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BARR

Technical Memorandum

To: Nick Larabel, Enbridge Energy
From: Ryan Erickson
Subject: Enbridge Superior Terminal – Manifold 221 Response
WDNR BRRTS #'s: 0216577298 (Manifold Corridor); 1616560657 (Terminal Facility-wide)
Barr Project: 49161092.11 003 007
Site Coordinates: 46.689020°, -92.058239° (NAD83)
Date: December 18, 2022

This memorandum summarizes the environmental response activities performed by Barr Engineering (Barr) at the request of Enbridge Energy (Enbridge) following the discovery of historical petroleum impacts in the Manifold 221 project excavation at the Enbridge Superior Terminal (Terminal) in Superior, Wisconsin (Figure 1).

Project Background

On September 13, 2022, Enbridge excavation contractors encountered an apparent petroleum sheen on water in the Manifold 221 maintenance project excavation (hereafter referred to as the site). Upon discovery, excavation activities were halted, and the site was inspected by Enbridge and no active release source was identified. Based on the field observations and site information described below, the impacts were considered historical. Enbridge Environment was notified and requested that Barr complete the following:

- review historical records of releases near the site,
- assist with the off-site management coordination of soil and/or water with suspected impacts,
- field screen and sample soil from the excavation extents to document the soil conditions, and
- prepare a memorandum summarizing the response actions and the excavation conditions upon the completion of project activities.

A review of historical release documentation for this location identified the site is within Manifold Corridor area (Bureau for Remediation and Redevelopment Tracking System (BRRTS; BRRTS# 0216577298) that was granted Closure with Continuing Obligations by the Wisconsin Department of Natural Resources (WDNR) on March 10, 2022 (WDNR, 2022). The Manifold Corridor area is part of the Enbridge Energy-Superior Terminal Facility-Wide agreement (BRRTS# 1616560657) that facilitates the tracking and reporting of historical impacts encountered at the facility.

Enbridge notified the Wisconsin Department of Natural Resources (WDNR) of the historical impacts via email.

Field Methods and Results

On September 14, 2022, Barr was on site to evaluate conditions in the ongoing project excavation (Photo 1; Figure 2) and collect waste characterization samples for off-site disposal of excavated soil. At the time of the inspection, the following conditions were observed:

- No apparent soil impacts (e.g., discoloration, petroleum sheen) or definitive sources of sheen were observed in the excavation sidewalls at the time.
- No sheen was observed on water in the southwestern half of the excavation (Photo 2). The project inspector reported that a sheen had been observed there the previous day but was no longer present.
- A sheen was observed on water in the northeastern half of the excavation (Photos 3 and 4) where excavation with a hydrovacuum truck (hydrovac) was ongoing.

A waste characterization sample was collected from the soil stockpile as described in the Material Management section below.

On September 20, 2022, Barr returned to the site to field screen and sample the final excavation sidewalls and to document environmental conditions per the WDNR-approved *Site Investigation and Response Action Plan* (SI/RAP; 2014). The final excavation was approximately 50 feet long (northeast to southwest) by 20 feet wide (northwest to southeast) by up to 8 feet deep. Soil consisted mostly of clay with sand fill around some buried infrastructure. Groundwater in this location was observed to be at approximately 4 feet below ground surface (bgs).

Barr collected fifteen field screening soil samples from the excavation sidewalls (Photos 5 and 6; Attachment A). No soil samples were collected from the excavation bottom due to the presence of excavation water and gravel. The soil samples were tested for the presence of organic vapors using a 10.6eV photoionization detector (PID) and inspected for the presence of other potential indicators of petroleum impacts such as odor, discoloration and sheen. The soil had headspace readings between 0.0 and 1.5 parts per million (ppm) and no discoloration, petroleum odor, or sheen were identified in the soil. However, a small, perched water zone with a rainbow sheen was observed within sandy fill material around electrical lines in the northwest sidewall at approximately 3 feet bgs (Photos 7 through 10). The electrical lines bisect the excavation. Water was not observed coming out of fill material in the southeast sidewall.

Analytical confirmation soil sample *MAN221-S-1* was collected from the fill material around the electrical lines from a depth of 3 to 3.5 feet bgs (Figure 2; Attachment A). The sample was submitted to ALS Environmental Laboratory (ALS) in Holland, Michigan for analysis of petroleum volatile organic compounds (PVOCs) and naphthalene. The analyte concentrations were below the laboratory method detection limits except for naphthalene (0.64 mg/kg), which is below the WDNR Groundwater Residual Contaminant Levels (RCLs; naphthalene = 0.6582 mg/kg). The laboratory report is provided in Attachment B.

Upon completion of the project activities, the excavation was backfilled with clean fill.

Receptor Survey
No direct contact risks were identified based on the field observations by the project team and due to the clean fill material used to backfill the excavation. No impacts to surface water were identified during the project and there is little risk of future surface water impacts based on field observations, distance to surface water receptors, and the use of clean backfill. No groundwater risks were identified based on the results of the analytical sample collected from the excavation and based on the results of the annual

facility-wide groundwater monitoring program. Specifically, the groundwater pathway at the Superior Terminal is addressed on a facility-wide basis through the established hydrogeologic performance standard approved by the WDNR; Enbridge samples the Terminal groundwater monitoring well network (Figure 3) on an annual basis and provides the data to the WDNR. The nearest downgradient monitoring well is MW-24A located approximately 600 feet to the northeast. No vapor receptors were identified as the nearest enclosed structure is approximately 30 feet west of the electrical lines, and the structure is an above grade pipeline-operation building with no basement and limited human occupancy. Further, Terminal employees are required to wear four-gas detectors that would alert them to a potentially hazardous atmosphere.

Material Management

During the project activities, hydrovac slurry soil and water with evidence of petroleum impacts were managed in hydrovac slurry management roll-off containers in the terminal Soil Management Area (SMA) and solidified for off-site disposal. Barr collected representative soil sample *MAN221-STOCKPILE-1* for laboratory analysis at ALS of benzene, toluene, ethylbenzene, xylenes (BTEX) and diesel range organics (DRO). A total of 111.17 tons of solidified soil was managed at the VONCO V landfill in Duluth, Minnesota under waste profile 22-085-I on October 18, 2022. The waste profile approval letter, landfill summary, and laboratory report are provided in Attachment C.

Conclusions

Excavation water with a petroleum sheen was identified in the Manifold 221 infrastructure maintenance excavation in September 2022 which is located within the Manifold Corridor area (BRRTS# 0216577298) that is part of the Terminal Facility-wide site (BRRTS# 1616560657). No evidence of petroleum impacted soil was identified during or after excavation activities. The water with a sheen appeared to originate from sandy fill material around electrical lines on the northwest side of the excavation. Hydrovac loads that excavated material (soil and water) with a sheen were managed at the VONCO V landfill.

Based on the location of the Manifold 221 excavation, field observations, and ongoing facility environmental monitoring activities, we believe the sheen was associated with residual historical impacts documented in the Manifold Corridor area (BRRTS# 0216577298) and that there is no apparent risk to human health and the environmental receptors. Based on this, Barr believes that no additional investigation actions will be required, and we recommend that Enbridge request that the WDNR add this report to the Manifold Corridor area BRRTS file.

Certification

I, Ryan Erickson, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

 , Professional Geologist (1446-13) 12/18/2022

Signature and Title DATE

References

Barr, 2014, *Site Investigation and Response Action Plan Enbridge, Energy Superior Terminal (Facility-Wide)*. Prepared for Enbridge Energy, July 2014.

WDNR, 2022. *Reported Contamination at 2800 E 21st St., Superior, Wisconsin; DNR BRRTS Activity Name: Enbridge Terminal - Manifold Corridor; DNR BRRTS Activity #: 02-16-577298; DNR Facility-Wide BRRTS Activity #: 16-16-560657; DNR FID #: 816010580*. WDNR site closure with continuing obligations letter sent to Enbridge Energy, March 10, 2022.

Attachments:

Site Photos	1 through 8
Table 1	Soil Analytical Data Summary
Figure 1	Site Location
Figure 2	Site Layout
Figure 3	Receptor Survey
Attachment A	Site Investigation Field Sampling and Screening Log
Attachment B	ALS Environmental Laboratory Report for Excavation Soil Sample
Attachment C	Material Management Documents

Site Photos

Photo 1

Photo 2

Photo 1: Manifold 221 excavation. Photo taken facing east on September 14, 2022.
Photo 2: Western half of Manifold 221 excavation. Photo taken facing west on September 14, 2022.

Photo 3

Photo 4

Photo 3: Eastern half of Manifold 221 excavation. Photo taken facing southeast on September 14, 2022.
Photo 4: Sheen on water in bottom of eastern half of the Manifold 221 excavation. Photo taken facing northeast on September 14, 2022.

Photo 5

Photo 6

Photo 5: Manifold 221 excavation. Photo taken facing southwest on September 20, 2022.
Photo 6: Electrical lines near center of Manifold 221 excavation. Photo taken facing south on September 20, 2022.

Photo 7

Photo 8

Photo 7: Manifold 221 excavation. Water (yellow arrow) from sandy fill around electrical lines on northwest sidewall. Photo taken facing west on September 20, 2022.
Photo 8: Electrical conduit on northwest sidewall. Photo taken facing down to the southeast on September 20, 2022.

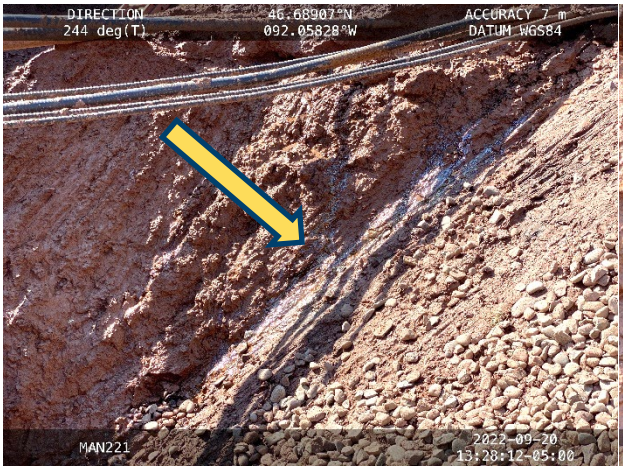


Photo 9

Photo 10

Photo 9: Water (yellow arrow) from sandy fill around electrical lines. Photo taken facing southwest on September 20, 2022.
Photo 10: Petroleum sheen on water. Photo taken facing northwest on September 2, 2022.

Table 1
Analytical Soil Data Summary
Manifold 221 Response
Enbridge Energy

			Location	MAN 221-S-1
			Date	9/20/2022
			Depth	3-3.5 ft
Parameter	Wisconsin Groundwater RCLs, DF=2	Wisconsin Not to Exceed Direct Contact Industrial RCLs		
Effective Date	06/01/2018	06/01/2018		
Exceedance Key	No Exceedances	No Exceedances		
Volatile Organic Compounds				
1,2,4-Trimethylbenzene	1.3787 (1)	219		< 0.031 U
1,3,5-Trimethylbenzene	1.3787 (1)	182		< 0.049 U
Benzene	0.0051	7.07		< 0.020 U
Ethyl benzene	1.57	35.4		< 0.0089 U
Naphthalene	6.582	24.1		0.640
Toluene	1.1072	818		< 0.011 U
Xylene, total	3.96	260		< 0.056 U

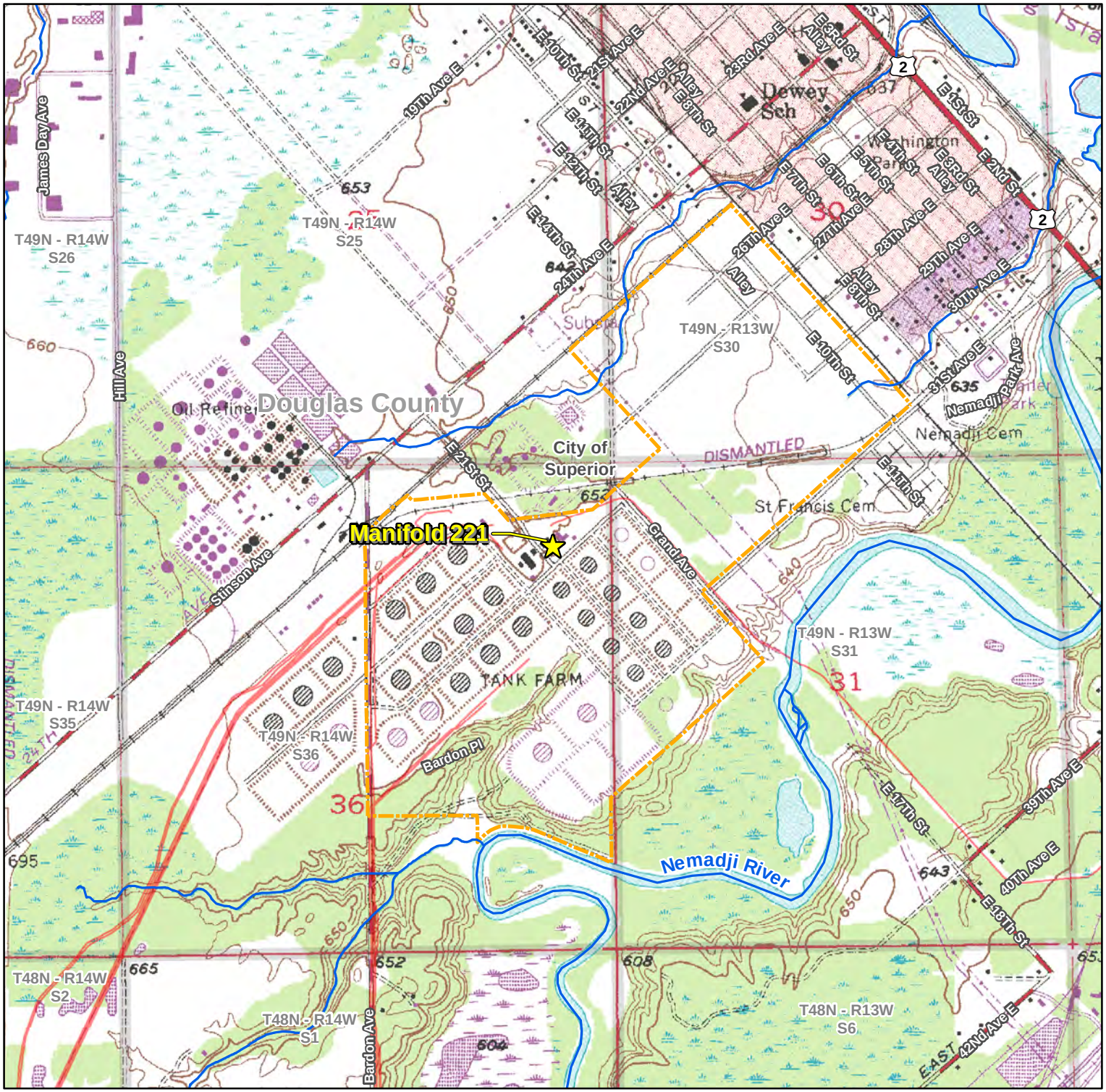
-All values in mg/kg unless otherwise noted

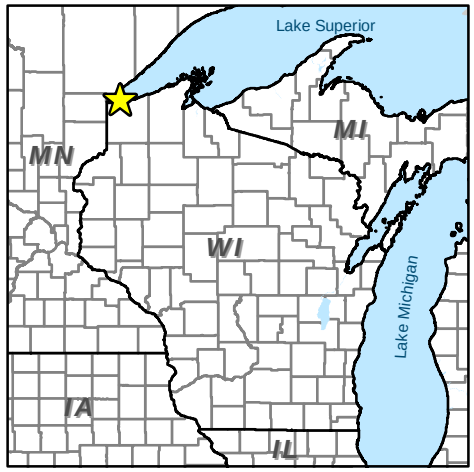
Barr Standard Footnotes and Qualifiers

U	The analyte was analyzed for, but was not detected.

Wisconsin Groundwater RCLs, DF=2

(1)	Representing the criteria for combined Trimethylbenzenes.





Site Location

Enbridge Pipelines

Terminal Property Boundary

Watercourses

N

0 1,500 3,000

Feet

1 Inch = 1,500 Feet

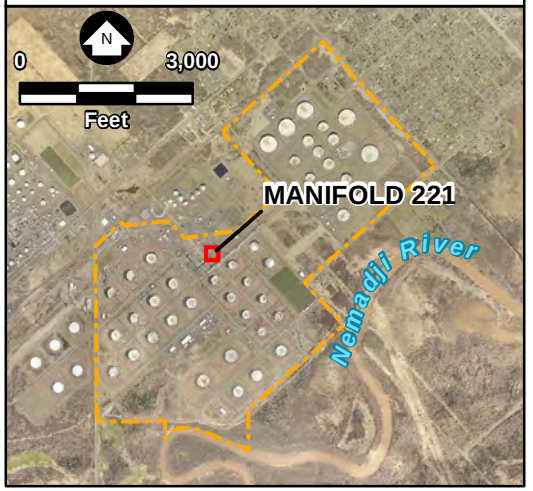
Figure 1

SITE LOCATION
MANIFOLD 221 EXCAVATION
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Barr Footer: ArcGIS 10.8.1, 2022-12-06 13:33 File: I:\Client\Enbridge_Energy\Work_Orders\Terminal_Permitting\49161092\Maps\Reports\Manifold_221_Response\Figure 1 Manifold 221 Site Location.mxd User: vaw

ENBRIDGE SUPERIOR TERMINAL



- Sample Location
- Excavation Extent
- Manifold Corridor - BRRTS#0216577298 *(Facility-wide Site)*
- Pipeline Infrastructure
- Terminal Property Boundary

N

0 30 60

Feet

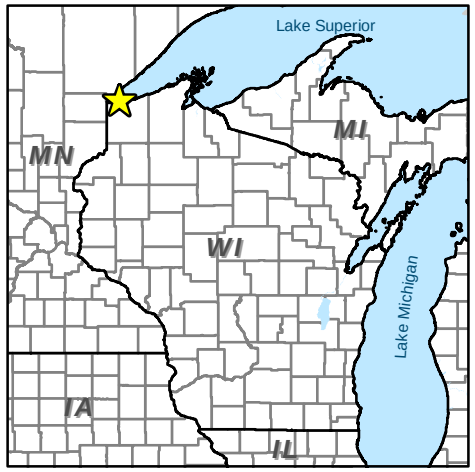
1 Inch = 30 Feet

Douglas County Imagery Circa May, 2019

Figure 2

SITE LAYOUT
MANIFOLD 221 EXCAVATION
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE



- Site Location
- Enbridge Monitoring Well
- Receptor Buffers
- Enbridge Pipelines
- Terminal Property Boundary
- Watercourses

Wisconsin Wetland Inventory

- Emergent/wet meadow
- Filled/drained wetland
- Forested
- Open Water
- Scrub/Shrub

N

0 1,000 2,000

Feet

1 Inch = 1,000 Feet

Figure 3

RECEPTOR SURVEY
MANIFOLD 221 EXCAVATION
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Barr Footer: ArcGIS 10.8.1, 2022-12-06 13:38 File: I:\Client\Enbridge_Energy\Work_Orders\Terminal_Permitting\49161092\Maps\Reports\Manifold_221_Response\Figure 3 Manifold 221 Receptor Survey.mxd User: vaw

Attachment A

Site Investigation Field Sampling and Screening Log

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Client: Enbridge Date: 9/20/22

Location: Superior Term Manhole 227 Sampler: REE

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

R = Removed **S** = Sidewall **B** = Bottom **Stockpile** = Stockpile

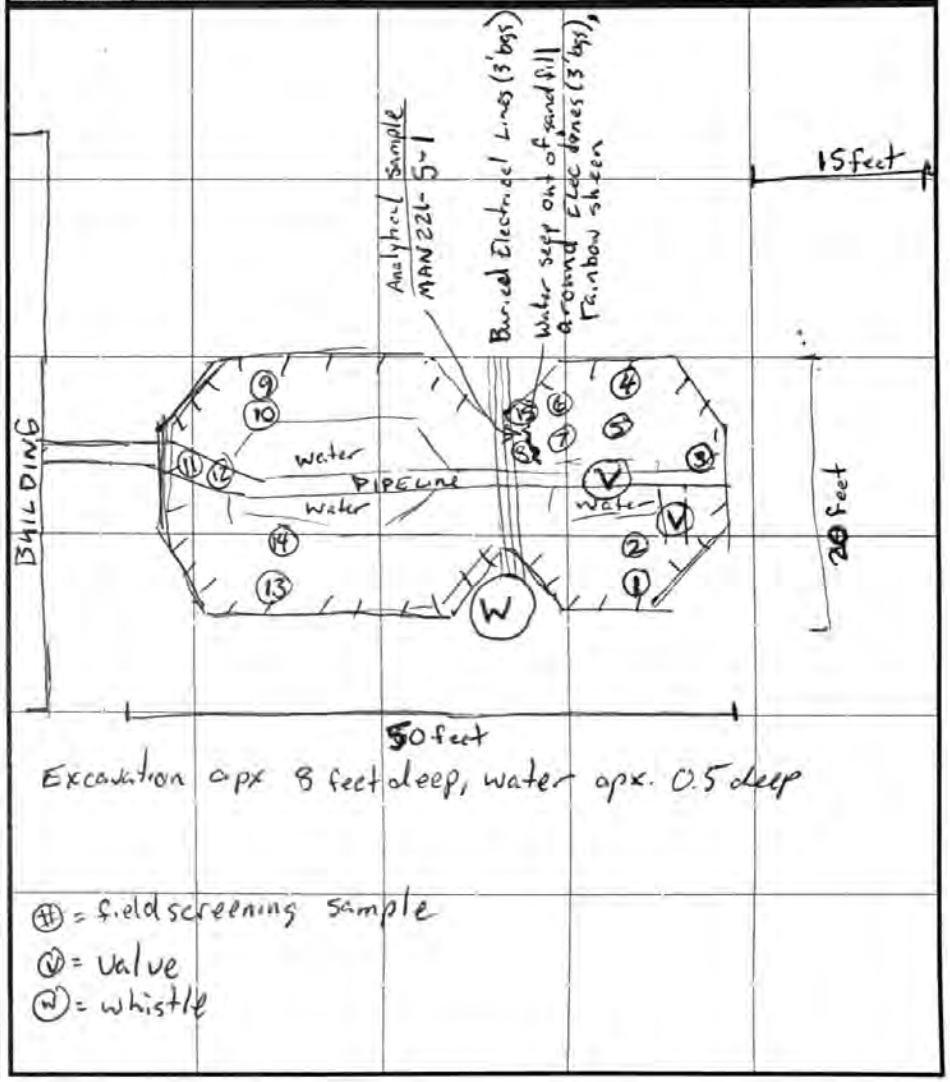
Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: Stockpile-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
S-1	2	100	CLAY	Red brown/N	N/N	0.4
S-2	7					1.5
S-3	2					0.4
S-4	2					0.4
S-5	7					0.5
S-6	4					0.3
S-7	7					0.5
S-8	3		fill sand		sheen on water/soil	0.3
S-9	2		CLAY			0.1
S-10	7					0.2
S-11	2					0.0
S-12	7					0.1
S-13	2					0.1
S-14	7					0.2
S-15	1	200				0.1
ANALYTICAL						
MAN221-S-1	3-35	200	sand & clay			see S-8

Equipment: Photoionization detector with 10.6 eV bulb

	Calibration	Bump Test 1	Bump Test 2
Time	1200		
Zero reading (ppm)	0.0		
Span reading (ppm)	100		
Background (ppm)	0.0		

BARR

Site Sketch: north arrow, scale, excavation extents & depths, impacted areas, sample locations ,borings, wells, structures, utilities, natural features...



Excavation apx 8 feet deep, water apx. 0.5 deep

(#) = field screening sample

(V) = valve

(W) = whistle

Attachment B

ALS Environmental Laboratory Report for Excavation Soil Sample

28-Sep-2022

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

Re: **Manifold 221** Work Order: **22092036**

Dear Ryan,

ALS Environmental received 1 sample on 21-Sep-2022 09:00 AM for the analyses presented in the following report.

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

Sample results are compliant with industry accepted practices and Quality Control 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 11.

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

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Jodi Blouw

Electronically approved by: Jodi Blouw

Jodi Blouw

Report of Laboratory Analysis

Certificate No: WI: 399084510

ALS Group, USA

Date: 28-Sep-22

Client: Barr Engineering Company
Project: Manifold 221
Work Order: **22092036**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
22092036-01	MAN 221-S-1	Soil		9/20/2022 14:00	9/21/2022 09:00	☐

Client: Barr Engineering Company
Project: Manifold 221
WorkOrder: **22092036**

QUALIFIERS, ACRONYMS, UNITS

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

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
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

Client: Barr Engineering Company
Project: Manifold 221
Work Order: 22092036

Case Narrative

Samples for the above noted Work Order were received on 09/21/2022. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, sample condition, preservation, and temperature compliance.
In order to ensure compliance with NR 149 criteria, please note the following report format:
(1) The Limit of Detection (LOD) is reported as the MDL (Method Detection Limit)
(2) The Limit of Quantitation (LOQ) is reported as the PQL (Practical Quantitation Limit)
(3) All reported concentrations, including those for the LOD and LOQ, are adjusted for any required dilutions
(4) All reported concentrations, including those for the LOD and LOQ, are adjusted for moisture content when samples are reported on a dry weight basis.

Samples were analyzed according to the analytical methodology previously documented 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. Detail as to the associated samples can be found 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, acronyms, and units utilized in reporting.

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

Volatile Organics
No deviations or anomalies noted

Wet Chemistry
No deviations or anomalies noted

ALS Group, USA

Date: *28-Sep-22*

Client: Barr Engineering Company
Project: Manifold 221
Sample ID: MAN 221-S-1
Collection Date: 9/20/2022 02:00 PM

Work Order: 22092036
Lab ID: 22092036-01
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**			Prep: SW5035A / 9/21/22		Analyst: **NAD**
1,2,4-Trimethylbenzene	U		31	100	µg/Kg-dry	1	9/28/2022 04:39
1,3,5-Trimethylbenzene	U		49	160	µg/Kg-dry	1	9/28/2022 04:39
Benzene	U		20	68	µg/Kg-dry	1	9/28/2022 04:39
Ethylbenzene	U		8.9	30	µg/Kg-dry	1	9/28/2022 04:39
m,p-Xylene	U		56	190	µg/Kg-dry	1	9/28/2022 04:39
Naphthalene	**640**		**100**	**340**	**µg/Kg-dry**	1	9/28/2022 04:39
o-Xylene	U		16	54	µg/Kg-dry	1	9/28/2022 04:39
Toluene	U		11	38	µg/Kg-dry	1	9/28/2022 04:39
Xylenes, Total	U		56	190	µg/Kg-dry	1	9/28/2022 04:39
Surr: 1,2-Dichloroethane-d4	*97.0*			*80-120*	*%REC*	1	9/28/2022 04:39
Surr: 4-Bromofluorobenzene	*98.3*			*80-120*	*%REC*	1	9/28/2022 04:39
Surr: Dibromofluoromethane	*96.8*			*80-120*	*%REC*	1	9/28/2022 04:39
Surr: Toluene-d8	*99.9*			*80-120*	*%REC*	1	9/28/2022 04:39
MOISTURE		Method: **SW3550C**					Analyst: **ALG**
Moisture	**27**		**0.10**	**0.10**	**% of sample**	1	9/22/2022 11:03

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

ALS Group, USA

Date: 28-Sep-22

Client: Barr Engineering Company

Work Order: 22092036

Project: Manifold 221

QC BATCH REPORT

Batch ID: **203566** Instrument ID **VMS9** Method: **SW8260C**

MBLK Sample ID: **MBLK-203566-203566** Units: **µg/Kg-dry** Analysis Date: **9/26/2022 10:14 PM**

Client ID: Run ID: **VMS9_220926A** SeqNo: **8837660** Prep Date: **9/21/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	U	22	30								
1,3,5-Trimethylbenzene	U	35	100								
Benzene	U	15	30								
Ethylbenzene	U	6.3	30								
m,p-Xylene	U	40	60								
Naphthalene	U	72	100								
o-Xylene	U	12	30								
Toluene	U	8.2	30								
Xylenes, Total	U	40	90								
Surr: 1,2-Dichloroethane-d4	*982*	0	0	*1000*	0	*98.2*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*990.5*	0	0	*1000*	0	*99*	*80-120*	0			
Surr: Dibromofluoromethane	*989*	0	0	*1000*	0	*98.9*	*80-120*	0			
Surr: Toluene-d8	*967*	0	0	*1000*	0	*96.7*	*80-120*	0			

LCS Sample ID: **LCS-203566-203566** Units: **µg/Kg-dry** Analysis Date: **9/26/2022 09:12 PM**

Client ID: Run ID: **VMS9_220926A** SeqNo: **8837652** Prep Date: **9/21/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	928.5	22	30	1000	0	92.8	64-126	0			
1,3,5-Trimethylbenzene	978.5	35	100	1000	0	97.8	66-130	0			
Benzene	944.5	15	30	1000	0	94.4	78-122	0			
Ethylbenzene	947.5	6.3	30	1000	0	94.8	75-121	0			
m,p-Xylene	1912	40	60	2000	0	95.6	67-129	0			
Naphthalene	933	72	100	1000	0	93.3	53-135	0			
o-Xylene	964.5	12	30	1000	0	96.4	75-120	0			
Toluene	981	8.2	30	1000	0	98.1	76-120	0			
Xylenes, Total	2877	40	90	3000	0	95.9	67-129	0			
Surr: 1,2-Dichloroethane-d4	*1006*	0	0	*1000*	0	*101*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*984*	0	0	*1000*	0	*98.4*	*80-120*	0			
Surr: Dibromofluoromethane	*970*	0	0	*1000*	0	*97*	*80-120*	0			
Surr: Toluene-d8	*972*	0	0	*1000*	0	*97.2*	*80-120*	0			

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

Client: Barr Engineering Company
Work Order: 22092036
Project: Manifold 221

QC BATCH REPORT

Batch ID: **203566** Instrument ID **VMS9** Method: **SW8260C**

MS Sample ID: **22091983-03A MS** Units: **µg/Kg-dry** Analysis Date: **9/27/2022 03:43 AM**
Client ID: Run ID: **VMS9_220926A** SeqNo: **8837693** Prep Date: **9/21/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	1206	31	42	1411	0	85.5	64-126	0			
1,3,5-Trimethylbenzene	1317	49	140	1411	0	93.4	66-130	0			
Benzene	1329	20	42	1411	0	94.2	78-122	0			
Ethylbenzene	1205	8.9	42	1411	0	85.4	75-121	0			
m,p-Xylene	2491	56	85	2821	0	88.3	67-129	0			
Naphthalene	1201	100	140	1411	0	85.2	53-135	0			
o-Xylene	1239	16	42	1411	0	87.8	75-120	0			
Toluene	1241	12	42	1411	0	88	76-120	0			
Xylenes, Total	3730	56	130	4232	0	88.1	67-129	0			
Surr: 1,2-Dichloroethane-d4	*1416*	0	0	*1411*	0	*100*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1466*	0	0	*1411*	0	*104*	*80-120*	0			
Surr: Dibromofluoromethane	*1315*	0	0	*1411*	0	*93.3*	*80-120*	0			
Surr: Toluene-d8	*1327*	0	0	*1411*	0	*94.1*	*80-120*	0			

MSD Sample ID: **22091983-03A MSD** Units: **µg/Kg-dry** Analysis Date: **9/27/2022 03:58 AM**
Client ID: Run ID: **VMS9_220926A** SeqNo: **8837694** Prep Date: **9/21/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trimethylbenzene	1394	34	46	1533	0	90.9	64-126	1206	14.4	30	
1,3,5-Trimethylbenzene	1473	54	150	1533	0	96.1	66-130	1317	11.2	30	
Benzene	1552	22	46	1533	0	101	78-122	1329	15.5	30	
Ethylbenzene	1351	9.7	46	1533	0	88.1	75-121	1205	11.4	30	
m,p-Xylene	2858	61	92	3066	0	93.2	67-129	2491	13.7	30	
Naphthalene	1322	110	150	1533	0	86.2	53-135	1201	9.61	30	
o-Xylene	1437	18	46	1533	0	93.7	75-120	1239	14.8	30	
Toluene	1386	13	46	1533	0	90.4	76-120	1241	11	30	
Xylenes, Total	4295	61	140	4600	0	93.4	67-129	3730	14.1	30	
Surr: 1,2-Dichloroethane-d4	*1541*	0	0	*1533*	0	*100*	*80-120*	1416	*8.48*	*30*	
Surr: 4-Bromofluorobenzene	*1595*	0	0	*1533*	0	*104*	*80-120*	1466	*8.38*	*30*	
Surr: Dibromofluoromethane	*1462*	0	0	*1533*	0	*95.3*	*80-120*	1315	*10.6*	*30*	
Surr: Toluene-d8	*1456*	0	0	*1533*	0	*94.9*	*80-120*	1327	*9.28*	*30*	

The following samples were analyzed in this batch: 22092036-01A

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

Client: Barr Engineering Company
Work Order: 22092036
Project: Manifold 221

QC BATCH REPORT

Batch ID: **R354086** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R354086** Units: **% of sample** Analysis Date: **9/22/2022 11:03 AM**
Client ID: Run ID: **MOIST_220922A** SeqNo: **8826954** 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	0.1	0.10								

LCS Sample ID: **LCS-R354086** Units: **% of sample** Analysis Date: **9/22/2022 11:03 AM**
Client ID: Run ID: **MOIST_220922A** SeqNo: **8826953** 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	0.1	0.10	100	0	100	98-102	0			

DUP Sample ID: **22091812-01A DUP** Units: **% of sample** Analysis Date: **9/22/2022 11:03 AM**
Client ID: Run ID: **MOIST_220922A** SeqNo: **8826933** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	7.15	0.1	0.10	0	0	0	0-0	7.05	1.41	10	

DUP Sample ID: **22092023-01A DUP** Units: **% of sample** Analysis Date: **9/22/2022 11:03 AM**
Client ID: Run ID: **MOIST_220922A** SeqNo: **8826936** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	20.63	0.1	0.10	0	0	0	0-0	20.99	1.73	10	

The following samples were analyzed in this batch: 22092036-01B

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

Barr Engineering Co. Chain of Custody

BARR ☐ Ann Arbor ☒ Duluth ☐ Hibbing ☐ Minneapolis
☐ Bismarck ☐ Grand Rapids ☐ Jefferson City ☐ Salt Lake City

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

COC Number: 57122
COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr	Company: Barr
Address: Duluth	Address:
Name: Ryan Erickson	Name:
email: REE@barr.com	email:
Copy to: datamgt@barr.com	P.O.
Project Name: Manifold 221	Barr Project No: 4916 1092.11 003 007

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: PVOC's + Naphthalene	Soil: % Solids	Preservative Code	Field Filtered Y/N
1.	MAN 221-S-1	3	3.5	FT	09/20/2022	2:00	S				2	1		
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														

22092036
BARRENG-DULUTH: Barr Engineering
Project: Manifold 221

BARR USE ONLY

Sampled by: REE
Barr Proj. Manager: REE
Barr DQ Manager: JET
Lab Name: ALS
Location: Holland, MI

Relinquished by: [signature] On Ice? Y N — Date: 9/20/22 — Time: 300
Received by: [signature] — Date: 9-21-22 — Time: 0900
Relinquished by: On Ice? Y N — Date — Time
Received by: — Date — Time

Samples Shipped VIA: ☐ Courier ☒ Federal Express ☐ Sampler ☐ Other: ____
Air Bill Number:

Lab WO: Temperature on Receipt (°C): 5.7C Custody Seal Intact? ☐ Y ☐ N ☒ None

Requested Due Date: ☒ Standard Turn Around Time ☐ Rush ____ (mm/dd/yyyy)

Location - 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. 01/02/18

ALS Group, USA
Holland, Michigan

Sample Receipt Checklist

Client Name: **BARRENG-MN** Date/Time Received: **21-Sep-22 09:00**

Work Order: **22092036** Received by: **JD**

Checklist completed by Jason Delinger (eSignature) 21-Sep-22 (Date) Reviewed by: Jodi Blouw (eSignature) 21-Sep-22 (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):	3.7/4.7 c	ir3	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	9/21/2022 2:28:30 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 C

Material Management Documents

Cassidy Potter
Sales Representative
1100 West Gary Street
Duluth, MN 55808

Office: 218.626.3867
Mobile: 218.395.0315
Fax: 218.626.1009
CPotter@VoncoUSA.com

September 21, 2022

Enbridge Energy
Nick Larabel
1100 Louisiana Ave, Ste 3300
Houston, TX 77002

RE: Profile 22-085-I/ Hydrocarbon Contaminated soil

Nick,

Please be advised that the above described waste material is acceptable for 500**/yards** for disposal at the Vonco V Waste Management Campus Facility in Duluth, MN. The waste material is acceptable per Vonco V (SW-536) Minnesota Pollution Control Agency Industrial Solid Waste Management Plan.

The referenced waste must maintain consistency with what was originally submitted on the waste profile. Vonco V Waste Management Campus must be contacted immediately for any changes in material composition or process generation as further testing and analysis may apply. The term of the approval is 3 years and will expire on 9\14\2024.

Additionally, acceptance is subject to the following conditions:

- **The material will be absent of free liquids and must meet the paint filter test.**
- A signed waste manifest with the correct profile number shall accompany each load delivered to The Vonco V Waste Management Campus.
- All hauling will be in compliance with the Federal and State D.O.T regulations.

Thank you for choosing Vonco V Waste Management Campus. We appreciate your business. If you have any questions or concerns, please feel free to contact me at: (218)-395-0315.

We look forward to working with you,

Cassidy Potter

Vonco V Duluth, LLC

Vonco V Duluth LLC
1100 West Gary Street
Duluth, MN 55808
Permit: SW 536

001342 - ENBRIDGE ENERGY					
Date	Ticket	Profile/Job	Truck	Material	Tons
10/18/2022	347463	22-085-I Manifold 221 Soil	T87446X	Contaminated Soil - Tons	10.73
10/18/2022	347465	22-085-I Manifold 221 Soil	T53691W	Contaminated Soil - Tons	18.55
10/18/2022	347471	22-085-I Manifold 221 Soil	T87446X	Contaminated Soil - Tons	15.56
10/18/2022	347472	22-085-I Manifold 221 Soil	T53691W	Contaminated Soil - Tons	18.37
10/18/2022	347480	22-085-I Manifold 221 Soil	T87446X	Contaminated Soil - Tons	13.30
10/18/2022	347481	22-085-I Manifold 221 Soil	T53691W	Contaminated Soil - Tons	20.44
10/18/2022	347492	22-085-I Manifold 221 Soil	T87446X	Contaminated Soil - Tons	14.22
				Total Tons	***111.17***
				Total Loads	***7***

20-Sep-2022

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

Re: **Manifold 221** Work Order: **22091469**

Dear Ryan,

ALS Environmental received 1 sample on 15-Sep-2022 09:30 AM for the analyses presented in the following report.

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

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

The total number of pages in this report is 12.

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

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Jodi Blouw

Electronically approved by: Jodi Blouw

Jodi Blouw

ALS Group, USA

Date: 20-Sep-22

Client: Barr Engineering Company
Project: Manifold 221
Work Order: **22091469**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
22091469-01	MAN 221 - STOCKPILE - 1	Soil		9/14/2022 09:30	9/15/2022 09:30	☐

Client: Barr Engineering Company
Project: Manifold 221
WorkOrder: **22091469**

QUALIFIERS, ACRONYMS, UNITS

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

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

Client: Barr Engineering Company
Project: Manifold 221
Work Order: 22091469

Case Narrative

Samples for the above noted Work Order were received on 09/15/2022. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, sample condition, preservation, and temperature compliance.
In order to ensure compliance with NR 149 criteria, please note the following report format:
(1) The Limit of Detection (LOD) is reported as the MDL (Method Detection Limit)
(2) The Limit of Quantitation (LOQ) is reported as the PQL (Practical Quantitation Limit)
(3) All reported concentrations, including those for the LOD and LOQ, are adjusted for any required dilutions
(4) All reported concentrations, including those for the LOD and LOQ, are adjusted for moisture content when samples are reported on a dry weight basis.

Samples were analyzed according to the analytical methodology previously documented 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. Detail as to the associated samples can be found 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, acronyms, and units utilized in reporting.

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

Volatile Organics
No deviations or anomalies noted

Extractable Organics
No deviations or anomalies noted

Wet Chemistry
No deviations or anomalies noted

ALS Group, USA

Date: *20-Sep-22*

Client: Barr Engineering Company
Project: Manifold 221
Sample ID: MAN 221 - STOCKPILE - 1
Collection Date: 9/14/2022 09:30 AM

Work Order: 22091469
Lab ID: 22091469-01
Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **PUBL-SW-141**					Analyst: **MTB**
DRO (C10-C28)	**4.9**	J	**0.72**	**7.2**	**mg/Kg-dry**	1	9/17/2022 00:58
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**			Prep: SW5035A / 9/16/22		Analyst: **BAM**
Benzene	U		16	34	µg/Kg-dry	1	9/17/2022 03:46
Ethylbenzene	U		7.2	34	µg/Kg-dry	1	9/17/2022 03:46
m,p-Xylene	U		45	68	µg/Kg-dry	1	9/17/2022 03:46
o-Xylene	U		13	34	µg/Kg-dry	1	9/17/2022 03:46
Toluene	U		9.3	34	µg/Kg-dry	1	9/17/2022 03:46
Xylenes, Total	U		45	100	µg/Kg-dry	1	9/17/2022 03:46
Surr: 1,2-Dichloroethane-d4	*96.3*			*80-120*	*%REC*	1	9/17/2022 03:46
Surr: 4-Bromofluorobenzene	*101*			*80-120*	*%REC*	1	9/17/2022 03:46
Surr: Dibromofluoromethane	*93.8*			*80-120*	*%REC*	1	9/17/2022 03:46
Surr: Toluene-d8	*99.8*			*80-120*	*%REC*	1	9/17/2022 03:46
MOISTURE		Method: **SW3550C**					Analyst: **ALG**
Moisture	**31**		**0.10**	**0.10**	**% of sample**	1	9/16/2022 10:50

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

ALS Group, USA

Date: 20-Sep-22

Client: Barr Engineering Company

Work Order: 22091469

Project: Manifold 221

QC BATCH REPORT

Batch ID: **203241a** Instrument ID **GC8** Method: **PUBL-SW-141**

MBLK Sample ID: **DBLKS1-203241-203241a** Units: **mg/Kg** Analysis Date: **9/16/2022 04:50 PM**

Client ID: Run ID: **GC8_220916A** SeqNo: **8808184** Prep Date: **9/16/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	1.598	0.5	5.0								J

LCS Sample ID: **DLCSS1-203241-203241a** Units: **mg/Kg** Analysis Date: **9/16/2022 05:27 PM**

Client ID: Run ID: **GC8_220916A** SeqNo: **8808185** Prep Date: **9/16/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	9.583	0.5	5.0	10	0	95.8	70-120	0			

LCSD Sample ID: **DLCSDS1-203241-203241a** Units: **mg/Kg** Analysis Date: **9/16/2022 06:42 PM**

Client ID: Run ID: **GC8_220916A** SeqNo: **8808187** Prep Date: **9/16/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	9.911	0.5	5.0	10	0	99.1	70-120	9.583	3.36	20	

The following samples were analyzed in this batch: 22091469-01C

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

Client: Barr Engineering Company
Work Order: 22091469
Project: Manifold 221

QC BATCH REPORT

Batch ID: **203257** Instrument ID **VMS10** Method: **SW8260C**

MBLK Sample ID: **MBLK-203257-203257** Units: **µg/Kg-dry** Analysis Date: **9/16/2022 09:55 PM**
Client ID: Run ID: **VMS10_220916B** SeqNo: **8809990** Prep Date: **9/16/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	15	30								
Ethylbenzene	U	6.3	30								
m,p-Xylene	U	40	60								
o-Xylene	U	12	30								
Toluene	U	8.2	30								
Xylenes, Total	U	40	90								
Surr: 1,2-Dichloroethane-d4	*987.5*	0	0	*1000*	0	*98.8*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1015*	0	0	*1000*	0	*102*	*80-120*	0			
Surr: Dibromofluoromethane	*895.5*	0	0	*1000*	0	*89.6*	*80-120*	0			
Surr: Toluene-d8	*973*	0	0	*1000*	0	*97.3*	*80-120*	0			

LCS Sample ID: **LCS-203257-203257** Units: **µg/Kg-dry** Analysis Date: **9/16/2022 08:48 PM**
Client ID: Run ID: **VMS10_220916B** SeqNo: **8809987** Prep Date: **9/16/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1052	15	30	1000	0	105	78-122	0			
Ethylbenzene	1012	6.3	30	1000	0	101	75-121	0			
m,p-Xylene	2042	40	60	2000	0	102	67-129	0			
o-Xylene	1032	12	30	1000	0	103	75-120	0			
Toluene	1018	8.2	30	1000	0	102	76-120	0			
Xylenes, Total	3074	40	90	3000	0	102	67-129	0			
Surr: 1,2-Dichloroethane-d4	*1016*	0	0	*1000*	0	*102*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1008*	0	0	*1000*	0	*101*	*80-120*	0			
Surr: Dibromofluoromethane	*1038*	0	0	*1000*	0	*104*	*80-120*	0			
Surr: Toluene-d8	*995.5*	0	0	*1000*	0	*99.6*	*80-120*	0			

MS Sample ID: **22091469-01A MS** Units: **µg/Kg-dry** Analysis Date: **9/17/2022 04:03 AM**
Client ID: **MAN 221 - STOCKPILE - 1** Run ID: **VMS10_220916B** SeqNo: **8810012** Prep Date: **9/16/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1196	16	34	1132	0	106	78-122	0			
Ethylbenzene	1142	7.2	34	1132	0	101	75-121	0			
m,p-Xylene	2335	45	68	2264	0	103	67-129	0			
o-Xylene	1160	13	34	1132	0	102	75-120	0			
Toluene	1147	9.3	34	1132	0	101	76-120	0			
Xylenes, Total	3495	45	100	3396	0	103	67-129	0			
Surr: 1,2-Dichloroethane-d4	*1105*	0	0	*1132*	0	*97.7*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1189*	0	0	*1132*	0	*105*	*80-120*	0			
Surr: Dibromofluoromethane	*1105*	0	0	*1132*	0	*97.6*	*80-120*	0			
Surr: Toluene-d8	*1082*	0	0	*1132*	0	*95.6*	*80-120*	0			

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

Client: Barr Engineering Company
Work Order: 22091469
Project: Manifold 221

QC BATCH REPORT

Batch ID: **203257** Instrument ID **VMS10** Method: **SW8260C**

MSD Sample ID: **22091469-01A MSD** Units: **µg/Kg-dry** Analysis Date: **9/17/2022 04:20 AM**

Client ID: **MAN 221 - STOCKPILE - 1** Run ID: **VMS10_220916B** SeqNo: **8810013** Prep Date: **9/16/2022** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1275	16	34	1132	0	113	78-122	1196	6.41	30	
Ethylbenzene	1243	7.2	34	1132	0	110	75-121	1142	8.5	30	
m,p-Xylene	2549	45	68	2264	0	113	67-129	2335	8.74	30	
o-Xylene	1267	13	34	1132	0	112	75-120	1160	8.82	30	
Toluene	1256	9.3	34	1132	0	111	76-120	1147	9.09	30	
Xylenes, Total	3815	45	100	3396	0	112	67-129	3495	8.76	30	
Surr: 1,2-Dichloroethane-d4	*1142*	0	0	*1132*	0	*101*	*80-120*	1105	*3.22*	*30*	
Surr: 4-Bromofluorobenzene	*1173*	0	0	*1132*	0	*104*	*80-120*	1189	*1.29*	*30*	
Surr: Dibromofluoromethane	*1121*	0	0	*1132*	0	*99*	*80-120*	1105	*1.42*	*30*	
Surr: Toluene-d8	*1131*	0	0	*1132*	0	*99.9*	*80-120*	1082	*4.5*	*30*	

The following samples were analyzed in this batch: 22091469-01A

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

Client: Barr Engineering Company
Work Order: 22091469
Project: Manifold 221

QC BATCH REPORT

Batch ID: **R353668** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R353668** Units: **% of sample** Analysis Date: **9/16/2022 10:50 AM**
Client ID: Run ID: **MOIST_220916A** SeqNo: **8808297** 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	0.1	0.10								

LCS Sample ID: **LCS-R353668** Units: **% of sample** Analysis Date: **9/16/2022 10:50 AM**
Client ID: Run ID: **MOIST_220916A** SeqNo: **8808296** 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	0.1	0.10	100	0	100	98-102	0			

DUP Sample ID: **22090910-06A DUP** Units: **% of sample** Analysis Date: **9/16/2022 10:50 AM**
Client ID: Run ID: **MOIST_220916A** SeqNo: **8808279** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	26.36	0.1	0.10	0	0	0	0-0	26.39	0.114	10	

DUP Sample ID: **22091300-01A DUP** Units: **% of sample** Analysis Date: **9/16/2022 10:50 AM**
Client ID: Run ID: **MOIST_220916A** SeqNo: **8808290** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.96	0.1	0.10	0	0	0	0-0	12.29	2.72	10	

The following samples were analyzed in this batch: 22091469-01B

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

Barr Engineering Co. Chain of Custody

Sample Origination State
☐ CO ☐ MI ☐ MN ☐ MO ☐ ND ☐ NV ☐ TX ☐ UT ☒ WI ☐ WY ☐ Other: _____

COC Number: № 591401
COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr	Company: Barr
Address: Duluth	Address:
Address:	Address:
Name: RYAN ERICKSON	Name:
email: REE@barr.com	email:
Copy to: BarrDM@barr.com	P.O.
Project Name: Manifold 221	Barr Project No: 49161092.11 003 007

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: BTEX	Soil: DRO	Soil: % Solids	Preservative Code	Field Filtered Y/N
1. MANZ21-STOCKPILE-1				9/14/2022	930	S		4		2	1	1		
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														

22091469
BARRENG-MN: Barr Engineering Company
Project: Manifold 221

IR3
3.9°C

Matrix Code: GW = Groundwater, SW = Surface Water, DW = Drinking Water, PW = Pore Water, WW = Waste Water, WQ = TB, FB, EB, etc., W = Unspecified, S = Soil/Solid, SD = Sediment, SQ = MeOH blank, OTH = Other (Oil, etc.)

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 = Zn Acetate, K = Other

BARR USE ONLY

Sampled by: REE
Barr Proj. Manager: REE
Barr DQ Manager: JET
Lab Name: ALS
Lab Location: HOLLAND

Relinquished by: [signature] On Ice? Y N — Date: 9/14/22 — Time: 1200 — Received by: FED EX — Date — Time

Relinquished by: FED EX On Ice? Y N — Date: 9/15/22 — Time: 0930 — Received by: [signature] — Date — Time

Samples Shipped VIA: ☐ Ground Courier ☒ Air Carrier ☐ Sampler ☐ Other: _____

Air Bill Number:

Lab WO: Temperature on Receipt (°C): Custody Seal Intact? ☐ Y ☐ N ☐ None

Requested Due Date:
☐ Standard Turn Around Time
☒ Rush ASAP (mm/dd/yyyy)

Distribution - White-Original: Accompanies Shipment to Laboratory; **Yellow Copy:** Include in Field Documents; **Scan and email:** a copy to BarrDM@barr.com for tracking and filing procedures

H:\RLG\STDFORMS\Chain of Custody Form 2015 RLG Rev. 01/30/2020

ALS Group, USA
Holland, Michigan

Sample Receipt Checklist

Client Name: **BARRENG-MN** Date/Time Received: **15-Sep-22 09:30**

Work Order: **22091469** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 15-Sep-22 (Date) Reviewed by: Jodi Blouw (eSignature) 16-Sep-22 (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):	3.9/4.9 c	IR3	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	9/15/2022 5:43:20 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: