS (B3K1308-BS1)**

Prepared & Analyzed: 11/13/13

1,2,4-Trimethylbenzene	112			ug/L	100		112	80-120			
1,3,5-Trimethylbenzene	100			ug/L	100		100	80-120			
Benzene	97.9			ug/L	100		97.9	80-120			
Ethylbenzene	101			ug/L	100		101	80-120			
Naphthalene	113			ug/L	100		113	80-120			
Toluene	99.2			ug/L	100		99.2	80-120			
Xylenes (total)	299			ug/L	300		99.7	80-120			
<i>Surrogate: 4-Fluorochlorobenzene</i>	26.1			ug/L	25.0		104	80-150			

**LCS Dup (B3K1308-BSD1)**

Prepared: 11/13/13 Analyzed: 11/14/13

1,2,4-Trimethylbenzene	97.5			ug/L	100		97.5	80-120	13.8	20	
1,3,5-Trimethylbenzene	90.9			ug/L	100		90.9	80-120	9.84	20	
Benzene	94.9			ug/L	100		94.9	80-120	3.13	20	
Ethylbenzene	96.7			ug/L	100		96.7	80-120	4.10	20	
Naphthalene	117			ug/L	100		117	80-120	3.35	20	
Toluene	94.6			ug/L	100		94.6	80-120	4.77	20	
Xylenes (total)	282			ug/L	300		93.9	80-120	6.05	20	
<i>Surrogate: 4-Fluorochlorobenzene</i>	23.0			ug/L	25.0		92.1	80-150			

**Matrix Spike (B3K1308-MS1)**

Source: 1305622-01

Prepared & Analyzed: 11/13/13

1,2,4-Trimethylbenzene	110			ug/L	100	<	110	80-120			
1,3,5-Trimethylbenzene	99.9			ug/L	100	0.180	99.7	80-120			
Benzene	97.8			ug/L	100	<	97.8	80-120			
Ethylbenzene	101			ug/L	100	0.269	101	80-120			
Naphthalene	100			ug/L	100	<	100	80-120			
Toluene	99.1			ug/L	100	<	99.1	80-120			
Xylenes (total)	299			ug/L	300	<	99.7	80-120			
<i>Surrogate: 4-Fluorochlorobenzene</i>	25.2			ug/L	25.0		101	80-150			

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: [none] Project Manager: Ms. Andrea Nord	Work Order #: 1305659 Date Reported: 11/21/13
---	---	--

**PERCENT SOLIDS - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B3K1913 - General Preparation</b>											
<b>Duplicate (B3K1913-DUP1)</b>											
	<b>Source: 1305716-02</b>		<b>Prepared &amp; Analyzed: 11/19/13</b>								
% Solids	93.0			%		92.0			1.08	20	
<b>Duplicate (B3K1913-DUP2)</b>											
	<b>Source: 1305754-05</b>		<b>Prepared &amp; Analyzed: 11/19/13</b>								
% Solids	89.0			%		90.0			1.12	20	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: [none] Project Manager: Ms. Andrea Nord	Work Order #: 1305659 Date Reported: 11/21/13
---	---	--

### Notes and Definitions

J	Parameter was present between the MDL and RL and should be considered an estimated value
B-02	Target analyte was present in the method blank between the MDL and RL.
B-01	Analyte was present in the method blank. Sample result is less than or equal to 10 times the blank concentration.
<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)



**Chain of Custody**  
**BARR**  
 4700 West 77th Street  
 Minneapolis, MN 55435-4803  
 (952) 832-2600

1305459

Project Number: 49161092  
 Project Name: Embridge - Pumphouse  
 Sample Origination State: WI (use two letter postal state abbreviation)  
 COC Number: **No 37216**

Number of Containers/Preservative		COC <u>2 of 1</u>
Water	Soil	
VOCs (HCl) #1	VOCs (unpreserved) #2	Project Manager: <u>RCE</u> Project QC Contact: <u>AAW</u> Sampled by: <u>CSGZ</u> Laboratory: <u>Legend</u> Total Number of Containers:
Dissolved Metals (HNO <sub>3</sub> )	Metals (unpreserved)	
Total Metals (HNO <sub>3</sub> )	Metals (unpreserved) #2	
General (unpreserved) #3	% Solids (plastic vial, unpres.)	
Diesel Range Organics (HCl)		
Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4		

Location	Start Depth	Stop Depth	Depth Unit (m, ft, or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type		Total Number of Containers
						Water	Soil	Grab	Comp. OC	
1. <u>Z03-Pumphouse-5-1</u>	<u>3.5</u>	<u>3.5</u>	<u>P+</u>	<u>11/12/13</u>	<u>1:55</u>	<u>X</u>	<u>X</u>			<u>1</u>
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										

**Common Parameter/Container - Preservation Key**  
 #1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCR, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [Signature] On Ice?  Y  N Date: 11/12/13 Time: 1:53 Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Relinquished By: [Signature] On Ice?  Y  N Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by: [Signature] Date: 11/13/13 Time: 9:40  
 Samples Shipped VIA:  Air Freight  Federal Express  Sampler Air Bill Number: 1-29  
 Other: \_\_\_\_\_

Distribution: White-Original Accompanies Shipment to Lab, Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

## **Attachment D**

### **Waste Disposal Documentation**

P.O. Number	Customer Code	SKB Representative	CL
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**I. Generator Information**

Generator Name: <b>Enbridge Pipelines Limited Partnership, LLC</b>		Generator EPA ID Number	SIC Code
Generator Location: <b>Enbridge Superior Terminal - Pump House #6 Soil</b>	County: <b>Douglas</b>	Generator Contact: <b>Alex Smith</b>	
		Phone: <b>715-398-4795</b>	Fax: <b>832-325-5511</b>
Generator Mailing Address (if different): <b>1320 Grand Ave, Superior, WI 54880</b>		Generator Email Address: <b>alex.smith@enbridge.com</b>	
Bill To Name & Address: <b>Enbridge Energy, 1100 Louisiana Ave, STE. 3300, Houston, TX 77002</b>	Bill To #:	Billing Contact: <b>Alex Smith</b>	
		Phone: <b>715-398-4795</b>	Fax: <b>832-325-5511</b>
		Billing Email Address: <b>alex.smith@enbridge.com</b>	
Invoice Contact:			

**II. Waste Generation Information**

Waste Name: <b>Crude contaminated soil - Pump House #6</b>	Estimated rate of waste generation: <u>200</u> <input type="checkbox"/> Lbs. <input type="checkbox"/> tons <input checked="" type="checkbox"/> cy <input type="checkbox"/> drums	<input checked="" type="checkbox"/> one time <input type="checkbox"/> yearly
Generator Facility Operations and/or Site History: <b>Enbridge Pipeline Terminal</b>		
Describe the generating process or source of contaminated soil/debris and/or waste: <b>Crude oil impacted soil</b>		

**III. Waste Composition and Constituents (list all known)**

	Actual Range	
	%	ppm
Crude oil impacted soil	100	

**IV. Waste Properties**

Physical state: <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Sludge <input type="checkbox"/> Gas	Free Liquids: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Content _____ %	pH Range: <input type="checkbox"/> <2 <input type="checkbox"/> 2-4 <input type="checkbox"/> 5-8 <input type="checkbox"/> 8-12.4 <input type="checkbox"/> >12.5	Flash point: <input type="checkbox"/> ≤ 140°F <input type="checkbox"/> > 140°F to < 200°F <input type="checkbox"/> > 200°F	Color: <b>Brown</b>	Odor (describe):
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**V. Waste Classification**

Waste stream properties (answer ALL questions)	Does this waste contain absorbents? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does this waste stream contain any D, F, K, U or P listed as hazardous waste, either in pure form, as a mixture, or treatment residue? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this waste lethal (by Minn. Rules 7045.0131 Subp. 6)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does this waste stream contain PCB material <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, concentration: _____ppm	Is this waste recyclable? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does this waste stream contain fuming acids? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this waste explosive? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does this waste contain asbestos? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this waste infectious? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does this waste contain oxidizers? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this waste putrescible waste? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does this waste contain radioactive material? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this waste demolition debris? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Is this waste sewer sludge? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Please attach any available information or analytical test results that have previously been performed on this waste that substantiates these determinations. Include MSDS's and any information from other agencies (i.e., MPCA, USEPA)</b>	

**VI. Shipping Information**

Proper DOT Shipping Name (per CFR 172.101) where applicable			
Reportable Quantity	DOT Hazard Class	UN/NA Number	Packing Group
Method of packaging: <input type="checkbox"/> drums (size _____) <input checked="" type="checkbox"/> Bulk Solids <input type="checkbox"/> boxes (size _____)		Method of shipment <input type="checkbox"/> Roll-off <input checked="" type="checkbox"/> End dump <input type="checkbox"/> Rail <input type="checkbox"/> Other (Specify) _____	

**VII. Certification of Non Hazardous Waste & Approval Conditions**

I hereby certify and warrant, on behalf of the generator and myself that, to the best of my knowledge and belief, the information contained herein is accurate, and true and that the waste is nonhazardous as defined in Title 42, Unites States Code Section 6903, Minnesota Statute Section 116.06, Subdivision 13, and/or any rules adopted by the Minnesota Pollution Control Agency under Minnesota Statute Section 116.07.

I understand that any approval is no longer valid if there are any changes in the process generating the waste or there have been changes in the composition of the waste. Therefore, if the composition of the waste stream changes or potentially changes, I or someone representing the generator, will immediately notify SKB Environmental. I, on behalf of the generator, hereby agree to fully indemnify SKB Environmental for any damages and/or costs incurred as a result of this certification being inaccurate or untrue.

Signature	Printed Name	Title
Alex Smith	Environmental Analyst	11/4/13
Date		Date



88 Empire Drive  
St Paul, MN 55103  
Tel: 651-642-1150  
Fax: 651-642-1239

October 29, 2013

Ms. Andrea Nord  
Barr Engineering Co.  
4700 W 77th St  
Minneapolis, MN 55435

Work Order Number: 1305312  
RE: 49161092

Enclosed are the results of analyses for samples received by the laboratory on 10/25/13. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

WI Accreditation #998022410

Prepared by,  
LEGEND TECHNICAL SERVICES, INC

A handwritten signature in black ink, appearing to read "Bach Pham".

Bach Pham  
Client Manager II  
bpham@legend-group.com

A handwritten signature in blue ink, appearing to read "Samantha Jaworski".

Samantha Jaworski  
Manager, Organics  
sjaworski@legend-group.com

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 Project Manager: Ms. Andrea Nord	Work Order #: 1305312 Date Reported: 10/29/13
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**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Pump #6-Stockpile-1	1305312-01	Soil	10/24/13 11:35	10/25/13 09:55

**Shipping Container Information**

**Default Cooler**                      Temperature (°C): 4.7

Received on ice: Yes                      Temperature blank was present                      Received on ice pack: No  
 Received on melt water: No                      Ambient: No                      Acceptable (IH/ISO only): No  
 Custody seals: No

**Case Narrative:**

The dry weight correction and dilution applies to the sample result, MDL, and RL.

Ethylbenzene was present in the method blank between the MDL and RL for the BTEX analysis.

The DRO chromatogram for the sample is attached.

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 Project Manager: Ms. Andrea Nord	Work Order #: 1305312 Date Reported: 10/29/13
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**DRO/8015D**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Pump #6-Stockpile-1 (1305312-01) Soil</b> <b>Sampled: 10/24/13 11:35</b> <b>Received: 10/25/13 9:55</b>										
<b>Diesel Range Organics</b>	<b>1700</b>	81	10	mg/kg dry	5	B3J2505	10/25/13	10/25/13	WI(95) DRO	L1
Surrogate: <i>Triacotane (C-30)</i>	97.0			70-130 %		"	"	"	"	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 Project Manager: Ms. Andrea Nord	Work Order #: 1305312 Date Reported: 10/29/13
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**WI(95) GRO/8015D**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Pump #6-Stockpile-1 (1305312-01) Soil</b> <b>Sampled: 10/24/13 11:35</b> <b>Received: 10/25/13 9:55</b>										
Benzene	1.5	0.044	0.0054	mg/kg dry	1	B3J2508	10/25/13	10/25/13	WI(95) GRO	
Ethylbenzene	2.0	0.044	0.0037	mg/kg dry	1	"	"	"	"	
Toluene	2.1	0.044	0.0047	mg/kg dry	1	"	"	"	"	
Xylenes (total)	5.9	0.13	0.014	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Fluorochlorobenzene	135			80-150 %		"	"	"	"	



88 Empire Drive  
 St Paul, MN 55103  
 Tel: 651-642-1150  
 Fax: 651-642-1239

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 Project Manager: Ms. Andrea Nord	Work Order #: 1305312 Date Reported: 10/29/13
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**PERCENT SOLIDS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Pump #6-Stockpile-1 (1305312-01) Soil</b> <b>Sampled: 10/24/13 11:35</b> <b>Received: 10/25/13 9:55</b>										
<b>% Solids</b>	<b>64</b>			%	1	B3J2906	10/29/13	10/29/13	% calculation	



Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 Project Manager: Ms. Andrea Nord	Work Order #: 1305312 Date Reported: 10/29/13
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**DRO/8015D - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B3J2505 - Sonication (Wisc DRO)</b>											
<b>Blank (B3J2505-BLK1)</b>											
						Prepared & Analyzed: 10/25/13					
Diesel Range Organics	< 0.99	8.0	0.99	mg/kg wet							
Surrogate: <i>Triacontane (C-30)</i>	13.5			mg/kg wet	16.0		84.1	70-130			
<b>LCS (B3J2505-BS1)</b>											
						Prepared & Analyzed: 10/25/13					
Diesel Range Organics	63.9	8.0	0.99	mg/kg wet	64.0		99.9	70-120			
Surrogate: <i>Triacontane (C-30)</i>	14.5			mg/kg wet	16.0		90.8	70-130			
<b>LCS Dup (B3J2505-BSD1)</b>											
						Prepared: 10/25/13 Analyzed: 10/26/13					
Diesel Range Organics	70.8	8.0	0.99	mg/kg wet	64.0		111	70-120	10.2	20	
Surrogate: <i>Triacontane (C-30)</i>	16.4			mg/kg wet	16.0		102	70-130			

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 Project Manager: Ms. Andrea Nord	Work Order #: 1305312 Date Reported: 10/29/13
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**WI(95) GRO/8015D - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B3J2508 - EPA 5035 Soil (Purge and Trap)</b>											
<b>Blank (B3J2508-BLK1)</b>						Prepared & Analyzed: 10/25/13					
Benzene	< 0.0031	0.025	0.0031	mg/kg wet							
Ethylbenzene	0.0132	0.025	0.0022	mg/kg wet							B-02, J
Toluene	< 0.0027	0.025	0.0027	mg/kg wet							
Xylenes (total)	< 0.0080	0.075	0.0080	mg/kg wet							
Surrogate: 4-Fluorochlorobenzene	22.9			ug/L	25.0		91.8	80-150			
<b>LCS (B3J2508-BS1)</b>						Prepared & Analyzed: 10/25/13					
Benzene	97.9			ug/L	100		97.9	80-120			
Ethylbenzene	100			ug/L	100		100	80-120			
Toluene	100			ug/L	100		100	80-120			
Xylenes (total)	298			ug/L	300		99.2	80-120			
Surrogate: 4-Fluorochlorobenzene	24.4			ug/L	25.0		97.7	80-150			
<b>LCS Dup (B3J2508-BSD1)</b>						Prepared & Analyzed: 10/25/13					
Benzene	96.7			ug/L	100		96.7	80-120	1.23	20	
Ethylbenzene	95.5			ug/L	100		95.5	80-120	4.69	20	
Toluene	97.8			ug/L	100		97.8	80-120	2.37	20	
Xylenes (total)	284			ug/L	300		94.6	80-120	4.78	20	
Surrogate: 4-Fluorochlorobenzene	22.2			ug/L	25.0		88.9	80-150			
<b>Matrix Spike (B3J2508-MS1)</b>						Source: 1305313-01 Prepared & Analyzed: 10/25/13					
Benzene	97.4			ug/L	100	<	97.4	80-120			
Ethylbenzene	101			ug/L	100	0.290	101	80-120			
Toluene	101			ug/L	100	0.120	100	80-120			
Xylenes (total)	300			ug/L	300	0.122	100	80-120			
Surrogate: 4-Fluorochlorobenzene	22.6			ug/L	25.0		90.4	80-150			



88 Empire Drive  
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 Fax: 651-642-1239

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 Project Manager: Ms. Andrea Nord	Work Order #: 1305312 Date Reported: 10/29/13
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**PERCENT SOLIDS - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B3J2906 - General Preparation</b>											
<b>Duplicate (B3J2906-DUP1)</b>						<b>Source: 1305312-01</b>	<b>Prepared &amp; Analyzed: 10/29/13</b>				
% Solids	68.0			%		64.0			6.06	20	
<b>Duplicate (B3J2906-DUP2)</b>						<b>Source: 1305323-03</b>	<b>Prepared &amp; Analyzed: 10/29/13</b>				
% Solids	95.0			%		95.0			0.00	20	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 Project Manager: Ms. Andrea Nord	Work Order #: 1305312 Date Reported: 10/29/13
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### Notes and Definitions

L1	Results in the diesel organics range are primarily due to overlap from a heavy oil range product.
J	Parameter was present between the MDL and RL and should be considered an estimated value
B-02	Target analyte was present in the method blank between the MDL and RL.
<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

**Chain of Custody**  
**BARR** 4700 West 77th Street  
 Minneapolis, MN 55435-4803  
 (952) 832-2600

305312

Project Number: 49161092  
 Project Name: Embury - Superior Terminal Pump #6  
 Sample Origination State: WI (use two letter postal state abbreviation)  
 COC Number: NO 40625

Number of Containers/Preservative		Total Number of Containers
Water	Soil	
VOCs (HCl) #1		6
SVOCs (unpreserved) #2		
Dissolved Metals (HNO <sub>3</sub> )		
Total Metals (HNO <sub>3</sub> )		
General (unpreserved) #3		
Diesel Range Organics (HCl)		
Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4		
VOCs (tared MeOH) #1		
BTEX (tared MeOH) #1	11	
DRO (tared unpreserved)	13	
Metals (unpreserved)		
SVOCs (unpreserved) #2		
% Solids (plastic vial, unpres.)		
Extra Jar - Hold		

COC 1 of 1  
 Project Manager: RGG/HAW  
 Project QC Contact: AAN  
 Sampled by: CJGZ  
 Laboratory: Legend

Location	Start Depth	Stop Depth	Depth Unit (m, ft, or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type	VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO <sub>3</sub> )	Total Metals (HNO <sub>3</sub> )	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4	VOCs (tared MeOH) #1	BTEX (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	Extra Jar - Hold	
						Water	Soil																
1 Pump #6 - Stockpile-1	-	-	-	10/24/13	11:35	X	X																
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

BTEX, DRO, %solids  
 Beta Jars - Hold  
 ASAP TURN

**Common Parameter/Container - Preservation Key**  
 #1 - Volatile Organics = BTEX, GRG, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCB, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [Signature] On Ice?  Date: 10/24/13 Time: 1315  
 Received by: [Signature] Date: 10/25/13 Time: 9:35  
 Samples Shipped VIA:  Air Freight  Federal Express  Sampler  Other: Air Bill Number: 4702

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Data File: \\lts-target\targetdata\chem\FID5.i\131024,b\039,d

Date : 25-OCT-2013 15:50

Client ID:

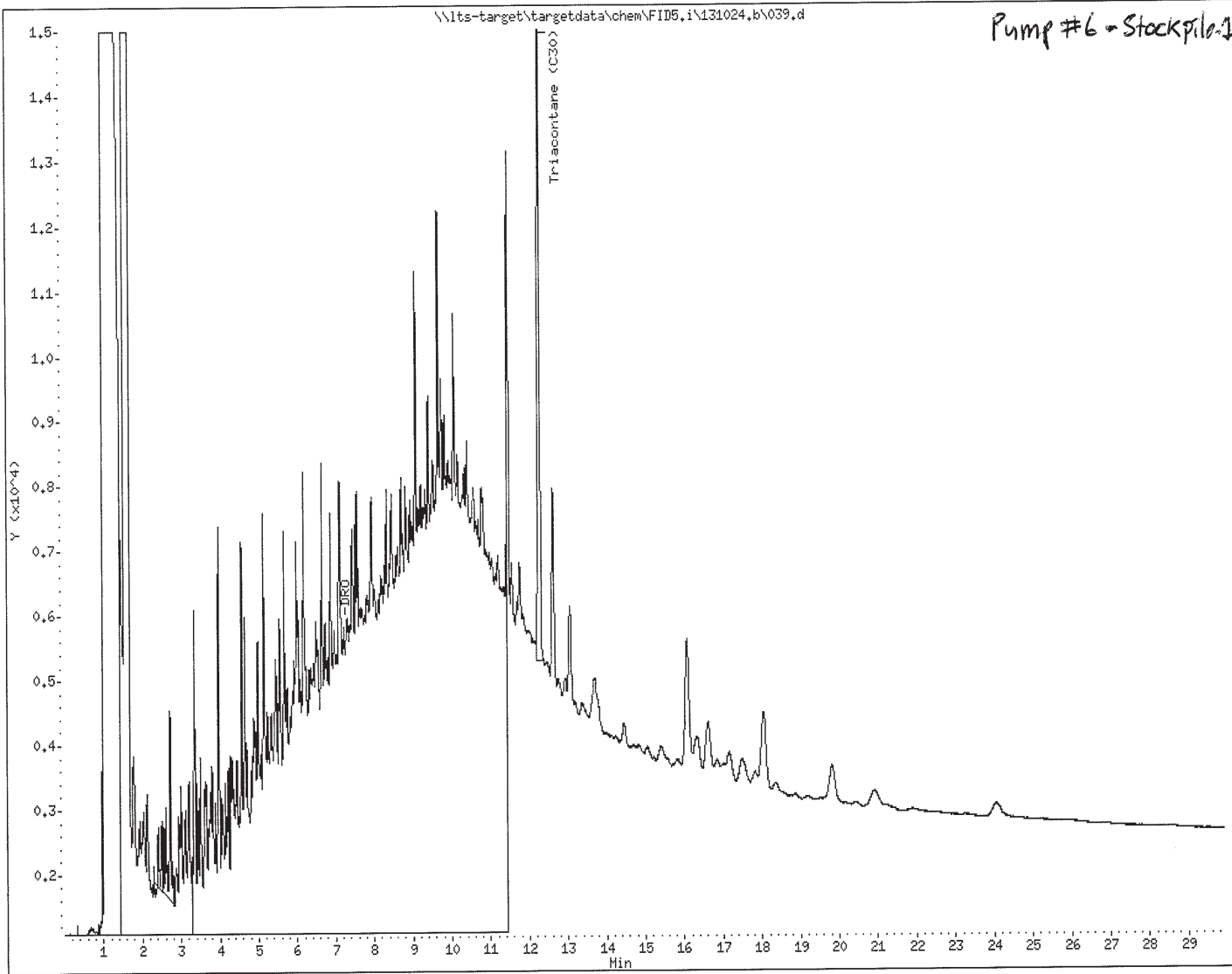
Sample Info: 1306312-01 x5

Instrument: FID5.i

Operator: TL

Column diameter: 0.53

Column phase:



November 05, 2013

Karl Beaster  
Enbridge Pipelines Limited Partnership, LLC  
Accounts Payable  
1100 Louisiana Ave, Ste 3300  
Houston, TX 77002

RE: CL13-0056 Crude Contaminated Soil - Pump House # 6

Dear Mr. Beaster,

This agreement will confirm the price and length of service for disposal and /or transportation of your non-hazardous industrial material at our facility. This agreement is for the term of the Waste Approval granted by Shamrock Landfill and is for all services ordered and performance initiated within such period and does include the disposal surcharge fees which you are obligated to pay as of the date of this agreement. Shamrock Landfill may incur additional costs including but not limited to increases in state and local taxes. Shamrock Landfill may pass these costs on to the customer only after notification to the Customer. This agreement grants Shamrock Landfill the exclusive right to dispose of the referenced waste for the term of this agreement. This agreement shall automatically renew thereafter for an additional term of 24 months "Renewal Term" unless either party gives the other party written notification of termination at least 90 days prior to the termination of the then-existing term. Shamrock Landfill will notify the customer prior to the expiration of the agreement of any rate changes prior to the start of the Renewal Term.

Payment and terms are net thirty (30) days. Interest will be charged at a rate of 1 ½% per month (18% annually) on any unpaid balance 30 days after the date of the invoice. In the event Customer terminates this Agreement prior to its expiration other than as a result of a breach by Shamrock Landfill or Shamrock Landfill terminates this agreement for Customer's breach (including nonpayment) Customer agrees to pay to Shamrock Landfill as liquidated damages a sum calculated as follows: (1) if the remaining term under this agreement is six or more months Customer shall pay its average monthly charges multiplied by six; or (2) if the remaining term under this agreement is less than six months Customer shall pay its average monthly charge multiplied by the number of months remaining in the term. Customer expressly acknowledges that in the event of an unauthorized termination of this agreement the anticipated loss to Shamrock Landfill in such event is estimated to be the amount set forth in the foregoing liquidated damages provision and such estimated value is reasonable and is not imposed as a penalty.

These prices are based on an approved waste stream composition. In the event that a non-conforming waste is received, you will be notified of additional charges, when applicable.

To accept this agreement, please sign one copy and return it to our St. Paul, MN office at Shamrock Landfill, 251 Starkey St., St. Paul, MN 55107 or Via Fax at 651-223-8197 or email to [sopstad@skbinc.com](mailto:sopstad@skbinc.com).

Shamrock Landfill



Steve Opstad

Customer ACCEPTED BY: (name, position) .....

DATE: .....

WASTE APPROVAL Period: ... 11/5/2013 to 10/24/2015 .....

**Bill To Customer**

Enbridge Pipelines Limited Partnership, LLC  
Accounts Payable  
1100 Louisiana Ave, Ste 3300  
Houston, TX 77002

**Service For Generator**

Enbridge Pipelines Limited Partnership, LLC  
2800 East 21st St  
Superior, WI 54880

**Disposal**

Waste Description: Crude Contaminated Soil - Pump House # 6

Estimated Volume: 200 YARDS / ONE TIME ONLY

Disposal Method: Secure Non-Hazardous Landfill

Treatment Method: None Expected For Conforming Waste

**Pricing**

Disposal	\$16.00	Per Ton	Crude Contaminated Soil - Pump House # 6
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**Notification of Waste Acceptance**

PAGE 1 of 2  
11/5/2013

**CUSTOMER INFORMATION**

EPA ID#: WID981092133  
Enbridge Pipelines Limited Partnership,  
Enbridge Superior Terminal

2800 East 21st St  
Superior, WI 54880  
Contact: Karl Beaster  
Phone: (715) 398-4795

**INVOICE INFORMATION**

Bill #: 2133  
Enbridge Pipelines Limited Partnership,  
Accounts Payable

1100 Louisiana Ave, Ste 3300  
Houston, TX 77002  
Contact: Karl Beaster  
Phone: (715) 398-4795

Profile Sheet #:  
Waste Stream #: CL13-0056  
Waste Name: Crude Contaminated Soil - Pump House # 6

Thank you for selecting SHAMROCK LANDFILL for your waste management requirements. Your waste stream has been reviewed and is acceptable for management at our facility based on the information provided in the profile sheet number listed above and conditions below. Our facility has the necessary permits to allow the storage, treatment, or disposal of this waste. The above referenced acceptance number should be listed on all shipping documents and correspondence. Please retain these documents for your records and future reference.

To schedule a shipment, or should you have any questions, please contact the facility at (218) 878-0112.

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**ACCEPTANCE INFORMATION**

The waste stream identified by the reference above is acceptable for disposal.  
The anticipated frequency of shipment is 200 YARDS / ONE TIME ONLY

This waste is acceptable for delivery beginning on 11/5/2013 thru 10/24/2015 at which time the material will need to be reanalyzed and recertified.

**PCB Statement:** The Minnesota Pollution Control Agency encourages generators of non-hazardous PCB waste to voluntarily manage the waste as hazardous waste or to seek an alternative to land disposal such as incineration

**Spill Reporting Reminder:** Proper County and MPCA spill reporting procedures must be followed.

**Empty Container Statement:** Each shipment containing empty containers must be accompanied with a completed 'EMPTY CONTAINER CERTIFICATION FORM'.

**Free Liquid Statement:** Free liquids will not be placed in cells at Shamrock Landfill. Free liquids must be solidified either prior to shipment to Shamrock Landfill or at Shamrock Landfill.

**Shipping Requirements** A NON-HAZARDOUS certificate is required to be on file, certifying the waste is non-hazardous as specified per 40 CFR 261.4. The shipment must be accompanied with an Shamrock Landfill manifest.

**WASTE STREAM ANALYSIS INFORMATION**

Waste Name: Crude Contaminated Soil - Pump House # 6  
Physical State: Solid  
Process Producing Waste: crude oil impacted soil

**PRE-ACCEPTANCE SAMPLE RESULTS**

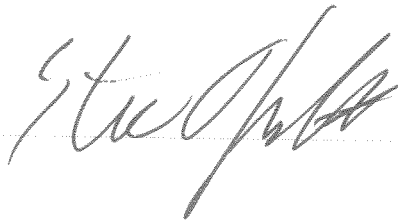
Color:		Physical State:	
Dust Present:	0	Free Liquids:	0
Paint Filter Test:	0	Odor:	
Flash Point Range:		Density:	
Radioactive?:	0	Water Reactivity:	0
pH Range:		React to Acid:	0
React to Base:	0	% Moisture:	
OVM Sniff:		Sulfide:	
Oxidizers:	0	Cyanide:	
Reacts with Air:	0		

This analysis is solely for use by Shamrock Landfill employees for the purpose of determining waste acceptability. No other claims are made or implied.

**COMMENTS**

**AUTHORIZATION**

Approval: \_\_\_\_\_



Date: \_\_\_\_\_

11/5/13



REPORT NAME: **Tons Each Load By WSID**  
DESCRIPTION: **Tonnage for EACH LOAD, grouped by customer**  
DATE RANGE: **01/01/2013 to 12/19/2013**  
PRINTED ON (DATE): **Thursday, December 19, 2013**

**ENBS1**

Enbridge Pipelines Limited Partnership,  
2800 East 21st St  
Superior WI 54880

LOAD #	MANIFEST	ARRIVED	WASTE STREAM	WASTE NAME	CELL	SPOT.	LIFT	TONS
15390 (A)	16974	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	15.29
15391 (A)	16975	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	15.26
15392 (A)	17019	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	14.87
15393 (A)	16976	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	15.55
15398 (A)	16953	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	15.27
15399 (A)	16955	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	15.37
15400 (A)	16956	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	17.28
15401 (A)	16957	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	18.31
15405 (A)	16959	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	16.79
15406 (A)	16958	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	15.39
15408 (A)	16960	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	14.32
15409 (A)	16961	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	15.97
15414 (A)	16962	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	15.43
15416 (A)	16963	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	17.19
15417 (A)	16964	11/6/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	Z38	1175	17.18
15766 (A)	013592	11/20/2013	CL13-0056	Crude Contaminated Soil - Pump H	2A	U34	1175	18.49

**Total # of Loads: 16** **Total Tons: 257.96**

**Grand Total (Tons): 257.96**  
**Grand Total (Loads): 16**



2626 Courtland Street  
Duluth, MN 55806-1894  
phone 218.722.3336  
fax 218.727.7471  
www.wlssd.com

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**Western Lake Superior Sanitary District**

November 8, 2013

Alex Smith  
Enbridge  
1320 Grand Avenue  
Superior, WI 54880

Re: WLSSD Discharge Approval (Pump House 5 & 6 Water)

Dear Mr. Smith:

Based on the analytical information provided on 11/8/2013, the WLSSD approves the discharge of **Up to 100,000 gallons of Pump House 5 & 6 Water from Enbridge Superior** provided there is no visual sign of the petroleum oil, grease or other petroleum related products. This contaminated water is to be disposed of at the WLSSD's main treatment facility, which is located at 2626 Courtland in Duluth.

This is a one time only approval for the waste described. It does not release **Enbridge** from any conditions/regulations set forth by the MPCA and/or any other agency that regulates the waste being discharged. In addition, this approval does not release **Enbridge or any consultant/contractor** involved from any subsequent liabilities associated with conducting this discharge.

Disposal during a significant rainstorm may be denied because of high flows. A copy of this letter of approval is to accompany each load and is to be disposed of and given to the process control operator. **Please attempt to discharge at our facility between 7:00 a.m. and 5:00 p.m. If you are unable to discharge at that time please call the process control operator (218) 722-3336 ext. 301 with you estimated time of arrival.**

If there are any questions, please contact me at (218) 740-4815.

Sincerely,

A handwritten signature in blue ink that reads "Tim Tuominen".

Tim Tuominen  
Chemist



88 Empire Drive  
St Paul, MN 55103  
Tel: 651-642-1150  
Fax: 651-642-1239

November 07, 2013

Ms. Andrea Nord  
Barr Engineering Co.  
4700 W 77th St  
Minneapolis, MN 55435

Work Order Number: 1305506  
RE: 49161092

Enclosed are the results of analyses for samples received by the laboratory on 11/06/13. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

WI Accreditation #998022410

Prepared by,  
LEGEND TECHNICAL SERVICES, INC

A handwritten signature in black ink, appearing to read "Bach Pham".

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Bach Pham  
Client Manager II  
bpham@legend-group.com

A handwritten signature in blue ink, appearing to read "Samantha Jaworski".

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Samantha Jaworski  
Manager, Organics  
sjaworski@legend-group.com

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 003 029 Project Manager: Ms. Andrea Nord	Work Order #: 1305506 Date Reported: 11/07/13
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**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Pump House 6-Water-1	1305506-01	Water	11/05/13 08:50	11/06/13 09:50

**Shipping Container Information**

**Default Cooler**                      Temperature (°C): 1.2

Received on ice: Yes                      Temperature blank was present                      Received on ice pack: No  
 Received on melt water: No                      Ambient: No                      Acceptable (IH/ISO only): No  
 Custody seals: No

**Case Narrative:**

The dry weight correction and dilution applies to the sample result, MDL, and RL.

Ethylbenzene was present in the method blank between the MDL and RL for the BTEX analysis.

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 003 029 Project Manager: Ms. Andrea Nord	Work Order #: 1305506 Date Reported: 11/07/13
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**DRO/8015D**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Pump House 6-Water-1 (1305506-01) Water</b> <b>Sampled: 11/05/13 08:50</b> <b>Received: 11/06/13 9:50</b>										
<b>Diesel Range Organics</b>	<b>1700</b>	100	28	ug/L	1	B3K0611	11/06/13	11/06/13	WI(95) DRO	
Surrogate: <i>Triacontane (C-30)</i>	98.4			70-130 %		"	"	"	"	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 003 029 Project Manager: Ms. Andrea Nord	Work Order #: 1305506 Date Reported: 11/07/13
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**WI(95) GRO/8015D**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Pump House 6-Water-1 (1305506-01) Water</b> <b>Sampled: 11/05/13 08:50</b> <b>Received: 11/06/13 9:50</b>										
Benzene	0.38	1.0	0.13	ug/L	1	B3K0703	11/07/13	11/07/13	WI(95) GRO	J
Ethylbenzene	0.42	1.0	0.022	ug/L	1	"	"	"	"	B-01, J
Toluene	0.18	1.0	0.15	ug/L	1	"	"	"	"	J
Xylenes (total)	0.41	3.0	0.41	ug/L	1	"	"	"	"	J
Surrogate: 4-Fluorochlorobenzene	97.0									
				80-150 %		"	"	"	"	



Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 003 029 Project Manager: Ms. Andrea Nord	Work Order #: 1305506 Date Reported: 11/07/13
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**DRO/8015D - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B3K0611 - EPA 3510C (Sep Funnel)</b>											
<b>Blank (B3K0611-BLK1)</b>											
						Prepared & Analyzed: 11/06/13					
Diesel Range Organics	< 28	100	28	ug/L							
Surrogate: <i>Triacontane (C-30)</i>	417			ug/L	400		104	70-130			
<b>LCS (B3K0611-BS1)</b>											
						Prepared & Analyzed: 11/06/13					
Diesel Range Organics	1740	100	28	ug/L	1600		109	75-115			
Surrogate: <i>Triacontane (C-30)</i>	413			ug/L	400		103	70-130			
<b>LCS Dup (B3K0611-BSD1)</b>											
						Prepared & Analyzed: 11/06/13					
Diesel Range Organics	1850	100	28	ug/L	1600		115	75-115	5.98	20	
Surrogate: <i>Triacontane (C-30)</i>	431			ug/L	400		108	70-130			

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 003 029 Project Manager: Ms. Andrea Nord	Work Order #: 1305506 Date Reported: 11/07/13
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**WI(95) GRO/8015D - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B3K0703 - EPA 5030 Water (Purge and Trap)</b>											
<b>Blank (B3K0703-BLK1)</b>						Prepared & Analyzed: 11/07/13					
Benzene	< 0.13	1.0	0.13	ug/L							
Ethylbenzene	0.242	1.0	0.022	ug/L							B-02, J
Toluene	< 0.15	1.0	0.15	ug/L							
Xylenes (total)	< 0.41	3.0	0.41	ug/L							
Surrogate: 4-Fluorochlorobenzene	23.1			ug/L	25.0		92.4	80-150			
<b>LCS (B3K0703-BS1)</b>											
<b>LCS (B3K0703-BS1)</b>						Prepared & Analyzed: 11/07/13					
Benzene	100	1.0	0.13	ug/L	100		100	80-120			
Ethylbenzene	104	1.0	0.022	ug/L	100		104	80-120			
Toluene	103	1.0	0.15	ug/L	100		103	80-120			
Xylenes (total)	308	3.0	0.41	ug/L	300		103	80-120			
Surrogate: 4-Fluorochlorobenzene	26.2			ug/L	25.0		105	80-150			
<b>LCS Dup (B3K0703-BSD1)</b>											
<b>LCS Dup (B3K0703-BSD1)</b>						Prepared & Analyzed: 11/07/13					
Benzene	99.9	1.0	0.13	ug/L	100		99.9	80-120	0.372	20	
Ethylbenzene	103	1.0	0.022	ug/L	100		103	80-120	0.754	20	
Toluene	102	1.0	0.15	ug/L	100		102	80-120	0.812	20	
Xylenes (total)	309	3.0	0.41	ug/L	300		103	80-120	0.338	20	
Surrogate: 4-Fluorochlorobenzene	25.5			ug/L	25.0		102	80-150			
<b>Matrix Spike (B3K0703-MS1)</b>											
<b>Matrix Spike (B3K0703-MS1)</b>						Prepared & Analyzed: 11/07/13					
<b>Source: 1305506-01</b>											
Benzene	99.4	1.0	0.13	ug/L	100	<1.0	99.1	80-120			
Ethylbenzene	104	1.0	0.022	ug/L	100	<1.0	103	80-120			
Toluene	99.5	1.0	0.15	ug/L	100	<1.0	99.3	80-120			
Xylenes (total)	305	3.0	0.41	ug/L	300	<3.0	101	80-120			
Surrogate: 4-Fluorochlorobenzene	25.9			ug/L	25.0		103	80-150			

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 49161092 Project Number: 49161092 003 029 Project Manager: Ms. Andrea Nord	Work Order #: 1305506 Date Reported: 11/07/13
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### Notes and Definitions

J	Parameter was present between the MDL and RL and should be considered an estimated value
B-02	Target analyte was present in the method blank between the MDL and RL.
B-01	Analyte was present in the method blank. Sample result is less than or equal to 10 times the blank concentration.
<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

