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Technical Memorandum

To: Alex Smith, Enbridge Energy
From: Ryan Erickson and Noelle Scelina
Subject: Superior Terminal Historical Contamination: Historical *Nemadji Release* Corridor
Date: June 15, 2016
SERTS ID: 20150319NO16-1
WDNR Historical BRRTS #: 02-16-513788
Barr Project #: 49161253.28

This memorandum summarizes the environmental assistance provided by Barr Engineering (Barr) at the request of Enbridge Energy (Enbridge) in response to the discovery of historical crude oil contamination in excavations along the 2003 *Nemadji Release* crude oil release corridor/roadway at the Enbridge Superior Terminal (Terminal) in Superior, Wisconsin (Figure 1) in 2015 and 2016.

Background

On January 24, 2003, approximately 4,500 barrels of crude oil were released from a Terminal pipeline valve south of Tank 13 (*Nemadji Release* - BRRTS # 02-16-513788; Figure 2). Crude oil from the release covered a section of the adjacent roadway and accumulated in the stormwater ditches on each side of the road, as shown in the historical release figure (Attachment A). Remedial actions were taken to clean-up the release; however, some residual contamination was not removed due to the presence of pipeline infrastructure. The site was closed by the Wisconsin Department of Natural Resources (WDNR) on April 8, 2008 and the site closure letter is included in Attachment A.

In 2015 and 2016, Enbridge conducted significant pipeline infrastructure maintenance and improvement activities in the area that was contaminated during the *Nemadji Release*. Soil with crude oil contamination, believed to be associated with the historical release, was encountered in multiple locations near the stormwater ditch that had been filled with crude oil on the south side of the Terminal roadway. The WDNR was notified about the historical contamination and the scope and schedule of the ongoing construction work and the WDNR agreed that Enbridge could submit a single memo identifying the residual impacts that were encountered during the work along the historically contaminated corridor. This memo is that document.

Response Activities

Enbridge contractor's excavated soil along the *Nemadji Release* corridor using hydrovacuum (hydrovac) trucks and excavators. Historical contamination was typically initially identified by the project contractors in the hydrovac potholes that were used to identify the exact location of buried infrastructure prior to full excavation. Additional contaminated soil was identified during the excavation of the infrastructure. Hydrocarbon contamination was typically identified by the excavation contractors when a rainbow sheen or free-product were observed or if a petroleum odor was present. Enbridge Environment was notified

whenever historical contamination was identified. All soil and water with evidence of hydrocarbon contamination removed from the project excavations was managed by the contractors at the Terminal soil management area (SMA) until off-site disposal could be coordinated. Free-product was remediated with oil absorbent booms or pads when possible. Residual soil contamination that was inaccessible due to the presence of buried infrastructure was left in place. Excavated soil with no evidence of hydrocarbon contamination was either used as backfill or was managed at the SMA in the clean soil handling area. All clean soil stockpiles in the SMA are field screened and sampled prior to off-site management to confirm that contamination is not present.

Enbridge Environment requested that Barr assist with the following activities:

- assess and document environmental site conditions during the response actions and after the completion of excavation activities;
- assist with coordination of the off-site management of contaminated soil and water;
- assess potential site receptors;
- review historical release documents for this location to identify potential contaminant sources, and;
- prepare a memorandum summarizing response actions and site environmental conditions upon the completion of remedial activities.

Field Activities

Barr responded to the Terminal multiple times between March 25, 2015 and March 9, 2016 to document the environmental conditions that were present in the project excavations along the *Nemadji Release* corridor. The areas with identified historical crude oil contamination have been grouped into the following locations (Figure 2):

- Field Booster 18 Area
- Field Booster 17 Area
- Field Booster 16 Area
- Tank 16 Berm

At each location, Barr assessed the environmental conditions in the excavations through field observations, field screening, and/or analytical sampling. Some excavations could not be safely accessed for sampling. As outlined in the conditionally approved WDNR Enbridge Superior Terminal *Site Investigation and Response Action Plan* (SI/RAP) (2014), soil was field screened using an 11.7 eV photoionization detector (PID). The environmental professional's field observations (sheen, odor, discoloration) and the PID results are documented on a field log included in Attachment B. Soil was considered contaminated if headspace readings were greater than 10 parts per million (ppm), or if other evidence of hydrocarbon contamination was observed. If contaminated soil remained in place following excavation activities, analytical soil samples were collected and submitted to a laboratory for analysis of petroleum volatile organic compounds (PVOC) and naphthalene to document the contaminant

concentrations. Although not required by the approach outlined in the SI/RAP, two samples were also analyzed for semi-volatile organic compounds (SVOC's). Soil sample analyte concentrations were compared to WDNR industrial direct contact residual contaminant levels (RCLs), WDNR groundwater RCLs and Cumulative Hazard Index criteria. All excavations were backfilled with clean soil upon completion of project work.

The contaminated soil and water removed from the excavations was characterized for offsite disposal. For this purpose, two soil stockpile samples and two water samples were collected and submitted to ALS Environmental, as described below in the Waste Disposal Coordination and Documentation section of this memo.

Results

The results of Barr's environmental field assessment activities in each of the identified contaminated areas are described below:

Field Booster 18 Area

On March 25, 2015, Enbridge contractor's encountered trace amounts of product and hydrocarbon sheen on water within a hydrovac excavation around valves northeast of Field Booster 18. Barr returned to the site on March 30, 2015 to document the environmental conditions of the completed excavation (Photo 1; Figure 2). The excavation was approximately 15 feet long by 10 feet wide and 7 feet deep (Attachment A). The sidewalls consisted of clay soil with sandy fill around pipeline infrastructure. Groundwater was present in the excavation at approximately 5 feet below ground surface (bgs) (Photo 2).

Barr collected 7 sidewall soil field screening samples from around the excavation perimeter from depths of 3 to 5 feet bgs (Attachment B – 3/30/2015). No evidence of hydrocarbon contamination was identified in the field screening samples or observed in the sidewalls; however, a hydrocarbon sheen and a trace amount of product were observed on the excavation water surface (Photo 2).

No analytical soil samples were collected based on the field screening results (<10 ppm).

Field Booster 17 Area

Hydrocarbon contamination was discovered in or near three project excavations (Field Booster 17 (FB17) Sites 1 through 3) located between the northwest Tank 17 containment berm and the southeast side of the low road (Figure 2a). The conditions encountered in those excavations are described below.

FB17-Site 1

On August 17, 2015, Enbridge contractors discovered crude oil in five hydrovac potholes along the southeast side of the low road (Photos 3 and 4; Figure 2a; Attachment B – 8/17/2015). Barr was onsite on August 17, 18, 21, and 24, 2015 to document field activities and environmental conditions. On August 24, 2015, Barr documented the conditions in the final excavation. The excavation was approximately 90 feet

long by 35 feet wide by 6 to 8 feet deep as shown in Photo 6 and Figure 2. Soil in the sidewalls and bottom consisted primarily of clay.

Barr field screened 20 soil samples from the excavation sidewalls and bottom (Attachment B – 8/24/2015). Residual contamination in the excavation was identified on the west side of the buried pipelines (*B-1, B-3, B-5, S-4, S-6*) and on the east side of the pipelines (*S-14*). Residual contamination was identified primarily below 5 feet bgs with the exception of screening sample *S-14* at 1.5 feet bgs. Contaminated soil headspace readings were between 18.3 and 589 ppm. A small amount of crude oil could be seen seeping out of the sidewall in the northern and western excavation corners (Photo 6). Field screening samples collected from the other excavation extents resulted in headspace readings below 10 ppm and no evidence of hydrocarbon contamination.

Barr collected five analytical soil samples from the excavation sidewalls and base (Figure 2a; Attachment B – 8/24/2015). Samples *TK 14/16-S-3, TK 14/16-B-1,* and *TK 14/16-B-2* were collected from soil with residual contamination. Samples *TK 14/16-S-1 and TK 14/16-S-2* were collected from the direct contact zone above identified contamination. The samples were submitted to ALS Environmental in Holland, Michigan. All detected analyte concentrations were below WDNR Industrial Direct Contact RCLs and passed the Cumulative Hazard Index criteria (Table 1; Attachment C). The analyte concentrations were below WDNR Groundwater RCLs with the exception of benzene exceedances in samples *TK 14/16-B-1* (0.21 mg/kg) and *TK14/16 B-2* (0.086 mg/kg).

FB17 Site 2

On November 6, 2015, Enbridge contractors discovered crude oil in hydrovac potholes between the southeast side of the low road and the planned project excavation (Photo 7; Figure 2a; Attachment B – 11/6/2015). Barr confirmed that hydrocarbon contamination was present that day. Enbridge subsequently completed a project excavation to the southeast of the contaminated potholes. Due to the proximity of the excavation to the potholes, Enbridge requested that Barr return to the site on December 16, 2015 to document environmental conditions within the final excavation. The excavation was approximately 40 feet long by 40 feet wide by 8 feet deep as shown in Photo 8. Soil in the excavation sidewalls and bottom consisted primarily of clay.

Barr field screened 10 soil samples from the excavation sidewalls and bottom (Attachment B – 12/16/2015). All headspace detections were 0.0 ppm and no other evidence of hydrocarbon contamination was observed.

No analytical soil samples were collected based on the excavation field screening results (<10 ppm).

FB17 Site 3

On December 16, 2015, Enbridge contractors discovered hydrocarbon contaminated soil with a sheen and petroleum odor in an excavation between the southeast side of the low road and Field Booster 17 (Figure

2a). Barr confirmed hydrocarbon contamination was present that day but did not field screen soil due to ongoing excavation activities. Barr returned to the site on December 17, 2015 to document environmental conditions within the final excavation (Photos 9 and 10; Attachment B – 12/17/2015). The excavation was approximately 35 feet long by 30 feet wide by 8 feet deep as shown in Photo 8. Soil in the excavation sidewalls and bottom consisted primarily of clay with some sand fill around pipeline infrastructure.

Barr field screened 4 soil samples from the southwest and northeast sidewalls in locations where the samples could be safely collected. Headspace detections greater than 10 ppm and a hydrocarbon odor were detected in samples *S-1* (84 ppm) and *S-3* (69 ppm). Hydrocarbon contamination was not identified in the other two screening samples.

Barr collected two analytical soil samples from the excavation northeast sidewall. Sample *FB17-S-1* was collected from the location of the field screening point with the highest headspace detection (*S-1* at 6 feet bgs) to document the concentration of the residual hydrocarbon contamination. Sample *FB17-S-2* was collected from the sidewall above *FB17-S-1* at 3 feet bgs to document the soil condition in the direct contact zone. The samples were submitted to ALS Environmental in Holland, Michigan and analyzed for PVOC's, naphthalene, and semi-volatile organic compounds (SVOC's). All detected PVOC analyte concentrations were below WDNR industrial direct contact RCL's and groundwater RCL's. The SVOC analyte concentrations were below WDNR industrial direct contact concentrations, with the exception of the *FB17-S-2* Benz[a]anthracene concentration (3 mg/Kg); however, the sample depth (6 feet bgs) was below the direct contact zone. WDNR groundwater RCLs exceedances were detected in both *FB17-S-1* (Chrysene = 0.25 mg/kg) and *FB17-S-2* (Benzo(a)pyrene = 1.8 mg/kg; Benzon(b)fluoranthene = 0.83 mg/kg; Chrysene = 2.7 mg/kg; and Naphthalene = 3.3 mg/kg). Cumulative Hazard Index criteria were met for *FB17-S-1* and were exceeded in *FB17-S-2* due to the industrial direct contact RCL exceedance. The PVOC and naphthalene data are summarized in Table 1 and the laboratory reports are provided in Attachment C.

Field Booster 16 Area

On March 9, 2016, Enbridge contractors discovered hydrocarbon contaminated water with a sheen and free-product hydrovac potholes located between the southeast side of the low road and Field Booster 16 (Photos 11 and 12; Figure 2b; Attachment B – 3/9/2016). Barr confirmed that hydrocarbon contamination was present that day but did not field screen soil. Barr returned to the site on April 8, 2016 to document environmental conditions within the final excavation (Photos 13 and 14; Attachment B – 4/8/2016). The excavation was approximately 35 feet long by 15 feet wide by 10 feet deep. Access to the excavation sidewalls and bottom was limited by sheet piling along the northwest and southeast sidewalls and gravel in the bottom of the excavation. Based on the soil that was exposed and site knowledge, the soil in the excavation extents consisted primarily of clay with some sand fill around pipeline infrastructure.

Small areas of crude oil contaminated soil were identified in the northeast and southwest sidewalls below the direct contact zone (Photo 14). The residual contamination identified in the sidewalls had the same

physical characteristics as residual contamination identified in a Field Booster 16 maintenance excavation where *Nemadji Release* residual contamination was encountered on March 19, 2015 (SERTS ID: 20150319NO16-1). The WDNR was notified about the March 19, 2015 residual contamination, a summary memo was submitted to them on April 4, 2015, and the memo was added to the Nemadji Release BRRTS file as an addendum.

Based on the small amount of observed residual contamination, the limited access to the excavation extents, and the proximity to the recently documented historical contamination, samples were not collected from this location.

Tank 16 Berm

On February 23, 2016, hydrovac operators reported encountering soil with hydrocarbon contamination (sheen, odor) at a depth of greater than 5 feet in an infrastructure foundation pothole on the northern corner of the Tank 16 containment berm (Figure 2b). Barr documented the location of the pothole but was unable to field screen or sample in-situ contaminated soil from this location due to the physical constraints of the pothole. A concrete infrastructure support foundation was constructed within the pothole (Photos 15 and 16).

Receptor Review

Potential direct contact exposure is minimal based on the clean soil used to backfill the excavations and potholes, the training and PPE required for onsite personnel, and the depth (6 feet bgs) of the one industrial direct contact exceedance in the *FB17-Site 3* excavation. The condition of water within the Terminal stormwater ditches is observed by Enbridge personnel on a near-daily basis and evidence of hydrocarbon contamination is immediately reported to Enbridge Environment and addressed in the field.

A facility-wide groundwater monitoring program is conducted at the Superior Terminal as part of the hydrogeologic performance standard established in the approved *SI/RAP* (2014), therefore, project-specific groundwater monitoring is not required for this site. Terminal groundwater monitoring wells located downgradient of the Nemadji corridor include MW-6, MW-14, MW-20a and MW-20b (Figure 2). No hydrocarbon analytes were detected in those wells in the November 2015 and May 2016 sampling events.

No potential vapor receptors were identified along the corridor as defined in the *SI/RAP* (2014).

Waste Disposal Coordination and Documentation

As described above, all soil with identified contamination that was removed from these excavations was placed in the SMA area pending characterization and disposal approval and coordination. Barr collected five representative analytical waste characterization soil samples (*Tank 14/16-Stockpile-1, Tank 14/16-Stockpile-2, Tank 14/16-Stockpile-3, Tank 14/16-Stockpile-4, Tank 14/16-Stockpile-5*) from the contaminated stockpiles for laboratory analysis during different phases of the construction work. The

samples were sent to ALS Environmental and Legend Technical Services laboratories and were analyzed for diesel range organics (DRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX). A waste profile application was submitted to Shamrock Landfill in Cloquet, Minnesota, the application was approved. Approximately 812.08 tons of crude oil impacted soil was managed at the facility under waste profile #CL15-0036. In 2016, a new project profile was set-up using the existing analytical data at the VONCO V landfill in Duluth, Minnesota (profile #16-017-I). Enbridge managed 170.20 tons of project soil at that landfill. The total amount of contaminated soil sent to the landfill from excavations along the *Nemadji Release* corridor was 982.28 tons.

Dewatering was only required for the *FB17-Site 1* excavation area. Water removed from this excavation was assumed to be contaminated and was temporarily containerized until off-site disposal could be coordinated. Barr collected two analytical waste characterization water samples (*Tank 14/16-Water-1 Bin 10* and *Tank 14/16- Water-1 Bin 11*) from the hydrocarbon contaminated water removed from the *FB17-Site 1* excavation. The samples were sent to ALS Environmental for laboratory analysis of DRO and BTEX. A waste water disposal request was submitted to Western Lake Superior Sanitary District (WLSSD) in Duluth, Minnesota and approval was received on August 27, 2015. Approximately 21,400 gallons of crude oil impacted water were transported to WLSSD in September 2015.

Waste profile documents, waste characterization laboratory reports, and disposal summaries are included in Attachment D.

Discussion

Below is a summary of the *Release Information*, *Site Specific Findings*, and a *Receptor Review* associated with the residual crude oil contamination encountered in Enbridge project excavations along the Terminal road where the 2003 *Nemadji Release* occurred:

Release Information

- The 4 project areas with observed residual contamination are located within, or very near to, the identified extents of the historical *Nemadji Release* (Figure 2; Attachment A – Figure). Buried pipeline infrastructure is located throughout the historical release area. Residual soil contamination was present in this area when the WDNR closed the site in 2008.
- No new/active crude oil releases were identified within the excavations.

Site Specific Findings

- *Field Booster 18 Area*: The excavation was located near the southern end of the historical *Nemadji Release* area. Trace amounts of product and a hydrocarbon sheen were observed on water within the excavation but hydrocarbon contaminated soil was not identified in the field screening samples.

- *Field Booster 17 Area - Site 1*: The excavation was located within the historical *Nemadji Release* area. Free-product was identified in pre-excavation hydrovac potholes and trace amounts product and contaminated soil were identified in soil near the bottom of the buried pipelines.
  Five laboratory samples were collected and the detected analyte concentrations were below WDNR industrial direct contact RCL's and passed the passed the Cumulative Hazard Index criteria. Benzene concentrations in two of the samples exceeded WDNR Groundwater RCLs.

- *Field Booster 17 Area – Site 2*: The excavation was located within the historical *Nemadji Release* area. Free-product was identified in pre-excavation hydrovac potholes immediately to the northwest of the excavation. No contamination was documented in the final excavation extents.

- *Field Booster 17 Area – Site 3*: The excavation was located within the historical *Nemadji Release* area. Hydrocarbon contaminated soil with headspace detections greater than 10 ppm was identified in the sidewalls near buried pipeline infrastructure. Two laboratory soil samples were collected and the detected PVOC and naphthalene concentrations were below WDNR industrial direct contact RCL's, Groundwater RCL's, and passed the passed the Cumulative Hazard Index criteria. Two SVOC analyses were also run on these samples and the sample collected from 6 feet bgs had a Benz[a]anthracene detection (3 mg/kg) that exceeded the industrial direct contact RCL (2.1 mg/kg).

- *Field Booster 16 Area*: The excavation was located within the historical release area. Trace amounts of free-product were observed in potholes and in sidewall soil near buried infrastructure. The potholes and excavation were located immediately adjacent to a 2015 historical contamination site that was reported to the WDNR and the contamination was attributed to the *Nemadji Release*.

- Tank 16 Berm: The pothole was located within the historical release area. Soil with a hydrocarbon odor and sheen were identified at depth in a pothole excavation. Soil from the pothole was not accessible for sampling. A concrete foundation was installed within the pothole.

Receptor Review

- Potential direct contact exposure is minimal based the depth of the industrial RCL exceedance (6 feet bgs), the restored site conditions, and personnel training and safety equipment.

- Environmental conditions at the Terminal, including the condition of water within the stormwater ditches along the roadways, are regularly monitored by Terminal personnel and if evidence of hydrocarbon contamination is identified it is reported to Enbridge Environment.

- A facility-wide groundwater monitoring program is conducted at the Superior Terminal as part of the hydrogeologic performance standard established in the approved *SI/RAP* (2014), therefore, project-specific monitoring is not required for this site.

- No potential vapor receptors were identified along the corridor as defined in the *WDNR SI/RAP* (2014).

- Soil and water with identified contamination that was removed from the project excavations was characterized and managed at off-site disposal facilities.

Conclusion

Because the observed hydrocarbon contamination was identified near buried infrastructure located along the historical *Nemadji Release* corridor, residual contamination remained in-situ at the time of BRRTS site closure, and no new release sources were identified during the recent project activity, it is reasonable to attribute the observed contamination to the *Nemadji Release* (WDNR BRRTS # 02-16-513788). The WDNR has also previously attributed identified historical contamination in these locations (SERTS ID: 20150319NO16-1) to the *Nemadji Release*.

Prior to construction activities, no evidence of hydrocarbon contamination was identified at the ground surface. During construction activities, the residual contamination was typically identified in soil near buried infrastructure. Because of its proximity to the buried infrastructure, additional remedial excavation beyond the project extents was not conducted to protect infrastructure integrity. All excavated soil and water with hydrocarbon contamination were managed at an off-site disposal facility.

Analytical samples were typically collected from hydrocarbon contaminated soil that was left in place above the 10 ppm field screening criteria. All detected analyte concentrations were below WDNR industrial direct contact RCL's except for the Benz[a]anthracene detection in *FB17-S-2,* which was located in soil below the direct contact zone. Multiple samples had WDNR ground water exceedances; however, project-specific monitoring is not required for this site because of the facility-wide groundwater monitoring program established in the approved SI/RAP (2014). No analyte concentrations were detected in the downgradient wells during the November 2015 and May 2016 sampling events. The conditions of stormwater in the Terminal ditches in regularly monitored, the risk of direct contact exposure is minimal based on the analytical sample results, the depth of contamination, and personnel training, and no vapor receptors were identified.

Enbridge will continue to monitor the condition of future soil excavated from the *Nemadji Release* corridor area. Contaminated soil that is identified will be reported and managed appropriately. Documentation of the environmental conditions in the final excavations will be submitted to the WDNR, as requested in the approved SI/RAP (2014).

Based on this information, Barr believes that no additional remediation work will be required at these locations. Barr recommends, that the Nemadji Release site remain closed and that this memo be added to the historical BRRTS file as an addendum.

Attachments

Site Photos	1 through 16
Figure 1	Site Location
Figures 2, 2a, 2b	Site Layout Figures
Table 1	Soil Analytical Data Summary
Attachment A	WDNR Communications and Historical Release Information
Attachment B	Site Investigation Field Sampling and Screening Log
Attachment C	ALS Environmental Laboratory Reports for Excavation Soil Samples
Attachment D	Waste Disposal Documentation

Site Photos

Field Booster 18 Area

Photo 1

Photo 2

Photo 1: Field Booster 18 (white pipe on left side of photo) valve excavation. Photo taken facing north on March 30, 2015.
Photo 2: Field Booster 18 valve excavation. A hydrocarbon sheen is visible on the excavation water surface. Photo taken on March 30, 2015.

Field Booster 17 Area – Site 1

Photo 3

Photo 4

Photo 3: Potholes with observed contamination located northwest of Tank 17 and northeast of Field Booster 17 (visible in top left corner). Photo taken facing southwest on August 17, 2015.
Photo 4: A pothole with crude oil contamination. Photo taken on August 17, 2015.

Photo 5

Photo 6

Photo 5: Pipeline excavation. Photo taken facing southwest on August 24, 2015.
Photo 6: Small volume of free-product in a sidewall (bottom right corner) beneath a pipeline (upper left corner) near the southwest end of the excavation. Photo taken facing south on August 24, 2015.

Field Booster 17 Area – Site 2

Photo 7

Photo 8

Photo 7: Hydrovac potholes (PVC pipes surrounded by snow fence) containing hydrocarbon contamination. Photo taken facing south on November 6, 2015.
Photo 8: Construction excavation northwest of Tank 17 and northeast of Field Booster 17. Photo taken facing south on November 16, 2015.

Field Booster 17 Area – Site 3

Photo 9

Photo 10

Photo 9: Excavation north of Field Booster 17 (top right corner). Photo taken facing southeast on December 17, 2015.
Photo 10: Sand and clay fill around pipeline infrastructure in the northern corner of the Field Booster 17 excavation. Photo taken facing northeast on December 17, 2015.

Field Booster 16 Area

Photo 11

Photo 12

Photo 11: Potholes (green vertical piping) located northwest of Field Booster 16. Photo taken facing west on March 9, 2016.
Photo 12: Pothole with crude oil contamination northwest of Field Booster 16. Photo taken on March 9, 2016.

Photo 13

Photo 14

Photo 13: Field Booster 16 excavation. Access to the excavation sidewalls and bottom was limited by the sheet pile and gravel. Photo taken facing southwest on April 8, 2016.
Photo 14: Trace amount of crude oil contamination exposed in the accessible Field Booster 16 sidewall. Photo taken on March 9, 2016.

Tank 16 Berm

Photo 15

Photo 16

Photo 15: New electrical rack foundations along the northwest Tank 16 berm. The foundation pothole with the contractor-observed contamination was on the end near the western corner of the containment basin. Photo taken facing south on February 24, 2016.
Photo 16: Close-up of the foundation that had the contractor-observed contamination. Photo taken on February 24, 2016.

Table 1
Soil Analytical Data Summary
Enbridge Nemadji Release Corridor
Superior, Wisconsin

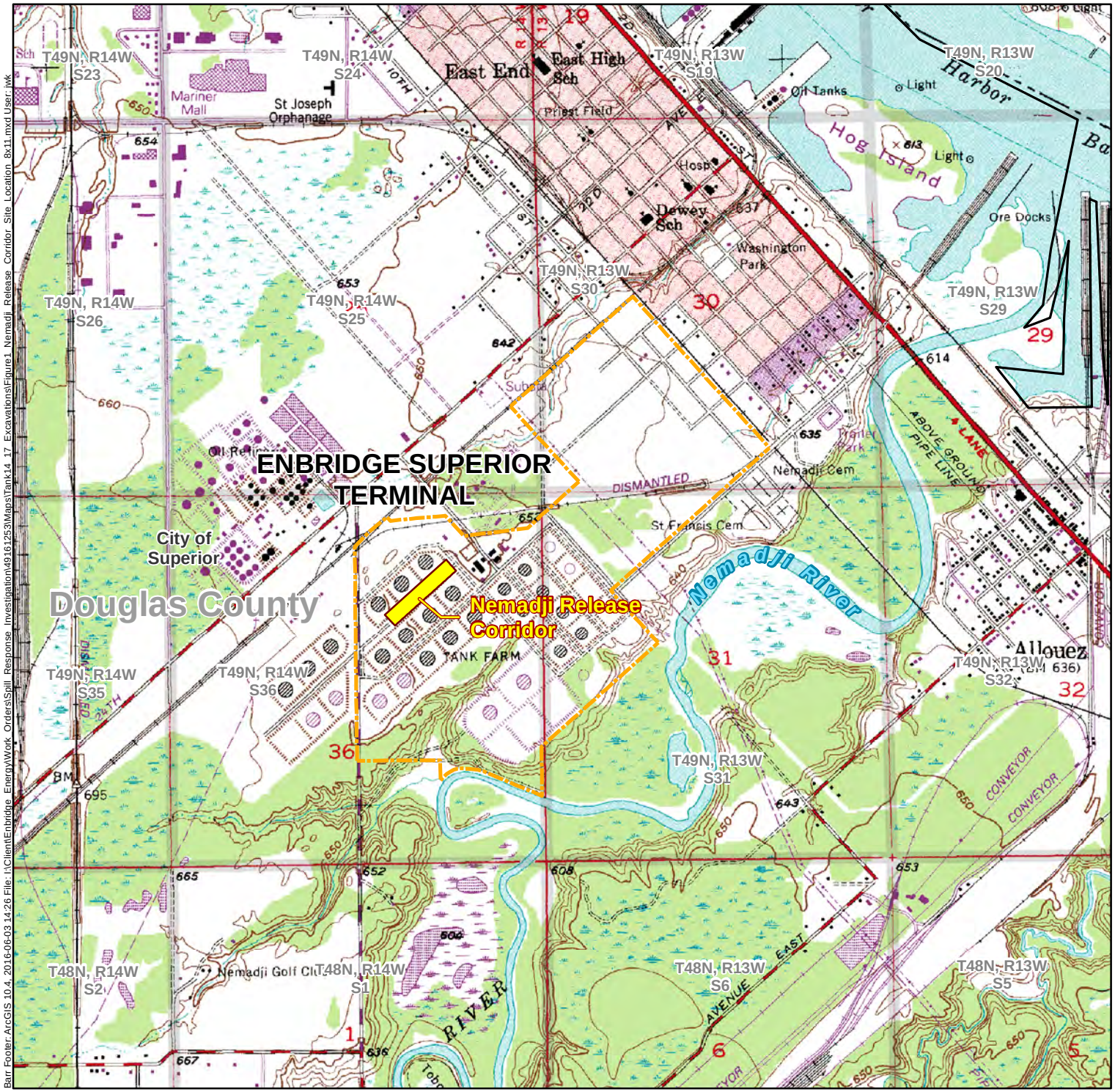
		Parameter	Moisture	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Benzene	Ethyl benzene	Toluene	Xylene, total	Naphthalene	WI DNR RCL Determinations			
	Effective Date	Exceedance Key									Exceedance Count	Hazard Index	Cumulative Cancer Risk	Pass or Fail
Wisconsin Groundwater RCLs	**06/01/2014**	**Bold**		1.3821 TR mg/kg	1.3821 TR mg/kg	**0.0051 mg/kg**	1.57 mg/kg	1.1072 mg/kg	3.96 XYL mg/kg	0.6582 mg/kg				
Wisconsin DC Industrial RCLs	06/01/2014	No Exceed		219 mg/kg	182 mg/kg	7.41 mg/kg	37 mg/kg	818 mg/kg	260 mg/kg	26 mg/kg	0	1	0.00001	Pass
Location	Date	Depth (ft.)												
Field Booster 17 - Site 1														
TK 14/16-B-1	8/24/2015	6 ft	34 %	0.19 mg/kg	< 0.018 mg/kg	**0.21 mg/kg**	0.24 mg/kg	< 0.017 mg/kg	0.87 mg/kg	0.19 mg/kg	0	0.0013	4.2E-08	Pass
TK 14/16-B-2	8/24/2015	8 ft	31 %	1 mg/kg	0.25 mg/kg	**0.086 mg/kg**	< 0.016 mg/kg	< 0.016 mg/kg	0.36 mg/kg	0.28 mg/kg	0	0.0032	2.3E-08	Pass
TK 14/16-S-1	8/24/2015	1.5 ft	22 %	< 0.015 mg/kg	< 0.015 mg/kg	< 0.015 mg/kg	< 0.014 mg/kg	< 0.014 mg/kg	< 0.045 mg/kg	< 0.017 mg/kg	0	0.0001	3.1E-09	Pass
TK 14/16-S-2	8/24/2015	1.5 ft	21 %	< 0.015 mg/kg	< 0.016 mg/kg	< 0.015 mg/kg	< 0.014 mg/kg	< 0.014 mg/kg	< 0.046 mg/kg	< 0.017 mg/kg	0	0.0001	3.1E-09	Pass
TK 14/16-S-3	8/24/2015	1 ft	23 %	< 0.016 mg/kg	< 0.017 mg/kg	< 0.017 mg/kg	< 0.016 mg/kg	< 0.016 mg/kg	< 0.05 mg/kg	< 0.019 mg/kg	0	0.0001	3.5E-09	Pass
Field Booster 17 - Site 3														
FB17-S-1_3[1]	12/17/2015	3 ft	29%	< 0.011 mg/kg	< 0.023 mg/kg	< 0.012 mg/kg	< 0.012 mg/kg	< 0.017 mg/kg	< 0.041mg/kg	0.100 mg/kg	0	0.0002	1.70E-07	Pass
FB17-S-2_6[1]	12/17/2015	6 ft	29%	0.039 mg/kg	< 0.023 mg/kg	0.024 mg/kg	0.042 mg/kg	< 0.017 mg/kg	< 0.041mg/kg	0.039 mg/kg	1[2]	0.0065	1.80E-06	Fail[2]

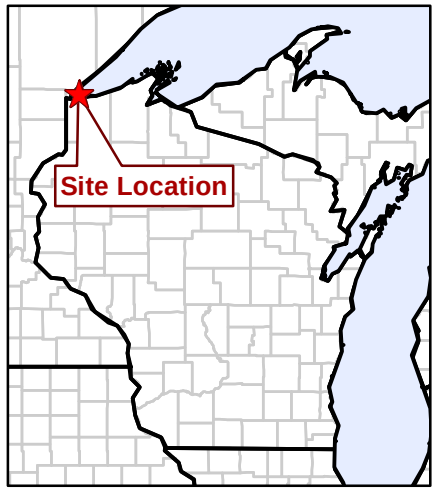
Notes

Laboratory reports are provided in Attachment C.

1 = Samples were also analyzed for SVOC's.

2 = The *FB17-2_6* Benz[a]anthracene concentration (3 mg/Kg) exceeded the WDNR industrial direct contact RCL (2.1 mg/kg).





Nemadji Release Corridor

Terminal Property Boundary

N

0 2,000 4,000

Feet

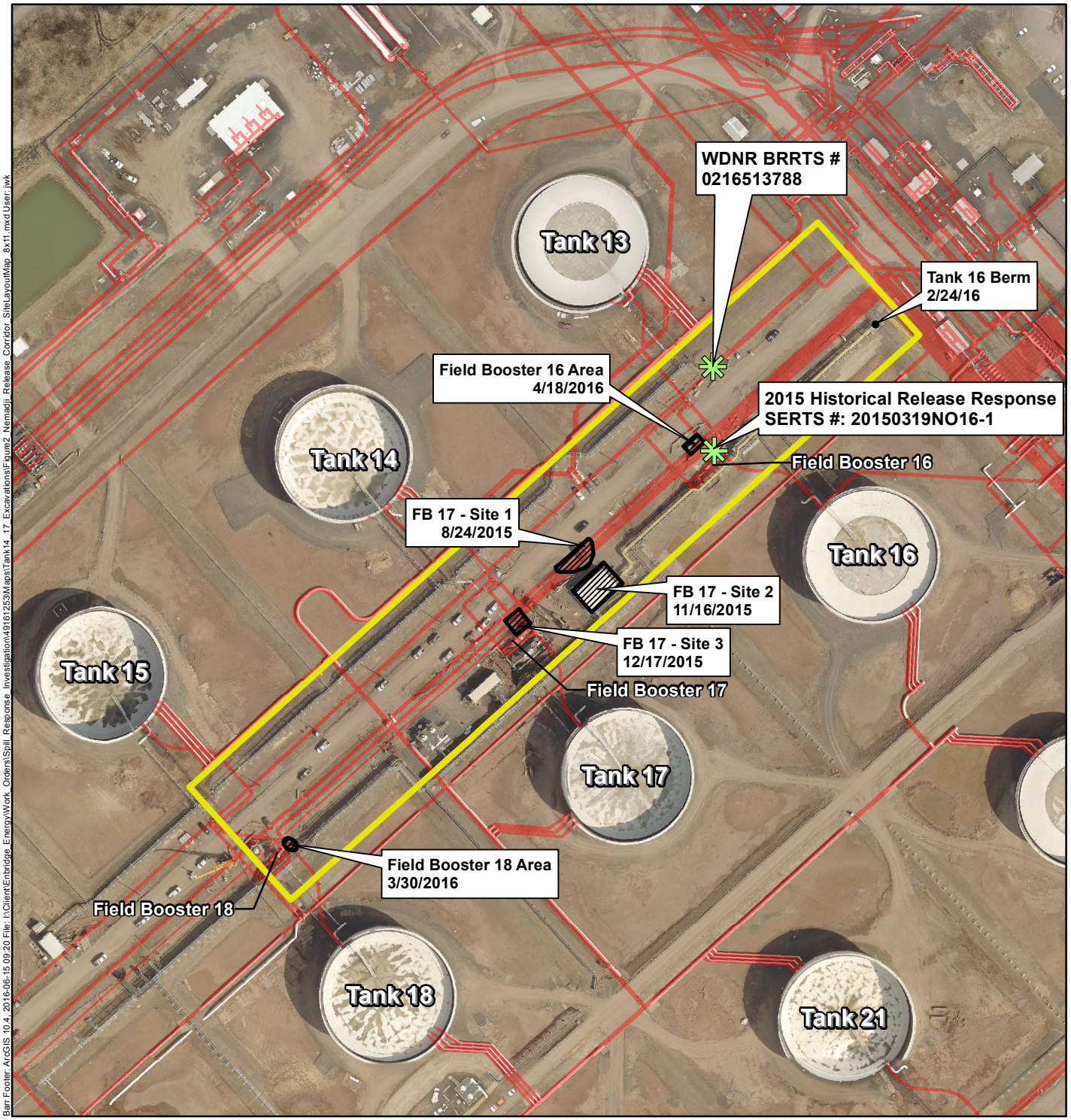
1 Inch = 2,000 Feet

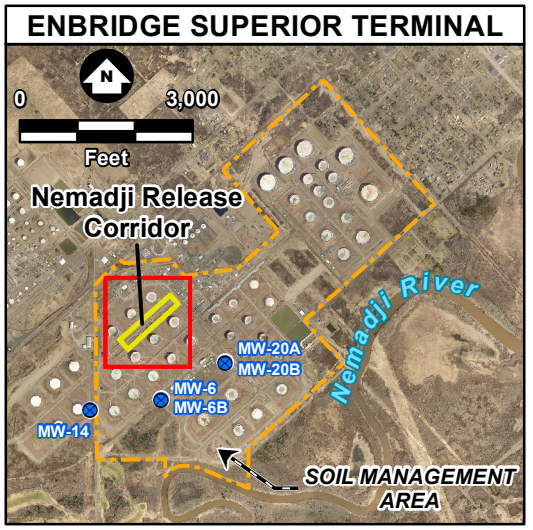
Figure 1

SITE LOCATION
NEMADJI RELEASE CORRIDOR
HISTORICAL CONTAMINATION
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Barr Footer: ArcGIS 10.4, 2016-06-03 14:26 File: I:\Client\Enbridge_EnergyWork_Orders\Spill_Response_Investigation\4916253\Maps\Tank14_17_Excavations\Figure1_Nemadji_Release_Corridor_Site_Location_8x11.mxd User: jwk





Historical Release Location
Monitoring Wells
Nemadji Release Corridor
Excavation Extents
Pipeline Infrastructure
Terminal Property Boundary

N

0 200 400

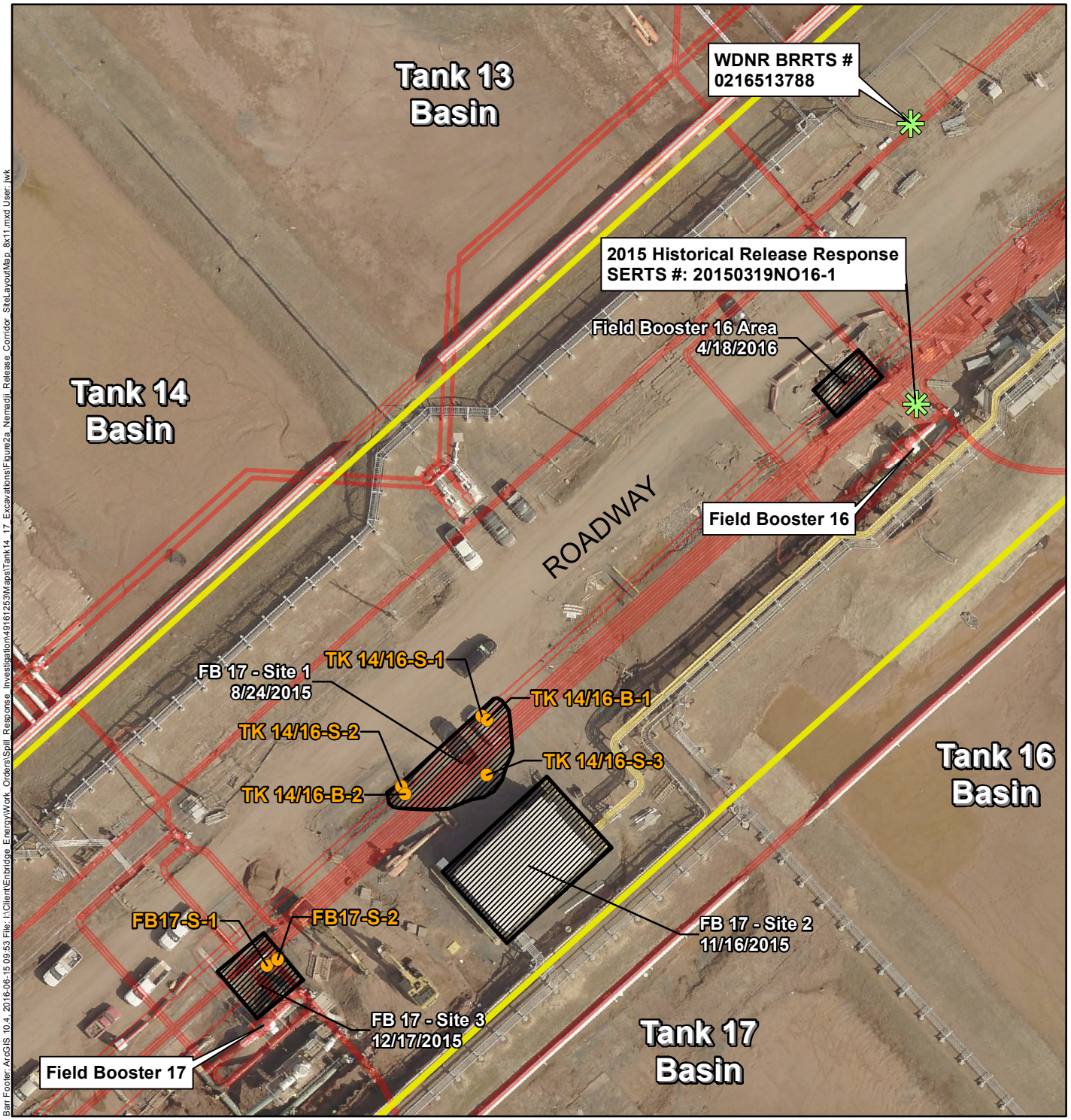
Feet
1 Inch = 200 Feet

Douglas County Imagery Circa 2016

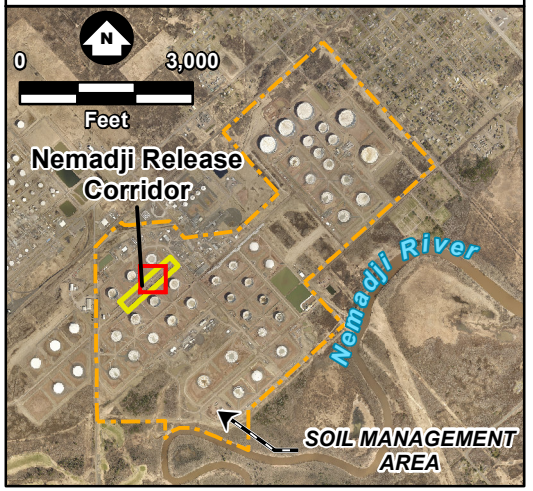
Figure 2

SITE LAYOUT
NEMADJI RELEASE CORRIDOR
HISTORICAL CONTAMINATION
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE



ENBRIDGE SUPERIOR TERMINAL



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

N

0 60 120

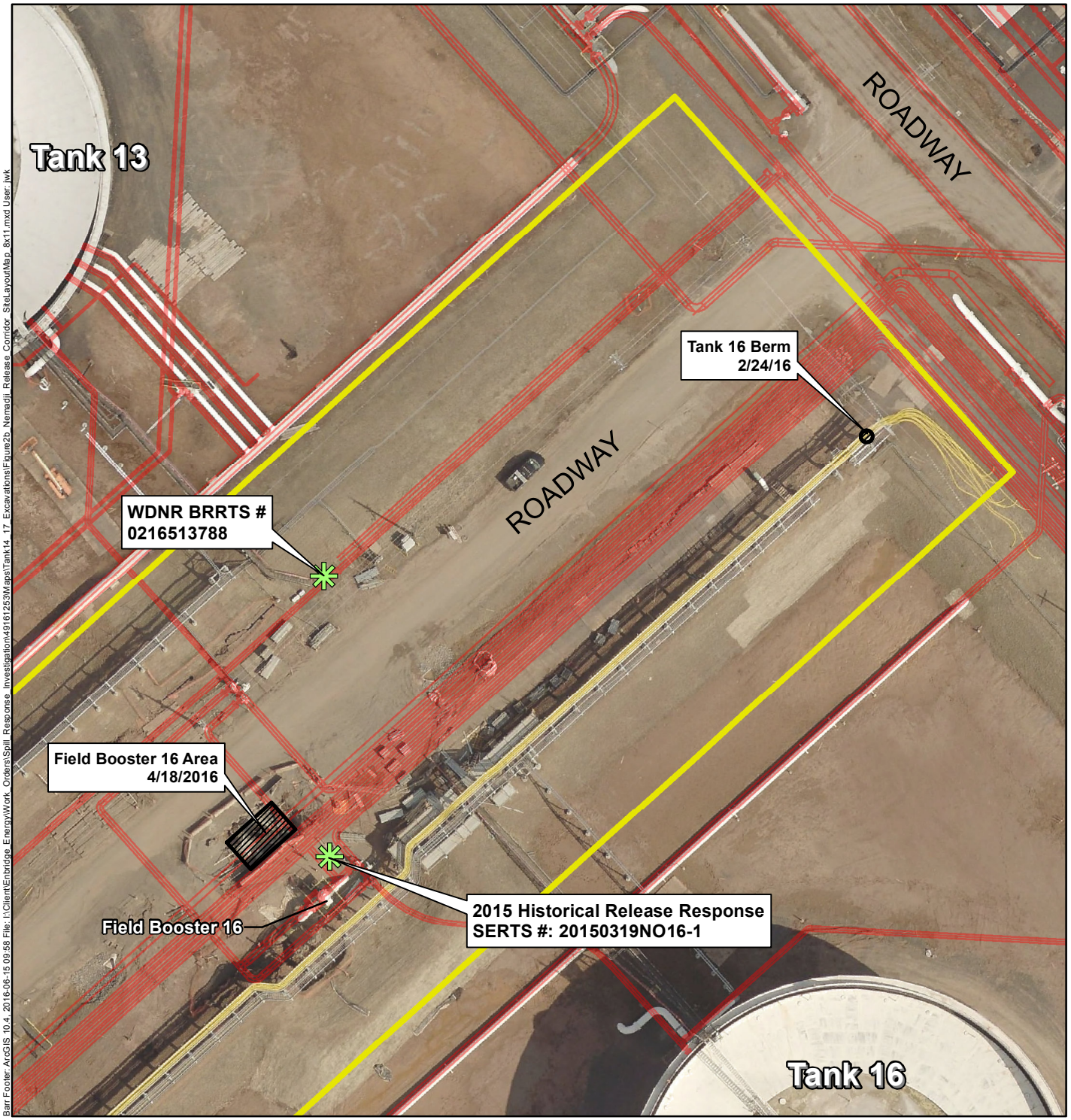
Feet
1 Inch = 60 Feet

Douglas County Imagery Circa 2016

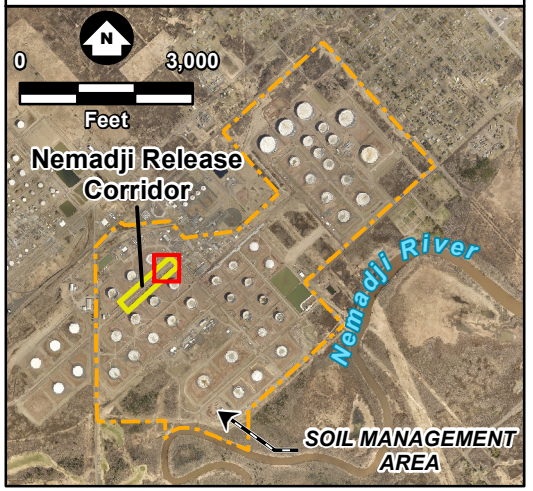
Figure 2a

SITE LAYOUT
NEMADJI RELEASE CORRIDOR
HISTORICAL CONTAMINATION
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE



ENBRIDGE SUPERIOR TERMINAL



Nemadji Release Corridor

Excavation Extents

Pipeline Infrastructure

Terminal Property Boundary

N

0 60 120

Feet

1 Inch = 60 Feet

Douglas County Imagery Circa 2016

Figure 2b

SITE LAYOUT
NEMADJI RELEASE CORRIDOR
HISTORICAL CONTAMINATION
SUPERIOR TERMINAL

Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Attachment A:

WDNR Communications and Historical Release Information

Christopher Goscinak

From: Alex Smith <alex.smith@enbridge.com>
Sent: Thursday, March 19, 2015 4:44 PM
To: Ryan E. Erickson
Cc: Christopher Goscinak
Subject: Fwd: Terminal spill reported today SERTS ID 20150319NO16-1
Attachments: ATT00001.htm; image002.gif; ATT00002.htm; image003.gif; ATT00003.htm; ATT00004.htm; image005.gif; ATT00005.htm; ATT00006.htm; spillTemp.xml682910.pdf; ATT00007.htm

Ryan,

In the morning can you send me a sat image with the gps coordinates? I'll give John a call too and provide an update.

Thanks for all the help today guys!

Alex Smith

Begin forwarded message:

> **From:** "Sager, John E - DNR" <John.Sager@wisconsin.gov>
> **Date:** March 19, 2015 at 4:24:34 PM CDT
> **To:** "Alex Smith (alex.smith@enbridge.com)" <alex.smith@enbridge.com>
> **Subject: Terminal spill reported today SERTS ID 20150319NO16-1**
>
> Hi Alex,
>
> I received the hotline notification for the release reported today. The SERTS ID for the release is 20150319NO16-1. Please use the SERTS ID on correspondence regarding this release. Please send me the coordinates of the spill and a brief status report. I will call you tomorrow morning. If anything comes up that is urgent please call me on my cell phone (715) 490-0123.
>
> Thanks.
>
> **We are committed to service excellence.**
> Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.
>
> John Sager
> Hydrogeologist – Remediation and Redevelopment Program
> Wisconsin Department of Natural Resources
> 1701 N. 4th St.
> Superior, WI 54880
> Phone: (715) 392-7822
> Fax: (715) 392-7993
> john.sager@wisconsin.gov

ENBRIDGE™

Enbridge Energy, Limited Partnership

Figure 2 : Superior Terminal Nemadji Release - Site Map

DATE ISSUED:	1/26/2003
DATE REVISED:	12/12/03
SCALE:	1:6,011
DRAWN BY:	JAS Z:\Enbridge\Leaks, Remediation, Compliance, Operations\Superior Terminal\Superior-Nemadji_Jan24.2003\maps
SERIES:	Douglas County

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
John Gozdzialski, Regional Director

Northern Region Headquarters
107 Sutliff Avenue
Rhinelander, Wisconsin 54501-3349
Telephone 715-365-8900
FAX 715-365-8932
TTY Access via relay - 711

March 24, 2010

Mr. Joseph McGaver
Enbridge Energy
119 N. 25th Street East
Superior, WI 54880

SUBJECT: Final Case Closure with Land Use Limitations or Conditions
Enbridge Energy Co. - Nemadji Release,
Superior, WI 54880

WDNR BRRTS Activity #: 02-16-513788

Dear Mr. McGaver:

On April 3, 2008, the Northern Region Closure Committee reviewed the above referenced case for closure. This committee reviews environmental remediation cases for compliance with state laws and standards to maintain consistency in the closure of these cases. On April 8, 2008, you were notified that the Closure Committee had granted conditional closure to this case.

On May 21, 2008 the Department received correspondence indicating that you have complied with the requirements of closure. Documentation was provided regarding borehole abandonment.

Based on the correspondence and data provided, it appears that your case meets the requirements of ch. NR 726, Wisconsin Administrative Code. The Department considers this case closed and no further investigation or remediation is required at this time.

GIS Registry

The conditions of case closure set out below in this letter require that your site be listed on the Remediation and Redevelopment Program's GIS Registry. The specific reasons are summarized below:

- Residual soil contamination exists that must be properly managed should it be excavated or removed
- If a structural impediment that obstructs a complete site investigation or cleanup is removed or modified, additional environmental work must be completed
- Before the land use could be changed from industrial to non-industrial, additional environmental work must be completed

Information that was submitted with your closure request application will be included on the GIS Registry. To review the sites on the GIS Registry web page, visit the RR Sites Map page at

http://dnr.wi.gov/org/aw/rr/gis/index.htm. If your property is listed on the GIS Registry because of remaining contamination and you intend to construct or reconstruct a well, you will need prior Department approval in accordance with s. NR 812.09(4)(w), Wis. Adm. Code. To obtain approval, Form 3300-254 needs to be completed and submitted to the DNR Drinking and Groundwater program's regional water supply specialist. This form can be obtained on-line http://dnr.wi.gov/org/water/dwg/3300254.pdf or at the web address listed above for the GIS Registry.

Closure Conditions

Please be aware that pursuant to s. 292.12 Wisconsin Statutes, compliance with the requirements of this letter is a responsibility to which you and any subsequent property owners must adhere. If these requirements are not followed or if additional information regarding site conditions indicates that contamination on or from the site poses a threat to public health, safety, welfare, or the environment, the Department may take enforcement action under s. 292.11 Wisconsin Statutes to ensure compliance with the specified requirements, limitations or other conditions related to the property or this case may be reopened pursuant to s. NR 726.09, Wis. Adm. Code. It is the Department's intent to conduct inspections in the future to ensure that the conditions included in this letter including compliance with referenced maintenance plans are met.

Remaining Residual Soil Contamination

Residual soil contamination remains in the area associated with Tank 13 in the area of TP-13 S1 and TP-13 S4, B-2 and B-3 and with Tank 14 in the area of S-BC-8 and SCW-5 as identified on the attached map Superior Terminal Nemadji Release Soil Sample Locations and Cross-Sections dated November 20, 2007, which is attached and was in the information submitted to the Department of Natural Resources. The locations and numbers of the tanks are identified within the property boundaries on the attached Enbridge Energy Co Tank Location Map prepared by the Department ion July 23, 2008. If soil in the specific locations described above is excavated in the future, then pursuant to ch. NR 718 or, if applicable, ch. 289, Stats., and chs. 500 to 536, the property owner at the time of excavation must sample and analyze the excavated soil to determine if residual contamination remains. If sampling confirms that contamination is present the property owner at the time of excavation will need to determine whether the material would be considered solid or hazardous waste and ensure that any storage, treatment or disposal is in compliance with applicable standards and rules. In addition, all current and future owners and occupants of the property need to be aware that excavation of the contaminated soil may pose an inhalation or other direct contact hazard and as a result special precautions may need to be taken to prevent a direct contact health threat to humans.

Structural Impediments

Structural impediments existing at the time of cleanup, piping associated with the tank farm within the area identified as Parcel 3C on the Superior – Terminal: Nemadji Release Map of All Contaminated Properties, made complete remediation of the soil contamination on this property impracticable. Pursuant to s. 292.12(2)(b), Wis. Stats., if the structural impediments on this property that are described above are removed, the property owner shall conduct an investigation of the degree and extent of crude oil contamination. If contamination is found at that time, the Wisconsin Department of Natural Resources shall be immediately notified and the contamination shall be properly remediated in accordance with applicable statutes and rules. If soil in the specific locations described above is excavated, the property owner at the time of

excavation must sample and analyze the excavated soil to determine if residual contamination remains. If sampling confirms that contamination is present the property owner at the time of excavation will need to determine whether the material would be considered solid or hazardous waste and ensure that any storage, treatment or disposal is in compliance with applicable statutes and rules. In addition, all current and future owners and occupants of the property need to be aware that excavation of the contaminated soil may pose an inhalation or other direct contact hazard and as a result special precautions may need to be taken during excavation activities to prevent a health threat to humans.

Industrial Residual Soil Standards

Soil samples that are representative of currently remaining residual soil contamination on this property were collected in April, May and June of 2003, and contained Polynuclear Aromatic Hydrocarbon concentrations that exceeded NR 720.11, Table 2, Wis. Adm. Code, non-industrial soil standards and met NR 720.11, Table 2, Wis. Adm. Code, industrial soil standards. Soil samples that are representative of currently remaining residual soil contamination on this property were collected during several events from March to October of 2003 contained Polynuclear Aromatic Hydrocarbons in concentrations that met the site-specific industrial soil standards developed for this site. Therefore, pursuant to s. 292.12(2)(c), Wis. Stats., the property described above may not be used or developed for a residential, commercial, agricultural or other non-industrial use, unless (at the time that the non-industrial use is proposed) an investigation is conducted, to determine the degree and extent of Polynuclear Aromatic Hydrocarbons contamination that remains on the property, and remedial action is taken as necessary to meet all applicable non-industrial soil cleanup standards. If soil in the specific locations described above is excavated in the future, the property owner at the time of excavation must sample and analyze the excavated soil to determine if residual contamination remains. If sampling confirms that contamination is present the property owner at the time of excavation will need to determine whether the material would be considered solid or hazardous waste and ensure that any storage, treatment or disposal is in compliance with applicable statutes and rules. In addition, all current and future owners and occupants of the property need to be aware that excavation of the contaminated soil may pose an inhalation or other direct contact hazard and as a result special precautions may need to be taken during excavation activities to prevent a health threat to humans.

The Department appreciates your efforts to restore the environment at this site. If you have any questions regarding this closure decision or anything outlined in this letter, please contact me at 715 365-8976.

Sincerely,

John Robinson, Northern Region Team Supervisor
Remediation & Redevelopment Program

Attachments: Superior Terminal Nemadji Release: Soil Sample Locations and Cross Sections
Enbridge Energy Co Tank Location Layout
Superior – Terminal: Nemadji Release Map of All Contaminated Properties

cc: Barry Power – 1409 Hammond Ave., Suite 10
Superior, Wisconsin 54880

Attachment B:

Site Investigation Field Sampling and Screening Logs

Field Booster 18 Area: 3/30/2015
FB17–Site 1: 8/17/2015, 8/24/2015
FB17-Site 2: 11/6/2015, 12/16/2015
FB17-Site 3: 12/17/2015
Field Booster 16 Area: 4/8/2016

Field Booster 18 Area - 1 of 1

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Valves North of Tank 18

Equipment used: Photo *-ionization detector with* 11.7 *eV lamp* Background Headspace: 00 ppm

Sample Nomenclature *(Location - sample type - #):* _____

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Date: 3-30-15

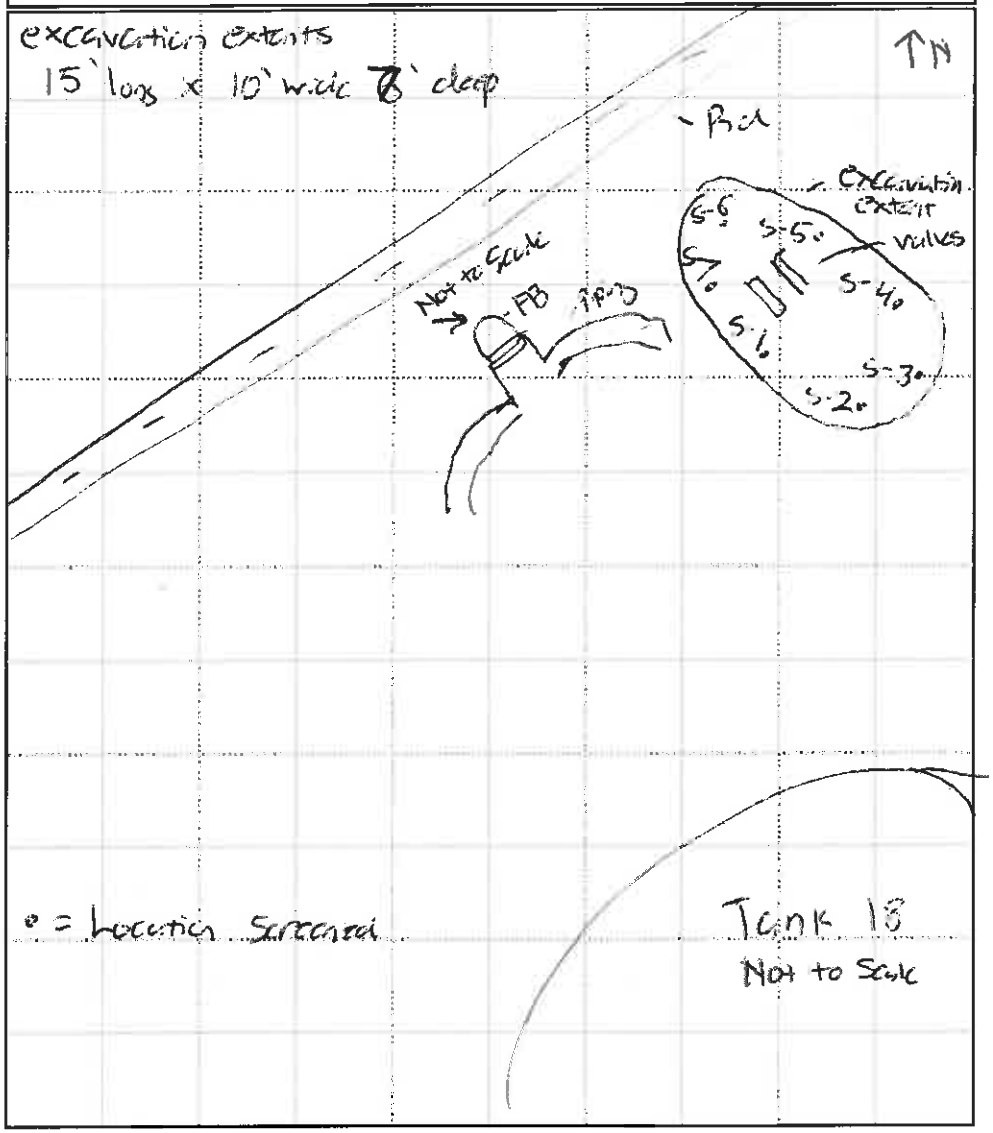
Sampler: NR, SZ

Calibration Time: 0925

BARR

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example TK99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
S-1	4	10:45	CL	Reddish Brown	none/none	0.1
S-2	3					0.0
S-3	4.5					0.0
S-4	5					0.0
S-5	3					0.0
S-6	4					0.0
S-7	4					0.1

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid =*** 10 ***FEET***



Field Booster 17 Area - Site 1: 1 of 3

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Tanks 14 & 17 Potholes Field Sketch

Equipment used: — *-ionization detector with* — *eV lamp*

Background Headspace: — ppm

Date: 8-17-15

Sampler: NRS2

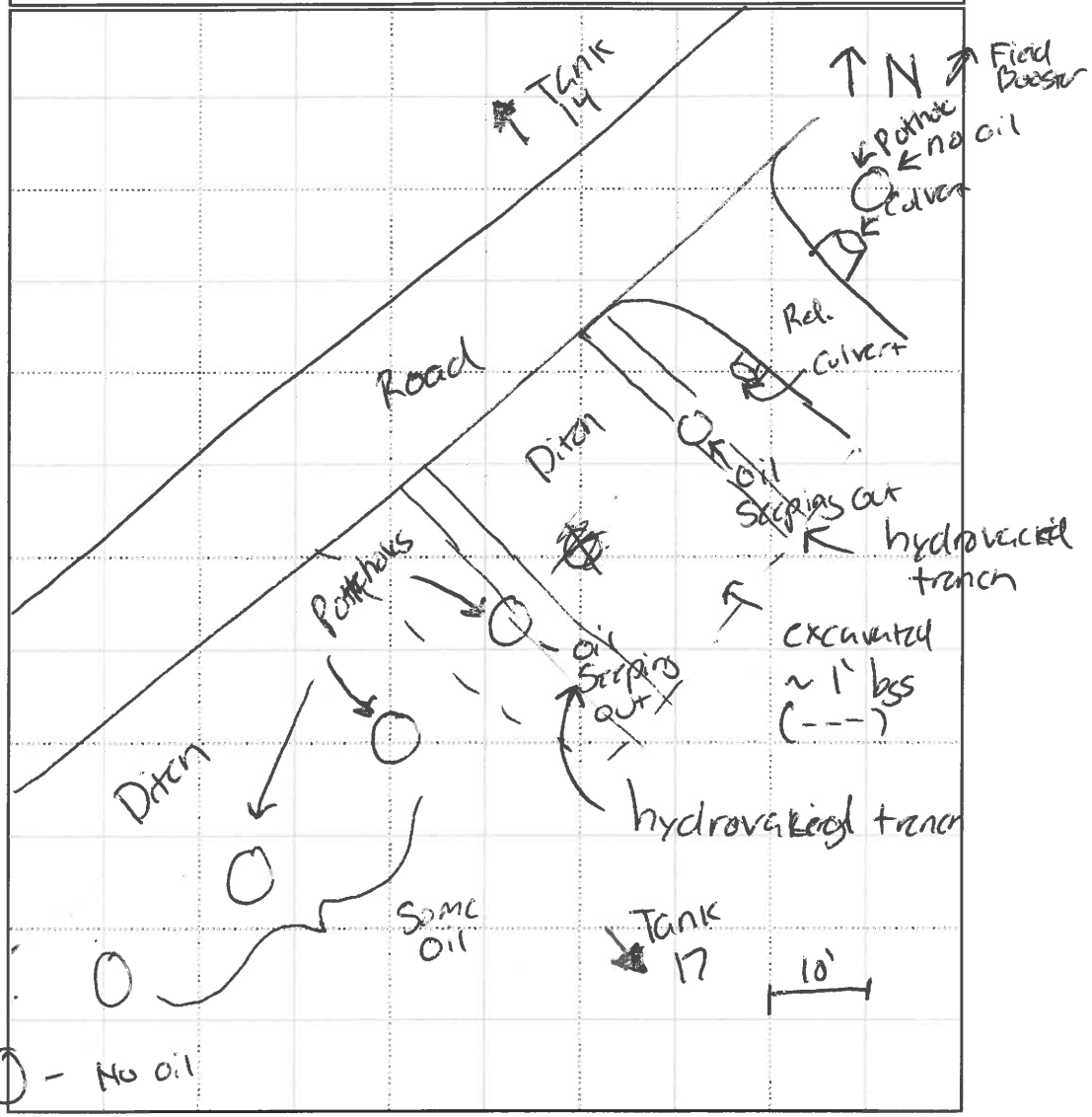
Calibration Time: —

Sample Nomenclature *(Location - sample type - #):* _____

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: Tk99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid =*** 20 ***FEET***



Field Booster 17 Area - Site 1: 2 of 3

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Tank 14/16 Enbridge Terminal Superior WI

Equipment used: PhotoVac *-ionization detector with* 11.7 *eV lamp*

Background Headspace: 0.0 ppm

Date: 8-24-15

Sampler: NRS2

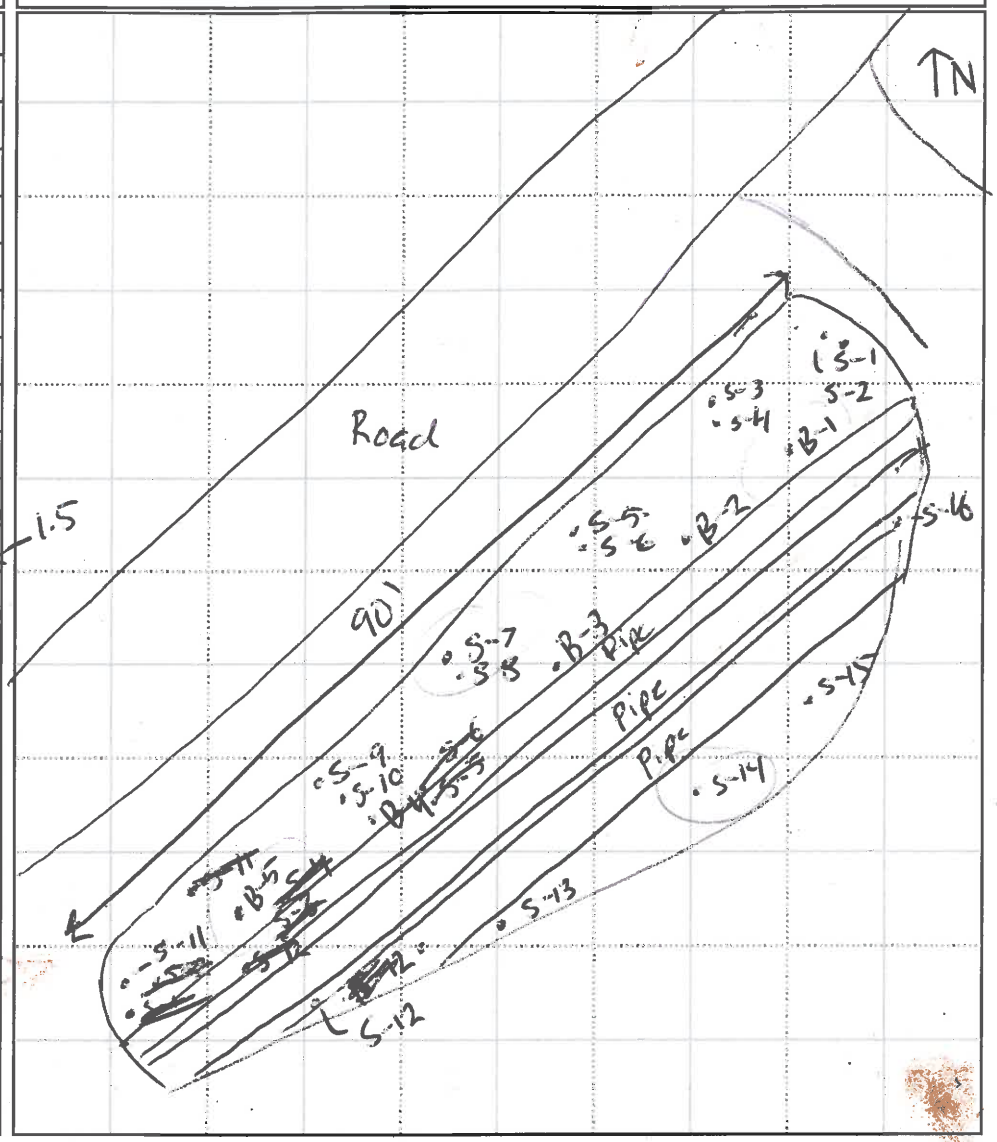
Calibration Time: 0850

Sample Nomenclature *(Location - sample type - #):*

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: TK99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
S-1	2'	1005	CL	Reddish brown	none/none	0.8
S-2	~~6.5~~				Slight/none	5.9
S-3	2.5				none/none	0.3
S-4	5'				none/none	18.8
S-5	1.5				none/none	0.0
S-6	7'				moderate/Sheen	42.4
S-7	2'				Slight/none	0.8
S-8	6				none/none	8.9
S-9	2'	1010				0.0
S-10	6'					~~1.5~~ 0.6
S-11	1'					~~5.10~~
S-12	2'					2.2
S-13	3'					0.5
S-14	1.5					35.4
S-15	2.5					3.5
B-1	6'	1035			Strong/Sheen	589+
B-2	7'				Slight/none	7.9
B-3	8'				none/none	18.3
B-4	8'				none/none	0.8
B-5	7.5				moderate/none	182.0

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid =*** 20 ***FEET***



all odor is a petroleum odor

excavation 6' deep at NE end and 8' deep at SW end

Field Booster 17 Area - Site 1: 3 of 3

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Tank 14/16 Enbridge Terminal Superior WI

Equipment used: Photo *-ionization detector with* 11.7 *eV lamp* Background Headspace: 0.0 ppm

Sample Nomenclature *(Location - sample type - #):* _____

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Date: 8-24-15

Sampler: NJS2

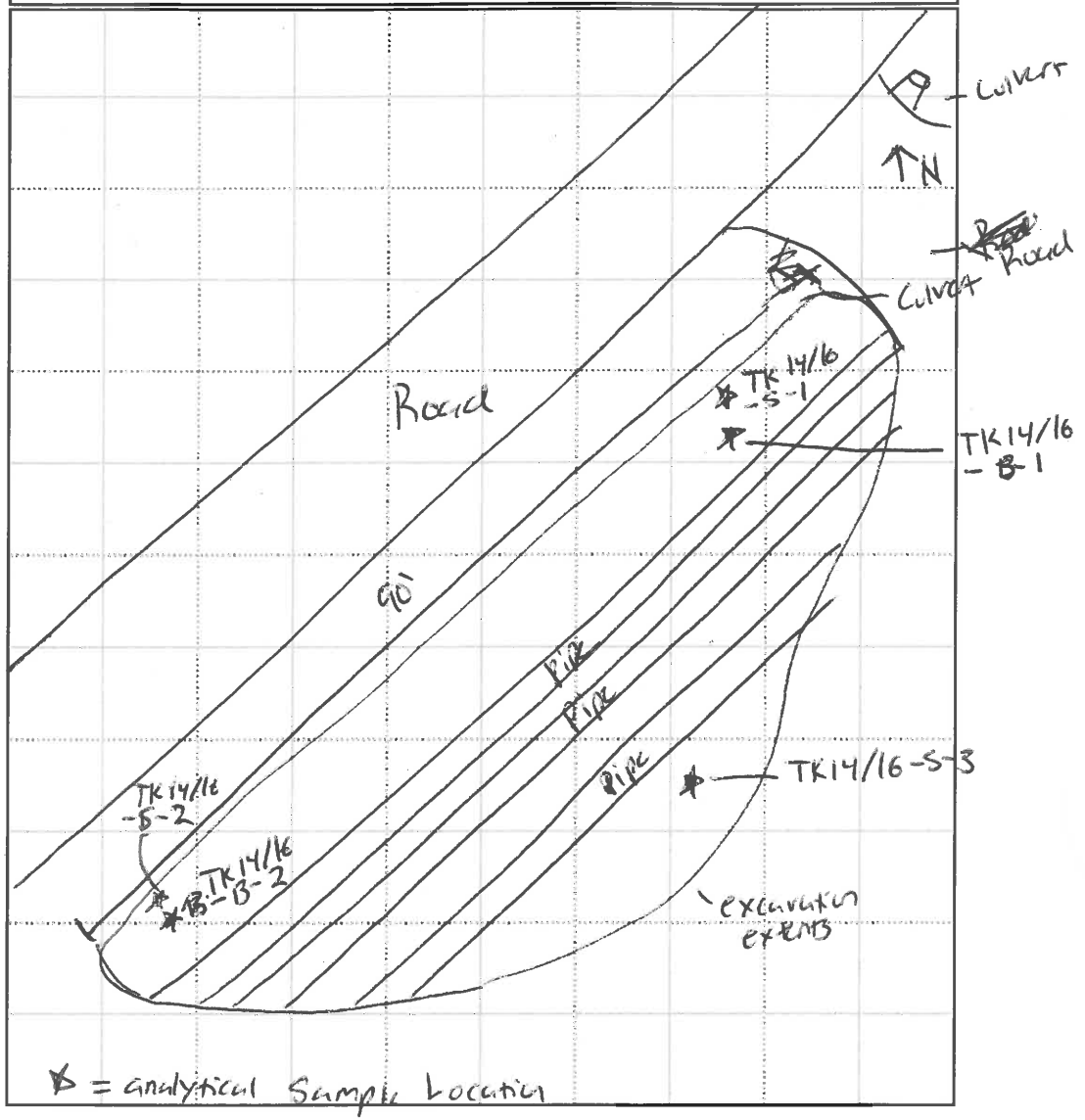
Calibration Time: 0850

BARR

All analytical Samples

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: TK99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
TK 14/16 - S-1	1.5'	11:00	CL	Reddish Brown	none/none	S-3 (0.3)
TK14/16 -S-2	1.5'	11:10	"	"	"	S-11 (1.5)
TK14/16 - S-3	1'	11:15	"	"	"	S-14 (35.4)
TK 14/16 - B-1	6'	11:25	"	"	~~Moderate~~/none	B-1 (584+)
TK14/16 - B-2	8'	11:35	"	"	~~moderate~~/Sheen	B-5 (182)

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid =*** ***FEET***



all odors are petroleum odors

Field Booster 17 Area - Site 2: 1 of 2

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Tank 17 Contamination Site Sketch

Equipment used: — *-ionization detector with* — *eV lamp* Background Headspace: — ppm

Sample Nomenclature *(Location - sample type - #):* _____

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Date: 11/6/15

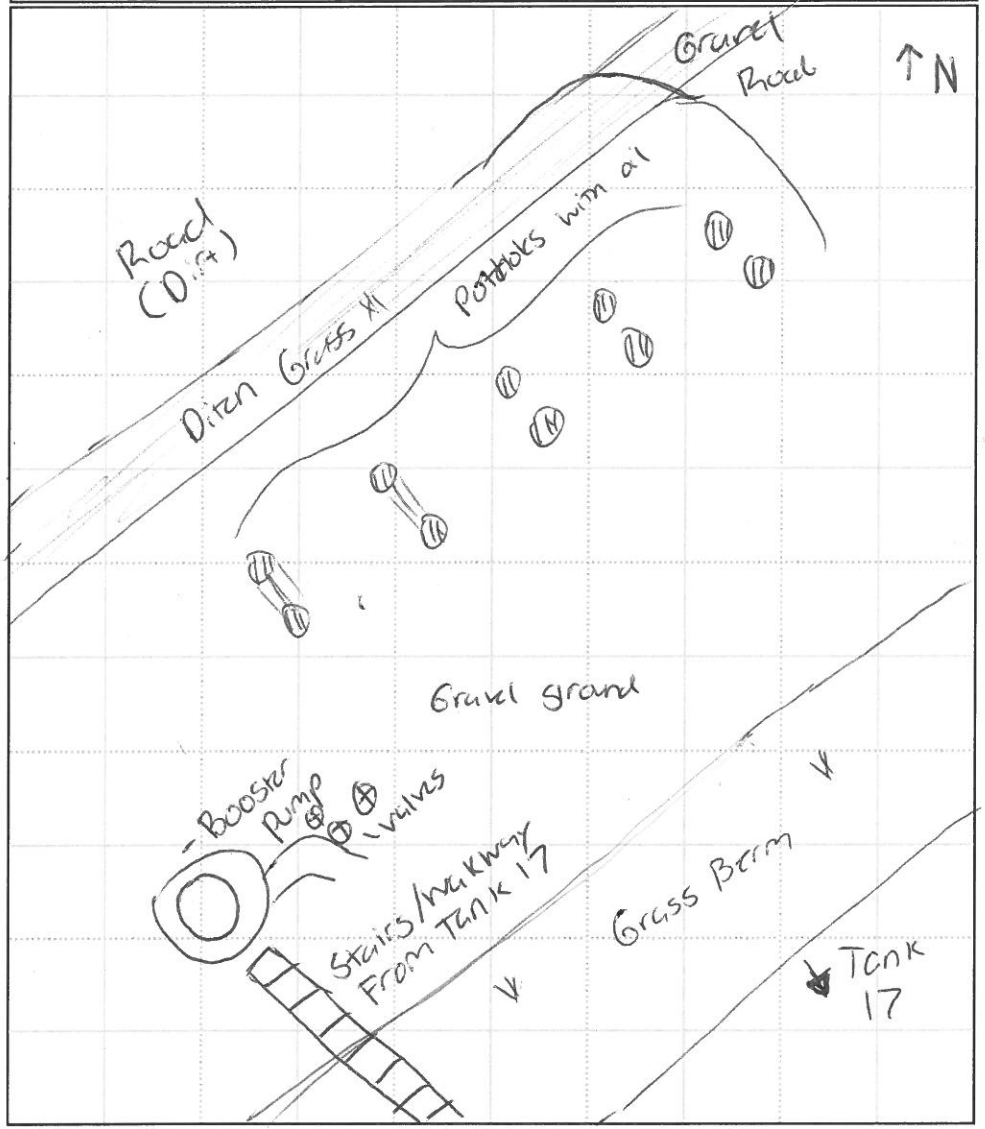
Sampler: NR52

Calibration Time: —

BARR

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: TK99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
N/A						

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid =*** 20 ***FEET***



⓪ = pothole with oil

Field Booster 17 Area - Site 2: 2 of 2

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Tank 17 (N of Tank 17 along Rd outside Containment Berm)

Equipment used: Photo *-ionization detector with* 11.7 *eV lamp* Background Headspace: 0.0 ppm

Date: 12/16/15

Sampler: NRS2

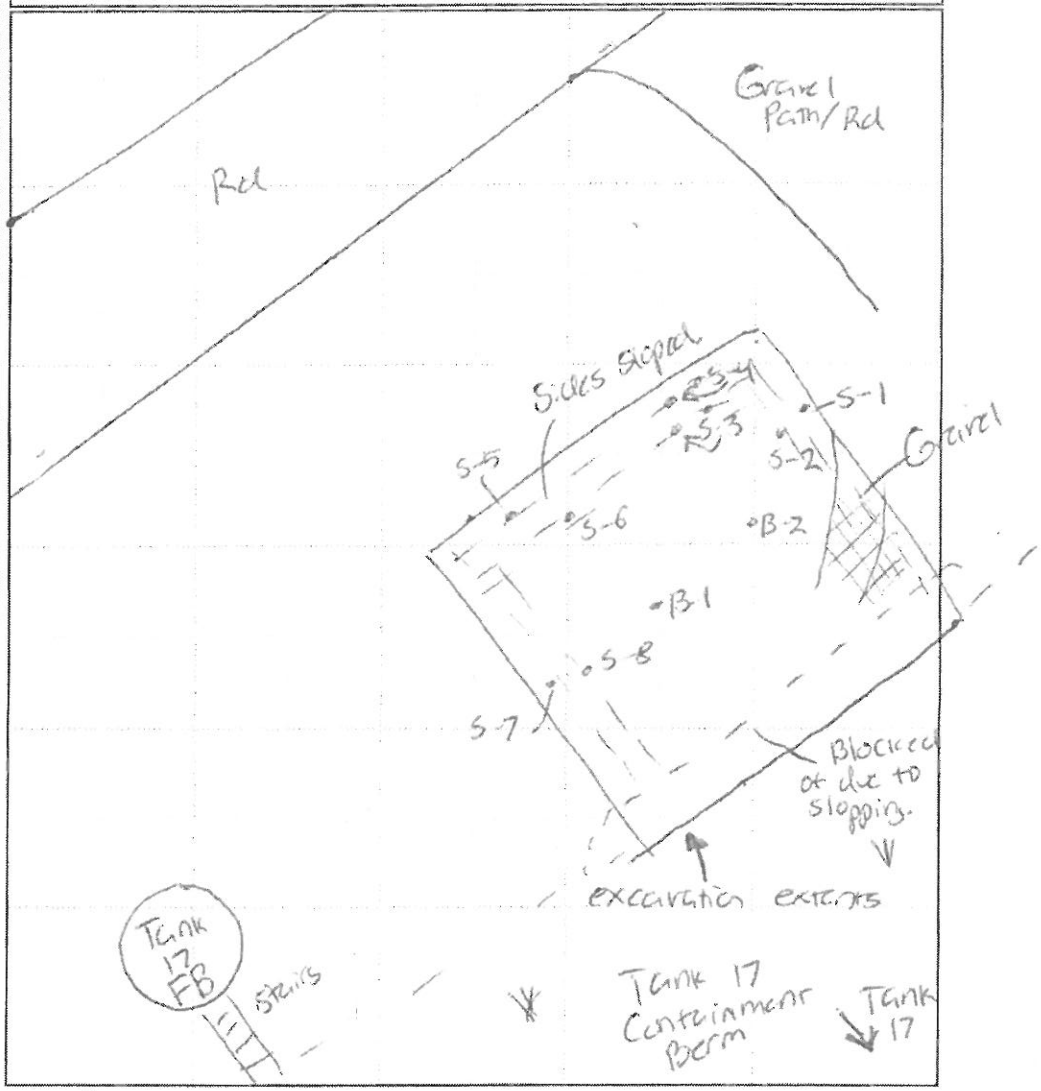
Calibration Time: 10:30

Sample Nomenclature *(Location - sample type - #):* _____

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: TK99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
S-1	2	10:10	CL	Reddish Brown	none/none	0.0
S-2	6					0.0
S-3	5					0.0
S-4	1.5'					0.0
S-5	2	10:20				0.0
S-6	6					0.0
S-7	12.5					0.0
S-8	5					0.0
B-1	7.5	10:30				0.0
B-2	8					0.0

SITE SKETCH: north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features... *1 inch/grid =* 20 *FEET*



Excavation 40' x 40' x 7-8' deep.

0 = Location screened

No analytical Sample Collected.

Field Booster 17 Area - Site 3: 1 of 1

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Tank 17

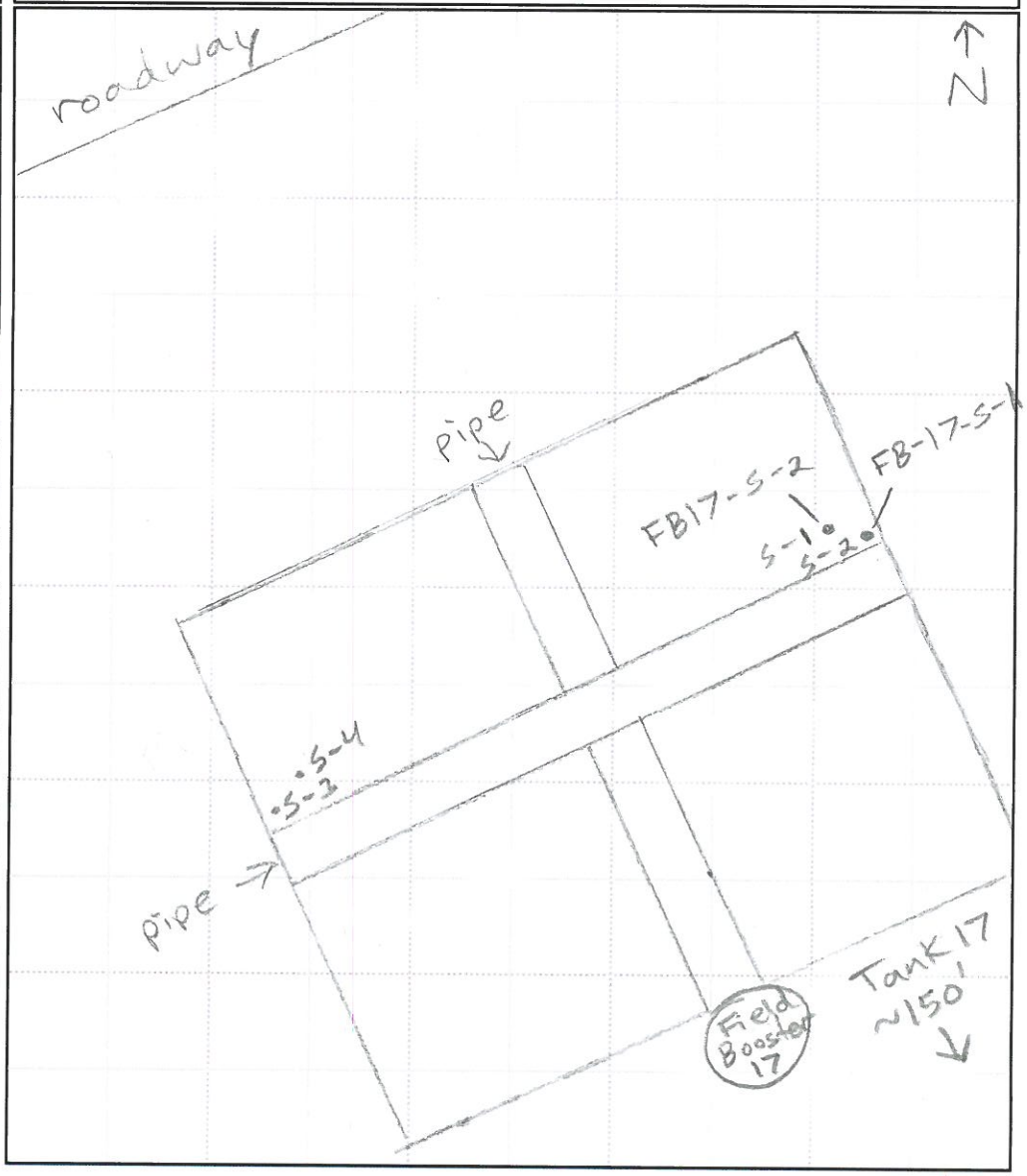
Equipment used: photo *-ionization detector with* 11.7 *eV lamp* Background Headspace: 0.0 ppm Date: 12-17-15

Sample Nomenclature *(Location - sample type - #)*: _____ Sampler: BJL2

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample* Calibration Time: 1020

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: TK99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
S-1	6	1035	SP	brown	Y/N	84+
S-2	3	1037	CL	red brown	N/N	5.0
S-3	2	1039	CL	red brown	Y/N	69+
S-4	6	1041	CL/SP	brown	N/N	3.8
FB17-S-1	3	1100	CL	red brown	N/N	~5
FB17-S-2	6	1110	CL/SP	red brown	Y/N	~84+

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid =*** ~10 ***FEET***



Field Booster 16 Area

SITE LAYOUT

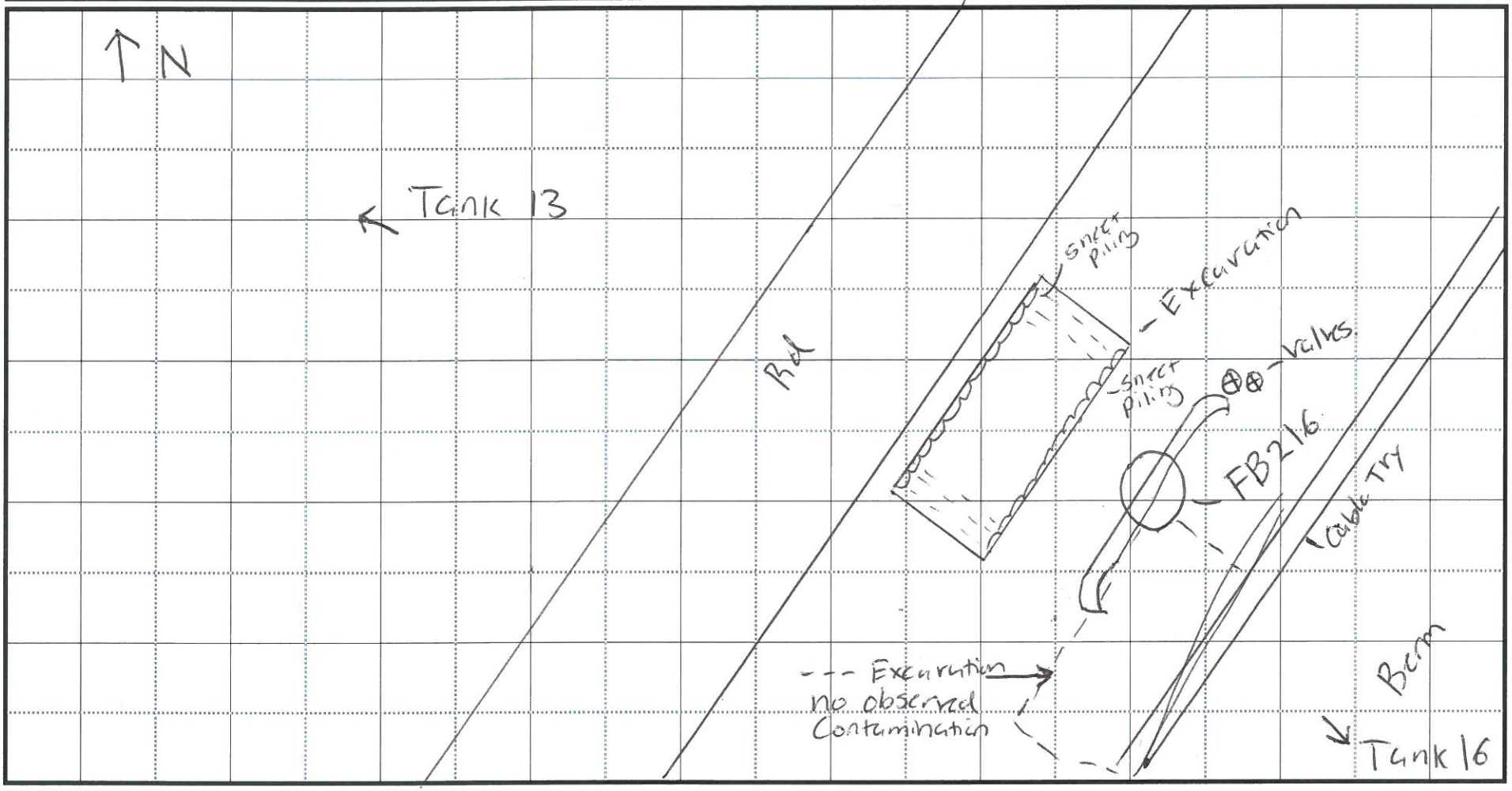
Location: *Milepost or Facility* FB 216 Date: 4/8/16

Barr Personnel: NR52

Was a GPS used to document the location of site features? YES or (NO)

Identify the GPS unit: _____

SITE SKETCH: *north is up; DRAW (to scale) AND LABEL THE LOCATION OF THE FOLLOWING SITE FEATURES, if applicable: release location, maximum extent of release impacts, roads, structures, pipelines and pipeline infrastucture, excavations, stockpiles, borings, wells, water tankers/frac tanks, roll-off containers, equipment staging areas, municipal utilities (electric, water, sewer...), culverts, natural features (water bodies, forested areas...), surface water drainage pathways/direction, other site features* ***1 inch/grid = 20 FEET***



SITE NOTES/LEGEND: Excavation ~ 15' wide x 35' long x 10' deep
Sheet piling on NE and SW ~~sides~~ vertical sides. Gravel in base and NW and SE sides
- NW and SE sides sloped.

Attachment C:

ALS Laboratory Reports for Confirmation Soil Samples
FB17–Site 1: 8/24/2015
FB17-Site 3: 12/17/2015

28-Aug-2015

Ryan Erickson
Barr Engineering Company
4700 West 77th Street
Minneapolis, MN 55435-4803

Re: **Enbridge Tank 14/16 (49161253.28)** Work Order: **15081302**

Dear Ryan,

ALS Environmental received 6 samples on 25-Aug-2015 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 19.

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: 399084510

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ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group USA, Corp

Date: 28-Aug-15

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
Work Order: **15081302**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15081302-01	TK 14/16-S-1	Soil		08/24/15 11:00	08/25/15 10:00	☐
15081302-02	TK 14/16-S-2	Soil		08/24/15 11:10	08/25/15 10:00	☐
15081302-03	TK 14/16-S-3	Soil		08/24/15 11:15	08/25/15 10:00	☐
15081302-04	TK 14/16-B-1	Soil		08/24/15 11:25	08/25/15 10:00	☐
15081302-05	TK 14/16-B-2	Soil		08/24/15 11:35	08/25/15 10:00	☐
15081302-06	Trip Blank	Soil		08/24/15	08/25/15 10:00	☐

ALS Group USA, Corp

Date: 28-Aug-15

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
WorkOrder: **15081302**

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 PQL, 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

ALS Group USA, Corp

Date: 28-Aug-15

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
Work Order: 15081302

Case Narrative

Samples for the above noted Work Order were received on 08/25/15. 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: *28-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
Sample ID: TK 14/16-S-1
Collection Date: 08/24/15 11:00 AM

Work Order: 15081302
Lab ID: 15081302-01
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/25/15		Analyst: **LSY**
1,2,4-Trimethylbenzene	U		15	38	µg/Kg-dry	1	08/26/15 02:54
1,3,5-Trimethylbenzene	U		15	38	µg/Kg-dry	1	08/26/15 02:54
Benzene	U		15	38	µg/Kg-dry	1	08/26/15 02:54
Ethylbenzene	U		14	38	µg/Kg-dry	1	08/26/15 02:54
m,p-Xylene	U		29	77	µg/Kg-dry	1	08/26/15 02:54
Naphthalene	U		17	130	µg/Kg-dry	1	08/26/15 02:54
o-Xylene	U		16	38	µg/Kg-dry	1	08/26/15 02:54
Toluene	U		14	38	µg/Kg-dry	1	08/26/15 02:54
Xylenes, Total	U		45	120	µg/Kg-dry	1	08/26/15 02:54
Surr: 1,2-Dichloroethane-d4	*103*			*70-130*	*%REC*	1	08/26/15 02:54
Surr: 4-Bromofluorobenzene	*92.0*			*70-130*	*%REC*	1	08/26/15 02:54
Surr: Dibromofluoromethane	*100*			*70-130*	*%REC*	1	08/26/15 02:54
Surr: Toluene-d8	*97.0*			*70-130*	*%REC*	1	08/26/15 02:54
MOISTURE		Method: **E160.3M**					Analyst: **EVB**
Moisture	**22**		**0.025**	**0.050**	**% of sample**	1	08/26/15 15:50

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

ALS Group USA, Corp

Date: *28-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
Sample ID: TK 14/16-S-2
Collection Date: 08/24/15 11:10 AM

Work Order: 15081302
Lab ID: 15081302-02
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/25/15		Analyst: **LSY**
1,2,4-Trimethylbenzene	U		15	39	µg/Kg-dry	1	08/26/15 03:20
1,3,5-Trimethylbenzene	U		16	39	µg/Kg-dry	1	08/26/15 03:20
Benzene	U		15	39	µg/Kg-dry	1	08/26/15 03:20
Ethylbenzene	U		14	39	µg/Kg-dry	1	08/26/15 03:20
m,p-Xylene	U		29	77	µg/Kg-dry	1	08/26/15 03:20
Naphthalene	U		17	130	µg/Kg-dry	1	08/26/15 03:20
o-Xylene	U		16	39	µg/Kg-dry	1	08/26/15 03:20
Toluene	U		14	39	µg/Kg-dry	1	08/26/15 03:20
Xylenes, Total	U		46	120	µg/Kg-dry	1	08/26/15 03:20
Surr: 1,2-Dichloroethane-d4	*103*			*70-130*	*%REC*	1	08/26/15 03:20
Surr: 4-Bromofluorobenzene	*90.6*			*70-130*	*%REC*	1	08/26/15 03:20
Surr: Dibromofluoromethane	*102*			*70-130*	*%REC*	1	08/26/15 03:20
Surr: Toluene-d8	*97.5*			*70-130*	*%REC*	1	08/26/15 03:20
MOISTURE		Method: **E160.3M**					Analyst: **EVB**
Moisture	**21**		**0.025**	**0.050**	**% of sample**	1	08/26/15 15:50

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

ALS Group USA, Corp

Date: *28-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
Sample ID: TK 14/16-S-3
Collection Date: 08/24/15 11:15 AM

Work Order: 15081302
Lab ID: 15081302-03
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/25/15		Analyst: **LSY**
1,2,4-Trimethylbenzene	U		16	43	µg/Kg-dry	1	08/26/15 03:45
1,3,5-Trimethylbenzene	U		17	43	µg/Kg-dry	1	08/26/15 03:45
Benzene	U		17	43	µg/Kg-dry	1	08/26/15 03:45
Ethylbenzene	U		16	43	µg/Kg-dry	1	08/26/15 03:45
m,p-Xylene	U		32	85	µg/Kg-dry	1	08/26/15 03:45
Naphthalene	U		19	140	µg/Kg-dry	1	08/26/15 03:45
o-Xylene	U		18	43	µg/Kg-dry	1	08/26/15 03:45
Toluene	U		16	43	µg/Kg-dry	1	08/26/15 03:45
Xylenes, Total	U		50	130	µg/Kg-dry	1	08/26/15 03:45
Surr: 1,2-Dichloroethane-d4	*103*			*70-130*	*%REC*	1	08/26/15 03:45
Surr: 4-Bromofluorobenzene	*92.3*			*70-130*	*%REC*	1	08/26/15 03:45
Surr: Dibromofluoromethane	*103*			*70-130*	*%REC*	1	08/26/15 03:45
Surr: Toluene-d8	*96.9*			*70-130*	*%REC*	1	08/26/15 03:45
MOISTURE		Method: **E160.3M**					Analyst: **EVB**
Moisture	**23**		**0.025**	**0.050**	**% of sample**	1	08/26/15 15:50

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

ALS Group USA, Corp

Date: *28-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
Sample ID: TK 14/16-B-1
Collection Date: 08/24/15 11:25 AM

Work Order: 15081302
Lab ID: 15081302-04
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/25/15		Analyst: **LSY**
1,2,4-Trimethylbenzene	**190**		**17**	**46**	**µg/Kg-dry**	1	08/26/15 04:11
1,3,5-Trimethylbenzene	U		18	46	µg/Kg-dry	1	08/26/15 04:11
Benzene	**210**		**18**	**46**	**µg/Kg-dry**	1	08/26/15 04:11
Ethylbenzene	**240**		**17**	**46**	**µg/Kg-dry**	1	08/26/15 04:11
m,p-Xylene	**620**		**34**	**91**	**µg/Kg-dry**	1	08/26/15 04:11
Naphthalene	190		20	150	µg/Kg-dry	1	08/26/15 04:11
o-Xylene	**240**		**19**	**46**	**µg/Kg-dry**	1	08/26/15 04:11
Toluene	U		17	46	µg/Kg-dry	1	08/26/15 04:11
Xylenes, Total	**870**		**54**	**140**	**µg/Kg-dry**	1	08/26/15 04:11
Surr: 1,2-Dichloroethane-d4	*103*			*70-130*	*%REC*	1	08/26/15 04:11
Surr: 4-Bromofluorobenzene	*96.2*			*70-130*	*%REC*	1	08/26/15 04:11
Surr: Dibromofluoromethane	*99.2*			*70-130*	*%REC*	1	08/26/15 04:11
Surr: Toluene-d8	*98.2*			*70-130*	*%REC*	1	08/26/15 04:11
MOISTURE		Method: **E160.3M**					Analyst: **EVB**
Moisture	**34**		**0.025**	**0.050**	**% of sample**	1	08/26/15 15:50

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

ALS Group USA, Corp

Date: *28-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
Sample ID: TK 14/16-B-2
Collection Date: 08/24/15 11:35 AM

Work Order: 15081302
Lab ID: 15081302-05
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/25/15		Analyst: **LSY**
1,2,4-Trimethylbenzene	**1,000**		**17**	**43**	**µg/Kg-dry**	1	08/26/15 04:36
1,3,5-Trimethylbenzene	**250**		**18**	**43**	**µg/Kg-dry**	1	08/26/15 04:36
Benzene	**86**		**17**	**43**	**µg/Kg-dry**	1	08/26/15 04:36
Ethylbenzene	U		16	43	µg/Kg-dry	1	08/26/15 04:36
m,p-Xylene	**360**		**33**	**87**	**µg/Kg-dry**	1	08/26/15 04:36
Naphthalene	280		19	140	µg/Kg-dry	1	08/26/15 04:36
o-Xylene	U		18	43	µg/Kg-dry	1	08/26/15 04:36
Toluene	U		16	43	µg/Kg-dry	1	08/26/15 04:36
Xylenes, Total	**360**		**51**	**130**	**µg/Kg-dry**	1	08/26/15 04:36
Surr: 1,2-Dichloroethane-d4	*102*			*70-130*	*%REC*	1	08/26/15 04:36
Surr: 4-Bromofluorobenzene	*107*			*70-130*	*%REC*	1	08/26/15 04:36
Surr: Dibromofluoromethane	*97.8*			*70-130*	*%REC*	1	08/26/15 04:36
Surr: Toluene-d8	*100*			*70-130*	*%REC*	1	08/26/15 04:36
MOISTURE		Method: **E160.3M**					Analyst: **EVB**
Moisture	**31**		**0.025**	**0.050**	**% of sample**	1	08/26/15 15:50

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

ALS Group USA, Corp

Date: *28-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14/16 (49161253.28)
Sample ID: Trip Blank
Collection Date: 08/24/15

Work Order: 15081302
Lab ID: 15081302-06
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/25/15		Analyst: **BG**
1,2,4-Trimethylbenzene	U		11	30	µg/Kg	1	08/26/15 17:55
1,3,5-Trimethylbenzene	U		12	30	µg/Kg	1	08/26/15 17:55
Benzene	U		12	30	µg/Kg	1	08/26/15 17:55
Ethylbenzene	U		11	30	µg/Kg	1	08/26/15 17:55
m,p-Xylene	U		23	60	µg/Kg	1	08/26/15 17:55
Naphthalene	U		13	100	µg/Kg	1	08/26/15 17:55
o-Xylene	U		13	30	µg/Kg	1	08/26/15 17:55
Toluene	U		11	30	µg/Kg	1	08/26/15 17:55
Xylenes, Total	U		35	90	µg/Kg	1	08/26/15 17:55
Surr: 1,2-Dichloroethane-d4	*100*			*70-130*	*%REC*	1	08/26/15 17:55
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	1	08/26/15 17:55
Surr: Dibromofluoromethane	*94.0*			*70-130*	*%REC*	1	08/26/15 17:55
Surr: Toluene-d8	*98.6*			*70-130*	*%REC*	1	08/26/15 17:55

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

Batch ID: **75200** Instrument ID **VMS5** Method: **SW8260B**

MBLK Sample ID: **MBLK-75200-75200** Units: **µg/Kg** Analysis Date: **08/25/15 12:26 PM**

Client ID: Run ID: **VMS5_150825A** SeqNo: **3430765** Prep Date: **08/25/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	U	30								
1,3,5-Trimethylbenzene	U	30								
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
Naphthalene	U	100								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*1014*	0	*1000*	0	*101*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*989.5*	0	*1000*	0	*99*	*70-130*	0			
Surr: Dibromofluoromethane	*987*	0	*1000*	0	*98.7*	*70-130*	0			
Surr: Toluene-d8	*989*	0	*1000*	0	*98.9*	*70-130*	0			

LCS Sample ID: **LCS-75200-75200** Units: **µg/Kg** Analysis Date: **08/25/15 11:10 AM**

Client ID: Run ID: **VMS5_150825A** SeqNo: **3430764** Prep Date: **08/25/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	1042	30	1000	0	104	65-135	0			
1,3,5-Trimethylbenzene	1080	30	1000	0	108	65-135	0			
Benzene	1082	30	1000	0	108	75-125	0			
Ethylbenzene	1074	30	1000	0	107	75-125	0			
m,p-Xylene	2146	60	2000	0	107	80-125	0			
Naphthalene	1161	100	1000	0	116	40-140	0			
o-Xylene	1049	30	1000	0	105	75-125	0			
Toluene	1076	30	1000	0	108	70-125	0			
Xylenes, Total	3195	90	3000	0	106	75-125	0			
Surr: 1,2-Dichloroethane-d4	*1009*	0	*1000*	0	*101*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1006*	0	*1000*	0	*101*	*70-130*	0			
Surr: Dibromofluoromethane	*984.5*	0	*1000*	0	*98.4*	*70-130*	0			
Surr: Toluene-d8	*997.5*	0	*1000*	0	*99.8*	*70-130*	0			

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

Client: Barr Engineering Company
Work Order: 15081302
Project: Enbridge Tank 14/16 (49161253.28)

QC BATCH REPORT

Batch ID: **75200** Instrument ID **VMS5** Method: **SW8260B**

MS Sample ID: **15081294-05A MS** Units: **µg/Kg** Analysis Date: **08/26/15 10:57 AM**
Client ID: Run ID: **VMS9_150825B** SeqNo: **3432172** Prep Date: **08/25/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	960.5	30	1000	0	96	65-135	0			
1,3,5-Trimethylbenzene	1019	30	1000	0	102	65-135	0			
Benzene	1014	30	1000	0	101	75-125	0			
Ethylbenzene	954	30	1000	0	95.4	75-125	0			
m,p-Xylene	1930	60	2000	0	96.5	80-125	0			
Naphthalene	822	100	1000	0	82.2	40-140	0			
o-Xylene	929	30	1000	0	92.9	75-125	0			
Toluene	962.5	30	1000	0	96.2	70-125	0			
Xylenes, Total	2859	90	3000	0	95.3	75-125	0			
Surr: 1,2-Dichloroethane-d4	*973*	0	*1000*	0	*97.3*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1082*	0	*1000*	0	*108*	*70-130*	0			
Surr: Dibromofluoromethane	*954*	0	*1000*	0	*95.4*	*70-130*	0			
Surr: Toluene-d8	*986*	0	*1000*	0	*98.6*	*70-130*	0			

MSD Sample ID: **15081294-05A MSD** Units: **µg/Kg** Analysis Date: **08/26/15 11:23 AM**
Client ID: Run ID: **VMS9_150825B** SeqNo: **3432182** Prep Date: **08/25/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	1026	30	1000	0	103	65-135	960.5	6.55	30	
1,3,5-Trimethylbenzene	1050	30	1000	0	105	65-135	1019	3.04	30	
Benzene	1044	30	1000	0	104	75-125	1014	2.96	30	
Ethylbenzene	1010	30	1000	0	101	75-125	954	5.65	30	
m,p-Xylene	2028	60	2000	0	101	80-125	1930	4.98	30	
Naphthalene	854.5	100	1000	0	85.4	40-140	822	3.88	30	
o-Xylene	980.5	30	1000	0	98	75-125	929	5.39	30	
Toluene	1022	30	1000	0	102	70-125	962.5	5.95	30	
Xylenes, Total	3009	90	3000	0	100	75-125	2859	5.11	30	
Surr: 1,2-Dichloroethane-d4	*967.5*	0	*1000*	0	*96.8*	*70-130*	973	*0.567*	*30*	
Surr: 4-Bromofluorobenzene	*1038*	0	*1000*	0	*104*	*70-130*	1082	*4.25*	*30*	
Surr: Dibromofluoromethane	*964*	0	*1000*	0	*96.4*	*70-130*	954	*1.04*	*30*	
Surr: Toluene-d8	*998*	0	*1000*	0	*99.8*	*70-130*	986	*1.21*	*30*	

The following samples were analyzed in this batch:

15081302-01B	15081302-02B	15081302-03B
15081302-04B	15081302-05B	

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

Client: Barr Engineering Company
Work Order: 15081302
Project: Enbridge Tank 14/16 (49161253.28)

QC BATCH REPORT

Batch ID: **75237** Instrument ID **VMS8** Method: **SW8260B**

MBLK Sample ID: **MBLK-75237-75237** Units: **µg/Kg** Analysis Date: **08/25/15 01:06 PM**
Client ID: Run ID: **VMS8_150825A** SeqNo: **3432384** Prep Date: **08/25/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	U	30								
1,3,5-Trimethylbenzene	U	30								
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
Naphthalene	U	100								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*1024*	0	*1000*	0	*102*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*956*	0	*1000*	0	*95.6*	*70-130*	0			
Surr: Dibromofluoromethane	*970*	0	*1000*	0	*97*	*70-130*	0			
Surr: Toluene-d8	*974*	0	*1000*	0	*97.4*	*70-130*	0			

LCS Sample ID: **LCS-75237-75237** Units: **µg/Kg** Analysis Date: **08/25/15 11:29 AM**
Client ID: Run ID: **VMS8_150825A** SeqNo: **3432383** Prep Date: **08/25/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	1118	30	1000	0	112	65-135	0			
1,3,5-Trimethylbenzene	1090	30	1000	0	109	65-135	0			
Benzene	1045	30	1000	0	104	75-125	0			
Ethylbenzene	1092	30	1000	0	109	75-125	0			
m,p-Xylene	2140	60	2000	0	107	80-125	0			
Naphthalene	1174	100	1000	0	117	40-140	0			
o-Xylene	1023	30	1000	0	102	75-125	0			
Toluene	1048	30	1000	0	105	70-125	0			
Xylenes, Total	3164	90	3000	0	105	75-125	0			
Surr: 1,2-Dichloroethane-d4	*1009*	0	*1000*	0	*101*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1025*	0	*1000*	0	*102*	*70-130*	0			
Surr: Dibromofluoromethane	*997.5*	0	*1000*	0	*99.8*	*70-130*	0			
Surr: Toluene-d8	*1018*	0	*1000*	0	*102*	*70-130*	0			

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

Client: Barr Engineering Company
Work Order: 15081302
Project: Enbridge Tank 14/16 (49161253.28)

QC BATCH REPORT

Batch ID: **75237** Instrument ID **VMS8** Method: **SW8260B**

LCS Sample ID: **LCS-75237-75237** Units: **µg/Kg** Analysis Date: **08/26/15 12:45 PM**
Client ID: Run ID: **VMS5_150826A** SeqNo: **3433467** Prep Date: **08/25/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	1038	30	1000	0	104	65-135	0			
1,3,5-Trimethylbenzene	1100	30	1000	0	110	65-135	0			
Benzene	1084	30	1000	0	108	75-125	0			
Ethylbenzene	1078	30	1000	0	108	75-125	0			
m,p-Xylene	2158	60	2000	0	108	80-125	0			
Naphthalene	1138	100	1000	0	114	40-140	0			
o-Xylene	1050	30	1000	0	105	75-125	0			
Toluene	1078	30	1000	0	108	70-125	0			
Xylenes, Total	3208	90	3000	0	107	75-125	0			
Surr: 1,2-Dichloroethane-d4	*997*	0	*1000*	0	*99.7*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1013*	0	*1000*	0	*101*	*70-130*	0			
Surr: Dibromofluoromethane	*976*	0	*1000*	0	*97.6*	*70-130*	0			
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0			

MS Sample ID: **15081325-07A MS** Units: **µg/Kg** Analysis Date: **08/25/15 11:37 PM**
Client ID: Run ID: **VMS6_150825A** SeqNo: **3431736** Prep Date: **08/25/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	980	30	1000	0	98	65-135	0			
1,3,5-Trimethylbenzene	1012	30	1000	0	101	65-135	0			
Benzene	1016	30	1000	0	102	75-125	0			
Ethylbenzene	981.5	30	1000	0	98.2	75-125	0			
m,p-Xylene	1998	60	2000	0	99.9	80-125	0			
Naphthalene	931.5	100	1000	0	93.2	40-140	0			
o-Xylene	962.5	30	1000	0	96.2	75-125	0			
Toluene	993.5	30	1000	0	99.4	70-125	0			
Xylenes, Total	2961	90	3000	0	98.7	75-125	0			
Surr: 1,2-Dichloroethane-d4	*1020*	0	*1000*	0	*102*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1029*	0	*1000*	0	*103*	*70-130*	0			
Surr: Dibromofluoromethane	*980*	0	*1000*	0	*98*	*70-130*	0			
Surr: Toluene-d8	*991.5*	0	*1000*	0	*99.2*	*70-130*	0			

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

Client: Barr Engineering Company
Work Order: 15081302
Project: Enbridge Tank 14/16 (49161253.28)

QC BATCH REPORT

Batch ID: **75237** Instrument ID **VMS8** Method: **SW8260B**

MSD	Sample ID: **15081325-07A MSD**			Units: **µg/Kg**			Analysis Date: **08/26/15 12:03 PM**			
Client ID:		Run ID: **VMS6_150825A**		SeqNo: **3431737**		Prep Date: **08/25/15**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	1034	30	1000	0	103	65-135	980	5.31	30	
1,3,5-Trimethylbenzene	1088	30	1000	0	109	65-135	1012	7.28	30	
Benzene	1094	30	1000	0	109	75-125	1016	7.4	30	
Ethylbenzene	1054	30	1000	0	105	75-125	981.5	7.12	30	
m,p-Xylene	2124	60	2000	0	106	80-125	1998	6.11	30	
Naphthalene	1098	100	1000	0	110	40-140	931.5	16.4	30	
o-Xylene	1020	30	1000	0	102	75-125	962.5	5.8	30	
Toluene	1064	30	1000	0	106	70-125	993.5	6.85	30	
Xylenes, Total	3144	90	3000	0	105	75-125	2961	6.01	30	
Surr: 1,2-Dichloroethane-d4	*1020*	0	*1000*	0	*102*	*70-130*	1020	*0.049*	*30*	
Surr: 4-Bromofluorobenzene	*1020*	0	*1000*	0	*102*	*70-130*	1029	*0.829*	*30*	
Surr: Dibromofluoromethane	*977*	0	*1000*	0	*97.7*	*70-130*	980	*0.307*	*30*	
Surr: Toluene-d8	*986.5*	0	*1000*	0	*98.6*	*70-130*	991.5	*0.506*	*30*	

The following samples were analyzed in this batch: 15081302-06A

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

Client: Barr Engineering Company
Work Order: 15081302
Project: Enbridge Tank 14/16 (49161253.28)

QC BATCH REPORT

Batch ID: **R170433** Instrument ID **MOIST** Method: **E160.3M**

MBLK Sample ID: **WBLKS-R170433** Units: **% of sample** Analysis Date: **08/26/15 03:50 PM**
Client ID: Run ID: **MOIST_150826B** SeqNo: **3433801** Prep Date: DF: **1**

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

LCS Sample ID: **LCS-R170433** Units: **% of sample** Analysis Date: **08/26/15 03:50 PM**
Client ID: Run ID: **MOIST_150826B** SeqNo: **3433799** Prep Date: DF: **1**

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

DUP Sample ID: **15081351-01B DUP** Units: **% of sample** Analysis Date: **08/26/15 03:50 PM**
Client ID: Run ID: **MOIST_150826B** SeqNo: **3433780** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.75	0.050	0	0	0		11.19	4.88	20	

DUP Sample ID: **15081369-01A DUP** Units: **% of sample** Analysis Date: **08/26/15 03:50 PM**
Client ID: Run ID: **MOIST_150826B** SeqNo: **3433795** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	6.15	0.050	0	0	0		6.56	6.45	20	

The following samples were analyzed in this batch:

15081302-01A	15081302-02A	15081302-03A
15081302-04A	15081302-05A	

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

15081302

Chain of Custody

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

Project Number: 49161253.28 001 001

Project Name: Enbridge Tank 14/16

Sample Origination State WI (use two letter postal state abbreviation)

COC Number: № 43636

COC 1 of 1

Project Manager: REE

Project QC Contact: JET

Sampled by: NRS2

Laboratory: ALS Holland

Location	Start Depth	Stop Depth	Depth Unit (m/ft or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	GRO, BTEX (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	PVOC-MTBE+naphthalene	Total Number Of Containers	
1. TK14/16-S-1	—	—	1.5'	8/24/15	11:00		X	X															1	2	3	PVOC - MTBE + naphthalene
2. TK14/16-S-2	—	—	1.5'	8/24/15	11:10		X	X															1	2	3	"
3. TK14/16-S-3	—	—	1'	8/24/15	11:15		X	X															1	2	3	"
4. TK14/16-B-1	—	—	6'	8/24/15	11:25		X	X															1	2	3	"
5. TK14/16-B-2	—	—	8'	8/24/15	11:35		X	X															1	2	3	"
6. Trip Blank	—	—	—	—	—					X													1		1	
7. Temp Blank	—	—	—	—	—					X															1	Standard TAT
8.																										
9.																										
10.																										

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, 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:	On Ice?	Date	Time	Received by:	Date	Time
Nicole Sucic	(Y) N	8-24-15	1330	SWilson	8/25	10:00
Relinquished By:	On Ice? (Y) N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☑ Federal Express ☐ Sampler ☐ Other: _____

Air Bill Number:

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

H:RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09\01\09

3.2°C

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

CUSTODY SEAL

Project Name: Endress Tank: 14/16 Project Number: 49161253.28 001 001

Date: 8-24-15 Initials: NRS2 Signature: Noelle Scelina

BARR

Container # 1 of 1

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **BARRENG-MN** Date/Time Received: **25-Aug-15 10:00**

Work Order: **15081302** Received by: **KRW**

Checklist completed by Keith Wierenga eSignature 25-Aug-15 Date Reviewed by: Tom Bramish eSignature 25-Aug-15 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 ☐	
Temperature(s)/Thermometer(s):	3.2/3.2 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	8/25/2015 2:17:29 PM		
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:

CorrectiveAction:

23-Dec-2015

Laura Novitzki
Barr Engineering Company
4300 MarketPointe Drive
Suite 200
Minneapolis, MN 55435

Re: **Tank 17 BP (49161253.28)** Work Order: **15121194**

Dear Laura,

ALS Environmental received 2 samples on 18-Dec-2015 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 16.

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: 399084510

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group USA, Corp

Date: 23-Dec-15

Client: Barr Engineering Company
Project: Tank 17 BP (49161253.28)
Work Order: **15121194**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15121194-01	FB17-S-1_3	Soil		12/17/15 11:00	12/18/15 09:30	☐
15121194-02	FB17-S-2_6	Soil		12/17/15 11:10	12/18/15 09:30	☐

ALS Group USA, Corp

Date: 23-Dec-15

Client: Barr Engineering Company
Project: Tank 17 BP (49161253.28)
WorkOrder: **15121194**

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 PQL, 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-dry	Micrograms per Kilogram Dry Weight

ALS Group USA, Corp

Date: 23-Dec-15

Client: Barr Engineering Company
Project: Tank 17 BP (49161253.28)
Work Order: 15121194

Case Narrative

Samples for the above noted Work Order were received on 12/18/15. 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:
Batch 80507, Method SVO_8270_S, Sample 15121194-01A MSD: The RPD between the MS and MSD was outside the control limit for several compounds. The corresponding results in the parent sample should be considered estimated.

Batch 80507, Method SVO_8270_S, Sample 15121194-01A MSD: The MSD recovery was below the lower control limit. The corresponding results in the parent sample may be biased low for the associated compounds.

No other deviations or anomalies were noted.

Wet Chemistry:
No deviations or anomalies were noted.

ALS Group USA, Corp

Date: *23-Dec-15*

Client: Barr Engineering Company
Project: Tank 17 BP (49161253.28)
Sample ID: FB17-S-1_3
Collection Date: 12/17/15 11:00 AM

Work Order: 15121194
Lab ID: 15121194-01
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW846 8270D**			Prep: SW3541 / 12/21/15		Analyst: **RS**
2-Chloronaphthalene	U		2.5	9.3	µg/Kg-dry	1	12/21/15 17:55
2-Methylnaphthalene	**16**		**3.3**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Acenaphthene	**56**		**3.5**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Acenaphthylene	U		2.9	9.3	µg/Kg-dry	1	12/21/15 17:55
Anthracene	**140**		**4.5**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Benzo(a)anthracene	**230**		**5.7**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Benzo(a)pyrene	**190**		**2.0**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Benzo(b)fluoranthene	**260**		**3.2**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Benzo(g,h,i)perylene	**84**		**4.1**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Benzo(k)fluoranthene	**100**		**5.8**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Chrysene	**250**		**7.9**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Dibenzo(a,h)anthracene	U		3.0	9.3	µg/Kg-dry	1	12/21/15 17:55
Fluoranthene	**520**		**5.7**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Fluorene	**39**		**5.2**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Indeno(1,2,3-cd)pyrene	**100**		**5.8**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Naphthalene	U		2.4	9.3	µg/Kg-dry	1	12/21/15 17:55
Phenanthrene	**320**		**5.2**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Pyrene	**630**		**7.1**	**9.3**	**µg/Kg-dry**	1	12/21/15 17:55
Surr: 2-Fluorobiphenyl	*89.7*			*12-100*	*%REC*	1	12/21/15 17:55
Surr: 4-Terphenyl-d14	*101*			*25-137*	*%REC*	1	12/21/15 17:55
Surr: Nitrobenzene-d5	*73.9*			*37-107*	*%REC*	1	12/21/15 17:55
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 12/21/15		Analyst: **DD**
1,2,4-Trimethylbenzene	U		11	53	µg/Kg-dry	1	12/21/15 12:50
1,3,5-Trimethylbenzene	U		23	53	µg/Kg-dry	1	12/21/15 12:50
Benzene	U		12	53	µg/Kg-dry	1	12/21/15 12:50
Ethylbenzene	U		12	53	µg/Kg-dry	1	12/21/15 12:50
m,p-Xylene	U		24	110	µg/Kg-dry	1	12/21/15 12:50
Naphthalene	100	J	9.0	180	µg/Kg-dry	1	12/21/15 12:50
o-Xylene	U		17	53	µg/Kg-dry	1	12/21/15 12:50
Toluene	U		17	53	µg/Kg-dry	1	12/21/15 12:50
Xylenes, Total	U		41	160	µg/Kg-dry	1	12/21/15 12:50
Surr: 1,2-Dichloroethane-d4	*93.4*			*70-130*	*%REC*	1	12/21/15 12:50
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	1	12/21/15 12:50
Surr: Dibromofluoromethane	*91.2*			*70-130*	*%REC*	1	12/21/15 12:50
Surr: Toluene-d8	*94.2*			*70-130*	*%REC*	1	12/21/15 12:50
MOISTURE		Method: **E160.3M**					Analyst: **TM**
Moisture	**29**		**0.025**	**0.050**	**% of sample**	1	12/21/15 13:02

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

ALS Group USA, Corp

Date: *23-Dec-15*

Client: Barr Engineering Company
Project: Tank 17 BP (49161253.28)
Sample ID: FB17-S-2_6
Collection Date: 12/17/15 11:10 AM

Work Order: 15121194
Lab ID: 15121194-02
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW846 8270D**			Prep: SW3541 / 12/21/15		Analyst: **RS**
2-Chloronaphthalene	U		25	93	µg/Kg-dry	10	12/21/15 21:03
2-Methylnaphthalene	**7,100**		**33**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Acenaphthene	**2,400**		**35**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Acenaphthylene	U		29	93	µg/Kg-dry	10	12/21/15 21:03
Anthracene	**4,300**		**45**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Benzo(a)anthracene	**3,000**		**56**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Benzo(a)pyrene	**1,800**		**20**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Benzo(b)fluoranthene	**2,600**		**32**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Benzo(g,h,i)perylene	**580**		**41**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Benzo(k)fluoranthene	**830**		**58**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Chrysene	**2,700**		**78**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Dibenzo(a,h)anthracene	U		30	93	µg/Kg-dry	10	12/21/15 21:03
Fluoranthene	**9,300**		**57**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Fluorene	**3,200**		**52**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Indeno(1,2,3-cd)pyrene	**720**		**58**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Naphthalene	**3,300**		**24**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Phenanthrene	**13,000**		**52**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Pyrene	**11,000**		**70**	**93**	**µg/Kg-dry**	10	12/21/15 21:03
Surr: 2-Fluorobiphenyl	*73.4*			*12-100*	*%REC*	10	12/21/15 21:03
Surr: 4-Terphenyl-d14	*105*			*25-137*	*%REC*	10	12/21/15 21:03
Surr: Nitrobenzene-d5	*51.4*			*37-107*	*%REC*	10	12/21/15 21:03
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 12/21/15		Analyst: **DD**
1,2,4-Trimethylbenzene	39	J	8.6	43	µg/Kg-dry	1	12/21/15 12:26
1,3,5-Trimethylbenzene	U		19	43	µg/Kg-dry	1	12/21/15 12:26
Benzene	24	J	9.7	43	µg/Kg-dry	1	12/21/15 12:26
Ethylbenzene	42	J	10	43	µg/Kg-dry	1	12/21/15 12:26
m,p-Xylene	U		19	86	µg/Kg-dry	1	12/21/15 12:26
Naphthalene	**1,600**		**7.4**	**140**	**µg/Kg-dry**	1	12/21/15 12:26
o-Xylene	U		14	43	µg/Kg-dry	1	12/21/15 12:26
Toluene	U		14	43	µg/Kg-dry	1	12/21/15 12:26
Xylenes, Total	U		33	130	µg/Kg-dry	1	12/21/15 12:26
Surr: 1,2-Dichloroethane-d4	*94.4*			*70-130*	*%REC*	1	12/21/15 12:26
Surr: 4-Bromofluorobenzene	*107*			*70-130*	*%REC*	1	12/21/15 12:26
Surr: Dibromofluoromethane	*91.9*			*70-130*	*%REC*	1	12/21/15 12:26
Surr: Toluene-d8	*96.8*			*70-130*	*%REC*	1	12/21/15 12:26
MOISTURE		Method: **E160.3M**					Analyst: **TM**
Moisture	**29**		**0.025**	**0.050**	**% of sample**	1	12/21/15 13:02

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

Batch ID: **80507** Instrument ID **SVMS4** Method: **SW846 8270D**

MBLK Sample ID: **SBLKS1-80507-80507** Units: **µg/Kg** Analysis Date: **12/21/15 02:51 PM**

Client ID: Run ID: **SVMS4_151221A** SeqNo: **3633006** Prep Date: **12/21/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	U	6.7								
2-Methylnaphthalene	U	6.7								
Acenaphthene	U	6.7								
Acenaphthylene	U	6.7								
Anthracene	U	6.7								
Benzo(a)anthracene	U	6.7								
Benzo(a)pyrene	U	6.7								
Benzo(b)fluoranthene	U	6.7								
Benzo(g,h,i)perylene	U	6.7								
Benzo(k)fluoranthene	U	6.7								
Chrysene	U	6.7								
Dibenzo(a,h)anthracene	U	6.7								
Fluoranthene	U	6.7								
Fluorene	U	6.7								
Indeno(1,2,3-cd)pyrene	U	6.7								
Naphthalene	U	6.7								
Phenanthrene	U	6.7								
Pyrene	U	6.7								
Surr: 2-Fluorobiphenyl	*1489*	0	*1667*	0	*89.4*	*12-100*	0			
Surr: 4-Terphenyl-d14	*1851*	0	*1667*	0	*111*	*25-137*	0			
Surr: Nitrobenzene-d5	*1336*	0	*1667*	0	*80.2*	*37-107*	0			

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

Client: Barr Engineering Company
Work Order: 15121194
Project: Tank 17 BP (49161253.28)

QC BATCH REPORT

Batch ID: **80507** Instrument ID **SVMS4** Method: **SW846 8270D**

LCS	Sample ID: **SLCSS1-80507-80507**				Units: **µg/Kg**			Analysis Date: **12/21/15 03:18 PM**		
Client ID:		Run ID: **SVMS4_151221A**			SeqNo: **3633007**		Prep Date: **12/21/15**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	592.3	6.7	666.7	0	88.8	45-105	0			
2-Methylnaphthalene	545	6.7	666.7	0	81.7	45-105	0			
Acenaphthene	576	6.7	666.7	0	86.4	45-110	0			
Acenaphthylene	575.7	6.7	666.7	0	86.3	45-105	0			
Anthracene	639	6.7	666.7	0	95.8	55-105	0			
Benzo(a)anthracene	636	6.7	666.7	0	95.4	50-110	0			
Benzo(a)pyrene	610	6.7	666.7	0	91.5	50-110	0			
Benzo(b)fluoranthene	616.7	6.7	666.7	0	92.5	45-115	0			
Benzo(g,h,i)perylene	515	6.7	666.7	0	77.2	40-125	0			
Benzo(k)fluoranthene	634	6.7	666.7	0	95.1	45-115	0			
Chrysene	628.3	6.7	666.7	0	94.2	55-110	0			
Dibenzo(a,h)anthracene	516.3	6.7	666.7	0	77.4	40-125	0			
Fluoranthene	587.7	6.7	666.7	0	88.1	55-115	0			
Fluorene	612.3	6.7	666.7	0	91.8	50-110	0			
Indeno(1,2,3-cd)pyrene	510.3	6.7	666.7	0	76.5	40-120	0			
Naphthalene	514.3	6.7	666.7	0	77.1	40-105	0			
Phenanthrene	569.3	6.7	666.7	0	85.4	50-110	0			
Pyrene	746.3	6.7	666.7	0	112	45-125	0			
Surr: 2-Fluorobiphenyl	*1500*	0	*1667*	0	*90*	*12-100*	0			
Surr: 4-Terphenyl-d14	*1701*	0	*1667*	0	*102*	*25-137*	0			
Surr: Nitrobenzene-d5	*1387*	0	*1667*	0	*83.2*	*37-107*	0			

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

Client: Barr Engineering Company
Work Order: 15121194
Project: Tank 17 BP (49161253.28)

QC BATCH REPORT

Batch ID: **80507** Instrument ID **SVMS4** Method: **SW846 8270D**

MS Sample ID: **15121194-01A MS** Units: **µg/Kg** Analysis Date: **12/21/15 05:03 PM**
Client ID: **FB17-S-1_3** Run ID: **SVMS4_151221A** SeqNo: **3633008** Prep Date: **12/21/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	549.3	6.6	661.1	0	83.1	45-105	0			
2-Methylnaphthalene	495.8	6.6	661.1	11.24	73.3	45-105	0			
Acenaphthene	538.1	6.6	661.1	39.67	75.4	45-110	0			
Acenaphthylene	535.1	6.6	661.1	0	80.9	45-105	0			
Anthracene	700.4	6.6	661.1	100.5	90.7	55-105	0			
Benzo(a)anthracene	676.9	6.6	661.1	166.3	77.2	50-110	0			
Benzo(a)pyrene	655.8	6.6	661.1	132.6	79.1	50-110	0			
Benzo(b)fluoranthene	713.6	6.6	661.1	181.2	80.5	45-115	0			
Benzo(g,h,i)perylene	468.4	6.6	661.1	59.83	61.8	40-125	0			
Benzo(k)fluoranthene	654.8	6.6	661.1	72.39	88.1	45-115	0			
Chrysene	706.7	6.6	661.1	180.5	79.6	55-110	0			
Dibenzo(a,h)anthracene	457.5	6.6	661.1	0	69.2	40-125	0			
Fluoranthene	865	6.6	661.1	368.3	75.1	55-115	0			
Fluorene	607.2	6.6	661.1	27.77	87.6	50-110	0			
Indeno(1,2,3-cd)pyrene	495.5	6.6	661.1	71.4	64.1	40-120	0			
Naphthalene	442.3	6.6	661.1	0	66.9	40-105	0			
Phenanthrene	692.1	6.6	661.1	224.1	70.8	50-110	0			
Pyrene	1006	6.6	661.1	445.9	84.8	45-125	0			
Surr: 2-Fluorobiphenyl	*1355*	0	*1653*	0	*82*	*12-100*	0			
Surr: 4-Terphenyl-d14	*1565*	0	*1653*	0	*94.7*	*25-137*	0			
Surr: Nitrobenzene-d5	*1210*	0	*1653*	0	*73.2*	*37-107*	0			

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

Client: Barr Engineering Company
Work Order: 15121194
Project: Tank 17 BP (49161253.28)

QC BATCH REPORT

Batch ID: **80507** Instrument ID **SVMS4** Method: **SW846 8270D**

MSD Sample ID: **15121194-01A MSD** Units: **µg/Kg** Analysis Date: **12/21/15 05:29 PM**

Client ID: **FB17-S-1_3** Run ID: **SVMS4_151221A** SeqNo: **3633009** Prep Date: **12/21/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	569.4	6.6	662.9	0	85.9	45-105	549.3	3.59	30	
2-Methylnaphthalene	498.8	6.6	662.9	11.24	73.6	45-105	495.8	0.611	30	
Acenaphthene	577.1	6.6	662.9	39.67	81.1	45-110	538.1	6.99	30	
Acenaphthylene	539.6	6.6	662.9	0	81.4	45-105	535.1	0.832	30	
Anthracene	834.3	6.6	662.9	100.5	111	55-105	700.4	17.4	30	S
Benzo(a)anthracene	1122	6.6	662.9	166.3	144	50-110	676.9	49.5	30	SR
Benzo(a)pyrene	984.8	6.6	662.9	132.6	129	50-110	655.8	40.1	30	SR
Benzo(b)fluoranthene	1177	6.6	662.9	181.2	150	45-115	713.6	49	30	SR
Benzo(g,h,i)perylene	662.2	6.6	662.9	59.83	90.9	40-125	468.4	34.3	30	R
Benzo(k)fluoranthene	849.9	6.6	662.9	72.39	117	45-115	654.8	25.9	30	S
Chrysene	1114	6.6	662.9	180.5	141	55-110	706.7	44.7	30	SR
Dibenzo(a,h)anthracene	530	6.6	662.9	0	79.9	40-125	457.5	14.7	30	
Fluoranthene	1705	6.6	662.9	368.3	202	55-115	865	65.4	30	SR
Fluorene	620.5	6.6	662.9	27.77	89.4	50-110	607.2	2.17	30	
Indeno(1,2,3-cd)pyrene	689.1	6.6	662.9	71.4	93.2	40-120	495.5	32.7	30	R
Naphthalene	451.1	6.6	662.9	0	68	40-105	442.3	1.98	30	
Phenanthrene	936.7	6.6	662.9	224.1	107	50-110	692.1	30	30	R
Pyrene	2054	6.6	662.9	445.9	243	45-125	1006	68.5	30	SRE
Surr: 2-Fluorobiphenyl	*1407*	0	*1657*	0	*84.9*	*12-100*	1355	*3.78*	*40*	
Surr: 4-Terphenyl-d14	*1695*	0	*1657*	0	*102*	*25-137*	1565	*7.97*	*40*	
Surr: Nitrobenzene-d5	*1170*	0	*1657*	0	*70.6*	*37-107*	1210	*3.39*	*40*	

The following samples were analyzed in this batch:

15121194-01A	15121194-02A

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

Client: Barr Engineering Company
Work Order: 15121194
Project: Tank 17 BP (49161253.28)

QC BATCH REPORT

Batch ID: **80518** Instrument ID **VMS8** Method: **SW8260B**

MBLK Sample ID: **MBLK-80518-80518** Units: **µg/Kg** Analysis Date: **12/21/15 12:01 PM**
Client ID: Run ID: **VMS8_151221A** SeqNo: **3632748** Prep Date: **12/21/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	U	30								
1,3,5-Trimethylbenzene	U	30								
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
Naphthalene	U	100								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*954*	0	*1000*	0	*95.4*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1008*	0	*1000*	0	*101*	*70-130*	0			
Surr: Dibromofluoromethane	*944*	0	*1000*	0	*94.4*	*70-130*	0			
Surr: Toluene-d8	*926*	0	*1000*	0	*92.6*	*70-130*	0			

LCS Sample ID: **LCS-80518-80518** Units: **µg/Kg** Analysis Date: **12/21/15 10:23 AM**
Client ID: Run ID: **VMS8_151221A** SeqNo: **3632746** Prep Date: **12/21/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	977.5	30	1000	0	97.8	65-135	0			
1,3,5-Trimethylbenzene	1003	30	1000	0	100	65-135	0			
Benzene	1024	30	1000	0	102	75-125	0			
Ethylbenzene	934.5	30	1000	0	93.4	75-125	0			
m,p-Xylene	1926	60	2000	0	96.3	80-125	0			
Naphthalene	900	100	1000	0	90	40-140	0			
o-Xylene	957	30	1000	0	95.7	75-125	0			
Toluene	946.5	30	1000	0	94.6	70-125	0			
Xylenes, Total	2882	90	3000	0	96.1	75-125	0			
Surr: 1,2-Dichloroethane-d4	*919.5*	0	*1000*	0	*92*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1042*	0	*1000*	0	*104*	*70-130*	0			
Surr: Dibromofluoromethane	*955*	0	*1000*	0	*95.5*	*70-130*	0			
Surr: Toluene-d8	*931.5*	0	*1000*	0	*93.2*	*70-130*	0			

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

Client: Barr Engineering Company
Work Order: 15121194
Project: Tank 17 BP (49161253.28)

QC BATCH REPORT

Batch ID: **80518** Instrument ID **VMS8** Method: **SW8260B**

MS Sample ID: **15121077-14A MS** Units: **µg/Kg** Analysis Date: **12/21/15 06:33 PM**
Client ID: Run ID: **VMS8_151221A** SeqNo: **3632777** Prep Date: **12/21/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	964	30	1000	0	96.4	65-135	0			
1,3,5-Trimethylbenzene	1024	30	1000	0	102	65-135	0			
Benzene	1010	30	1000	0	101	75-125	0			
Ethylbenzene	929.5	30	1000	0	93	75-125	0			
m,p-Xylene	1922	60	2000	0	96.1	80-125	0			
Naphthalene	821	100	1000	0	82.1	40-140	0			
o-Xylene	960.5	30	1000	0	96	75-125	0			
Toluene	931.5	30	1000	0	93.2	70-125	0			
Xylenes, Total	2883	90	3000	0	96.1	75-125	0			
Surr: 1,2-Dichloroethane-d4	*947.5*	0	*1000*	0	*94.8*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1045*	0	*1000*	0	*104*	*70-130*	0			
Surr: Dibromofluoromethane	*959*	0	*1000*	0	*95.9*	*70-130*	0			
Surr: Toluene-d8	*938*	0	*1000*	0	*93.8*	*70-130*	0			

MSD Sample ID: **15121077-14A MSD** Units: **µg/Kg** Analysis Date: **12/21/15 06:57 PM**
Client ID: Run ID: **VMS8_151221A** SeqNo: **3632779** Prep Date: **12/21/15** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	980	30	1000	0	98	65-135	964	1.65	30	
1,3,5-Trimethylbenzene	999.5	30	1000	0	100	65-135	1024	2.47	30	
Benzene	998.5	30	1000	0	99.8	75-125	1010	1.15	30	
Ethylbenzene	933	30	1000	0	93.3	75-125	929.5	0.376	30	
m,p-Xylene	1922	60	2000	0	96.1	80-125	1922	0.026	30	
Naphthalene	892	100	1000	0	89.2	40-140	821	8.29	30	
o-Xylene	952	30	1000	0	95.2	75-125	960.5	0.889	30	
Toluene	913	30	1000	0	91.3	70-125	931.5	2.01	30	
Xylenes, Total	2874	90	3000	0	95.8	75-125	2883	0.313	30	
Surr: 1,2-Dichloroethane-d4	*934*	0	*1000*	0	*93.4*	*70-130*	947.5	*1.44*	*30*	
Surr: 4-Bromofluorobenzene	*1064*	0	*1000*	0	*106*	*70-130*	1045	*1.8*	*30*	
Surr: Dibromofluoromethane	*934.5*	0	*1000*	0	*93.4*	*70-130*	959	*2.59*	*30*	
Surr: Toluene-d8	*942.5*	0	*1000*	0	*94.2*	*70-130*	938	*0.479*	*30*	

The following samples were analyzed in this batch:

15121194-01B	15121194-02B

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

Client: Barr Engineering Company
Work Order: 15121194
Project: Tank 17 BP (49161253.28)

QC BATCH REPORT

Batch ID: **R178752** Instrument ID **MOIST** Method: **E160.3M**

MBLK	Sample ID: **WBLKS-R178752**				Units: **% of sample**		Analysis Date: **12/21/15 01:02 PM**			
Client ID:	Run ID: **MOIST_151221A**				SeqNo: **3631130**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS	Sample ID: **LCS-R178752**				Units: **% of sample**		Analysis Date: **12/21/15 01:02 PM**			
Client ID:	Run ID: **MOIST_151221A**				SeqNo: **3631129**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP	Sample ID: **15121192-06A DUP**				Units: **% of sample**		Analysis Date: **12/21/15 01:02 PM**			
Client ID:	Run ID: **MOIST_151221A**				SeqNo: **3631109**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	18.72	0.050	0	0	0		18.28	2.38	20	

DUP	Sample ID: **15121196-02A DUP**				Units: **% of sample**		Analysis Date: **12/21/15 01:02 PM**			
Client ID:	Run ID: **MOIST_151221A**				SeqNo: **3631119**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	19.54	0.050	0	0	0		19.72	0.917	20	

The following samples were analyzed in this batch:

15121194-01C	15121194-02C

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

15121194

Barr Engineering Co. Chain of Custody

BARR ☐ Ann Arbor ☐ Bismarck ☒ Duluth ☐ Hibbing ☐ Jefferson City ☐ Minneapolis

Sample Origination State: ☐ KS ☐ MO ☒ WI ☐ MI ☐ ND Other: ☐ MN ☐ SD

COC Number: № 49481

COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr Engineering	Company: Barr Engineering
Address:	Address:
Name: Jim Teraldson	Name:
email: JET@barr.com	email:
Copy to: datamgt@barr.com	P.O.
Project Name: Tank 17 BP	Barr Project No: 4916/253.28 001 001

Matrix Code: GW = Groundwater; SW = Surface Water; WW = Waste Water; DW = Drinking Water; S = Soil/Solid; SD = Sediment; O = Other

Preservative Code: A = None; B = HCl; C = HNO_3; D = H_2SO_4; E = NaOH; F = MeOH; G = $NaHSO_4$; H = $Na_2S_2O_3$; I = Ascorbic Acid; J = NH_4Cl; K = Zn Acetate; O = Other

Location	Sample Depth Start	Stop	Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD Y / N	Total Number Of Containers	Analysis Requested: Water	Soil: PAH	Soil: PAH-MBF+naphthalene	Soil: % Solids	Preservative Code	Field Filtered Y/N
										A	A	A		
										-	-	-		
1. FB17-S-1	3	3	ft	12-17-15	1100	S		4		X	XX	XX		
2. FB17-S-2	6	6	ft	12-17-15	1110	S		4		X	XX	XX		
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														

BARR USE ONLY							
Sampled by: BJL2	Relinquished by: Brad Lee	On Ice? ⊙ N	Date 12-17-15	Time 1300	Received by: FEDEX	Date	Time
Barr Proj. Manager: LEN	Relinquished by: FEDEX	On Ice? Y N	Date 12/18/15	Time 0930	Received by:	Date	Time
Barr DQ Manager: JET	Samples Shipped VIA: ☐ Courier ☒ Federal Express ☐ Sampler ☐ Other:				Air Bill Number:	Requested Due Date: ☐ Standard Turn Around Time ☒ Rush ASAP (mm/dd/yyyy)	
Lab Name: ALS							
Lab Location: Holland, MI	Lab WO:	Temperature on Receipt (°C):			Custody Seal Intact? ☐ Y ☐ N ☐ None		

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

H:\RLG\STDFORMS\Chain Of Custody Form 2015 RLG Rev. 06/16/15

1B3

After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

CUSTODY SEAL

Project Name: FBIT Alaska 221 Project Number: 4916125328

Date: 12-17-15 Initials: BJA2 Signature: Container #

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **BARRENG-MN** Date/Time Received: **18-Dec-15 09:30**

Work Order: **15121194** Received by: **KRW**

Checklist completed by Keith Wierenga eSignature 18-Dec-15 Date Reviewed by: Tom Bramish eSignature 18-Dec-15 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 ☐	
Temperature(s)/Thermometer(s):	2.0/2.0 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	12/18/2015 2:35:37 PM		
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:

CorrectiveAction:

Attachment D:

Waste Disposal Documentation

Soil Disposal
Water Disposal

Soil Disposal

Shamrock Landfill

Waste Profile Sheet

Shamrock Landfill

P.O. Number	Customer Code	SKB Representative	CL

I. Generator Information

Generator Name: Enbridge Pipelines Limited Partnership, LLC		Generator EPA ID Number	SIC Code
Generator Location: Enbridge Superior Terminal -Tank 14,16 Roadway	County: Douglas	Generator Contact: Alex Smith	
		Phone: 715-398-4795	Fax: 832-325-5511
Generator Mailing Address (if different: 1320 Grand Ave, Superior, WI 54880		Generator Email Address: alex.smith@enbridge.com	
Bill To Name & Address: Enbridge Energy, 1100 Louisiana Ave, STE. 3300, Houston, TX 77002	Bill To #:	Billing Contact: Alex Smith	
		Phone: 715-398-4795	Fax: 832-325-5511
Invoice Contact:		Billing Email Address: alex.smith@enbridge.com	

II. Waste Generation Information

Waste Name: Crude contaminated soil - Tank 14,16 Roaway	Estimated rate of waste generation: 500 ☐ Lbs. ☐ tons ☒ cy ☐ drums	☒ one time ☐ yearly
Generator Facility Operations and/or Site History: Enbridge Pipeline Terminal		
Describe the generating process or source of contaminated soil/debris and/or waste: Pipeline Terminal Activities		

III. Waste Composition and Constituents (list all known)

	Actual Range %	Actual Range ppm
Crude contaminated soil	100	

IV. Waste Properties

Physical state:	Free Liquids:	pH Range:	Flash point:	Color:	Odor (describe):
☒ Solid ☐ Liquid ☐ Sludge ☐ Gas	☐ Yes ☒ No Content ____ %	☐ <2 ☐ 2-4 ☐ 5-8 ☐ 8-12.4 ☐ >12.5	☐ ≤ 140°F ☐ > 140°F to < 200°F ☐ > 200°F	Reddish Brown	petroleum odor

V. Waste Classification

Waste stream properties (answer ALL questions)					
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?	☐ Yes	☒ No	Does this waste contain absorbents?	☐ Yes	☒ No
			Is this waste lethal (by Minn. Rules 7045.0131 Subp. 6)?	☐ Yes	☒ No
Does this waste stream contain PCB material	☐ Yes	☒ No	Is this waste recyclable?	☐ Yes	☒ No
If yes, concentration: _____ppm			Is this waste explosive?	☐ Yes	☒ No
Does this waste stream contain fuming acids?	☐ Yes	☒ No	Is this waste infectious?	☐ Yes	☒ No
Does this waste contain asbestos?	☐ Yes	☒ No	Is this putrescible waste?	☐ Yes	☒ No
Does this waste contain oxidizers?	☐ Yes	☒ No	Is this waste demolition debris?	☐ Yes	☒ No
Does this waste contain radioactive material?	☐ Yes	☒ No	Is this waste sewer sludge?	☐ Yes	☒ No

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)

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: ☐ drums (size _____) ☒ Bulk Solids ☐ boxes (size _____)		Method of shipment ☐ Roll-off ☒ End dump ☐ Rail ☐ 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	Date
	Alex Smith	Environmental Analyst	8-25-15

Version 2012

Shamrock Landfill

Notification of Waste Acceptance

8/28/2015

CUSTOMER INFORMATION

EPA ID#:
Enbridge Pipelines Limited
Superior Terminal Tank 14,16

1320 Grand Ave
Tank 14,16
Superior, WI 54880
Contact: Alex Smith
Phone: (715) 398-4795

INVOICE INFORMATION

Bill #: 2153
Enbridge Pipelines Limited Partnership,
Accounts Payable

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

Profile Sheet #:
Waste Stream #: CL15-0036
Waste Name: Crude Contaminated Soil-Tank 14,16 Roadway

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.

ACCEPTANCE INFORMATION

The waste stream identified by the reference above is acceptable for disposal.
The anticipated frequency of shipment is 500 YARDS / ONE TIME ONLY

This waste is acceptable for delivery beginning on 8/27/2015 thru 8/28/2017 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.

AUTHORIZATION

Approval: 

Date: 8/28/15

P.O. Box 338 • Esko, MN 55733-0338
Main: 218.878.0112 • Fax: 218.879.2120

Shamrock Landfill

August 28, 2015

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

RE: CL15-0036 Crude Contaminated Soil-Tank 14,16 Roadway

Dear Mr. Smith,

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 jonp@shamrocklandfill.com.

Shamrock Landfill

Jon Pentheiter

Customer ACCEPTED BY: (name, position) Alex Smith Env Analyst II

DATE: 8-31-15

WASTE APPROVAL Period: 8/27/2015 to 8/28/2017

P.O. Box 338 • Esko, MN 55733-0338
Main: 218.878.0112 • Fax: 218.879.2120

Shamrock Landfill

Bill To Customer

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

Service For Generator

Enbridge Pipelines Limited
1320 Grand Ave
Tank 14,16
Superior, WI 54880

Disposal

Waste Description: Crude Contaminated Soil-Tank 14,16 Roadway

Estimated Volume: 500 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-Tank 14,16

24-Aug-2015

Ryan Erickson
Barr Engineering Company
4700 West 77th Street
Minneapolis, MN 55435-4803

Re: **Enbridge - Tank 14/16 (49161253.28)** Work Order: **15081056**

Dear Ryan,

ALS Environmental received 3 samples on 20-Aug-2015 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 14.

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: 399084510

Report of Laboratory Analysis

ALS Group USA, Corp

Date: 24-Aug-15

Client: Barr Engineering Company
Project: Enbridge - Tank 14/16 (49161253.28)
Work Order: **15081056**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15081056-01	Tank 14/16 - Stockpile-1	Soil		08/18/15 11:30	08/20/15 09:00	☐
15081056-02	Tank 14/16 - Stockpile-2	Soil		08/18/15 11:45	08/20/15 09:00	☐
15081056-03	Trip Blank	Soil		08/18/15	08/20/15 09:00	☐

ALS Group USA, Corp

Date: 24-Aug-15

Client: Barr Engineering Company
Project: Enbridge - Tank 14/16 (49161253.28)
WorkOrder: **15081056**

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 PQL, 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: 24-Aug-15

Client: Barr Engineering Company
Project: Enbridge - Tank 14/16 (49161253.28)
Work Order: 15081056

Case Narrative

Samples for the above noted Work Order were received on 08/20/15. 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: *24-Aug-15*

Client: Barr Engineering Company
Project: Enbridge - Tank 14/16 (49161253.28)
Sample ID: Tank 14/16 - Stockpile-1
Collection Date: 08/18/15 11:30 AM

Work Order: 15081056
Lab ID: 15081056-01
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **PUBL-SW-141**			Prep: PUBL-SW-141 / 8/21/15		Analyst: **IT**
DRO (C10-C28)	**220**		**2.9**	**7.0**	**mg/Kg-dry**	1	08/24/15 11:42
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/20/15		Analyst: **AK**
Benzene	ND		16	40	µg/Kg-dry	1	08/21/15 17:55
Ethylbenzene	**220**		**15**	**40**	**µg/Kg-dry**	1	08/21/15 17:55
m,p-Xylene	**230**		**30**	**80**	**µg/Kg-dry**	1	08/21/15 17:55
o-Xylene	ND		17	40	µg/Kg-dry	1	08/21/15 17:55
Toluene	ND		15	40	µg/Kg-dry	1	08/21/15 17:55
Xylenes, Total	**250**		**47**	**120**	**µg/Kg-dry**	1	08/21/15 17:55
Surr: 1,2-Dichloroethane-d4	*99.3*			*70-130*	*%REC*	1	08/21/15 17:55
Surr: 4-Bromofluorobenzene	*102*			*70-130*	*%REC*	1	08/21/15 17:55
Surr: Dibromofluoromethane	*99.6*			*70-130*	*%REC*	1	08/21/15 17:55
Surr: Toluene-d8	*105*			*70-130*	*%REC*	1	08/21/15 17:55
MOISTURE		Method: **E160.3M**					Analyst: **EVB**
Moisture	**25**		**0.025**	**0.050**	**% of sample**	1	08/21/15 14:45

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

ALS Group USA, Corp

Date: *24-Aug-15*

Client: Barr Engineering Company
Project: Enbridge - Tank 14/16 (49161253.28)
Sample ID: Tank 14/16 - Stockpile-2
Collection Date: 08/18/15 11:45 AM

Work Order: 15081056
Lab ID: 15081056-02
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **PUBL-SW-141**			Prep: PUBL-SW-141 / 8/21/15		Analyst: **IT**
DRO (C10-C28)	**890**		**7.0**	**17**	**mg/Kg-dry**	2	08/24/15 13:13
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/20/15		Analyst: **AK**
Benzene	**150**		**21**	**53**	**µg/Kg-dry**	1	08/21/15 18:19
Ethylbenzene	**820**		**20**	**53**	**µg/Kg-dry**	1	08/21/15 18:19
m,p-Xylene	**2,400**		**40**	**110**	**µg/Kg-dry**	1	08/21/15 18:19
o-Xylene	**500**		**22**	**53**	**µg/Kg-dry**	1	08/21/15 18:19
Toluene	ND		20	53	µg/Kg-dry	1	08/21/15 18:19
Xylenes, Total	**2,900**		**62**	**160**	**µg/Kg-dry**	1	08/21/15 18:19
Surr: 1,2-Dichloroethane-d4	*97.6*			*70-130*	*%REC*	1	08/21/15 18:19
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	1	08/21/15 18:19
Surr: Dibromofluoromethane	*100*			*70-130*	*%REC*	1	08/21/15 18:19
Surr: Toluene-d8	*109*			*70-130*	*%REC*	1	08/21/15 18:19
MOISTURE		Method: **E160.3M**					Analyst: **EVB**
Moisture	**43**		**0.025**	**0.050**	**% of sample**	1	08/21/15 14:45

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

ALS Group USA, Corp

Date: *24-Aug-15*

Client: Barr Engineering Company
Project: Enbridge - Tank 14/16 (49161253.28)
Sample ID: Trip Blank
Collection Date: 08/18/15

Work Order: 15081056
Lab ID: 15081056-03
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 8/20/15		Analyst: **AK**
Benzene	ND		12	30	µg/Kg	1	08/21/15 19:09
Ethylbenzene	ND		11	30	µg/Kg	1	08/21/15 19:09
m,p-Xylene	ND		23	60	µg/Kg	1	08/21/15 19:09
o-Xylene	ND		13	30	µg/Kg	1	08/21/15 19:09
Toluene	ND		11	30	µg/Kg	1	08/21/15 19:09
Xylenes, Total	ND		35	90	µg/Kg	1	08/21/15 19:09
Surr: 1,2-Dichloroethane-d4	*100*			*70-130*	*%REC*	1	08/21/15 19:09
Surr: 4-Bromofluorobenzene	*102*			*70-130*	*%REC*	1	08/21/15 19:09
Surr: Dibromofluoromethane	*97.0*			*70-130*	*%REC*	1	08/21/15 19:09
Surr: Toluene-d8	*102*			*70-130*	*%REC*	1	08/21/15 19:09

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

Client: Barr Engineering Company

QC BATCH REPORT

Work Order: 15081056

Project: Enbridge - Tank 14/16 (49161253.28)

Batch ID: **75077** Instrument ID **GC8** Method: **PUBL-SW-141**

MBLK Sample ID: **DBLKS1-75077-75077** Units: **mg/Kg** Analysis Date: **08/24/15 10:42 AM**

Client ID: Run ID: **GC8_150824A** SeqNo: **3429147** Prep Date: **08/21/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	ND	2	5.0								

LCS Sample ID: **DLCSS1-75077-75077** Units: **mg/Kg** Analysis Date: **08/24/15 10:12 AM**

Client ID: Run ID: **GC8_150824A** SeqNo: **3429146** Prep Date: **08/21/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	179.2	2	5.0	200	0	89.6	70-120	0			

LCSD Sample ID: **DLCSDS1-75077-75077** Units: **mg/Kg** Analysis Date: **08/24/15 12:41 PM**

Client ID: Run ID: **GC8_150824A** SeqNo: **3429151** Prep Date: **08/21/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	191.4	2	5.0	200	0	95.7	70-120	179.2	6.61	20	

The following samples were analyzed in this batch:

15081056-01C	15081056-02C

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

Client: Barr Engineering Company
Work Order: 15081056
Project: Enbridge - Tank 14/16 (49161253.28)

QC BATCH REPORT

Batch ID: **75049** Instrument ID **VMS5** Method: **SW8260B**

MBLK Sample ID: **MBLK-75049-75049** Units: **µg/Kg** Analysis Date: **08/20/15 03:12 PM**
Client ID: Run ID: **VMS5_150820A** SeqNo: **3426688** Prep Date: **08/20/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	12	30								
Ethylbenzene	ND	11	30								
m,p-Xylene	ND	23	60								
o-Xylene	ND	13	30								
Toluene	ND	11	30								
Xylenes, Total	ND	35	90								
Surr: 1,2-Dichloroethane-d4	*1008*	0	0	*1000*	0	*101*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*988.5*	0	0	*1000*	0	*98.8*	*70-130*	0			
Surr: Dibromofluoromethane	*1004*	0	0	*1000*	0	*100*	*70-130*	0			
Surr: Toluene-d8	*1020*	0	0	*1000*	0	*102*	*70-130*	0			

LCS Sample ID: **LCS-75049-75049** Units: **µg/Kg** Analysis Date: **08/20/15 01:55 PM**
Client ID: Run ID: **VMS5_150820A** SeqNo: **3426687** Prep Date: **08/20/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	993	12	30	1000	0	99.3	75-125	0			
Ethylbenzene	971	11	30	1000	0	97.1	75-125	0			
m,p-Xylene	1966	23	60	2000	0	98.3	80-125	0			
o-Xylene	957.5	13	30	1000	0	95.8	75-125	0			
Toluene	992	11	30	1000	0	99.2	70-125	0			
Xylenes, Total	2924	35	90	3000	0	97.5	75-125	0			
Surr: 1,2-Dichloroethane-d4	*963.5*	0	0	*1000*	0	*96.4*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*995.5*	0	0	*1000*	0	*99.6*	*70-130*	0			
Surr: Dibromofluoromethane	*999.5*	0	0	*1000*	0	*100*	*70-130*	0			
Surr: Toluene-d8	*1004*	0	0	*1000*	0	*100*	*70-130*	0			

MS Sample ID: **15081030-01A MS** Units: **µg/Kg** Analysis Date: **08/20/15 11:41 PM**
Client ID: Run ID: **VMS5_150820A** SeqNo: **3426784** Prep Date: **08/20/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	973	12	30	1000	0	97.3	75-125	0			
Ethylbenzene	955	11	30	1000	65.5	89	75-125	0			
m,p-Xylene	1962	23	60	2000	327	81.8	80-125	0			
o-Xylene	942	13	30	1000	66	87.6	75-125	0			
Toluene	957.5	11	30	1000	0	95.8	70-125	0			
Xylenes, Total	2904	35	90	3000	396	83.6	75-125	0			
Surr: 1,2-Dichloroethane-d4	*983*	0	0	*1000*	0	*98.3*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1031*	0	0	*1000*	0	*103*	*70-130*	0			
Surr: Dibromofluoromethane	*971.5*	0	0	*1000*	0	*97.2*	*70-130*	0			
Surr: Toluene-d8	*1010*	0	0	*1000*	0	*101*	*70-130*	0			

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

Client: Barr Engineering Company
Work Order: 15081056
Project: Enbridge - Tank 14/16 (49161253.28)

QC BATCH REPORT

Batch ID: **75049** Instrument ID **VMS5** Method: **SW8260B**

MSD Sample ID: **15081030-01A MSD** Units: **µg/Kg** Analysis Date: **08/21/15 12:07 PM**
Client ID: Run ID: **VMS5_150820A** SeqNo: **3426785** Prep Date: **08/20/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1011	12	30	1000	0	101	75-125	973	3.83	30	
Ethylbenzene	997	11	30	1000	65.5	93.2	75-125	955	4.3	30	
m,p-Xylene	2003	23	60	2000	327	83.8	80-125	1962	2.04	30	
o-Xylene	961	13	30	1000	66	89.5	75-125	942	2	30	
Toluene	989.5	11	30	1000	0	99	70-125	957.5	3.29	30	
Xylenes, Total	2964	35	90	3000	396	85.6	75-125	2904	2.03	30	
Surr: 1,2-Dichloroethane-d4	*982.5*	0	0	*1000*	0	*98.2*	*70-130*	983	*0.0509*	*30*	
Surr: 4-Bromofluorobenzene	*1009*	0	0	*1000*	0	*101*	*70-130*	1031	*2.16*	*30*	
Surr: Dibromofluoromethane	*959*	0	0	*1000*	0	*95.9*	*70-130*	971.5	*1.3*	*30*	
Surr: Toluene-d8	*993*	0	0	*1000*	0	*99.3*	*70-130*	1010	*1.7*	*30*	

The following samples were analyzed in this batch: 15081056-01A, 15081056-02A, 15081056-03A

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

Client: Barr Engineering Company
Work Order: 15081056
Project: Enbridge - Tank 14/16 (49161253.28)

QC BATCH REPORT

Batch ID: **R170180** Instrument ID **MOIST** Method: **E160.3M**

MBLK Sample ID: **WBLKS-R170180** Units: **% of sample** Analysis Date: **08/21/15 02:45 PM**
Client ID: Run ID: **MOIST_150821A** SeqNo: **3428821** Prep Date: DF: **1**

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

LCS Sample ID: **LCS-R170180** Units: **% of sample** Analysis Date: **08/21/15 02:45 PM**
Client ID: Run ID: **MOIST_150821A** SeqNo: **3428820** 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: **15081099-01B DUP** Units: **% of sample** Analysis Date: **08/21/15 02:45 PM**
Client ID: Run ID: **MOIST_150821A** SeqNo: **3428807** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	6.58	0.025	0.050	0	0	0		6.17	6.43	20	

DUP Sample ID: **15081123-01A DUP** Units: **% of sample** Analysis Date: **08/21/15 02:45 PM**
Client ID: Run ID: **MOIST_150821A** SeqNo: **3428814** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	7.1	0.025	0.050	0	0	0		7.08	0.282	20	

The following samples were analyzed in this batch: 15081056-01B 15081056-02B

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

1S0810S6

Chain of Custody

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

Project Number: 49161253.28 001 001

Project Name: ~~Tank 14/17~~ Enbridge - Tank 14/17

Sample Origination State WI (use two letter postal state abbreviation)

COC Number: **№ 43419**

COC 1 of 1

Project Manager: REE

Project QC Contact: JET

Sampled by: NRS2

Laboratory: ALS Holland

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Matrix:	Type: Grab	Type: Comp.	Type: QC	Water: VOCs (HCl) #1	Water: SVOCs (unpreserved) #2	Water: Dissolved Metals (HNO_3)	Water: Total Metals (HNO_3)	Water: General (unpreserved) #3	Water: Diesel Range Organics (HCl)	Water: Nutrients (H_2SO_4) #4	Water:	Water:	Water:	Soil: VOCs (tared MeOH) #1	Soil: ~~GRO~~ BTEX (tared MeOH) #1	Soil: DRO (tared unpreserved) WI DRO	Soil: Metals (unpreserved)	Soil: SVOCs (unpreserved) #2	Soil: % Solids (plastic vial, unpres.)	Soil: hold 35 days 4 oz	Soil:	Total Number Of Containers	
1. Tank 14/17-STOCKPILE-1			—	08/18/15	1130		X		X													2	1			1	1			5	BTEX, WI DRO, % Solids.
2. Tank 14/17-STOCKPILE-2			—	08/18/15	11:45		X		X													2	1			1	1			5	11
3. Trip Blank											X											1									
4. Temp Blank											X																				
5.																															
6.																															ASAP TAT
7.																															
8.																															
9.																															
10.																															

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, 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:	On Ice? (Y) N	Date	Time	Received by:	Date	Time
Relinquished By:	On Ice? Y (N)	Date	Time	Received by:	Date 8/21/15	Time 900

Samples Shipped VIA: ☐ Air Freight ☑ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number:

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

1.2 oa

H:RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09\01\09

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **BARRENG-MN** Date/Time Received: **20-Aug-15 09:00**

Work Order: **15081056** Received by: **NML**

Checklist completed by Diane Shaw (eSignature) 20-Aug-15 (Date) Reviewed by: Tom Bramish (eSignature) 20-Aug-15 (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 ☐	
Temperature(s)/Thermometer(s):	1.2/1.2 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	8/20/2015 11:16:56 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:

CorrectiveAction:

21-Dec-2015

Laura Novitzki
Barr Engineering Company
4300 MarketPointe Drive
Suite 200
Minneapolis, MN 55435

Re: **Tank 14, 16, 17 Roadway - Enbridge (49161253.28)** Work Order: **15121051**

Dear Laura,

ALS Environmental received 3 samples on 17-Dec-2015 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 15.

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: 399084510

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group USA, Corp

Date: 21-Dec-15

Client: Barr Engineering Company
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)
Work Order: **15121051**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15121051-01	Tank 14/16 - Stockpile - 3	Soil		12/16/15 12:45	12/17/15 09:30	☐
15121051-02	Tank 14/16 - Stockpile - 4	Soil		12/16/15 12:55	12/17/15 09:30	☐
15121051-03	Trip Blank	Soil		12/16/15	12/17/15 09:30	☐

ALS Group USA, Corp

Date: 21-Dec-15

Client: Barr Engineering Company
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)
WorkOrder: **15121051**

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 PQL, 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: 21-Dec-15

Client: Barr Engineering Company
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)
Work Order: 15121051

Case Narrative

Samples for the above noted Work Order were received on 12/17/15. 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: *21-Dec-15*

Client: Barr Engineering Company
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)
Sample ID: Tank 14/16 - Stockpile - 3
Collection Date: 12/16/15 12:45 PM

Work Order: 15121051
Lab ID: 15121051-01
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **PUBL-SW-141**			Prep: PUBL-SW-141 / 12/18/15		Analyst: **IT**
DRO (C10-C28)	**710**		**4.4**	**11**	**mg/Kg-dry**	1	12/21/15 11:50
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 12/17/15		Analyst: **WH**
Benzene	U		11	50	µg/Kg-dry	1	12/17/15 18:41
Ethylbenzene	U		12	50	µg/Kg-dry	1	12/17/15 18:41
m,p-Xylene	U		23	100	µg/Kg-dry	1	12/17/15 18:41
o-Xylene	U		16	50	µg/Kg-dry	1	12/17/15 18:41
Toluene	U		17	50	µg/Kg-dry	1	12/17/15 18:41
Xylenes, Total	U		39	150	µg/Kg-dry	1	12/17/15 18:41
Surr: 1,2-Dichloroethane-d4	*99.7*			*70-130*	*%REC*	1	12/17/15 18:41
Surr: 4-Bromofluorobenzene	*100*			*70-130*	*%REC*	1	12/17/15 18:41
Surr: Dibromofluoromethane	*98.2*			*70-130*	*%REC*	1	12/17/15 18:41
Surr: Toluene-d8	*95.8*			*70-130*	*%REC*	1	12/17/15 18:41
MOISTURE		Method: **E160.3M**					Analyst: **ED**
Moisture	**39**		**0.025**	**0.050**	**% of sample**	1	12/17/15 16:26

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

ALS Group USA, Corp

Date: *21-Dec-15*

Client: Barr Engineering Company
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)
Sample ID: Tank 14/16 - Stockpile - 4
Collection Date: 12/16/15 12:55 PM

Work Order: 15121051
Lab ID: 15121051-02
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **PUBL-SW-141**			Prep: PUBL-SW-141 / 12/18/15		Analyst: **IT**
DRO (C10-C28)	**450**		**3.7**	**9.1**	**mg/Kg-dry**	1	12/21/15 12:20
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 12/17/15		Analyst: **WH**
Benzene	U		13	57	µg/Kg-dry	1	12/17/15 17:48
Ethylbenzene	**32**	J	**13**	**57**	**µg/Kg-dry**	1	12/17/15 17:48
m,p-Xylene	**43**	J	**25**	**110**	**µg/Kg-dry**	1	12/17/15 17:48
o-Xylene	U		18	57	µg/Kg-dry	1	12/17/15 17:48
Toluene	U		19	57	µg/Kg-dry	1	12/17/15 17:48
Xylenes, Total	U		44	170	µg/Kg-dry	1	12/17/15 17:48
Surr: 1,2-Dichloroethane-d4	*99.0*			*70-130*	*%REC*	1	12/17/15 17:48
Surr: 4-Bromofluorobenzene	*102*			*70-130*	*%REC*	1	12/17/15 17:48
Surr: Dibromofluoromethane	*98.2*			*70-130*	*%REC*	1	12/17/15 17:48
Surr: Toluene-d8	*97.0*			*70-130*	*%REC*	1	12/17/15 17:48
MOISTURE		Method: **E160.3M**					Analyst: **ED**
Moisture	**47**		**0.025**	**0.050**	**% of sample**	1	12/17/15 16:26

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

ALS Group USA, Corp

Date: *21-Dec-15*

Client: Barr Engineering Company
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)
Sample ID: Trip Blank
Collection Date: 12/16/15

Work Order: 15121051
Lab ID: 15121051-03
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260B**			Prep: SW5035 / 12/17/15		Analyst: **WH**
Benzene	U		6.8	30	µg/Kg	1	12/17/15 18:14
Ethylbenzene	U		7.0	30	µg/Kg	1	12/17/15 18:14
m,p-Xylene	U		13	60	µg/Kg	1	12/17/15 18:14
o-Xylene	U		9.7	30	µg/Kg	1	12/17/15 18:14
Toluene	U		9.9	30	µg/Kg	1	12/17/15 18:14
Xylenes, Total	U		23	90	µg/Kg	1	12/17/15 18:14
Surr: 1,2-Dichloroethane-d4	*98.6*			*70-130*	*%REC*	1	12/17/15 18:14
Surr: 4-Bromofluorobenzene	*95.3*			*70-130*	*%REC*	1	12/17/15 18:14
Surr: Dibromofluoromethane	*99.8*			*70-130*	*%REC*	1	12/17/15 18:14
Surr: Toluene-d8	*96.8*			*70-130*	*%REC*	1	12/17/15 18:14

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

ALS Group USA, Corp

Date: 21-Dec-15

Client: Barr Engineering Company

QC BATCH REPORT

Work Order: 15121051

Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)

Batch ID: **80457** Instrument ID **GC8** Method: **PUBL-SW-141**

MBLK	Sample ID: **DBLKS1-80457-80457**				Units: **mg/Kg**			Analysis Date: **12/21/15 10:50 AM**			
Client ID:	Run ID: **GC8_151221A**				SeqNo: **3630946**			Prep Date: **12/18/15**		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	2	5.0								

LCS	Sample ID: **DLCSS1-80457-80457**				Units: **mg/Kg**			Analysis Date: **12/21/15 10:20 AM**			
Client ID:	Run ID: **GC8_151221A**				SeqNo: **3630945**			Prep Date: **12/18/15**		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	156.5	2	5.0	200	0	78.3	70-120	0			

LCSD	Sample ID: **DLCSDS1-80457-80457**				Units: **mg/Kg**			Analysis Date: **12/21/15 01:20 PM**			
Client ID:	Run ID: **GC8_151221A**				SeqNo: **3630963**			Prep Date: **12/18/15**		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	173.6	2	5.0	200	0	86.8	70-120	156.5	10.3	20	

The following samples were analyzed in this batch:

15121051-01B	15121051-02B

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

Client: Barr Engineering Company
Work Order: 15121051
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)

QC BATCH REPORT

Batch ID: **80407** Instrument ID **VMS7** Method: **SW8260B**

MBLK Sample ID: **MBLK-80407-80407** Units: **µg/Kg** Analysis Date: **12/18/15 01:58 PM**
Client ID: Run ID: **VMS7_151218A** SeqNo: **3628854** Prep Date: **12/17/15** 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	90								
Surr: 1,2-Dichloroethane-d4	*1001*	0	0	*1000*	0	*100*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1013*	0	0	*1000*	0	*101*	*70-130*	0			
Surr: Dibromofluoromethane	*958.5*	0	0	*1000*	0	*95.8*	*70-130*	0			
Surr: Toluene-d8	*976*	0	0	*1000*	0	*97.6*	*70-130*	0			

LCS Sample ID: **LCS-80407-80407** Units: **µg/Kg** Analysis Date: **12/18/15 12:18 PM**
Client ID: Run ID: **VMS7_151218A** SeqNo: **3628853** Prep Date: **12/17/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1144	6.8	30	1000	0	114	75-125	0			
Ethylbenzene	1024	7	30	1000	0	102	75-125	0			
m,p-Xylene	2117	13	60	2000	0	106	80-125	0			
o-Xylene	1023	9.7	30	1000	0	102	75-125	0			
Toluene	1030	9.9	30	1000	0	103	70-125	0			
Xylenes, Total	3140	23	90	3000	0	105	75-125	0			
Surr: 1,2-Dichloroethane-d4	*958.5*	0	0	*1000*	0	*95.8*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1024*	0	0	*1000*	0	*102*	*70-130*	0			
Surr: Dibromofluoromethane	*1012*	0	0	*1000*	0	*101*	*70-130*	0			
Surr: Toluene-d8	*960*	0	0	*1000*	0	*96*	*70-130*	0			

MS Sample ID: **15121051-02A MS** Units: **µg/Kg** Analysis Date: **12/17/15 07:59 PM**
Client ID: **Tank 14/16 - Stockpile - 4** Run ID: **VMS5_151217A** SeqNo: **3626652** Prep Date: **12/17/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1146	6.8	30	1000	0	115	75-125	0			
Ethylbenzene	1145	7	30	1000	17	113	75-125	0			
m,p-Xylene	2298	13	60	2000	22.5	114	80-125	0			
o-Xylene	1120	9.7	30	1000	0	112	75-125	0			
Toluene	1089	9.9	30	1000	0	109	70-125	0			
Xylenes, Total	3418	23	90	3000	22	113	75-125	0			
Surr: 1,2-Dichloroethane-d4	*970.5*	0	0	*1000*	0	*97*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1034*	0	0	*1000*	0	*103*	*70-130*	0			
Surr: Dibromofluoromethane	*993.5*	0	0	*1000*	0	*99.4*	*70-130*	0			
Surr: Toluene-d8	*982.5*	0	0	*1000*	0	*98.2*	*70-130*	0			

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

Client: Barr Engineering Company
Work Order: 15121051
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)

QC BATCH REPORT

Batch ID: **80407** Instrument ID **VMS7** Method: **SW8260B**

MSD Sample ID: **15121051-02A MSD** Units: **µg/Kg** Analysis Date: **12/17/15 08:25 PM**

Client ID: **Tank 14/16 - Stockpile - 4** Run ID: **VMS5_151217A** SeqNo: **3626654** Prep Date: **12/17/15** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1145	6.8	30	1000	0	114	75-125	1146	0.0437	30	
Ethylbenzene	1161	7	30	1000	17	114	75-125	1145	1.39	30	
m,p-Xylene	2334	13	60	2000	22.5	116	80-125	2298	1.6	30	
o-Xylene	1132	9.7	30	1000	0	113	75-125	1120	1.07	30	
Toluene	1104	9.9	30	1000	0	110	70-125	1089	1.32	30	
Xylenes, Total	3466	23	90	3000	22	115	75-125	3418	1.42	30	
Surr: 1,2-Dichloroethane-d4	*955.5*	0	0	*1000*	0	*95.6*	*70-130*	970.5	*1.56*	*30*	
Surr: 4-Bromofluorobenzene	*1028*	0	0	*1000*	0	*103*	*70-130*	1034	*0.582*	*30*	
Surr: Dibromofluoromethane	*989.5*	0	0	*1000*	0	*99*	*70-130*	993.5	*0.403*	*30*	
Surr: Toluene-d8	*985.5*	0	0	*1000*	0	*98.6*	*70-130*	982.5	*0.305*	*30*	

The following samples were analyzed in this batch:

15121051-01A	15121051-02A	15121051-03A

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

Client: Barr Engineering Company
Work Order: 15121051
Project: Tank 14, 16, 17 Roadway - Enbridge (49161253.28)

QC BATCH REPORT

Batch ID: **R178592** Instrument ID **MOIST** Method: **E160.3M**

MBLK Sample ID: **WBLKS-R178592** Units: **% of sample** Analysis Date: **12/17/15 04:26 PM**
Client ID: Run ID: **MOIST_151217A** SeqNo: **3627378** 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-R178592** Units: **% of sample** Analysis Date: **12/17/15 04:26 PM**
Client ID: Run ID: **MOIST_151217A** SeqNo: **3627377** 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: **15121025-03A DUP** Units: **% of sample** Analysis Date: **12/17/15 04:26 PM**
Client ID: Run ID: **MOIST_151217A** SeqNo: **3627350** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.8	0.025	0.050	0	0	0		15.34	3.58	20	

DUP Sample ID: **15121048-07A DUP** Units: **% of sample** Analysis Date: **12/17/15 04:26 PM**
Client ID: Run ID: **MOIST_151217A** SeqNo: **3627369** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	59.77	0.025	0.050	0	0	0		55.27	7.82	20	

The following samples were analyzed in this batch: 15121051-01B 15121051-02C

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

15121051

Chain of Custody

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

COC 1 of 1

Project Number: 49161253.28 001 001

Project Name: Tank 14, 16, 17 Roadway - Enbridge

Sample Origination State WI (use two letter postal state abbreviation)

COC Number: № 45417

Project Manager: LENIREE

Project QC Contact: JET

Sampled by: NRS2

Laboratory: ALS Holland

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	GRO, BTEX (tared MeOH) #1	DRO (tared unpreserved) WI	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	1 unpreserved (hold)	Total Number Of Containers	
1. Tank 14/16 - Stockpile - 3	—	—	—	12/16/15	12:45		X	X										2	1			1	1		5	BTEX, GRO,
2. Tank 14/16 - Stockpile - 4	—	—	—	12/16/15	12:55		X	X										2	1			1	1		5	" "
3. Temp Blank	—	—	—	—	—					X															1	
4. Trip Blank	—	—	—	—	—					X								1							1	
5.																										
6.																										
7.																										ASAP TAT
8.																										
9.																										
10.																										

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, 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

	On Ice?	Date	Time		Date	Time
Relinquished By: [signature]	(Y) N	12/17 1530		Received by: FedEx		
Relinquished By: FedEx	(Y) N	12/17/15	0930	Received by: [signature]		

Samples Shipped VIA: ☐ Air Freight ☑ Federal Express ☐ Sampler ☐ Other: _____

Air Bill Number:

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

2.8°C

H:RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09\01\09

Tom Beamish

From: James E. Taraldsen [JTaraldsen@barr.com]
Sent: Thursday, December 17, 2015 12:37 PM
To: Tom Beamish
Cc: Laura E. Novitzki; Noelle R. Scelina
Subject: COC # 45417 Analysis Change

Hi Tom,

You should have received two sets of samples from us this morning. For the Tank 14/16 Stockplie-3 and Stockpile-4 samples, we need BTEX and **DRO** analyzed for these samples. The COC had incorrectly listed BTEX and ORO as soil analytes. The project number for these stockpiles is 49161253.28 001 001, and the COC # is 45417. As we discussed, if we could get these sample results by Tuesday, December 22nd, that would be helpful. Please let me know if you have any questions. Thanks!

Jim

James E. Taraldsen

Data Quality Specialist
Duluth, MN office: 218.529.7138
JTaraldsen@barr.com
www.barr.com

ORIGIN ID:DLHA (440) 539-2050
NOELLE SCELINA
BARR ENGINEERING
325 S LAKE AVE
SUITE 700
DULUTH, MN 55802
UNITED STATES US

SHIP DATE: 16DEC15
ACTWGT: 31.00 LB
CAD: 8247816/INET3670
DIMS: 22x16x15 IN

BILL SENDER

TO TOM BEAMISH
ALS ENVIRONMENTAL
3352 128TH AVE

HOLLAND MI 49424
(616) 738-7318 REF: 49161253.28 001 001
INV:
PO: DEPT:

539J1/13D3/D0

FedEx Express

THU - 17 DEC 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7752 2787 6657

XX HLMA

49424
MI-US GRR

label:
tion on this page to print your label to your laser or inkjet printer.
age along the horizontal line.
pping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could
illing charges, along with the cancellation of your FedEx account number.
onstitutes your agreement to the service conditions in the current FedEx Service Guide, available on
ll not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-
or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a
ons found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic
e, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct,
ntial, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual
aximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other
erviceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

2.8°C

CUSTODY SEAL
Project Name: Tank 14, 16, 17 Roadway Project Number: 49161253.28 001 001
Date: 12/16/15 Initials: NRS Signature: Noelle Scelina Container # 1 of 1

BARR

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **BARRENG-MN** Date/Time Received: **17-Dec-15 09:30**

Work Order: **15121051** Received by: **KRW**

Checklist completed by Keith Wierenga eSignature 17-Dec-15 Date Reviewed by: Tom Bramish eSignature 17-Dec-15 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 ☐	
Temperature(s)/Thermometer(s):	2.8/2.8 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	12/17/2015 11:46:16 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:

CorrectiveAction:

LEGEND
Technical Services, Inc.
www.legend-group.com

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

March 01, 2016

Mr. James E. Taraldsen
Barr Engineering Co.
325 South Lake Avenue, Suite 700
Duluth, MN 55802

Work Order Number: 1600885
RE: 49161253

Enclosed are the results of analyses for samples received by the laboratory on 02/25/16. 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.

Prepared by,
LEGEND TECHNICAL SERVICES, INC

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

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Tel: 651-642-1150
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Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Tank 14/16 Stockpile-5	1600885-01	Soil	02/22/16 12:40	02/25/16 09:30

Shipping Container Information

Default Cooler Temperature (°C): 0.6

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: Yes

Case Narrative:
The DRO chromatogram for the sample is attached.

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Fax: 651-642-1239

Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

DRO/8015D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Tank 14/16 Stockpile-5 (1600885-01) Soil	**Sampled: 02/22/16 12:40**			**Received: 02/25/16 9:30**						
Diesel Range Organics	**750**	12	3.7	mg/kg dry	1	B6B2601	02/26/16	02/26/16	WI(95) DRO	L1
Surrogate: Triacontane (C-30)	*102*			*70-130 %*		"	"	"	"	

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Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

PERCENT SOLIDS
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Tank 14/16 Stockpile-5 (1600885-01) Soil	**Sampled: 02/22/16 12:40**			**Received: 02/25/16 9:30**						
% Solids	**46**			%	1	B6B2609	02/26/16	02/26/16	% calculation	

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Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Tank 14/16 Stockpile-5 (1600885-01) Soil	**Sampled: 02/22/16 12:40**			**Received: 02/25/16 9:30**						
Benzene	<0.035	0.47	0.035	mg/kg dry	1	B6B2920	02/29/16	02/29/16	EPA 8260B	
Ethylbenzene	<0.049	0.47	0.049	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.11	0.94	0.11	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.040	0.47	0.040	mg/kg dry	1	"	"	"	"	
Toluene	<0.016	0.47	0.016	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*98.5*			*80-124 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*101*			*77.1-123 %*		"	"	"	"	
Surrogate: Toluene-d8	*97.9*			*78.1-125 %*		"	"	"	"	

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Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

DRO/8015D - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B6B2601 - Sonication (Wisc DRO)											
Blank (B6B2601-BLK1)				Prepared & Analyzed: 02/26/16							
Diesel Range Organics	< 5.6	5.6	1.7	mg/kg wet							
Surrogate: Triacontane (C-30)	*17.5*			*mg/kg wet*	*16.0*		*109*	*70-130*			
LCS (B6B2601-BS1)				Prepared & Analyzed: 02/26/16							
Diesel Range Organics	59.8	5.6	1.7	mg/kg wet	64.0		93.4	70-120			
Surrogate: Triacontane (C-30)	*15.5*			*mg/kg wet*	*16.0*		*96.7*	*70-130*			
LCS Dup (B6B2601-BSD1)				Prepared & Analyzed: 02/26/16							
Diesel Range Organics	70.5	5.6	1.7	mg/kg wet	64.0		110	70-120	16.5	20	
Surrogate: Triacontane (C-30)	*16.6*			*mg/kg wet*	*16.0*		*104*	*70-130*			

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Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

PERCENT SOLIDS - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B6B2609 - General Preparation											
Duplicate (B6B2609-DUP1)		**Source: 1600814-03**			Prepared & Analyzed: 02/26/16						
% Solids	90.0			%		89.0			1.12	20	
Duplicate (B6B2609-DUP2)		**Source: 1600886-01**			Prepared & Analyzed: 02/26/16						
% Solids	46.0			%		45.0			2.20	20	

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Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

VOC 8260B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B6B2920 - EPA 5035 Soil (Purge and Trap)											
Blank (B6B2920-BLK1)					Prepared & Analyzed: 02/29/16						
Benzene	< 0.015	0.20	0.015	mg/kg wet							
Ethylbenzene	< 0.021	0.20	0.021	mg/kg wet							
m,p-Xylene	< 0.048	0.40	0.048	mg/kg wet							
o-Xylene	< 0.017	0.20	0.017	mg/kg wet							
Toluene	< 0.0068	0.20	0.0068	mg/kg wet							
Surrogate: 4-Bromofluorobenzene	*53.7*			*ug/L*	*56.0*		*96.0*	*80-124*			
Surrogate: Dibromofluoromethane	*57.6*			*ug/L*	*56.0*		*103*	*77.1-123*			
Surrogate: Toluene-d8	*56.1*			*ug/L*	*56.0*		*100*	*78.1-125*			
LCS (B6B2920-BS1)					Prepared & Analyzed: 02/29/16						
1,1,2,2-Tetrachloroethane	52.3			ug/L	50.0		105	75-120			
1,1-Dichloroethane	52.5			ug/L	50.0		105	79.6-120			
1,1-Dichloroethene	52.4			ug/L	50.0		105	78.3-120			
1,3,5-Trimethylbenzene	55.3			ug/L	50.0		111	77-120			
1,4-Dichlorobenzene	52.2			ug/L	50.0		104	75-125			
2-Chlorotoluene	53.5			ug/L	50.0		107	75.9-120			
Benzene	51.5			ug/L	50.0		103	80-120			
Bromoform	54.8			ug/L	50.0		110	80-120			
Chlorobenzene	53.8			ug/L	50.0		108	80-120			
Chloroform	52.7			ug/L	50.0		105	80-120			
Ethylbenzene	54.4			ug/L	50.0		109	80-120			
n-Butylbenzene	56.7			ug/L	50.0		113	75-125			
n-Propylbenzene	54.1			ug/L	50.0		108	75-120			
Toluene	51.9			ug/L	50.0		104	80-120			
Trichloroethene	52.4			ug/L	50.0		105	80-120			
Vinyl chloride	50.4			ug/L	50.0		101	75-130			
Surrogate: 4-Bromofluorobenzene	*57.2*			*ug/L*	*56.0*		*102*	*80-124*			
Surrogate: Dibromofluoromethane	*58.0*			*ug/L*	*56.0*		*104*	*77.1-123*			
Surrogate: Toluene-d8	*56.7*			*ug/L*	*56.0*		*101*	*78.1-125*			
Matrix Spike (B6B2920-MS1)	**Source: 1600885-01**				Prepared & Analyzed: 02/29/16						
1,1,2,2-Tetrachloroethane	52.8			ug/L	50.0	<	106	75-125			
1,1-Dichloroethane	51.4			ug/L	50.0	<	103	78.7-123			
1,1-Dichloroethene	51.0			ug/L	50.0	<	102	75.8-121			
1,3,5-Trimethylbenzene	55.3			ug/L	50.0	<	111	75-120			
1,4-Dichlorobenzene	52.7			ug/L	50.0	<	105	75-125			
2-Chlorotoluene	53.0			ug/L	50.0	<	106	75-120			
Benzene	52.9			ug/L	50.0	<	106	80-120			
Bromoform	55.4			ug/L	50.0	<	111	80-120			
Chlorobenzene	53.9			ug/L	50.0	<	108	80-120			

LEGEND Technical Services, Inc.
www.legend-group.com

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

Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

VOC 8260B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B6B2920 - EPA 5035 Soil (Purge and Trap)											
Matrix Spike (B6B2920-MS1)	**Source: 1600885-01**				Prepared & Analyzed: 02/29/16						
Chloroform	53.4			ug/L	50.0	<	107	80-120			
Ethylbenzene	54.9			ug/L	50.0	<	110	80-120			
n-Butylbenzene	56.2			ug/L	50.0	<	112	73.8-125			
n-Propylbenzene	54.0			ug/L	50.0	<	108	75-120			
Toluene	53.6			ug/L	50.0	<	107	80-120			
Trichloroethene	53.5			ug/L	50.0	<	107	80-120			
Vinyl chloride	49.3			ug/L	50.0	<	98.5	74.8-130			
Surrogate: 4-Bromofluorobenzene	*56.9*			*ug/L*	*56.0*		*102*	*80-124*			
Surrogate: Dibromofluoromethane	*58.5*			*ug/L*	*56.0*		*105*	*77.1-123*			
Surrogate: Toluene-d8	*57.6*			*ug/L*	*56.0*		*103*	*78.1-125*			
Matrix Spike Dup (B6B2920-MSD1)	**Source: 1600885-01**				Prepared & Analyzed: 02/29/16						
1,1,2,2-Tetrachloroethane	53.9			ug/L	50.0	<	108	75-125	2.11	20	
1,1-Dichloroethane	51.3			ug/L	50.0	<	103	78.7-123	0.235	20	
1,1-Dichloroethene	50.7			ug/L	50.0	<	101	75.8-121	0.573	20	
1,3,5-Trimethylbenzene	56.3			ug/L	50.0	<	113	75-120	1.78	20	
1,4-Dichlorobenzene	52.4			ug/L	50.0	<	105	75-125	0.510	20	
2-Chlorotoluene	53.4			ug/L	50.0	<	107	75-120	0.704	20	
Benzene	53.8			ug/L	50.0	<	108	80-120	1.75	20	
Bromoform	56.5			ug/L	50.0	<	113	80-120	1.84	20	
Chlorobenzene	54.1			ug/L	50.0	<	108	80-120	0.350	20	
Chloroform	53.4			ug/L	50.0	<	107	80-120	0.00412	20	
Ethylbenzene	55.3			ug/L	50.0	<	111	80-120	0.742	20	
n-Butylbenzene	57.5			ug/L	50.0	<	115	73.8-125	2.24	20	
n-Propylbenzene	54.6			ug/L	50.0	<	109	75-120	1.10	20	
Toluene	54.6			ug/L	50.0	<	109	80-120	1.86	20	
Trichloroethene	53.8			ug/L	50.0	<	108	80-120	0.641	20	
Vinyl chloride	48.4			ug/L	50.0	<	96.9	74.8-130	1.69	20	
Surrogate: 4-Bromofluorobenzene	*57.7*			*ug/L*	*56.0*		*103*	*80-124*			
Surrogate: Dibromofluoromethane	*58.4*			*ug/L*	*56.0*		*104*	*77.1-123*			
Surrogate: Toluene-d8	*58.2*			*ug/L*	*56.0*		*104*	*78.1-125*			

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

Barr Engineering Co.	Project:	49161253	
325 South Lake Avenue, Suite 700	Project Number:	49161253.28 001 001	Work Order #: 1600885
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 03/01/16

Notes and Definitions

L1	Results in the diesel organics range are primarily due to overlap from a heavy oil range product.
<	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; Equivalent to the method LOD (Limit of Detection)
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)

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

1600385

Barr Engineering Co. Chain of Custody

Sample Origination State: ☐ KS ☐ MO ☑ WI ☐ MI ☐ ND Other: ☐ MN ☐ SD

☐ Ann Arbor ☑ Duluth ☐ Jefferson City ☐ Bismarck ☐ Hibbing ☐ Minneapolis

COC Number: № 49550
COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr Engineering	Company: Barr
Address:	Address:
Name:	Name: Laura Novitski
email: len@barr.com	email: len@barr.com
Copy to: datamgt@barr.com	P.O.
Project Name: Tank 14/17 Reading	Barr Project No: 4916 125328 001 001

Matrix Code: GW = Groundwater, SW = Surface Water, WW = Waste Water, DW = Drinking Water, S = Soil/Solid, SD = Sediment, O = Other

Preservative Code: A = None, B = HCl, C = HNO_3, D = H_2SO_4, E = NaOH, F = MeOH, G = $NaHSO_4$, H = $Na_2S_2O_3$, I = Ascorbic Acid, J = NH_4Cl, K = Zn Acetate, O = Other

Location	Sample Depth Start	Stop	Unit (in./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD Y / N	Total Number Of Containers	Analysis Requested: Water	Soil: BTEX	DRO	WF method	Hold	Analysis	% Solids	Preservative Code	Field Filtered Y/N	
1. Tank 14/16 Stockpile S	-	-	-	2/22/2016	1240	S	N	5		2	1		1					BTEX, DRO, % solids, Hold
2.																		
3.																		
4.																		
5.																		
6.																		
7.																		
8.																		
9.																		
10.																		

BARR USE ONLY		Relinquished by	On Ice?	Date	Time	Received by	Date	Time
Sampled by:	TLS		☑ Y ☐ N	2/24/16	1520			
Barr Proj. Manager:	LEN REE	Relinquished by	On Ice?	Date	Time	Received by:	Date	Time
Barr DQ Manager:	JET		☑ Y ☐ N				2/25/16	930
Lab Name:	Legend	Samples Shipped VIA: ☐ Courier ☑ Federal Express ☐ Sampler ☐ Other:				Air Bill Number:	Requested Due Date: ☐ Standard Turn Around Time ☑ Rush 2 day (mm/dd/yyyy)	
Lab Location:	St. Paul	Lab WO:	Temperature on Receipt (°C):			Custody Seal Intact? ☐ Y ☐ N ☐ None		

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

H:\RES\STD\FORMS\Chain Of Custody Form 2015 RUG Rev 06/16/15

LEGEND
Technical Services, Inc.
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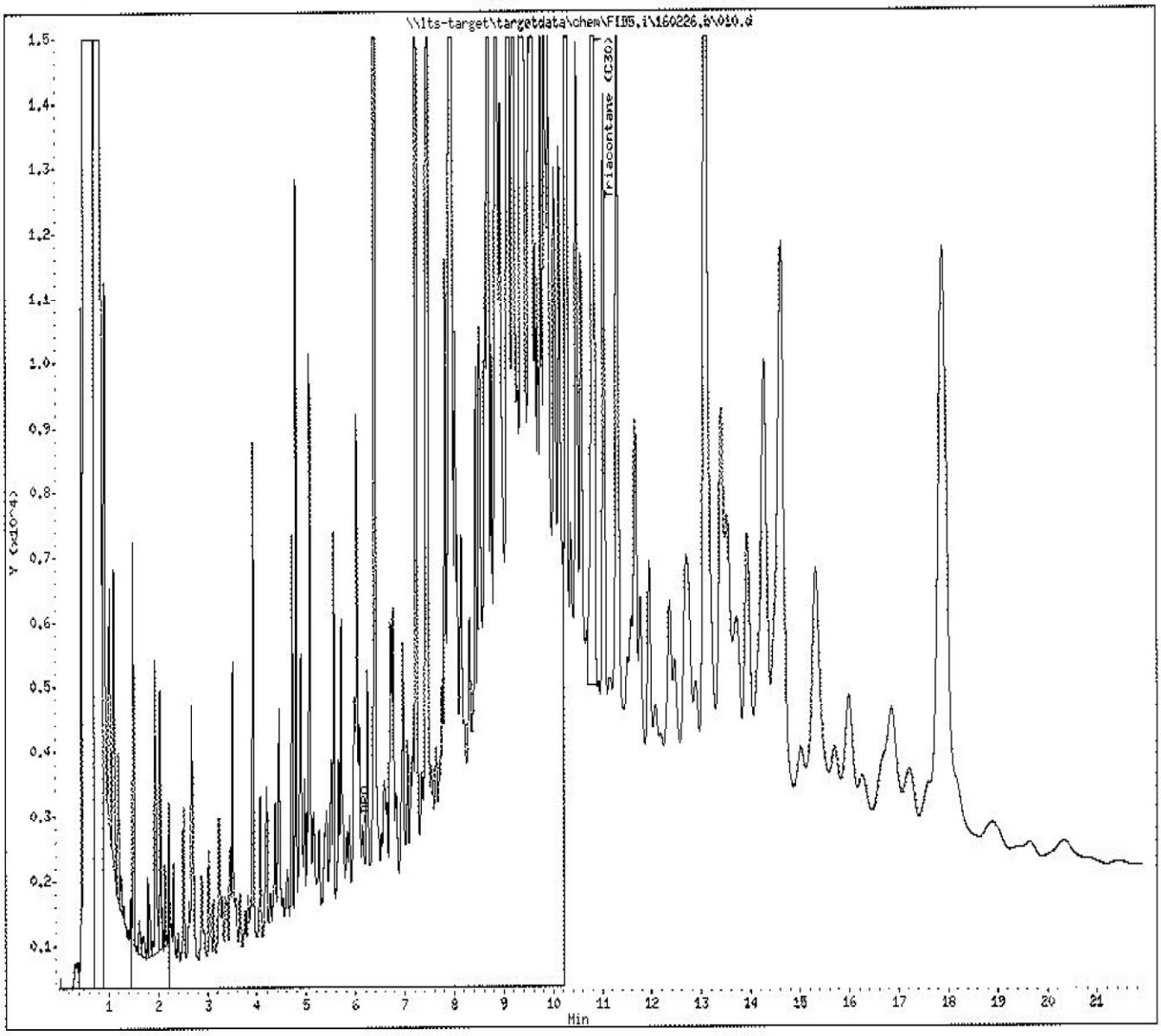
88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Data File: \\lts-target\targetdata\chem\FID5.i\160226.b\010.d
Date : 26-FEB-2016 12:45
Client ID:
Sample Info: 1600885-01

Column phase:

Instrument: FID5.i

Operator: ge
Column diameter: 0.53



SKB CLOQUET

REPORT NAME: **Tons Each Load By WSID**
DESCRIPTION: **Tonnage for EACH LOAD, grouped by customer**
DATE RANGE: **01/01/2015 to 09/30/2015**
PRINTED ON (DATE): **Wednesday, June 15, 2016**

ENB38
Enbridge Pipelines Limited
1320 Grand Ave
Superior WI 54880

LOAD #	MANIFEST	ARRIVED	WASTE STREAM	WASTE NAME	CELL	SPOT	LIFT	TONS
32346 (A)	160413	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	11.81
32347 (A)	160415	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.87
32348 (A)	160412	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	14.47
32349 (A)	160414	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	17.37
32353 (A)	160418	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	12.42
32354 (A)	160411	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	17.67
32358 (A)	160410	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	13.46
32359 (A)	160419	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	16.43
32364 (A)	160420	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	13.40
32367 (A)	160417	9/1/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	16.05
32379 (A)	160425	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	16.53
32380 (A)	160423	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	13.56
32381 (A)	160422	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	12.49
32382 (A)	160421	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	12.33
32383 (A)	160430	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	12.92
32384 (A)	160431	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	10.18
32386 (A)	160436	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	18.83
32387 (A)	160434	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	13.42
32389 (A)	160426	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.96
32390 (A)	160424	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	13.31
32391 (A)	160427	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	17.04
32392 (A)	160428	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	11.23
32394 (A)	160429	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	13.92
32396 (A)	160432	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	12.72
32398 (A)	160433	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	16.56
32400 (A)	160435	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	16.07
32402 (A)	160437	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.40
32403 (A)	160439	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	12.21
32404 (A)	160441	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.79
32406 (A)	160446	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	13.65
32407 (A)	160448	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	14.57
32408 (A)	160449	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	12.60
32409 (A)	160451	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	19.21
32410 (A)	160452	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	18.89
32411 (A)	160438	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.38
32413 (A)	160440	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.67
32414 (A)	160444	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.76
32415 (A)	160445	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.36
32416 (A)	160447	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	13.21
32417 (A)	160450	9/2/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	12.81
32424 (A)	160454	9/3/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	14.76
32425 (A)	160453	9/3/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.36
32431 (A)	160455	9/3/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	9.86
32434 (A)	160457	9/3/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	15.84
32436 (A)	160416	9/3/2015	CL15-0036	Crude Contaminated Soil-Tank 14,1	2A	Z44	1210	16.32

Total # of Loads: 45 **Total Tons: 658.67**

Grand Total (Tons): 658.67
Grand Total (Loads): 45

Print Date: 6/15/2016

Start Date: 10/1/2015 Stop Date: 6/14/2016

BILL TO ACCOUNT
2133 ENBRIDGE PIPELINES LIMITE

Enbridge Pipelines Limited
1320 Grand Ave
Superior, WI 54880

TICKET	Manifest	DATE	Waste Stream	Waste Name	TONS
1608	160589	11/24/15	15-0036	Crude Contaminated Soil-Tank 14	15.11
1609	160595	11/24/15	15-0036	Crude Contaminated Soil-Tank 14	13.85
1610	160596	11/24/15	15-0036	Crude Contaminated Soil-Tank 14	9.32
1611	160588	11/24/15	15-0036	Crude Contaminated Soil-Tank 14	13.90
2469	160603	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	6.65
2471	160611	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	9.89
2472	160602	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	12.80
2477	160606	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	10.89
2478	160605	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	12.13
2479	160604	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	11.96
2483	160607	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	12.31
2484	160609	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	12.26
2486	160608	1/11/16	15-0036	Crude Contaminated Soil-Tank 14	12.34
	# of Loads: 13			**SUBTOTAL FOR Waste Stream**	**153.41**
				GRAND TOTALS	**153.41**

VONCO

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

16-017-I SUP Terminal Namagji Release

Date	Ticket	Customer	Truck	Material	Tons
03/11/2016	272003	001342 - Enbridge Pipelines LLC	T53691W	Contaminated Soil Tons	14.50
03/11/2016	272008	001342 - Enbridge Pipelines LLC	T53691W	Contaminated Soil Tons	16.38
03/11/2016	272013	001342 - Enbridge Pipelines LLC	T53691W	Contaminated Soil Tons	15.38
03/30/2016	272433	001342 - Enbridge Pipelines LLC	S39449X	Contaminated Soil Tons	13.43
03/30/2016	272438	001342 - Enbridge Pipelines LLC	S39449X	Contaminated Soil Tons	12.57
03/30/2016	272461	001342 - Enbridge Pipelines LLC	S39449X	Contaminated Soil Tons	14.94
03/30/2016	272471	001342 - Enbridge Pipelines LLC	S38099W	Contaminated Soil Tons	15.94
03/30/2016	272472	001342 - Enbridge Pipelines LLC	S39449X	Contaminated Soil Tons	14.15
03/30/2016	272473	001342 - Enbridge Pipelines LLC	S36746W	Contaminated Soil Tons	13.78
04/18/2016	273067	001342 - Enbridge Pipelines LLC	T53691W	Contaminated Soil Tons	18.41
04/18/2016	273077	001342 - Enbridge Pipelines LLC	T53691W	Contaminated Soil Tons	20.72
				Total Tons	***170.20***
				Total Loads	***11***

Water Disposal

From: Alex Smith <alex.smith@enbridge.com>
Sent: Thursday, August 27, 2015 3:10 PM
To: Ryan E. Erickson; Ross Soukkala (ross@fourstarconstruction.us)
Subject: FW: Tank 14/16 Water WLSSD Discharge Approval
Attachments: Enbridge Tank 14-16 08272015.pdf

Approval from WLSSD for the Tank 14-16 water is attached.

Thanks,
Alex

From: Tim Tuominen [mailto:Tim.Tuominen@wlssd.com]
Sent: Thursday, August 27, 2015 3:03 PM
To: Alex Smith
Subject: RE: Tank 14/16 Water WLSSD Discharge Approval

Tim Tuominen
Chemist WLSSD
2626 Courtland Street
Duluth, MN 55806
(218) 740-4815

From: Alex Smith [mailto:alex.smith@enbridge.com]
Sent: Thursday, August 27, 2015 2:31 PM
To: Tim Tuominen <Tim.Tuominen@wlssd.com>
Subject: Tank 14/16 Water WLSSD Management Request

Mr. Tuominen,

I am submitting a request to manage hydrocarbon impacted water at the WLSSD water treatment facility in Duluth, Minnesota. Approximately 5,000 gallons of ground water and rain water with a sheen was removed from a contaminated excavation associated with the Enbridge Superior Terminal Tank 14/16 Ditch Excavation (Project) in Superior, WI. Two representative waste water analytical samples (Tank 14/16 - Water - 1 Bin 10; Tank 14/16 - Water - 1 Bin 11) were collected (laboratory report attached) and based on the results it appears that the water would be acceptable for disposal at the WLSSD waste water treatment facility. Please review the attached laboratory report and let me know if the water may be managed at your facility.

Please contact me about billing or if you have any additional questions.
Thank you,

Alex Smith
Environmental Analyst II, LP US Environment Operations
—

ENBRIDGE
TEL: 715-398-4795 | FAX: 832-325-5511 | CELL: 715-817-8322
119 N. 25th Street East, Superior, WI 54880
enbridge.com

Integrity. Safety. Respect.

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

WLSSD
Western Lake Superior Sanitary District

August 27, 2015

Alex Smith
Enbridge
1320 Grand Avenue
Superior, WI 54880

Re: WLSSD Discharge Approval (**Enbridge Tank 14-16 Water Bins 10 & 11**)

Dear Mr. Smith:

Based on the analytical information provided on **8/27/2015**, the WLSSD approves the discharge of **approximately to 5,000 gallons of water from Enbridge Tank 14-16 Bins 10 & 11** 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 procees 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,

Tim Tuominen
Chemist

26-Aug-2015

Ryan Erickson
Barr Engineering Company
4700 West 77th Street
Minneapolis, MN 55435-4803

Re: **Enbridge Tank 14-16 - Water -1 (49161253.78)** Work Order: **15081208**

Dear Ryan,

ALS Environmental received 3 samples on 22-Aug-2015 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 15.

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: 399084510

Report of Laboratory Analysis

ALS Group USA, Corp

Date: 26-Aug-15

Client: Barr Engineering Company
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)
Work Order: **15081208**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15081208-01	Tank 14/16 - Water - 1 Bin 10	Water		08/21/15 13:30	08/22/15 10:00	☐
15081208-02	Tank 14/16 - Water-1 Bin 11	Water		08/21/15 13:45	08/22/15 10:00	☐
15081208-03	Trip Blank	Water		08/21/15 13:30	08/22/15 10:00	☐

ALS Group USA, Corp

Date: 26-Aug-15

Client: Barr Engineering Company
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)
WorkOrder: **15081208**

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 PQL, 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
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: 26-Aug-15

Client: Barr Engineering Company
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)
Work Order: 15081208

Case Narrative

Samples for the above noted Work Order were received on 08/22/15. 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.

ALS Group USA, Corp

Date: *26-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)
Sample ID: Tank 14/16 - Water - 1 Bin 10
Collection Date: 08/21/15 01:30 PM

Work Order: 15081208
Lab ID: 15081208-01
Matrix: WATER

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **PUBL-SW-141**			Prep: PUBL-SW-141 / 8/24/15		Analyst: **IT**
DRO (C10-C28)	**1.3**		**0.0070**	**0.10**	**mg/L**	1	08/24/15 17:42
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260**					Analyst: **JNJ**
Benzene	**2.8**		**0.25**	**1.0**	**µg/L**	1	08/25/15 04:22
Ethylbenzene	U		0.22	1.0	µg/L	1	08/25/15 04:22
m,p-Xylene	U		0.40	2.0	µg/L	1	08/25/15 04:22
o-Xylene	**1.9**		**0.21**	**1.0**	**µg/L**	1	08/25/15 04:22
Toluene	U		0.20	1.0	µg/L	1	08/25/15 04:22
Xylenes, Total	**1.9**	J	**0.62**	**3.0**	**µg/L**	1	08/25/15 04:22
Surr: 1,2-Dichloroethane-d4	*102*			*75-120*	*%REC*	1	08/25/15 04:22
Surr: 4-Bromofluorobenzene	*98.4*			*80-110*	*%REC*	1	08/25/15 04:22
Surr: Dibromofluoromethane	*98.3*			*85-115*	*%REC*	1	08/25/15 04:22
Surr: Toluene-d8	*99.0*			*85-110*	*%REC*	1	08/25/15 04:22

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

ALS Group USA, Corp

Date: *26-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)
Sample ID: Tank 14/16 - Water-1 Bin 11
Collection Date: 08/21/15 01:45 PM

Work Order: 15081208
Lab ID: 15081208-02
Matrix: WATER

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **PUBL-SW-141**			Prep: PUBL-SW-141 / 8/24/15		Analyst: **IT**
DRO (C10-C28)	**0.63**		**0.010**	**0.14**	**mg/L**	1	08/24/15 18:12
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260**					Analyst: **BG**
Benzene	**6.2**		**0.25**	**1.0**	**µg/L**	1	08/23/15 15:30
Ethylbenzene	**2.8**		**0.22**	**1.0**	**µg/L**	1	08/23/15 15:30
m,p-Xylene	**11**		**0.40**	**2.0**	**µg/L**	1	08/23/15 15:30
o-Xylene	**4.6**		**0.21**	**1.0**	**µg/L**	1	08/23/15 15:30
Toluene	**1.9**		**0.20**	**1.0**	**µg/L**	1	08/23/15 15:30
Xylenes, Total	**15**		**0.62**	**3.0**	**µg/L**	1	08/23/15 15:30
Surr: 1,2-Dichloroethane-d4	*99.2*			*75-120*	*%REC*	1	08/23/15 15:30
Surr: 4-Bromofluorobenzene	*103*			*80-110*	*%REC*	1	08/23/15 15:30
Surr: Dibromofluoromethane	*101*			*85-115*	*%REC*	1	08/23/15 15:30
Surr: Toluene-d8	*99.8*			*85-110*	*%REC*	1	08/23/15 15:30

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

ALS Group USA, Corp

Date: *26-Aug-15*

Client: Barr Engineering Company
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)
Sample ID: Trip Blank
Collection Date: 08/21/15 01:30 PM

Work Order: 15081208
Lab ID: 15081208-03
Matrix: WATER

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260**					Analyst: **BG**
Benzene	U		0.25	1.0	µg/L	1	08/23/15 13:47
Ethylbenzene	U		0.22	1.0	µg/L	1	08/23/15 13:47
m,p-Xylene	U		0.40	2.0	µg/L	1	08/23/15 13:47
o-Xylene	U		0.21	1.0	µg/L	1	08/23/15 13:47
Toluene	U		0.20	1.0	µg/L	1	08/23/15 13:47
Xylenes, Total	U		0.62	3.0	µg/L	1	08/23/15 13:47
Surr: 1,2-Dichloroethane-d4	*99.6*			*75-120*	*%REC*	1	08/23/15 13:47
Surr: 4-Bromofluorobenzene	*97.6*			*80-110*	*%REC*	1	08/23/15 13:47
Surr: Dibromofluoromethane	*99.2*			*85-115*	*%REC*	1	08/23/15 13:47
Surr: Toluene-d8	*99.6*			*85-110*	*%REC*	1	08/23/15 13:47

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

Client: Barr Engineering Company

Work Order: 15081208

Project: Enbridge Tank 14-16 - Water -1 (49161253.78)

QC BATCH REPORT

Batch ID: **75137** Instrument ID **GC8** Method: **PUBL-SW-141**

MBLK	Sample ID: **DBLKW1-75137-75137**				Units: **mg/L**			Analysis Date: **08/24/15 04:42 PM**			
Client ID:		Run ID: **GC8_150824A**			SeqNo: **3430000**			Prep Date: **08/24/15**		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	0.012	0.10								

LCS	Sample ID: **DLCSW1-75137-75137**				Units: **mg/L**			Analysis Date: **08/24/15 04:12 PM**			
Client ID:		Run ID: **GC8_150824A**			SeqNo: **3429999**			Prep Date: **08/24/15**		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	3.834	0.012	0.10	5	0	76.7	75-115	0			

LCSD	Sample ID: **DLCSDW1-75137-75137**				Units: **mg/L**			Analysis Date: **08/24/15 06:42 PM**			
Client ID:		Run ID: **GC8_150824A**			SeqNo: **3430004**			Prep Date: **08/24/15**		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	3.802	0.012	0.10	5	0	76	75-115	3.834	0.859	20	

The following samples were analyzed in this batch:

15081208-01B	15081208-02B

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

Client: Barr Engineering Company
Work Order: 15081208
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)

QC BATCH REPORT

Batch ID: **R170157A** Instrument ID **VMS5** Method: **SW8260**

MBLK Sample ID: **VBLKW1-150823-R170157A** Units: **µg/L** Analysis Date: **08/23/15 01:21 PM**
Client ID: Run ID: **VMS5_150823A** SeqNo: **3428550** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	0.25	1.0								
Ethylbenzene	U	0.22	1.0								
m,p-Xylene	U	0.4	2.0								
o-Xylene	U	0.21	1.0								
Toluene	U	0.2	1.0								
Xylenes, Total	U	0.62	3.0								
Surr: 1,2-Dichloroethane-d4	*20.39*	0	0	*20*	0	*102*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*19.5*	0	0	*20*	0	*97.5*	*80-110*	0			
Surr: Dibromofluoromethane	*20.24*	0	0	*20*	0	*101*	*85-115*	0			
Surr: Toluene-d8	*19.93*	0	0	*20*	0	*99.6*	*85-110*	0			

LCS Sample ID: **VLCSW1-150823-R170157A** Units: **µg/L** Analysis Date: **08/23/15 12:30 PM**
Client ID: Run ID: **VMS5_150823A** SeqNo: **3428548** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.99	0.25	1.0	20	0	95	85-125	0			
Ethylbenzene	17.82	0.22	1.0	20	0	89.1	85-125	0			
m,p-Xylene	36.33	0.4	2.0	40	0	90.8	75-130	0			
o-Xylene	17.46	0.21	1.0	20	0	87.3	80-125	0			
Toluene	18.34	0.2	1.0	20	0	91.7	85-125	0			
Xylenes, Total	53.79	0.62	3.0	60	0	89.6	80-126	0			
Surr: 1,2-Dichloroethane-d4	*19.96*	0	0	*20*	0	*99.8*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*20.57*	0	0	*20*	0	*103*	*80-110*	0			
Surr: Dibromofluoromethane	*20.03*	0	0	*20*	0	*100*	*85-115*	0			
Surr: Toluene-d8	*20.11*	0	0	*20*	0	*101*	*85-110*	0			

MS Sample ID: **15081131-01A MS** Units: **µg/L** Analysis Date: **08/23/15 10:19 PM**
Client ID: Run ID: **VMS5_150823A** SeqNo: **3428585** Prep Date: DF: **100**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	3854	25	100	2000	1687	108	85-125	0			
Ethylbenzene	2122	22	100	2000	23	105	85-125	0			
m,p-Xylene	4280	40	200	4000	37	106	75-130	0			
o-Xylene	2035	21	100	2000	0	102	80-125	0			
Toluene	2145	20	100	2000	29	106	85-125	0			
Xylenes, Total	6315	62	300	6000	0	105	80-126	0			
Surr: 1,2-Dichloroethane-d4	*1985*	0	0	*2000*	0	*99.2*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*2067*	0	0	*2000*	0	*103*	*80-110*	0			
Surr: Dibromofluoromethane	*1992*	0	0	*2000*	0	*99.6*	*85-115*	0			
Surr: Toluene-d8	*2020*	0	0	*2000*	0	*101*	*85-110*	0			

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

Client: Barr Engineering Company
Work Order: 15081208
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)

QC BATCH REPORT

Batch ID: **R170157A** Instrument ID **VMS5** Method: **SW8260**

MSD	Sample ID: **15081131-01A MSD**				Units: **µg/L**			Analysis Date: **08/23/15 10:44 PM**			
Client ID:		Run ID: **VMS5_150823A**			SeqNo: **3428586**		Prep Date:		DF: **100**		
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	3783	25	100	2000	1687	105	85-125	3854	1.86	30	
Ethylbenzene	2060	22	100	2000	23	102	85-125	2122	2.97	30	
m,p-Xylene	4154	40	200	4000	37	103	75-130	4280	2.99	30	
o-Xylene	1983	21	100	2000	0	99.2	80-125	2035	2.59	30	
Toluene	2075	20	100	2000	29	102	85-125	2145	3.32	30	
Xylenes, Total	6137	62	300	6000	0	102	80-126	6315	2.86	30	
Surr: 1,2-Dichloroethane-d4	*1961*	0	0	*2000*	0	*98*	*75-120*	1985	*1.22*	*30*	
Surr: 4-Bromofluorobenzene	*2036*	0	0	*2000*	0	*102*	*80-110*	2067	*1.51*	*30*	
Surr: Dibromofluoromethane	*1993*	0	0	*2000*	0	*99.6*	*85-115*	1992	*0.0502*	*30*	
Surr: Toluene-d8	*1988*	0	0	*2000*	0	*99.4*	*85-110*	2020	*1.6*	*30*	

The following samples were analyzed in this batch:

15081208-01A	15081208-02A	15081208-03A

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

Client: Barr Engineering Company
Work Order: 15081208
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)

QC BATCH REPORT

Batch ID: **R170247A** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **VBLKW2-150824-R170247A** Units: **µg/L** Analysis Date: **08/25/15 02:38 AM**
Client ID: Run ID: **VMS6_150824A** SeqNo: **3430183** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	0.25	1.0								
Ethylbenzene	U	0.22	1.0								
m,p-Xylene	U	0.4	2.0								
o-Xylene	U	0.21	1.0								
Toluene	U	0.2	1.0								
Xylenes, Total	U	0.62	3.0								
Surr: 1,2-Dichloroethane-d4	*20.64*	0	0	*20*	0	*103*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*19.32*	0	0	*20*	0	*96.6*	*80-110*	0			
Surr: Dibromofluoromethane	*19.76*	0	0	*20*	0	*98.8*	*85-115*	0			
Surr: Toluene-d8	*19.94*	0	0	*20*	0	*99.7*	*85-110*	0			

LCS Sample ID: **VLCSW1-150824-R170247A** Units: **µg/L** Analysis Date: **08/25/15 01:20 AM**
Client ID: Run ID: **VMS6_150824A** SeqNo: **3430182** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.14	0.25	1.0	20	0	106	85-125	0			
Ethylbenzene	20.23	0.22	1.0	20	0	101	85-125	0			
m,p-Xylene	41.21	0.4	2.0	40	0	103	75-130	0			
o-Xylene	19.87	0.21	1.0	20	0	99.4	80-125	0			
Toluene	20.63	0.2	1.0	20	0	103	85-125	0			
Xylenes, Total	61.08	0.62	3.0	60	0	102	80-126	0			
Surr: 1,2-Dichloroethane-d4	*19.92*	0	0	*20*	0	*99.6*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*20.32*	0	0	*20*	0	*102*	*80-110*	0			
Surr: Dibromofluoromethane	*20.11*	0	0	*20*	0	*101*	*85-115*	0			
Surr: Toluene-d8	*19.88*	0	0	*20*	0	*99.4*	*85-110*	0			

MS Sample ID: **15081133-01B MS** Units: **µg/L** Analysis Date: **08/25/15 11:46 AM**
Client ID: Run ID: **VMS6_150824A** SeqNo: **3430473** Prep Date: DF: **50**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	2888	13	50	1000	1920	96.8	85-125	0			
Ethylbenzene	1022	11	50	1000	8.5	101	85-125	0			
m,p-Xylene	2060	20	100	2000	6.5	103	75-130	0			
o-Xylene	989	11	50	1000	0	98.9	80-125	0			
Toluene	1040	9.8	50	1000	8.5	103	85-125	0			
Xylenes, Total	3049	31	150	3000	0	102	80-126	0			
Surr: 1,2-Dichloroethane-d4	*981.5*	0	0	*1000*	0	*98.2*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*1024*	0	0	*1000*	0	*102*	*80-110*	0			
Surr: Dibromofluoromethane	*975.5*	0	0	*1000*	0	*97.6*	*85-115*	0			
Surr: Toluene-d8	*1006*	0	0	*1000*	0	*101*	*85-110*	0			

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

Client: Barr Engineering Company
Work Order: 15081208
Project: Enbridge Tank 14-16 - Water -1 (49161253.78)

QC BATCH REPORT

Batch ID: **R170247A** Instrument ID **VMS6** Method: **SW8260**

MSD	Sample ID: **15081133-01B MSD**				Units: **µg/L**			Analysis Date: **08/25/15 12:12 PM**			
Client ID:		Run ID: **VMS6_150824A**			SeqNo: **3430474**		Prep Date:		DF: **50**		
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	2982	13	50	1000	1920	106	85-125	2888	3.2	30	
Ethylbenzene	1092	11	50	1000	8.5	108	85-125	1022	6.63	30	
m,p-Xylene	2196	20	100	2000	6.5	109	75-130	2060	6.37	30	
o-Xylene	1046	11	50	1000	0	105	80-125	989	5.6	30	
Toluene	1112	9.8	50	1000	8.5	110	85-125	1040	6.74	30	
Xylenes, Total	3242	31	150	3000	0	108	80-126	3049	6.12	30	
Surr: 1,2-Dichloroethane-d4	*981.5*	0	0	*1000*	0	*98.2*	*75-120*	981.5	*0*	*30*	
Surr: 4-Bromofluorobenzene	*1021*	0	0	*1000*	0	*102*	*80-110*	1024	*0.293*	*30*	
Surr: Dibromofluoromethane	*983.5*	0	0	*1000*	0	*98.4*	*85-115*	975.5	*0.817*	*30*	
Surr: Toluene-d8	*1004*	0	0	*1000*	0	*100*	*85-110*	1006	*0.249*	*30*	

The following samples were analyzed in this batch: 15081208-01A

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

150812 08

Chain of Custody

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

COC 1 of 1

Project Number: 49161253.28 001 001

Project Name: Enbridge - Tank 14/16 - Water - 1

Sample Origination State: WI (use two letter postal state abbreviation)

COC Number: № 41193

Project Manager: REE LEN

Project QC Contact: JET

Sampled by: JET

Laboratory: ALS - Holland

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative: Water: VOCs (HCl) #1 BTEX	SVOCs (unpreserved) #2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H_2SO_4) #4 Hold Bottle	Soil: VOCs (tared MeOH) #1	GRO, BTEX (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	Total Number Of Containers	
1. Tank 14/16 - water - 1 Bin 10	—			8/21/15	13:30	X		X			3					1								4	DRO, BTEX
2. Tank 14/16 - water - 1 Bin 11	—			8/21/15	13:45	X					3					1								4	DRO, BTEX
3. Trip Blank	—			8/21/15	13:30					X	1													1	BTEX
4. Temp Blank	—									X														1	—
5.																									
6.																									
7. Tank 14/16 - water - 1 Bin 10	—			8/21/15	13:30	X		X									1								Hold
8. Tank 14/16 - water - 1 Bin 11		—		8/21/15	13:45	X		X									1		BROKEN KW 8/22/15						Hold
9.																									
10.																									

ASAP TAT

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, 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

		On Ice?	Date	Time		Date	Time
Relinquished By: James Lockhart		Y N	8/24/15	15:15	Received by: FEDEX		
Relinquished By: FEDEX		Y N	8/22/15	1000	Received By:		

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other: X

Air Bill Number:

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

3.6°C

H:RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09\01\09

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **BARRENG-MN** Date/Time Received: **22-Aug-15 10:00**

Work Order: **15081208** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 22-Aug-15 (Date) Reviewed by: Tom Beamish (eSignature) 24-Aug-15 (Date)

Matrices: Water

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 ☐	
Temperature(s)/Thermometer(s):	3.6/3.6 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	8/22/2015 10:52:08 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: Broken Amber bottle (HCl preserved) for sample "Bin 11"

Client Contacted: yes Date Contacted: 24-Aug-15 Person Contacted: REE, LEN, JET

Contacted By: Tom Beamish Regarding: One sample bottle arrived broken

Comments:

CorrectiveAction: