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January 31, 2013

Mr. Karl F. Beaster, P.G.
Environmental Analyst, Liquids Pipelines Environment
Enbridge Energy
Central Square Office
1320 Grand Avenue
Superior, Wisconsin 54880

RE: Annual Report - 2012; Enbridge Energy South Cass Lake Pumping Station, Cass Lake, Minnesota

Dear Mr. Beaster:

This letter report documents groundwater monitoring activities conducted in June and December 2012 as well as remedial action activities proposed and conducted for the above referenced site. Figure 1 shows the site location. Figure 2 depicts the layout of the pumping station, property boundaries, and the monitoring well network (Site).

2012 Groundwater Monitoring Activities

Aquifer Hydraulics

Depth to groundwater measurements were collected from the monitoring well network prior to purging and groundwater sample collection activities in June and December 2012. Table 1 provides a comprehensive summary of groundwater elevation data collected at the Site. Figure 3 depicts the groundwater flow direction based on data collected during the most recent sampling event in December 2012. Locally, the configuration of the water table and the distribution of compounds dissolved in the groundwater indicate that groundwater flows under unconfined conditions with a southeast to east flow direction. Regionally, groundwater flow is to the southeast toward Fox Creek which is part of the Pike Bay drainage (refer to Figure 1).

Light Non-Aqueous Phase Liquid (LNAPL)

During both the June and December 2012 monitoring events, LNAPL thickness measurements were collected with an oil/water interface probe from monitoring wells MW-3, MW-5, MW-11 and MW-13. Table 1 provides a comprehensive summary of the LNAPL thickness measurements observed from these four monitoring locations. During the most recent sampling event in December 2012, the crude oil thickness ranged from 0.85 feet at monitoring wells MW-13 to 1.24 feet at monitoring well MW-11. Figure 4 depicts the approximate lateral extent of LNAPL observed on the water table at the Site.

During the June 2012 sampling event, crude oil was manually recovered with a disposable bailer from monitoring wells MW-3, MW-5, MW-11, and MW-13 and placed in a sealed drum located within the fenced station yard. A minimal total volume of LNAPL was recovered from the 2-inch diameter monitoring wells (i.e., less than 0.25 gallons) in June 2012. LNAPL was not recovered

during the December 2012 sampling event given the minimal recovery volumes observed from previous sampling events.

Groundwater Quality

Table 2 provides a comprehensive summary of groundwater analytical data collected at the Site. In June 2012, samples from six monitoring wells at the Site (i.e., MW-4, MW-9, MW-10, USGS-1A, USGS-2A, and USGS-3A) exhibited one or more BTEX parameters above the laboratory reporting limit (excluding wells containing LNAPL). The benzene concentrations detected during the June 2012 sampling event ranged from below the detection limit to 282 µg/L at monitoring well USGS-2A.

During the most recent sampling event in December 2012, samples from seven wells exhibited benzene at or above the reporting limit. The reported benzene concentrations detected in December 2012 ranged from 1.0 µg/L to 653 µg/L (MW-10). Due to a detection of benzene at monitoring well MW-16A in December 2012 (59.8 µg/L), two additional samples were collected to confirm the presence of dissolved phase benzene at this location. The two additional samples detected benzene at 48.8 µg/L and 47 µg/L. Figure 5 depicts the inferred lateral extent of dissolved phase benzene concentrations in exceedance of 1.0 µg/L based on December 2012 analytical results.

Extended Range Diesel Range Organic (ERDRO) concentrations at the Site ranged from below the laboratory detection limit to 15,900 µg/L at MW-10 in June 2012. In December 2012, ERDRO concentrations at the Site ranged from below the laboratory detection limit to 7,400 µg/L at MW-10. The complete analytical laboratory reports for the June and December 2012 sampling events are included in Attachment I.

Water samples collected from monitoring wells, noted to be free of LNAPL, were also submitted for laboratory analysis of nitrate + nitrite, sulfate, and methane during the June and December 2012 sampling events. The field measurements of dissolved oxygen, oxidation-reduction potential, and conductivity concentrations were also collected from the Site monitoring wells. These laboratory and field data were collected to support the evaluation of biodegradation processes potentially occurring in groundwater at the Site. Table 3 summarizes the results of these data collection activities.

Groundwater and Contaminant Velocity Calculations

Due to the proximity of well MW-16A to the downgradient property boundary (Figure 5), a desktop analysis was performed to estimate groundwater and contaminant velocities.

The mean groundwater velocity can be expressed as:

$$V_x = \frac{K \partial \phi}{n_e \partial x}$$

Where:

K	= mean hydraulic conductivity from the slug test data (ft/day)
V_x	= mean groundwater flow velocity in the x direction (ft/day)
n_e	= effective porosity (dimensionless)
$\partial \phi / \partial x$	= hydraulic gradient (dimensionless)

Using a typical value of 0.25 for the effective porosity of sand, the hydraulic gradient of 0.001, and an average hydraulic conductivity of 17.3 ft/day (2003 data), the mean groundwater velocity calculated for the site is approximately 25 ft/year.

Of the constituents associated with crude oil, benzene is typically the first compound to arrive downgradient in a groundwater plume, and was observed to be present in MW-16A. The velocity of the benzene traveling through the aquifer may be estimated with the following equation:

$$V_c = \frac{V_x}{R_{benzene}}$$

Where:

V_x = groundwater flow in the x direction
 $R_{benzene}$ = retardation factor for benzene

The retardation factor for benzene can be calculated by the following equation:

$$R_{benzene} = 1 + \left(\frac{\rho_b}{n_e} \right) (K_{oc} f_{oc})$$

The following assumptions were made based on site specific information:

K_{oc}	= partitioning coefficient for benzene (cm^3/g)	= 83 cm^3/g for benzene
ρ_b	= bulk dry density of the soil (g/cm^3)	= 2.0 g/cm^3 for sand
n_e	= effective porosity (dimensionless)	= 0.25 for sand
f_{oc}	= fraction organic carbon (dimensionless)	= 0.09%

For the site, the calculated retardation factor is 1.60, yielding an estimated mean groundwater transport velocity of benzene of approximately 16 ft/year. This assumes no dispersion, diffusion, or biodegradation is taking place and also that the source area is not decreasing. Based on these calculations, dissolved phase benzene observed in the groundwater at MW-16A may potentially reach the eastern Enbridge property boundary in approximately six years.

2012 Pilot Study Implementation Activities

In an August 2012 *Remedial Action Implementation Plan*, AECOM proposed the implementation of an air sparging system at the Site. In accordance with this plan, an existing air sparge system located at the Enbridge MP 85 site was to be transported and adapted for Site use after the performance of a pilot study. However, during advancement of three borings along the south side of the facility in October 2012, it was observed that a confining clay layer is present at a depth of approximately 28 to 32 feet below ground surface. Boring logs for these three locations are included in Attachment II. The confining layer serves as a barrier to petroleum impacts, which were not observed to extend more than 6 inches into the confining layer. This results in a much thinner zone of petroleum impacts (i.e., approximately 3 to 8 feet) than previously expected. To better accommodate the observed geologic conditions noted in October 2012, and in consultation with Enbridge, a bioventing and natural source zone depletion (NSZD) pilot study will be implemented. This approach will utilize shallower wells with lower flow/pressure requirements, thus requiring less overall operation and maintenance.

Bioventing/NSZD Pilot Study

Bioventing is a remediation technology that promotes biodegradation by the injection of air, at relatively slow air flow rates, into the unsaturated (vadose) zone. To evaluate the effectiveness of bioventing on remediating LNAPL impacts at the Site, a pilot study will be completed in 2013. The bioventing test methodology includes background sampling of soil gas, a soil gas permeability test, and *in situ* respiration test. The results of the pilot study will be used to determine the expected petroleum degradation that could be achieved if a full-scale bioventing remedial approach was implemented.

Additionally, AECOM will complete a natural source zone depletion (NSZD) evaluation. The NSZD evaluation was a component of the original approach (i.e., with air sparging); however, the scope of the NSZD evaluation has been modified to include collection of data within the pumping station to provide a more comprehensive determination of the rate at which LNAPL impacts would be naturally degraded. The NSZD evaluation involves installation of carbon dioxide traps at the ground surface to assess the carbon dioxide flux within the vadose zone. Four carbon dioxide traps will be deployed in early May, once thawing conditions persist and frost is not observed in the subsurface. These will be installed based on a combination of logistical considerations and a "snapshot" geospatial survey of carbon dioxide flux in the vicinity of the extent of LNAPL that will be conducted during the same mobilization as the trap deployment. The "snapshot" survey will be conducted using a field-grade infrared spectrometer. For logistical reasons, the preferred location for the trap deployment will be immediately outside the station yard to the south within the inferred extent of LNAPL. Enbridge will be consulted prior to deployment if it is determined that other locations are more favorable. Following deployment of the four carbon dioxide traps and after analysis of the data, the bioventing portion of the pilot study will be conducted (mid June 2013) and will take approximately one week to complete. A second set of four traps will be deployed in September 2013 to evaluate if there are seasonal variations in carbon dioxide flux. The results of the bioventing and NSZD studies will be directly compared to determine if bioventing is significantly more effective than natural mechanisms in degrading petroleum impacts at the Site. Depending on the results of the pilot study, either a full scale bioventing/NSZD system will be implemented or alternative remedial technologies will be evaluated for the Site.

The bioventing test methodology will be discussed in further detail in the Work Plan which will be submitted to Enbridge in late March 2013.

Bioventing System Installation

In November 2012, four nested vapor monitoring points (VP-1 through VP-4) and one bioventing well (BVW-1) were installed for the bioventing/NSZD pilot study. Construction details for these components are provided in Attachment III. Each nested vapor monitoring point contains three points completed to depths of 15ft, 20ft, and 24ft with a 6-inch screened tip. The screens were set in a two foot thick filter pack of silica sand and overlain with a bentonite seal. The vapor points were installed via geoprobe and utilize 3/8-inch silicone tubing for soil vapor sampling activities. The bioventing well was installed via hollow-stem auger, contains a 2-in diameter PVC riser pipe, a flush thread 10-ft (0.010-in slot) screened interval, and was completed to a depth of 25 feet below grade. The bioventing well screen was set in a filter pack of red flint sand overlain by a two foot bentonite seal and cement grout to the ground surface. The bioventing well and vapor point nests were completed with flush-grade well protection. Figure 2 depicts the locations of the bioventing well and nested vapor monitoring points.

Recommendations

Groundwater Monitoring Activities - 2013

To further evaluate dissolved phase contaminant trends, as well as biodegradation processes, it is proposed that groundwater monitoring continue at the Site on a semi-annual basis in June and December 2013. The scope of the monitoring activities (i.e., locations, procedures, and analytical parameters) will be consistent with previous groundwater sampling events. Biodegradation evaluation parameters will continue to be collected during each sampling event. In addition to groundwater sample collection, LNAPL thickness measurements will continue to be collected from monitoring wells MW-3, -5, -11, and -13. A simple groundwater fate and transport model (e.g., Natural Attenuation Software and/or BIOSCREEN) shall be utilized using subsequent groundwater monitoring data to assist in the prediction of downgradient transport of dissolved phase constituents. These platforms are capable of incorporating dispersion and biodegradation effects.

Bioventing - NSZD Pilot Study Activities/Schedule

It is recommended that the NSZD evaluation and bioventing pilot study be initiated during the first quarter of 2013. In order to assess seasonal variations in volatilization rates in the vadose zone, AECOM recommends the NSZD evaluation be conducted again in mid-summer 2013. The following is the proposed schedule for pilot study activities:

- Late March 2013: Prepare a Work Plan documenting pilot study fieldwork activities and results;
- Early May 2013: Procure and deploy four carbon dioxide traps;
- Mid June 2013: Retrieve the carbon dioxide traps and submit for analysis. At that time, the bioventing portion of the pilot study will be conducted;
- Late summer 2013: Conduct data analysis from pilot study activities; and
- September 2013: A second set of four traps will be deployed to evaluate possible seasonal variations in carbon dioxide flux.

In addition, an Annual Report will be completed in December 2013 and will be submitted to Enbridge documenting groundwater monitoring and remedial action activities conducted at the Site in 2013.

Should you have any questions or comments related to the information provided in this submittal, please call Brian Hill at (218) 625-8768. AECOM appreciates the opportunity to assist Enbridge with this important assignment.
Sincerely yours,

AECOM Technical Services, Inc.



Brian Hill
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Tables

**Table 1: Groundwater Elevations/Crude Oil Thickness Measurements
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Well ID	Unique Well No.	Date	Top of Inner Casing Elevation (feet NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (feet NGVD)	Top of Screen (feet NGVD)	Screen Above Groundwater (feet)
MW-1	662109	06-Jun-01	100.00	26.29				73.71	77.00	3.29
		10-May-02	100.00	27.57				72.43	77.00	4.57
		14-May-02	100.00	27.60				72.40	77.00	4.60
		21-Jul-03	100.00	28.07				71.93	77.00	5.07
		06-Jan-04	100.00	28.50				71.50	77.00	5.50
		02-Apr-04	100.00	28.53				71.47	77.00	5.53
		12-May-04	100.00	28.55				71.45	77.00	5.55
		26-Aug-04	100.00	27.97				72.03	77.00	4.97
		30-Dec-04	100.00	27.00				73.00	77.00	4.00
		06-Apr-05	100.00	27.35				72.65	77.00	4.35
		26-Jun-08	100.00	27.33				72.67	77.00	4.33
		25-Nov-08	100.00	27.22				72.78	77.00	4.22
		04-Jun-09	100.00	26.75				73.25	77.00	3.75
		26-Oct-09	1340.19	27.25				1312.94	1317.19	4.25
		29-Jun-10	1340.19	27.52				1312.67	1317.19	4.52
		01-Dec-10	1340.19	27.10				1313.09	1317.19	4.10
		01-Dec-11	1340.19	27.18				1313.01	1317.19	4.18
07-Jun-12	1340.19	27.80				1312.39	1317.19	4.80		
03-Dec-12	1340.19	28.26				1311.93	1317.19	5.26		
MW-2	662110	06-Jun-01	99.57	25.87				73.70	77.07	3.37
		10-May-02	99.57	Not Recorded						
		14-May-02	99.57	27.25				72.32	77.07	4.75
		21-Jul-03	99.57	27.71				71.86	77.07	5.21
		06-Jan-04	99.57	28.12				71.45	77.07	5.62
		02-Apr-04	99.57	28.11				71.46	77.07	5.61
		12-May-04	99.57	28.28				71.29	77.07	5.78
		26-Aug-04	99.57	27.60				71.97	77.07	5.10
		30-Dec-04	99.57	26.62				72.95	77.07	4.12
		06-Apr-05	99.57	26.92				72.65	77.07	4.42
		26-Jun-08	99.57	27.13				72.44	77.07	4.63
		25-Nov-08	99.57	26.86				72.71	77.07	4.36
		04-Jun-09	99.57	26.52				73.05	77.07	4.02
WELL ABANDONED										
MW-3	662111	06-Jun-01	99.60	25.92	25.32	0.60	25.37	74.23	78.10	3.87
		10-May-02	99.60	27.19	26.51	0.68	26.57	73.03	78.10	5.07
		14-May-02	99.60	27.22	26.6	0.62	26.66	72.94	78.10	5.16
		21-Jul-03	99.60	28.30	27.77	0.53	27.82	71.78	78.10	6.32
		5-Jan-04	99.60	29.12	28.05	1.07	28.15	71.45	78.10	6.65
		2-Apr-04	99.60	28.77	28.09	0.68	28.15	71.45	78.10	6.65
		12-May-04	99.60	29.15	28.2	0.95	28.29	71.31	78.10	6.79
		26-Aug-04	99.60	28.05	27.62	0.43	27.66	71.94	78.10	6.16
		30-Dec-04	99.60	26.99	26.7	0.29	26.73	72.87	78.10	5.23
		06-Apr-05	99.60	27.51	26.97	0.54	27.02	72.58	78.10	5.52
		26-Jun-08	99.60	27.29	27.15	0.14	27.16	72.44	78.10	5.66
		25-Nov-08	99.60	27.10	26.87	0.23	26.89	72.71	78.10	5.39
		06-Feb-09	99.60	27.92	27.67	0.25	27.69	71.91	78.10	6.19
		04-Jun-09	99.60	26.57	26.56	0.01	26.56	73.04	78.10	5.06
		26-Oct-09	1339.79	26.92	26.91	0.01	26.91	1312.88	1318.29	5.41
		29-Jun-10	1339.79	27.95	27.25	0.70	27.31	1312.48	1318.29	5.81
		02-Dec-10	1339.79	27.19	26.8	0.39	26.83	1312.96	1318.29	5.33
02-Dec-11	1339.79	26.68	26.68	0.00	26.68	1313.11	1318.29	5.18		
07-Jun-12	1339.79	29.38	27.2	2.18	27.40	1312.39	1318.29	5.90		
03-Dec-12	1339.79	28.47	27.52	0.95	27.61	1312.18	1318.29	6.11		
MW-4	662112	06-Jun-01	100.39	26.68				73.71	77.89	4.18
		10-May-02	100.39	27.92				72.47	77.89	5.42
		14-May-02	100.39	27.96				72.43	77.89	5.46
		21-Jul-03	100.39	28.35				72.04	77.89	5.85
		06-Jan-04	100.39	28.75				71.64	77.89	6.25
		02-Apr-04	100.39	28.80				71.59	77.89	6.30
		12-May-04	100.39	28.85				71.54	77.89	6.35
		26-Aug-04	100.39	28.22				72.17	77.89	5.72
		30-Dec-04	100.39	27.36				73.03	77.89	4.86
		06-Apr-05	100.39	27.71				72.68	77.89	5.21
		26-Jun-08	100.39	27.76				72.63	77.89	5.26
		25-Nov-08	100.39	27.56				72.83	77.89	5.06
		04-Jun-09	100.39	27.21				73.18	77.89	4.71

**Table 1: Groundwater Elevations/Crude Oil Thickness Measurements
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Well ID	Unique Well No.	Date	Top of Inner Casing Elevation (feet NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (feet NGVD)	Top of Screen (feet NGVD)	Screen Above Groundwater (feet)
		26-Oct-09	1340.58	27.59				1312.99	1318.08	5.09
		29-Jun-10	1340.58	27.90				1312.68	1318.08	5.40
		01-Dec-10	1340.58	27.45				1313.13	1318.08	4.95
		01-Dec-11	1340.58	27.53				1313.05	1318.08	5.03
		07-Jun-12	1340.58	28.10				1312.48	1318.08	5.60
		03-Dec-12	1340.58	28.55				1312.03	1318.08	6.05
MW-5	705515	05-Jan-04	99.58	29.65	28.18	1.47	28.27	71.31	76.08	4.77
		2-Apr-04	99.58	29.72	28.47	1.25	28.55	71.03	76.08	5.05
		12-May-04	99.58	29.75	28.14	1.61	28.24	71.34	76.08	4.74
		26-Aug-04	99.58	28.05	27.6	0.45	27.63	71.95	76.08	4.13
		30-Dec-04	99.58	27.20	26.65	0.55	26.68	72.90	76.08	3.18
		06-Apr-05	99.58	28.03	26.94	1.09	27.01	72.57	76.08	3.51
		26-Jun-08	99.58	28.05	27.1	0.95	27.16	72.42	76.08	3.66
		25-Nov-08	99.58	27.17	26.9	0.27	26.92	72.66	76.08	3.42
		06-Feb-09	99.58	28.90	28.56	0.34	28.58	71.00	76.08	5.08
		04-Jun-09	99.58	26.82	26.56	0.26	26.58	73.00	76.08	3.08
		26-Oct-09	1339.78	27.11	26.9	0.21	26.91	1312.87	1316.28	3.41
		29-Jun-10	1339.78	28.86	27.24	1.62	27.34	1312.44	1316.28	3.84
		01-Dec-10	1339.78	26.95						
		02-Dec-11	1339.78	27.05	26.67	0.38	26.69	1313.09	1316.28	3.28
		07-Jun-12	1339.78	28.88	27.1	1.78	27.21	1312.57	1316.28	3.71
		03-Dec-12	1339.78	28.98	27.74	1.24	27.82	1311.96	1316.28	3.28
MW-6	680691	21-Jul-03	100.71	28.75				71.96	72.71	0.75
		06-Jan-04	100.71	29.05				71.66	72.71	1.05
		02-Apr-04	100.71	29.15				71.56	72.71	1.15
		12-May-04	100.71	29.15				71.56	72.71	1.15
		26-Aug-04	100.71	28.62				72.09	72.71	0.62
		30-Dec-04	100.71	27.76				72.95	72.71	-0.24
		06-Apr-05	100.71	28.09				72.62	72.71	0.09
		26-Jun-08	100.71	28.17				72.54	72.71	0.17
		25-Nov-08	100.71	28.43				72.28	72.71	0.43
		04-Jun-09	100.71	27.60				73.11	72.71	-0.40
		26-Oct-09	1340.90	27.98				1312.92	1311.90	-1.02
		29-Jun-10	1340.90	28.28				1312.62	1311.90	-0.72
		01-Dec-10	1340.90	27.89				1313.01	1311.90	-1.11
		01-Dec-11	1340.90	27.89				1313.01	1311.90	-1.11
		07-Jun-12	1340.90	28.53				1312.37	1311.90	-0.47
		03-Dec-12	1340.90	28.89				1312.01	1311.90	-0.11
MW-7	680692	21-Jul-03	99.83	28.09				71.74	73.33	1.59
		06-Jan-04	99.83	28.34				71.49	73.33	1.84
		02-Apr-04	99.83	28.43				71.40	73.33	1.93
		12-May-04	99.83	28.46				71.37	73.33	1.96
		26-Aug-04	99.83	28.00				71.83	73.33	1.50
		30-Dec-04	99.83	27.05				72.78	73.33	0.55
		06-Apr-05	99.83	27.34				72.49	73.33	0.84
		26-Jun-08	99.83	27.15				72.68	73.33	0.65
		25-Nov-08	99.83	27.28				72.55	73.33	0.78
		04-Jun-09	99.83	26.87				72.96	73.33	0.37
		26-Oct-09	1340.03	27.24				1312.79	1313.53	0.74
		29-Jun-10	1340.03	27.61				1312.42	1313.53	1.11
		01-Dec-10	1340.03	27.21				1312.82	1313.53	0.71
		01-Dec-11	1340.03	27.11				1312.92	1313.53	0.61
		07-Jun-12	1340.03	27.80				1312.23	1313.53	1.30
		03-Dec-12	1340.03	28.16				1311.87	1313.53	1.66
MW-8	680693	21-Jul-03	101.00	29.37				71.63	74.50	2.87
		06-Jan-04	101.00	29.70				71.30	74.50	3.20
		02-Apr-04	101.00	29.77				71.23	74.50	3.27
		12-May-04	101.00	29.85				71.15	74.50	3.35
		26-Aug-04	101.00	29.21				71.79	74.50	2.71
		30-Dec-04	101.00	28.20				72.80	74.50	1.70
		06-Apr-05	101.00	28.54				72.46	74.50	2.04
		26-Jun-08	101.00	28.73				72.27	74.50	2.23
		25-Nov-08	101.00	28.45				72.55	74.50	1.95
		04-Jun-09	101.00	28.09				72.91	74.50	1.59
		26-Oct-09	1341.21	28.45				1312.76	1315.16	2.40
		29-Jun-10	1341.21	28.83				1312.38	1315.16	2.78
		01-Dec-10	1341.21	28.34				1312.87	1315.16	2.29

**Table 1: Groundwater Elevations/Crude Oil Thickness Measurements
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Well ID	Unique Well No.	Date	Top of Inner Casing Elevation (feet NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (feet NGVD)	Top of Screen (feet NGVD)	Screen Above Groundwater (feet)
		01-Dec-11	1341.21	28.27				1312.94	1315.16	2.22
		07-Jun-12	1341.21	29.10				1312.11	1315.16	3.05
		03-Dec-12	1341.21	29.42				1311.79	1315.16	3.37
MW-9	680694	21-Jul-03	98.25	26.41				71.84	73.75	1.91
		21-Jul-03	98.25	26.79				71.46	73.75	2.29
		02-Apr-04	98.25	26.81				71.44	73.75	2.31
		12-May-04	98.25	26.91				71.34	73.75	2.41
		26-Aug-04	98.25	26.29				71.96	73.75	1.79
		30-Dec-04	98.25	25.35				72.90	73.75	0.85
		06-Apr-05	98.25	25.65				72.60	73.75	1.15
		26-Jun-08	98.25	25.83				72.42	73.75	1.33
		25-Nov-08	98.25	25.57				72.68	73.75	1.07
		04-Jun-09	98.25	25.22				73.03	73.75	0.72
		26-Oct-09	1338.45	25.59				1312.86	1314.38	1.52
		29-Jun-10	1338.45	25.94				1312.51	1314.38	1.87
		01-Dec-10	1338.45	25.49				1312.96	1314.38	1.42
		01-Dec-11	1338.45	25.45				1313.00	1314.38	1.38
		07-Jun-12	1338.45	26.14				1312.31	1314.38	2.07
		03-Dec-12	1338.45	26.55				1311.90	1314.38	2.48
MW-10	705513	05-Jan-04	99.66	28.38				71.28	77.16	5.88
		2-Apr-04	99.66	28.30				71.36	77.16	5.80
		12-May-04	99.66	28.36				71.30	77.16	5.86
		26-Aug-04	99.66	27.76				71.90	77.16	5.26
		30-Dec-04	99.66	27.72				71.94	77.16	5.22
		06-Apr-05	99.66	27.02				72.64	77.16	4.52
		26-Jun-08	99.66	27.20				72.46	77.16	4.70
		25-Nov-08	99.66	26.94				72.72	77.16	4.44
		04-Jun-09	99.66	26.61				73.05	77.16	4.11
		26-Oct-09	1339.87	26.96				1312.91	1317.87	4.96
		29-Jun-10	1339.87	27.33				1312.54	1317.87	5.33
		01-Dec-10	1339.87	26.84				1313.03	1317.87	4.84
		01-Dec-11	1339.87	26.83				1313.04	1317.87	4.83
		07-Jun-12	1339.87	27.55				1312.32	1317.87	5.55
		03-Dec-12	1339.87	27.97				1311.90	1317.87	5.97
MW-11	705514	17-Dec-04	99.99	28.66	28.5	0.16	28.51	71.48	76.49	5.01
		05-Jan-04	99.99	29.70	28.49	1.21	28.60	71.39	76.49	5.10
		2-Apr-04	99.99	29.78	28.45	1.33	28.57	71.42	76.49	5.07
		12-May-04	99.99	29.75	28.5	1.25	28.61	71.38	76.49	5.11
		26-Aug-04	99.99	28.68	27.94	0.74	28.01	71.98	76.49	4.51
		30-Dec-04	99.99	27.60	27.06	0.54	27.11	72.88	76.49	3.61
		06-Apr-05	99.99	28.07	27.38	0.69	27.44	72.55	76.49	3.94
		26-Jun-08	99.99	27.79	27.58	0.21	27.60	72.39	76.49	4.10
		25-Nov-08	99.99	27.59	27.28	0.31	27.31	72.68	76.49	3.81
		29-Jan-09	99.99	28.20	27.32	0.88	27.40	72.59	76.49	3.90
		06-Feb-09	99.99	28.28	27.53	0.75	27.60	72.39	76.49	4.10
		04-Jun-09	99.99	27.13	26.95	0.18	26.97	73.02	76.49	3.47
		26-Oct-09	1340.18	27.65	27.30	0.35	27.33	1312.85	1316.68	3.83
		29-Jun-10	1340.18	28.13	27.62	0.51	27.67	1312.51	1316.68	4.17
		02-Dec-10	1340.18	27.50	26.61	0.89	26.69	1313.49	1316.68	3.19
		02-Dec-11	1340.18	27.68	27.02	0.66	27.08	1313.10	1316.68	3.58
		07-Jun-12	1340.18	32.50	27.7	4.80	28.13	1312.05	1316.68	4.63
		03-Dec-12	1340.18	29.31	28.09	1.22	28.20	1311.98	1316.68	4.70
MW-13	705516	05-Jan-04	101.02	29.92	29.52	0.40	29.58	71.44	74.52	3.08
		2-Apr-04	101.02	30.57	29.53	1.04	29.68	71.34	74.52	3.18
		12-May-04	101.02	31.22	29.59	1.63	29.83	71.19	74.52	3.33
		26-Aug-04	101.02	29.20	29.07	0.13	29.09	71.93	74.52	2.59
		30-Dec-04	101.02	28.20	28.11	0.09	28.12	72.90	74.52	1.62
		06-Apr-05	101.02	28.80	28.38	0.42	28.44	72.58	74.52	1.94
		26-Jun-08	101.02	28.70	28.62	0.08	28.63	72.39	74.52	2.13
		25-Nov-08	101.02	28.35	28.35	0.00	28.35	72.67	74.52	1.85
		06-Feb-09	101.02	28.62	28.61	0.01	28.61	72.41	74.52	2.11
		04-Jun-09	101.02	28.01	28.01	0.00	28.01	73.01	74.52	1.51
		26-Oct-09	1341.23	28.42	28.35	0.07	28.36	1312.87	1314.73	1.86
		29-Jun-10	1341.23	28.84	28.72	0.12	28.74	1312.49	1314.73	2.24
		02-Dec-10	1341.23	28.27	28.23	0.04	28.24	1312.99	1314.73	1.74
		02-Dec-11	1341.23	28.13	28.13	0.00	28.13	1313.10	1314.73	1.63
		07-Jun-12	1341.23	29.00	28.88	0.12	28.90	1312.33	1314.73	2.40

**Table 1: Groundwater Elevations/Crude Oil Thickness Measurements
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Well ID	Unique Well No.	Date	Top of Inner Casing Elevation (feet NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (feet NGVD)	Top of Screen (feet NGVD)	Screen Above Groundwater (feet)
		03-Dec-12	1341.23	30.08	29.23	0.85	29.36	1311.87	1314.73	2.86
MW-14		26-Jun-08	98.73	26.93				71.80		
		25-Nov-08		25.99				72.74		
		04-Jun-09		26.31				72.42		
WELL ABANDONED										
MW-15		26-Jun-08	99.35	26.27				73.08		
		25-Nov-08	99.35	26.66				72.69		
		04-Jun-09	99.35	25.64				73.71		
		26-Oct-09	1339.61	26.70				1312.91		
		29-Jun-10	1339.61	27.05				1312.56		
		01-Dec-10	1339.61	not collected						
		01-Dec-11	1339.61	26.54				1313.07		
		07-Jun-12	1339.61	27.20				1312.41		
		03-Dec-12	1339.61	27.72				1311.89		
MW-16A		29-Jun-10	1338.97	26.70				1312.27	1315.47	3.20
		01-Dec-10	1338.97	26.20				1312.77	1315.47	2.70
		01-Dec-11	1338.97	26.15				1312.82	1315.47	2.65
		07-Jun-12	1338.97	26.92				1312.05	1315.47	3.42
		03-Dec-12	1338.97	27.28				1311.69	1315.47	3.78
MW-16B		29-Jun-10	1339.52	27.26				1312.26	1301.02	-11.24
		01-Dec-10	1339.52	26.78				1312.74	1301.02	-11.72
		01-Dec-11	1339.52	26.71				1312.81	1301.02	-11.79
		07-Jun-12	1339.52	27.50				1312.02	1301.02	-10.24
		03-Dec-12	1339.52	27.82				1311.70	1301.02	-10.68
MW-17		29-Jun-10	1338.79	26.56				1312.23	1315.29	3.06
		01-Dec-10	1338.79	26.08				1312.71	1315.29	2.58
		01-Dec-11	1338.79	26.00				1312.79	1315.29	2.50
		07-Jun-12	1338.79	26.80				1311.99	1315.29	3.30
		03-Dec-12	1338.79	27.11				1311.68	1315.29	3.61
MW-18		29-Jun-10	1340.29	27.92				1312.37	1316.79	4.42
		01-Dec-10	1340.29	27.41				1312.88	1316.79	3.91
		01-Dec-11	1340.29	27.35				1312.94	1316.79	3.85
		07-Jun-12	1340.29	28.15				1312.14	1316.79	4.65
		03-Dec-12	1340.29	28.50				1311.79	1316.79	5.00
MW-19		29-Jun-10	1334.72	22.54				1312.18	1315.22	3.04
		01-Dec-10	1334.72	22.03				1312.69	1315.22	2.53
		01-Dec-11	1334.72	21.97				1312.75	1315.22	2.47
		07-Jun-12	1334.72	22.76				1311.96	1315.22	4.04
		03-Dec-12	1334.72	23.10				1311.62	1315.22	3.60
USGS 1A		26-Oct-09	1341.60	28.78				1312.82	1312.60	-0.22
		29-Jun-10	1341.60	29.15				1312.45	1312.60	0.15
		02-Dec-10	1341.60	28.70				1312.90	1312.60	-0.30
		01-Dec-11	1341.60	28.64				1312.96	1312.60	-0.36
		07-Jun-12	1341.60	29.38				1312.22	1312.60	0.38
		03-Dec-12	1341.60	29.77				1311.83	1312.60	0.77
USGS 2A		26-Oct-09	1342.37	29.60				1312.77	1311.97	-0.80
		29-Jun-10	1342.37	29.97				1312.40	1311.97	-0.43
		02-Dec-10	1342.37	29.49				1312.88	1311.97	-0.91
		01-Dec-11	1342.37	29.42				1312.95	1311.97	-0.98
		07-Jun-12	1342.37	30.18				1312.19	1311.97	-0.22
		03-Dec-12	1342.37	30.57				1311.80	1311.97	0.17
USGS 3A		26-Oct-09	1341.26	28.54				1312.72	1311.92	-0.80
		29-Jun-10	1341.26	28.93				1312.33	1311.92	-0.41
		02-Dec-10	1341.26	28.44				1312.82	1311.92	-0.90
		01-Dec-11	1341.26	28.36				1312.90	1311.92	-0.98
		07-Jun-12	1341.26	29.13				1312.13	1311.92	-0.21
		03-Dec-12	1341.26	29.51				1311.75	1311.92	0.17
USGS 4A		26-Oct-09	1339.63	26.95				1312.68	1311.49	-1.19
		29-Jun-10	1339.63	27.32				1312.31	1311.49	-0.82
		02-Dec-10	1339.63	26.85				1312.78	1311.49	-1.29

**Table 1: Groundwater Elevations/Crude Oil Thickness Measurements
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Well ID	Unique Well No.	Date	Top of Inner Casing Elevation (feet NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (feet NGVD)	Top of Screen (feet NGVD)	Screen Above Groundwater (feet)
		01-Dec-11	1339.63	26.76				1312.87	1311.49	-1.38
		07-Jun-12	1339.63	27.53				1312.10	1311.49	-0.61
		03-Dec-12	1339.63	27.90				1311.73	1311.49	-0.24

Notes:

NGVD - National Geodetic Vertical Datum

* Assumed specific gravity for oil = 0.9105

** A re-survey was conducted in August 2009 to tie in the Enbridge and USGS monitoring wells to a common benchmark (MNDOT). Prior to that, top of inner casing elevations were based on an assumed inner casing elevation of 100.00 at monitoring well MW-1.

*** In June 2010, monitoring wells MW-16A, -16B, -17, -18, and -19 were surveyed by NREC. The wells were tied into a known elevation from monitoring well USGS-4A.

**Table 2: Groundwater Sampling Results - BTEX and ERDRO
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO (ug/L)
MW-1	6/6/2001	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-1	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-1	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 110
MW-1	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-1	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-1	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-1	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-1	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	< 100
MW-1	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 100
MW-1	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	91.6
MW-1	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 23.1
MW-1	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-1	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 76.9
MW-1	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	157
MW-1	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 68
MW-1	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		260
MW-1	12/3/2012	< 1.0	< 1.0	< 1.0	< 3.0		<110
MW-2	6/6/2001	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-2	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-2	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-2	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-2	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	140
MW-2	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-2	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-2	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	114
MW-2	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	242
MW-2	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	159
MW-2	10/26/2009		Well was abandoned due to new construction.				
MW-4	6/6/2001	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-4	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-4	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-4	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-4	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-4	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-4	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-4	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	< 100
MW-4	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	276
MW-4	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	137
MW-4	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	<23.1
MW-4	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-4	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-4	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-4	12/1/2011	< 1.0	2.1	< 1.0	< 3.0		230
MW-4	6/13/2012	< 1.0	1.2	< 1.0	< 3.0		< 300
MW-4	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 110
MW-5	1/6/2004	6,500	530	<50	1,800	<50	
MW-6	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100

**Table 2: Groundwater Sampling Results - BTEX and ERDRO
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO (ug/L)
MW-6	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-6	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-6	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	130
MW-6	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-6	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-6	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	188
MW-6	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	128
MW-6	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	209
MW-6	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	<23.1
MW-6	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-6	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 76.9
MW-6	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	290
MW-6	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 71
MW-6	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		110
MW-6	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		<100
MW-7	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-7	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-7	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-7	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-7	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-7	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-7	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	118
MW-7	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 100
MW-7	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	134
MW-7	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	<23.1
MW-7	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-7	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 76.9
MW-7	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	180
MW-7	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 71
MW-7	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		110
MW-7	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 110
MW-8	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-8	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-8	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	150
MW-8	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-8	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-8	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-8	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	149
MW-8	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 100
MW-8	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	143
MW-8	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	<23.1
MW-8	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-8	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	114
MW-8	6/14/2011	273	< 1.0	< 1.0	< 2.0	< 1.0	2,050
MW-8	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		230
MW-8	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		470
MW-8	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		110
MW-9	7/16/2003	0.51	< 1.0	< 1.0	< 2.0	< 1.0	< 100

**Table 2: Groundwater Sampling Results - BTEX and ERDRO
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO (ug/L)
MW-9	1/6/2004	<1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-9	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
MW-9	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	210
MW-9	12/30/2004	7.5	3.7	< 1.0	< 2.0	< 1.0	260
MW-9	4/6/2005	18	< 1.0	< 1.0	< 2.0	< 1.0	230
MW-9	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	101
MW-9	11/25/2008	25.7	2.6	< 0.36	< 0.74	< 0.36	364
MW-9	6/4/2009	132	< 1.0	< 1.0	< 2.0	< 1.0	1,860
MW-9	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	831
MW-9	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-9	12/1/2010	573	95.4	< 5.0	18.1	< 5.0	3,690
MW-9	6/14/2011	573	7.0	< 5.0	< 10.0	< 5.0	3,460
MW-9	12/1/2011	500	5.5	2.7	< 3.0		6,400
MW-9	6/13/2012	48.9	< 1.0	< 1.0	< 3.0		5,400
MW-9	12/7/2012	3.9	< 1.0	< 1.0	< 3.0		630
MW-9 Duplicate	12/1/2011	498	4.8	2.5	< 6.0		10,300
MW-10	1/5/2004	1,100	110	<5.0	520	<5.0	30,000
MW-10	5/12/2004	2,100	210	< 10	350	< 10	6,500
MW-10	8/26/2004	2,600	240	< 25	180	< 25	7,800
MW-10	12/30/2004	1,400	160	< 10	61	< 10	6,500
MW-10	4/6/2005	1,100	220	< 10	62	< 10	6,500
MW-10	6/26/2008	1,830	44.2	< 3.6	< 7.4	< 3.6	9,000
MW-10	11/25/2008	595	18.1	< 0.71	3.3	< 0.72	65,900
MW-10	6/4/2009	305	15	<1.0	3.4	<1.0	50,800
MW-10	10/26/2009	159	5.6	< 0.36	3	< 0.36	22,400
MW-10	6/29/2010	2,180	< 25.0	< 25.0	< 50.0	< 25.0	33,700
MW-10	12/1/2010	193	4.8	< 1.0	10.5	< 1.0	28,100
MW-10	6/14/2011	35.2	< 2.0	< 2.0	< 4.0	< 2.0	15,500
MW-10	12/1/2011	38.3	1.6	4.4	4.1		12,900
MW-10	6/13/2012	103	1.2	3.2	3.4		15,900
MW-10	12/6/2012	653	1.7	< 1.0	< 3.0		7,400
MW-10 Duplicate	6/13/2012	81.2	1.8	2.8	3.1		15,000
MW-10 Duplicate	12/6/2012	579.0	1.9	1	< 3.0		7,700
MW-15	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 330
MW-15	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		110
MW-15	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 110
MW-16A	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	234
MW-16A	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	1,150
MW-16A	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	413
MW-16A	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		670
MW-16A	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		1,410
MW-16A	12/5/2012	59.8	< 1.0	< 1.0	< 3.0		1,000
MW-16A	12/27/2012	48.8	< 1.0	< 1.0	< 3.0		NA
MW-16A	12/27/2012	47	< 1.0	< 1.0	< 3.0		NA
MW-16B	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	1,310

**Table 2: Groundwater Sampling Results - BTEX and ERDRO
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO (ug/L)
MW-16B	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	9,470
MW-16B	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	2,790
MW-16B	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		1,580
MW-16B	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		610
MW-16B	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		250
MW-17	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	75.7
MW-17	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 76.2
MW-17	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	184
MW-17	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		110
MW-17	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		250
MW-17	12/6/2012	< 1.0	< 1.0	< 1.0	< 3.0		170
MW-18	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 77.7
MW-18	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
MW-18	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	134
MW-18	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 330
MW-18	6/18/2012	< 1.0	< 1.0	< 1.0	< 3.0		130
MW-18	12/6/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 100
MW-19	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	347
MW-19	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	843
MW-19	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	608
MW-19	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 330
MW-19	6/19/2012	< 1.0	< 1.0	< 1.0	< 3.0		5,400
MW-19	12/6/2012	< 1.0	< 1.0	< 1.0	< 3.0		370
USGS 1A	10/26/2009	776	142	< 1.8	< 3.7	< 1.8	4,930
USGS 1A	6/29/2010	39.7	< 1.0	< 1.0	< 2.0	< 1.0	2,990
USGS 1A	12/2/2010	791	< 10.0	< 10.0	< 20.0	< 10.0	5,370
USGS 1A	6/14/2011	1,590	< 10.0	< 10.0	< 20.0	< 10.0	5,410
USGS 1A	12/1/2011	67.8	1.2	3.2	< 3.0		8,200
USGS 1A	6/13/2012	6.4	< 1.0	1.0	< 3.0		4,500
USGS 1A	12/6/2012	5.4	< 1.0	1.0	< 3.0		1,000
USGS 2A	10/26/2009	705	< 2.0	< 1.8	< 3.7	< 1.8	5,520
USGS 2A	6/29/2010	63.5	< 1.0	< 1.0	< 2.0	< 1.0	2,150
USGS 2A	12/2/2010	239	< 1.0	< 1.0	< 2.0	< 1.0	3,370
USGS 2A	6/14/2011	81.7	< 1.0	< 1.0	< 2.0	< 1.0	2,670
USGS 2A	12/1/2011	21.1	< 1.0	1.4	< 3.0		3,600
USGS 2A	6/13/2012	282	< 1.0	1.6	< 3.0		7,200
USGS 2A	12/6/2012	554	< 1.0	1	< 3.0		4,900
USGS 3A	10/26/2009	147	0.74	< 0.36	1.5	< 0.36	4,060
USGS 3A	6/29/2010	202	< 1.0	< 1.0	< 2.0	< 1.0	2,470
USGS 3A	12/2/2010	6.2	< 1.0	< 1.0	< 2.0	< 1.0	1,810
USGS 3A	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	1,420
USGS 3A	12/1/2011	< 1.0	< 1.0	1.1	< 3.0		2,400
USGS 3A	6/13/2012	14.7	< 1.0	1.0	< 3.0		5,700
USGS 3A	12/6/2012	1	< 1.0	1.0	< 3.0		2,200

**Table 2: Groundwater Sampling Results - BTEX and ERDRO
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO (ug/L)
USGS 4A	10/26/2009	13.8	< 0.40	< 0.36	< 0.74	< 0.36	1,670
USGS 4A	6/29/2010	44.8	< 1.0	< 1.0	< 2.0	< 1.0	4,130
USGS 4A	12/2/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	2,010
USGS 4A	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	2,420
USGS 4A	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		1,320
USGS 4A	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		2,160
USGS 4A	12/6/2012	7.2	< 1.0	< 1.0	< 3.0		1,700
SCDW	9/21/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 300
SCDW	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 330
SCDW	6/25/2012	< 1.0	< 1.0	< 1.0	< 3.0		<100
SCDW	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		<110
Field Blank	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
Field Blank	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100
Field Blank	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	< 100
Field Blank	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 100
Field Blank	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	106
Field Blank	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	NA
Field Blank	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
Field Blank	12/1/2010						389
Field Blank	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5
Field Blank	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 300
Field Blank	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 330
Field Blank	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 110
Trip Blank	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	
Trip Blank	1/6/2004				Froze during the sampling event.		
Trip Blank	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	
Trip Blank	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	
Trip Blank	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	
Trip Blank	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	
Trip Blank	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	
Trip Blank	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	
Trip Blank	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	
Trip Blank	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	
Trip Blank	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		
Trip Blank	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		

Notes: ug/L - micrograms per liter
mg/L-milligrams per liter
< - results below the applicable laboratory analytical method detection limit (MDL)
NA- Not Analyzed
mg/L-milligrams per liter

**Table 3: Groundwater Sampling Results: Biodegradation Evaluation Parameters
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Collection Date	Nitrite (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP	Conductivity (mS/cm)	Disolved Oxygen (mg/L)	Fe ⁺² (mg/L)
MW-1	7/16/2003						5.4	<0.1
	1/6/2004	2.1	6.3				5.2	<0.1
	5/12/2004						5	<0.1
	8/26/2004	0.69	< 4.0	< 10			7	<0.1
	12/30/2004	0.81	< 4.0	< 10			6.5	<0.1
	4/6/2005	0.58	< 4.0	< 10			6	<0.1
	11/25/2008	0.62	3.6	4.9			11.35	516
	10/26/2009	0.2	3.3	< 0.93			11.82	0.024
	12/1/2010	0.61	< 4.0	< 2.8			11.06	< 0.12
	12/1/2011	< 0.10	< 2.5	< 10	210.8	0.381	9.9	NM
	6/13/2012	0.42	< 2.5	< 6.6	218	0.224	6.12	NM
	12/3/2012	1.2	<2.5	<6.6	127.5	0.408	15.09	NM
MW-2	7/16/2003						4.1	<0.1
	1/6/2004	4.1	< 4.0				4.5	<0.1
	5/12/2004						4.3	<0.1
	11/25/2008	9.7	9.8	< 2.0			7	1.52
	10/26/2009	Well was removed due to new construction						
MW-4	7/16/2003						3.8	<0.1
	1/6/2004	1	< 4.0				5.5	<0.1
	5/12/2004						5.7	<0.1
	11/25/2008	5.8	6.3	< 2.0			7.7	2.12
	10/26/2009	6.2	6.6	< 0.93			10.57	< 0.018
	12/1/2010	4.8	5.9	< 2.8			9.78	< 0.05
	12/1/2011	< 0.10	6.1	< 10	217.7	0.505	8.64	NM
	6/13/2012	3.9	5.3	< 6.6	195.8	0.324	3.13	NM
12/5/2012	3.0	4.5	< 6.6	138.8	0.585	8.26	NM	
MW-6	7/16/2003						2	<0.1
	1/6/2004	1.9	5.4				2.6	<0.1
	5/12/2004						2.2	<0.1
	11/25/2008	2.8	7	4.2			9.3	22.9
	10/26/2009	2	5.9	< 0.93			11.35	< 0.018
	12/1/2010	1.8	4.9	< 2.8			10.7	< 0.12
	12/1/2011	< 0.10	3.3	< 10	221.5	0.366	9.72	NM
	6/12/2012	2.6	3.6	< 6.6	115.2	0.279	9.05	NM
	12/5/2012	2.3	3.2	< 6.6	92.1	0.362	8.97	NM
MW-7	7/16/2003						3.4	<0.1
	1/6/2004	< 0.25	5.7				4.3	<0.1
	5/12/2004						5.5	<0.1
	11/25/2008	0.46	8.3	< 2.0			8.7	9.2
	10/26/2009	0.61	7.8	< 0.93			11.45	< 0.018
	12/1/2010	1.1	7.6	< 2.8			9.29	< 0.05

**Table 3: Groundwater Sampling Results: Biodegradation Evaluation Parameters
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Collection Date	Nitrite (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP	Conductivity (mS/cm)	Disolved Oxygen (mg/L)	Fe ⁺² (mg/L)
MW-8	12/1/2011	< 0.10	5.6	< 10	247.6	0.43	9.4	NM
	6/12/2012	0.18	5.5	< 6.6	107.5	0.281	3.14	NM
	12/5/2012	0.14	6.4	< 6.6	158.6	0.643	6.92	NM
	7/16/2003						2.5	<0.1
	1/6/2004	0.34	5.5				2.8	<0.1
	5/12/2004						2	<0.1
	8/26/2004	0.31	5.2	< 10			6	<0.1
	12/30/2004	< 0.25	7.5	< 10			5	<0.1
	4/6/2005	< 0.25	11	< 10			5	<0.1
	11/25/2008	0.26	9.5	< 2.0			8.3	22.2
	10/26/2009	0.33	10	< 0.93			12.75	< 0.018
	12/1/2010	< 0.40	7.4	< 2.8			8.9	< 0.05
	12/1/2011	< 0.10	5	< 10	NM	NM	NM	NM
	6/12/2012	0.1	7.3	< 6.6	149.3	0.343	1.91	NM
12/5/2012	0.11	7.2	< 6.6	73.9	0.430	11.15	NM	
MW-9	7/16/2003						2.8	<0.1
	1/6/2004	< 0.25	6.3				2	<0.1
	5/12/2004						1.5	<0.1
	8/26/2004	< 0.25	7.2	< 10			1.5	<0.1
	12/30/2004	< 0.25	< 4.0	1800			2	<0.1
	4/6/2005	< 0.25	4.7	280			2	<0.1
	11/25/2008	0.19	4	968			2.52	39.8
	10/26/2009	< 0.20	4.6	543			5.73	0.021
	12/1/2010	< 0.40	< 4.0	3590			0.87	0.09
	12/1/2011	< 0.10	< 2.5	8710	-132.3	NM	0.7	NM
	6/13/2012	< 0.10	< 2.5	1460	-0.2	0.514	1.14	NM
	12/7/2012	<0.10	< 2.5	359	-55.4	0.562	0.70	NM
MW-9 Duplicate	12/1/2011	< 0.10	< 2.5	8830	NM	NM	NM	NM
MW-10	1/5/2004	< 0.25	< 4.0				1.5	<0.1
	5/12/2004						1	<0.1
	8/26/2004	< 0.25	< 4.0	4900			0.8	<0.1
	12/30/2004	2.9	4.2	6100			1	<0.1
	4/6/2005	0.51	< 4.0	2600			1.5	<0.1
	11/25/2008	1.1	3.3	2290			2.7	54.8
	10/26/2009	0.3	2.9	5100			2.5	1.3
	12/1/2010	2.4	4.3	7030			0.72	5.1
	12/1/2011	< 0.10	< 2.5	3720	-56		0.3	NM
	6/13/2012	< 0.10	< 2.5	5470	-36.6	0.656	0.078	NM
	12/6/2012	< 0.10	< 2.5	6900	-80.2	1.291	1.11	NM
MW-10 Duplicate	6/13/2012	< 0.10	< 2.5	3950	NM	NM	NM	
	12/6/2012	< 0.10	<2.5	3030	NM	NM	NM	NM

**Table 3: Groundwater Sampling Results: Biodegradation Evaluation Parameters
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Collection Date	Nitrite (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP	Conductivity (mS/cm)	Disolved Oxygen (mg/L)	Fe ⁺² (mg/L)
MW-15	12/1/2011	< 0.10	< 2.5	< 10	202.7	0.328	9.5	NM
	6/13/2012	2	< 2.5	< 6.6	80.8	0.224	4.2	NM
	12/5/2012	3.4	< 2.5	331	100.6	0.431	9.57	NM
MW-16A	12/1/2010	< 0.40	< 4.0	528			1.41	0.09
	12/1/2011	< 0.10	3.1	81	-178.2	0.54	2.32	NM
	6/12/2012	< 0.10	3.1	20.5	107.5	0.372	0.66	NM
	12/5/2012	< 0.10	< 2.5	297	48.0	0.479	1.88	NM
MW-16B	12/1/2010	< 0.40	< 4.0	9.5			0.64	< 0.05
	12/1/2011	< 0.10	7.8	< 10	-143	0.62	1.5	NM
	6/12/2012	1.2	9.6	7.4	-8.8	0.417	0.83	NM
	12/5/2012	1.1	11.3	7.9	-34.3	0.503	0.49	NM
MW-17	12/1/2010	< 0.40	9.5	6.9			8.16	<0.12
	12/1/2011	< 0.10	5.6	< 10	256	0.503	7.93	NM
	6/12/2012	0.11	9.4	< 6.6	170.4	0.341	10.06	NM
	12/6/2012	< 0.10	8.5	< 6.6	81.9	0.699	5.99	NM
MW-18	12/1/2010	4.2	5.8	4.4			10.01	<0.05
	12/1/2011	< 0.10	3.7	< 10	-117	0.363	9.7	NM
	6/12/2012	4.2	3.6	< 6.6	65.9	0.346	6.16	NM
	12/6/2012	2.8	3.4	< 6.6	97.8	0.400	10.26	NM
MW-19	12/1/2010	<0.40	5.2	187			2.1	<0.05
	12/1/2011	< 0.10	6.9	< 10	220.9	0.53	2.12	NM
	6/12/2012	0.13	5.8	< 6.6	125.7	0.339	2.37	NM
	12/6/2012	<0.10	3.5	12.8	57.3	0.657	2.37	NM
USGS-1A	10/26/2009	< 0.20	2.1	11700			1.53	< 0.018
	12/2/2010	< 0.40	< 4.0	10200			1.2	12.3
	12/1/2011	< 0.10	< 2.5	5970	-142	0.715	0.5	NM
	6/13/2012	< 0.10	< 2.5	683	-54.2	0.486	11.93	NM
	12/6/2012	< 0.10	< 2.5	395	-99.5	0.818	1.43	NM
USGS-2A	10/26/2009	< 0.20	2.5	5480			1.71	< 0.018
	12/2/2010	< 0.40	< 4.0	2310			1.2	2.8
	12/1/2011	< 0.10	< 2.5	1730	-136	0.569	0.8	NM
	6/13/2012	< 0.10	< 2.5	5900	NM	NM	NM	NM
	12/6/2012	< 0.10	< 2.5	7210	-85.4	0.602	2.08	NM
USGS-3A	10/26/2009	< 0.20	2.3	3240			3.72	< 0.018
	12/2/2010	< 0.40	< 4.0	1180			0.7	1.8
	12/1/2011	< 0.10	< 2.5	800	-156.1	0.544	0.4	NM
	6/13/2012	< 0.10	< 2.5	2340	NM	NM	NM	NM

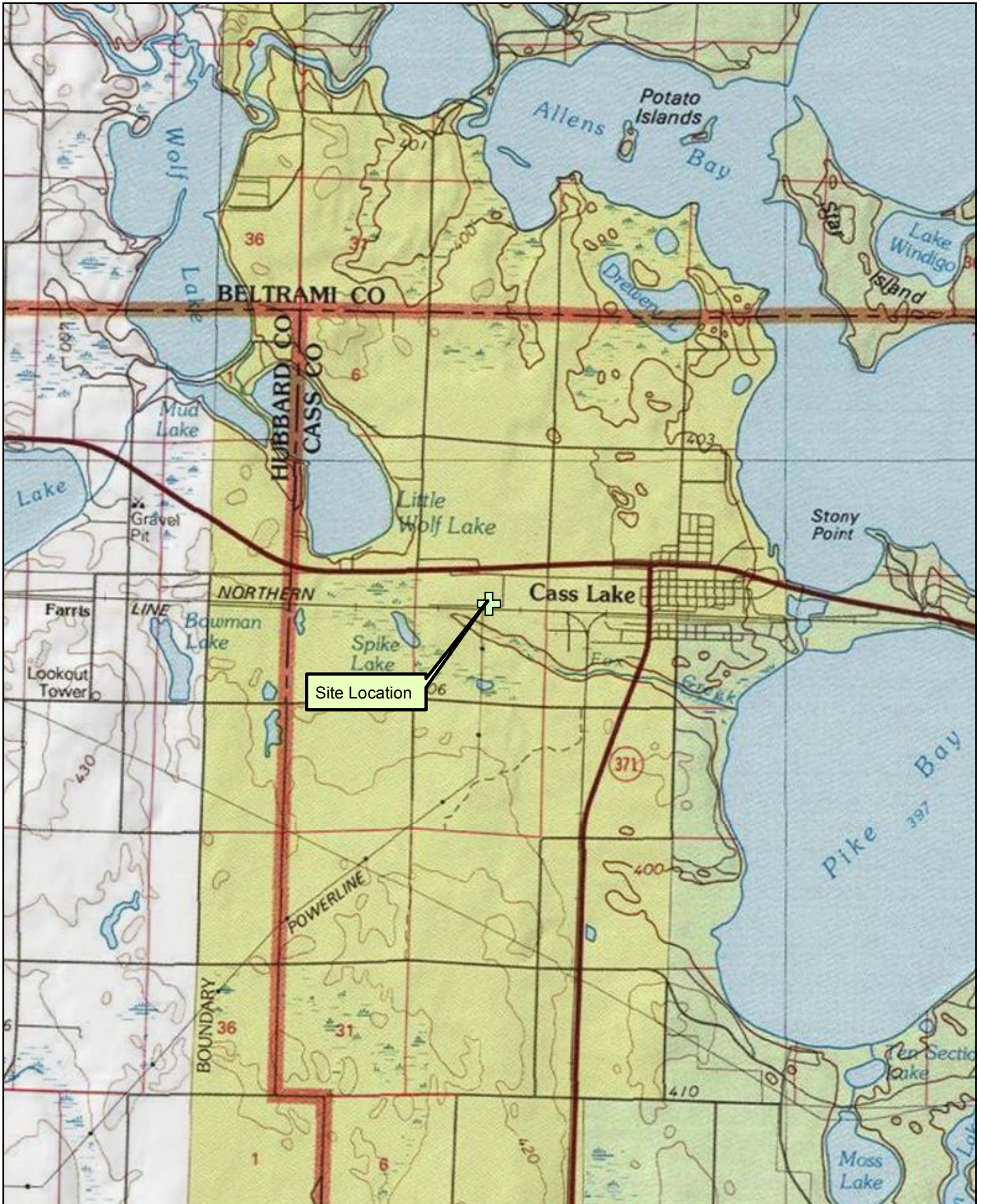
**Table 3: Groundwater Sampling Results: Biodegradation Evaluation Parameters
Enbridge Energy, Limited Partnership - South Cass Lake Station**

Location	Collection Date	Nitrite (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP	Conductivity (mS/cm)	Disolved Oxygen (mg/L)	Fe ⁺² (mg/L)
	12/6/2012	< 0.10	<2.5	1860	-106.1	0.534	1.02	NM
USGS-4A	10/26/2009	< 0.20	4.2	665			13.54	< 0.018
	12/2/2010	< 0.40	< 4.0	398			1.9	< 0.05
	12/1/2011	< 0.10	< 2.5	214	-157	0.525	1.2	NM
	6/13/2012	< 0.10	< 2.5	142	8.5	0.349	1.3	NM
	12/6/2012	< 0.10	<2.5	270	-30.4	0.507	1.21	NM
SCDW	12/1/2011	< 0.10	< 2.5	< 10	NM	NM	NM	NM
	6/25/2012	0.45	3.3	< 6.6	NM	NM	NM	NM
	12/5/2012	0.38	< 2.5	< 6.6	NM	NM	NM	NM
Field Blank	12/30/2004	< 0.25	< 4.0	< 10				
	4/6/2005	< 0.25	< 4.0	< 10				
	11/25/2008	< 0.085	< 0.51	< 2.0				0.0115
	12/1/2011	< 0.10	< 2.5	19.8	NM	NM	NM	NM
	6/13/2012	< 0.10	< 2.5	< 6.6	NM	NM	NM	NM
	12/5/2012	< 0.10	<2.5	25.9	NM	NM	NM	NM

Notes:

- ug/L - micrograms per liter
- mg/L-milligrams per liter
- < - results below the applicable laboratory analytical method detection limit (MDL)
- NM- Not Measured
- mg/L-milligrams per liter
- mS/cm -milli siemens per centimeter (electrical conductivity)

Figures



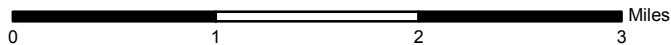
Site Location



LEGEND

⊕ Site Location

Enbridge Pipelines (Lakehead) L.L.C
 Figure 1: Site Location Map
 South Cass Lake Pumping Station



11 East Superior Street
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 Duluth, MN 55802
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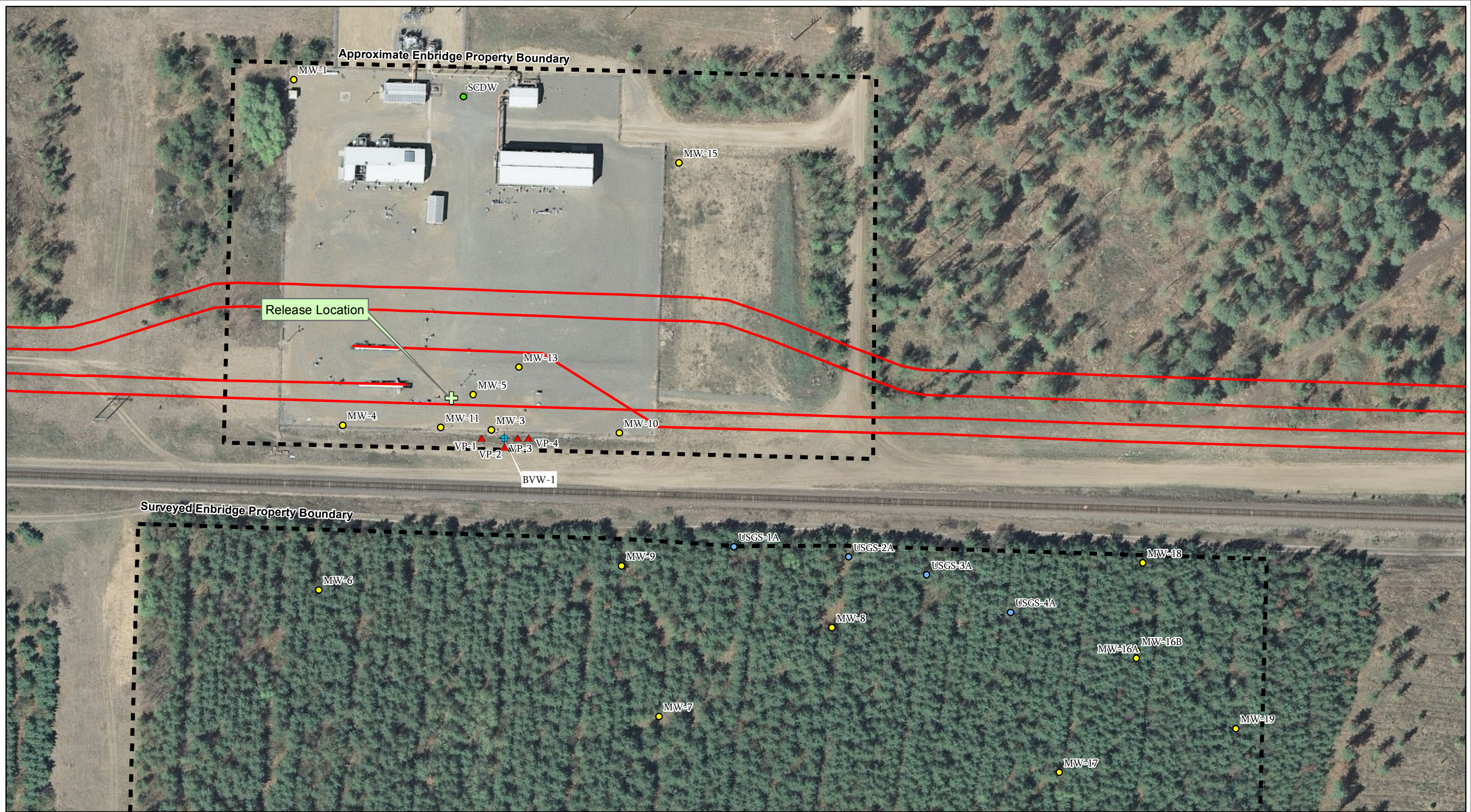
Drawn: TTB 12/19/2012

Approved: BDH 01/02/2013

Scale: 1:60,000

PROJECT NUMBER: 60254681

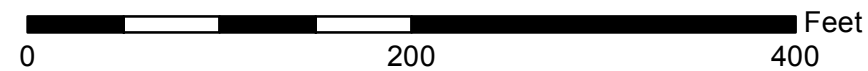
FIGURE NUMBER: 1



LEGEND

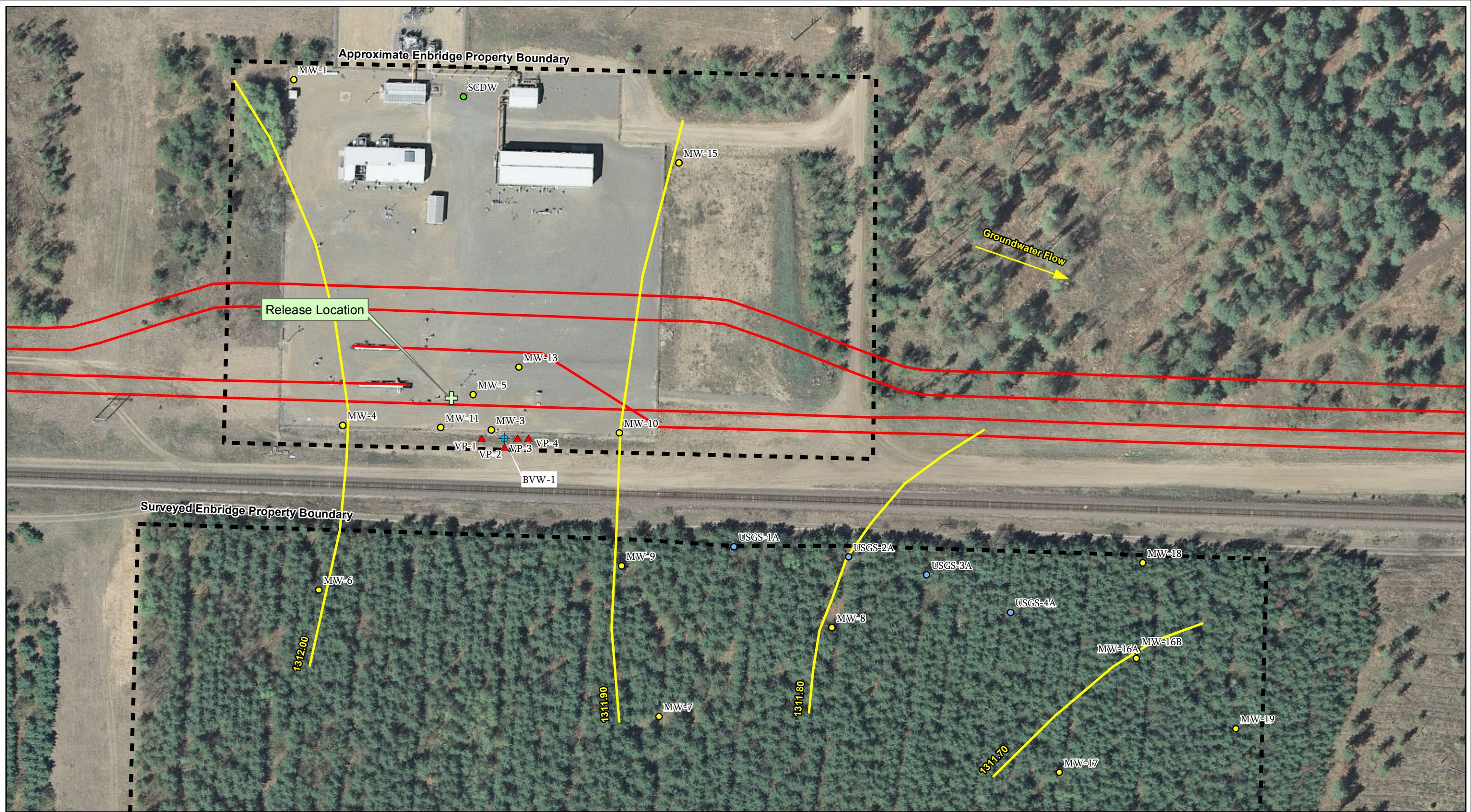
- + Release Location
- Monitoring Well
- USGS Monitoring Well
- Drinking Water Well
- Enbridge Pipeline
- ◆ Bioventing Well
- ▲ Vapor Monitoring Point

**Enbridge Pipelines (Lakehead) L.L.C.
Figure 2: Site Layout Map
South Cass Lake Pumping Station**



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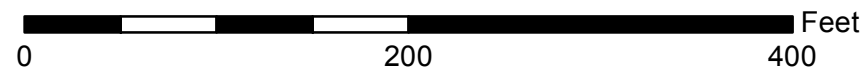
Drawn:	TTB 12/19/2012
Approved:	BDH 01/02/2013
Scale:	1:1,200
PROJECT NUMBER	60254681
FIGURE NUMBER	2



LEGEND

- + Release Location
- Monitoring Well
- USGS Monitoring Well
- Drinking Water Well
- Enbridge Pipeline
- + Bioventing Well
- ▲ Vapor Monitoring Point
- Piezometric Contour (ft NVGD)

**Enbridge Pipelines (Lakehead) L.L.C.
Figure 3: Groundwater Flow Map - December 2012
South Cass Lake Pumping Station**



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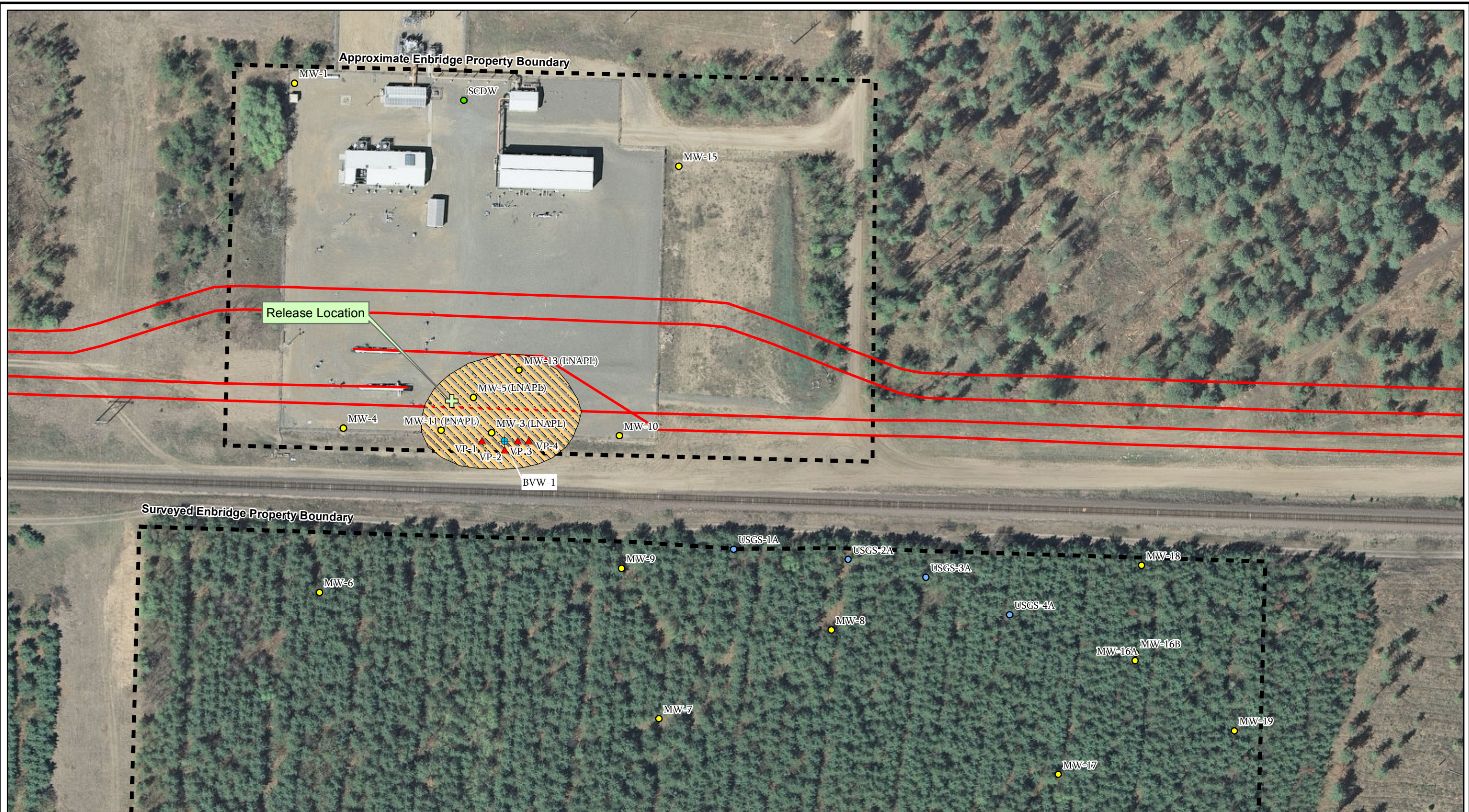
Drawn: TTB 12/19/2012

Approved:BDH 01/02/2013

Scale: 1:1,200

PROJECT NUMBER 60254681

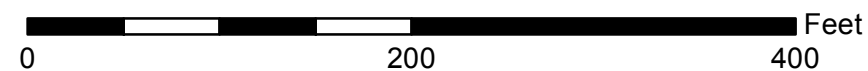
FIGURE NUMBER 3



LEGEND

- + Release Location
- Monitoring Well
- USGS Monitoring Well
- Drinking Water Well
- Enbridge Pipeline
- + Bioventing Well
- ▲ Vapor Monitoring Point
- Inferred Extent of Crude Oil

**Enbridge Pipelines (Lakehead) L.L.C.
Figure 4: Inferred Extent of Crude Oil
South Cass Lake Pumping Station**



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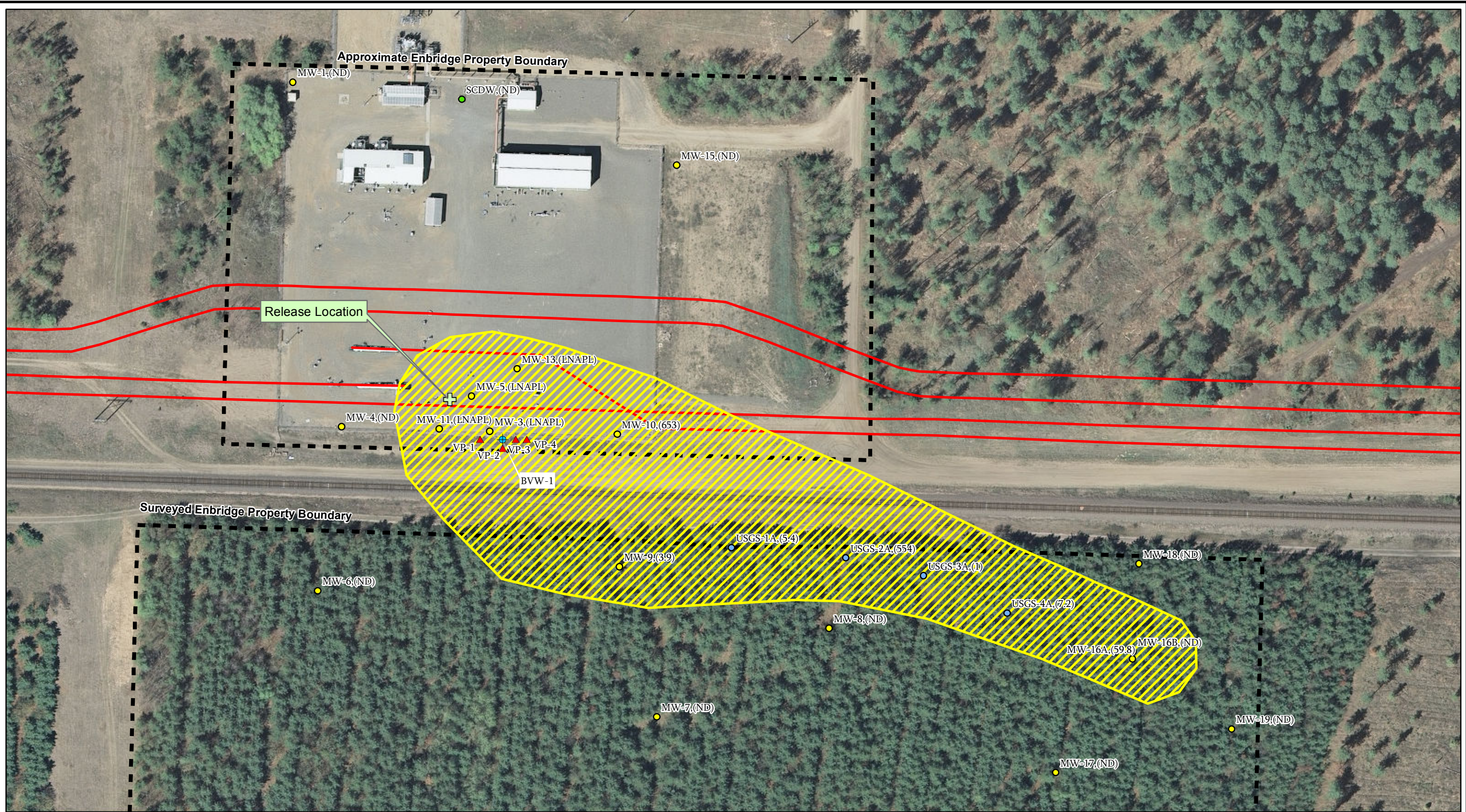
Drawn: TTB 12/19/2012

Approved:BDH 01/02/2013

Scale: 1:1,200

PROJECT NUMBER 60254681

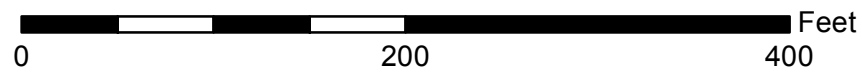
FIGURE NUMBER 4



LEGEND

- + Release Location
- Monitoring Well
- USGS Monitoring Well
- Drinking Water Well
- Enbridge Pipeline
- + Bioventing Well
- ▲ Vapor Monitoring Point
- Inferred Extent of Benzene Concentration >1.0 µg/L

Enbridge Pipelines (Lakehead) L.L.C.
Figure 5: Inferred Extent of Dissolved Phase Benzene
South Cass Lake Pumping Station



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Drawn:	TTB 12/19/2012
Approved:	BDH 01/02/2013
Scale:	1:1,200
PROJECT NUMBER	60254681
FIGURE NUMBER	5

Attachment I – Complete Analytical Laboratory Reports

June 25, 2012

*South Cass
June 2012 Event*

Brian Hill
AECOM
11 E. Superior Street, Suite 5
Duluth, MN 55802

RE: Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Dear Brian Hill:
Enclosed are the analytical results for sample(s) received by the laboratory on June 16, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carol Davy

carol.davy@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10195702001	MW-1	Water	06/13/12 15:06	06/16/12 09:10
10195702002	MW-15	Water	06/13/12 17:09	06/16/12 09:10
10195702003	MW-4	Water	06/13/12 15:44	06/16/12 09:10
10195702004	MW-6	Water	06/12/12 16:31	06/16/12 09:10
10195702005	MW-7	Water	06/12/12 17:36	06/16/12 09:10
10195702006	MW-8	Water	06/12/12 18:18	06/16/12 09:10
10195702007	MW-19	Water	06/12/12 12:40	06/16/12 09:10
10195702008	MW-18	Water	06/12/12 13:18	06/16/12 09:10
10195702009	MW-17	Water	06/12/12 11:50	06/16/12 09:10
10195702010	MW-16A	Water	06/12/12 11:20	06/16/12 09:10
10195702011	MW-16B	Water	06/12/12 10:45	06/16/12 09:10
10195702012	MW-USGA-3A	Water	06/13/12 08:49	06/16/12 09:10
10195702013	MW-USGA-2A	Water	06/13/12 08:25	06/16/12 09:10
10195702014	MW-USGA-1A	Water	06/13/12 09:20	06/16/12 09:10
10195702015	MW-9	Water	06/12/12 17:07	06/16/12 09:10
10195702016	MW-10	Water	06/13/12 16:28	06/16/12 09:10
10195702017	MW-USGA-4A	Water	06/12/12 15:16	06/16/12 09:10
10195702018	MW-10 DUPLICATE	Water	06/13/12 16:30	06/16/12 09:10
10195702019	TRIP BLANK	Water	06/12/12 00:00	06/16/12 09:10
10195702020	FB-S.C.	Water	06/13/12 19:30	06/16/12 09:10

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Minnesota Certification IDs
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
AZLA Certification #: 2926-01
Alaska Certification #: L153-078
Alaska Certification #: MN000054
Arizona Certification #: AZ-0014
Arkansas Certification #: 85-0980
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN000054
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: MN_00054
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 599407970

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Lab ID	Sample ID	Method	Analysts	Analyses Reported
10195702001	MW-1	RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
10195702002	MW-15	RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
10195702003	MW-4	RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
10195702004	MW-6	RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
10195702005	MW-7	RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
10195702006	MW-8	RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
10195702007	MW-19	RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
10195702008	MW-18	RSK 175	SK4	1
		Diesel Range Organics	JRH	4

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10195702009	MW-17	VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
10195702010	MW-16A	VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
10195702011	MW-16B	VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
10195702012	MW-USGA-3A	VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
10195702013	MW-USGA-2A	VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
10195702014	MW-USGA-1A	VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
10195702015	MW-9	VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10195702016	MW-10	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
10195702017	MW-USGA-4A	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
10195702018	MW-10 DUPLICATE	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
10195702019	TRIP BLANK	VI MOD GRO	KT1	5
10195702020	FB-S.C.	RSK 175	SK4	1
10195702020	FB-S.C.	Diesel Range Organics	JRH	4
		VI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Method: RSK 175
Description: RSK 175 AIR Headspace
Client: AECOM
Date: June 25, 2012

General Information:
19 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:
Analyte Comments:
QC Batch: AJR15129
E: Analyte concentration exceeded the calibration range. The reported result is estimated.
• MW-10, (Lab ID: 10195702016)
• Methane

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Method: Diesel Range Organics
Description: WDRO Extended GCS
Client: AECOM
Date: June 25, 2012

General Information:
19 samples were analyzed for Diesel Range Organics. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with Diesel Range Organics with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.
QC Batch: OEXT18907
S1: Surrogate recovery outside laboratory control limits (confirmed by re-analysis).
• LCSd (Lab ID: 1221710)
• n-Triacontane (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Method: WI MOD GRO
Description: WIGRO GCV
Client: AECOM
Date: June 25, 2012

General Information:
20 samples were analyzed for WI MOD GRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Method: SM 4500-NO3 H
Description: SM4500NO3-H, NO2 + NO3 pres.
Client: AECOM
Date: June 25, 2012

Analyte Comments:
QC Batch: WETA/12885
E: Analyte concentration exceeded the calibration range. The reported result is estimated.
• MSD (Lab ID: 1224135)
• Nitrogen, NO2 plus NO3

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PROJECT NARRATIVE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Method: SM 4500-NO3 H
Description: SM4500NO3-H, NO2 + NO3 pres.
Client: AECOM
Date: June 25, 2012

General Information:
19 samples were analyzed for SM 4500-NO3 H. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WETA/12885
A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10195068010,10195702003
M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
• MSD (Lab ID: 1224135)
• Nitrogen, NO2 plus NO3

QC Batch: WETA/12886
A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10195564003,10195702013
M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
• MSD (Lab ID: 1224139)
• Nitrogen, NO2 plus NO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:
QC Batch: WETA/12885
E: Analyte concentration exceeded the calibration range. The reported result is estimated.
• MS (Lab ID: 1224134)
• Nitrogen, NO2 plus NO3

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PROJECT NARRATIVE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Method: ASTM D516-02
Description: ASTM D516-90 Sulfate Water
Client: AECOM
Date: June 25, 2012

General Information:
19 samples were analyzed for ASTM D516-02. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:
This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Sample: MW-1 Lab ID: 10195702001 Collected: 06/13/12 15:06 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 17:02	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.14	mg/L	0.11	0.022	1	06/19/12 15:26	06/22/12 12:26		
WIDRO C10-C28	ND	mg/L	0.11	0.020	1	06/19/12 15:26	06/22/12 12:26		
WIDRO, Extended C10-C32	0.12	mg/L	0.11	0.021	1	06/19/12 15:26	06/22/12 12:26		
Surrogates									
n-Triacontane (S)	76	%	50-150		1	06/19/12 15:26	06/22/12 12:26		
WIGRO GCV Analytical Method: VM MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 03:00	71-43-2	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 03:00	108-88-3	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 03:00	100-41-4	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 03:00	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	102	%	80-125		1		06/21/12 03:00	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	0.42	mg/L	0.10	0.050	1		06/22/12 10:00		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 10:58	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Sample: MW-4 Lab ID: 10195702003 Collected: 06/13/12 15:44 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 17:44	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	ND	mg/L	0.10	0.022	1	06/19/12 15:26	06/22/12 12:40		
WIDRO C10-C28	ND	mg/L	0.10	0.020	1	06/19/12 15:26	06/22/12 12:40		
WIDRO, Extended C10-C32	ND	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 12:40		
Surrogates									
n-Triacontane (S)	82	%	50-150		1	06/19/12 15:26	06/22/12 12:40		
WIGRO GCV Analytical Method: VM MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 00:25	71-43-2	
Ethylbenzene	1.2	ug/L	1.0	0.25	1		06/21/12 00:25	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 00:25	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 00:25	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	101	%	80-125		1		06/21/12 00:25	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	3.9	mg/L	0.10	0.050	1		06/22/12 10:01		M1
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	5.3	mg/L	2.5	0.012	1		06/19/12 10:58	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Sample: MW-15 Lab ID: 10195702002 Collected: 06/13/12 17:09 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 17:23	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.11	mg/L	0.10	0.022	1	06/19/12 15:26	06/22/12 12:33		
WIDRO C10-C28	ND	mg/L	0.10	0.019	1	06/19/12 15:26	06/22/12 12:33		
WIDRO, Extended C10-C32	ND	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 12:33		
Surrogates									
n-Triacontane (S)	83	%	50-150		1	06/19/12 15:26	06/22/12 12:33		
WIGRO GCV Analytical Method: VM MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 02:21	71-43-2	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 02:21	108-88-3	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 02:21	100-41-4	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 02:21	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	103	%	80-125		1		06/21/12 02:21	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	2.0	mg/L	0.10	0.050	1		06/22/12 10:01		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 10:58	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Sample: MW-6 Lab ID: 10195702004 Collected: 06/12/12 16:31 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 17:55	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.11	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 12:47		
WIDRO C10-C28	ND	mg/L	0.10	0.019	1	06/19/12 15:26	06/22/12 12:47		
WIDRO, Extended C10-C32	ND	mg/L	0.10	0.020	1	06/19/12 15:26	06/22/12 12:47		
Surrogates									
n-Triacontane (S)	87	%	50-150		1	06/19/12 15:26	06/22/12 12:47		
WIGRO GCV Analytical Method: VM MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 00:44	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 00:44	108-88-3	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 00:44	100-41-4	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 00:44	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	97	%	80-125		1		06/21/12 00:44	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	2.6	mg/L	0.10	0.050	1		06/22/12 10:05		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	3.6	mg/L	2.5	0.012	1		06/19/12 10:58	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Sample: MW-7 Lab ID: 10195702006 Collected: 06/12/12 17:38 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 18:06	74-82-8	
WDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.11	mg/L	0.10	0.022	1	06/19/12 15:26	06/22/12 12:54		
WDRO C10-C28	ND	mg/L	0.10	0.020	1	06/19/12 15:26	06/22/12 12:54		
WDRO, Extended C10-C32	ND	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 12:54		
Surrogates									
n-Triscontane (S)	82	%	50-150		1	06/19/12 15:26	06/22/12 12:54		
WGRO GCV Analytical Method: VM MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 01:03	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 01:03	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 01:03	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 01:03	1330-20-7	
Surrogates									
a.a.-Trifluorotoluene (S)	101	%	80-125		1		06/21/12 01:03	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	0.18	mg/L	0.10	0.050	1		06/22/12 10:06		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	5.5	mg/L	2.5	0.012	1		06/19/12 11:01	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Sample: MW-8 Lab ID: 10195702006 Collected: 06/12/12 18:18 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 18:16	74-82-8	
WDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.20	mg/L	0.10	0.022	1	06/19/12 15:26	06/22/12 14:36		
WDRO C10-C28	0.12	mg/L	0.10	0.020	1	06/19/12 15:26	06/22/12 14:36		
WDRO, Extended C10-C32	0.15	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 14:36		
Surrogates									
n-Triscontane (S)	87	%	50-150		1	06/19/12 15:26	06/22/12 14:36		
WGRO GCV Analytical Method: VM MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 07:30	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 07:30	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 07:30	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 07:30	1330-20-7	
Surrogates									
a.a.-Trifluorotoluene (S)	99	%	80-125		1		06/21/12 07:30	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	0.10	mg/L	0.10	0.050	1		06/22/12 10:10		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	7.3	mg/L	2.5	0.012	1		06/19/12 11:01	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Sample: MW-19 Lab ID: 10195702007 Collected: 06/12/12 12:40 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 18:27	74-82-8	
WDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.21	mg/L	0.11	0.023	1	06/19/12 15:26	06/22/12 13:00		
WDRO C10-C28	0.16	mg/L	0.11	0.021	1	06/19/12 15:26	06/22/12 13:00		
WDRO, Extended C10-C32	0.18	mg/L	0.11	0.022	1	06/19/12 15:26	06/22/12 13:00		
Surrogates									
n-Triscontane (S)	90	%	50-150		1	06/19/12 15:26	06/22/12 13:00		
WGRO GCV Analytical Method: VM MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 01:23	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 01:23	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 01:23	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 01:23	1330-20-7	
Surrogates									
a.a.-Trifluorotoluene (S)	96	%	80-125		1		06/21/12 01:23	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	0.13	mg/L	0.10	0.050	1		06/22/12 10:11		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	5.8	mg/L	2.5	0.012	1		06/19/12 11:01	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Sample: MW-18 Lab ID: 10195702008 Collected: 06/12/12 13:18 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 19:10	74-82-8	
WDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.13	mg/L	0.10	0.022	1	06/19/12 15:26	06/22/12 13:07		
WDRO C10-C28	ND	mg/L	0.10	0.020	1	06/19/12 15:26	06/22/12 13:07		
WDRO, Extended C10-C32	ND	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 13:07		
Surrogates									
n-Triscontane (S)	82	%	50-150		1	06/19/12 15:26	06/22/12 13:07		
WGRO GCV Analytical Method: VM MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 01:42	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 01:42	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 01:42	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 01:42	1330-20-7	
Surrogates									
a.a.-Trifluorotoluene (S)	102	%	80-125		1		06/21/12 01:42	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	4.2	mg/L	0.10	0.050	1		06/22/12 10:11		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	3.6	mg/L	2.5	0.012	1		06/19/12 11:01	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/18/12 19:31	74-82-8	
WDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.14	mg/L	0.10	0.022	1	06/19/12 15:26	06/22/12 13:14		
WDRO C10-C28	ND	mg/L	0.10	0.019	1	06/19/12 15:26	06/22/12 13:14		
WDRO, Extended C10-C32	0.11	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 13:14		
Surrogates									
n-Triscontane (S)	74	%	50-150		1	06/19/12 15:26	06/22/12 13:14		
WGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 02:02	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 02:02	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 02:02	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 02:02	1330-20-7	
Surrogates									
a.a.-Trifluorotoluene (S)	102	%	80-125		1		06/21/12 02:02	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	0.11	mg/L	0.10	0.050	1		06/22/12 10:15		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	9.4	mg/L	2.5	0.012	1		06/19/12 11:04	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	20.5	ug/L	6.6	0.69	1		06/18/12 19:52	74-82-8	
WDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.71	mg/L	0.11	0.022	1	06/19/12 15:26	06/22/12 14:29		
WDRO C10-C28	0.58	mg/L	0.11	0.020	1	06/19/12 15:26	06/22/12 14:29		
WDRO, Extended C10-C32	0.64	mg/L	0.11	0.021	1	06/19/12 15:26	06/22/12 14:29		
Surrogates									
n-Triscontane (S)	82	%	50-150		1	06/19/12 15:26	06/22/12 14:29		
WGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 04:36	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 04:36	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 04:36	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 04:36	1330-20-7	
Surrogates									
a.a.-Trifluorotoluene (S)	100	%	80-125		1		06/21/12 04:36	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:15		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	3.1	mg/L	2.5	0.012	1		06/19/12 11:04	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	7.4	ug/L	6.6	0.69	1		06/18/12 20:03	74-82-8	
WDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.23	mg/L	0.11	0.022	1	06/19/12 15:26	06/22/12 13:21		
WDRO C10-C28	0.18	mg/L	0.11	0.020	1	06/19/12 15:26	06/22/12 13:21		
WDRO, Extended C10-C32	0.20	mg/L	0.11	0.021	1	06/19/12 15:26	06/22/12 13:21		
Surrogates									
n-Triscontane (S)	78	%	50-150		1	06/19/12 15:26	06/22/12 13:21		
WGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 04:56	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 04:56	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 04:56	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 04:56	1330-20-7	
Surrogates									
a.a.-Trifluorotoluene (S)	96	%	80-125		1		06/21/12 04:56	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	1.2	mg/L	0.10	0.050	1		06/22/12 10:16		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	9.6	mg/L	2.5	0.012	1		06/19/12 11:04	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	2340	ug/L	6.6	0.69	1		06/18/12 20:13	74-82-8	
WDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	2.0	mg/L	0.11	0.024	1	06/19/12 15:26	06/22/12 14:02		
WDRO C10-C28	1.8	mg/L	0.11	0.021	1	06/19/12 15:26	06/22/12 14:02		
WDRO, Extended C10-C32	1.9	mg/L	0.11	0.022	1	06/19/12 15:26	06/22/12 14:02		
Surrogates									
n-Triscontane (S)	79	%	50-150		1	06/19/12 15:26	06/22/12 14:02		
WGRO GCV Analytical Method: WI MOD GRO									
Benzene	14.7	ug/L	1.0	0.27	1		06/21/12 05:34	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 05:34	100-41-4	
Toluene	1.0	ug/L	1.0	0.22	1		06/21/12 05:34	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 05:34	1330-20-7	
Surrogates									
a.a.-Trifluorotoluene (S)	101	%	80-125		1		06/21/12 05:34	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:16		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:06	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Sample: MW-USGA-2A Lab ID: 10195702013 Collected: 06/13/12 08:25 Received: 06/16/12 09:10 Matrix: Water									
Analytical Method: RSK 175									
RSK 175 AIR Headspace									
Methane	5900	ug/L	6.6	0.69	1		06/18/12 20:24	74-82-8	
Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WIDRO Extended GCS									
TEH (C10-C36), 8015	2.5	mg/L	0.13	0.028	1	06/19/12 15:26	06/22/12 14:09		
WIDRO C10-C28	2.3	mg/L	0.13	0.025	1	06/19/12 15:26	06/22/12 14:09		
WIDRO, Extended C10-C32	2.4	mg/L	0.13	0.027	1	06/19/12 15:26	06/22/12 14:09		
Surrogates									
n-Triacontane (S)	80	%	50-150		1	06/19/12 15:26	06/22/12 14:09		
Analytical Method: WI MOD GRO									
WIGRO GCV									
Benzene	282	ug/L	1.0	0.27	1	06/21/12 06:32	71-43-2		
Ethylbenzene	ND	ug/L	1.0	0.25	1	06/21/12 06:32	100-41-4		
Toluene	1.6	ug/L	1.0	0.22	1	06/21/12 06:32	108-88-3		
Xylene (Total)	ND	ug/L	3.0	0.75	1	06/21/12 06:32	1330-20-7		
Surrogates									
a,a,a-Trifluorotoluene (S)	102	%	80-125		1	06/21/12 06:32	98-08-8		
Analytical Method: SM 4500-NO3 H									
SM4500NO3-H, NO2 + NO3 pres.									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:21		M1
Analytical Method: ASTM D516-02									
ASTM D516-90 Sulfate Water									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:06	14808-79-8	



ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Sample: MW-USGA-1A Lab ID: 10195702014 Collected: 06/13/12 09:20 Received: 06/16/12 09:10 Matrix: Water									
Analytical Method: RSK 175									
RSK 175 AIR Headspace									
Methane	663	ug/L	6.6	0.69	1		06/18/12 20:35	74-82-8	
Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WIDRO Extended GCS									
TEH (C10-C36), 8015	1.6	mg/L	0.10	0.022	1	06/19/12 15:26	06/22/12 13:48		
WIDRO C10-C28	1.4	mg/L	0.10	0.020	1	06/19/12 15:26	06/22/12 13:48		
WIDRO, Extended C10-C32	1.5	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 13:48		
Surrogates									
n-Triacontane (S)	73	%	50-150		1	06/19/12 15:26	06/22/12 13:48		
Analytical Method: WI MOD GRO									
WIGRO GCV									
Benzene	6.4	ug/L	1.0	0.27	1		06/21/12 06:52	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 06:52	100-41-4	
Toluene	1.0	ug/L	1.0	0.22	1		06/21/12 06:52	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 06:52	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	101	%	80-125		1		06/21/12 06:52	98-08-8	
Analytical Method: SM 4500-NO3 H									
SM4500NO3-H, NO2 + NO3 pres.									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:26		
Analytical Method: ASTM D516-02									
ASTM D516-90 Sulfate Water									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:06	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Sample: MW-9 Lab ID: 10195702015 Collected: 06/12/12 17:07 Received: 06/16/12 09:10 Matrix: Water									
Analytical Method: RSK 175									
RSK 175 AIR Headspace									
Methane	1460	ug/L	6.6	0.69	1		06/18/12 20:46	74-82-8	
Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WIDRO Extended GCS									
TEH (C10-C36), 8015	1.9	mg/L	0.10	0.022	1	06/19/12 15:26	06/22/12 13:55		
WIDRO C10-C28	1.7	mg/L	0.10	0.020	1	06/19/12 15:26	06/22/12 13:55		
WIDRO, Extended C10-C32	1.8	mg/L	0.10	0.021	1	06/19/12 15:26	06/22/12 13:55		
Surrogates									
n-Triacontane (S)	71	%	50-150		1	06/19/12 15:26	06/22/12 13:55		
Analytical Method: WI MOD GRO									
WIGRO GCV									
Benzene	48.9	ug/L	1.0	0.27	1		06/22/12 15:55	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/22/12 15:55	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/22/12 15:55	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/22/12 15:55	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	101	%	80-125		1		06/22/12 15:55	98-08-8	
Analytical Method: SM 4500-NO3 H									
SM4500NO3-H, NO2 + NO3 pres.									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:29		
Analytical Method: ASTM D516-02									
ASTM D516-90 Sulfate Water									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:06	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Sample: MW-10 Lab ID: 10195702016 Collected: 06/13/12 16:28 Received: 06/16/12 09:10 Matrix: Water									
Analytical Method: RSK 175									
RSK 175 AIR Headspace									
Methane	5470	ug/L	6.6	0.69	1		06/19/12 09:38	74-82-8	E
Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WIDRO Extended GCS									
TEH (C10-C36), 8015	5.5	mg/L	0.11	0.023	1	06/19/12 15:26	06/22/12 14:22		
WIDRO C10-C28	5.1	mg/L	0.11	0.021	1	06/19/12 15:26	06/22/12 14:22		
WIDRO, Extended C10-C32	5.3	mg/L	0.11	0.022	1	06/19/12 15:26	06/22/12 14:22		
Surrogates									
n-Triacontane (S)	79	%	50-150		1	06/19/12 15:26	06/22/12 14:22		
Analytical Method: WI MOD GRO									
WIGRO GCV									
Benzene	183	ug/L	1.0	0.27	1		06/21/12 07:11	71-43-2	
Ethylbenzene	1.2	ug/L	1.0	0.25	1		06/21/12 07:11	100-41-4	
Toluene	3.2	ug/L	1.0	0.22	1		06/21/12 07:11	108-88-3	
Xylene (Total)	3.4	ug/L	3.0	0.75	1		06/21/12 07:11	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	107	%	80-125		1		06/21/12 07:11	98-08-8	
Analytical Method: SM 4500-NO3 H									
SM4500NO3-H, NO2 + NO3 pres.									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:29		
Analytical Method: ASTM D516-02									
ASTM D516-90 Sulfate Water									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:06	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702
Sample: MW-USGA-4A Lab ID: 10195702017 Collected: 06/12/12 15:16 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	142	ug/L	6.6	0.69	1		06/19/12 10:00	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	0.77	mg/L	0.11	0.022	1	06/19/12 15:26	06/22/12 13:41		
WIDRO C10-C28	0.67	mg/L	0.11	0.020	1	06/19/12 15:26	06/22/12 13:41		
WIDRO, Extended C10-C32	0.72	mg/L	0.11	0.021	1	06/19/12 15:26	06/22/12 13:41		
Surrogates									
n-Triacontane (S)	70	%	50-150		1	06/19/12 15:26	06/22/12 13:41		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/21/12 05:15	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/21/12 05:15	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/21/12 05:15	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/21/12 05:15	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	101	%	80-125		1		06/21/12 05:15	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:30		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:08	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702
Sample: MW-10 DUPLICATE Lab ID: 10195702018 Collected: 06/13/12 16:30 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	3950	ug/L	6.6	0.69	1		06/19/12 10:10	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	5.2	mg/L	0.11	0.023	1	06/19/12 15:26	06/22/12 14:15		
WIDRO C10-C28	4.8	mg/L	0.11	0.021	1	06/19/12 15:26	06/22/12 14:15		
WIDRO, Extended C10-C32	5.0	mg/L	0.11	0.022	1	06/19/12 15:26	06/22/12 14:15		
Surrogates									
n-Triacontane (S)	79	%	50-150		1	06/19/12 15:26	06/22/12 14:15		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	81.2	ug/L	1.0	0.27	1		06/20/12 20:32	71-43-2	
Ethylbenzene	1.8	ug/L	1.0	0.25	1		06/20/12 20:32	100-41-4	
Toluene	2.8	ug/L	1.0	0.22	1		06/20/12 20:32	108-88-3	
Xylene (Total)	3.1	ug/L	3.0	0.75	1		06/20/12 20:32	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	105	%	80-125		1		06/20/12 20:32	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:31		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:08	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702
Sample: TRIP BLANK Lab ID: 10195702019 Collected: 06/12/12 00:00 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/20/12 14:42	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/20/12 14:42	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/20/12 14:42	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/20/12 14:42	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	98	%	80-125		1		06/20/12 14:42	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:34		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:08	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702
Sample: FB-S.C. Lab ID: 10195702020 Collected: 06/13/12 19:30 Received: 06/16/12 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	0.69	1		06/19/12 10:21	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	ND	mg/L	0.11	0.022	1	06/19/12 09:18	06/22/12 15:51		
WIDRO C10-C28	ND	mg/L	0.11	0.020	1	06/19/12 09:18	06/22/12 15:51		
WIDRO, Extended C10-C32	ND	mg/L	0.11	0.021	1	06/19/12 09:18	06/22/12 15:51		
Surrogates									
n-Triacontane (S)	83	%	50-150		1	06/19/12 09:18	06/22/12 15:51		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		06/20/12 15:02	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		06/20/12 15:02	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		06/20/12 15:02	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		06/20/12 15:02	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	99	%	80-125		1		06/20/12 15:02	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/22/12 10:34		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		06/19/12 11:08	14808-79-8	

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

QC Batch: AIR/15125 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012, 10195702013, 10195702014, 10195702015

METHOD BLANK: 1220518 Matrix: Water
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012, 10195702013, 10195702014, 10195702015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	ug/L	ND	6.6	06/18/12 16:39	

LABORATORY CONTROL SAMPLE & LCSD: 1220519 1220520

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	57.0	57.7	94	95	70-130	1	30	

SAMPLE DUPLICATE: 1221048

Parameter	Units	10195702008 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	ND	1.6J		30	

SAMPLE DUPLICATE: 1221049

Parameter	Units	10195702001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	ND	1.5J		30	

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

QC Batch: AIR/15129 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10195702016, 10195702017, 10195702018, 10195702020

METHOD BLANK: 1220939 Matrix: Water
Associated Lab Samples: 10195702016, 10195702017, 10195702018, 10195702020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	ug/L	ND	6.6	06/19/12 08:49	

LABORATORY CONTROL SAMPLE & LCSD: 1220940 1220941

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	57.8	58.2	95	96	70-130	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1221473 1221474

Parameter	Units	92121231001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methane	ug/L	ND	60.7	63.8	55.7	53.3	90	82	30-150	4	30	

SAMPLE DUPLICATE: 1221475

Parameter	Units	10195702016 Result	Dup Result	RPD	Max RPD	Qualifiers	
Methane	ug/L	5470	5890		7	30	

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

QC Batch: GCV/9418 Analysis Method: W/ MOD GRO
QC Batch Method: W/ MOD GRO Analysis Description: W/ MOD GRO Water
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012, 10195702013, 10195702014, 10195702016, 10195702017

METHOD BLANK: 1221449 Matrix: Water
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012, 10195702013, 10195702014, 10195702016, 10195702017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/20/12 23:46	
Ethylbenzene	ug/L	ND	1.0	06/20/12 23:46	
Toluene	ug/L	ND	1.0	06/20/12 23:46	
Xylene (Total)	ug/L	ND	3.0	06/20/12 23:46	
a,a,a-Trifluorotoluene (S)	%	98	80-125	06/20/12 23:46	

LABORATORY CONTROL SAMPLE & LCSD: 1221450 1221451

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	100	103	102	103	102	80-120	2	20	
Ethylbenzene	ug/L	100	100	97.4	100	97	80-120	3	20	
Toluene	ug/L	100	102	101	102	101	80-120	1	20	
Xylene (Total)	ug/L	300	301	289	100	95	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				99	101	80-125			

MATRIX SPIKE SAMPLE: 1224752

Parameter	Units	10195702001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	ND	100	111	111	80-120	
Ethylbenzene	ug/L	ND	100	108	108	80-120	
Toluene	ug/L	ND	100	110	110	80-120	
Xylene (Total)	ug/L	ND	300	318	106	80-120	
a,a,a-Trifluorotoluene (S)	%				100	80-125	

SAMPLE DUPLICATE: 1224753

Parameter	Units	10195702002 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	ND		20	
Ethylbenzene	ug/L	ND	ND		20	
Toluene	ug/L	ND	ND		20	
Xylene (Total)	ug/L	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%	103	102		7	

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

QC Batch: GCV/9419 Analysis Method: W/ MOD GRO
QC Batch Method: W/ MOD GRO Analysis Description: W/ MOD GRO Water
Associated Lab Samples: 10195702018, 10195702019, 10195702020

METHOD BLANK: 1221540 Matrix: Water
Associated Lab Samples: 10195702018, 10195702019, 10195702020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/20/12 14:23	
Ethylbenzene	ug/L	ND	1.0	06/20/12 14:23	
Toluene	ug/L	ND	1.0	06/20/12 14:23	
Xylene (Total)	ug/L	ND	3.0	06/20/12 14:23	
a,a,a-Trifluorotoluene (S)	%	98	80-125	06/20/12 14:23	

LABORATORY CONTROL SAMPLE & LCSD: 1221541 1221542

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	100	112	106	112	105	80-120	6	20	
Ethylbenzene	ug/L	100	109	102	109	102	80-120	7	20	
Toluene	ug/L	100	111	104	111	104	80-120	6	20	
Xylene (Total)	ug/L	300	326	305	109	102	80-120	7	20	
a,a,a-Trifluorotoluene (S)	%				101	100	80-125			

MATRIX SPIKE SAMPLE: 1225539

Parameter	Units	10195377003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	ND	100	107	107	80-120	
Ethylbenzene	ug/L	ND	100	101	101	80-120	
Toluene	ug/L	ND	100	104	104	80-120	
Xylene (Total)	ug/L	ND	300	282	94	80-120	
a,a,a-Trifluorotoluene (S)	%				100	80-125	

SAMPLE DUPLICATE: 1225540

Parameter	Units	10195377004 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	ND		20	
Ethylbenzene	ug/L	ND	ND		20	
Toluene	ug/L	ND	ND		20	
Xylene (Total)	ug/L	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%	100	102		2	

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702
QC Batch: GCV/8429 Analysis Method: WI MOD GRO
QC Batch Method: WI MOD GRO Analysis Description: WIGRO GCV Water
Associated Lab Samples: 10195702015
METHOD BLANK: 1224726 Matrix: Water
Associated Lab Samples: 10195702015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/22/12 14:37	
Ethylbenzene	ug/L	ND	1.0	06/22/12 14:37	
Toluene	ug/L	ND	1.0	06/22/12 14:37	
Xylene (Total)	ug/L	ND	3.0	06/22/12 14:37	
a,a,a-Trifluorotoluene (S)	%	101	80-125	06/22/12 14:37	

LABORATORY CONTROL SAMPLE & LCSD: 1224727

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	100	108	98.8	108	99	80-120	9	20	
Ethylbenzene	ug/L	100	105	95.3	105	96	80-120	9	20	
Toluene	ug/L	100	107	98.0	107	98	80-120	9	20	
Xylene (Total)	ug/L	300	314	290	105	97	80-120	8	20	
a,a,a-Trifluorotoluene (S)	%				100	100	80-125			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1224729

Parameter	Units	10195486001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	4800	2500	2500	6960	6830	87	81	80-120	2	20	
Ethylbenzene	ug/L	1360	2500	2500	3500	3440	86	83	80-120	2	20	
Toluene	ug/L	7360	2500	2500	9640	9400	91	81	80-120	3	20	
Xylene (Total)	ug/L	6690	7500	7500	12900	12700	83	80	80-120	2	20	
a,a,a-Trifluorotoluene (S)	%						106	106	80-125			

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702
QC Batch: OEXT/18902 Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012, 10195702013, 10195702014, 10195702015, 10195702016, 10195702017, 10195702018

METHOD BLANK: 1221476 Matrix: Water
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012, 10195702013, 10195702014, 10195702015, 10195702016, 10195702017, 10195702018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TEH (C10-C36), 8015	mg/L	ND	0.10	06/22/12 12:13	
WDRO C10-C28	mg/L	ND	0.10	06/22/12 12:13	
WDRO, Extended C10-C32	mg/L	ND	0.10	06/22/12 12:13	
n-Triscontane (S)	%	89	50-150	06/22/12 12:13	

LABORATORY CONTROL SAMPLE & LCSD: 1221477

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
TEH (C10-C36), 8015	mg/L		1.5	1.6					6	20
WDRO C10-C28	mg/L	2	1.5	1.6	77	81	75-115	6	20	
WDRO, Extended C10-C32	mg/L	2	1.5	1.6	77	81	75-115	6	20	
n-Triscontane (S)	%				86	91	50-150			

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702
QC Batch: OEXT/18907 Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10195702020
METHOD BLANK: 1221708 Matrix: Water
Associated Lab Samples: 10195702020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TEH (C10-C36), 8015	mg/L	ND	0.10	06/22/12 15:37	
WDRO C10-C28	mg/L	ND	0.10	06/22/12 15:37	
WDRO, Extended C10-C32	mg/L	ND	0.10	06/22/12 15:37	
n-Triscontane (S)	%	90	50-150	06/22/12 15:37	

LABORATORY CONTROL SAMPLE & LCSD: 1221709

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
TEH (C10-C36), 8015	mg/L		1.6	1.6				2	20	
WDRO C10-C28	mg/L	2	1.6	1.6	78	80	75-115	2	20	
WDRO, Extended C10-C32	mg/L	2	1.6	1.6	78	80	75-115	2	20	
n-Triscontane (S)	%				76	42	50-150			S1

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702
QC Batch: WETA/12885 Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012

METHOD BLANK: 1224130 Matrix: Water
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	06/22/12 09:41	

LABORATORY CONTROL SAMPLE: 1224131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1224132

Parameter	Units	10195068010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.52	2.5	2.5	3.1	3.1	104	104	80-120	03	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1224134

Parameter	Units	10195702003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	3.9	2.5	2.5	6.1	5.6	86	86	80-120	9	30	E.M1

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QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

QC Batch: WETA12686 Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10195702013, 10195702014, 10195702015, 10195702016, 10195702017, 10195702018, 10195702020

METHOD BLANK: 1224136 Matrix: Water
Associated Lab Samples: 10195702013, 10195702014, 10195702015, 10195702016, 10195702017, 10195702018, 10195702020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	06/22/12 10:19	

LABORATORY CONTROL SAMPLE: 1224137

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1224138 1224139

Parameter	Units	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.1	2.0	80	78	80-120	3	30 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1224140 1224141

Parameter	Units	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.51	2.5	2.5	3.2	108	109	80-120	9	30



QUALITY CONTROL DATA

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

QC Batch: WETA12624 Analysis Method: ASTM D516-02
QC Batch Method: ASTM D516-02 Analysis Description: ASTM D516-9002 Sulfate Water
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012, 10195702013, 10195702014, 10195702015, 10195702016, 10195702017, 10195702018, 10195702020

METHOD BLANK: 1220951 Matrix: Water
Associated Lab Samples: 10195702001, 10195702002, 10195702003, 10195702004, 10195702005, 10195702006, 10195702007, 10195702008, 10195702009, 10195702010, 10195702011, 10195702012, 10195702013, 10195702014, 10195702015, 10195702016, 10195702017, 10195702018, 10195702020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	06/19/12 10:56	

LABORATORY CONTROL SAMPLE: 1220952

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	7.5	7.2	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1220953 1220954

Parameter	Units	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Sulfate	mg/L	ND	20	20	21.4	107	108	80-120	1	30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1220955 1220956

Parameter	Units	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Sulfate	mg/L	9.6	20	20	25.7	105	105	80-120	17	30

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QUALIFIERS

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.
ND - Not Detected at or above adjusted reporting limit.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PRL - Pace Reporting Limit.
RL - Reporting Limit.
S - Surrogate.
1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Acetobenzene.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAP Institute.

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
S1 Surrogate recovery outside laboratory control limits (confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10195702001	MW-1	RSK 175	AIR15125		
10195702002	MW-15	RSK 175	AIR15125		
10195702003	MW-4	RSK 175	AIR15125		
10195702004	MW-6	RSK 175	AIR15125		
10195702005	MW-7	RSK 175	AIR15125		
10195702006	MW-8	RSK 175	AIR15125		
10195702007	MW-19	RSK 175	AIR15125		
10195702008	MW-18	RSK 175	AIR15125		
10195702009	MW-17	RSK 175	AIR15125		
10195702010	MW-16A	RSK 175	AIR15125		
10195702011	MW-16B	RSK 175	AIR15125		
10195702012	MW-USGA-3A	RSK 175	AIR15125		
10195702013	MW-USGA-2A	RSK 175	AIR15125		
10195702014	MW-USGA-1A	RSK 175	AIR15125		
10195702015	MW-9	RSK 175	AIR15125		
10195702016	MW-10	RSK 175	AIR15129		
10195702017	MW-USGA-4A	RSK 175	AIR15129		
10195702018	MW-10 DUPLICATE	RSK 175	AIR15129		
10195702020	FB-S-C	RSK 175	AIR15129		
10195702001	MW-1	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702002	MW-15	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702003	MW-4	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702004	MW-6	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702005	MW-7	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702006	MW-8	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702007	MW-19	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702008	MW-18	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702009	MW-17	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702010	MW-16A	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702011	MW-16B	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702012	MW-USGA-3A	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702013	MW-USGA-2A	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702014	MW-USGA-1A	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702015	MW-9	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702016	MW-10	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702017	MW-USGA-4A	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702018	MW-10 DUPLICATE	Diesel Range Organics	OEXT18902	Diesel Range Organics	GCSV9720
10195702020	FB-S-C	Diesel Range Organics	OEXT18907	Diesel Range Organics	GCSV9721
10195702001	MW-1	WI MOD GRO	GCV9418		
10195702002	MW-15	WI MOD GRO	GCV9418		
10195702003	MW-4	WI MOD GRO	GCV9418		
10195702004	MW-6	WI MOD GRO	GCV9418		
10195702005	MW-7	WI MOD GRO	GCV9418		
10195702006	MW-8	WI MOD GRO	GCV9418		
10195702007	MW-19	WI MOD GRO	GCV9418		
10195702008	MW-18	WI MOD GRO	GCV9418		
10195702009	MW-17	WI MOD GRO	GCV9418		

Date: 06/25/2012 07:39 PM

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10195702010	MW-16A	WI MOD GRO	GCV9418		
10195702011	MW-16B	WI MOD GRO	GCV9418		
10195702012	MW-USGA-3A	WI MOD GRO	GCV9418		
10195702013	MW-USGA-2A	WI MOD GRO	GCV9418		
10195702014	MW-USGA-1A	WI MOD GRO	GCV9418		
10195702015	MW-9	WI MOD GRO	GCV9429		
10195702016	MW-10	WI MOD GRO	GCV9418		
10195702017	MW-USGA-4A	WI MOD GRO	GCV9418		
10195702018	MW-10 DUPLICATE	WI MOD GRO	GCV9419		
10195702019	TRIP BLANK	WI MOD GRO	GCV9419		
10195702020	FB-S.C.	WI MOD GRO	GCV9419		
10195702001	MW-1	SM 4500-NO3 H	WETA12685		
10195702002	MW-15	SM 4500-NO3 H	WETA12685		
10195702003	MW-4	SM 4500-NO3 H	WETA12685		
10195702004	MW-6	SM 4500-NO3 H	WETA12685		
10195702005	MW-7	SM 4500-NO3 H	WETA12685		
10195702006	MW-8	SM 4500-NO3 H	WETA12685		
10195702007	MW-19	SM 4500-NO3 H	WETA12685		
10195702008	MW-18	SM 4500-NO3 H	WETA12685		
10195702009	MW-17	SM 4500-NO3 H	WETA12685		
10195702010	MW-16A	SM 4500-NO3 H	WETA12685		
10195702011	MW-16B	SM 4500-NO3 H	WETA12685		
10195702012	MW-USGA-3A	SM 4500-NO3 H	WETA12685		
10195702013	MW-USGA-2A	SM 4500-NO3 H	WETA12686		
10195702014	MW-USGA-1A	SM 4500-NO3 H	WETA12686		
10195702015	MW-9	SM 4500-NO3 H	WETA12686		
10195702016	MW-10	SM 4500-NO3 H	WETA12686		
10195702017	MW-USGA-4A	SM 4500-NO3 H	WETA12686		
10195702018	MW-10 DUPLICATE	SM 4500-NO3 H	WETA12686		
10195702020	FB-S.C.	SM 4500-NO3 H	WETA12686		
10195702001	MW-1	ASTM D516-02	WETA12624		
10195702002	MW-15	ASTM D516-02	WETA12624		
10195702003	MW-4	ASTM D516-02	WETA12624		
10195702004	MW-6	ASTM D516-02	WETA12624		
10195702005	MW-7	ASTM D516-02	WETA12624		
10195702006	MW-8	ASTM D516-02	WETA12624		
10195702007	MW-19	ASTM D516-02	WETA12624		
10195702008	MW-18	ASTM D516-02	WETA12624		
10195702009	MW-17	ASTM D516-02	WETA12624		
10195702010	MW-16A	ASTM D516-02	WETA12624		
10195702011	MW-16B	ASTM D516-02	WETA12624		
10195702012	MW-USGA-3A	ASTM D516-02	WETA12624		
10195702013	MW-USGA-2A	ASTM D516-02	WETA12624		
10195702014	MW-USGA-1A	ASTM D516-02	WETA12624		
10195702015	MW-9	ASTM D516-02	WETA12624		
10195702016	MW-10	ASTM D516-02	WETA12624		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60254681.2 ENBRIDGE CASS LAKE
Pace Project No.: 10195702

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10195702017	MW-USGA-4A	ASTM D516-02	WETA12624		
10195702018	MW-10 DUPLICATE	ASTM D516-02	WETA12624		
10195702020	FB-S.C.	ASTM D516-02	WETA12624		

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CHAIN-OF-CUSTODY / Analytical Request Document

SHO! HOLD
NO# : 10195702

Section A: Project Information
 Section B: Sample Information
 Section C: Analytical Information
 Section D: Chain of Custody

Company: **AECOM**
 Project: **60254681.2 ENBRIDGE CASS LAKE**
 Sample ID: **MW-1**
 Date: **6/15/12**
 Time: **17:00**

Signature: **[Signature]**

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CHAIN-OF-CUSTODY / Analytical Request Document

SHO! HOLD
NO# : 10195702

Section A: Project Information
 Section B: Sample Information
 Section C: Analytical Information
 Section D: Chain of Custody

Company: **AECOM**
 Project: **60254681.2 ENBRIDGE CASS LAKE**
 Sample ID: **MW-1**
 Date: **6/15/12**
 Time: **17:00**

Signature: **[Signature]**

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Pace Analytical Services, Inc.
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Pace Analytical Services, Inc.
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July 10, 2012

Brian Hill
AECOM
11 E. Superior Street, Suite 5
Duluth, MN 55802

RE: Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Dear Brian Hill:
Enclosed are the analytical results for sample(s) received by the laboratory on June 29, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carol Davy

carol.davy@pacelabs.com
Project Manager

Enclosures

CERTIFICATIONS

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Minnesota Certification IDs
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
AZLA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 98-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA980009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970



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Minneapolis, MN 55414
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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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SAMPLE SUMMARY

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10197201001	SCDW	Water	06/29/12 13:25	06/29/12 10:05

SAMPLE ANALYTE COUNT

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Lab ID	Sample ID	Method	Analysts	Analyses Reported
10197201001	SCDW	RSK 175	SK4	1
		Diesel Range Organics	JRH	4
		WI MOD GRO	KT1	5
		SM 4500-NO3 H	MWD	1
		ASTM D516-02	KEO	1

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PROJECT NARRATIVE

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Method: RSK 175
Description: RSK 175 AIR Headspace
Client: AECOM
Date: July 10, 2012

General Information:
1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Method: WI MOD GRO
Description: WIGRO GCV
Client: AECOM
Date: July 10, 2012

General Information:
1 sample was analyzed for WI MOD GRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Method: Diesel Range Organics
Description: WIDRO Extended GCS
Client: AECOM
Date: July 10, 2012

General Information:
1 sample was analyzed for Diesel Range Organics. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with Diesel Range Organics with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Method: SM 4500-NO3 H
Description: SM4500NO3-H, NO2 + NO3 pres.
Client: AECOM
Date: July 10, 2012

General Information:
1 sample was analyzed for SM 4500-NO3 H. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WETA/12779
A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10196685024, 10197120001

- M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 1234550)
 - Nitrogen, NO2 plus NO3
 - MSD (Lab ID: 1234549)
 - Nitrogen, NO2 plus NO3
 - MSD (Lab ID: 1234551)
 - Nitrogen, NO2 plus NO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: WETA/12779

- E: Analyte concentration exceeded the calibration range. The reported result is estimated.
- MS (Lab ID: 1234549)
 - Nitrogen, NO2 plus NO3

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PROJECT NARRATIVE

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Method: ASTM D516-02
Description: ASTM D516-90 Sulfate Water
Client: AECOM
Date: July 10, 2012

General Information:
1 sample was analyzed for ASTM D516-02. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:
This data package has been reviewed for quality and completeness and is approved for release.

ANALYTICAL RESULTS

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Sample: SCDW Lab ID: 10197201001 Collected: 06/25/12 13:25 Received: 06/29/12 10:05 Matrix: Water									
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L		6.6	0.69	1	07/02/12 11:11	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
TEH (C10-C36), 8015	ND	mg/L		0.10	0.022	1	07/02/12 10:55	07/09/12 11:00	
WDRO C10-C28	ND	mg/L		0.10	0.020	1	07/02/12 10:55	07/09/12 11:00	
WDRO, Extended C10-C32	ND	mg/L		0.10	0.021	1	07/02/12 10:55	07/09/12 11:00	
Surrogates									
n-Triacontane (S)	84	%		50-150		1	07/02/12 10:55	07/09/12 11:00	
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L		1.0	0.27	1	07/04/12 03:12	71-43-2	
Ethylbenzene	ND	ug/L		1.0	0.25	1	07/04/12 03:12	100-41-4	
Toluene	ND	ug/L		1.0	0.22	1	07/04/12 03:12	108-88-3	
Xylene (Total)	ND	ug/L		3.0	0.75	1	07/04/12 03:12	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	99	%		80-125		1	07/04/12 03:12	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	0.45	mg/L		0.10	0.050	1	07/06/12 11:07		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	3.3	mg/L		2.5	0.012	1	07/02/12 10:48	14808-79-8	

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QUALITY CONTROL DATA

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

QC Batch: AIR/15224 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10197201001

METHOD BLANK: 1231968 Matrix: Water
Associated Lab Samples: 10197201001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	ug/L	ND	6.6	07/02/12 08:44	

LABORATORY CONTROL SAMPLE & LCS D:		1231969		1231970							
Parameter	Units	Spike Conc.	LCS Result	LCS D Result	% Rec	% Rec	Limits	RPD	Max RPD	Qualifiers	
Methane	ug/L	60.7	62.4	63.4	103	104	70-130	1	30		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		1232533		1232534							
Parameter	Units	MS Result	MSD Spike Conc.	MSD Result	% Rec	% Rec	Limits	RPD	Max RPD	Qual	
Methane	ug/L	ND	60.7	55.1	71.1	70.6	117	128	30-150	.8 30	

SAMPLE DUPLICATE:		1232536									
Parameter	Units	10197224010 Result	Dup Result	RPD	Max RPD	Qualifiers					
Methane	ug/L	176	165	7	30						

SAMPLE DUPLICATE:		1234137									
Parameter	Units	10197224001 Result	Dup Result	RPD	Max RPD	Qualifiers					
Methane	ug/L	ND	2.4J		30						

QUALITY CONTROL DATA

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

QC Batch: GCV/9461 Analysis Method: WI MOD GRO
QC Batch Method: WI MOD GRO Analysis Description: WIGRO GCV Water
Associated Lab Samples: 10197201001

METHOD BLANK: 1232426 Matrix: Water
Associated Lab Samples: 10197201001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	07/04/12 02:13	
Ethylbenzene	ug/L	ND	1.0	07/04/12 02:13	
Toluene	ug/L	ND	1.0	07/04/12 02:13	
Xylene (Total)	ug/L	ND	3.0	07/04/12 02:13	
a,a,a-Trifluorotoluene (S)	%	100	80-125	07/04/12 02:13	

LABORATORY CONTROL SAMPLE & LCS D:		1232427		1232428							
Parameter	Units	Spike Conc.	LCS Result	LCS D Result	% Rec	% Rec	Limits	RPD	Max RPD	Qualifiers	
Benzene	ug/L	100	103	107	103	107	80-120	4	20		
Ethylbenzene	ug/L	100	100	104	100	104	80-120	4	20		
Toluene	ug/L	100	102	106	102	106	80-120	5	20		
Xylene (Total)	ug/L	300	305	315	102	105	80-120	3	20		
a,a,a-Trifluorotoluene (S)	%				99	100	80-125				

MATRIX SPIKE SAMPLE:		1234922									
Parameter	Units	10197224003 Result	Spike Conc.	MS Result	% Rec	% Rec	Limits	RPD	Max RPD	Qualifiers	
Benzene	ug/L	ND	100	110	110	110	80-120				
Ethylbenzene	ug/L	ND	100	100	100	100	80-120				
Toluene	ug/L	ND	100	102	102	102	80-120				
Xylene (Total)	ug/L	ND	300	260	87	80-120					
a,a,a-Trifluorotoluene (S)	%				98	80-125					

SAMPLE DUPLICATE:		1234923									
Parameter	Units	10197224004 Result	Dup Result	RPD	Max RPD	Qualifiers					
Benzene	ug/L	ND	ND		20						
Ethylbenzene	ug/L	ND	.46J		20						
Toluene	ug/L	ND	ND		20						
Xylene (Total)	ug/L	ND	ND		20						
a,a,a-Trifluorotoluene (S)	%	100	100	2							

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QUALITY CONTROL DATA

Project: Enbridge South Cass Lake
Pace Project No.: 10197201
QC Batch: OEXT19000 Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10197201001

METHOD BLANK: 1232115 Matrix: Water
Associated Lab Samples: 10197201001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TEH (C10-C36), 8015	mg/L	ND	0.10	07/09/12 10:47	
WDRO C10-C28	mg/L	ND	0.10	07/09/12 10:47	
WDRO, Extended C10-C32	mg/L	ND	0.10	07/09/12 10:47	
n-Triacontane (S)	%	84	50-150	07/09/12 10:47	

LABORATORY CONTROL SAMPLE & LCS/D: 1232116 1232117

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	% Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
TEH (C10-C36), 8015	mg/L	2	1.7	1.7	84	86	75-115	2	20	
WDRO C10-C28	mg/L	2	1.7	1.7	84	86	75-115	2	20	
WDRO, Extended C10-C32	mg/L	2	1.7	1.7	84	86	75-115	2	20	
n-Triacontane (S)	%				84	86	50-150			

QUALITY CONTROL DATA

Project: Enbridge South Cass Lake
Pace Project No.: 10197201
QC Batch: WETA12779 Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10197201001

METHOD BLANK: 1234546 Matrix: Water
Associated Lab Samples: 10197201001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	07/06/12 10:38	

LABORATORY CONTROL SAMPLE: 1234547

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1234548 1234549

Parameter	Units	10197120001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	8.1	2.5	2.5	10.2	10	82	74	80-120	2	30	E,M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1234550 1234551

Parameter	Units	10196685024 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	1.6	1.5	62	57	80-120	8	30	M1

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QUALITY CONTROL DATA

Project: Enbridge South Cass Lake
Pace Project No.: 10197201
QC Batch: WETA12764 Analysis Method: ASTM D516-02
QC Batch Method: ASTM D516-02 Analysis Description: ASTM D516-9002 Sulfate Water
Associated Lab Samples: 10197201001

METHOD BLANK: 1232056 Matrix: Water
Associated Lab Samples: 10197201001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	07/02/12 10:48	

LABORATORY CONTROL SAMPLE: 1232057

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	7.5	6.6	88	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1232058 1232059

Parameter	Units	10197201001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	3.3	20	20	21.2	21.1	90	89	80-120	8	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1232060 1232061

Parameter	Units	10197224010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	9.9	20	20	28.8	28.5	95	93	80-120	1	30	

QUALIFIERS

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

DEFINITIONS

- DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.
- ND - Not Detected at or above adjusted reporting limit.
- J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
- MDL - Adjusted Method Detection Limit.
- PRL - Pace Reporting Limit.
- RL - Reporting Limit.
- S - Surrogate
- 1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.
- Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
- LCS(D) - Laboratory Control Sample (Duplicate)
- MS(D) - Matrix Spike (Duplicate)
- DUP - Sample Duplicate
- RPD - Relative Percent Difference
- NC - Not Calculable.
- SG - Silica Gel - Clean-Up
- U - Indicates the compound was analyzed for, but not detected.
- N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
- Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
- TNI - The NELAP Institute.

ANALYTE QUALIFIERS

- E Analyte concentration exceeded the calibration range. The reported result is estimated.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Enbridge South Cass Lake
Pace Project No.: 10197201

Table with 6 columns: Lab ID, Sample ID, QC Batch Method, QC Batch, Analytical Method, Analytical Batch. Contains 5 rows of data.

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Document Name: Sample Condition Upon Receipt Form
Document Revised: 19Jun2012
Document No.: F-MN-L-213-rev.03
Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt form. Includes fields for Client Name (Aecom), Project # (10197201), Courier, Tracking Number, Custody Seal, Packing Material, Thermometer Used, Cooler Temperature, and Date and Initials of Person Examining Contents.

Chain of Custody Present? Chain of Custody Filled Out? Chain of Custody Relinquished? Sampler Name and Signature on COC? Samples Arrived within Hold Time? Short Hold Time Analysis (<72 hr)? Rush Turn Around Time Requested? Sufficient Volume? Correct Containers Used? -Pace Containers Used? Containers Intact? Filtered Volume Received for Dissolved Tests? Sample Labels Match COC? Includes checkboxes for Yes/No/N/A and a list of 15 items.

CLIENT NOTIFICATION/RESOLUTION form. Includes fields for Person Contacted, Date/Time, Comments/Resolution, and Field Data Required.

Project Manager Review: Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

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CHAIN-OF-CUSTODY / Analytical Request Document. Includes fields for Page, Sample ID (1504532), Regulatory Agency, Site Location, Requested Analysis, and a large table for tracking sample collection, preservation, and analysis.

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

December 17, 2012

Brian Hill
AECOM
11 E. Superior Street, Suite 5
Duluth, MN 55802

RE: Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Dear Brian Hill: Enclosed are the analytical results for sample(s) received by the laboratory on December 08, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely, Carol Davy
carol.davy@pacelabs.com
Project Manager

Enclosures



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CERTIFICATIONS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Minnesota Certification IDs
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
AZLA Certification #: 2926.01
Alaska Certification #: U31-078
Alaska Certification #MNO0064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 359
Hawaii Certification #Pace
Idaho Certification #: MN00064
Illinois Certification #: 200011
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA980009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEC Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace

Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02819
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia/DCLS Certification #: 002521
Virginia/VELAP Certification #: 460163
Washington Certification #: C754
West Virginia Certification #: 362
Wisconsin Certification #: 999407970

SAMPLE SUMMARY

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10214762001	MW-1	Water	12/03/12 16:35	12/08/12 08:50
10214762002	MW-4	Water	12/05/12 10:15	12/08/12 08:50
10214762003	MW-6	Water	12/05/12 10:05	12/08/12 08:50
10214762004	MW-7	Water	12/05/12 14:20	12/08/12 08:50
10214762005	MW-8	Water	12/05/12 14:00	12/08/12 08:50
10214762006	MW-9	Water	12/07/12 08:45	12/08/12 08:50
10214762007	MW-10	Water	12/06/12 15:45	12/08/12 08:50
10214762008	MW-15	Water	12/05/12 16:00	12/08/12 08:50
10214762009	MW-16A	Water	12/05/12 15:20	12/08/12 08:50
10214762010	MW-16B	Water	12/05/12 16:25	12/08/12 08:50
10214762011	MW-17	Water	12/06/12 09:40	12/08/12 08:50
10214762012	MW-18	Water	12/06/12 08:45	12/08/12 08:50
10214762013	MW-19	Water	12/06/12 11:10	12/08/12 08:50
10214762014	USGS-1A	Water	12/06/12 12:45	12/08/12 08:50
10214762015	USGS-2A	Water	12/06/12 11:40	12/08/12 08:50
10214762016	USGS-3A	Water	12/06/12 10:50	12/08/12 08:50
10214762017	USGS-4A	Water	12/06/12 10:00	12/08/12 08:50
10214762018	SLDW	Water	12/05/12 11:05	12/08/12 08:50
10214762019	Field Blank	Water	12/05/12 11:35	12/08/12 08:50
10214762020	Dup	Water	12/06/12 16:10	12/08/12 08:50

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SAMPLE ANALYTE COUNT

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Lab ID	Sample ID	Method	Analysts	Analyses Reported
10214762001	MW-1	RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	DJT	5
		SM 4500-NO3 H	PH1	1
10214762002	MW-4	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	DJT	5
10214762003	MW-6	SM 4500-NO3 H	PH1	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
10214762004	MW-7	WI MOD GRO	DJT	5
		SM 4500-NO3 H	PH1	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
10214762005	MW-8	Diesel Range Organics	JRH	2
		WI MOD GRO	DJT	5
		SM 4500-NO3 H	PH1	1
		ASTM D516-02	KEO	1
10214762006	MW-9	RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	DJT	5
		SM 4500-NO3 H	PH1	1
10214762007	MW-10	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	DJT, KT1	5
10214762008	MW-15	SM 4500-NO3 H	PH1	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2

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SAMPLE ANALYTE COUNT

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Lab ID	Sample ID	Method	Analysts	Analyses Reported
10214762009	MW-16A	WI MOD GRO	DJT	5
		SM 4500-NO3 H	PH1	1
		ASTM D516-02	KEO	1
10214762010	MW-16B	RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	DJT	5
10214762011	MW-17	SM 4500-NO3 H	PH1	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
10214762012	MW-18	Diesel Range Organics	JRH	2
		WI MOD GRO	DJT	5
		SM 4500-NO3 H	PH1	1
10214762013	MW-19	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
10214762014	USGS-1A	WI MOD GRO	DJT	5
		SM 4500-NO3 H	PH1	1
		ASTM D516-02	KEO	1
10214762015	USGS-2A	RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	KT1	5
10214762016	USGS-3A	SM 4500-NO3 H	PH1	1
		ASTM D516-02	KEO	1
		RSK 175	SK4	1
10214762017	USGS-4A	Diesel Range Organics	JRH	2
		WI MOD GRO	KT1	5
		SM 4500-NO3 H	PH1	1

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SAMPLE ANALYTE COUNT

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Lab ID	Sample ID	Method	Analysts	Analyses Reported
10214762016	USGS-3A	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	KT1	5
		SM 4500-NO3 H	PH1	1
10214762017	USGS-4A	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	KT1	5
		SM 4500-NO3 H	PH1	1
10214762018	SLDW	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	KT1	5
		SM 4500-NO3 H	PH1	1
10214762019	Field Blank	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	KT1	5
		SM 4500-NO3 H	PH1	1
10214762020	Dup	ASTM D516-02	KEO	1
		RSK 175	SK4	1
		Diesel Range Organics	JRH	2
		WI MOD GRO	KT1	5
		SM 4500-NO3 H	PH1	1

PROJECT NARRATIVE

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Method: RSK 175
Description: RSK 175 AIR Headspace
Client: AECOM
Date: December 17, 2012

General Information:
20 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:
Analyte Comments:
QC Batch: AIR/16362
E: Analyte concentration exceeded the calibration range. The reported result is estimated.
• USGS-2A (Lab ID: 10214762015)
• Methane

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PROJECT NARRATIVE

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Method: Diesel Range Organics
Description: WIDRO Extended GCS
Client: AECOM
Date: December 17, 2012

General Information:
20 samples were analyzed for Diesel Range Organics. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with Diesel Range Organics with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

PROJECT NARRATIVE

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Method: WI MOD GRO
Description: WIGRO GCV
Client: AECOM
Date: December 17, 2012

General Information:
20 samples were analyzed for WI MOD GRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.
QC Batch: GCV/10168
A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10214762001
M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
• MS (Lab ID: 1345309)
• Benzene

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Method: SM 4500-NO3 H
Description: SM4500NO3-H, NO2 + NO3 pres.
Client: AECOM
Date: December 17, 2012

General Information:
20 samples were analyzed for SM 4500-NO3 H. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WETA14095

A matrix spike and matrix spike duplicate (MSMSD) were performed on the following sample(s): 10214762001, 10214762011
M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1348519)
- Nitrogen, NO2 plus NO3
- MSD (Lab ID: 1348520)
- Nitrogen, NO2 plus NO3

Additional Comments:



PROJECT NARRATIVE

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Method: ASTM D516-02
Description: ASTM D516-90 Sulfate Water
Client: AECOM
Date: December 17, 2012

General Information:
20 samples were analyzed for ASTM D516-02. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
MW-1	10214762001	12/03/12 16:35	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	3.3	1		12/10/12 16:32	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WIDRO, Extended C10-C32	ND	mg/L	0.11	0.022	1	12/10/12 15:47	12/15/12 14:31		
Surrogates	74	%	50-150		1	12/10/12 15:47	12/15/12 14:31		
n-Triacontane (S)									
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/11/12 21:37	71-43-2	M1
Toluene	ND	ug/L	1.0	0.22	1		12/11/12 21:37	108-88-3	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/11/12 21:37	100-41-4	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/11/12 21:37	1330-20-7	
Surrogates	101	%	80-125		1		12/11/12 21:37	98-08-8	
a,a,a-Trifluorotoluene (S)									
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	1.2	mg/L	0.10	0.050	1		12/12/12 12:07		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:19	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
MW-4	10214762002	12/05/12 10:15	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	3.3	1		12/10/12 17:04	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WIDRO, Extended C10-C32	ND	mg/L	0.11	0.022	1	12/10/12 15:47	12/15/12 14:38		
Surrogates	86	%	50-150		1	12/10/12 15:47	12/15/12 14:38		
n-Triacontane (S)									
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/11/12 20:57	71-43-2	
Toluene	ND	ug/L	1.0	0.22	1		12/11/12 20:57	108-88-3	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/11/12 20:57	100-41-4	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/11/12 20:57	1330-20-7	
Surrogates	98	%	80-125		1		12/11/12 20:57	98-08-8	
a,a,a-Trifluorotoluene (S)									
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	3.0	mg/L	0.10	0.050	1		12/12/12 12:09		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	4.5	mg/L	2.5	0.012	1		12/14/12 12:22	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
Sample: MW-6	Lab ID: 10214762003	12/05/12 10:05	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	6.6	3.3	1		12/10/12 16:53	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 14:45		
Surrogates									
n-Triacontane (S)	87	%	50-150		1	12/10/12 15:47	12/15/12 14:45		
WIGRO GCV	Analytical Method: WI MOD GRO								
Benzene	ND	ug/L	1.0	0.27	1		12/11/12 23:17	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/11/12 23:17	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/11/12 23:17	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/11/12 23:17	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	100	%	80-125		1		12/11/12 23:17	98-08-8	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	2.3	mg/L	0.10	0.050	1		12/12/12 12:12		
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-02								
Sulfate	3.2	mg/L	2.5	0.012	1		12/14/12 12:22	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
Sample: MW-8	Lab ID: 10214762005	12/05/12 14:00	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	6.6	3.3	1		12/10/12 17:58	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	0.11	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 15:00		
Surrogates									
n-Triacontane (S)	75	%	50-150		1	12/10/12 15:47	12/15/12 15:00		
WIGRO GCV	Analytical Method: WI MOD GRO								
Benzene	ND	ug/L	1.0	0.27	1		12/11/12 23:57	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/11/12 23:57	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/11/12 23:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/11/12 23:57	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	100	%	80-125		1		12/11/12 23:57	98-08-8	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	0.11	mg/L	0.10	0.050	1		12/12/12 12:13		
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-02								
Sulfate	7.2	mg/L	2.5	0.012	1		12/14/12 12:25	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
Sample: MW-7	Lab ID: 10214762004	12/05/12 14:20	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	6.6	3.3	1		12/10/12 17:37	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.022	1	12/10/12 15:47	12/15/12 14:52		
Surrogates									
n-Triacontane (S)	83	%	50-150		1	12/10/12 15:47	12/15/12 14:52		
WIGRO GCV	Analytical Method: WI MOD GRO								
Benzene	ND	ug/L	1.0	0.27	1		12/11/12 23:37	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/11/12 23:37	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/11/12 23:37	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/11/12 23:37	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	100	%	80-125		1		12/11/12 23:37	98-08-8	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	0.14	mg/L	0.10	0.050	1		12/12/12 12:13		
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-02								
Sulfate	6.4	mg/L	2.5	0.012	1		12/14/12 12:22	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
Sample: MW-9	Lab ID: 10214762006	12/07/12 08:45	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	359	ug/L	6.6	3.3	1		12/10/12 18:09	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	0.63	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 15:51		
Surrogates									
n-Triacontane (S)	76	%	50-150		1	12/10/12 15:47	12/15/12 15:51		
WIGRO GCV	Analytical Method: WI MOD GRO								
Benzene	3.9	ug/L	1.0	0.27	1		12/12/12 00:17	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 00:17	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 00:17	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 00:17	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	103	%	80-125		1		12/12/12 00:17	98-08-8	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:17		
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-02								
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:25	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
Sample: MW-10	Lab ID: 10214762007	12/06/12 15:45	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	6900	ug/L	6.6	3.3	1		12/10/12 18:20	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	7.4	mg/L	0.22	0.043	2	12/10/12 15:47	12/15/12 17:18		
Surrogates	ND	ug/L	1.0	0.22	1				
n-Triacontane (S)	100	%	50-150		2	12/10/12 15:47	12/15/12 17:18		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	653	ug/L	5.0	1.4	5		12/12/12 09:27	71-43-2	
Ethylbenzene	1.7	ug/L	1.0	0.25	1		12/12/12 02:17	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 02:17	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 02:17	1330-20-7	
Surrogates	ND	ug/L	1.0	0.22	1				
a.a.a-Trifluorotoluene (S)	111	%	80-125		1		12/12/12 02:17	98-08-8	HS
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:18		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:25	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
Sample: MW-15	Lab ID: 10214762008	12/05/12 16:00	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	331	ug/L	6.6	3.3	1		12/10/12 18:30	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	ND	mg/L	0.11	0.022	1	12/10/12 15:47	12/15/12 15:58		
Surrogates	73	%	50-150		1	12/10/12 15:47	12/15/12 15:58		
n-Triacontane (S)	73	%	50-150		1	12/10/12 15:47	12/15/12 15:58		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/12/12 00:37	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 00:37	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 00:37	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 00:37	1330-20-7	
Surrogates	99	%	80-125		1		12/12/12 00:37	98-08-8	
a.a.a-Trifluorotoluene (S)	99	%	80-125		1		12/12/12 00:37	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	3.4	mg/L	0.10	0.050	1		12/12/12 12:19		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:25	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
Sample: MW-16A	Lab ID: 10214762009	12/05/12 15:20	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	297	ug/L	6.6	3.3	1		12/10/12 18:41	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	1.0	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 16:05		
Surrogates	82	%	50-150		1	12/10/12 15:47	12/15/12 16:05		
n-Triacontane (S)	82	%	50-150		1	12/10/12 15:47	12/15/12 16:05		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	59.8	ug/L	1.0	0.27	1		12/12/12 02:37	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 02:37	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 02:37	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 02:37	1330-20-7	
Surrogates	102	%	80-125		1		12/12/12 02:37	98-08-8	
a.a.a-Trifluorotoluene (S)	102	%	80-125		1		12/12/12 02:37	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:22		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:27	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
Sample: MW-16B	Lab ID: 10214762010	12/05/12 16:25	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	7.9	ug/L	6.6	3.3	1		12/10/12 19:02	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	0.25	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 15:07		
Surrogates	86	%	50-150		1	12/10/12 15:47	12/15/12 15:07		
n-Triacontane (S)	86	%	50-150		1	12/10/12 15:47	12/15/12 15:07		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/12/12 00:57	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 00:57	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 00:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 00:57	1330-20-7	
Surrogates	101	%	80-125		1		12/12/12 00:57	98-08-8	
a.a.a-Trifluorotoluene (S)	101	%	80-125		1		12/12/12 00:57	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	1.1	mg/L	0.10	0.050	1		12/12/12 12:22		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	11.3	mg/L	2.5	0.012	1		12/14/12 12:27	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
MW-17	10214762011	12/06/12 09:40	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	3.3	1		12/10/12 19:13	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	0.17	mg/L	0.11	0.022	1	12/10/12 15:47	12/15/12 15:43		
Surrogates									
n-Triacontane (S)	76	%	50-150		1	12/10/12 15:47	12/15/12 15:43		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/12/12 01:17	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 01:17	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 01:17	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 01:17	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	101	%	80-125		1		12/12/12 01:17	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:23		M1
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	8.5	mg/L	2.5	0.012	1		12/14/12 12:27	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
MW-18	10214762012	12/06/12 08:45	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	3.3	1		12/10/12 20:06	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	ND	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 15:14		
Surrogates									
n-Triacontane (S)	71	%	50-150		1	12/10/12 15:47	12/15/12 15:14		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/12/12 01:37	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 01:37	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 01:37	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 01:37	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	101	%	80-125		1		12/12/12 01:37	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	2.8	mg/L	0.10	0.050	1		12/12/12 12:27		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	3.4	mg/L	2.5	0.012	1		12/14/12 12:30	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
MW-19	10214762013	12/06/12 11:10	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	12.8	ug/L	6.6	3.3	1		12/10/12 20:17	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	0.37	mg/L	0.11	0.022	1	12/10/12 15:47	12/15/12 15:21		
Surrogates									
n-Triacontane (S)	75	%	50-150		1	12/10/12 15:47	12/15/12 15:21		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/12/12 01:57	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 01:57	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 01:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 01:57	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	101	%	80-125		1		12/12/12 01:57	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:28		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	3.5	mg/L	2.5	0.012	1		12/14/12 12:30	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	Lab ID:	Collected:	Received:	Matrix:					
USGS-1A	10214762014	12/06/12 12:45	12/08/12 08:50	Water					
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	395	ug/L	6.6	3.3	1		12/10/12 20:27	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	1.0	mg/L	0.11	0.022	1	12/10/12 15:47	12/15/12 16:49		
Surrogates									
n-Triacontane (S)	75	%	50-150		1	12/10/12 15:47	12/15/12 16:49		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	5.4	ug/L	1.0	0.27	1		12/12/12 13:57	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 13:57	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 13:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 13:57	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	105	%	80-125		1		12/12/12 13:57	98-08-8	
SM4500NO3-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:32		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:30	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	USGS-2A	Lab ID:	10214762015	Collected:	12/06/12 11:40	Received:	12/08/12 08:50	Matrix:	Water
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	7210	ug/L	6.6	3.3	1		12/10/12 20:38	74-82-8	E
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	4.9	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 16:34		
Surrogates									
n-Triacontane (S)	111	%	50-150		1	12/10/12 15:47	12/15/12 16:34		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	554	ug/L	5.0	1.4	5		12/13/12 15:33	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 14:17	100-41-4	
Toluene	1.0	ug/L	1.0	0.22	1		12/12/12 14:17	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 14:17	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	108	%	80-125		1		12/12/12 14:17	98-08-8	
SM4500N03-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:33		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:30	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	USGS-3A	Lab ID:	10214762016	Collected:	12/06/12 10:50	Received:	12/08/12 08:50	Matrix:	Water
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	1860	ug/L	6.6	3.3	1		12/10/12 20:49	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	2.2	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 16:12		
Surrogates									
n-Triacontane (S)	69	%	50-150		1	12/10/12 15:47	12/15/12 16:12		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	1.0	ug/L	1.0	0.27	1		12/13/12 15:13	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/13/12 15:13	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/13/12 15:13	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/13/12 15:13	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	108	%	80-125		1		12/13/12 15:13	98-08-8	
SM4500N03-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:33		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:30	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	USGS-4A	Lab ID:	10214762017	Collected:	12/06/12 10:00	Received:	12/08/12 08:50	Matrix:	Water
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	270	ug/L	6.6	3.3	1		12/10/12 19:45	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	1.7	mg/L	0.10	0.021	1	12/10/12 15:47	12/15/12 16:19		
Surrogates									
n-Triacontane (S)	67	%	50-150		1	12/10/12 15:47	12/15/12 16:19		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	7.2	ug/L	1.0	0.27	1		12/12/12 14:57	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 14:57	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 14:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 14:57	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	104	%	80-125		1		12/12/12 14:57	98-08-8	
SM4500N03-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:36		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:32	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample:	SLDW	Lab ID:	10214762018	Collected:	12/05/12 11:05	Received:	12/08/12 08:50	Matrix:	Water
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	ND	ug/L	6.6	3.3	1		12/10/12 20:59	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	ND	mg/L	0.11	0.023	1	12/10/12 15:47	12/15/12 15:29		
Surrogates									
n-Triacontane (S)	79	%	50-150		1	12/10/12 15:47	12/15/12 15:29		
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/12/12 15:17	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 15:17	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 15:17	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 15:17	1330-20-7	
Surrogates									
a.a.a-Trifluorotoluene (S)	99	%	80-125		1		12/12/12 15:17	98-08-8	
SM4500N03-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	0.38	mg/L	0.10	0.050	1		12/12/12 12:37		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:32	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample: **Field Blank** Lab ID: **10214762019** Collected: 12/05/12 11:35 Received: 12/08/12 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	25.9	ug/L	6.6	3.3	1		12/10/12 21:10	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	ND	mg/L	0.11	0.022	1	12/10/12 15:47	12/15/12 15:36		
Surrogates	87	%	50-150		1	12/10/12 15:47	12/15/12 15:36		
n-Triacontane (S)									
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	ND	ug/L	1.0	0.27	1		12/12/12 10:07	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		12/12/12 10:07	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		12/12/12 10:07	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 10:07	1330-20-7	
Surrogates	100	%	80-125		1		12/12/12 10:07	98-08-8	
a.a.a-Trifluorotoluene (S)									
SM4500N03-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:37		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:32	14808-79-8	

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ANALYTICAL RESULTS

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Sample: **Dup** Lab ID: **10214762020** Collected: 12/06/12 16:10 Received: 12/08/12 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace Analytical Method: RSK 175									
Methane	3030	ug/L	6.6	3.3	1		12/10/12 21:21	74-82-8	
WIDRO Extended GCS Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics									
WDRO, Extended C10-C32	7.7	mg/L	0.22	0.044	2	12/10/12 15:47	12/15/12 17:25		
Surrogates	90	%	50-150		2	12/10/12 15:47	12/15/12 17:25		
n-Triacontane (S)									
WIGRO GCV Analytical Method: WI MOD GRO									
Benzene	579	ug/L	5.0	1.4	5		12/13/12 15:53	71-43-2	
Ethylbenzene	1.9	ug/L	1.0	0.25	1		12/12/12 15:37	100-41-4	
Toluene	1.0	ug/L	1.0	0.22	1		12/12/12 15:37	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		12/12/12 15:37	1330-20-7	
Surrogates	116	%	80-125		1		12/12/12 15:37	98-08-8	
a.a.a-Trifluorotoluene (S)									
SM4500N03-H, NO2 + NO3 pres. Analytical Method: SM 4500-NO3 H									
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/12/12 12:38		
ASTM D516-90 Sulfate Water Analytical Method: ASTM D516-02									
Sulfate	ND	mg/L	2.5	0.012	1		12/14/12 12:32	14808-79-8	

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QUALITY CONTROL DATA

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

QC Batch: AIR/16362 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10214762001, 10214762002, 10214762003, 10214762004, 10214762005, 10214762006, 10214762007, 10214762008, 10214762009, 10214762010, 10214762011, 10214762012, 10214762013, 10214762014, 10214762015, 10214762016, 10214762017, 10214762018, 10214762019, 10214762020

METHOD BLANK: 1348170 Matrix: Water

Associated Lab Samples: 10214762001, 10214762002, 10214762003, 10214762004, 10214762005, 10214762006, 10214762007, 10214762008, 10214762009, 10214762010, 10214762011, 10214762012, 10214762013, 10214762014, 10214762015, 10214762016, 10214762017, 10214762018, 10214762019, 10214762020

Parameter	Units	Blank		Analyzed	Qualifiers
		Result	Limit		
Methane	ug/L	ND	6.6	12/10/12 16:22	

LABORATORY CONTROL SAMPLE & LCSD: 1348171 1348172

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	% Rec	% Rec Limits	RPD	Max RPD	Qualifiers

SAMPLE DUPLICATE: 1348544

Parameter	Units	Dup		RPD	Max RPD	Qualifiers
		Result	Result			
Methane	ug/L	ND	ND		30	

SAMPLE DUPLICATE: 1348545

Parameter	Units	Dup		RPD	Max RPD	Qualifiers
		Result	Result			
Methane	ug/L	ND	ND		30	

SAMPLE DUPLICATE: 1348546

Parameter	Units	Dup		RPD	Max RPD	Qualifiers
		Result	Result			
Methane	ug/L	270	261	3	30	

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QUALITY CONTROL DATA

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

QC Batch: GCV/10168 Analysis Method: WI MOD GRO
QC Batch Method: WI MOD GRO Analysis Description: WIGRO GCV Water

Associated Lab Samples: 10214762001, 10214762002, 10214762003, 10214762004, 10214762005, 10214762006, 10214762007, 10214762008, 10214762009, 10214762010, 10214762011, 10214762012, 10214762013

METHOD BLANK: 1348339 Matrix: Water

Associated Lab Samples: 10214762001, 10214762002, 10214762003, 10214762004, 10214762005, 10214762006, 10214762007, 10214762008, 10214762009, 10214762010, 10214762011, 10214762012, 10214762013

Parameter	Units	Blank		Analyzed	Qualifiers
		Result	Limit		
Benzene	ug/L	ND	1.0	12/11/12 18:37	
Ethylbenzene	ug/L	ND	1.0	12/11/12 18:37	
Toluene	ug/L	ND	1.0	12/11/12 18:37	
Xylene (Total)	ug/L	ND	3.0	12/11/12 18:37	
a.a.a-Trifluorotoluene (S)	%	101	80-125	12/11/12 18:37	

LABORATORY CONTROL SAMPLE & LCSD: 1348340 1348341

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	% Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethylbenzene	ug/L	100	92.6	97.0	93	97	80-120	5	20
Toluene	ug/L	100	93.2	98.1	93	98	80-120	5	20
Xylene (Total)	ug/L	300	278	291	93	97	80-120	5	20
a.a.a-Trifluorotoluene (S)	%				101	100	80-125		

MATRIX SPIKE SAMPLE: 1349309

Parameter	Units	Dup		MS Result	MS % Rec	% Rec Limits	Qualifiers
		Result	Result				
Benzene	ug/L	ND	100	121	121	114	80-120 M1
Ethylbenzene	ug/L	ND	100	114	114	114	80-120
Toluene	ug/L	ND	100	116	116	116	80-120
Xylene (Total)	ug/L	ND	300	341	114	114	80-120
a.a.a-Trifluorotoluene (S)	%				99	99	80-125

SAMPLE DUPLICATE: 1349310

Parameter	Units	Dup		RPD	Max RPD	Qualifiers
		Result	Result			
Benzene	ug/L	ND	ND		20	
Ethylbenzene	ug/L	ND	77.1		20	
Toluene	ug/L	ND	ND		20	
Xylene (Total)	ug/L	ND	ND		20	
a.a.a-Trifluorotoluene (S)	%	98	99	6		

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QUALITY CONTROL DATA

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762
QC Batch: GCV/10172 Analysis Method: WI MOD GRO
QC Batch Method: WI MOD GRO Analysis Description: WIGRO GCV Water
Associated Lab Samples: 10214762014, 10214762015, 10214762017, 10214762018, 10214762019, 10214762020

METHOD BLANK: 1348888 Matrix: Water
Associated Lab Samples: 10214762014, 10214762015, 10214762017, 10214762018, 10214762019, 10214762020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	12/12/12 08:34	
Ethylbenzene	ug/L	ND	1.0	12/12/12 08:34	
Toluene	ug/L	ND	1.0	12/12/12 08:34	
Xylene (Total)	ug/L	ND	3.0	12/12/12 08:34	
a.a.a-Trifluorotoluene (S)	%	100	80-125	12/12/12 08:34	

LABORATORY CONTROL SAMPLE & LCS/D: 1348889 1348890

Parameter	Units	Spike Conc.	LCS Result	LCS/D Result	LCS % Rec	LCS/D % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	100	112	104	112	104	80-120	8	20	
Ethylbenzene	ug/L	100	107	103	107	103	80-120	4	20	
Toluene	ug/L	100	108	103	108	103	80-120	5	20	
Xylene (Total)	ug/L	300	321	309	107	103	80-120	4	20	
a.a.a-Trifluorotoluene (S)	%				100	100	80-125			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1348891 1348892

Parameter	Units	MS Result	MSD Spike Conc.	MSD Spike Result	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	434	1000	1000	1420	1500	98	108	80-120	5	20	
Ethylbenzene	ug/L	1200	1000	1000	2140	2270	93	106	80-120	6	20	
Toluene	ug/L	300	1000	1000	1290	1360	99	106	80-120	5	20	
Xylene (Total)	ug/L	4350	3000	3000	7070	7500	91	105	80-120	6	20	
a.a.a-Trifluorotoluene (S)	%						99	100	80-125			

Date: 12/17/2012 03:32 PM

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762
QC Batch: GCV/10184 Analysis Method: WI MOD GRO
QC Batch Method: WI MOD GRO Analysis Description: WIGRO GCV Water
Associated Lab Samples: 10214762016

METHOD BLANK: 1350487 Matrix: Water
Associated Lab Samples: 10214762016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	12/13/12 14:12	
Ethylbenzene	ug/L	ND	1.0	12/13/12 14:12	
Toluene	ug/L	ND	1.0	12/13/12 14:12	
Xylene (Total)	ug/L	ND	3.0	12/13/12 14:12	
a.a.a-Trifluorotoluene (S)	%	100	80-125	12/13/12 14:12	

LABORATORY CONTROL SAMPLE & LCS/D: 1350488 1350489

Parameter	Units	Spike Conc.	LCS Result	LCS/D Result	LCS % Rec	LCS/D % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	100	95.8	97.1	96	97	80-120	1	20	
Ethylbenzene	ug/L	100	94.6	95.8	95	96	80-120	1	20	
Toluene	ug/L	100	94.5	95.2	95	95	80-120	.8	20	
Xylene (Total)	ug/L	300	285	288	95	96	80-120	.9	20	
a.a.a-Trifluorotoluene (S)	%				100	100	80-125			

MATRIX SPIKE SAMPLE: 1351196

Parameter	Units	10214940001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	26.0	100	136	110	80-120	
Ethylbenzene	ug/L	1.4	100	105	104	80-120	
Toluene	ug/L	11.8	100	118	106	80-120	
Xylene (Total)	ug/L	20.3	300	332	104	80-120	
a.a.a-Trifluorotoluene (S)	%				100	80-125	

SAMPLE DUPLICATE: 1351197

Parameter	Units	10214940002 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	.461		20	
Ethylbenzene	ug/L	ND	ND		20	
Toluene	ug/L	ND	ND		20	
Xylene (Total)	ug/L	ND	ND		20	
a.a.a-Trifluorotoluene (S)	%	100	98	1		

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QUALITY CONTROL DATA

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762
QC Batch: OEXT/20476 Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10214762001, 10214762002, 10214762003, 10214762004, 10214762005, 10214762006, 10214762007, 10214762008, 10214762009, 10214762010, 10214762011, 10214762012, 10214762013, 10214762014, 10214762015, 10214762016, 10214762017, 10214762018, 10214762019, 10214762020

METHOD BLANK: 1348358 Matrix: Water
Associated Lab Samples: 10214762001, 10214762002, 10214762003, 10214762004, 10214762005, 10214762006, 10214762007, 10214762008, 10214762009, 10214762010, 10214762011, 10214762012, 10214762013, 10214762014, 10214762015, 10214762016, 10214762017, 10214762018, 10214762019, 10214762020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO, Extended C10-C32	mg/L	ND	0.10	12/15/12 14:16	
n-Triacontane (S)	%	80	50-150	12/15/12 14:16	

LABORATORY CONTROL SAMPLE & LCS/D: 1348359 1348360

Parameter	Units	Spike Conc.	LCS Result	LCS/D Result	LCS % Rec	LCS/D % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO, Extended C10-C32	mg/L	2	2.0	2.0	100	101	75-115	1	20	
n-Triacontane (S)	%				99	100	50-150			

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QUALITY CONTROL DATA

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762
QC Batch: WETA/14095 Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10214762001, 10214762002, 10214762003, 10214762004, 10214762005, 10214762006, 10214762007, 10214762008, 10214762009, 10214762010, 10214762011, 10214762012, 10214762013, 10214762014, 10214762015, 10214762016, 10214762017, 10214762018, 10214762019, 10214762020

METHOD BLANK: 1348515 Matrix: Water
Associated Lab Samples: 10214762001, 10214762002, 10214762003, 10214762004, 10214762005, 10214762006, 10214762007, 10214762008, 10214762009, 10214762010, 10214762011, 10214762012, 10214762013, 10214762014, 10214762015, 10214762016, 10214762017, 10214762018, 10214762019, 10214762020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	12/12/12 12:04	

LABORATORY CONTROL SAMPLE: 1348516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1348517 1348518

Parameter	Units	10214762001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.2	2.5	2.5	3.3	3.3	86	85	80-120	.8	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1348519 1348520

Parameter	Units	10214762011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	1.6	1.6	62	63	80-120	.6	30 M1	

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QUALITY CONTROL DATA

Table with columns: Project, Pace Project No., QC Batch, Analysis Method, Associated Lab Samples, METHOD BLANK, Associated Lab Samples, LABORATORY CONTROL SAMPLE, MATRIX SPIKE & MATRIX SPIKE DUPLICATE. Includes data for Sulfate concentration and various analytical parameters.

QUALIFIERS

Table with columns: Project, Pace Project No., DEFINITIONS, WORKORDER QUALIFIERS, ANALYTE QUALIFIERS. Lists various analytical terms and their definitions, such as Dilution Factor, Reporting Limit, and Matrix Spike recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Cross-reference table with columns: Lab ID, Sample ID, QC Batch Method, QC Batch, Analytical Method, Analytical Batch. Lists sample IDs and their corresponding QC and analytical batch numbers.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Cross-reference table with columns: Lab ID, Sample ID, QC Batch Method, QC Batch, Analytical Method, Analytical Batch. Lists sample IDs and their corresponding QC and analytical batch numbers.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60254681 Enbridge S. Cass Lake
Pace Project No.: 10214762

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10214762015	USGS-2A	ASTM D516-02	WETA/14121		
10214762016	USGS-3A	ASTM D516-02	WETA/14121		
10214762017	USGS-4A	ASTM D516-02	WETA/14121		
10214762018	SLDW	ASTM D516-02	WETA/14121		
10214762019	Field Blank	ASTM D516-02	WETA/14121		
10214762020	Dup	ASTM D516-02	WETA/14121		

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0026.D Page 1
Report Date: 15-Dec-2012 15:03

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NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0026.D
Lab Smp Id: 10214762001
Inj Date : 15-DEC-2012 14:31
Operator : JRH Inst ID: 10gcs5.i
Smp Info : 10214762001
Misc Info : 10608
Comment :
Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
Als bottle: 4
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 4.14
Processing Host: 10VOA3

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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Date: 12/17/2012 03:32 PM

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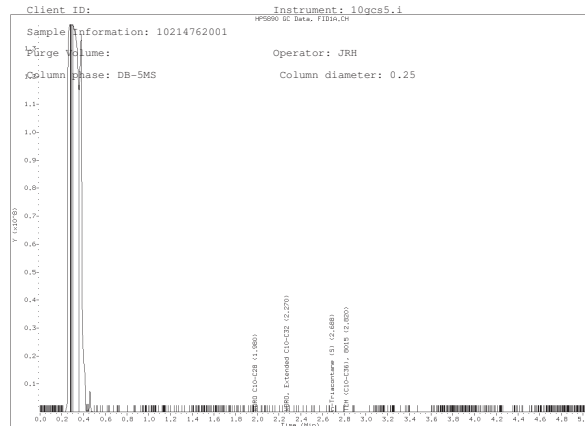
DF 1.000 Dilution Factor
Uf 1.000 ng unit correction factor
Vt 1.000 Volume of final extract (mL)
Vo 1000.000 Volume of sample extracted (mL)
Vi 1.000 Volume injected
Cpnd Variable Local Compound Variable

Compounds	CONCENTRATIONS					
	RT	EXP RT	DLT RT	RESPONSE	ON-COLUMN (ug/mL)	FINAL (ug/L)
S 1 WDRO C10-C28	1.340	2.620		249715	40.7893	0.0408 (a)
S 2 WDRO, Extended C10-C32	1.340	3.200		337961	52.4718	0.0525 (aM)
S 3 TEH (C10-C36), 8015	1.340	4.300		393285	60.7550	0.0608 (aM)
S 7 n-Triacontane (S)	2.687	2.692	-0.005	184616	36.7504	0.0368 (aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation (BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0026.D
Report Date: 12/15/2012
Sample ID: 10214762001
Client ID:



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DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0027.D
 Lab Smp Id: 10214762002
 Inj Date : 15-DEC-2012 14:38
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762002
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 5
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (ng/L)
S 1 WDRO C10-C28	1.340	2.620		306371	49.2722	0.0493(a)
S 2 WDRO, Extended C10-C32	1.340	3.200		421039	65.0584	0.0650(aM)
S 3 TRH (C10-C36), 8015	1.340	4.300		499252	77.5013	0.0775(aM)
S 7 n-Tricosane (S)	2.687	2.692	-0.005	216683	43.1904	0.0432(aM)

QC Flag Legend

a - Target compound detected but, quantitated amount
 Below Limit Of Quantitation (BLOQ).
 M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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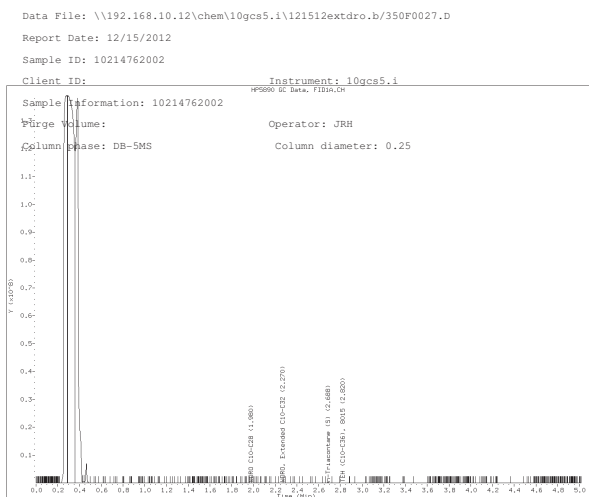
Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0028.D
 Lab Smp Id: 10214762003
 Inj Date : 15-DEC-2012 14:45
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762003
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 6
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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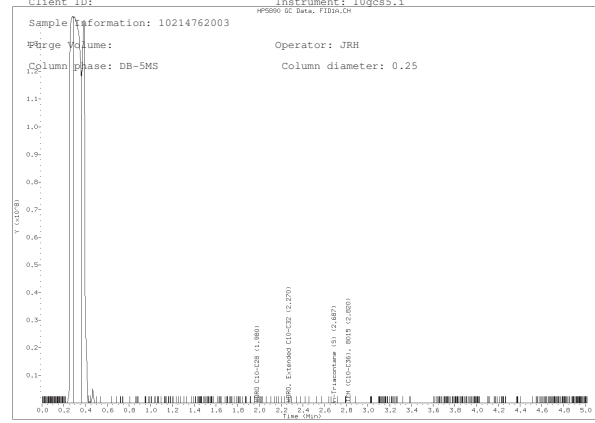
DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Compounds	CONCENTRATIONS				
	RT	EXP RT	DLT RT	RESPONSE	FINAL
S 1 WDRO C10-C28	1.340-2.620			488406	76.5276 (a)
S 2 WDRO, Extended C10-C32	1.340-3.200			626726	96.2208 (aM)
S 3 TEH (C10-C36), 8015	1.340-4.300			720211	112.420 (aM)
S 7 n-Triacontane (S)	2.686 2.692	-0.006		218893	43.6342 (aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation (BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0028.D
 Report Date: 12/15/2012
 Sample ID: 10214762003
 Client ID:



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Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0029.D Page 1
 Report Date: 15-Dec-2012 15:03

DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0029.D
 Lab Smp Id: 10214762004
 Inj Date: 15-DEC-2012 14:52
 Operator: JRH Inst ID: 10gcs5.i
 Smp Info: 10214762004
 Misc Info: 10608
 Comment:
 Method: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date: 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date: 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 7
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	CONCENTRATIONS				
	RT	EXP RT	DLT RT	RESPONSE	FINAL
S 1 WDRO C10-C28	1.340-2.620			299021	48.1717 (a)
S 2 WDRO, Extended C10-C32	1.340-3.200			409617	63.3280 (aM)
S 3 TEH (C10-C36), 8015	1.340-4.300			484727	75.2059 (aM)
S 7 n-Triacontane (S)	2.686 2.692	-0.006		209478	41.7434 (aM)

QC Flag Legend

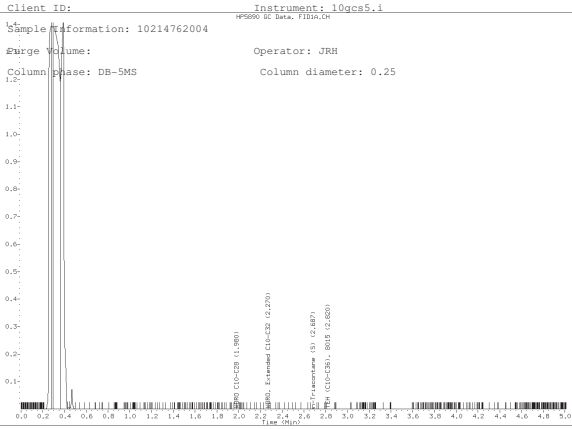
- a - Target compound detected but, quantitated amount Below Limit Of Quantitation (BLOQ).
- M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description

Pace Analytical Services

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0029.D
 Report Date: 12/15/2012
 Sample ID: 10214762004



Client ID: Instrument: 10gcs5.i
 Sample Information: 10214762004
 Sample Volume: Operator: JRH
 Column phase: DB-5MS Column diameter: 0.25
 NWTPH-Dx
 Data file: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0030.D
 Lab Smp Id: 10214762005
 Inj Date: 15-DEC-2012 15:00
 Operator: JRH Inst ID: 10gcs5.i
 Smp Info: 10214762005
 Misc Info: 10608
 Comment:
 Method: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
 Meth Date: 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date: 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 8
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected

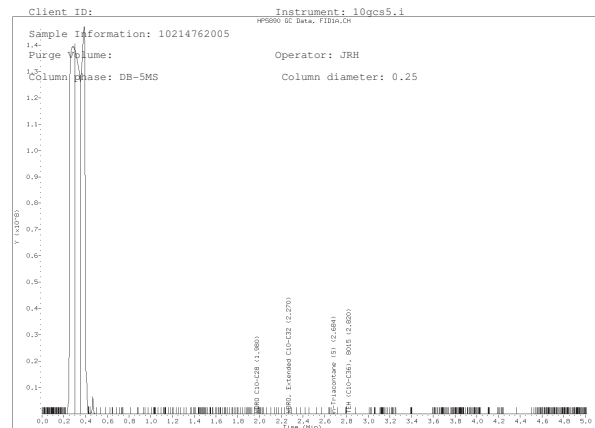
Cpnd Variable Local Compound Variable

Compounds	CONCENTRATIONS					
	RT	EXP RT	DLT RT	RESPONSE	(ug/mL)	FINAL (mg/L)
S 1 WDR0 C10-C28	1.340-2.620			558321	86.9957	0.0870(a)
S 2 WDR0, Extended C10-C32	1.340-3.200			720590	110.442	0.110(aM)
S 3 TEH (C10-C36), 8015	1.340-4.300			838300	131.082	0.131(aM)
S 7 n-Triacontane (S)	2.684 2.692	-0.008		188036	37.4372	0.0374(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0030.D
 Report Date: 12/15/2012
 Sample ID: 10214762005



901.P025

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0037.D Page 1
 Report Date: 15-Dec-2012 16:20

DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0037.D
 Lab Smp Id: 10214762006
 Inj Date : 15-DEC-2012 15:51
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762006
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 15
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (ng/L)
S 1 WDRO C10-C28	1.340	2.620		3594973	541.662	0.542(a)
S 2 WDRO, Extended C10-C32	1.340	3.200		4015046	609.564	0.610(aM)
S 3 TER (C10-C36), 8015	1.340	4.300		4240726	668.778	0.669(aM)
S 7 n-Tricosane (S)	2.686	2.692	-0.006	190953	38.0231	0.0380(aM)

QC Flag Legend

a - Target compound detected but, quantitated amount
 Below Limit Of Quantitation(BLOQ).
 M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt/ (Vo * Vi) * CpndVariable

Name	Value	Description
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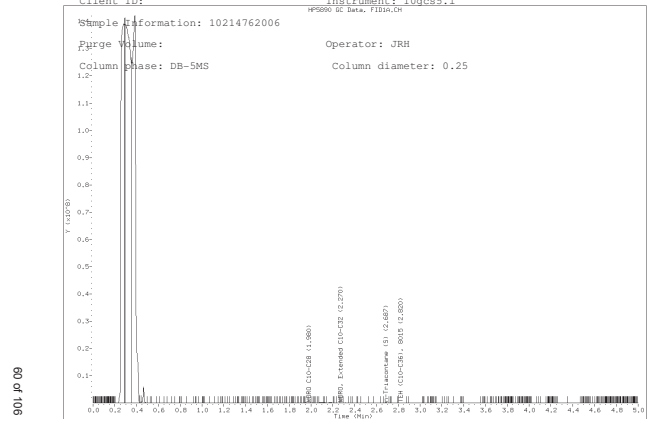
Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0049.D Page 1
 Report Date: 16-Dec-2012 11:10

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0049.D
 Lab Smp Id: 10214762007
 Inj Date : 15-DEC-2012 17:18
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762007,2
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 16-Dec-2012 11:08 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 26
 Dil Factor: 2.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0037.D
 Report Date: 12/15/2012
 Sample ID: 10214762006
 Client ID: Instrument: 10gcs5.i
 Sample Information: 10214762006
 Purge Volume: Operator: JRH
 Column Phase: DB-5MS Column diameter: 0.25



Concentration Formula: Amt * DF * Uf * Vt/ (Vo * Vi) * CpndVariable

Name	Value	Description
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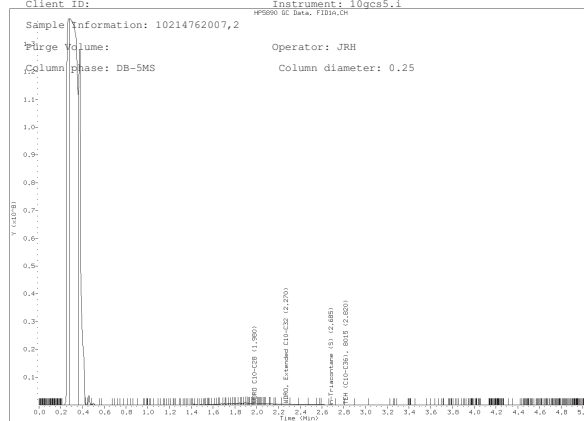
DF 2.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Compounds	CONCENTRATIONS				
	RT	EXP RT	DLT RT	RESPONSE	FINAL
S 1 WDRO C10-C28	1.340-2.620			21839914	3273.41 6.55
S 2 WDRO, Extended C10-C32	1.340-3.200			22780794	3452.64 6.90(M)
S 3 TEH (C10-C36), 8015	1.340-4.300			23289233	3680.65 7.36(M)
S 7 n-Triacontane (S)	2.685 2.692	-0.007	125701	24.9185	0.0498(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0049.D
 Report Date: 12/16/2012
 Sample ID: 10214762007
 Client ID:



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Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0038.D Page 1
 Report Date: 15-Dec-2012 16:20

DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0038.D
 Lab Smp Id: 10214762008
 Inj Date : 15-DEC-2012 15:58
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762008
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 16
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	CONCENTRATIONS				
	RT	EXP RT	DLT RT	RESPONSE	FINAL
S 1 WDRO C10-C28	1.340-2.620			302092	48.6315 0.0486(a)
S 2 WDRO, Extended C10-C32	1.340-3.200			420670	65.0025 0.0650(aM)
S 3 TEH (C10-C36), 8015	1.340-4.300			499859	77.5972 0.0776(aM)
S 7 n-Triacontane (S)	2.680 2.692	-0.012	184526	36.7323	0.0367(aM)

QC Flag Legend

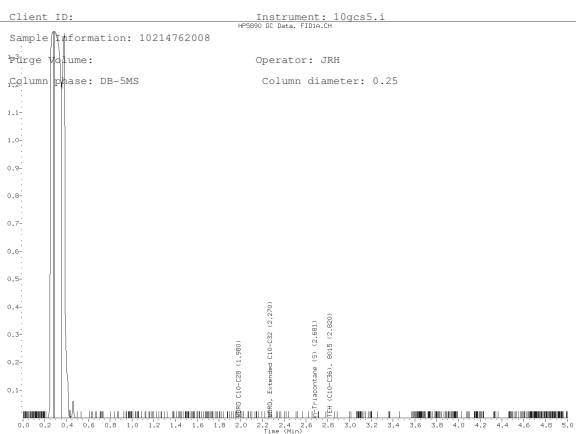
- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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Pace Analytical Services

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0038.D
 Report Date: 12/15/2012
 Sample ID: 10214762008



NWTPH-Dx
 Data file: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0039.D
 Lab Smp Id: 10214762009
 Inj Date: 15-DEC-2012 16:05
 Operator: JRH Inst ID: 10gcs5.i
 Smp Info: 10214762009
 Misc Info: 10608
 Comment:
 Method: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
 Meth Date: 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date: 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 17
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected

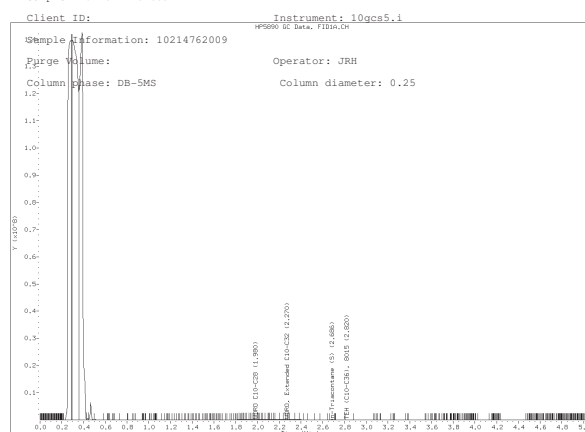
Cpnd Variable Local Compound Variable

Compounds	RT		DLT	RT	CONCENTRATIONS	
	EXP	RT			RESPONSE	(ug/mL)
S 1 MDRO C10-C28	1.340	2.620		5989577	900.197	0.900(a)
S 2 MDRO, Extended C10-C32	1.340	3.200		6569460	996.567	0.996(aM)
S 3 TEH (C10-C36), 8015	1.340	4.300		6847460	1080.73	1.08(M)
S 7 n-Triacontane (S)	2.685	2.692	-0.007	205885	41.0218	0.0410(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0039.D
 Report Date: 12/15/2012
 Sample ID: 10214762009



901.p.69

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0031.D Page 1
 Report Date: 15-Dec-2012 15:36

DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0031.D
 Lab Smp Id: 10214762010
 Inj Date : 15-DEC-2012 15:07
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762010
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 9
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (ng/L)
S 1 WDRO C10-C28	1.340	2.620		1371521	208.753	0.209(a)
S 2 WDRO, Extended C10-C32	1.340	3.200		1608254	244.926	0.245(aM)
S 3 TER (C10-C36), 8015	1.340	4.300		1752109	275.494	0.275(aM)
S 7 n-Tricosane (S)	2.686	2.692	-0.006	214504	42.7528	0.0428(aM)

QC Flag Legend

a - Target compound detected but, quantitated amount
 Below Limit Of Quantitation(BLOQ).
 M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt/ (Vo * Vi) * CpndVariable

Name	Value	Description
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Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0036.D Page 1
 Report Date: 15-Dec-2012 16:19

Pace Analytical Services

NWTPH-Dx

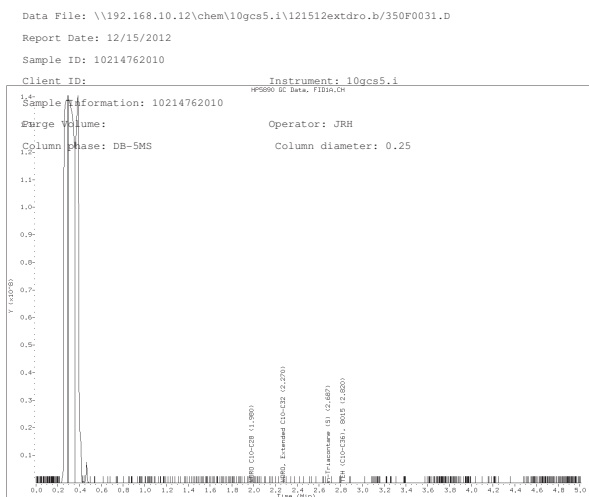
Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0036.D
 Lab Smp Id: 10214762011
 Inj Date : 15-DEC-2012 15:43
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762011
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 14
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Concentration Formula: Amt * DF * Uf * Vt/ (Vo * Vi) * CpndVariable

Name	Value	Description
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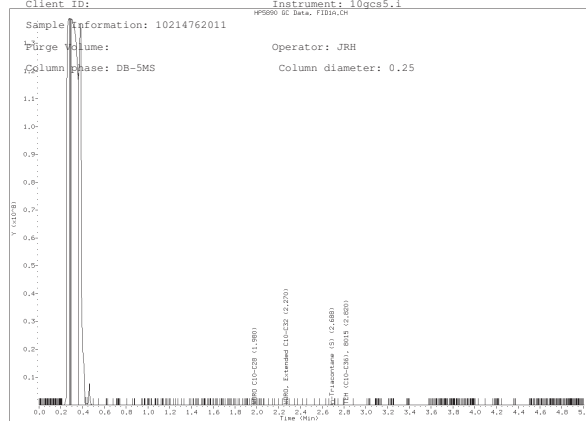
DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Compounds	CONCENTRATIONS				
	RT	EXP RT	DLT RT	RESPONSE	FINAL
S 1 WDRO C10-C28	1.340-2.620			820389	126.234 0.126(a)
S 2 WDRO, Extended C10-C32	1.340-3.200			1035413	159.138 0.158(aM)
S 3 TEH (C10-C36), 8015	1.340-4.300			1169210	183.219 0.183(aM)
S 7 n-Triacontane (S)	2.688 2.692	-0.004	190772	37.9867	0.0380(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0036.D
 Report Date: 12/15/2012
 Sample ID: 10214762011
 Client ID:



750106

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0032.D Page 1
 Report Date: 15-Dec-2012 15:37

DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0032.D
 Lab Smp Id: 10214762012
 Inj Date : 15-DEC-2012 15:14
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762012
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 10
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	CONCENTRATIONS				
	RT	EXP RT	DLT RT	RESPONSE	FINAL
S 1 WDRO C10-C28	1.340-2.620			304495	48.9913 0.0490(a)
S 2 WDRO, Extended C10-C32	1.340-3.200			418769	64.7145 0.0647(aM)
S 3 TEH (C10-C36), 8015	1.340-4.300			498087	77.3172 0.0773(aM)
S 7 n-Triacontane (S)	2.688 2.692	-0.007	177215	35.2641	0.0353(aM)

QC Flag Legend

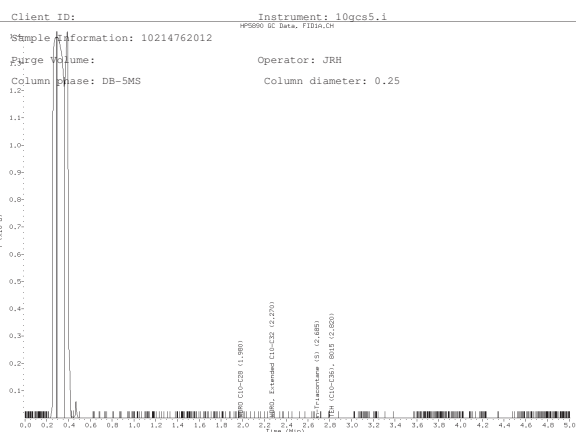
- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt/ (Vo * Vi) * CpndVariable

Name	Value	Description

Pace Analytical Services

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0032.D
 Report Date: 12/15/2012
 Sample ID: 10214762012



NWTPH-Dx

Data file: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0033.D
 Lab Smp Id: 10214762013
 Inj Date: 15-DEC-2012 15:21
 Operator: JRH Inst ID: 10gcs5.i
 Smp Info: 10214762013
 Misc Info: 10608
 Comment:
 Method: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
 Meth Date: 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date: 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 11
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected

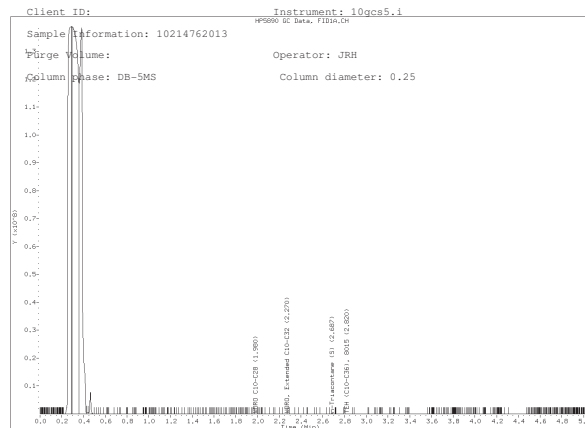
Cpnd Variable Local Compound Variable

Compounds	CONCENTRATIONS				
	RT	EXP RT	DLT RT	RESPONSE (ug/mL)	FINAL (mg/L)
S 1 MDBO C10-C28	1.340-2.620			1916911	290.412 0.290(a)
S 2 MDBO, Extended C10-C32	1.340-3.200			2213691	336.652 0.337(aM)
S 3 TEH (C10-C36), 8015	1.340-4.300			2381624	374.978 0.375(aM)
S 7 n-Triacontane (S)	2.686 2.692 -0.006			189199	37.6708 0.0377(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0033.D
 Report Date: 12/15/2012
 Sample ID: 10214762013



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DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0045.D
 Lab Smp Id: 10214762014
 Inj Date : 15-DEC-2012 16:49
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762014
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 23
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (ng/L)
S 1 WDR0 C10-C28	1.340	2.620		5264871	791.689	0.792(a)
S 2 WDR0, Extended C10-C32	1.340	3.200		5887092	893.185	0.893(aM)
S 3 TRH (C10-C36), 8015	1.340	4.300		6306093	995.175	0.995(aM)
S 7 n-Tricosane (S)	2.688	2.692	-0.004	187794	37.3886	0.0374(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation (BLOQ).
- M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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Pace Analytical Services

NWTPH-Dx

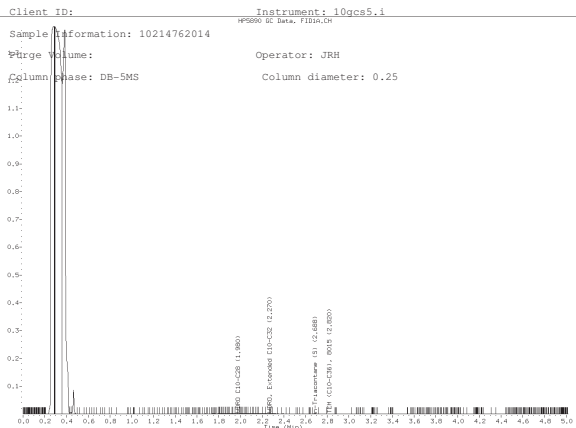
Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0043.D
 Lab Smp Id: 10214762015
 Inj Date : 15-DEC-2012 16:34
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762015
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 21
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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901.10.18

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0045.D
 Report Date: 12/15/2012
 Sample ID: 10214762014
 Client ID:



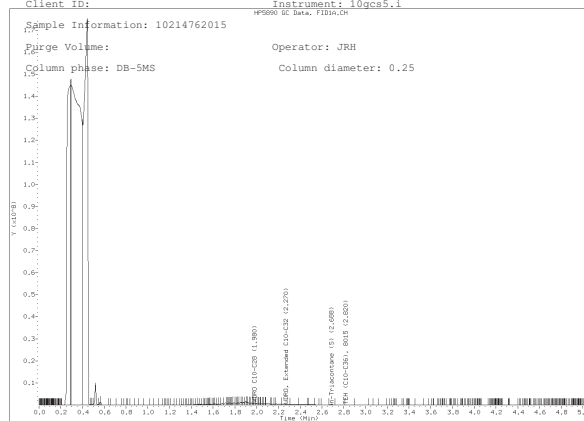
DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (mg/L)
S 1 WDRO C10-C28	1.340-2.620			30490312	4568.60	4.57
S 2 WDRO, Extended C10-C32	1.340-3.200			31381764	4755.72	4.76 (M)
S 3 TEH (C10-C36), 8015	1.340-4.300			31884978	5037.49	5.04 (AM)
S 7 n-Triacontane (S)	2.687 2.692	-0.005		277286	55.3613	0.0554 (AM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation (BLOQ).
- A - Target compound detected but, quantitated amount exceeded maximum amount.
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0043.D
 Report Date: 12/15/2012
 Sample ID: 10214762015
 Client ID:



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Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0040.D Page 1
 Report Date: 15-Dec-2012 16:20

DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0040.D
 Lab Smp Id: 10214762016
 Inj Date: 15-DEC-2012 16:12
 Operator: JRH Inst ID: 10gcs5.i
 Smp Info: 10214762016
 Misc Info: 10608
 Comment:
 Method: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date: 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date: 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 18
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (mg/L)
S 1 WDRO C10-C28	1.340-2.620			13382817	2007.16	2.01
S 2 WDRO, Extended C10-C32	1.340-3.200			14123638	2141.05	2.14 (M)
S 3 TEH (C10-C36), 8015	1.340-4.300			14504572	2250.81	2.29 (M)
S 7 n-Triacontane (S)	2.689 2.692	-0.003		173203	34.4583	0.0344 (AM)

QC Flag Legend

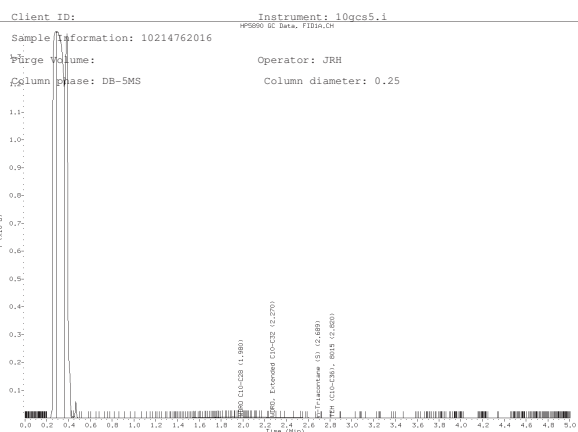
- a - Target compound detected but, quantitated amount Below Limit Of Quantitation (BLOQ).
- M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description

Pace Analytical Services

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0040.D
 Report Date: 12/15/2012
 Sample ID: 10214762016



NWTPH-Dx
 Data file: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0041.D
 Lab Smp Id: 10214762017
 Inj Date: 15-DEC-2012 16:19
 Operator: JRH Inst ID: 10gcs5.i
 Smp Info: 10214762017
 Misc Info: 10608
 Comment:
 Method: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
 Meth Date: 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date: 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 19
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Concentration Formula: Amt * DF * Uf * Vt / (Vo * Vi) * CpndVariable

Name	Value	Description
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DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected

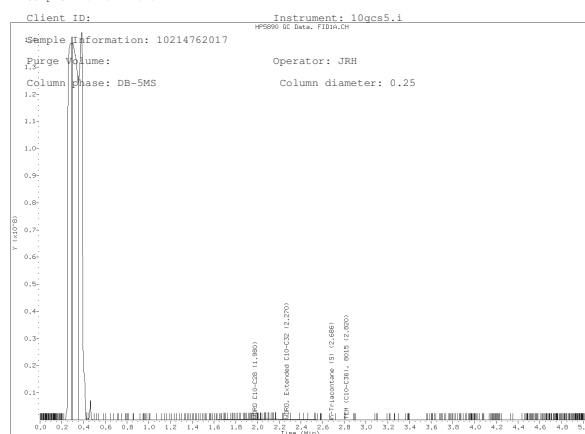
Cpnd Variable Local Compound Variable

Compounds	CONCENTRATIONS				
	RT	EXP RT	DLT RT	RESPONSE (ug/mL)	FINAL (mg/L)
S 1 WDR0 C10-C28	1.340-2.620			10261672	1539.84 1.54
S 2 WDR0, Extended C10-C32	1.340-3.200			10996835	1667.33 1.67(M)
S 3 TEH (C10-C36), 8015	1.340-4.300			11387949	1758.28 1.80(M)
S 7 n-Triacontane (S)	2.685 2.692	-0.007	169394	33.6934	0.0337(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation (BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0041.D
 Report Date: 12/15/2012
 Sample ID: 10214762017



DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0034.D
 Lab Smp Id: 10214762018
 Inj Date : 15-DEC-2012 15:29
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762018
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 12
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (ng/L)
S 1 WDR0 C10-C28	1.340	2.620		329611	52.7518	0.0528(a)
S 2 WDR0, Extended C10-C32	1.340	3.200		453438	69.9670	0.0700(aM)
S 3 TRH (C10-C36), 8015	1.340	4.300		542375	84.3161	0.0843(aM)
S 7 n-Tricosane (S)	2.685	2.692	-0.007	199518	39.7432	0.0397(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

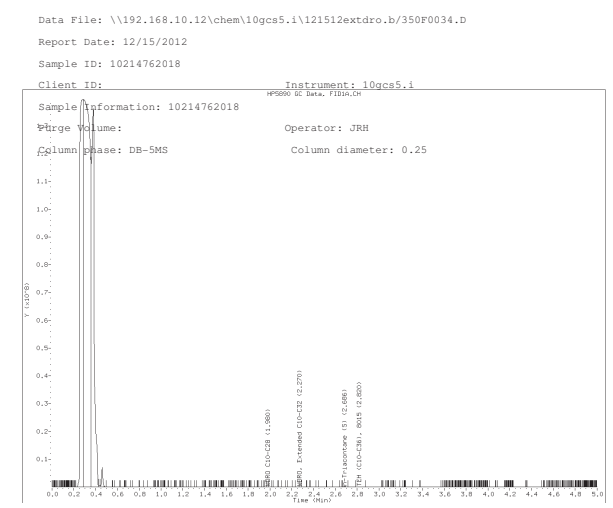
Concentration Formula: Amt * DF * Uf * Vt/ (Vo * Vi) * CpndVariable

Name	Value	Description
------	-------	-------------

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0035.D
 Lab Smp Id: 10214762019
 Inj Date : 15-DEC-2012 15:36
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762019
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDR05-Extended-102312.m
 Meth Date : 15-Dec-2012 14:31 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 13
 Dil Factor: 1.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3



Concentration Formula: Amt * DF * Uf * Vt/ (Vo * Vi) * CpndVariable

Name	Value	Description
------	-------	-------------

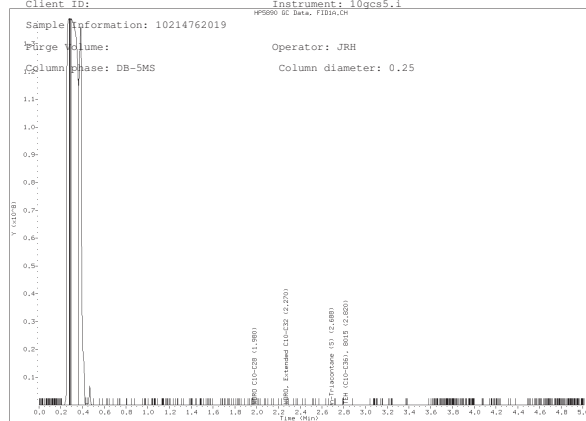
DF 1.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (mg/L)
S 1 WDRO C10-C28	1.340-2.620			340665	54.4069	0.0544(a)
S 2 WDRO, Extended C10-C32	1.340-3.200			455785	70.3226	0.0703(aM)
S 3 TEH (C10-C36), 8015	1.340-4.300			531951	82.6688	0.0827(aM)
S 7 n-Triacontane (S)	2.687 2.692	-0.005		218354	43.5260	0.0435(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0035.D
 Report Date: 12/15/2012
 Sample ID: 10214762019
 Client ID:



901068

Data File: \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0050.D Page 1
 Report Date: 16-Dec-2012 11:11

DF 2.000 Dilution Factor
 Uf 1.000 ng unit correction factor
 Vt 1.000 Volume of final extract (mL)
 Vo 1000.000 Volume of sample extracted (mL)
 Vi 1.000 Volume injected
 Cpnd Variable Local Compound Variable

Pace Analytical Services

NWTPH-Dx

Data file : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\350F0050.D
 Lab Smp Id: 10214762020
 Inj Date : 15-DEC-2012 17:25
 Operator : JRH Inst ID: 10gcs5.i
 Smp Info : 10214762020,2
 Misc Info : 10608
 Comment :
 Method : \\192.168.10.12\chem\10gcs5.i\121512extdro.b\WDRO5-Extended-102312.m
 Meth Date : 16-Dec-2012 11:08 jheinecke Quant Type: ESTD
 Cal Date : 23-OCT-2012 11:08 Cal File: 297F0018.D
 Als bottle: 27
 Dil Factor: 2.00000
 Integrator: Falcon Compound Sublist: all.sub
 Target Version: 4.14
 Processing Host: 10VOA3

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS	
					ON-COLUMN (ug/mL)	FINAL (mg/L)
S 1 WDRO C10-C28	1.340-2.620			21962588	3291.77	6.58
S 2 WDRO, Extended C10-C32	1.340-3.200			22928284	3474.99	6.95(M)
S 3 TEH (C10-C36), 8015	1.340-4.300			23504678	3713.12	7.43(M)
S 7 n-Triacontane (S)	2.687 2.692	-0.005		113126	22.3931	0.0448(aM)

QC Flag Legend

- a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
- M - Compound response manually integrated.

Concentration Formula: Amt * DF * Uf * Vt/ (Vo * Vi) * CpndVariable

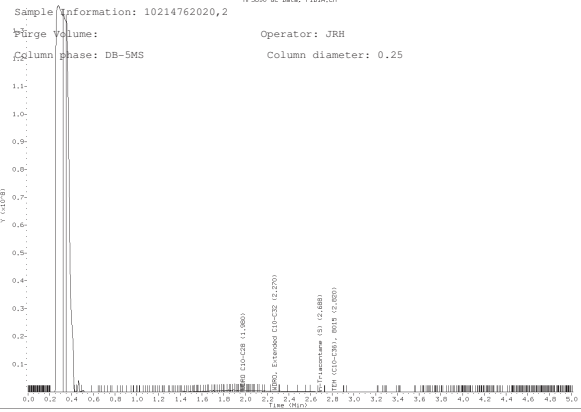
Name	Value	Description
-----	-----	-----

Section A Required Client Information Company: AECOM Address: 11 E Superior St, Ste 260 City: Duluth, MN 55802 Phone: 612-575-5181 Project Name: Embark on South Lake Lake	Section B Required Project Information Report To: Brian Hill Project Name: Embark on South Lake Lake Project Number: 60251681	Section C Inhouse Information Customer Name: Kel Becher Company Name: Kel Becher Energy Address: 1600 Eastman St., Ste 200 City: Houston, TX 77002 State: TX Regulatory Agency: REGULATORY AGENCY USE: <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> OTHER
--	---	--

ITEM #	SAMPLER ID	DATE	TIME	DATE	TIME	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATION	ANALYSIS TEST	DATE	TIME	DATE	TIME	RESIDUAL CHLORINE (Y/N)	SAMPLER NO./LAB ID
						CONCENTRATED	ORIGINAL										
1	MV-1	12-13	15:55	12-13	15:55	10	X	10	X	X	12-13	15:55	12-13	15:55	Y	10814762-013	
2	MV-4	12-5	01:55	12-5	01:55	10	X	10	X	X	12-5	01:55	12-5	01:55	Y	10814762-014	
3	MV-6	12-5	10:55	12-5	10:55	10	X	10	X	X	12-5	10:55	12-5	10:55	Y	10814762-015	
4	MV-7	12-5	14:00	12-5	14:00	10	X	10	X	X	12-5	14:00	12-5	14:00	Y	10814762-016	
5	MV-8	12-5	14:00	12-5	14:00	10	X	10	X	X	12-5	14:00	12-5	14:00	Y	10814762-017	
6	MV-9	12-5	09:45	12-5	09:45	10	X	10	X	X	12-5	09:45	12-5	09:45	Y	10814762-018	
7	MV-10	12-5	15:45	12-5	15:45	10	X	10	X	X	12-5	15:45	12-5	15:45	Y	10814762-019	
8	MV-15	12-5	16:00	12-5	16:00	10	X	10	X	X	12-5	16:00	12-5	16:00	Y	10814762-020	
9	MV-16	12-5	15:20	12-5	15:20	10	X	10	X	X	12-5	15:20	12-5	15:20	Y	10814762-021	
10	MV-17	12-6	09:40	12-6	09:40	10	X	10	X	X	12-6	09:40	12-6	09:40	Y	10814762-022	
11	MV-18	12-6	08:40	12-6	08:40	10	X	10	X	X	12-6	08:40	12-6	08:40	Y	10814762-023	
12	MV-18	12-6	08:40	12-6	08:40	10	X	10	X	X	12-6	08:40	12-6	08:40	Y	10814762-024	

Report Note: By signing this form you are accepting Pace's MSU 50-ppm protocol limits and agreeing to our charges of 1.50 per sample for any analyses not included in the MSU.

Data File: \\192.168.10.12\chem\10gcs5.1\121512extdro.b\350F0050.D
Report Date: 12/16/2012
Sample ID: 10214762020
Client ID: Instrument: 10gcs5.1



SAMPLER NAME AND SIGNATURE: TRISTIN SHERBET	DATE SIGNED: 12-7-12		
PRINT NAME OF SAMPLER: T. Sherbet	DATE SIGNED: 12-7-12		
SIGNATURE OF SAMPLER: T. Sherbet	DATE SIGNED: 12-7-12		
Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Sampler Intact (Y/N)
	Y	Y	Y

Document Name: **SCUR Exceptions Form**
Document No.: **F-MN-L-220-Rev.00**
Document Date: **16Apr2012**
Page 1 of 1
Issuing Authority: **Pace Minnesota Quality Office**

Issue	Sample ID	Container Type/#
7942	5008	5024
		1.3
		0.3
		1.6
		5024
		4749
		2521
		1.3
		1.8
		0.8
		2.1
		1.8
		1.3
		1.8



Section A Required Client Information Company: AECOM Address: 11 E Superior St, Ste 260 City: Duluth, MN 55802 Phone: 612-575-5181 Project Name: Embark on South Lake Lake	Section B Required Project Information Report To: Brian Hill Project Name: Embark on South Lake Lake Project Number: 60251681	Section C Inhouse Information Customer Name: Kel Becher Company Name: Kel Becher Energy Address: 1600 Eastman St., Ste 200 City: Houston, TX 77002 State: TX Regulatory Agency: REGULATORY AGENCY USE: <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> OTHER
--	---	--

ITEM #	SAMPLER ID	DATE	TIME	DATE	TIME	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATION	ANALYSIS TEST	DATE	TIME	DATE	TIME	RESIDUAL CHLORINE (Y/N)	SAMPLER NO./LAB ID
						CONCENTRATED	ORIGINAL										
1	MV-19	12-6	11:02	12-6	11:02	10	X	10	X	X	12-6	11:02	12-6	11:02	Y	10814762-025	
2	0565-1A	12-6	11:40	12-6	11:40	10	X	10	X	X	12-6	11:40	12-6	11:40	Y	015	
3	0565-2A	12-6	10:50	12-6	10:50	10	X	10	X	X	12-6	10:50	12-6	10:50	Y	016	
4	0565-3A	12-6	10:00	12-6	10:00	10	X	10	X	X	12-6	10:00	12-6	10:00	Y	017	
5	0565-4A	12-5	14:55	12-5	14:55	10	X	10	X	X	12-5	14:55	12-5	14:55	Y	018	
6	0201	12-6	11:40	12-6	11:40	10	X	10	X	X	12-6	11:40	12-6	11:40	Y	019	
7	Field Wash																020
8	Field Wash																021
9	Field Wash																022
10	Field Wash																023
11	Field Wash																024
12	Field Wash																025

Document Name: Sample Condition Upon Receipt Form
 Document No.: F-MN-L-213-rev.05
 Document Revised: 13Nov2012
 Page 1 of 1
 Issuing Authority: Pace Minnesota Quality Office

Pace Analytical[®]

Sample Condition Upon Receipt

Client Name: Aecom Project #: W0#: 10214762

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other:

Tracking Number: see exceptions sheet

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: Temp Blank? Yes No

Thermometer Used: 88A812167504 80512447 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read (°C): exception Cooler Temp Corrected (°C): exception Biological Tissue Frozen? Yes No
 Temp should be above freezing to 6°C Date and Initials of Person Examining Contents: 12/8/12 TW

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.	
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.	
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.	
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.	
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.	
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.	
Rush Turn Around Time Requested?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.	
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.	
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.	
Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.	
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.	
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.	
Includes Date/Time/ID/Analysis Matrix:	<u>WT</u>	13.	<input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing acid/base preservation have been checked? Noncompliances are noted in 13. All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , HCl+2; NaOH+12) Exception: CO ₂ , Puffform, TOC, Oil and Grease, Wt:ORO (water)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.	Sample # <u>A11 1</u>
Headpace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.	Initial when completed: <u>TW</u> Lot # of added preservative:
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.	
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: _____ Date: _____
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414
 (612)607-1700

January 03, 2013

Brian Hill
 AECOM
 11 E. Superior Street, Suite 5
 Duluth, MN 55802

RE: Project: Enbridge South Cass Lake
 Pace Project No.: 10216477

Dear Brian Hill:
 Enclosed are the analytical results for sample(s) received by the laboratory on December 28, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carol Davy

Carol Davy
 carol.davy@pacelabs.com
 Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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 1700 Elm Street - Suite 200
 Minneapolis, MN 55414
 (612)607-1700



Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414
 (612)607-1700

CERTIFICATIONS

Project: Enbridge South Cass Lake
 Pace Project No.: 10216477

Minnesota Certification IDs
 1700 Elm Street SE Suite 200, Minneapolis, MN 55414
 AZLA Certification #: 2926.01
 Alaska Certification #: UST-078
 Alaska Certification #MN00064
 Arizona Certification #: AZ-0014
 Arkansas Certification #: 88-0880
 California Certification #: 01155CA
 Colorado Certification #Pace
 Connecticut Certification #: PH-0256
 EPA Region 8 Certification #: Pace
 Florida/NELAP Certification #: E87605
 Georgia Certification #: 359
 Hawaii Certification #Pace
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Kansas Certification #: E-10167
 Louisiana Certification #: 03086
 Louisiana Certification #: LA080009
 Maine Certification #: 2007029
 Maryland Certification #: 322
 Michigan DEC Certification #: 9809
 Minnesota Certification #: 027-053-137
 Mississippi Certification #: Pace

Montana Certification #: MT CERT0092
 Nevada Certification #: MN_00064
 Nebraska Certification #: Pace
 New Jersey Certification #: MN-002
 New York Certification #: 11647
 North Carolina Certification #: 530
 North Dakota Certification #: R-036
 North Dakota Certification #: R-036A
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon Certification #: MN200001
 Oregon Certification #: MN300001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification
 Tennessee Certification #: 02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Virginia/DCLS Certification #: 002521
 Virginia/VELAP Certification #: 460163
 Washington Certification #: C754
 West Virginia Certification #: 362
 Wisconsin Certification #: 989407970

SAMPLE SUMMARY

Project: Enbridge South Cass Lake
 Pace Project No.: 10216477

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10216477001	MW-16A	Water	12/27/12 10:15	12/28/12 10:05

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SAMPLE ANALYTE COUNT

Project: Enbridge South Cass Lake
Pace Project No.: 10216477

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10216477001	MW-16A	WI MOD GRO	DJT	5

PROJECT NARRATIVE

Project: Enbridge South Cass Lake
Pace Project No.: 10216477

Method: WI MOD GRO
Description: WIGRO GCV
Client: AECOM
Date: January 03, 2013

General Information:
1 sample was analyzed for WI MOD GRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:
This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Enbridge South Cass Lake
Pace Project No.: 10216477

Sample: MW-16A Lab ID: 10216477001 Collected: 12/27/12 10:15 Received: 12/28/12 10:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Analytical Method: WI MOD GRO									
Benzene	48.8	ug/L	1.0	0.27	1		01/02/13 17:00	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.25	1		01/02/13 17:00	100-41-4	
Toluene	ND	ug/L	1.0	0.22	1		01/02/13 17:00	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.75	1		01/02/13 17:00	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	100	%	80-125		1		01/02/13 17:00	98-08-8	

QUALITY CONTROL DATA

Project: Enbridge South Cass Lake
Pace Project No.: 10216477

QC Batch: GCV10252 Analysis Method: WI MOD GRO
QC Batch Method: WI MOD GRO Analysis Description: WIGRO GCV Water
Associated Lab Samples: 10216477001

METHOD BLANK: 1358705 Matrix: Water
Associated Lab Samples: 10216477001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	01/02/13 11:17	
Ethylbenzene	ug/L	ND	1.0	01/02/13 11:17	
Toluene	ug/L	ND	1.0	01/02/13 11:17	
Xylene (Total)	ug/L	ND	3.0	01/02/13 11:17	
a,a,a-Trifluorotoluene (S)	%	96	80-125	01/02/13 11:17	

LABORATORY CONTROL SAMPLE & LCS: 1358706 1358707

Parameter	Units	Spike Conc	LCS Result	LCS Result	LCS % Rec	LCS % Rec	RPD	Max RPD	Qualifiers
Benzene	ug/L	100	95.3	98.7	95	99	80-120	4	20
Ethylbenzene	ug/L	100	91.1	93.5	91	94	80-120	3	20
Toluene	ug/L	100	92.1	95.3	92	95	80-120	3	20
Xylene (Total)	ug/L	300	275	280	92	93	80-120	2	20
a,a,a-Trifluorotoluene (S)	%				99	99	80-125		

MATRIX SPIKE SAMPLE: 1358708

Parameter	Units	10216173006 Result	Spike Conc	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	ND	100	96.3	96	80-120	
Ethylbenzene	ug/L	ND	100	87.0	87	80-120	
Toluene	ug/L	ND	100	90.8	90	80-120	
Xylene (Total)	ug/L	ND	300	259	86	80-120	
a,a,a-Trifluorotoluene (S)	%				99	80-125	

SAMPLE DUPLICATE: 1359285

Parameter	Units	10216132008 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	ND		20	
Ethylbenzene	ug/L	ND	ND		20	
Toluene	ug/L	ND	.29J		20	
Xylene (Total)	ug/L	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%	98	98	.8		

REPORT OF LABORATORY ANALYSIS

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Enbridge South Cass Lake
Pace Project No.: 10216477

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.
 ND - Not Detected at or above adjusted reporting limit.
 J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
 MDL - Adjusted Method Detection Limit.
 PRL - Pace Reporting Limit.
 RL - Reporting Limit.
 S - Surrogate
 1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.
 Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
 LCS(D) - Laboratory Control Sample (Duplicate)
 MS(D) - Matrix Spike (Duplicate)
 DUP - Sample Duplicate
 RPD - Relative Percent Difference
 NC - Not Calculable.
 SG - Silica Gel - Clean-Up
 U - Indicates the compound was analyzed for, but not detected.
 N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
 Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
 TNI - The NELAC Institute.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Enbridge South Cass Lake
Pace Project No.: 10216477

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10216477001	MW-16A	WI MOD GRO	GCV110252		

Date: 01/03/2013 03:21 PM

REPORT OF LABORATORY ANALYSIS

Page 8 of 9

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8 of 11

Date: 01/03/2013 03:21 PM

REPORT OF LABORATORY ANALYSIS

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Original

ITEM #	SAMPLE ID	DATE	TIME	ANALYSIS TEST #	RESIDUAL CHLORINE (Y/N)
1	MW-16A	12/27/12	10:15	1578X	

Station A: AECOM
 Station B: Brian Hill
 Station C: Brian Hill

REGULATORY AGENCY: MN
 SAMPLE LOCATION: Enbridge South Cass Lake

Temp in °C: 15.0
 Received on ice (Y/N): Y
 Custody Sealed Cooler (Y/N): N
 Samples Intact (Y/N): Y

Document Name: Sample Condition Upon Receipt Form
 Document No.: F-MN-L-213-rev.05
 Document Revised: 13Nov2012
 Page 1 of 1
 Issuing Authority: Pace Minnesota Quality Office

Client Name: AECOM
 Project #: W0#: 10216477

Courier: Fed Ex
 Tracking Number: 8992 6653 0610

Custody Seal on Cooler/Box Present? Yes [X] No []
 Seals Intact? Yes [X] No []
 Packing Material: Bubble Bags [X]
 Thermometer Used: 8884912167504
 Cooler Temp Read (°C): 1.3
 Cooler Temp Corrected (°C): 1.5
 Date and Initials of Person Examining Contents: 12/28/12 TN

Chain of Custody Present?	Yes [X]	No []	N/A []	1.
Chain of Custody Filled Out?	Yes [X]	No []	N/A []	2.
Chain of Custody Relinquished?	Yes [X]	No []	N/A []	3.
Sampler Name and/or Signature on COC?	Yes [X]	No []	N/A []	4.
Samples Arrived within Hold Time?	Yes [X]	No []	N/A []	5.
Short Hold Time Analysis (<72 hr)?	Yes [X]	No []	N/A []	6.
Rush Turn Around Time Requested?	Yes [X]	No []	N/A []	7.
Sufficient Volume?	Yes [X]	No []	N/A []	8.
Correct Containers Used?	Yes [X]	No []	N/A []	9.
Containers Intact?	Yes [X]	No []	N/A []	10.
Filtered Volume Received for Dissolved Tests?	Yes [X]	No []	N/A []	11.
Sample Labels Match COC?	Yes [X]	No []	N/A []	12.
Includes Date/Time/ID/Analysis Matrix?	Yes [X]	No []	N/A []	13.
All containers needing acid/base preservation have been checked?	Yes [X]	No []	N/A []	14.
All containers needing preservation are found to be in compliance with EPA recommendation?	Yes [X]	No []	N/A []	15.

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: DMH
 Date: 12/28/12

10 of 11

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31-Dec-2012

Brian Hill
AECOM
11 East Superior Street
Suite 260
Duluth, MN 55802

Re: **Enbridge MW-16A 12/22/12** Work Order: **1212911**

Dear Brian,

ALS Environmental received 1 sample on 28-Dec-2012 10:00 AM for the analyses presented in the following report.

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

QC sample results for this data met 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 8.

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

Sincerely,

Electronically approved by Ann Preston

Ann Preston
Project Manager



Certificate No: MN331938

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



ALS Group USA, Corp

Date: 31-Dec-12

Client: AECOM
Project: Enbridge MW-16A 12/22/12
Work Order: 1212911

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1212911-01	MW-16A	Water		12/22/2012 10:15	12/28/2012 10:00	<input type="checkbox"/>

SS Page 1 of 1

ALS Group USA, Corp

Date: 31-Dec-12

Client: AECOM
Project: Enbridge MW-16A 12/22/12
WorkOrder: 1212911

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
+	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
µg/L	Micrograms per Liter

ALS Group USA, Corp

Date: 31-Dec-12

Client: AECOM
Project: Enbridge MW-16A 12/22/12
Sample ID: MW-16A
Collection Date: 12/22/2012 10:15 AM
Work Order: 1212911
Lab ID: 1212911-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			SW8260			Analyst: AK
Benzene	47		1.0	µg/L	1	12/30/2012 07:36 PM
Ethylbenzene	U		1.0	µg/L	1	12/30/2012 07:36 PM
m,p-Xylene	U		1.0	µg/L	1	12/30/2012 07:36 PM
o-Xylene	U		1.0	µg/L	1	12/30/2012 07:36 PM
Toluene	U		1.0	µg/L	1	12/30/2012 07:36 PM
Xylenes, Total	U		3.0	µg/L	1	12/30/2012 07:36 PM
Surr: 1,2-Dichloroethane-d4	94.2		70-120	%REC	1	12/30/2012 07:36 PM
Surr: 4-Bromofluorobenzene	97.0		75-120	%REC	1	12/30/2012 07:36 PM
Surr: Dibromofluoromethane	93.4		85-115	%REC	1	12/30/2012 07:36 PM
Surr: Toluene-d8	107		85-120	%REC	1	12/30/2012 07:36 PM

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

Client: AECOM
 Work Order: 1212911
 Project: Enbridge MW-16A 12/22/12

QC BATCH REPORT

Client: AECOM
 Work Order: 1212911
 Project: Enbridge MW-16A 12/22/12

Batch ID: R114542A Instrument ID VMS8 Method: SW8260

MBLK	Sample ID: VBLKW1-121230-R114542A	Units: µg/L	Analysis Date: 12/30/2012 12:03 PM							
Client ID:	Run ID: VMS8_121230A	SeqNo: 2182350	Prep Date: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	1.0								
Ethylbenzene	U	1.0								
m,p-Xylene	U	2.0								
o-Xylene	U	1.0								
Toluene	U	1.0								
Xylenes, Total	U	3.0								
Surr: 1,2-Dichloroethane-d4	19.36	0	20	0	96.8	70-120	0			
Surr: 4-Bromofluorobenzene	20.3	0	20	0	102	75-120	0			
Surr: Dibromofluoromethane	19	0	20	0	95	85-115	0			
Surr: Toluene-d8	20.45	0	20	0	102	85-120	0			

LCS	Sample ID: VLCSW1-121230-R114542A	Units: µg/L	Analysis Date: 12/30/2012 11:15 AM							
Client ID:	Run ID: VMS8_121230A	SeqNo: 2182283	Prep Date: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.21	1.0	20	0	96	80-120	0			
Ethylbenzene	21.24	1.0	20	0	106	75-125	0			
m,p-Xylene	40.66	2.0	40	0	102	75-130	0			
o-Xylene	20.9	1.0	20	0	104	80-120	0			
Toluene	20.52	1.0	20	0	103	75-120	0			
Xylenes, Total	61.56	3.0	60	0	103	75-130	0			
Surr: 1,2-Dichloroethane-d4	19.06	0	20	0	95.3	70-120	0			
Surr: 4-Bromofluorobenzene	20.53	0	20	0	103	75-120	0			
Surr: Dibromofluoromethane	18.47	0	20	0	92.4	85-115	0			
Surr: Toluene-d8	20.37	0	20	0	102	85-120	0			

Batch ID: R114542A Instrument ID VMS8 Method: SW8260

MS	Sample ID: 1212826-02A MS	Units: µg/L	Analysis Date: 12/30/2012 09:12 PM							
Client ID:	Run ID: VMS8_121230A	SeqNo: 2182370	Prep Date: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.13	1.0	20	2.16	94.8	80-120	0			
Ethylbenzene	66.94	1.0	20	46.18	104	75-125	0			
m,p-Xylene	126.2	2.0	40	88.01	95.4	75-130	0			
o-Xylene	83.68	1.0	20	63.79	99.4	80-120	0			
Toluene	41.39	1.0	20	20.24	106	75-120	0			
Xylenes, Total	209.8	3.0	60	151.8	96.7	75-130	0			
Surr: 1,2-Dichloroethane-d4	18.6	0	20	0	93	70-120	0			
Surr: 4-Bromofluorobenzene	20.41	0	20	0	102	75-120	0			
Surr: Dibromofluoromethane	18.98	0	20	0	94.9	85-115	0			
Surr: Toluene-d8	19.65	0	20	0	98.2	85-120	0			

MSD	Sample ID: 1212826-02A MSD	Units: µg/L	Analysis Date: 12/30/2012 09:36 PM							
Client ID:	Run ID: VMS8_121230A	SeqNo: 2182371	Prep Date: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.47	1.0	20	2.16	91.6	80-120	21.13	3.17	30	
Ethylbenzene	65.15	1.0	20	46.18	94.8	75-125	66.94	2.71	30	
m,p-Xylene	122.5	2.0	40	88.01	96.2	75-130	126.2	2.94	30	
o-Xylene	81.08	1.0	20	63.79	86.4	80-120	83.68	3.16	30	
Toluene	39.52	1.0	20	20.24	96.4	75-120	41.39	4.62	30	
Xylenes, Total	203.6	3.0	60	151.8	86.3	75-130	209.8	3.02	30	
Surr: 1,2-Dichloroethane-d4	18.22	0	20	0	91.7	70-120	18.6	2.06	30	
Surr: 4-Bromofluorobenzene	19.61	0	20	0	98	75-120	20.41	4	30	
Surr: Dibromofluoromethane	18.82	0	20	0	94.1	85-115	18.98	0.847	30	
Surr: Toluene-d8	19.28	0	20	0	96.4	85-120	19.65	1.9	30	

The following samples were analyzed in this batch: 1212911-01A

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

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

ALS Environmental Chain of Custody Form

ALS Project Manager: ALS Work Order #: 1212911

Customer Information: Project Name: Enbridge, Project Number: BTEX

Company Name: AECOM, Bill To Company: Enbridge Energy

Address: 11 East Superior Street, Suite 260, Duluth, MN 55802

City/State/Zip: Duluth, MN 55802

Phone: (218) 625-8788, Fax: 218-625-2201

e-Mail Address: Brian.Hill@aecom.com

Shipping Method: Fed Ex, Required Turnaround Time: 2 WK Days

Temperature: 2.5°C

Preservative Key: 1-ACI, 2-HNO3, 3-H2SO4, 4-NaOH, 5-Na2SO4, 6-NH2OH, 7-Other, 8-4°C, 9-50/55

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: AECOM - DULUTH Date/Time Received: 28-Dec-12 10:00
 Work Order: 1212911 Received by: DS
 Checklist completed by: Dana Shinn Date: 28-Dec-12 Reviewed by: Dana Preston Date: 30-Dec-12

Matrices: Water, FedEx
 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

Temperature(s) Thermometer(s): 2.0°C

Cooler(s) (K) (s):

Date/Time sample(s) sent to storage: 12/28/2012 10:48:05 AM

Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

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

Comments:

Corrective Action:

Attachment II – Boring Logs (Air Sparging Locations)



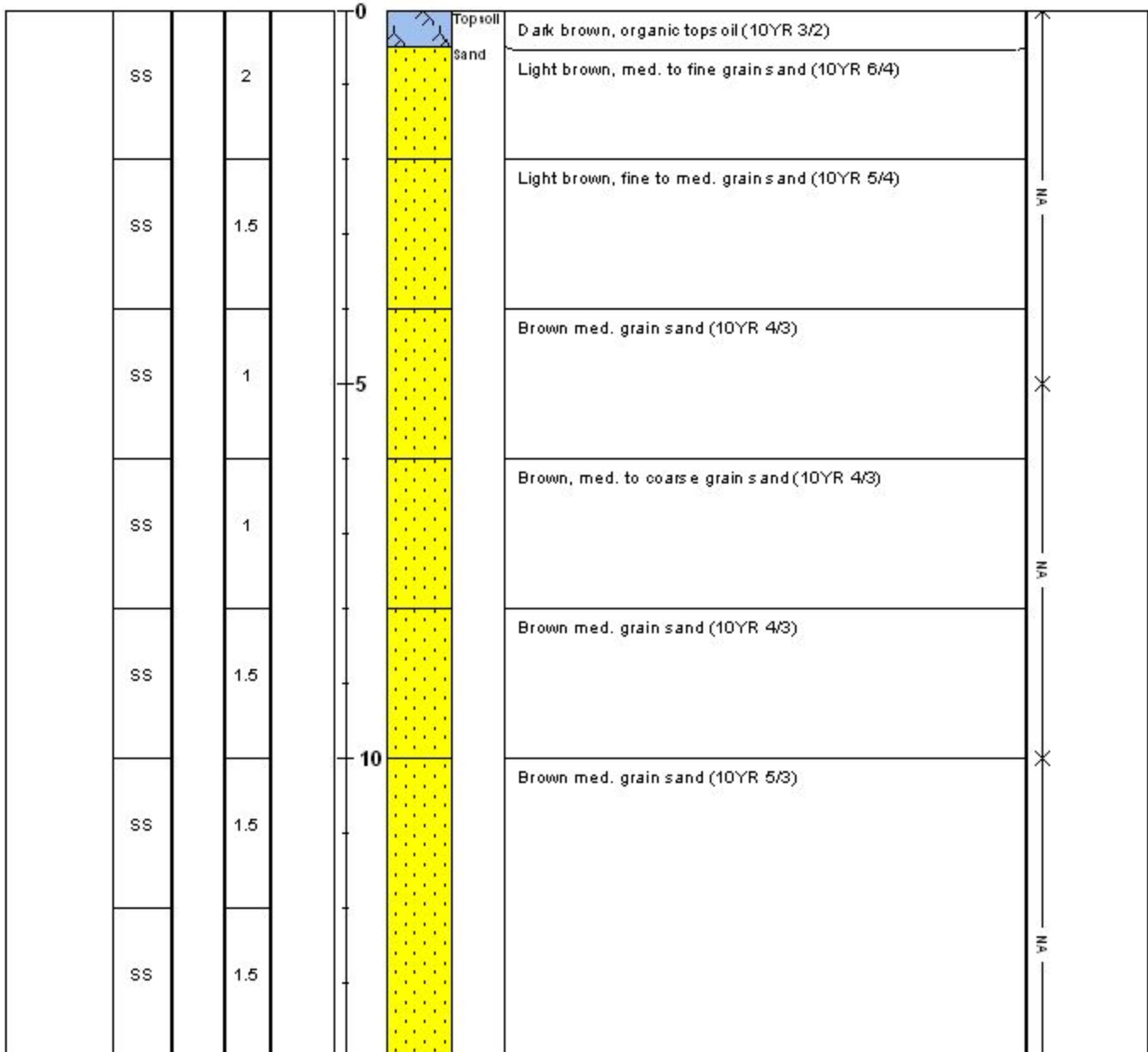
Boring and Well Construction Log

Boring #: SP-1

Sheet 1 of 3

Project: South Cass Lake	Contractor: Thein Well	Location: Cass Lake, MN
Project #: 60254681	Operator: Thein Well	Northing: Easting:
Client: Enbridge Energy	Drill Rig Type: Hollow Stem Auger	Surface Elevation (ft AMSL):
Start Date & Time: 10/15/2012 1400	Method: Split Spoon- Hollow Stem Auger	Total Depth (ft): 32
Finish Date & Time: 10/15/2012 1600	Boring ID: SP-1	Logged By: Angela Hawkins/ Brian Hill

Sample					Depth (ft.)	Lithology	USCS Symbol	Soil and Rock Description	Well Diagram
Analytical Sample	Sample Type	Blows/ 6 inch	Rec (ft)	PID (ppm)					



Remarks and Datum Used:	
AECOM First National Bank Building 332 Minnesota Street, E1000 St. Paul, MN 55101 Phone: (651) 222-0841	NA= not applicable SS= split spoon Depth to Water Table (ft): 26 (assumed)

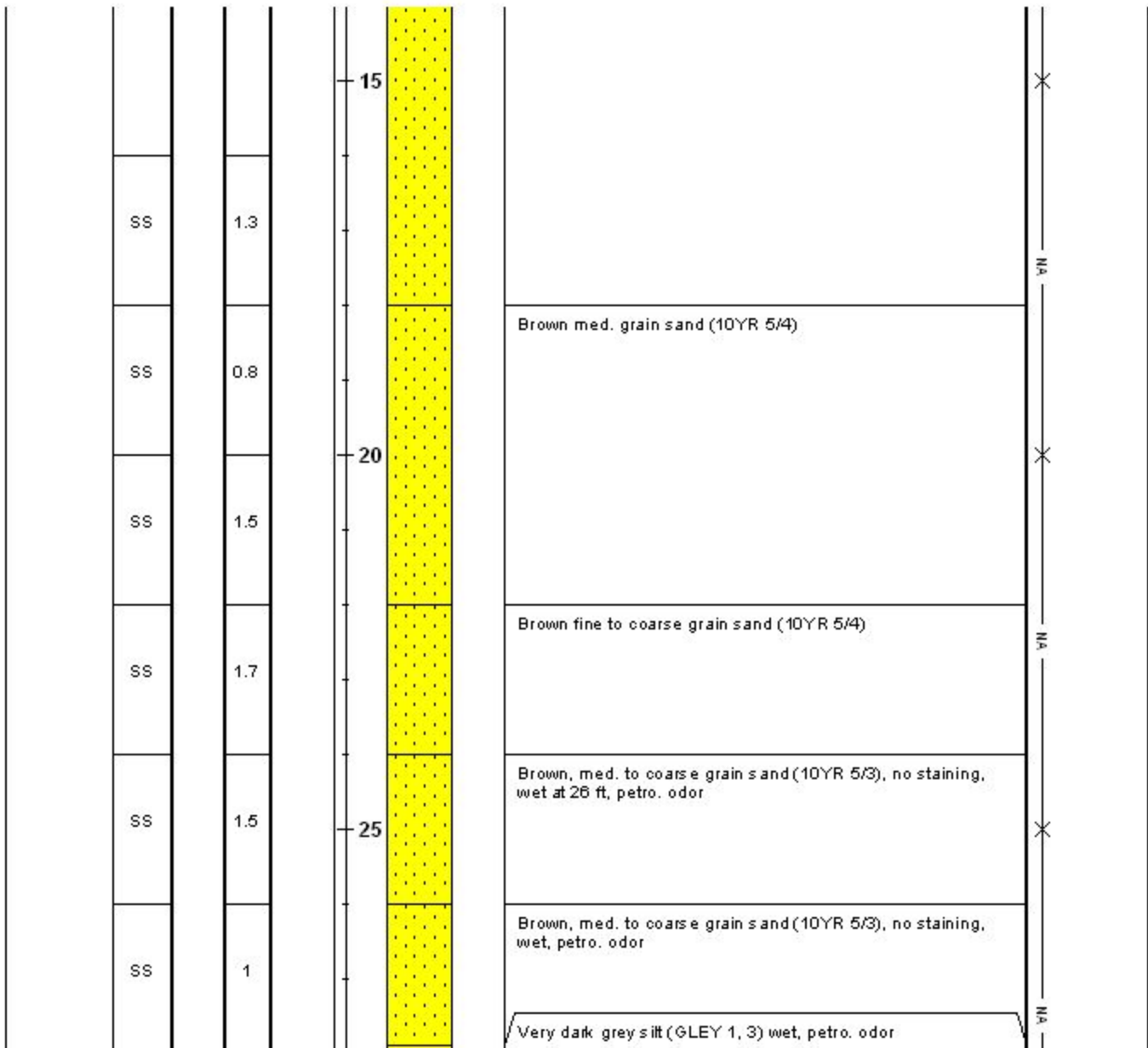


Boring and Well Construction Log

Boring #: SP-1
Sheet 2 of 3

Project: South Cass Lake	Contractor: Thein Well	Location: Cass Lake, MN
Project #: 60254681	Operator: Thein Well	Northing: Easting:
Client: Enbridge Energy	Drill Rig Type: Hollow Stem Auger	Surface Elevation (ft AMSL):
Start Date & Time: 10/15/2012 1400	Method: Split Spoon- Hollow Stem Auger	Total Depth (ft): 32
Finish Date & Time: 10/15/2012 1600	Boring ID: SP-1	Logged By: Angela Hawkins/ Brian Hill

Sample					Depth (ft.)	Lithology	USCS Symbol	Soil and Rock Description	Well Diagram
Analytical Sample	Sample Type	Blows/ 6 inch	Rec (ft)	PID (ppm)					



Remarks and Datum Used:	
AECOM First National Bank Building 332 Minnesota Street, E1000 St. Paul, MN 55101 Phone: (651) 222-0841	NA= not applicable SS= split spoon Depth to Water Table (ft): 26 (assumed)



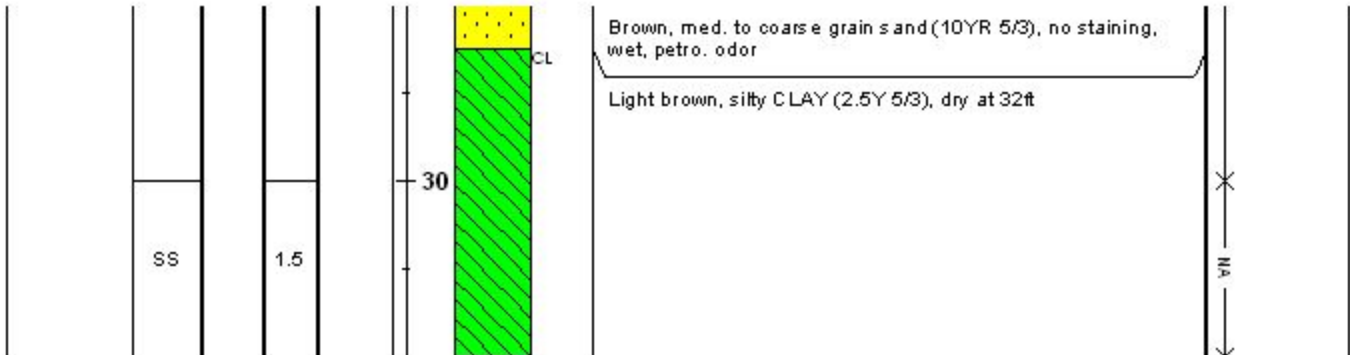
Boring and Well Construction Log

Boring #: SP-1

Sheet 3 of 3

Project: South Cass Lake	Contractor: Thein Well	Location: Cass Lake, MN
Project #: 60254681	Operator: Thein Well	Northing: Easting:
Client: Enbridge Energy	Drill Rig Type: Hollow Stem Auger	Surface Elevation (ft AMSL):
Start Date & Time: 10/15/2012 1400	Method: Split Spoon- Hollow Stem Auger	Total Depth (ft): 32
Finish Date & Time: 10/15/2012 1600	Boring ID: SP-1	Logged By: Angela Hawkins/ Brian Hill

Sample					Depth (ft.)	Lithology	USCS Symbol	Soil and Rock Description	Well Diagram
Analytical Sample	Sample Type	Blows/ 6 inch	Rec (ft)	PID (ppm)					



Remarks and Datum Used:

AECOM
 First National Bank Building
 332 Minnesota Street, E1000
 St. Paul, MN 55101
 Phone: (651) 222-0841

NA= not applicable

SS= split spoon

Depth to Water Table (ft): 26 (assumed)



Boring and Well Construction Log

Boring #: SP-2
Sheet 1 of 1

Project: South Cass Lake	Contractor: Their Well	Location: Cass Lake, MN
Project #: 60254681	Operator: Their Well	Northing: Easting:
Client: Enbridge Energy	Drill Rig Type: Hollow Stem Auger	Surface Elevation (ft AMSL):
Start Date & Time: 10/16/2012 0745	Method: Split Spoon- Hollow Stem Auger	Total Depth (ft): 34
Finish Date & Time: 10/16/2012 0845	Boring ID:	Logged By: Angela Hawkins/ Brian Hill

Sample					Depth (ft.)	Lithology	USCS Symbol	Soil and Rock Description	Well Diagram
Analytical Sample	Sample Type	Blows/ 6 inch	Rec (ft)	PID (ppm)					

	SS		NA			NA	Blind drilled to 24'		
	SS		1.3	25	sand		Brown, med. to coarse sand, no staining, petro. odor, wet (10YR 5/3)		
	SS		0.7				Crude oil stained, med to coarse sand w/ intermittent pebbles, petro odor, wet (10YR 3/2)		
	SS		0.5				Crude oil stained, silty sand, petro odor, wet (GLE Y 1 5/1)		
	SS		2	30			0-16" Crude oil stained, med. to coarse grain sand w/ intermittent gravel, petro odor (2.5Y 5/3)		
					CL		16-24" Grayish brown silty CLAY (2.5Y 5/2)		
	SS		1.3				0-8" s luff, 8-16" Light brown silty CLAY, dry (2.5Y 5/4)		

Remarks and Datum Used:	Drill location 120' east of SP-1.	Test drill to confirm location of clay confining unit.
AECOM First National Bank Building 332 Minnesota Street, E1000 St. Paul, MN 55101 Phone: (651) 222-0841	NA= not applicable	Depth to Water Table (ft): 26 (assumed)
	SS= split spoon	



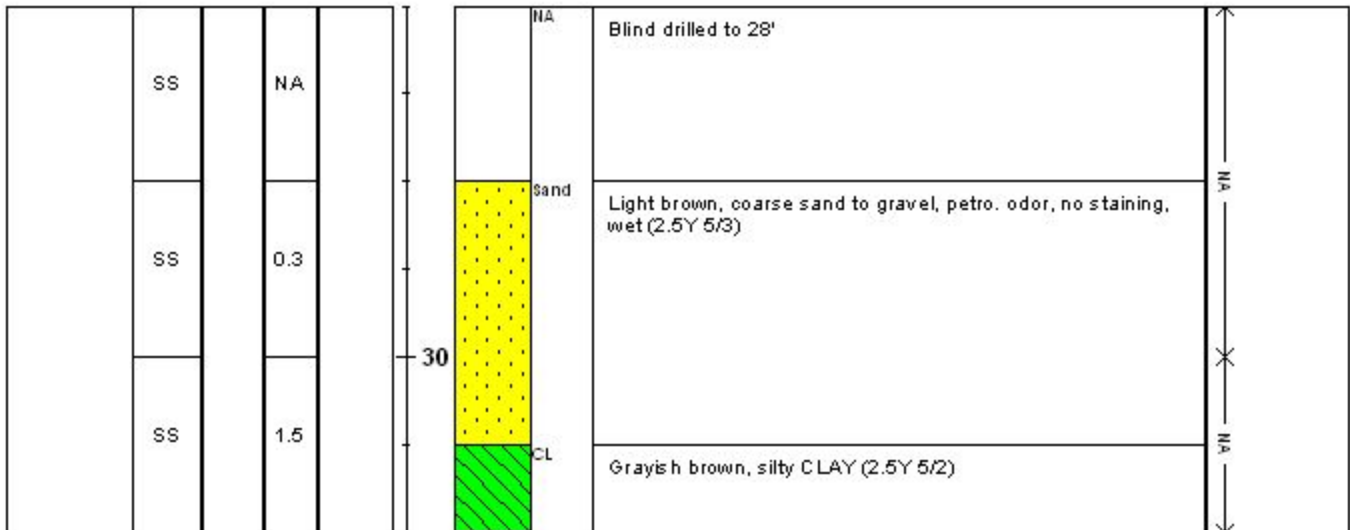
Boring and Well Construction Log

Boring #: SP-3

Sheet 1 of 1

Project: South Cass Lake	Contractor: Thein Well	Location: Cass Lake, MN
Project #: 60254681	Operator: Thein Well	Northing: Easting:
Client: Enbridge Energy	Drill Rig Type: Hollow Stem Auger	Surface Elevation (ft AMSL):
Start Date & Time: 10/16/2012 1125	Method: Split Spoon- Hollow Stem Auger	Total Depth (ft): 32
Finish Date & Time: 10/16/2012 1200	Boring ID:	Logged By: Angela Hawkins/ Brian Hill

Sample					Depth (ft.)	Lithology	USCS Symbol	Soil and Rock Description	Well Diagram
Analytical Sample	Sample Type	Blows/ 6 inch	Rec (ft)	PID (ppm)					



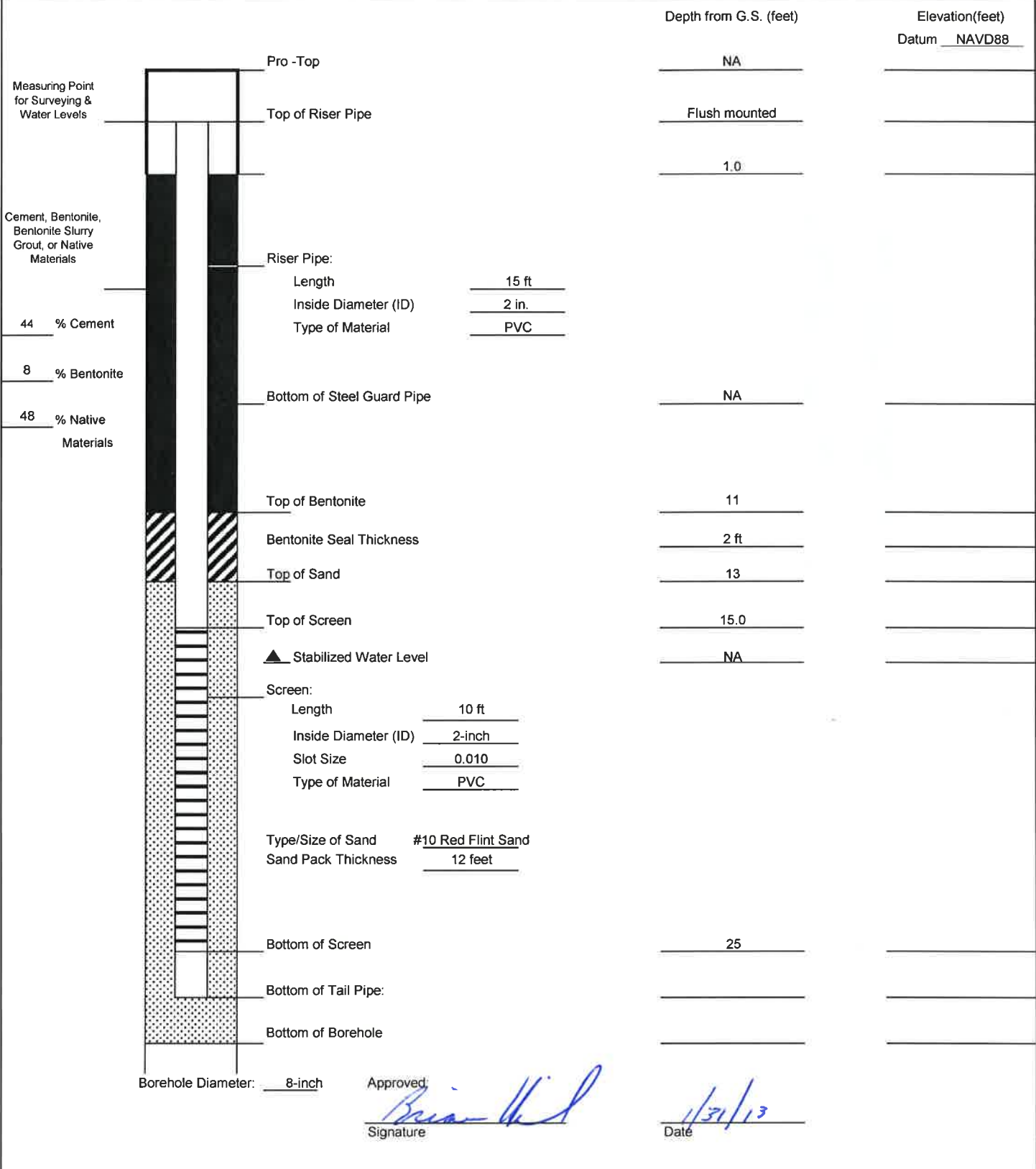
Remarks and Datum Used:	Drill location near MW-10 along fence.	Test drill to confirm location of clay confining unit.
AECOM First National Bank Building 332 Minnesota Street, E1000 St. Paul, MN 55101 Phone: (651) 222-0841	NA= not applicable	Depth to Water Table (ft): 26 (assumed)
	SS= split spoon	

**Attachment III – Bioventing
Well and Vapor Monitoring
Point Construction Details**



Client: <i>Enbridge Energy</i>	WELL ID: BVW-1
Project Number: <i>60254681</i>	UNIQUE WELL ID:
Site Location: <i>South Cass Lake, Cass Lake, MN</i>	Date Installed: <i>19-Nov-12</i>
Well Location: _____ Coords: _____	Inspector: <i>Brian Hill</i>
Method: <i>Hollow Stem Auger</i>	Contractor: <i>Thein Well Company</i>

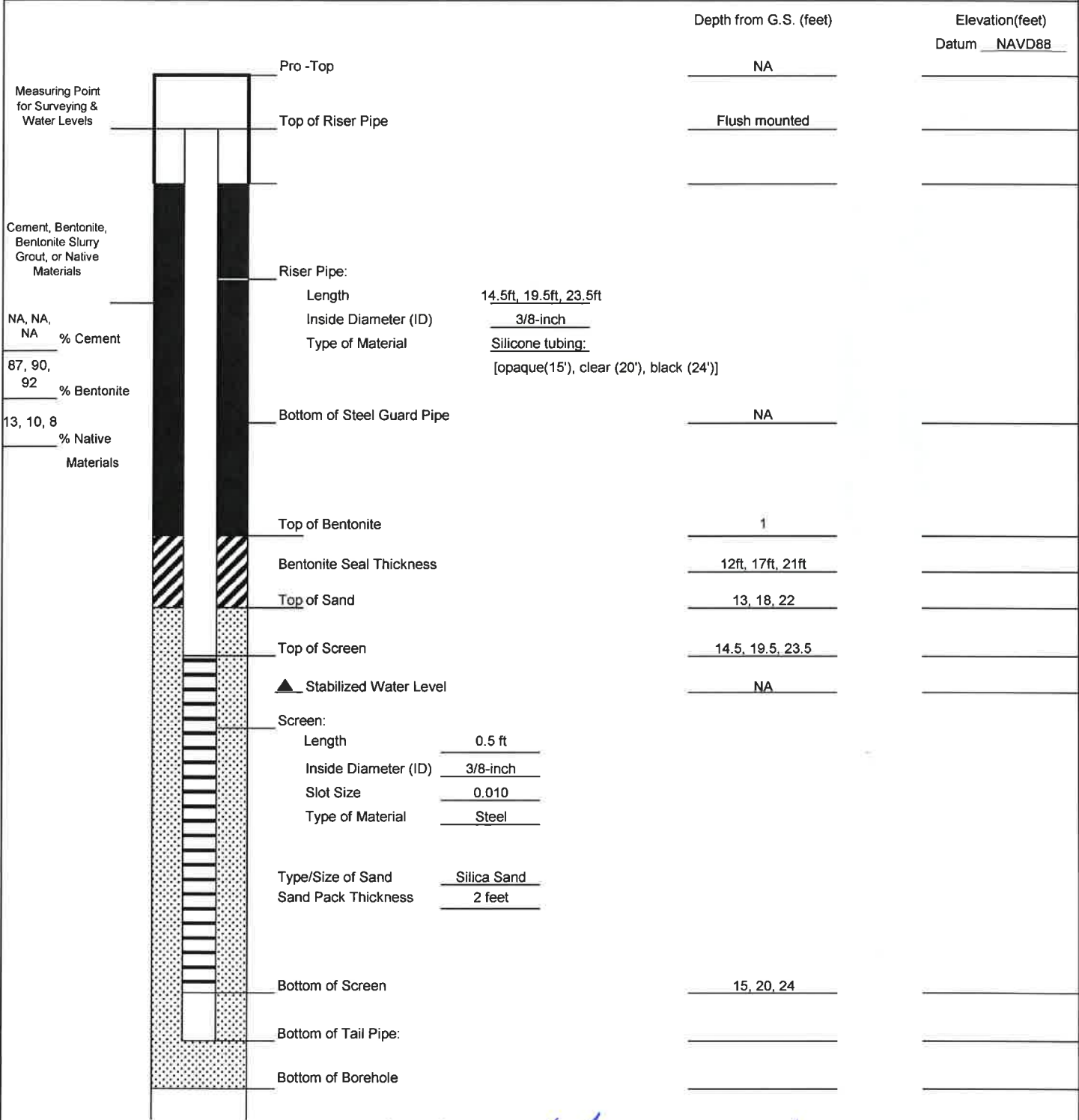
BIOVENTING WELL CONSTRUCTION DETAIL





Client: <i>Enbridge Energy</i>	WELL ID: VP-1
Project Number: <i>60254681</i>	UNIQUE WELL ID:
Site Location: <i>South Cass Lake, Cass Lake, MN</i>	Date Installed: <i>19-Nov-12</i>
Well Location: _____ Coords: _____	Inspector: <i>Brian Hill</i>
Method: <i>Geoprobe</i>	Contractor: <i>Thein Well Company</i>

NESTED VAPOR POINTS CONSTRUCTION DETAIL (DEPTHS: 15ft, 20ft, 24ft)



Cement, Bentonite, Bentonite Slurry Grout, or Native Materials

NA, NA, NA % Cement

87, 90, 92 % Bentonite

13, 10, 8 % Native Materials

Riser Pipe:

Length 14.5ft, 19.5ft, 23.5ft

Inside Diameter (ID) 3/8-inch

Type of Material Silicone tubing:
[opaque(15'), clear (20'), black (24')]

Screen:

Length 0.5 ft

Inside Diameter (ID) 3/8-inch

Slot Size 0.010

Type of Material Steel

Type/Size of Sand Silica Sand

Sand Pack Thickness 2 feet

Borehole Diameter: 2-inch


Approved: 
Signature

1/31/13
Date



Client: <i>Enbridge Energy</i>	WELL ID: VP-2
Project Number: <i>60254681</i>	UNIQUE WELL ID:
Site Location: <i>South Cass Lake, Cass Lake, MN</i>	Date Installed: <i>20-Nov-12</i>
Well Location: <i>Coords:</i>	Inspector: <i>Brian Hill</i>
Method: <i>Geoprobe</i>	Contractor: <i>Thein Well Company</i>

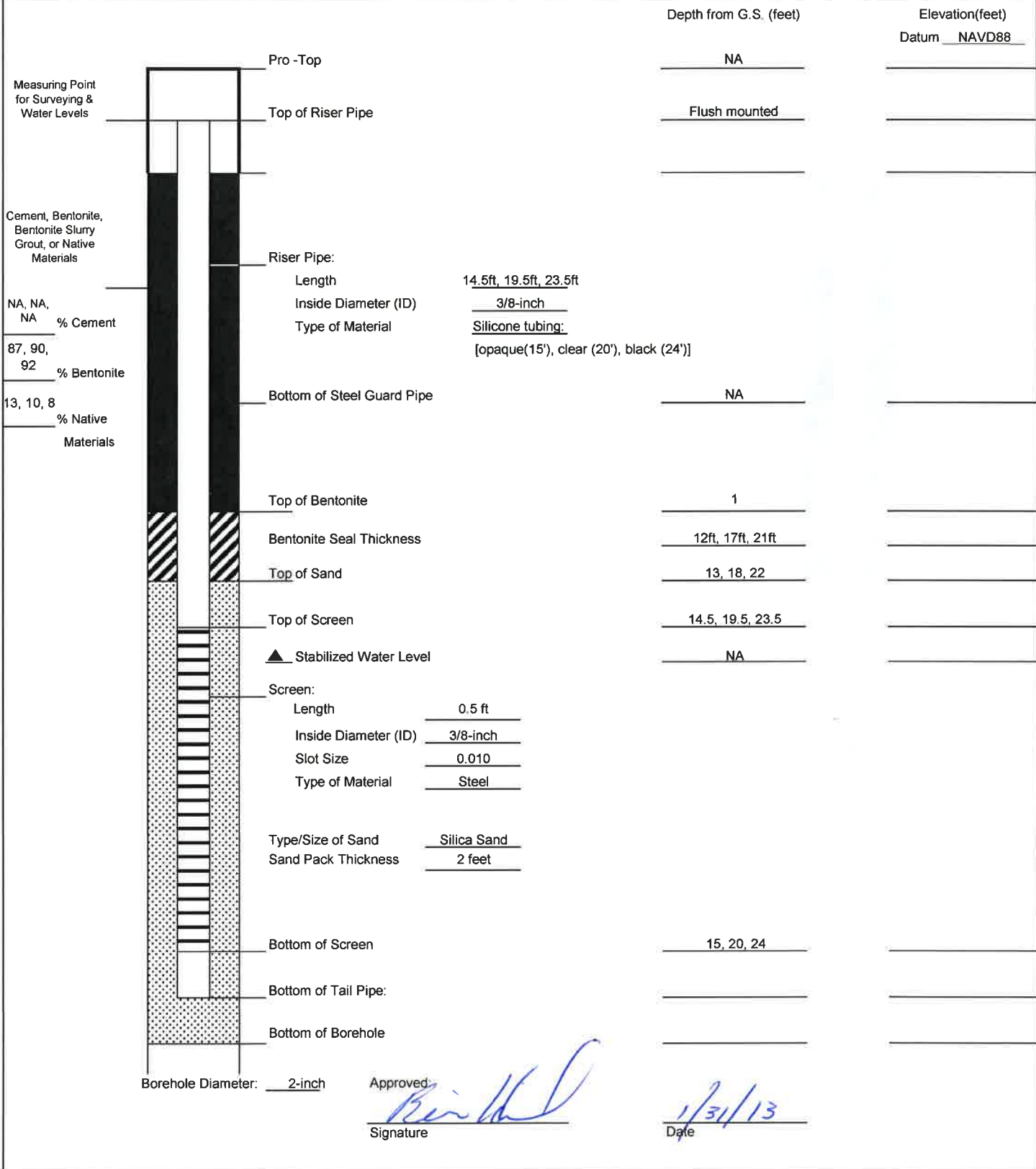
NESTED VAPOR POINTS CONSTRUCTION DETAIL (DEPTHS: 15ft, 20ft, 24ft)

		Depth from G.S. (feet)	Elevation(feet) Datum <u>NAVD88</u>
	Pro -Top	NA	
Measuring Point for Surveying & Water Levels	Top of Riser Pipe	Flush mounted	
Cement, Bentonite, Bentonite Slurry Groul, or Native Materials	Riser Pipe: Length <u>14.5ft, 19.5ft, 23.5ft</u> Inside Diameter (ID) <u>3/8-inch</u> Type of Material <u>Silicone tubing:</u> <u>[opaque(15'), clear (20'), black (24')]</u>		
NA, NA, NA % Cement	Bottom of Steel Guard Pipe	NA	
87, 90, 92 % Bentonite	Top of Bentonite	1	
13, 10, 8 % Native Materials	Bentonite Seal Thickness	12ft, 17ft, 21ft	
	Top of Sand	13, 18, 22	
	Top of Screen	14.5, 19.5, 23.5	
	▲ Stabilized Water Level	NA	
	Screen: Length <u>0.5 ft</u> Inside Diameter (ID) <u>3/8-inch</u> Slot Size <u>0.010</u> Type of Material <u>Steel</u>		
	Type/Size of Sand <u>Silica Sand</u> Sand Pack Thickness <u>2 feet</u>		
	Bottom of Screen	15, 20, 24	
	Bottom of Tail Pipe:		
	Bottom of Borehole		
Borehole Diameter: <u>2-inch</u>	Approved: 	Date <u>1/31/13</u>	
	Signature	Date	



Client: <i>Enbridge Energy</i>	WELL ID: VP-3
Project Number: <i>60254681</i>	UNIQUE WELL ID:
Site Location: <i>South Cass Lake, Cass Lake, MN</i>	Date Installed: <i>20-Nov-12</i>
Well Location: _____ Coords: _____	Inspector: <i>Brian Hill</i>
Method: <i>Geoprobe</i>	Contractor: <i>Thein Well Company</i>

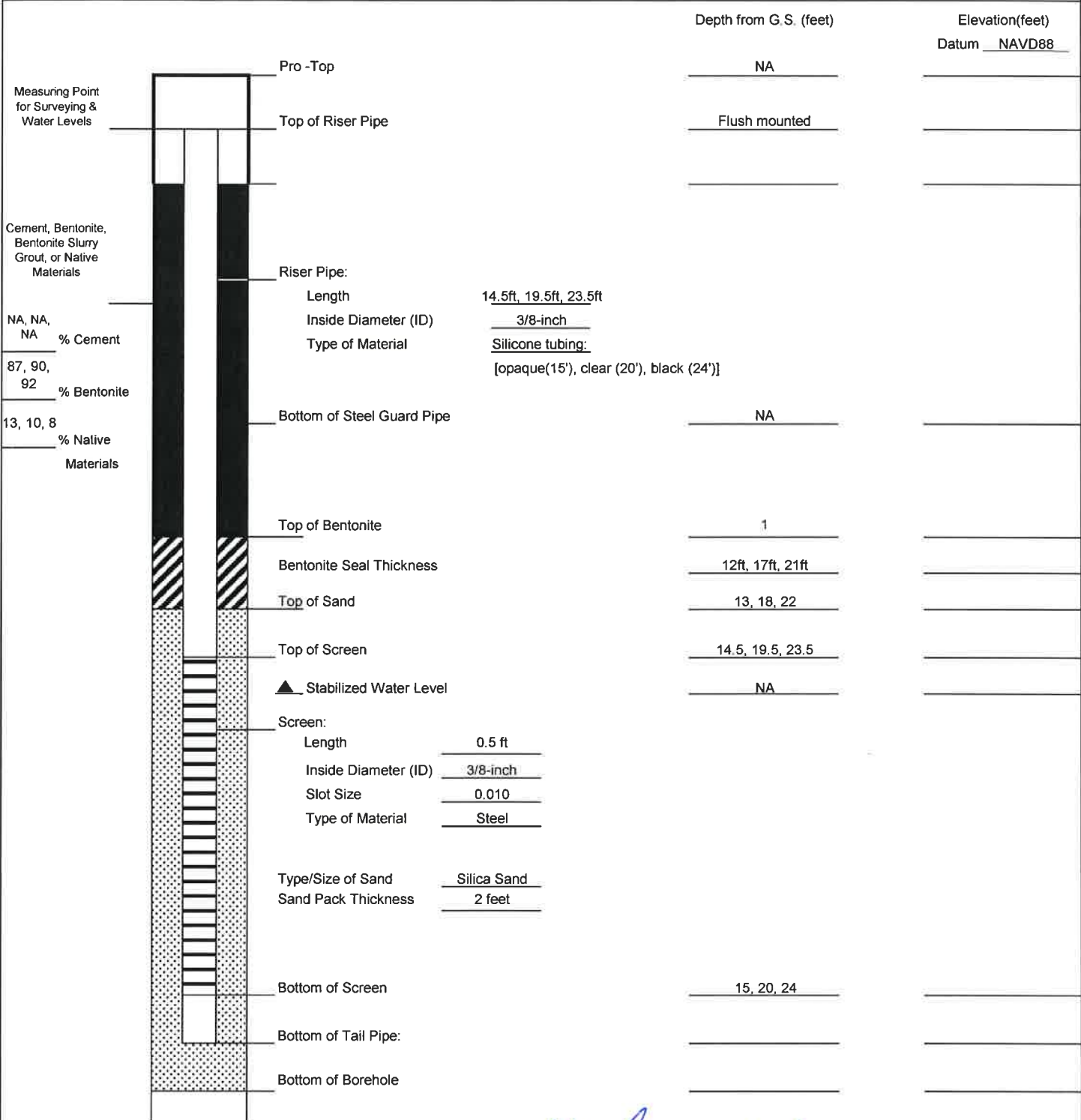
NESTED VAPOR POINTS CONSTRUCTION DETAIL (DEPTHS: 15ft, 20ft, 24ft)





Client: <i>Enbridge Energy</i>	WELL ID: VP-4
Project Number: <i>60254681</i>	UNIQUE WELL ID:
Site Location: <i>South Cass Lake, Cass Lake, MN</i>	Date Installed: <i>20-Nov-12</i>
Well Location: _____ Coords: _____	Inspector: <i>Brian Hill</i>
Method: <i>Geoprobe</i>	Contractor: <i>Thein Well Company</i>

NESTED VAPOR POINTS CONSTRUCTION DETAIL (DEPTHS: 15ft, 20ft, 24ft)



Measuring Point
for Surveying &
Water Levels

Cement, Bentonite,
Bentonite Slurry
Grout, or Native
Materials

NA, NA,
NA
% Cement
87, 90,
92
% Bentonite
13, 10, 8
% Native
Materials

Pro -Top

Top of Riser Pipe

Riser Pipe:
Length 14.5ft, 19.5ft, 23.5ft
Inside Diameter (ID) 3/8-inch
Type of Material Silicone tubing:
[opaque(15'), clear (20'), black (24')]

Bottom of Steel Guard Pipe

Top of Bentonite

Bentonite Seal Thickness

Top of Sand

Top of Screen

▲ Stabilized Water Level

Screen:
Length 0.5 ft
Inside Diameter (ID) 3/8-inch
Slot Size 0.010
Type of Material Steel

Type/Size of Sand Silica Sand
Sand Pack Thickness 2 feet

Bottom of Screen

Bottom of Tail Pipe:

Bottom of Borehole

Borehole Diameter: 2-inch

Approved: 
Signature

1/31/13
Date