CALUMET
CALUMET SUPERIOR, LLC

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June 23, 2014

John Sager
Emergency Response Coordinator / Hydrogeologist
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
1701 North 4th Street
Superior, WI 54880

Re: #6 Fuel Oil Release SERTS ID 20131226NO16-1

Dear Mr. Sager,

Please find the attached report regarding the immediate action taken in response to the #6 fuel oil release reported the WDNR on December 26, 2013 as required under NR 708.09(1). Based on the conclusions and recommendations of this report, we are requesting no further action for this release.

If you have any additional questions, please feel free to contact me at (715) 398-8434.

Sincerely,

Peter Fredman
Environmental Engineer

Enclosure

Immediate Response Action Report

#6 Fuel Oil Release SERTS ID 20131226NO16-1

Prepared By:
Peter Fredman
Calumet Superior, LLC
2407 Stinson Avenue
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6/23/2014

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1.0 INTRODUCTION

This report contains a summary of the immediate response actions at the Calumet Superior, LLC Superior, WI refinery in response to a #6 fuel oil release on December 26th, 2013. The site location is shown in figure 1. The response was initiated on December 26th, 2013 after the release was discovered.

The purpose of this report is to document that the immediate response action is complete and no further action is necessary to respond to the hazardous substance discharge or environmental pollution. The following report was prepared is in accordance with Wisconsin Administrative Code NR 708 final report criteria under NR 708.09 for no further response action.

2.0 TYPE OF HAZARDOUS SUBSTANCE DISCHARGED, TOXICITY, MOBILITY AND VOLUME- NR 708.09 (1)(a)

The #6 fuel oil spill occurred within an earthen berm located on refinery property just east of the #2 cooling tower. The volume of the release was estimated to be 100 gallons. The area impacted was primarily located under a pipe rack within the berm. The release had very little mobility due to the viscosity of the product released and weather conditions at the time of the release. Weather conditions are shown in appendix B.

The spill did not reach any water bodies, and did not migrate from the impacted area. A site map is included in Figure 2. Spill site conditions are depicted in the photographs which are included in Appendix A. WTM coordinates of the spill are included in section 16.0.

3.0 DURATION OF DISCHARGE – NR 708.09(1)(b)

The duration of the discharge is unknown; however, based on the volume of the release, it is expected to be less than 24 hours.

4.0 TIME DISCHARGE WAS RESPONDED TO AND PROPERLY CONTAINED– NR 708.09(1)(c)

As the release occurred within an earthen berm deigned to contain oil, the berm acted as designed and contained the release. In order to eliminate the source of the discharge, the leaking pipe was replaced on December 26th, 2013. On December 27th, 2013, cleanup of the spill was initiated by means of excavation.

5.0 Mitigation Efforts that may have Accelerated Migration of Pollution or Hazardous Substances NR 708.09(1)(d)

Steam was used to thaw the soil underneath the pipe rack in order for excavation to take place. It became apparent this was causing the release to migrate and cleanup was suspended until the ground thawed.

6.0 Weather Conditions – NR 708.09 (1)(e)

Weather conditions were average on the day of the spill and the day after for that time of year. However, the following week produced bitterly cold temperatures which remained for months. This greatly reduced the ability to remediate the release. A summary of local weather conditions from December 26th, 2013 – June 5th, 2014 is located in Appendix B.

7.0 Migration Potential of the Contamination – NR 708.09 (1)(f)

All visually impacted soil and free product was removed from the site. This release occurred on conditionally closed site BRRTS# 02-16-190549. Samples taken after cleanup indicated residual contamination which is consistent with expectations based on former samples taken at the release site. Stormwater from the release area is drained to Pond 4 which is in turn discharged through outfall 002. Outfall 002 is regulated under WPDES permit No. WI-0003085-08-0.

Because of the relatively impermeable surficial clay at the refinery, releases tend to migrate more horizontally along the ground surface. Based on the very low groundwater velocities and absence of any groundwater receptors, there is literally no groundwater exposure risk at the refinery.
All water and oil recovered by means of vacuum truck after the release was recovered/treated in the refineries No. 1 Oil/Water Separator/WWTP.

8.0 Nature and Scope of Immediate Action Conducted - NR 708.09 (1)(g)

The release resulted from corroded thermal relief piping within a bermed area at the refinery. In order to determine the exact location of the release, insulation was stripped from the piping. After the insulation was stripped, a large section of piping was replaced. This was completed on the day of the spill, December 26th, 2013.

On December 27th, 2013 a mini excavator was brought into the release area. Work was completed by the mini excavator and shoveling by hand. Due to the cold temperatures following the release, insulation blankets and steam coils were used to thaw the ground under the pipe rack and promote hand

excavation. That effort continued until January 2nd, 2014. A total of 10 cubic yards of soil and 10 cubic yards of snow were recovered.

On January 30th, 2014, the effort to excavate the soil further was postponed. Extremely cold temperatures and frequent snowfall had made further excavation difficult.

On April 22nd and April 23rd, 2014, an additional 50 cubic yards of soil was excavated from the site. This work was done primarily with an excavator and by hand. J.R. Jensen operated the excavator and In-Line Construction completed hand excavation under the pipe rack.

On June 3rd, 2014 5 cubic yards of soil was excavated using a mini excavator.

Contaminated soil from the excavation was stockpiled at Calumet's Solid Waste Storage Facility (License No. 4062). The excavation was approximately 80 feet by 15 feet and was excavated to a depth between one and five feet. Spill site conditions and remediation efforts are depicted in the photographs which are included in Appendix A. The area of the spill and excavation are depicted in Figure 2.

9.0 SAMPLING RESULTS - NR 708.09 (1)(h)

Five laboratory samples were collected after the initial excavation was complete to confirm the removal of contaminated soil. All soil samples were analyzed for petroleum volatile organic compounds (PVOC) and naphthalene. Confirmation sample S-5 showed contamination over the NR720 industrial direct contact standards for naphthalene. Further excavation was completed at the sample location and confirmation sample S-5-2 was collected during the excavation. Sample S-5-2 was analyzed for PVOC's and naphthalene and the results were below the NR720 industrial direct contact standards for all contaminants. Soil sample locations are displayed in Figure 2. A summary of the analytical results is contained in Table 1. Full laboratory analytical results are included in Appendix C.

10.0 VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION - NR 708.09 (1)(i)

Visual and olfactory evidence of #6 fuel oil contamination was present upon arrival to the site and during the excavation. Some residual olfactory contamination was present at the site after excavation. This was most likely from the conditionally closed release that occurred previously. The visual extent of contamination was excavated. As #6 fuel oil is black in color, the most effective means to determine the extent of contamination is visually. It would have been unnecessary and unsafe to excavate further for risk of undermining pipe supports.

11.0 ACTUAL OR POTENTIAL ENVIRONMENTAL IMPACTS - NR 708.09 (1)(j)

The contaminated material collected during the excavation of the spill area was stockpiled at Calumet's Solid Waste Storage Facility (License No. 4062). Disposal of this material ultimately occurred at the Shamrock Industrial Waste Landfill in Cloquet, MN. It is expected that the #6 fuel did not penetrate beyond the depth of the excavation due to visual observations after the release. Potential environmental impacts are expected to be minimal. The spill did not run off into other areas, and was restricted to the area of the excavation; therefore, the actual or potential environmental impacts are expected to be minimal.

12.0 PROXIMITY OF CONTAMINATION TO RECEPTORS - NR 708.09 (1)(k)

Exposure via the groundwater pathway is strongly a function of the soil permeability. Groundwater velocities in the clay are on the order of 0.013 ft/yr. Petroleum compounds will also be naturally attenuated by retardation and biodegradation processes, thus will have transport velocities less than groundwater velocities. The closest groundwater receptor is Newton Creek, which is over 1,000 feet downgradient from the petroleum-impacted area. Using a contaminant transport velocity of 0.013 ft/yr (assumes no retardation), it would take literally 1,000's of years for groundwater from this area to reach Newton Creek. In reality, the petroleum contaminants will very likely naturally attenuate (biodegraded or sorbed onto the aquifer matrix) as they are being transported and it is highly unlikely that any residual dissolved-phase compounds will ever reach Newton Creek. Based on the very low groundwater velocities and absence of any groundwater receptors, there is literally no groundwater exposure risk at the refinery.

13.0 PRESENT AND ANTICIPATED FUTURE LAND USE - NR 708.09 (1)(l)

The land is presently used as a tank farm for an oil refinery. The refinery was constructed in 1951 and has remained in the same use since that time. There is no anticipation the land will be used for another purpose in the future.

14.0 EVALUATE IF ROUTES OF EXPOSURE ARE PROTECTIVE AND ENVIRONMENT HAS BEEN RESTORED TO THE EXTENT PRACTICABLE – NR 708.09 (1)(m)

A good faith effort was undertaken to remove all newly contaminated material from the release site. No off site receptors were impacted by the release. Given the amount of #6 fuel oil released, and considering the site conditions at the time of the release, there is little chance the #6 fuel oil penetrated below the excavation depth. Confirmation samples indicate the spill has been remediated to below industrial direct contact levels. Based on limited exposure routes, the site has been adequately remediated to the extent practicable.

15.0 OTHER RELEVANT INFORMATION – NR 708.09 (1)(n)

The site is located in the NW ¼ of the NW ¼ of Section 36, Township 49 North, Range 14 West, City of Superior, Douglas County, WI. The WTM coordinates for the spill site are 361711, 692928. A site vicinity map is included in Figure 1.

16.0 CONCLUSION AND RECOMMENDATIONS

Based on visual observations following cleanup activities and laboratory results indicating no contaminants remain above the NR720 industrial direct contact soil RCL's, the spill has been remediated to the extent practicable. Therefore, it is recommended that no further response action is necessary at the site.

TABLES

Table 1	Soil Sample Analytical Results
Table 2	PID Screening Results

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TABLE 1

ANALYTICAL RESULTS FOR POST-EXCAVATION SOIL SAMPLES
December 2013 RELEASE NEAR COOLING TOWER #2

Sample ID and Sample Depth	**S-1 0.5 ft.**	**S-2 0.5 ft.**	**S-3 0.5 ft.**	**S-4 0.5 ft.**	**S-5 0.5 ft.**	**S-5-2 5.5ft**	**NR 720 Ground Water RCL**	**NR 720 Industrial Direct Contact RCL**
Approx. Water Table Depth, ft.	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**		
Sample Date	**05/22/14**	**05/22/14**	**05/22/14**	**05/22/14**	**05/22/14**	**06/03/14**		
Soil Excavated?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**		
PID (ppm)	NM	NM	NM	NM	NM	50	NS	NS
GRO (mg/kg)	120	620	7	10	980	130	NS	NS
PVOCs (mg/kg)								
1,2,4-TMB	0.86	7.1	0.064	0.13	6.2	0.73	NS	219
1,3,5-TMB	1.5	13	<0.041	<0.040	13	1.1	NS	184
Benzene	0.36	<0.13	0.023	0.02	1.8	0.84	0.0051	7.41
Ethylbenzene	<0.34	1.5	<0.021	0.02	5.4	1.2	1.57	37
MTBE	<0.68	<0.26	<0.041	<0.040	<1.0	0.17	0.027	293
Toluene	<3.4	<1.3	<0.21	<0.20	<5.0	<0.37	1.1072	818
Xylenes Total	<1.02	2.9	0.063	<0.060	2.8	0.39	3.94	258
PAHs (mg/kg)								
Naphthalene	9.5	24	<0.21	1.4	**39**	<0.37	0.6587	26

NOTES:
Unless noted otherwise, all results reported in units of milligrams per kilogram or parts per million (ppm).
Underlined values are above an NR 720 RCL. Valid only for samples collected above the water table.
Bold results are above an NR 720 Indusrial Direct Contact RCL.

RCL = Residual contaminant level.
GRO = Gasoline Range Organics.
TMB = Trimethylbenzene.
MTBE = Methyl tert-butyl ether.
PVOCs = Petroleum Volatile Organic Chemicals
PAH = Polycylic Aromatic Hydrocarbons
PID = Photo-ionization detector.
NS = No standard.
NM = Not measured.

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TABLE 2

POST-EXCAVATION SOIL PID DATA FOR CT2 AREA RELEASE (JUNE 5, 2014)

Sample ID	Photoionization Detector (PID) Reading (ppmv) Sample Interval (feet below ground surface)				Comments
	0-2.5	2.5-5.0	5.0-7.5	7.5-10.0	
GP-1/CT2	**51**	**82**	--	--	TD = 5 ft
GP-2/CT2	**97**	**120**	--	--	TD = 5 ft
GP-3/CT2	**72**	**11**	--	--	TD = 5 ft
GP-4/CT2	**118**	**274**	--	--	TD = 5 ft
GP-5/CT2	0.7	1.9	--	--	TD = 5 ft
GP-6/CT2	**125**	**422**	--	--	TD = 5 ft
GP-7/CT2	1.6	1.2	--	--	TD = 5 ft
GP-8/CT2	0.8	**15**	--	--	TD = 5 ft
GP-9/CT2	1.0	1.2	**132**	**409**	On berm about 5 ft tall; TD = 10 ft
GP-10/CT2	**286**	**206**	--	--	TD = 5 ft
GP-11/CT2	**873**	**894**	--	--	TD = 5 ft
GP-12/CT2	**830**	**891**	--	--	TD = 5 ft
GP-13/CT2	1.4	**33**	--	--	TD = 5 ft
GP-14/CT2	1.6	1.5	--	--	TD = 5 ft

NOTES:
PID readings are in units of parts per million, volume (ppmv).
PID = Rae Systems MiniRAE 3000 photoionization detector with 11.7 electron volt (eV) lamp.
Readings in bold exceed the facility-wide PID field screening standard of 10 ppmv.
Soil samples collected by Twin Ports Testing and field screened by Insight Environmental, both from Superior, WI.
TD = Total depth of Geoprobe sample boring.

FIGURES

Figure 1 Site Vicinity Map

Figure 2 Site Map

Figure 3 PID Analysis Map

Figure 1 - Site Vicinity Map

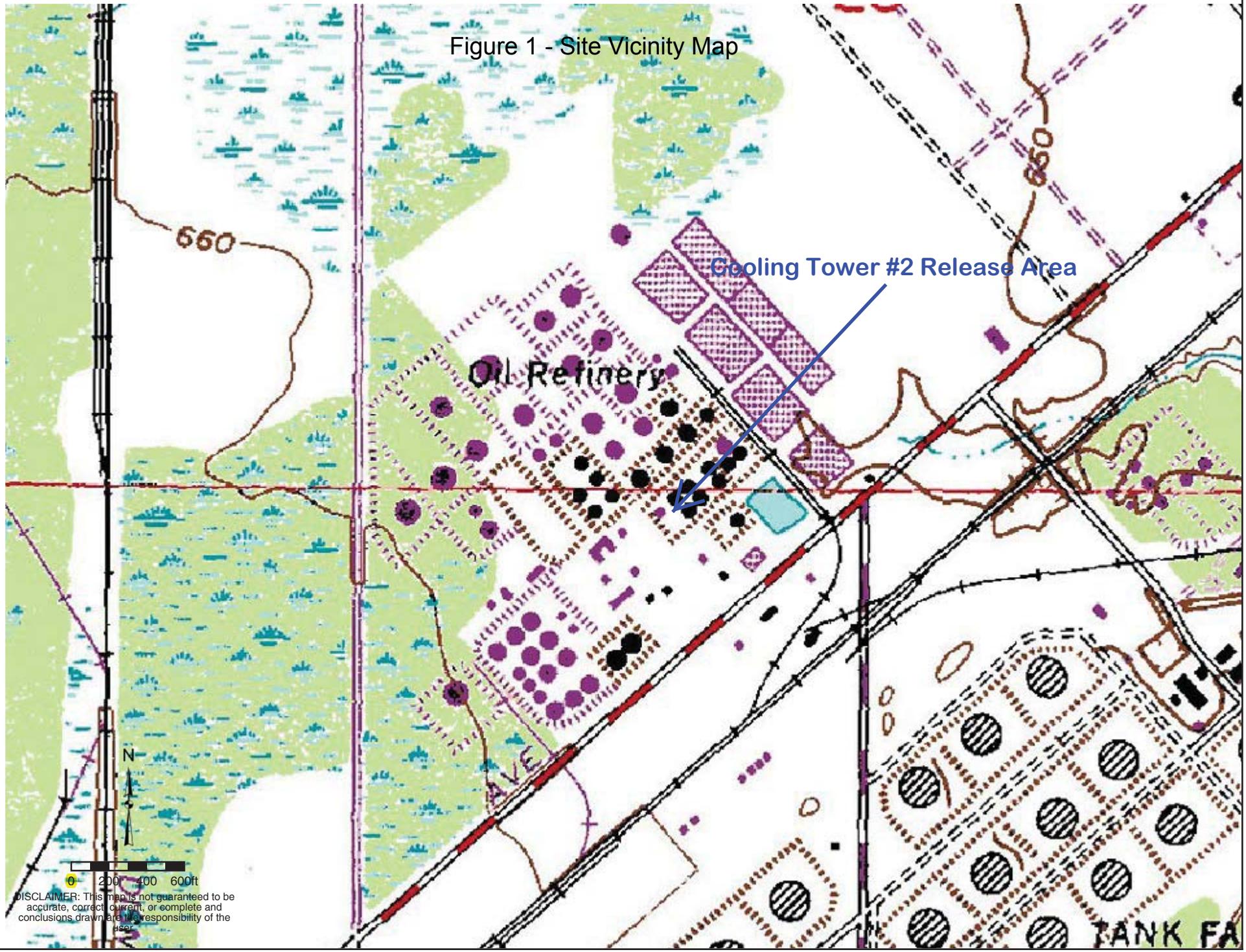


Figure 2 - Site Map

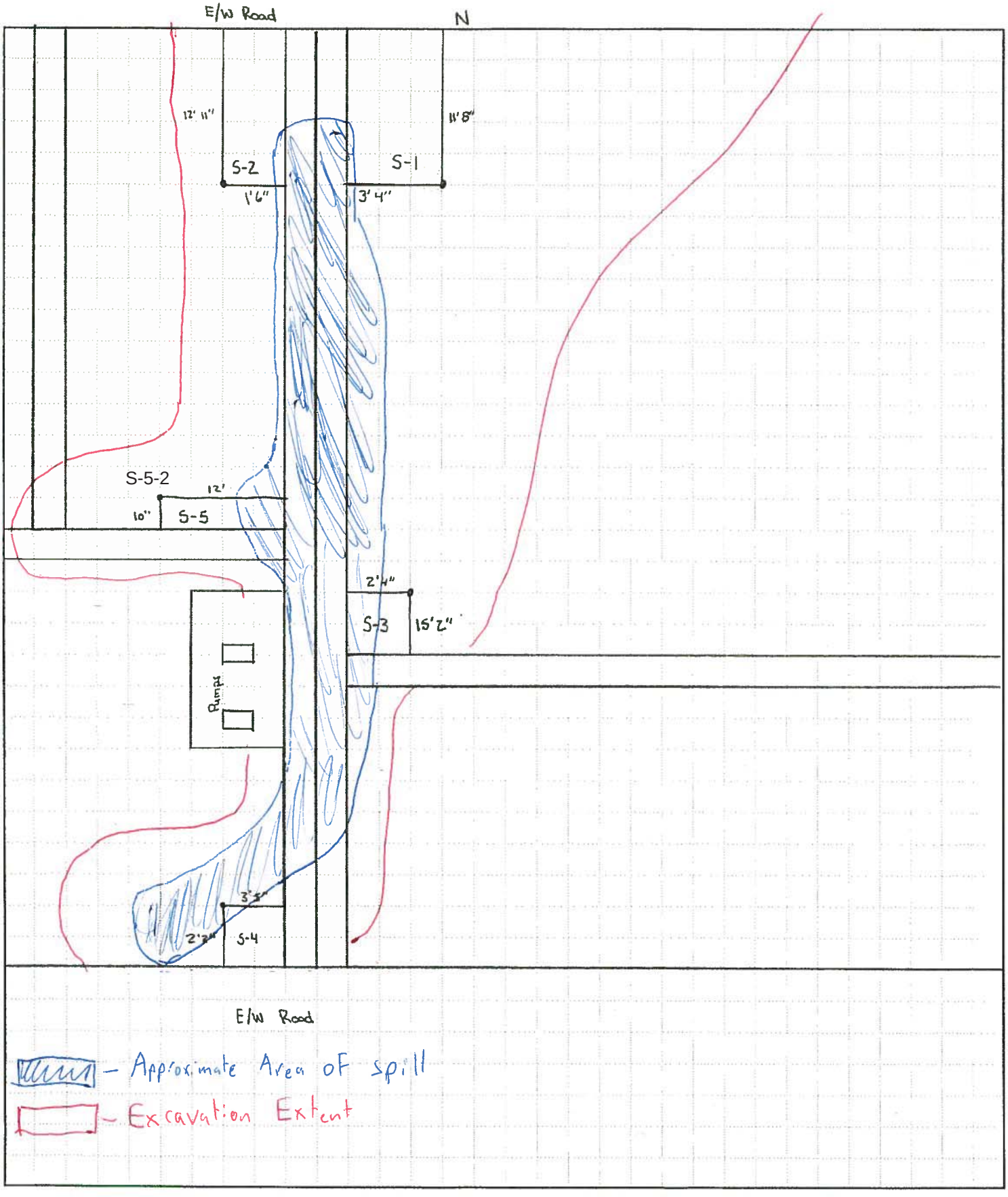
DATE: 5-22-14

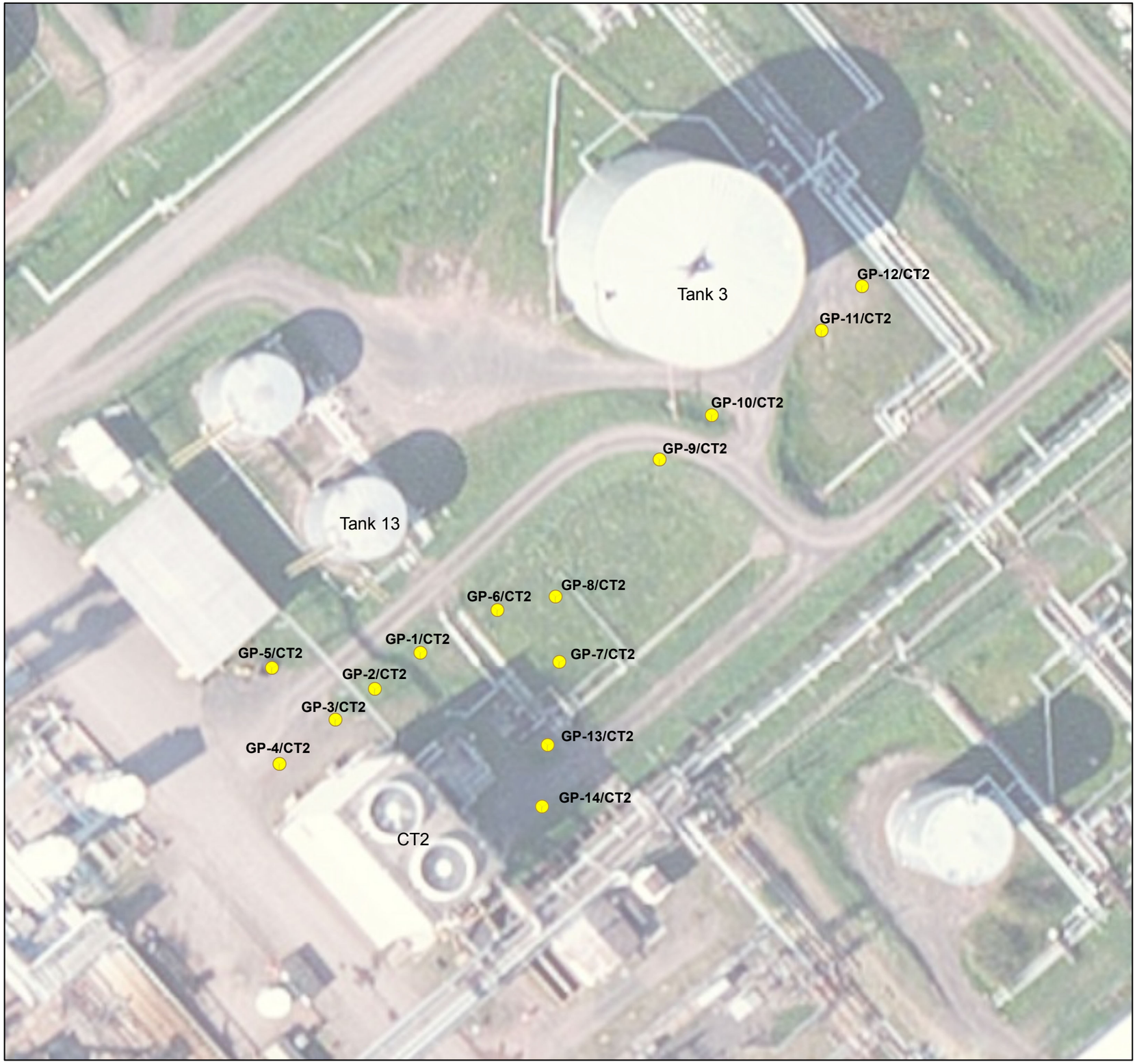
SHEET _____ OF _____

BY: Riley Loabs – Soil Sample Locations

MURPHY OIL USA, INC.

Superior Refinery





N
W E
S

Legend

Geoprobe Boring Location (06/05/2014)

0 15 30 60 90 120
Feet

Geoprobe Boring Locations near Cooling Tower 2 (CT2)

CALUMET SUPERIOR, LLC
SUPERIOR REFINERY
SUPERIOR, WISCONSIN

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Project No.	34265.003	Date	06/09/2014	Figure	3

APPENDICES

Appendix A	Photographs
Appendix B	Historical Weather Information
Appendix C	Laboratory Analytical Reports

Appendix A - Photographs

Photo 1

Photo 2

Photo 1: Looking west at the release area.

Photo 2: Close up of the pipe rack at the release location.

Photo 3

Photo 4

Photo 3: Looking west at the release area.

Photo 4: Release are looking North West.

Photo 5

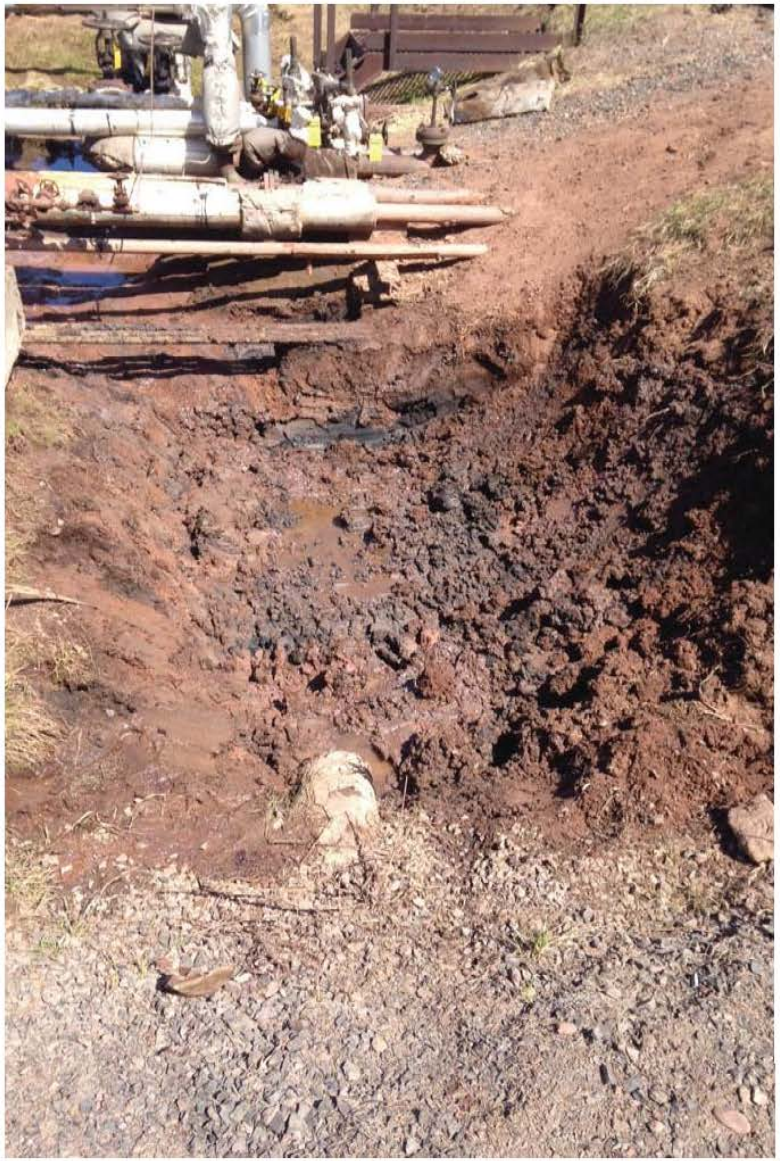


Photo 6

Photo 5: Excavated area where sample S-5-2 was taken.

Photo 6: Excavated area where sample S-4 was taken.

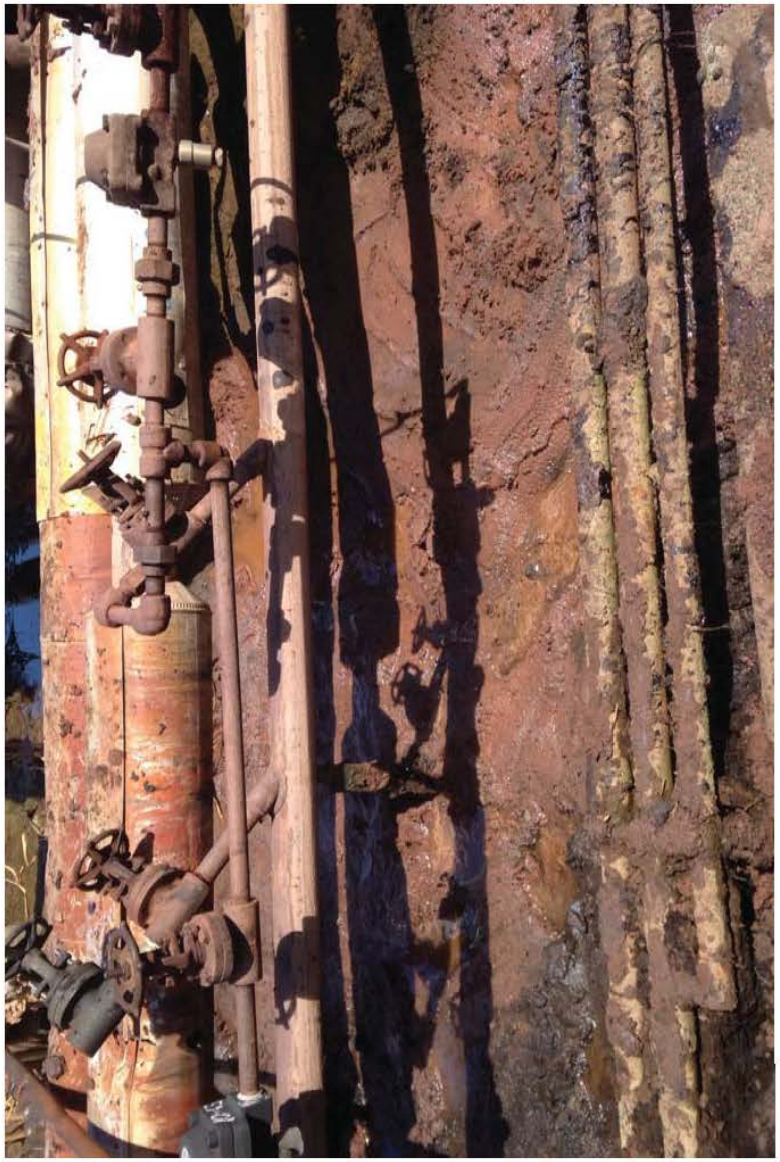


Photo 7

Photo 8

Photo 7: Excavated area where sample S-3 was taken.

Photo 8: North side of the pipe rack were sample S-3 was taken.

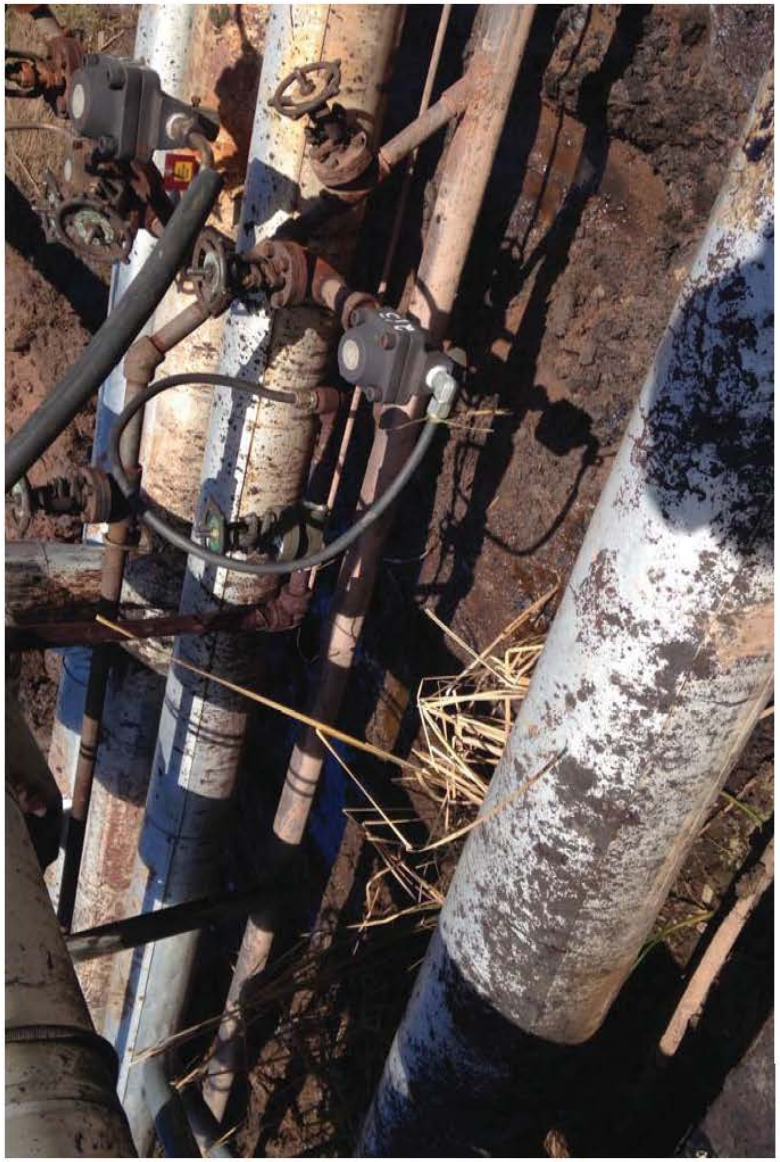


Photo 9

Photo 10

Photo 9: Close up under the pipe rack.

Photo 10: Excavated area near sample S-3.

Photo 11

Photo 11: Looking west at the excavation site.

Appendix B - Historical Weather Information

Weather History for Superior, WI

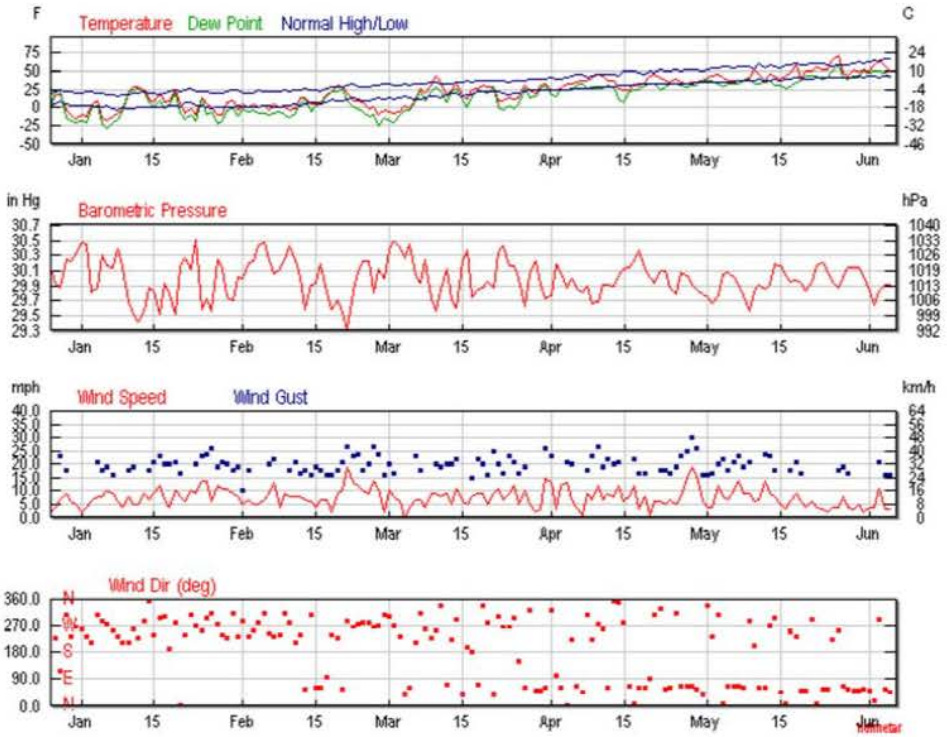
December 26, 2013 through June 5, 2014

December 26, 2013 through June 5, 2014

December 26 2013 - TO - June 5 2014 Go

Daily | Weekly | Monthly | Custom

	Max	Avg	Min	Sum
Temperature				
Max Temperature	**87** °F	**32** °F	**-12** °F	
Mean Temperature	**71** °F	**22** °F	**-18** °F	
Min Temperature	**55** °F	**13** °F	**-24** °F	
Degree Days				
Heating Degree Days (base 65)	83	43	0	6895
Cooling Degree Days (base 65)	6	0	0	6
Growing Degree Days (base 50)	21	1	0	88
Dew Point				
Dew Point	**63** °F	**15** °F	**-34** °F	
Precipitation				
Precipitation	**1.19** in	**0.05** in	**0.00** in	**8.27** in
Snowdepth	-	-	-	-
Wind				
Wind	**28** mph	**7** mph	**0** mph	
Gust Wind	**40** mph	**20** mph	**9** mph	
Sea Level Pressure				
Sea Level Pressure	**30.67** in	**29.98** in	**29.11** in	



Certify This Report

Observations

2013	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Dec	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
26	14	5	-5	7	0	-9	92	80	66	30.18	30.13	30.09	10	10	2	6	2	-	0.00	
27	35	16	-4	27	21	-8	96	85	71	30.16	29.93	29.76	10	10	5	24	4	29	0.00	
28	30	20	11	30	24	5	98	92	76	30.08	29.87	29.74	10	7	2	21	7	33	0.00	Snow
29	10	-3	-16	4	-15	-24	75	65	55	30.32	30.25	30.10	10	10	10	13	9	18	0.00	Snow
30	-2	-11	-20	-9	-18	-27	81	74	67	30.27	30.23	30.17	10	10	7	8	6	-	0.00	
31	-7	-16	-24	-13	-21	-29	85	72	58	30.46	30.31	30.16	10	10	10	10	5	-	0.00	
2014	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Jan	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	-2	-10	-19	-12	-18	-25	79	70	55	30.55	30.48	30.45	10	10	10	7	2	-	0.00	
2	1	-12	-24	-15	-22	-29	84	70	45	30.50	30.45	30.34	10	10	10	7	4	-	0.00	
3	22	2	-18	20	-2	-24	93	72	62	30.33	29.80	29.38	10	9	2	22	6	28	0.01	Snow
4	23	8	-8	20	2	-17	96	69	54	30.23	29.86	29.38	10	9	2	22	8	31	0.01	Snow
5	-7	-14	-22	-17	-23	-31	78	64	53	30.38	30.30	30.24	10	10	10	17	8	23	0.00	
6	-12	-18	-24	-25	-29	-34	66	60	54	30.26	30.16	30.07	10	10	5	17	10	22	0.00	
7	-2	-12	-23	-14	-21	-30	74	66	55	30.24	30.13	30.05	10	10	7	13	9	16	0.00	
8	2	-8	-19	-11	-17	-25	82	70	53	30.44	30.38	30.24	10	10	10	10	6	-	0.00	
9	16	-4	-23	10	-6	-28	84	72	54	30.42	30.14	29.88	10	10	10	16	4	21	0.00	
10	26	20	15	26	21	11	99	91	80	29.88	29.68	29.47	10	5	1	16	8	22	0.00	Snow
11	30	28	25	27	24	22	99	87	77	29.60	29.51	29.43	10	8	0	17	5	21	0.00	Fog
12	36	28	19	31	26	19	96	88	75	29.58	29.41	29.30	10	8	3	10	5	-	0.04	Rain
13	32	25	17	28	19	12	94	71	60	29.63	29.55	29.43	10	10	10	18	9	22	0.00	Snow
14	19	12	4	13	6	-2	77	69	61	30.09	29.87	29.60	10	10	10	14	7	18	0.00	
15	19	7	-5	16	0	-9	87	76	66	30.11	29.82	29.29	10	9	1	22	9	26	0.00	Snow
16	30	20	10	26	10	0	93	76	62	29.85	29.51	29.24	10	8	2	24	12	29	0.00	Snow
17	13	6	-1	2	-2	-5	87	71	55	30.02	29.94	29.82	10	10	10	16	7	23	0.00	
18	21	10	0	15	3	-4	83	65	43	29.90	29.78	29.56	10	10	10	16	4	24	0.00	
19	31	24	17	24	19	8	85	77	63	29.73	29.52	29.43	10	10	5	15	10	26	0.00	
20	17	4	-9	10	-9	-20	78	59	37	30.45	30.13	29.74	10	10	5	14	8	18	0.00	Snow
21	1	-9	-19	-5	-16	-25	82	68	51	30.46	30.26	29.98	10	8	2	12	6	-	0.00	Snow
22	1	-2	-6	-4	-11	-15	79	65	55	30.47	30.12	29.91	10	8	2	24	10	31	0.00	Snow
23	-1	-10	-18	-9	-18	-26	72	64	53	30.67	30.51	30.04	10	10	10	16	9	24	0.00	
24	29	14	0	25	11	-9	92	75	51	29.99	29.57	29.37	10	9	1	25	14	34	0.00	Snow

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2013	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
25	12	5	-2	3	-11	-15	66	55	42	29.83	29.72	29.53	10	10	5	24	14	34	0.00	
26	7	0	-7	-1	-5	-17	84	72	58	29.98	29.55	29.33	10	5	1	24	6	38	0.00	Snow
27	-3	-10	-18	-18	-23	-29	65	58	48	30.32	30.24	29.99	10	10	7	18	12	28	0.00	
28	0	-10	-21	-12	-19	-27	75	62	49	30.29	30.13	29.95	10	10	10	20	11	26	0.00	
29	23	6	-10	13	-3	-16	77	61	43	29.95	29.74	29.51	10	10	10	20	11	26	0.00	
30	22	8	-6	13	-2	-16	69	59	50	29.99	29.71	29.54	10	10	10	16	9	20	0.00	
31	8	-4	-15	-7	-13	-20	79	65	48	30.07	30.02	29.99	10	10	10	15	8	21	0.00	
2014	**Temp.** (°F)			**Dew Point** (°F)			**Humidity** (%)			**Sea Level Press.** (in)			**Visibility** (mi)			**Wind** (mph)			**Precip.** (in)	**Events**
Feb	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**high**	**sum**	
1	14	4	-5	6	-1	-11	82	72	64	30.18	30.00	29.93	10	9	2	14	5	10	0.00	Snow
2	12	0	-13	0	-7	-18	83	69	54	30.26	30.20	30.16	10	10	10	15	7	25	0.00	
3	17	4	-9	4	-3	-14	88	74	52	30.34	30.22	30.17	10	10	10	9	5	-	0.00	
4	10	1	-8	-4	-8	-13	85	70	52	30.49	30.44	30.34	10	10	10	12	5	-	0.00	
5	5	2	-3	-6	-9	-12	73	65	59	30.50	30.47	30.42	10	10	2	12	7	17	0.03	Snow
6	5	-4	-12	-7	-11	-17	80	67	53	30.42	30.24	30.08	10	10	10	17	9	23	0.00	
7	14	5	-4	-5	-8	-10	79	61	39	30.13	30.05	30.00	10	10	10	20	13	30	0.00	
8	16	0	-17	5	-6	-21	86	71	58	30.16	30.12	30.07	10	10	10	9	4	-	0.00	
9	5	0	-6	-6	-11	-14	70	59	49	30.36	30.25	30.16	10	10	10	15	9	18	0.00	
10	5	-4	-14	-9	-14	-19	82	64	49	30.45	30.42	30.37	10	10	10	13	8	18	0.00	
11	16	-1	-18	8	-8	-22	83	65	43	30.43	30.23	30.01	10	10	2	20	8	26	0.00	Snow
12	19	14	8	8	4	0	87	65	45	30.09	30.01	29.83	10	10	5	14	8	20	0.00	Snow
13	22	14	6	19	12	-1	91	81	67	29.81	29.58	29.44	10	5	0	14	7	25	0.05	Snow
14	16	4	-7	1	-6	-12	90	70	49	30.00	29.91	29.75	10	10	10	12	6	16	0.00	
15	18	4	-9	15	3	-13	90	81	58	30.10	29.94	29.83	10	8	1	14	4	23	0.00	Snow
16	12	6	0	8	4	-4	87	80	73	30.28	30.19	30.09	10	8	2	16	7	22	0.00	Snow
17	23	17	11	21	16	7	96	88	72	30.08	29.80	29.69	10	5	0	12	7	16	0.10	Snow
18	38	21	4	29	21	2	98	76	62	29.70	29.59	29.51	10	6	0	10	2	16	0.00	Fog
19	42	30	19	27	21	16	89	65	38	29.74	29.71	29.66	10	10	10	15	9	20	0.00	
20	32	28	23	31	26	21	99	93	80	29.74	29.54	29.16	10	5	0	16	10	25	0.26	Snow
21	30	19	8	29	8	0	96	76	66	29.63	29.32	29.11	10	5	1	25	19	34	0.04	Snow
22	17	10	3	3	0	-4	75	63	53	30.00	29.82	29.63	10	10	7	22	13	30	0.00	
23	19	10	1	2	-1	-5	75	63	45	30.17	30.08	30.01	10	10	7	23	12	30	0.00	
24	14	6	-1	-1	-5	-10	74	60	48	30.26	30.22	30.16	10	10	10	16	10	25	0.00	
25	7	-2	-12	-7	-12	-17	80	62	50	30.26	30.23	30.18	10	10	10	20	9	25	0.00	
26	13	0	-12	6	-11	-20	75	61	49	30.23	29.80	29.51	10	8	2	28	14	37	0.00	Snow
27	0	-10	-19	-19	-25	-28	67	51	35	30.19	30.11	29.91	10	10	10	21	11	26	0.00	
28	12	-4	-21	-3	-14	-29	73	58	39	30.15	30.00	29.87	10	10	10	13	2	18	0.00	
2014	**Temp.** (°F)			**Dew Point** (°F)			**Humidity** (%)			**Sea Level Press.** (in)			**Visibility** (mi)			**Wind** (mph)			**Precip.** (in)	**Events**
Mar	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**high**	**sum**	
1	0	-7	-14	-8	-19	-29	72	55	38	30.52	30.39	30.16	10	10	10	17	10	24	0.00	

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2013	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
2	5	-8	-22	-13	-21	-30	66	52	40	30.54	30.49	30.43	10	10	10	13	8	18	0.00	
3	10	-6	-21	3	-11	-28	84	68	37	30.52	30.41	30.27	10	8	1	12	6	-	0.00	Snow
4	18	2	-13	4	-3	-17	88	76	48	30.38	30.26	30.22	10	9	1	5	0	-	0.00	Snow
5	13	-2	-17	6	-4	-22	88	80	70	30.55	30.45	30.33	10	10	5	16	4	25	0.00	Snow
6	32	12	-7	23	10	-11	86	71	58	30.33	30.04	29.76	10	10	7	24	7	29	0.00	
7	32	26	19	27	21	10	92	78	64	30.23	29.93	29.77	10	8	3	16	7	22	0.00	Snow
8	28	20	13	10	8	5	77	60	41	30.33	30.24	30.09	10	10	10	10	4	-	0.00	Snow
9	43	31	19	31	22	11	82	68	53	30.07	29.73	29.57	10	10	10	17	9	22	0.00	
10	54	43	32	33	29	24	92	63	31	29.66	29.56	29.50	10	10	10	21	9	26	0.00	
11	40	34	27	30	22	15	70	58	45	30.04	29.85	29.66	10	10	10	17	8	21	0.00	
12	27	16	4	21	6	1	92	70	54	30.20	30.12	30.01	10	9	1	15	9	22	0.00	Snow
13	45	25	5	35	21	2	87	69	54	30.01	29.70	29.42	10	10	10	16	5	22	0.00	
14	40	32	24	36	27	16	87	75	64	29.95	29.60	29.41	10	10	10	23	11	30	0.00	Snow
15	24	18	13	18	8	-3	77	61	47	30.49	30.22	29.95	10	10	10	9	6	-	0.00	
16	24	12	0	8	1	-4	88	57	36	30.53	30.36	30.01	10	10	10	12	5	18	0.00	
17	29	24	20	20	15	5	76	67	50	30.01	29.74	29.64	10	10	5	14	8	18	0.00	Snow
18	28	26	25	26	24	20	95	89	74	29.90	29.84	29.76	10	4	1	18	9	28	0.04	Snow
19	34	30	25	25	22	19	94	73	52	29.95	29.86	29.83	10	9	3	17	9	22	0.00	Snow
20	41	29	17	28	20	13	90	63	42	30.01	29.95	29.91	10	10	10	10	5	16	0.00	
21	34	28	21	31	28	14	98	90	74	30.10	29.86	29.72	10	6	0	26	9	30	0.22	Snow
22	17	10	1	12	0	-6	73	63	54	30.47	30.35	30.11	10	10	7	17	11	28	0.00	
23	20	8	-4	2	-3	-8	85	62	42	30.49	30.43	30.33	10	10	10	13	7	17	0.00	
24	28	13	-2	12	2	-7	85	62	38	30.32	30.17	30.03	10	10	7	21	9	29	0.00	
25	21	12	3	5	-1	-6	70	55	44	30.23	30.16	30.10	10	10	10	18	12	29	0.00	
26	33	14	-5	18	4	-9	87	66	40	30.14	30.00	29.68	10	10	10	15	5	17	0.00	
27	31	30	28	30	27	18	99	91	59	29.77	29.63	29.58	10	4	0	16	10	23	0.22	Snow
28	33	25	17	24	13	9	83	61	37	30.25	30.06	29.78	10	10	10	10	5	-	0.00	
29	32	20	8	23	15	6	96	74	49	30.30	30.22	30.07	10	10	10	8	2	-	0.00	
30	46	31	16	32	26	15	98	81	56	30.07	29.91	29.87	10	10	5	13	3	16	0.00	
31	34	32	31	32	31	30	99	94	87	29.91	29.72	29.46	10	9	2	22	15	36	0.30	Rain

2014	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Apr	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	33	24	13	32	18	10	100	77	60	30.12	29.76	29.42	10	8	0	24	13	30	0.12	Snow
2	37	23	9	25	15	6	93	69	42	30.24	30.19	30.12	10	10	10	9	3	-	0.00	
3	30	27	24	26	23	20	95	82	73	30.21	30.08	29.91	10	7	0	22	12	29	0.07	Snow
4	40	32	25	28	25	20	96	78	49	29.98	29.86	29.78	10	6	0	20	13	30	0.17	Snow
5	46	32	17	32	23	14	91	68	43	30.07	29.99	29.92	10	10	10	18	7	23	0.00	
6	41	34	27	32	31	28	100	82	66	29.94	29.87	29.83	10	8	0	9	4	-	0.00	Fog
7	48	37	27	38	33	27	100	92	57	29.87	29.80	29.75	10	4	0	13	1	18	0.03	Fog , Rain

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2013	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
8	45	38	31	30	26	22	80	60	40	29.95	29.89	29.77	10	10	10	15	9	21	0.00	
9	57	41	26	40	28	19	78	57	40	29.93	29.66	29.37	10	10	10	21	7	30	0.00	
10	51	45	38	40	27	21	75	51	31	29.88	29.69	29.46	10	10	10	28	12	36	0.00	
11	55	43	31	33	27	23	78	53	34	29.98	29.91	29.87	10	10	10	16	7	22	0.00	
12	40	37	32	32	31	29	100	92	60	30.01	29.92	29.81	10	9	3	21	9	29	0.10	Rain
13	42	37	32	35	29	20	100	80	61	29.99	29.90	29.81	10	8	0	18	8	25	0.00	Fog
14	33	27	22	21	12	6	68	51	35	30.10	30.03	29.96	10	10	5	20	12	28	0.00	
15	33	23	14	15	7	0	75	51	25	30.15	30.11	30.06	10	10	10	12	6	-	0.00	
16	29	24	19	28	21	6	96	81	45	30.19	30.15	30.13	10	4	0	22	8	33	0.11	Snow
17	38	32	25	29	25	21	97	77	55	30.33	30.22	30.13	10	9	2	18	12	28	0.02	Snow
18	37	28	18	28	23	17	96	78	51	30.43	30.37	30.32	10	10	10	12	3	18	0.00	
19	37	34	30	32	31	28	98	90	81	30.32	30.12	30.02	10	10	5	14	8	20	0.02	Rain
20	64	44	25	40	33	25	99	73	37	30.07	30.02	29.97	10	8	3	6	1	-	0.00	
21	64	46	29	39	32	26	98	65	35	30.07	29.94	29.84	10	9	4	23	6	32	0.00	
22	55	42	30	28	25	21	89	55	29	30.12	30.09	30.05	10	10	10	12	6	23	0.00	
23	45	36	28	33	29	26	96	80	53	30.16	30.10	30.01	10	10	4	10	5	18	0.05	Rain
24	35	34	32	35	33	32	100	99	96	30.04	29.87	29.69	10	5	1	14	7	20	0.62	Rain , Snow
25	46	39	32	38	33	31	100	85	61	29.98	29.78	29.68	10	8	1	15	5	22	0.00	Rain
26	37	34	31	32	30	27	94	86	76	30.15	30.08	29.98	10	10	4	20	8	26	0.00	Snow
27	34	32	31	32	29	26	96	86	76	30.13	30.03	29.93	10	10	5	23	15	37	0.12	Rain
28	36	34	33	32	31	30	92	87	78	29.94	29.91	29.88	10	10	5	28	19	40	0.20	Rain , Snow
29	38	35	32	35	31	29	99	86	71	29.90	29.85	29.79	10	7	1	23	16	37	0.28	Rain , Snow
30	39	37	35	39	36	34	100	96	92	29.79	29.78	29.75	10	6	2	10	6	16	0.35	Rain
2014	**Temp.** (°F)			**Dew Point** (°F)			**Humidity** (%)			**Sea Level Press.** (in)			**Visibility** (mi)			**Wind** (mph)			**Precip.** (in)	**Events**
May	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**high**	**sum**	
1	46	42	37	39	37	36	100	85	70	29.79	29.75	29.71	10	9	2	12	4	17	0.08	Rain
2	52	44	35	44	38	34	97	79	59	29.77	29.67	29.61	10	10	10	12	4	17	0.00	Rain
3	55	46	39	38	32	27	82	60	36	29.94	29.77	29.65	10	10	10	23	12	29	0.00	
4	55	42	31	31	29	28	87	63	35	30.11	30.05	29.95	10	10	10	17	8	24	0.00	
5	43	37	32	34	33	30	98	86	69	30.10	30.08	30.03	10	10	4	17	7	21	0.08	Rain
6	40	36	33	34	33	32	97	86	77	30.08	30.02	29.96	10	10	10	18	10	25	0.00	
7	43	38	33	37	33	32	97	83	70	29.98	29.89	29.77	10	10	3	22	14	30	0.20	Rain
8	41	38	35	40	37	35	99	96	90	29.84	29.76	29.64	10	8	1	16	9	24	0.78	Rain , Snow
9	48	42	36	47	40	36	100	93	79	29.74	29.56	29.46	10	6	1	18	9	28	0.03	Rain
10	69	52	36	39	32	22	97	56	21	29.89	29.82	29.74	10	10	7	10	6	-	0.00	
11	54	46	38	37	33	32	79	67	47	29.96	29.92	29.86	10	10	10	16	7	24	0.00	Rain
12	41	38	34	37	35	33	99	96	72	29.94	29.85	29.74	10	5	1	23	14	32	1.19	Rain , Snow

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2013	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
13	55	46	36	40	37	32	99	74	50	30.11	29.92	29.74	10	10	2	21	9	30	0.15	Rain
14	55	43	32	35	30	25	97	62	35	30.25	30.18	30.10	10	10	10	15	8	22	0.00	
15	46	40	35	32	31	28	86	67	52	30.24	30.16	30.09	10	10	10	10	5	-	0.00	
16	54	43	32	34	26	20	91	53	28	30.09	30.03	29.99	10	10	10	13	3	16	0.00	
17	67	48	30	35	28	22	84	46	19	30.00	29.95	29.91	10	10	10	16	6	22	0.00	
18	74	58	41	38	35	33	77	43	23	30.02	29.97	29.94	10	10	10	20	9	28	0.00	
19	43	40	37	41	37	34	100	90	76	30.04	29.94	29.81	10	7	2	10	6	17	0.26	Rain
20	61	49	38	53	43	38	100	93	71	29.86	29.82	29.78	10	4	0	9	4	-	0.29	Fog , Rain
21	64	50	38	48	44	39	100	74	53	30.09	29.96	29.84	10	8	0	17	6	22	0.00	Fog
22	68	56	42	45	43	39	92	62	39	30.21	30.16	30.10	10	10	10	9	4	-	0.00	
23	70	52	35	45	40	35	99	69	37	30.27	30.21	30.13	10	10	4	10	3	-	0.00	
24	71	53	36	46	42	36	98	67	41	30.17	30.09	30.01	10	10	7	9	2	-	0.00	
25	84	64	45	56	49	43	92	55	25	30.04	29.96	29.88	10	10	5	15	4	24	0.00	
26	87	71	55	63	58	52	100	69	40	29.91	29.87	29.82	10	10	10	12	4	18	0.00	
27	56	48	38	53	42	38	97	77	62	30.07	30.01	29.91	10	10	10	16	8	23	0.00	
28	58	44	32	43	39	32	100	79	61	30.18	30.14	30.07	10	9	0	12	4	18	0.00	Fog
29	70	52	33	50	43	33	100	73	46	30.18	30.13	30.07	10	10	1	8	3	-	0.00	
30	59	48	37	45	42	37	97	77	57	30.20	30.15	30.09	10	10	10	12	5	17	0.00	
31	62	52	42	62	50	40	100	96	83	30.12	30.04	29.93	10	4	0	8	2	-	0.96	Fog , Rain
2014	**Temp.** (°F)			**Dew Point** (°F)			**Humidity** (%)			**Sea Level Press.** (in)			**Visibility** (mi)			**Wind** (mph)			**Precip.** (in)	**Events**
Jun	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**low**	**high**	**avg**	**high**	**sum**	
1	59	50	43	53	47	43	100	97	82	29.93	29.82	29.75	10	4	0	7	4	-	0.03	Fog , Rain
2	74	58	43	59	50	44	100	88	54	29.76	29.64	29.51	10	8	0	20	4	31	0.49	Fog , Rain
3	76	64	51	53	50	48	94	64	38	29.86	29.82	29.69	10	10	10	20	11	25	0.00	
4	70	56	43	52	47	40	100	77	52	29.96	29.92	29.85	10	9	0	12	3	16	0.00	Fog
5	57	49	41	46	41	39	95	80	57	29.96	29.91	29.87	10	10	3	10	3	16	0.15	Rain

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Company Name/Address:

Calumet Specialty Products

2407 Stinson Avenue
Superior, WI 54880

Billing Information:

David Beattie
2407 Stinson Avenue
Superior, WI 54880

Analysis/Container/Preservative: PVOCGRO 60ml Amb/MeOH; TS 2oz CLR - NoPres

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone: (800) 767-5859
Phone: (615) 758-5858
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H231

Report to: Peter Fredman

Email to: peter.fredman@clmt.com

Project Description: CT2 #6 Oil

City/State Collected: Superior/WI

Phone: (715) 398-8455
FAX: (715) 398-8209

Client Project #:

ESC Key:

Collected by: (print) Josh Vanderwander

Site/Facility ID#:

P.O.#: 67981

Collected by (signature): [signature]

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day....... 200%
___ Next Day........ 100%
___ Two Day......... 50%
X Three Day......... 25%

Date Results Needed:
Email? __No X Yes
FAX? X No __Yes

CoCode **MUROILSW** (lab use only)
Template/Prelogin
Shipped Via: Fed EX

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	PVOCGRO 60ml Amb/MeOH	TS 2oz CLR - NoPres					Remarks/Contaminant	Sample # (lab only)
S-1	Grab	SS	6"	5/22/14	10:47	2	X	X						L700815-01
S-2	Grab	SS	6"	5/22/14	11:14	2	X	X						02
S-3	Grab	SS	6"	5/22/14	11:34	2	X	X						03
S-4	Grab	SS	6"	5/22/14	11:50	2	X	X						04
S-5	Grab	SS	6"	5/22/14	12:08	2	X	X						05

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ________

pH ________ Temp ________

Remarks: 5622 3981 6758

Flow ________ Other ________

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐	Condition: (lab use only)
[signature]	5/22/14	13:53	Pete [signature]		OK
Relinquished by: (Signature)	**Date:**	**Time:**	**Received by: (Signature)**	**Temp:** 3.1° / **Bottles Received:** 10	CoC Seals Intact ✓ Y __ N __ NA
Peter [signature]	5/22/14	1910			
Relinquished by: (Signature)	**Date:**	**Time:**	**Received for lab by: (Signature)**	**Date:** 5/23/14 / **Time:** 1000	**pH Checked:** / **NCF:**
			[signature]		

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Est. 1970

Peter Fredman
Calumet Specialty Products
2407 Stinson Avenue
Superior, WI 54880

Report Summary

Wednesday May 28, 2014

Report Number: L700815
Samples Received: 05/23/14
Client Project: CT2 6 Oil

Description: CT2 6 Oil

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: John Hawkins

John Hawkins , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

Peter Fredman
Calumet Specialty Products
2407 Stinson Avenue
Superior, WI 54880

May 28,2014

ESC Sample # : L700815-01

Site ID :

Project # : CT2 6 Oil

Date Received : May 23, 2014
Description : CT2 6 Oil

Sample ID : S-1 6IN

Collected By : Josh V
Collection Date : 05/22/14 10:47

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	74.7		%	2540 G-2011	05/24/14	1
PVOCGRO						
Benzene	0.36	0.34	mg/kg	8021	05/24/14	505
Toluene	BDL	3.4	mg/kg	8021	05/24/14	505
Ethylbenzene	BDL	0.34	mg/kg	8021	05/24/14	505
m&p-Xylene	BDL	0.68	mg/kg	8021	05/24/14	505
o-Xylene	BDL	0.34	mg/kg	8021	05/24/14	505
Methyl tert-butyl ether	BDL	0.68	mg/kg	8021	05/24/14	505
Naphthalene	9.5	3.4	mg/kg	8021	05/24/14	505
1,3,5-Trimethylbenzene	1.5	0.68	mg/kg	8021	05/24/14	505
1,2,4-Trimethylbenzene	0.86	0.68	mg/kg	8021	05/24/14	505
TPH (GC/FID) Low Fraction	120	68.	mg/kg	8015	05/24/14	505
Surrogate recovery-%						
a,a,a-Trifluorotoluene(PID)	98.0		% Rec.	8021	05/24/14	505

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:

The reported analytical results relate only to the sample submitted
Reported: 05/28/14 08:59 Printed: 05/28/14 08:59

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REPORT OF ANALYSIS

Peter Fredman
Calumet Specialty Products
2407 Stinson Avenue
Superior, WI 54880

May 28,2014

ESC Sample # : L700815-02

Site ID :

Project # : CT2 6 Oil

Date Received : May 23, 2014
Description : CT2 6 Oil

Sample ID : S-2 6IN

Collected By : Josh V
Collection Date : 05/22/14 11:14

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	77.6		%	2540 G-2011	05/24/14	1
PVOCGRO						
Benzene	BDL	0.13	mg/kg	8021	05/25/14	200
Toluene	BDL	1.3	mg/kg	8021	05/25/14	200
Ethylbenzene	1.5	0.13	mg/kg	8021	05/25/14	200
m&p-Xylene	1.5	0.26	mg/kg	8021	05/25/14	200
o-Xylene	1.4	0.13	mg/kg	8021	05/25/14	200
Methyl tert-butyl ether	BDL	0.26	mg/kg	8021	05/25/14	200
Naphthalene	24.	1.3	mg/kg	8021	05/25/14	200
1,3,5-Trimethylbenzene	13.	0.26	mg/kg	8021	05/25/14	200
1,2,4-Trimethylbenzene	7.1	0.26	mg/kg	8021	05/25/14	200
TPH (GC/FID) Low Fraction	620	26.	mg/kg	8015	05/25/14	200
Surrogate recovery-%						
a,a,a-Trifluorotoluene(PID)	98.7		% Rec.	8021	05/25/14	200

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:

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REPORT OF ANALYSIS

Peter Fredman
Calumet Specialty Products
2407 Stinson Avenue
Superior, WI 54880

May 28,2014

ESC Sample # : L700815-03

Site ID :

Project # : CT2 6 Oil

Date Received : May 23, 2014
Description : CT2 6 Oil

Sample ID : S-3 6IN

Collected By : Josh V
Collection Date : 05/22/14 11:34

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	78.4		%	2540 G-2011	05/28/14	1
PVOCGRO						
Benzene	0.023	0.021	mg/kg	8021	05/25/14	32.5
Toluene	BDL	0.21	mg/kg	8021	05/25/14	32.5
Ethylbenzene	BDL	0.021	mg/kg	8021	05/25/14	32.5
m&p-Xylene	BDL	0.041	mg/kg	8021	05/25/14	32.5
o-Xylene	0.022	0.021	mg/kg	8021	05/25/14	32.5
Methyl tert-butyl ether	BDL	0.041	mg/kg	8021	05/25/14	32.5
Naphthalene	BDL	0.21	mg/kg	8021	05/25/14	32.5
1,3,5-Trimethylbenzene	BDL	0.041	mg/kg	8021	05/25/14	32.5
1,2,4-Trimethylbenzene	0.064	0.041	mg/kg	8021	05/25/14	32.5
TPH (GC/FID) Low Fraction	6.5	4.1	mg/kg	8015	05/25/14	32.5
Surrogate recovery-%						
a,a,a-Trifluorotoluene(PID)	97.8		% Rec.	8021	05/25/14	32.5

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:

The reported analytical results relate only to the sample submitted
Reported: 05/28/14 08:59 Printed: 05/28/14 08:59

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REPORT OF ANALYSIS

Peter Fredman
Calumet Specialty Products
2407 Stinson Avenue
Superior, WI 54880

May 28,2014

ESC Sample # : L700815-04

Date Received : May 23, 2014
Description : CT2 6 Oil

Site ID :

Sample ID : S-4 6IN

Project # : CT2 6 Oil

Collected By : Josh V
Collection Date : 05/22/14 11:50

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	78.5		%	2540 G-2011	05/28/14	1
PVOCGRO						
Benzene	0.020	0.020	mg/kg	8021	05/25/14	31.5
Toluene	BDL	0.20	mg/kg	8021	05/25/14	31.5
Ethylbenzene	0.020	0.020	mg/kg	8021	05/25/14	31.5
m&p-Xylene	BDL	0.040	mg/kg	8021	05/25/14	31.5
o-Xylene	BDL	0.020	mg/kg	8021	05/25/14	31.5
Methyl tert-butyl ether	BDL	0.040	mg/kg	8021	05/25/14	31.5
Naphthalene	1.4	0.20	mg/kg	8021	05/25/14	31.5
1,3,5-Trimethylbenzene	BDL	0.040	mg/kg	8021	05/25/14	31.5
1,2,4-Trimethylbenzene	0.13	0.040	mg/kg	8021	05/25/14	31.5
TPH (GC/FID) Low Fraction	9.8	4.0	mg/kg	8015	05/25/14	31.5
Surrogate recovery-%						
a,a,a-Trifluorotoluene(PID)	98.6		% Rec.	8021	05/25/14	31.5

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:

The reported analytical results relate only to the sample submitted
Reported: 05/28/14 08:59 Printed: 05/28/14 08:59

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REPORT OF ANALYSIS

Peter Fredman
Calumet Specialty Products
2407 Stinson Avenue
Superior, WI 54880

May 28,2014

ESC Sample # : L700815-05

Site ID :

Project # : CT2 6 Oil

Date Received : May 23, 2014
Description : CT2 6 Oil

Sample ID : S-5 6IN

Collected By : Josh V
Collection Date : 05/22/14 12:08

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	73.6		%	2540 G-2011	05/28/14	1
PVOCGRO						
Benzene	1.8	0.50	mg/kg	8021	05/25/14	735
Toluene	BDL	5.0	mg/kg	8021	05/25/14	735
Ethylbenzene	5.4	0.50	mg/kg	8021	05/25/14	735
m&p-Xylene	1.0	1.0	mg/kg	8021	05/25/14	735
o-Xylene	1.8	0.50	mg/kg	8021	05/25/14	735
Methyl tert-butyl ether	BDL	1.0	mg/kg	8021	05/25/14	735
Naphthalene	39.	5.0	mg/kg	8021	05/25/14	735
1,3,5-Trimethylbenzene	13.	1.0	mg/kg	8021	05/25/14	735
1,2,4-Trimethylbenzene	6.2	1.0	mg/kg	8021	05/25/14	735
TPH (GC/FID) Low Fraction	980	100	mg/kg	8015	05/25/14	735
Surrogate recovery-%						
a,a,a-Trifluorotoluene(PID)	98.0		% Rec.	8021	05/25/14	735

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:

The reported analytical results relate only to the sample submitted
Reported: 05/28/14 08:59 Printed: 05/28/14 08:59

Summary of Remarks For Samples Printed
05/28/14 at 08:59:42

TSR Signing Reports: 341
R4 - Rush: Three Day

Sample: L700815-01 Account: MUROILSWI Received: 05/23/14 10:00 Due Date: 05/29/14 00:00 RPT Date: 05/28/14 08:59

Sample: L700815-02 Account: MUROILSWI Received: 05/23/14 10:00 Due Date: 05/29/14 00:00 RPT Date: 05/28/14 08:59

Sample: L700815-03 Account: MUROILSWI Received: 05/23/14 10:00 Due Date: 05/29/14 00:00 RPT Date: 05/28/14 08:59

Sample: L700815-04 Account: MUROILSWI Received: 05/23/14 10:00 Due Date: 05/29/14 00:00 RPT Date: 05/28/14 08:59

Sample: L700815-05 Account: MUROILSWI Received: 05/23/14 10:00 Due Date: 05/29/14 00:00 RPT Date: 05/28/14 08:59

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Calumet Specialty Products
Peter Fredman
2407 Stinson Avenue

Superior, WI 54880

Quality Assurance Report
Level II

L700815

May 28, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Total Solids	< .1	%			WG722800	05/24/14 11:13
1,2,4-Trimethylbenzene	< .001	mg/kg			WG722805	05/24/14 14:29
1,3,5-Trimethylbenzene	< .001	mg/kg			WG722805	05/24/14 14:29
Benzene	< .0005	mg/kg			WG722805	05/24/14 14:29
Ethylbenzene	< .0005	mg/kg			WG722805	05/24/14 14:29
m&p-Xylene	< .001	mg/kg			WG722805	05/24/14 14:29
Methyl tert-butyl ether	< .001	mg/kg			WG722805	05/24/14 14:29
Naphthalene	< .005	mg/kg			WG722805	05/24/14 14:29
o-Xylene	< .0005	mg/kg			WG722805	05/24/14 14:29
Toluene	< .005	mg/kg			WG722805	05/24/14 14:29
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG722805	05/24/14 14:29
a,a,a-Trifluorotoluene(PID)		% Rec.	99.60	80-120	WG722805	05/24/14 14:29
Total Solids	< .1	%			WG722853	05/28/14 06:21

Duplicate

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
Total Solids	%	82.6	81.7	1.12	5	L700755-05	WG722800
Total Solids	%	75.6	76.0	0.521	5	L700855-04	WG722853

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Total Solids	%	50	50.0	100.	85-115	WG722800
1,2,4-Trimethylbenzene	mg/kg	.05	0.0512	102.	80-120	WG722805
1,3,5-Trimethylbenzene	mg/kg	.05	0.0507	101.	80-120	WG722805
Benzene	mg/kg	.05	0.0525	105.	80-120	WG722805
Ethylbenzene	mg/kg	.05	0.0518	104.	80-120	WG722805
m&p-Xylene	mg/kg	.1	0.105	105.	80-120	WG722805
Methyl tert-butyl ether	mg/kg	.05	0.0527	105.	80-120	WG722805
Naphthalene	mg/kg	.05	0.0509	102.	80-120	WG722805
o-Xylene	mg/kg	.05	0.0507	101.	80-120	WG722805
Toluene	mg/kg	.05	0.0503	101.	80-120	WG722805
a,a,a-Trifluorotoluene(PID)				100.0	80-120	WG722805
TPH (GC/FID) Low Fraction	mg/kg	.5	0.469	93.7	80-120	WG722805
a,a,a-Trifluorotoluene(PID)				100.0	80-120	WG722805
Total Solids	%	50	50.0	100.	85-115	WG722853

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
1,2,4-Trimethylbenzene	mg/kg	0.0516	0.0512	103.	80-120	0.630	20	WG722805
1,3,5-Trimethylbenzene	mg/kg	0.0516	0.0507	103.	80-120	1.84	20	WG722805
Benzene	mg/kg	0.0541	0.0525	108.	80-120	3.11	20	WG722805
Ethylbenzene	mg/kg	0.0533	0.0518	107.	80-120	2.89	20	WG722805
m&p-Xylene	mg/kg	0.107	0.105	107.	80-120	1.39	20	WG722805
Methyl tert-butyl ether	mg/kg	0.0529	0.0527	106.	80-120	0.390	20	WG722805
Naphthalene	mg/kg	0.0536	0.0509	107.	80-120	5.24	20	WG722805
o-Xylene	mg/kg	0.0517	0.0507	103.	80-120	2.01	20	WG722805

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Calumet Specialty Products
Peter Fredman
2407 Stinson Avenue
Superior, WI 54880

Quality Assurance Report
Level II

L700815

May 28, 2014

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Toluene	mg/kg	0.0517	0.0503	103.	80-120	2.78	20	WG722805
a,a,a-Trifluorotoluene(PID)				98.50	80-120			WG722805
TPH (GC/FID) Low Fraction	mg/kg	0.448	0.469	90.0	80-120	4.51	20	WG722805
a,a,a-Trifluorotoluene(PID)				98.50	80-120			WG722805

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
1,2,4-Trimethylbenzene	mg/kg	1.16	0.00765	.05	92.0	80-120	L700389-01	WG722805
1,3,5-Trimethylbenzene	mg/kg	1.14	0.00540	.05	91.0	80-120	L700389-01	WG722805
Benzene	mg/kg	1.19	0.0	.05	95.0	32-137	L700389-01	WG722805
Ethylbenzene	mg/kg	1.17	0.00334	.05	93.0	10-150	L700389-01	WG722805
m&p-Xylene	mg/kg	2.37	0.00748	.1	94.0	14-141	L700389-01	WG722805
Methyl tert-butyl ether	mg/kg	1.08	0.00500	.05	86.0	24-151	L700389-01	WG722805
Naphthalene	mg/kg	1.01	0.0117	.05	80.0	80-120	L700389-01	WG722805
o-Xylene	mg/kg	1.14	0.00442	.05	91.0	10-157	L700389-01	WG722805
Toluene	mg/kg	1.13	0.00451	.05	90.0	20-142	L700389-01	WG722805
a,a,a-Trifluorotoluene(PID)					101.0	80-120		WG722805
TPH (GC/FID) Low Fraction	mg/kg	11.9	0.00167	.5	95.0	80-120	L700389-01	WG722805
a,a,a-Trifluorotoluene(PID)					101.0	80-120		WG722805

Matrix Spike Duplicate

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
1,2,4-Trimethylbenzene	mg/kg	1.28	1.16	102.	80-120	9.88	20	L700389-01	WG722805
1,3,5-Trimethylbenzene	mg/kg	1.26	1.14	100.	80-120	9.99	20	L700389-01	WG722805
Benzene	mg/kg	1.31	1.19	104.	32-137	9.60	39	L700389-01	WG722805
Ethylbenzene	mg/kg	1.29	1.17	103.	10-150	9.74	44	L700389-01	WG722805
m&p-Xylene	mg/kg	2.61	2.37	104.	14-141	9.84	44	L700389-01	WG722805
Methyl tert-butyl ether	mg/kg	1.26	1.08	100.	24-151	15.8	37	L700389-01	WG722805
Naphthalene	mg/kg	1.20	1.01	95.2	80-120	17.1	20	L700389-01	WG722805
o-Xylene	mg/kg	1.26	1.14	100.	10-157	9.87	44	L700389-01	WG722805
Toluene	mg/kg	1.25	1.13	99.9	20-142	9.88	42	L700389-01	WG722805
a,a,a-Trifluorotoluene(PID)				101.0	80-120				WG722805
TPH (GC/FID) Low Fraction	mg/kg	12.9	11.9	103.	80-120	7.86	20	L700389-01	WG722805
a,a,a-Trifluorotoluene(PID)				101.0	80-120				WG722805

Batch number /Run number / Sample number cross reference

WG722800: R2927667: L700815-01 02
WG722805: R2928832: L700815-01 02 03 04 05
WG722853: R2929088: L700815-03 04 05

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Superior, WI 54880

Quality Assurance Report
Level II

L700815

May 28, 2014

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

Company Name/Address:

Calumet Specialty Products

2407 Stinson Avenue
Superior, WI 54880

Billing Information:

David Beattie
2407 Stinson Avenue
Superior, WI 54880

Report to: Peter Fredman

Email to: Peter.fredman@clmt.com

Project Description: CT2 #6 Oil

City/Sate Collected: Superior / WI

Phone: (715) 398-8455
FAX: (715) 398-8209

Client Project #:

ESC Key:

Collected by: (print) Cliff Wright

Site/Facility ID#:

P.O.#: 67981

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day..... 200%
___ Next Day..... 100%
___ Two Day..... 50%
___ Three Day..... 25%

Date Results Needed:

Email? __No__Yes

FAX? __No__Yes

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Analysis/Container/Preservative: PVOCGRO 60ml Amb/MeOH	TS 2oz CLR - No Pres						Remarks/Contaminant	Sample # (lab only)
S-5-2	Grab	SS	5'6"	6-3-2014	14:10	2	X	X						PID 50ppmv	L709393-01

Chain of Custody Page 1 of 1

E111

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Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

CoCode MUROILSW (lab use only)

Template/Prelogin

Shipped Via: FedEx

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

pH _____ Temp _____

Remarks:

5274 8784 2917

Flow _____ Other _____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	6-3-14	14:16	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	6-3-14	15:30	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 2.4°C

Bottles Received: 2

Condition: (lab use only) 323

CoC Seals Intact ___ Y ___ N ___ NA

Date: 6-4-14

Time: 0900

pH Checked:

NCF:

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Est. 1970

Peter Fredman
Calumet Specialty Products
2407 Stinson Avenue
Superior, WI 54880

Report Summary

Thursday June 05, 2014

Report Number: L702393
Samples Received: 06/04/14
Client Project:

Description: CT2 #6 Oil

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Jimmy Hunt

Jimmy Hunt , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

Peter Fredman
Calumet Specialty Products
2407 Stinson Avenue
Superior, WI 54880

June 05,2014

ESC Sample # : L702393-01

Date Received : June 04, 2014
Description : CT2 #6 Oil

Site ID :

Sample ID : S-5-2 5-6IN

Project # :

Collected By : Cliff Wright
Collection Date : 06/03/14 14:10

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	76.6		%	2540 G-2011	06/05/14	1
PVOCGRO						
Benzene	0.84	0.037	mg/kg	8021	06/04/14	56.75
Toluene	BDL	0.37	mg/kg	8021	06/04/14	56.75
Ethylbenzene	1.2	0.037	mg/kg	8021	06/04/14	56.75
m&p-Xylene	0.12	0.074	mg/kg	8021	06/04/14	56.75
o-Xylene	0.27	0.037	mg/kg	8021	06/04/14	56.75
Methyl tert-butyl ether	0.17	0.074	mg/kg	8021	06/04/14	56.75
Naphthalene	BDL	0.37	mg/kg	8021	06/04/14	56.75
1,3,5-Trimethylbenzene	1.1	0.074	mg/kg	8021	06/04/14	56.75
1,2,4-Trimethylbenzene	0.73	0.074	mg/kg	8021	06/04/14	56.75
TPH (GC/FID) Low Fraction	130	7.4	mg/kg	8015	06/04/14	56.75
Surrogate recovery-%						
a,a,a-Trifluorotoluene(PID)	98.9		% Rec.	8021	06/04/14	56.75

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:

The reported analytical results relate only to the sample submitted
Reported: 06/05/14 08:50 Printed: 06/05/14 08:51

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L702393-01	WG724512	SAMP	Naphthalene	R2934106	J5
	WG724512	SAMP	1,3,5-Trimethylbenzene	R2934106	J5
	WG724512	SAMP	1,2,4-Trimethylbenzene	R2934106	J5
	WG724512	SAMP	TPH (GC/FID) Low Fraction	R2934106	J5

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
06/05/14 at 08:51:10

TSR Signing Reports: 341
R1 - Rush: Sameday

Sample: L702393-01 Account: MUROILSWI Received: 06/04/14 09:00 Due Date: 06/05/14 00:00 RPT Date: 06/05/14 08:50

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Calumet Specialty Products
Peter Fredman
2407 Stinson Avenue
Superior, WI 54880

Quality Assurance Report
Level II

L702393

June 05, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
1,2,4-Trimethylbenzene	< .001	mg/kg			WG724512	06/04/14 12:29
1,3,5-Trimethylbenzene	< .001	mg/kg			WG724512	06/04/14 12:29
Benzene	< .0005	mg/kg			WG724512	06/04/14 12:29
Ethylbenzene	< .0005	mg/kg			WG724512	06/04/14 12:29
m&p-Xylene	< .001	mg/kg			WG724512	06/04/14 12:29
Methyl tert-butyl ether	< .001	mg/kg			WG724512	06/04/14 12:29
Naphthalene	< .005	mg/kg			WG724512	06/04/14 12:29
o-Xylene	< .0005	mg/kg			WG724512	06/04/14 12:29
Toluene	< .005	mg/kg			WG724512	06/04/14 12:29
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG724512	06/04/14 12:29
a,a,a-Trifluorotoluene(PID)		% Rec.	98.70	80-120	WG724512	06/04/14 12:29
Total Solids	< .1	%			WG724509	06/05/14 07:40

Duplicate

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
Total Solids	%	74.9	76.6	2.21	5	L702393-01	WG724509

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
1,2,4-Trimethylbenzene	mg/kg	.05	0.0484	96.8	80-120	WG724512
1,3,5-Trimethylbenzene	mg/kg	.05	0.0479	95.9	80-120	WG724512
Benzene	mg/kg	.05	0.0486	97.3	80-120	WG724512
Ethylbenzene	mg/kg	.05	0.0489	97.7	80-120	WG724512
m&p-Xylene	mg/kg	.1	0.0979	97.9	80-120	WG724512
Methyl tert-butyl ether	mg/kg	.05	0.0493	98.6	80-120	WG724512
Naphthalene	mg/kg	.05	0.0485	97.1	80-120	WG724512
o-Xylene	mg/kg	.05	0.0476	95.2	80-120	WG724512
Toluene	mg/kg	.05	0.0468	93.7	80-120	WG724512
a,a,a-Trifluorotoluene(PID)				101.0	80-120	WG724512
TPH (GC/FID) Low Fraction	mg/kg	.5	0.414	82.8	80-120	WG724512
a,a,a-Trifluorotoluene(PID)				101.0	80-120	WG724512
Total Solids	%	50	50.0	100.	85-115	WG724509

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
1,2,4-Trimethylbenzene	mg/kg	0.0515	0.0484	103.	80-120	6.21	20	WG724512
1,3,5-Trimethylbenzene	mg/kg	0.0506	0.0479	101.	80-120	5.48	20	WG724512
Benzene	mg/kg	0.0509	0.0486	102.	80-120	4.56	20	WG724512
Ethylbenzene	mg/kg	0.0515	0.0489	103.	80-120	5.17	20	WG724512
m&p-Xylene	mg/kg	0.103	0.0979	103.	80-120	5.40	20	WG724512
Methyl tert-butyl ether	mg/kg	0.0524	0.0493	105.	80-120	6.14	20	WG724512
Naphthalene	mg/kg	0.0507	0.0485	101.	80-120	4.32	20	WG724512
o-Xylene	mg/kg	0.0503	0.0476	100.	80-120	5.51	20	WG724512
Toluene	mg/kg	0.0493	0.0468	98.0	80-120	5.10	20	WG724512
a,a,a-Trifluorotoluene(PID)				98.90	80-120			WG724512
TPH (GC/FID) Low Fraction	mg/kg	0.475	0.414	95.0	80-120	13.8	20	WG724512
a,a,a-Trifluorotoluene(PID)				98.90	80-120			WG724512

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
1,2,4-Trimethylbenzene	mg/kg	4.47	0.559	.05	140.*	80-120	L702393-01	WG724512

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Calumet Specialty Products
Peter Fredman
2407 Stinson Avenue

Superior, WI 54880

Quality Assurance Report
Level II

L702393

June 05, 2014

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
1,3,5-Trimethylbenzene	mg/kg	4.79	0.867	.05	140.*	80-120	L702393-01	WG724512
Benzene	mg/kg	3.14	0.636	.05	88.0	32-137	L702393-01	WG724512
Ethylbenzene	mg/kg	3.80	0.937	.05	100.	10-150	L702393-01	WG724512
m&p-Xylene	mg/kg	5.68	0.0913	.1	98.0	14-141	L702393-01	WG724512
Methyl tert-butyl ether	mg/kg	2.52	0.128	.05	84.0	24-151	L702393-01	WG724512
Naphthalene	mg/kg	6.62	0.0	.05	230.*	80-120	L702393-01	WG724512
o-Xylene	mg/kg	2.84	0.213	.05	93.0	10-157	L702393-01	WG724512
Toluene	mg/kg	2.80	0.216	.05	91.0	20-142	L702393-01	WG724512
a,a,a-Trifluorotoluene(PID)					101.0	80-120		WG724512
TPH (GC/FID) Low Fraction	mg/kg	136.	101.	.5	120.*	80-120	L702393-01	WG724512
a,a,a-Trifluorotoluene(PID)					101.0	80-120		WG724512

Analyte	Units	Matrix Spike Duplicate MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
1,2,4-Trimethylbenzene	mg/kg	4.66	4.47	144.*	80-120	4.02	20	L702393-01	WG724512
1,3,5-Trimethylbenzene	mg/kg	4.99	4.79	145.*	80-120	4.07	20	L702393-01	WG724512
Benzene	mg/kg	3.32	3.14	94.5	32-137	5.47	39	L702393-01	WG724512
Ethylbenzene	mg/kg	4.01	3.80	108.	10-150	5.27	44	L702393-01	WG724512
m&p-Xylene	mg/kg	5.98	5.68	104.	14-141	5.12	44	L702393-01	WG724512
Methyl tert-butyl ether	mg/kg	2.72	2.52	91.2	24-151	7.37	37	L702393-01	WG724512
Naphthalene	mg/kg	7.09	6.62	250.*	80-120	6.91	20	L702393-01	WG724512
o-Xylene	mg/kg	2.98	2.84	97.4	10-157	4.72	44	L702393-01	WG724512
Toluene	mg/kg	2.95	2.80	96.3	20-142	5.10	42	L702393-01	WG724512
a,a,a-Trifluorotoluene(PID)				99.30	80-120				WG724512
TPH (GC/FID) Low Fraction	mg/kg	130.	136.	103.	80-120	4.13	20	L702393-01	WG724512
a,a,a-Trifluorotoluene(PID)				99.30	80-120				WG724512

Batch number /Run number / Sample number cross reference

WG724512: R2934106: L702393-01
WG724509: R2934628: L702393-01

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
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Quality Assurance Report
Level II

L702393

June 05, 2014

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