



March 28, 2016

Mr. Grant Lidren  
Alaska Department of Environmental Conservation-SPAR  
555 Cordova St.  
Anchorage, AK 99501

**RE: June 2015 Groundwater Monitoring at the ML&P Transformer Shop; 1130 E. First Ave., Anchorage, Alaska (Hazard ID: 23842)**

Dear Mr. Lidren:

This report presents the results of the June 2015 groundwater monitoring conducted at the Municipal Light and Power's (ML&P) Transformer Shop Site at 1130 E. First Avenue (formerly 1201 E. Third Ave.), in Anchorage, Alaska. The Site is listed with the Alaska Department of Environmental Conservation (ADEC) as File # 2100.26.302, Record Key # 90210001102, and Hazard ID: 23842. The petroleum hydrocarbon contamination in the groundwater is attributed to leaking underground storage tanks removed in 1989. All of the groundwater monitoring wells are flush mounted and located in an asphalt paved lot adjacent the Transformer Shop Building (Figures 1 and 2).

Except for items noted in this report, the sampling activities were conducted in accordance with the December 3, 2002 Work Plan, and subsequent modifications approved by ADEC. These modifications include:

- ADEC's February 3, 2004 letter approving the *September 2003 Groundwater Monitoring Event* which requested ML&P to continue groundwater sampling of five of the six monitoring wells at the Site (MW-3, MW-5, MW-6, MW-7 and MW-9). The monitoring was to be conducted annually in June and the samples analyzed for diesel range organics (DRO), gasoline range organics (GRO) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Sampling of MW-8, which is adjacent to MW-9, was not requested for annual monitoring and sampling was discontinued.
- ADEC's February 3, 2015 letter approving a reduction in the number monitoring wells to be sampled to four (MW-5, MW-6, MW-7 and MW-9). Well MW-3 was damaged the previous winter due to frost heaving and was no longer functional (the casing was apparently broken in the subsurface and well was blocked at 17 feet below ground surface with only a foot of water in the well in June 2014).

## 2016 Groundwater Sampling

SLR International Corporation (SLR) personnel collected groundwater samples at four monitoring wells (MW-5, MW-6, MW-7, and MW-9) on June 25 and June 26, 2015. The sampling effort was completed by Aleria Knudson and Kyle Johnson, who meet the criteria of ADEC qualified environmental professionals and samplers per 18 AAC 75.333. Groundwater sampling forms documenting the sampling of the wells are included in the Appendix of this letter. A photograph log is also included documenting the site conditions during the sampling event.

Prior to the collection of the groundwater samples, the water levels in all wells were measured using an electronic water level indicator. With the exception of monitoring well MW-9 (discussed below) groundwater samples were collected using a low-flow sampling technique (method) by means of a peristaltic pump to improve sample quality (decreased turbidity) and reduce the volume of purge water generated. This method differs from the 2002 Work Plan, which detailed the removal of 3 well casing volumes of purge water with a bailer prior to sampling. Low-flow sampling methods have been used for the annual monitoring since 2011. The low-flow sampling method consist of purging at low flow rate [between 0.05 and 0.5 liters per minute (L/min)], while maintaining a drawdown of less than 0.3 feet, if possible. During the purging, up to six water quality parameters are measured [temperature, pH, conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and turbidity] at three to five minute intervals. Water quality parameters are considered stable when three consecutive readings of at least three parameters [or four in temperatures is used are within:

- $\pm 3\%$  for temperature (minimum of  $\pm 0.2^\circ\text{C}$ ),
- $\pm 0.1$  for pH,
- $\pm 3\%$  for conductivity,
- $\pm 10$  mv for ORP,
- $\pm 10\%$  for DO, and
- $\pm 10\%$  for turbidity.

All monitoring wells except MW-9 sustained near constant water levels during purging, at flow rates of 0.1 to 0.25 L/min. While purging, the water quality parameters were measured using a YSI 556 multi-parameter instrument. Turbidity was measured with a La Motte 2020 e/i turbidity meter. Stability criteria was met for all wells except MW-9. Water level data and final water quality parameters are presented in Table 1. Purge water generated during sampling activities was placed in labeled containers and disposed of by ML&P following the receipt of analytical results.

MW-9 has typically been a poor yielding well, which has repeatedly gone dry when purging while attempting achieve stable parameters, even at low flow rates. In 2015, MW-9 was purged dry on June 25. During the purging, the water level dropped continually and the parameters did not meet stabilization criteria. A total of 3 gallons of water were purged, which was over three times the volume of water in the casing (Table 1). The water in the well was as allowed to recover approximately 24 hours and analytical samples were collected on June 26, without

additional purging. At the time, the water level well had recovered approximately 50%. Water quality parameters were measured both days for comparison purposes.

### Laboratory Analyses

Groundwater samples collected from the four monitoring wells, including a duplicate sample from well MW-9, were submitted to SGS North America in Anchorage using chain-of-custody procedures. The samples were analyzed for DRO by Method AK 102, GRO by Method AK101 and BTEX by Method SW8021B.

Analytical data was reviewed for consistency with the *ADEC Technical Memorandum, Environmental Laboratory Data and Quality Assurance Requirements* (ADEC 2009). Appendices contain the laboratory analytical data package, ADEC Laboratory Data Review Checklist, and Data Quality Assessment (DQA). One anomaly was associated with the data. The BTEX surrogate recovered high for parent sample MW-9TS and its duplicate MW-99TS. Sample results were flagged "QH" and are considered estimated with a potentially high bias. For all affected results, either the parent and field duplicate results for the analyte were above the applicable project cleanup level (e.g., benzene), or the parent and field duplicate results for an analyte were below the applicable project cleanup level (18 AAC 75, Table C, January 2016); In addition, results were consistent with historical data. Therefore, data usability was not impacted. The DQA indicated that the laboratory data was of good quality and 100% complete.

### Analytical Results

The June 2015 analytical results are provided in Table 2. Table 3 provides a summary of current and historical analytical results. Of the four wells sampled, monitoring well MW-9 was the only well with detected concentrations above applicable groundwater cleanup levels (18 AAC 75.345, Table C).

Groundwater cleanup levels in MW-9 were exceeded for benzene, GRO and DRO as shown on Table 2. Benzene was 3.62 mg/L in the primary sample and 2.79 mg/L in the duplicate, which was greater than the groundwater cleanup level of 0.005 mg/L. GRO was detected at 12.5 mg/L in the primary sample and 9.85 mg/L in the duplicate, which was greater the groundwater cleanup level of 2.2 mg/L. Concentrations of DRO were 3.22 mg/L and 2.83 mg/L in the duplicate, which were slightly greater than the groundwater cleanup level of 1.5 mg/L. The field team noted a petroleum-like odor when collecting the MW-9 samples, and possible sheen on the meniscus of the GRO/BTEX sample containers.

Samples from monitoring wells MW-5, MW-6, and MW-7 had concentrations well below groundwater cleanup levels. MW-6 and MW-7 contained detectable but trace levels of DRO [concentrations were between the detection limit (DL) and limit of quantitation (LOQ)]. All other analytical results for MW-5, MW-6, and MW-7 were non-detectable. This is consistent with the historical data set, and indicates the plume of petroleum hydrocarbon impacted groundwater is very localized around MW-9. Wells MW-7 and MW-6 are located less than 150 feet down gradient from MW-9, and show essentially no petroleum hydrocarbon impacted groundwater.

Monitoring well MW-9 has historically contained the highest concentrations of analytes (Table 3). The concentration of analytes in MW-9 in 2015 was lower than in 2014 but similar to the

2013 results for the samples collected after purging. The 2015 and 2014 results for the samples collected without purging appear to be somewhat anomalous with respect to the long term trend. The water sampled results collected after purging are more likely representative of the formation water and not biased high.

Based on the long term data set (2000-2015), the concentration of the contaminants of concern has dropped over time, with the greatest reduction in the first few years of monitoring. Over the past 3-5 years concentrations have tended to remain relatively constant, with slight oscillations (especially if the results for samples collected without purging are eliminated from the data set). DRO is close the groundwater cleanup level, but GRO and benzene remain well above the groundwater cleanup level.

It is noted that DO concentrations measured in the down gradient wells (MW-6 and MW-7) are low, relative to the concentration in the hydraulically upgradient well (MW-5). DO levels measured in MW-9 were also low during the initial purging on June 25, but elevated after the well had recharged. This suggests biological activity (by microorganisms) is still occurring in the area and attenuating the petroleum hydrocarbons. The apparent low groundwater movement in the area surrounding MW-9 as evidenced by the poor recharge, would tend to favor a slow rate of attenuation.

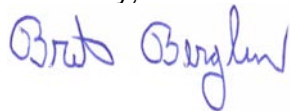
### **Conclusions and Recommendations**

The groundwater monitoring at the Transformer Shop Site indicates the petroleum hydrocarbons in the groundwater are decreasing over time but still exceed ADEC groundwater cleanup levels at one monitoring location (MW-9) for DRO, GRO and benzene. The extent of petroleum hydrocarbon impacted groundwater is very localized, and plume is stable or decreasing.

In accordance with the ADEC monitoring request (ADEC 2004), the next groundwater monitoring event at the Site is planned for June of 2016. As noted, ground water samples have been collected using a low-flow sampling technique with a peristaltic pump since 2011, and this technique is proposed for subsequent events. The benzene and GRO concentrations in MW-9 are well above groundwater cleanup levels in MW-9, and well below in the other wells so the potential slight loss of VOCs using a peristaltic pump does not appear to relevant to accessing the site conditions. In addition, the stairs over MW-5 make the use of a peristaltic pump the most practical. Therefore, ML&P requests approval for the use of a peristaltic pump for sampling at this site.

If you have any questions or concerns, please contact Bret Berglund (SLR, 907-563-2128) or Yelena Saville (ML&P, 907-263-5273).

Sincerely,



Bret Berglund  
Project Manager, C.P.G.

CC: Yelena Saville, ML&P

Attachments:

Table 1 – June 2015 Water Sampling Log

Table 2 – June 2015 Groundwater Sample Results

Table 3 – Historical Groundwater Analytical Results

Figure 1 – Site Vicinity Map

Figure 2 – Site Map with June 2015 Groundwater Sampling Results

Photograph Log

Appendices

A-Data Quality Assessment

B-ADEC Laboratory Data Review Checklist

C-SGS Laboratory Data Reports

D-Groundwater Sampling Forms



## **TABLES**

Table 1	June 2015 Water Sampling Log
Table 2	June 2015 Groundwater Sample Results
Table 3	Historical Groundwater Analytical Results





**TABLE 1 - JUNE 2015 WATER SAMPLING LOG  
ML&P TRANSFORMER SHOP**

Well Number <sup>1,2,3</sup>	MW-5	MW-6	MW-7	MW-9	
<b><u>Water Level &amp; Well Purging Data</u></b>					
Date Water Level Measured	6/25/2015	6/25/2015	6/25/2015	6/25/2015	6/26/2015
Time Water Level Measured	13:16	11:21	12:12	9:53	9:05
TOC Elevation, ft	Unknown	Unknown <sup>4</sup>	49.23	51.23	51.23
Depth to Water Below TOC, ft	4.88	15.75	17.40	4.23	6.54
Water Level Elevation, ft	NC	NC	31.83	47.00	44.69
Depth of Well Below Top of Casing, ft	13.77	20.98	20.94	8.72	8.72
Water Column in Well, ft	8.89	5.23	3.54	4.49	2.18
Diameter of Well Casing, inch	2	2	2	2	2
Gallons per Foot	0.163	0.163	0.163	0.163	0.163
Gallons in Well	1.45	0.85	0.58	0.73	0.36
Total Gallons Purged (Low Flow)	1.7	2.3	1.4	3 (purged dry)	0.0
<b><u>Sampling/Water Parameters</u></b>					
Date Sampled	6/25/2015	6/25/2015	6/25/2015	6/25/2015	6/26/2015
Time Sampled	13:42	11:54	12:39	--	9:05
Temperature, C	9.13	7.22	8.08	12.47	13.71
Specific Conductance, uS/cm	610	6.23	829	1299	1063
Turbidity (NTU)	2.08	4.04	2.01	23.40	7.10
pH	7.06	6.46	6.49	7.03	6.86
Dissolved Oxygen, mg/L	5.47	0.47	1.13	0.95	5.56
Sample Number	MW-5TS	MW-6TS	MW-7TS	Not applicable	MW-9TS, MW-99TS (duplicate)

**Abbreviations:**

C Celsius  
ft feet  
mg/L milligrams per liter  
NC Not calculated (TOC elevation not known).  
uS/cm microsiemens per centimeter  
TOC Top of casing

**Notes**

- 1 Sampled By SLR: Kyle Johnson, and Aleria Knudson.
- 2 All wells were purged and sampled by a low-flow method with a peristaltic pump, except for MW-9. MW-9 was purged dry on 6/25/15, and was sampled 24 hours later without additional purging. Water level was about 50% recovered.
- 3 All wells are flush-mounted in paved areas surrounding the Transformer Shop.
- 4 The top of MW-6 casing was reduced (cut) 1 inch in 2015 for maintenance purposes after sampling. Depth to water listed is prior to cutting.



**TABLE 2 - JUNE 2015 GROUNDWATER SAMPLE RESULTS  
ML&P TRANSFORMER SHOP  
June 25, 2015**

Compound (mg/L)	Method	18 AAC 75.345 Table C Cleanup Level	Monitoring Well MW-3	Monitoring Well MW-5	Monitoring Well MW-6	Monitoring Well MW-7	Monitoring Well MW-9		
Sample ID <sup>1</sup>			Due to damage no sample was collected.	MW-5TS	MW-6TS	MW-7TS	MW-9TS/MW-99TS		
Diesel Range Organics (DRO)	AK 102	1.5		0.423 J	0.223 J	0.878	<b>3.22/2.83</b>		
Gasoline Range Organics (GRO)				AK 101	2.2	ND [0.05]	ND [0.05]	ND [0.05]	<b>12.5/9.85</b>
Benzene	SW8021B	0.005		ND [0.00025]	ND [0.00025]	ND [0.00025]	<b>3.62 QH/2.79 QH</b>		
Toluene	SW8021B	1.0		ND [0.0005]	ND [0.0005]	ND [0.0005]	0.133/0.126		
Ethylbenzene	SW8021B	0.7		ND [0.0005]	ND [0.0005]	ND [0.0005]	0.237/0.231		
Total Xylenes	SW8021B	10.0		ND[0.0015]	ND[0.0015]	ND[0.0015]	1.2458/1.0952		

**Notes:**

<sup>1</sup>All wells were purged and sampled by low-flow method with a peristaltic pump, except for MW-9. MW-9 was sampled without purging.

ND [0.360] Analyte not detected above the Limit of Quantitation (LOQ).

**2.63** Bold/Shaded - Concentration exceeded the 18 AAC 75.345, Table C groundwater cleanup level (January 2016).

0.945/1.72 Primary sample concentration followed by duplicate sample concentration

**Abbreviations:**

- AAC Alaska Administrative Code
- J Compound was positively identified. Concentration is above the method detection limit (DL), but below the LOQ.
- ft Feet
- Q The quantitation is an estimate. A "H", "L", or "N" indicates a potential high, low, or unknown bias respectively.
- mg/L milligrams/liter



**TABLE 3 - HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
ML&P TRANSFORMER SHOP**

Compound (mg/L)		DRO	GRO	Benzene	Total BTEX
Cleanup Level (18 AAC 75.345, Table C)		1.5	2.2	0.005	--
Monitoring Well	Date <sup>1</sup>				
MW-3	8/27/1998	0.206	--	--	--
	12/31/1998	0.669	--	--	--
	3/19/1999	ND [0.333]	--	--	--
	6/23/1999	0.427	--	--	--
	9/30/1999	<b>4.42</b>	--	--	--
	2/2/2000	ND [0.395]	ND [0.0900]	ND [0.00050]	--
	5/26/2000	0.700	ND [0.0900]	ND [0.00050]	--
	8/25/2000	0.622	ND [0.0900]	ND [0.00050]	0.0194
	12/1/2000	ND [0.326]	ND [0.0900]	ND [0.00050]	0.00303
	6/24/2004	ND [0.300]	ND [0.0900]	ND [0.00050]	ND
	6/15/2005	ND [0.337]	ND [0.0900]	ND [0.00050]	ND
	8/3/2006	0.465	ND [0.100]	ND [0.00050]	ND
	8/1/2007	ND [0.357]	ND [0.100]	ND [0.00050]	ND
	7/10/2008	0.495 B	ND [0.100]	ND [0.00050]	ND
	7/29/2010	ND [0.574]	ND [0.062]	ND [0.0003]	ND
	6/23/2011	ND [0.266]	ND [0.031]	0.00029 J	0.00029 J
	6/22/2012	ND [0.382]	ND [0.0620]	ND [0.0003]	ND
7/12/2013	ND [0.360]	ND [0.0620]	ND [0.0003]	ND	
6/25/2014	Well damaged, not sampled.				
MW-5	7/16/2004	0.352	ND [0.0900]	ND [0.00050]	ND
	6/15/2005	ND [0.333]	ND [0.0900]	ND [0.00050]	ND
	8/2/2006	ND [0.370]	ND [0.100]	ND [0.00050]	ND
	8/1/2007	ND [0.328]	ND [0.100]	ND [0.00050]	ND
	7/11/2008	0.276 J, B	ND [0.100]	ND [0.00050]	ND
	7/29/2010	ND [0.526]	ND [0.062]	ND [0.0003]	ND
	6/22/2011	ND [0.266]	ND [0.031]	ND [0.00015]	ND
	6/22/2012	ND [0.392]	ND [0.0620]	0.00016 J	0.00016 J
	7/11/2013	0.236 J	ND [0.0620]	ND [0.0003]	ND
	6/25/2014	ND [0.308]	ND [0.0500]	ND [0.00025]	ND
6/25/2015	0.423 J	ND [0.05]	ND [0.00025]	ND	
MW-6	8/27/1998	0.282	--	--	--
	12/31/1998	0.759	--	--	--
	3/19/1999	1.21	--	--	--
	6/23/1999	<b>2.17</b>	--	--	--
	9/30/1999	1.43	--	--	--
	2/2/2000	0.419	ND [0.0900]	ND [0.00050]	ND
	5/26/2000	ND [0.674]	ND [0.0900]	ND [0.00050]	ND
	8/25/2000	ND [0.323]	ND [0.0900]	ND [0.00050]	ND
	12/1/2000	1.29	ND [0.0900]	ND [0.00050]	ND
	6/24/2004	ND [0.366]	ND [0.0900]	ND [0.00050]	ND
	6/15/2005	ND [0.333]	ND [0.0900]	ND [0.00050]	ND
	8/3/2006	ND [0.366]	ND [0.100]	ND [0.00050]	ND
	8/1/2007	0.519	ND [0.100]	ND [0.00050]	ND
	7/11/2008	0.407 B	ND [0.100]	ND [0.00050]	ND
	7/29/2010	ND [0.544]	ND [0.062]	ND [0.0003]	ND
	6/22/2011	ND [0.260]	ND [0.031] QN	ND [0.00015]	ND
	6/21/2012	ND [0.378]	ND [0.0620]	ND [0.0003]	ND
	7/12/2013	0.185 J	ND [0.0620]	ND [0.0003]	ND
	6/25/2014	0.189 J	ND [0.0500]	ND [0.00025]	ND
6/25/2015	0.223 J	ND [0.05]	ND [0.00025]	ND	

**TABLE 3, Continued - HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
ML&P TRANSFORMER SHOP**

Compound (mg/L)	DRO	GRO	Benzene	Total BTEX	
<b>Cleanup Level (18 AAC 75.345, Table C)</b>	<b>1.5</b>	<b>2.2</b>	<b>0.005</b>	<b>--</b>	
Monitoring Well	Date				
MW-7	8/27/1998	ND [0.104]	--	--	--
	12/31/1998	0.158	--	--	--
	3/19/1999	ND [0.309]	--	--	--
	6/23/1999	ND [0.297]	--	--	--
	9/30/1999	ND [0.319]	--	--	--
	2/2/2000	ND [0.357]	ND [0.0900]	ND [0.00050]	ND
	5/26/2000	ND [0.674]	ND [0.0900]	ND [0.00050]	ND
	8/25/2000	ND [0.333]	ND [0.0900]	ND [0.00050]	ND
	12/1/2000	ND [0.330]	ND [0.0900]	ND [0.00050]	ND
	6/24/2004	ND [0.361]	ND [0.0900]	ND [0.00050]	ND
	6/15/2005	ND [0.375]	ND [0.0900]	ND [0.00050]	ND
	8/3/2006	ND [0.368]	ND [0.100]	ND [0.00050]	ND
	8/1/2007	ND [0.321]	ND [0.100]	ND [0.00050]	ND
	7/11/2008	ND [0.621] B	ND [0.100]	ND [0.00050]	ND
	7/29/2010	ND [0.538]	ND [0.062]	ND [0.0003]	ND
	6/23/2011	ND [0.266]	ND [0.031]	0.00035 J	0.00035 J
	6/21/2012	ND [0.378]	ND [0.0620]	ND [0.0003]	ND
7/11/2013	0.465 J	ND [0.0620]	ND [0.0003]	ND	
6/25/2014	0.211 J	ND [0.0500]	ND [0.00025]	ND	
6/25/2015	0.878	ND [0.05]	ND [0.00025]	ND	
MW-8	6/23/1999	<b>7.53</b>	0.25	<b>0.103</b>	0.109
	9/30/1999	<b>5.34</b>	0.22	<b>0.0599</b>	0.0759
	2/2/2000	<b>12</b>	0.33	<b>0.172</b>	0.177
	5/26/2000	<b>4.73</b>	0.94	<b>0.473</b>	0.473
	9/13/2002 <sup>2</sup>	<b>3.06</b>	0.464	<b>0.0158</b>	0.160
	12/4/2002	<b>2.31</b>	1.40	<b>0.00677</b>	0.449
	3/20/2003	<b>3.02</b>	1.04	0.00489	0.364
	6/26/2003	<b>4.78</b>	0.862	<b>0.726</b>	0.762
	9/23/2003	<b>2.37</b>	1.410	<b>0.019</b>	0.7762
MW-9	5/26/2000	<b>18.8</b>	<b>31</b>	<b>7.97</b>	19.8
	8/25/2000	<b>36.1</b>	<b>47.6</b>	<b>3.42</b>	21.4
	12/1/2000	<b>11.92</b>	<b>44.9</b>	<b>3.3</b>	6.55
	9/13/2002 <sup>2</sup>	<b>6.11</b>	<b>15.1</b>	<b>3.36</b>	5.94
	12/4/2002	<b>8.03</b>	<b>9.76</b>	<b>2.44</b>	3.52
	3/20/2003	<b>3.39</b>	<b>9.67</b>	<b>1.82</b>	3.38
	6/26/2003	<b>61.2</b>	<b>10.2</b>	<b>3.84</b>	6.97
	9/23/2003	<b>7.47</b>	<b>14.1</b>	<b>4.95</b>	9.25
	6/24/2004	<b>6.33</b>	<b>17.7</b>	<b>3.89</b>	7.40
	6/15/2005	<b>4.51</b>	<b>13.4</b>	<b>3.50</b>	5.81
	8/3/2006	<b>2.23</b>	<b>5.53</b>	<b>2.01</b>	3.20
	8/1/2007	<b>8.22</b>	<b>9.99</b>	<b>1.93</b>	3.74
	7/11/2008	<b>4.81</b>	<b>15.4</b>	<b>4.14</b>	8.26
	7/30/2010	<b>5.44</b>	<b>14.2</b>	<b>6.01 Q+</b>	8.49
	6/23/2011	<b>5.25/4.07</b>	<b>11.2/11.8</b>	<b>3.94/4.10</b>	5.71/5.80
	6/21/2012	<b>5.09/3.89</b>	<b>14.5/16.2</b>	<b>4.97/5.12</b>	7.18 QN/7.99 QN
	7/11/2013 <sup>3</sup>	<b>0.871 QN /1.75 QN</b>	<b>8.31 QN/15.9 QN</b>	<b>2.14 QN/5.62 QN</b>	3.47 QN/7.94 QN
7/12/2013	<b>2.61</b>	--	--	--	
6/25/2014 <sup>3</sup>	<b>2.63/1.97</b>	<b>17.1 QN/2.87 QN</b>	<b>6.16 QN/0.996 QN</b>	8.79 QN/1.45 QN	
6/25/2015	<b>3.22/2.83</b>	<b>12.5/9.85</b>	<b>3.62 QH/2.79 QH</b>	5.24 QH/4.24 QH	

**Notes:**

<sup>1</sup> Sampling method prior to 2011 was purging 3 casing volumes with a bailer, followed by sample collection with a bailer. Starting in 2011 the sampling method switched to a low flow sampling technique with purging and sampling performed with a peristaltic pump and tubing.

<sup>2</sup> Analytical results are suspected to have been mislabeled or switched for monitoring wells MW-8 and MW-9 during sampling handling of 9/13/2002 samples. Analytical results in this table have been placed in corrected locations.

<sup>3</sup> Sample collected without prior purging.

<sup>4</sup> Well purged dry and sampled the approximately 24 hours later.

**Coding**

0.377 / 0.364	Primary sample concentration followed by duplicate sample concentration
<b>4.81</b>	Bold and Shaded - Concentration exceeded the 18 AAC 75.345, Table C groundwater cleanup level
ND [0.0900]	Analyte not detected above the practical quantitation limit (limit of quantitation, or LOQ), data prior to 2012 analytes were not detect above the Detection Limit (DL)

**Abbreviations:**

AAC	Alaska Administration Code
B	Compound was positively identified in the trip blank or method blank.
BTEX	benzene, toluene, ethylbenzene, and total xylenes
DRO	diesel range organics
J	Compound was positively identified, above the detection limit, but below the Limit of Quantitation.
GRO	gasoline range organics
Q	The quantitation is an estimate. A "H", "L", or "N" indicates a potential high, low, or unknown bias respectively.
mg/L	milligrams/liter
ND	not detected
--	Sample not analyzed for parameter



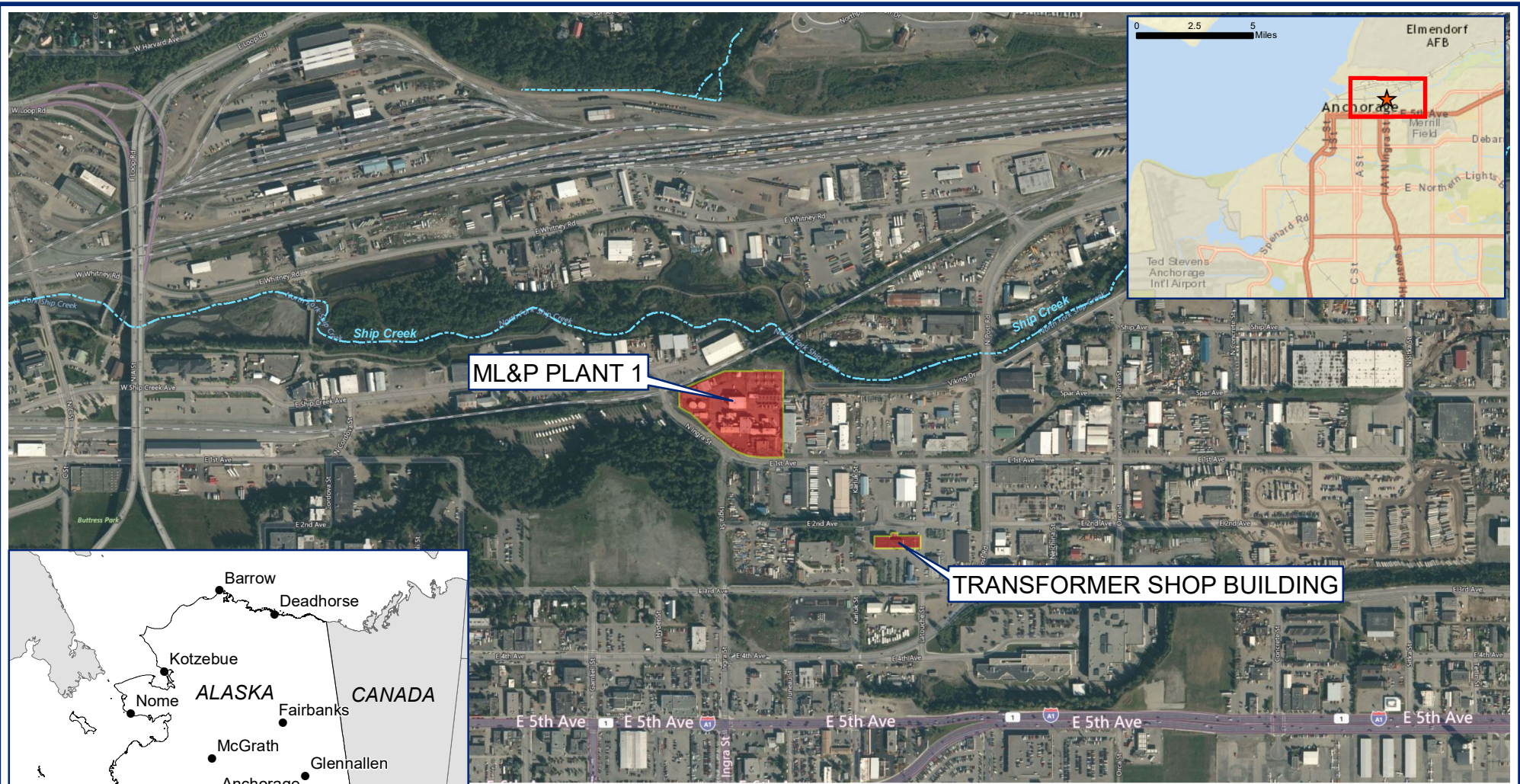


## FIGURES

Figure 1 Site Vicinity Map

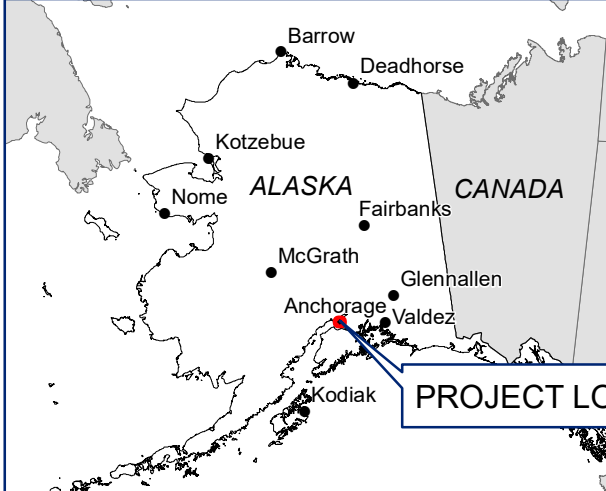
Figure 2 Site Map with June 2015 Groundwater Sampling Results





**ML&P PLANT 1**

**TRANSFORMER SHOP BUILDING**

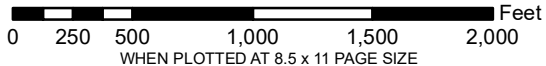


**PROJECT LOCATION**

Site  
**ML & P TRANSFORMER SHOP SITE**  
 1130 EAST 1ST AVENUE  
 (FORMERLY 1201 EAST 3RD AVENUE)  
 ANCHORAGE, ALASKA

Report  
**TRANSFORMER SHOP  
 GROUNDWATER SAMPLING**

Drawing  
**SITE VICINITY MAP**



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY.  
 ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.



Drawing March 2016  
 File Name F1 Transformer Shop Bldg\_16.mxd

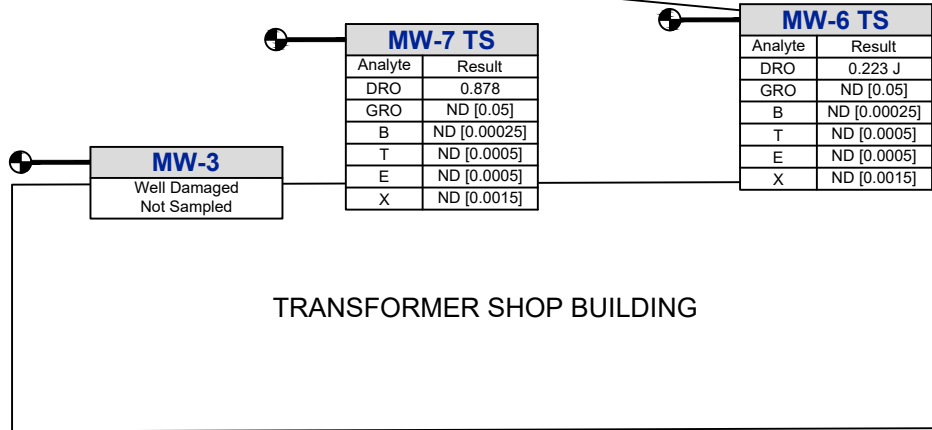
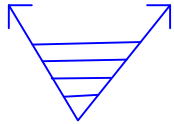
Scale 1 in = 800 feet  
 Project No. 101.00528.11001

Fig. No. **1**





Historical Groundwater Flow Direction (Approximate)



MW-8 TS

MW-9 TS / MW-99 TS	
Analyte	Result
DRO	3.22 / 2.83 DUP
GRO	12.5 / 9.85 DUP
B	3.62 / 2.79 DUP
T	0.133 / 0.126 DUP
E	0.237 / 0.231 DUP
X	1.25 / 1.10 DUP

Asphalt Pavement

**MW-5 TS**

Analyte	Result
DRO	0.423 J
GRO	ND [0.05]
B	ND [0.00025]
T	ND [0.0005]
E	ND [0.0005]
X	ND [0.0015]

BUILDING

Legend

- GROUNDWATER MONITORING WELL
- GROUNDWATER MONITORING WELL - SAMPLING DISCONTINUED IN 2003
- CHAIN-LINK FENCE

Sampling Results Guidelines

<b>AAC</b>	ALASKA ADMINISTRATIVE CODE
<b>ADEC</b>	ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
<b>DRO</b>	DIESEL RANGE ORGANICS
<b>GRO</b>	GASOLINE RANGE ORGANICS
<b>B</b>	BENZENE
<b>T</b>	TOLUENE
<b>E</b>	ETHYLBENZENE
<b>X</b>	TOTAL XYLENES
<b>DUP</b>	DUPLICATE SAMPLE
<b>ND</b>	ANALYTE IS NOT DETECTED ABOVE THE LIMIT OF DETECTION (LOD) SHOWN
<b>Q</b>	RESULT IS AN ESTIMATION
<b>J</b>	COMPOUND WAS POSITIVELY IDENTIFIED AT A CONCENTRATION ABOVE THE DETECTION LIMIT BUT BELOW THE LIMIT OF QUANTITATION (LOQ).

**0.00249** SAMPLE HAS **EXCEEDED** ADEC CLEANUP LEVEL LISTED IN 18 AAC 75.345 TABLE C [JANUARY 2016]

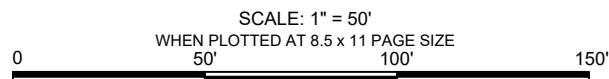
**0.005** SAMPLE **DOES NOT EXCEED** ADEC CLEANUP LEVEL LISTED IN 18 AAC 75.345 TABLE C [JANUARY 2016]

Site  
**ML & P TRANSFORMER SHOP SITE**  
 1130 E. 1ST AVENUE  
 (FORMERLY 1201 EAST 3RD AVENUE)  
 ANCHORAGE, ALASKA

Report  
**TRANSFORMER SHOP**  
**GROUNDWATER SAMPLING**

Drawing  
**SITE PLAN AND JUNE 2015**  
**GROUNDWATER SAMPLING RESULTS**

Date	March 2016	Scale	1" = 50 Feet	Fig. No.	2
File Name	F2 Site Plan GW Results_15	Project No.	105.00528.11001		



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.





## **PHOTOGRAPH LOG**







**Photo 1:** Monitoring Well MW-5, located under the stairs.



**Photo 2:** Monitoring Well MW-5 located in a cement utility enclosure under staircase.



SITE PHOTOGRAPHS  
June 25 2015

Transformer Shop Groundwater Sampling  
ML&P  
Anchorage Alaska


Job No: 105.00528.11001



**Photo 3:** Maintenance at MW-6 included removing (cutting off) 1 inch from top of the well casing, so it was not hitting the monument cover.



**Photo 4:** Monitoring Well MW-9 in front of transformer building.

 <p><b>SLR</b></p>	<p>Transformer Shop Groundwater Sampling ML&amp;P Anchorage Alaska</p>
<p>SITE PHOTOGRAPHS June 25 2015</p>	<p>Job No: 105.00528.11001</p>



**Photo 5:** Monitoring Well MW-9 in front of Transformer building.



SITE PHOTOGRAPHS  
June 25 2015

Transformer Shop Groundwater Sampling  
ML&P  
Anchorage Alaska

Job No: 105.00528.11001



## **APPENDIX A**

### **DATA QUALITY ASSESSMENT**





# Data Quality Assessment Report:

## 2015 Groundwater Monitoring At Transformer Shop Area (1130 E. 1<sup>st</sup> Ave., Anchorage, AK)

Prepared By: Jenifer McLean, SLR Project Chemist  
July 20, 2015

### 1 LAB ANALYSIS, DATA VALIDATION, AND REPORTING

This Data Quality Assessment (DQA) covers sampling conducted at the ML&P Transformer Shop at 1201 East Third Avenue on June 25 and June 26, 2015. SGS North America Inc. (SGS), in Anchorage, Alaska (an ADEC-approved laboratory) provided the analytical support for this project. Table 1 provides the laboratory work order number and corresponding receipt temperature.

Samples were taken according to the specifications in Table 2. The chain of custody form was completed as the samples were packaged into a cooler for transport. A temperature blank and gel ice were added as required. The samples were placed in a cooler at the time of collection and were kept chilled until delivery to the laboratory. Documentation pertaining to chain of custody and sample condition was filed in field and laboratory records.

**Table 1 Summary of Work Order and Cooler Receipt Information**

Work Order Number	Matrix	Date of Receipt	Temperature Blank	Cooler Temperature
1153180	Water	06/26/2015	4.8°C	NA

NA – Not Applicable  
°C – degrees Celsius

**Table 2 Summary of Sample Containers and Preservatives**

Method	Container Volume	Container Material	Preservative	Hold time (days)	Trip Blank <sup>1</sup>
GRO/BTEX (AK101/SW8021B)	3 x 40 mL VOA vials	Glass	HCl, 4°C (±2°)	14	Required
DRO (AK102)	2 x 1 Liter	Amber Glass	HCl, 4°C (±2°)	7	NA

Notes:

1 – This type of sample requires a trip blank to be included in the cooler, with the trip blank noted on the chain of custody.

Abbreviations:

GRO – gasoline range organics

BTEX – benzene, toluene, ethylbenzene, and xylene

DRO – diesel range organics

HCl – hydrochloric acid

mL – milliliter

VOA – volatile organic analysis

The SGS final report was presented as hard copy Level II data deliverable package and electronic deliverables compatible with Microsoft Access. The analytic data was reviewed for consistency with ADEC Technical Memorandum 06-002, *Environmental Laboratory Data and Quality Assurance* (ADEC 2009) requirements. An ADEC Laboratory Data Review Checklist was completed for each analytical work order and was included in this report. Any anomalies to the

requirements for precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS) are discussed below and the data were flagged where appropriate.

### Application of Data Flags

General data quality flagging conventions in Table 3 were used to indicate quality control anomalies. Data was flagged, where appropriate. A data quality summary is provided below.

**Table 3 Data Qualifiers**

Qualifier	Description
ND	The analyte was analyzed for, but not detected. The associated numerical value was at or below the detection limit (DL).
Q	The reported value was considered an estimate. Where applicable, a “H”, “L”, or “N” was appended to indicate positive, negative, or unknown bias, respectively.
J	Compound was positively identified. Concentration was above the detection limit, but below the limit of quantitation.

### Preservation, Temperature, and Hold Time

All preservation and holding time criteria were considered met.

### PRECISION

Precision was measured from the Field Duplicate, and the Relative Percent Difference (RPD) between the Laboratory Control Spike (LCS)/Laboratory Control Spike Duplicate (LCSD), and Matrix Spike (MS)/Matrix Spike Duplicate (MSD).

### Field Duplicate

The ADEC requirement of one field duplicate per ten samples or less was met. One field duplicate was collected for four samples for GRO, DRO, and BTEX. Sample MW-99TS was a field duplicate of MW-9TS. All RPDs between field duplicate and the parent sample were within limits (less than the 30% required for water samples).

### Laboratory Control Sample and Duplicate (LCS/LCSD) RPD

Analytical batch precision was established through the extraction and analysis of an LCS/LCSD, one per batch of 20 samples or less. For DRO, one MS/MSD pair was also analyzed. All LCS/LCSD and MS/MSD RPDs were within control limits.

## 1.1 ACCURACY

Accuracy was measured from laboratory QC sample percent recoveries to include LCS/LCSD, ICVs and CCVs, and surrogates. No MS/MSDs were evaluated.

### Continuing Calibration Verification (CCV)

All ICVs and CCVs were within method and laboratory limits.

### Surrogates

With the exceptions noted below, all surrogate recoveries were within established control limits.

- Sample MW-9TS – BTEX surrogate 1,4-Difluorbenzene recovered at 128% (limits 77-115%). The data were qualified “QH” with a potential high bias indicated.
- Sample MW-99TS (Field Duplicate of MW-9TS) – BTEX surrogate 1,4-Difluorbenzene recovered at 127% (limits 77-115%). The data were qualified “QH” with a potential high bias indicated.

Sample results were above the ADEC Table C cleanup level of 0.005 mg/L for benzene at 3.62 mg/L and 2.79 mg/L, respectively. In addition, results were comparable to historical data. Therefore, there was no impact to the usability of the data for groundwater monitoring.



### **Laboratory Control Sample and Duplicate (LCS/LCSD) Recovery**

An LCS/LCSD was analyzed for each batch of 20 samples or less. For DRO, one MS/MSD pair was also analyzed. All LCS/LCSD and MS/MSD recoveries were within ADEC and laboratory limits.

### **Internal Standards**

Not applicable to the analyses included in this work order.

## **1.2 REPRESENTATIVENESS**

The data deliverables were consistent with the site conditions. Samples were collected from usual locations.

## **1.3 COMPARABILITY**

Comparability between laboratories was not applicable to this investigation. Standard SW846 and Alaska methods were used by SGS, an ADEC-approved laboratory.

## **1.5 COMPLETENESS**

Completeness was measured as the number of usable results versus the total number of results. The data set was 100% complete with no omissions or rejections with respect to analysis. The information fulfilled the data quality objectives of this sampling event.

## **1.6 SENSITIVITY**

Sensitivity was measured by evaluating whether the limit of detection (LOD) was less than the regulatory clean up levels or project required goals. Additionally, sensitivity was evaluated by determining whether method blank results were less than the LOD or detection limit (DL).

### **Blanks (Method and Trip)**

One trip blank was included in the cooler with samples. One method blank was analyzed for every analytical batch of twenty samples or less. There were no detections in any method blanks or the trip blank.

### **Reporting Limits**

The LODs for non-detect values were evaluated against 18 AAC 75, Table C (January 2016). All LODs were below project goals.

## **2 SUMMARY**

The data were considered good quality. No data was rejected and all data was considered usable for the intended purpose.



## **APPENDIX B**

### **ADEC LABORATORY DATA REVIEW CHECKLIST**



## Laboratory Data Review Checklist

Completed by:

Title:  Date:

CS Report Name:  Report Date:

Consultant Firm:

Laboratory Name:  Laboratory Report Number:

ADEC File Number:  ADEC RecKey Number:

### 1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?  
 Yes     No     NA (Please explain.)    Comments:

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?  
 Yes     No     NA (Please explain.)    Comments:

### 2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?  
 Yes     No     NA (Please explain.)    Comments:

- b. Correct analyses requested?  
 Yes     No     NA (Please explain.)    Comments:

### 3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ( $4^{\circ} \pm 2^{\circ} \text{C}$ )?  
 Yes     No     NA (Please explain.)    Comments:

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?  
 Yes     No     NA (Please explain.)    Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes     No     NA (Please explain.)    Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes     No     NA (Please explain.)    Comments:

No discrepancies were noted.

e. Data quality or usability affected? (Please explain.)

Comments:

No impact.

#### 4. Case Narrative

a. Present and understandable?

Yes     No     NA (Please explain.)    Comments:

b. Discrepancies, errors or QC failures identified by the lab?

Yes     No     NA (Please explain.)    Comments:

c. Were all corrective actions documented?

Yes     No     NA (Please explain.)    Comments:

None were taken.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

No impact.

#### 5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes     No     NA (Please explain.)    Comments:

b. All applicable holding times met?

Yes     No     NA (Please explain.)    Comments:

c. All soils reported on a dry weight basis?

Yes     No     NA (Please explain.)

Comments:

Only water samples were associated with this work order.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

Yes     No     NA (Please explain.)

Comments:

e. Data quality or usability affected?

Comments:

No impact.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes     No     NA (Please explain.)

Comments:

ii. All method blank results less than PQL?

Yes     No     NA (Please explain.)

Comments:

iii. If above PQL, what samples are affected?

Comments:

Not applicable.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

Yes     No     NA (Please explain.)

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality was not impacted.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes     No     NA (Please explain.)

Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes     No     NA (Please explain.)    Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes     No     NA (Please explain.)    Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes     No     NA (Please explain.)    Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Not applicable.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes     No     NA (Please explain.)    Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

No impact.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

Yes     No     NA (Please explain.)    Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes     No     NA (Please explain.)    Comments:

BTEX surrogate 1,4-Difluorobenzene recovered at 128% and 127%, respectively, in primary sample MW-9TS and its field duplicate MW-99TS (limits 77-115%).



iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes     No     NA (Please explain.)    Comments:

BTEX results were flagged QH

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

A high bias was indicated; however, the data was considered usable. Benzene results were above the 18 AAC 75 Table C cleanup level and data were consistent with historical

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes     No     NA (Please explain.)    Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes     No     NA (Please explain.)    Comments:

iii. All results less than PQL?

Yes     No     NA (Please explain.)    Comments:

iv. If above PQL, what samples are affected?

Comments:

Not applicable.

v. Data quality or usability affected? (Please explain.)

Comments:

No impact.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes     No     NA (Please explain.)    Comments:

One field duplicate was collected for four samples for BTEX, GRO, and DRO.

ii. Submitted blind to lab?

Yes     No     NA (Please explain.)

Comments:

Sample MW-99TS was a field duplicate of MW-9TS.

iii. Precision – All relative percent differences (RPD) less than specified DQOs?  
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2) / 2)} \times 100$$

Where  $R_1$  = Sample Concentration

$R_2$  = Field Duplicate Concentration

Yes     No     NA (Please explain.)

Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No impact.

f. Decontamination or Equipment Blank (If not used explain why).

Yes     No     NA (Please explain.)

Comments:

Disposable sampling equipment was used for collection of all samples.

i. All results less than PQL?

Yes     No     NA (Please explain.)

Comments:

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

Not applicable.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes     No     NA (Please explain.)

Comments:

## **APPENDIX C**

### **SGS LABORATORY DATA REPORTS**





## Laboratory Report of Analysis

To: SLR Alaska-Anchorage  
2700 Gambell Street, Suite 200  
Anchorage, AK 99503  
907-222-1112

Report Number: **1153180**

Client Project: **ML&P Transformer Shop**

Dear Bret Berglund,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,  
SGS North America Inc.

SGS North America  
Environmental Services – Alaska Division  
Client Services/Continuous Improvement Lead

Heather Hall

2015.07.17

19:22:55 -08'00'

Justin Nelson  
Project Manager  
Justin.Nelson@sgs.com

Date

Print Date: 07/17/2015 3:23:08PM

## Case Narrative

SGS Client: **SLR Alaska-Anchorage**  
SGS Project: **1153180**  
Project Name/Site: **ML&P Transformer Shop**  
Project Contact: **Bret Berglund**

Refer to sample receipt form for information on sample condition.

**MW-9TS (1153180004) PS**

8021B - Surrogate recovery for 1,4-difluorobenzene (128%) does not meet QC criteria due to matrix interference.

**MW-99TS (1153180005) PS**

8021B - Surrogate recovery for 1,4-difluorobenzene (127%) does not meet QC criteria due to matrix interference.

**GW-062715-MW2-02 MS (1153093003) BMS**

AK101 - Surrogate recovery for 4-bromofluorobenzene (200%) does not meet QC criteria due to matrix interference.

**GW-062715-MW2-02 MSD (1153093004) BMSD**

AK101 - Surrogate recovery for 4-bromofluorobenzene (201%) does not meet QC criteria due to matrix interference.

\*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 07/17/2015 3:23:10PM

## Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

### Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
GW-062715-MW2-02 MS	1153093003	06/27/2015	06/29/2015	Water (Surface, Eff., Ground)
GW-062715-MW2-02 MSD	1153093004	06/27/2015	06/29/2015	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO Low Volume (W)

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
MW-6TS	1153180001	06/25/2015	06/26/2015	Water (Surface, Eff., Ground)
MW-7TS	1153180002	06/25/2015	06/26/2015	Water (Surface, Eff., Ground)
MW-5TS	1153180003	06/25/2015	06/26/2015	Water (Surface, Eff., Ground)
MW-9TS	1153180004	06/25/2015	06/26/2015	Water (Surface, Eff., Ground)
MW-99TS	1153180005	06/25/2015	06/26/2015	Water (Surface, Eff., Ground)
TB-062515	1153180006	06/25/2015	06/26/2015	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO Low Volume (W)





### Detectable Results Summary

Client Sample ID: **MW-6TS**

Lab Sample ID: 1153180001

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.223J	mg/L

Client Sample ID: **MW-7TS**

Lab Sample ID: 1153180002

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.878	mg/L

Client Sample ID: **MW-5TS**

Lab Sample ID: 1153180003

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.423J	mg/L

Client Sample ID: **MW-9TS**

Lab Sample ID: 1153180004

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3.22	mg/L
Benzene	3620	ug/L
Ethylbenzene	237	ug/L
Gasoline Range Organics	12.5	mg/L
o-Xylene	35.8	ug/L
P & M -Xylene	1210	ug/L
Toluene	133	ug/L

Client Sample ID: **MW-99TS**

Lab Sample ID: 1153180005

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2.83	mg/L
Benzene	2790	ug/L
Ethylbenzene	231	ug/L
Gasoline Range Organics	9.85	mg/L
o-Xylene	35.2	ug/L
P & M -Xylene	1060	ug/L
Toluene	126	ug/L

Print Date: 07/17/2015 3:23:13PM

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**Results of MW-6TS**

Client Sample ID: **MW-6TS**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180001  
Lab Project ID: 1153180

Collection Date: 06/25/15 11:54  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.223 J	0.610	0.183	mg/L	1		07/11/15 16:40
<b>Surrogates</b>							
5a Androstane (surr)	91.5	50-150		%	1		07/11/15 16:40

**Batch Information**

Analytical Batch: XFC11934  
Analytical Method: AK102  
Analyst: NLL  
Analytical Date/Time: 07/11/15 16:40  
Container ID: 1153180001-A

Prep Batch: XXX33486  
Prep Method: SW3520C  
Prep Date/Time: 07/08/15 09:13  
Prep Initial Wt./Vol.: 246 mL  
Prep Extract Vol: 1 mL



Results of MW-6TS

Client Sample ID: MW-6TS
Client Project ID: ML&P Transformer Shop
Lab Sample ID: 1153180001
Lab Project ID: 1153180

Collection Date: 06/25/15 11:54
Received Date: 06/26/15 09:58
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.0500 U, 0.100, 0.0310, mg/L, 1, 06/30/15 13:35

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 90.5, 50-150, %, 1, 06/30/15 13:35

Batch Information

Analytical Batch: VFC12498
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 06/30/15 13:35
Container ID: 1153180001-C

Prep Batch: VXX27520
Prep Method: SW5030B
Prep Date/Time: 06/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 83.8, 77-115, %, 1, 06/30/15 13:35

Batch Information

Analytical Batch: VFC12498
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 06/30/15 13:35
Container ID: 1153180001-C

Prep Batch: VXX27520
Prep Method: SW5030B
Prep Date/Time: 06/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



**Results of MW-7TS**

Client Sample ID: **MW-7TS**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180002  
Lab Project ID: 1153180

Collection Date: 06/25/15 12:39  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.878	0.605	0.181	mg/L	1		07/11/15 17:00
<b>Surrogates</b>							
5a Androstane (surr)	101	50-150		%	1		07/11/15 17:00

**Batch Information**

Analytical Batch: XFC11934  
Analytical Method: AK102  
Analyst: NLL  
Analytical Date/Time: 07/11/15 17:00  
Container ID: 1153180002-A

Prep Batch: XXX33486  
Prep Method: SW3520C  
Prep Date/Time: 07/08/15 09:13  
Prep Initial Wt./Vol.: 248 mL  
Prep Extract Vol: 1 mL



**Results of MW-7TS**

Client Sample ID: **MW-7TS**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180002  
Lab Project ID: 1153180

Collection Date: 06/25/15 12:39  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		06/30/15 13:54

**Surrogates**

4-Bromofluorobenzene (surr)	92.4	50-150		%	1		06/30/15 13:54
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**Batch Information**

Analytical Batch: VFC12498  
Analytical Method: AK101  
Analyst: CRD  
Analytical Date/Time: 06/30/15 13:54  
Container ID: 1153180002-C

Prep Batch: VXX27520  
Prep Method: SW5030B  
Prep Date/Time: 06/30/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/30/15 13:54
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/30/15 13:54
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/30/15 13:54
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/30/15 13:54
Toluene	0.500 U	1.00	0.310	ug/L	1		06/30/15 13:54

**Surrogates**

1,4-Difluorobenzene (surr)	83.3	77-115		%	1		06/30/15 13:54
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**Batch Information**

Analytical Batch: VFC12498  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 06/30/15 13:54  
Container ID: 1153180002-C

Prep Batch: VXX27520  
Prep Method: SW5030B  
Prep Date/Time: 06/30/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



**Results of MW-5TS**

Client Sample ID: **MW-5TS**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180003  
Lab Project ID: 1153180

Collection Date: 06/25/15 13:42  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.423 J	0.600	0.180	mg/L	1		07/11/15 17:21
<b>Surrogates</b>							
5a Androstane (surr)	93.5	50-150		%	1		07/11/15 17:21

**Batch Information**

Analytical Batch: XFC11934  
Analytical Method: AK102  
Analyst: NLL  
Analytical Date/Time: 07/11/15 17:21  
Container ID: 1153180003-A

Prep Batch: XXX33486  
Prep Method: SW3520C  
Prep Date/Time: 07/08/15 09:13  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL



**Results of MW-5TS**

Client Sample ID: **MW-5TS**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180003  
Lab Project ID: 1153180

Collection Date: 06/25/15 13:42  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		06/30/15 14:13

**Surrogates**

4-Bromofluorobenzene (surr)	92.1	50-150		%	1		06/30/15 14:13
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**Batch Information**

Analytical Batch: VFC12498  
Analytical Method: AK101  
Analyst: CRD  
Analytical Date/Time: 06/30/15 14:13  
Container ID: 1153180003-C

Prep Batch: VXX27520  
Prep Method: SW5030B  
Prep Date/Time: 06/30/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/30/15 14:13
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/30/15 14:13
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/30/15 14:13
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/30/15 14:13
Toluene	0.500 U	1.00	0.310	ug/L	1		06/30/15 14:13

**Surrogates**

1,4-Difluorobenzene (surr)	85.1	77-115		%	1		06/30/15 14:13
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**Batch Information**

Analytical Batch: VFC12498  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 06/30/15 14:13  
Container ID: 1153180003-C

Prep Batch: VXX27520  
Prep Method: SW5030B  
Prep Date/Time: 06/30/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



**Results of MW-9TS**

Client Sample ID: **MW-9TS**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180004  
Lab Project ID: 1153180

Collection Date: 06/25/15 13:42  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	3.22		0.600	0.180	mg/L	1		07/11/15 17:41
<b>Surrogates</b>								
5a Androstane (surr)	85.8		50-150		%	1		07/11/15 17:41

**Batch Information**

Analytical Batch: XFC11934  
Analytical Method: AK102  
Analyst: NLL  
Analytical Date/Time: 07/11/15 17:41  
Container ID: 1153180004-A

Prep Batch: XXX33486  
Prep Method: SW3520C  
Prep Date/Time: 07/08/15 09:13  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL





**Results of MW-9TS**

Client Sample ID: **MW-9TS**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180004  
Lab Project ID: 1153180

Collection Date: 06/25/15 13:42  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	12.5	2.00	0.620	mg/L	20		07/01/15 16:08

**Surrogates**

4-Bromofluorobenzene (surr)	88.4	50-150		%	20		07/01/15 16:08
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**Batch Information**

Analytical Batch: VFC12501  
Analytical Method: AK101  
Analyst: CRD  
Analytical Date/Time: 07/01/15 16:08  
Container ID: 1153180004-D

Prep Batch: VXX27527  
Prep Method: SW5030B  
Prep Date/Time: 07/01/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	3620	10.0	3.00	ug/L	20		07/01/15 16:08
Ethylbenzene	237	1.00	0.310	ug/L	1		06/30/15 14:32
o-Xylene	35.8	1.00	0.310	ug/L	1		06/30/15 14:32
P & M -Xylene	1210	40.0	12.4	ug/L	20		07/01/15 16:08
Toluene	133	1.00	0.310	ug/L	1		06/30/15 14:32

**Surrogates**

1,4-Difluorobenzene (surr)	128	*	77-115	%	1		06/30/15 14:32
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**Batch Information**

Analytical Batch: VFC12498  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 06/30/15 14:32  
Container ID: 1153180004-C

Prep Batch: VXX27520  
Prep Method: SW5030B  
Prep Date/Time: 06/30/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Analytical Batch: VFC12501  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 07/01/15 16:08  
Container ID: 1153180004-D

Prep Batch: VXX27527  
Prep Method: SW5030B  
Prep Date/Time: 07/01/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



**Results of MW-99TS**

Client Sample ID: **MW-99TS**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180005  
Lab Project ID: 1153180

Collection Date: 06/25/15 13:42  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	2.83		0.610	0.183	mg/L	1		07/11/15 18:01
<b>Surrogates</b>								
5a Androstane (surr)	95		50-150		%	1		07/11/15 18:01

**Batch Information**

Analytical Batch: XFC11934  
Analytical Method: AK102  
Analyst: NLL  
Analytical Date/Time: 07/11/15 18:01  
Container ID: 1153180005-A

Prep Batch: XXX33486  
Prep Method: SW3520C  
Prep Date/Time: 07/08/15 09:13  
Prep Initial Wt./Vol.: 246 mL  
Prep Extract Vol: 1 mL



Results of MW-99TS

Client Sample ID: MW-99TS
Client Project ID: ML&P Transformer Shop
Lab Sample ID: 1153180005
Lab Project ID: 1153180

Collection Date: 06/25/15 13:42
Received Date: 06/26/15 09:58
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 9.85, 2.00, 0.620, mg/L, 20, 07/01/15 16:27

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 88.7, 50-150, %, 20, 07/01/15 16:27

Batch Information

Analytical Batch: VFC12501
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 07/01/15 16:27
Container ID: 1153180005-D

Prep Batch: VXX27527
Prep Method: SW5030B
Prep Date/Time: 07/01/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 127, \*, 77-115, %, 1, 06/30/15 14:51

Batch Information

Analytical Batch: VFC12498
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 06/30/15 14:51
Container ID: 1153180005-C

Prep Batch: VXX27520
Prep Method: SW5030B
Prep Date/Time: 06/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VFC12501
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 07/01/15 16:27
Container ID: 1153180005-D

Prep Batch: VXX27527
Prep Method: SW5030B
Prep Date/Time: 07/01/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



**Results of TB-062515**

Client Sample ID: **TB-062515**  
Client Project ID: **ML&P Transformer Shop**  
Lab Sample ID: 1153180006  
Lab Project ID: 1153180

Collection Date: 06/25/15 11:00  
Received Date: 06/26/15 09:58  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		07/07/15 18:24

**Surrogates**

4-Bromofluorobenzene (surr)	104	50-150		%	1		07/07/15 18:24
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**Batch Information**

Analytical Batch: VFC12507  
Analytical Method: AK101  
Analyst: CRD  
Analytical Date/Time: 07/07/15 18:24  
Container ID: 1153180006-B

Prep Batch: VXX27546  
Prep Method: SW5030B  
Prep Date/Time: 07/07/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		07/07/15 18:24
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/07/15 18:24
o-Xylene	0.500 U	1.00	0.310	ug/L	1		07/07/15 18:24
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		07/07/15 18:24
Toluene	0.500 U	1.00	0.310	ug/L	1		07/07/15 18:24

**Surrogates**

1,4-Difluorobenzene (surr)	83.9	77-115		%	1		07/07/15 18:24
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**Batch Information**

Analytical Batch: VFC12507  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 07/07/15 18:24  
Container ID: 1153180006-B

Prep Batch: VXX27546  
Prep Method: SW5030B  
Prep Date/Time: 07/07/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Method Blank

Blank ID: MB for HBN 1712138 [VXX/27520]  
Blank Lab ID: 1274398

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1153180001, 1153180002, 1153180003, 1153180004, 1153180005, 1153180006

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	93.1	50-150		%

### Batch Information

Analytical Batch: VFC12498  
Analytical Method: AK101  
Instrument: Agilent 7890 PID/FID  
Analyst: CRD  
Analytical Date/Time: 6/30/2015 10:37:00AM

Prep Batch: VXX27520  
Prep Method: SW5030B  
Prep Date/Time: 6/30/2015 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:17PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1153180 [VXX27520]  
Blank Spike Lab ID: 1274401  
Date Analyzed: 06/30/2015 12:00

Spike Duplicate ID: LCSD for HBN 1153180 [VXX27520]  
Spike Duplicate Lab ID: 1274402  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153180001, 1153180002, 1153180003, 1153180004, 1153180005, 1153180006

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	1.12	112	1.00	1.05	105	( 60-120 )	5.70	(< 20 )

### Surrogates

4-Bromofluorobenzene (surr)	0.0500	97.6	98	0.0500	91.7	92	( 50-150 )	6.20	
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### Batch Information

Analytical Batch: VFC12498  
Analytical Method: AK101  
Instrument: Agilent 7890 PID/FID  
Analyst: CRD

Prep Batch: VXX27520  
Prep Method: SW5030B  
Prep Date/Time: 06/30/2015 08:00  
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL  
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:19PM



### Method Blank

Blank ID: MB for HBN 1712138 [VXX/27520]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1274398

QC for Samples:

1153180001, 1153180002, 1153180003, 1153180004, 1153180005, 1153180006

### Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L

### Surrogates

1,4-Difluorobenzene (surr)	81.9	77-115	%
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### Batch Information

Analytical Batch: VFC12498  
Analytical Method: SW8021B  
Instrument: Agilent 7890 PID/FID  
Analyst: CRD  
Analytical Date/Time: 6/30/2015 10:37:00AM

Prep Batch: VXX27520  
Prep Method: SW5030B  
Prep Date/Time: 6/30/2015 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:20PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1153180 [VXX27520]  
 Blank Spike Lab ID: 1274399  
 Date Analyzed: 06/30/2015 11:15

Spike Duplicate ID: LCSD for HBN 1153180 [VXX27520]  
 Spike Duplicate Lab ID: 1274400  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153180001, 1153180002, 1153180003, 1153180004, 1153180005, 1153180006

## Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	114	114	100	112	112	( 80-120 )	2.50	(< 20 )
Ethylbenzene	100	113	113	100	110	110	( 75-125 )	3.20	(< 20 )
o-Xylene	100	109	109	100	105	105	( 80-120 )	3.60	(< 20 )
P & M -Xylene	200	223	112	200	215	108	( 75-130 )	3.50	(< 20 )
Toluene	100	113	113	100	112	112	( 75-120 )	1.20	(< 20 )
<b>Surrogates</b>									
1,4-Difluorobenzene (surr)	50	91.1	91	50	89	89	( 77-115 )	2.30	

## Batch Information

Analytical Batch: **VFC12498**  
 Analytical Method: **SW8021B**  
 Instrument: **Agilent 7890 PID/FID**  
 Analyst: **CRD**

Prep Batch: **VXX27520**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **06/30/2015 08:00**  
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL





### Method Blank

Blank ID: MB for HBN 1712210 [VXX/27527]

Blank Lab ID: 1274765

QC for Samples:

1153180004, 1153180005

Matrix: Water (Surface, Eff., Ground)

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	94.2	50-150		%

### Batch Information

Analytical Batch: VFC12501  
Analytical Method: AK101  
Instrument: Agilent 7890 PID/FID  
Analyst: CRD  
Analytical Date/Time: 7/1/2015 12:58:00PM

Prep Batch: VXX27527  
Prep Method: SW5030B  
Prep Date/Time: 7/1/2015 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:22PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1153180 [VXX27527]  
Blank Spike Lab ID: 1274768  
Date Analyzed: 07/01/2015 13:55

Spike Duplicate ID: LCSD for HBN 1153180 [VXX27527]  
Spike Duplicate Lab ID: 1274769  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153180004, 1153180005

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	1.11	111	1.00	1.11	111	( 60-120 )	0.40	(< 20 )

### Surrogates

4-Bromofluorobenzene (surr)	0.0500	96.8	97	0.0500	97.3	97	( 50-150 )	0.54	
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### Batch Information

Analytical Batch: VFC12501  
Analytical Method: AK101  
Instrument: Agilent 7890 PID/FID  
Analyst: CRD

Prep Batch: VXX27527  
Prep Method: SW5030B  
Prep Date/Time: 07/01/2015 08:00  
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL  
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:24PM



### Method Blank

Blank ID: MB for HBN 1712210 [VXX/27527]

Blank Lab ID: 1274765

QC for Samples:

1153180004, 1153180005

Matrix: Water (Surface, Eff., Ground)

### Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.250U	0.500	0.150	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
<b>Surrogates</b>				
1,4-Difluorobenzene (surr)	82.7	77-115		%

### Batch Information

Analytical Batch: VFC12501  
Analytical Method: SW8021B  
Instrument: Agilent 7890 PID/FID  
Analyst: CRD  
Analytical Date/Time: 7/1/2015 12:58:00PM

Prep Batch: VXX27527  
Prep Method: SW5030B  
Prep Date/Time: 7/1/2015 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:25PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1153180 [VXX27527]  
 Blank Spike Lab ID: 1274766  
 Date Analyzed: 07/01/2015 13:36

Spike Duplicate ID: LCSD for HBN 1153180 [VXX27527]  
 Spike Duplicate Lab ID: 1274767  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153180004, 1153180005

### Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL	
	Spike	Result	Rec (%)	Spike	Result	Rec (%)				
Benzene	100	114	114	100	112	112	( 80-120 )	1.90	(< 20 )	
P & M -Xylene	200	222	111	200	222	111	( 75-130 )	0.13	(< 20 )	
<b>Surrogates</b>										
1,4-Difluorobenzene (surr)	50	89.7	90	50	92	92	( 77-115 )	2.50		

### Batch Information

Analytical Batch: VFC12501  
 Analytical Method: SW8021B  
 Instrument: Agilent 7890 PID/FID  
 Analyst: CRD

Prep Batch: VXX27527  
 Prep Method: SW5030B  
 Prep Date/Time: 07/01/2015 08:00  
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:26PM



### Method Blank

Blank ID: MB for HBN 1712748 [VXX/27546]

Blank Lab ID: 1275537

QC for Samples:

1153180006

Matrix: Water (Surface, Eff., Ground)

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	104	50-150		%

### Batch Information

Analytical Batch: VFC12507

Analytical Method: AK101

Instrument: Agilent 7890A PID/FID

Analyst: CRD

Analytical Date/Time: 7/7/2015 4:49:00PM

Prep Batch: VXX27546

Prep Method: SW5030B

Prep Date/Time: 7/7/2015 8:00:00AM

Prep Initial Wt./Vol.: 5 mL

Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:28PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1153180 [VXX27546]  
Blank Spike Lab ID: 1275540  
Date Analyzed: 07/07/2015 17:46

Spike Duplicate ID: LCSD for HBN 1153180 [VXX27546]  
Spike Duplicate Lab ID: 1275541  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153180006

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	1.02	102	1.00	0.980	98	( 60-120 )	3.70	(< 20 )

### Surrogates

4-Bromofluorobenzene (surr)	0.0500	107	107	0.0500	107	107	( 50-150 )	0.80	
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### Batch Information

Analytical Batch: VFC12507  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: CRD

Prep Batch: VXX27546  
Prep Method: SW5030B  
Prep Date/Time: 07/07/2015 08:00  
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL  
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:29PM



### Method Blank

Blank ID: MB for HBN 1712748 [VXX/27546]

Blank Lab ID: 1275537

QC for Samples:

1153180006

Matrix: Water (Surface, Eff., Ground)

### Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L

### Surrogates

1,4-Difluorobenzene (surr)	83.2	77-115	%
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### Batch Information

Analytical Batch: VFC12507  
Analytical Method: SW8021B  
Instrument: Agilent 7890A PID/FID  
Analyst: CRD  
Analytical Date/Time: 7/7/2015 4:49:00PM

Prep Batch: VXX27546  
Prep Method: SW5030B  
Prep Date/Time: 7/7/2015 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:31PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1153180 [VXX27546]  
Blank Spike Lab ID: 1275538  
Date Analyzed: 07/07/2015 17:27

Spike Duplicate ID: LCSD for HBN 1153180 [VXX27546]  
Spike Duplicate Lab ID: 1275539  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153180006

### Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	98.1	98	100	96.2	96	( 80-120 )	1.90	(< 20 )
Ethylbenzene	100	104	104	100	100	100	( 75-125 )	3.50	(< 20 )
o-Xylene	100	105	105	100	101	101	( 80-120 )	3.40	(< 20 )
P & M -Xylene	200	210	105	200	203	101	( 75-130 )	3.50	(< 20 )
Toluene	100	101	101	100	99.0	99	( 75-120 )	2.30	(< 20 )
<b>Surrogates</b>									
1,4-Difluorobenzene (surr)	50	94.6	95	50	98.8	99	( 77-115 )	4.40	

### Batch Information

Analytical Batch: VFC12507  
Analytical Method: SW8021B  
Instrument: Agilent 7890A PID/FID  
Analyst: CRD

Prep Batch: VXX27546  
Prep Method: SW5030B  
Prep Date/Time: 07/07/2015 08:00  
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL  
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:33PM





### Method Blank

Blank ID: MB for HBN 1712735 [XXX/33486]  
Blank Lab ID: 1275472

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1153180001, 1153180002, 1153180003, 1153180004, 1153180005

### Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.180	mg/L
<b>Surrogates</b>				
5a Androstane (surr)	97.9	60-120		%

### Batch Information

Analytical Batch: XFC11934  
Analytical Method: AK102  
Instrument: HP 7890A FID SV E F  
Analyst: NLL  
Analytical Date/Time: 7/11/2015 1:37:00PM

Prep Batch: XXX33486  
Prep Method: SW3520C  
Prep Date/Time: 7/8/2015 9:13:09AM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 07/17/2015 3:23:35PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1153180 [XXX33486]  
Blank Spike Lab ID: 1275473  
Date Analyzed: 07/11/2015 13:58

Spike Duplicate ID: LCSD for HBN 1153180 [XXX33486]  
Spike Duplicate Lab ID: 1275474  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153180001, 1153180002, 1153180003, 1153180004, 1153180005

### Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	21.1	106	20	21.3	107	( 75-125 )	1.10	(< 20 )

### Surrogates

5a Androstane (surr)	0.4	106	106	0.4	105	105	( 60-120 )	0.46	
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### Batch Information

Analytical Batch: XFC11934  
Analytical Method: AK102  
Instrument: HP 7890A FID SV E F  
Analyst: NLL

Prep Batch: XXX33486  
Prep Method: SW3520C  
Prep Date/Time: 07/08/2015 09:13  
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL  
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 07/17/2015 3:23:36PM



### Billable Matrix Spike Summary

Original Sample ID: 1153093002  
MS Sample ID: 1153093003 BMS  
MSD Sample ID: 1153093004 BMSD

Analysis Date: 07/11/2015 21:25  
Analysis Date: 07/11/2015 21:45  
Analysis Date: 07/11/2015 22:05  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153180001, 1153180002, 1153180003, 1153180004, 1153180005

### Results by AK102

Parameter	Sample	Matrix Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	3.61	22.3	27.7	108	21.6	25.7	103	75-125	7.40	(< 30 )
<b>Surrogates</b>										
5a Androstane (surr)		0.446	.529	118	0.431	0.494	115	50-150	6.80	

### Batch Information

Analytical Batch: XFC11934  
Analytical Method: AK102  
Instrument: HP 7890A FID SV E F  
Analyst: NLL  
Analytical Date/Time: 7/11/2015 9:45:00PM

Prep Batch: XXX33486  
Prep Method: Cnt. Liq/Liq Ext. for AK102/3 Low Vol  
Prep Date/Time: 7/8/2015 9:13:09AM  
Prep Initial Wt./Vol.: 224.00mL  
Prep Extract Vol: 1.00mL

Print Date: 07/17/2015 3:23:38PM



1153180

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**CLIENT:** SLR Consulting

**CONTACT:** Aleria Knudson  
Bret Berglund

**PHONE #:** 222-1112

**PROJECT NAME:** MLP Transformer

**Project/ PWSID/ PERMIT#:** 105.00528.11001

**REPORTS TO:** Aleria Knudson  
Bret Berglund

**E-MAIL:** AKnudson@SLRConsulting.com

**INVOICE TO:** SLR Consulting

**QUOTE #:** 10658

**P.O. #:**

**Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.**

Page 1 of 1

Section 3		Section 4		Section 5	
#	C O N T A I N E R S	Pres: Type:	Comp Grab MI (Multi-Incremental)	REMARKS/ LOC ID	REMARKS/ LOC ID
1	A-E	MW-6TS	6/25/15 1154	GW	AK102 - DRO LV
2	A-E	MW-7TS	1239	GW	AK101/SW8021 - GRO/BTEX
3	A-E	MW-5TS	1342	GW	
4	A-E	MW-9TS	0905	GW	
5	A-E	MW-99TS	0905	GW	
6	A-C	TB-062515	6/25/15 1100	TB	

**Section 4**

**Section 5**

**Relinquished By: (1)** Kyle Johnson

**Relinquished By: (2)**

**Relinquished By: (3)**

**Relinquished By: (4)**

**Date:** 6/26/15 09:57

**Date:**

**Date:**

**Date:** 6/26/15 09:58

**Received By:**

**Received By:**

**Received By:**

**Received For Laboratory By:**

**Temp Blank °C:** 4.8/D2

**Chain of Custody Seal: (Circle)** INTACT

**Broken Seal: (Circle)** BROKEN

**Absent Seal: (Circle)** ABSENT

**Data Deliverable Requirements:** Standard

**Requested Turnaround Time and/or Special Instructions:**

**Temp Blank °C:** 4.8/D2

**Chain of Custody Seal: (Circle)** INTACT

**Broken Seal: (Circle)** BROKEN

**Absent Seal: (Circle)** ABSENT

**Data Deliverable Requirements:** Standard

**Requested Turnaround Time and/or Special Instructions:**

http://www.sgs.com/terms-and-conditions

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[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557



1153180



SAMPLE RECEIPT FORM

Review Criteria:	Yes	N/A	No	Comments/Action Taken:
Were <b>custody seals</b> intact? Note # & location, if applicable. COC accompanied samples?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Exemption permitted if sampler hand carries/delivers.</i> 1F, 1B
<b>Temperature blank</b> compliant* (i.e., 0-6°C after CF)? <i>If &gt;6°C, were samples collected &lt;8 hours ago?</i> <i>If &lt;0°C, were all sample containers ice free?</i> Cooler ID: <u>1</u> @ <u>4.8</u> w/ Therm.ID: <u>D2</u> Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ If samples are received <u>without</u> a temperature blank, the “cooler temperature” will be documented in lieu of the temperature blank & “COOLER TEMP” will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note “ambient” or “chilled.”	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<i>Exemption permitted if chilled &amp; collected &lt;8 hrs ago.</i>          <i>Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.</i>
Delivery method (specify all that apply): <input type="checkbox"/> Client (hand carried) <input type="checkbox"/> USPS <input checked="" type="checkbox"/> Lynden <input type="checkbox"/> AK Air <input type="checkbox"/> Alert Courier <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> RAVN <input type="checkbox"/> C&D Delivery <input type="checkbox"/> Carfile <input type="checkbox"/> Pen Air <input type="checkbox"/> Warp Speed <input type="checkbox"/> Other: _____ → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Yes N/A No				
Were samples received within hold time? Do samples <b>match COC*</b> (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<i>Note: Refer to form F-083 “Sample Guide” for hold times.</i> <i>Note: If times differ &lt;1hr, record details and login per COC.</i>
Were samples in <b>good condition</b> (no leaks/cracks/breakage)? Packing material used (specify all that apply): <input checked="" type="checkbox"/> Bubble Wrap <input type="checkbox"/> Separate plastic bags <input type="checkbox"/> Vermiculite <input type="checkbox"/> Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were <b>proper containers</b> (type/mass/volume/preservative*) used? Were <b>Trip Blanks</b> (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials <b>free of headspace</b> (i.e., bubbles ≤6 mm)? Were all soil VOAs <b>field extracted</b> with MeOH+BFB?	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <i>Exemption permitted for metals (e.g., 200.8/6020A).</i>
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was <b>pH verified and compliant</b> ? If pH was adjusted, were bottles flagged (i.e., stickers)?	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
For <b>special handling</b> (e.g., “MI” soils, foreign soils, lab filter for dissolved..., lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
For <b>RUSH/SHORT Hold Time</b> , were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
For <b>SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP</b> , were containers / paperwork flagged accordingly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>For any question answered “No,”</b> has the PM been notified and the problem resolved (or paperwork put in their bin)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SRF Completed by: D. C 06/26/2015 PM notified:
Was <b>PEER REVIEW</b> of <i>sample numbering/labeling completed</i> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Peer Reviewed by: AAL
Additional notes (if applicable):				

Note to Client: Any “no” answer above indicates non-compliance with standard procedures and may impact data quality.



## Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1153180001-A	HCL to pH < 2	OK			
1153180001-B	HCL to pH < 2	OK			
1153180001-C	HCL to pH < 2	OK			
1153180001-D	HCL to pH < 2	OK			
1153180001-E	HCL to pH < 2	OK			
1153180002-A	HCL to pH < 2	OK			
1153180002-B	HCL to pH < 2	OK			
1153180002-C	HCL to pH < 2	OK			
1153180002-D	HCL to pH < 2	OK			
1153180002-E	HCL to pH < 2	OK			
1153180003-A	HCL to pH < 2	OK			
1153180003-B	HCL to pH < 2	OK			
1153180003-C	HCL to pH < 2	OK			
1153180003-D	HCL to pH < 2	OK			
1153180003-E	HCL to pH < 2	OK			
1153180004-A	HCL to pH < 2	OK			
1153180004-B	HCL to pH < 2	OK			
1153180004-C	HCL to pH < 2	OK			
1153180004-D	HCL to pH < 2	OK			
1153180004-E	HCL to pH < 2	OK			
1153180005-A	HCL to pH < 2	OK			
1153180005-B	HCL to pH < 2	OK			
1153180005-C	HCL to pH < 2	OK			
1153180005-D	HCL to pH < 2	OK			
1153180005-E	HCL to pH < 2	OK			
1153180006-A	HCL to pH < 2	OK			
1153180006-B	HCL to pH < 2	OK			
1153180006-C	HCL to pH < 2	OK			

### Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates that an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

BU - The container was received with headspace greater than 6mm.

## **APPENDIX D**

### **GROUNDWATER SAMPLING FORMS**







# Groundwater Sampling Form

*Tubing left in well*

Site/Client Name: <u>MLP</u>	Well ID: <u>MW-7FS</u>
Project #:	Sample ID: <u>MW-7FS</u>
Sampled By: <u>A. Kavson, K. Johnson</u>	Sample Time: <u>1239</u> Sample Date: <u>9/25/15</u>
Weather Conditions: <u>cloudy 60°F</u>	Duplicate ID: _____
Sampling Method: <input type="checkbox"/> Low Flow <input checked="" type="checkbox"/> Other	MS/MSD <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Trip Blank Required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

*one bolt strip*

Well Information	
Well Type: <input checked="" type="checkbox"/> Permanent <input type="checkbox"/> Temporary	Well Diameter: <u>2.0X</u> Screen Interval: _____ ft. BTOC to _____ ft BTOC
Well Condition: <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor (if fair or poor explain in Notes)	Stickup <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No; If yes, _____ ft above ground

Gauging/Purging Information	
Depth to Water (ft BTOC): <u>17.40</u>	Tubing/Pump Depth (ft. BTOC): <u>16.40</u>
Total Depth (ft BTOC): <u>20.94 medium-hard</u>	Purge Start Time (24-hr) <u>1212</u>
Depth to Product (ft. BTOC) _____	Purge End Time (24-hr) <u>1245</u>
Product Thickness (ft) <u>0</u>	Total Purge Time (min)

LOW FLOW: Max Draw Down = \_\_\_\_\_ (Tubing Depth - Top of Screen Depth in ft) X 0.25 = \_\_\_\_\_ (ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.; achieve stable parameter for 3 consecutive reading (each reading taken after pumping a minimum of 1 flow through cell volume).

OTHER: Purge Volume minimum of 3 casing volume and stable parameters for 3 consecutive readings, or maximum of 10 casing volumes purged. Purge Volume = 3.14 X \_\_\_\_\_ (well radius squared in ft.) X \_\_\_\_\_ (water column in ft.) X \_\_\_\_\_ (number of casing volume to be purge) X 28.3 = \_\_\_\_\_ (liters) (1 gallon = 3.79 liters)

1" Casing Vol (liters) = 0.154 \* Water Column (ft)    2" Casing Vol (liters) = 0.617 \* Water Column (ft)    4" Casing Vol (liters) = 2.47 \* Water Column (ft)

Water Quality Parameters										
Time (24-hr)	Flow Rate (liters or ml/gal/minute)	Purge Volume (liters or gal)	Temp (°C) (± 3%)	Specific Conductance (µS/cm²) (± 3%)	DO (mg/L) (± 10%)	ORP (mV) (± 10mV)	pH (± 0.1)	Turbidity (NTU) (± 10%)	DTW (ft BTOC)	Drawdown (ft) (Max _____ ft.)
1218	300ml	0.2gal	8.69	825	3.20	8.3	6.93	231	17.44	.04
1221	300	0.4	8.54	820	1.72	20.5	6.71	69	17.45	.05
1224	300	0.6	8.29	824	1.57	15.0	6.61	17.1	17.45	.05
1227	300	0.8	8.23	827	1.35	9.4	6.58	656	17.45	.05
1230	300	1.0	8.15	828	1.24	6.1	6.55	4.28	17.45	.05
1233	300	1.2	8.13	828	1.20	3.5	6.52	2.13	17.46	.06
1236	300	1.4	8.08	829	1.13	2.9	6.41	2.01	17.46	.06
<u>1239</u>	<u>Sample</u>		<u>Time</u>							

Sample Color: <u>clear</u>	Sample Odor: <u>None</u>	Sheen: <input checked="" type="checkbox"/> none <input type="checkbox"/> light <input type="checkbox"/> med <input type="checkbox"/> heavy
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Analytical Sampling					
Analyses	Number/Type of Bottle	Preservative/Comments	Analyses	Number/Type of Bottle	Preservative/Comments
GRO/BTEX			Total Metals		
DRO			Dissolved Metals		
RRO					
VOCs					
SVOCs					
PAHs					

Notes: Water orange brown to start, minor precip at bottom of flow thru

Equipment Used: Pump Type <u>Peri</u>	Tubing (Type/Length) _____	Bailer Type _____
Water Level Meter _____	Multi-Parameter Meter (Make/SN#) <u>VSI 556</u>	
Turbidity Meter (Make/SN#) <u>200P 11741</u>	Filter Lot # _____	<u>07L100513</u>
IDW Disposal: <input type="checkbox"/> Discharged to surface <input type="checkbox"/> Treated (how?) _____	<input checked="" type="checkbox"/> Other: <u>Given to MLP</u>	



# Groundwater Sampling Form

*Tubing left in well*

Site/Client Name: <i>MLP</i>	Well ID: <i>MW-GTS</i>
Project #: <i>105</i>	Sample ID: <i>MW-GTS</i>
Sampled By: <i>A. Knudson K. Johnson</i>	Sample Time: <i>1154</i> Sample Date: <i>9/25/15</i>
Weather Conditions: <i>cloudy 60°F</i>	Duplicate ID: <i>---</i>
Sampling Method: <input checked="" type="checkbox"/> Low Flow <input type="checkbox"/> Other	MS/MSD <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Trip Blank Required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Well Information	
Well Type: <input checked="" type="checkbox"/> Permanent <input type="checkbox"/> Temporary	Well Diameter: <i>2 1/8"</i> Screen Interval: _____ ft. BTOC to _____ ft BTOC
Well Condition: <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor (if fair or poor explain in Notes)	Stickup <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No; if yes, _____ ft above ground

Gauging/Purging Information	
Depth to Water (ft BTOC): <i>15.75</i>	Tubing/Pump Depth (ft. BTOC): <i>19.98</i>
Total Depth (ft BTOC): <i>20.98 mod-holed</i>	Purge Start Time (24-hr) <i>1121</i>
Depth to Product (ft. BTOC) <i>0</i>	Purge End Time (24-hr) <i>1158</i>
Product Thickness (ft) <i>0</i>	Total Purge Time (min) <i>37 min</i>

**LOW FLOW:** Max Draw Down = \_\_\_\_\_ (Tubing Depth - Top of Screen Depth in ft) X 0.25 = \_\_\_\_\_ (ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.; achieve stable parameter for 3 consecutive reading (each reading taken after pumping a minimum of 1 flow through cell volume).

**OTHER:** Purge Volume minimum of 3 casing volume and stable parameters for 3 consecutive readings, or maximum of 10 casing volumes purged. Purge Volume = 3.14 X \_\_\_\_\_ (well radius squared in ft.) X \_\_\_\_\_ (water column in ft.) X \_\_\_\_\_ (number of casing volume to be purge) X 2.83 = \_\_\_\_\_ (liters) (1 gallon = 3.79 liters)

1" Casing Vol (liters) = 0.154 \* Water Column (ft)    2" Casing Vol (liters) = 0.617 \* Water Column (ft)    4" Casing Vol (liters) = 2.47 \* Water Column (ft)

Water Quality Parameters										
Time (24-hr)	Flow Rate (liters or gal/minute)	Purge Volume (liters or gal)	Temp (°C) (± 3%)	Specific Conductance (µS/cm²) (± 3%)	DO (mg/L) (± 10%)	ORP (mV) (± 10mV)	pH (± 0.1)	Turbidity (NTU) (± 10%)	DTW (ft BTOC)	Drawdown (ft) (Max _____ ft.)
1123	250ml	500ml	7.81	672	4.14	19.4	7.15	326	15.76	.01
1128	<del>250ml</del> 75gal	75gal	7.52	642	0.94	-15.6	6.69	76.8	15.77	.02
1131	250	1.0gal	7.36	632	0.72	-19.6	6.58	40.8	15.77	.02
1134	250	1.2	7.32	628	0.65	-21.4	6.53	26.0	15.77	.02
1137	250	1.4	7.51	624	0.56	-22.8	6.52	17.7	15.77	.02
1140	250	1.5	7.38	626	0.55	-24.4	6.50	10.3	15.77	.02
1143	250	1.75	7.32	624	0.53	-26.1	6.49	8.71	15.77	.02
1146	250	2.0	7.26	623	0.50	-27.0	6.47	4.99	15.77	.02
1150	250	2.25	7.22	6.23	0.47	-28.1	6.46	4.04	15.77	.02
<i>Sample 1154</i>										

Sample Color: <i>clear</i>	Sample Odor: <i>organic</i>	Sheen: <input checked="" type="checkbox"/> none <input type="checkbox"/> light <input type="checkbox"/> med <input type="checkbox"/> heavy
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Analytical Sampling					
Analyses	Number/Type of Bottle	Preservative/Comments	Analyses	Number/Type of Bottle	Preservative/Comments
GRO/BTEX	3x40mL	HCL	Total Metals		
DRO	2x250mL		Dissolved Metals		
RRO					
VOCs					
SVOCs					
PAHs					

Notes: *first 500ml orange color sed rich*

Equipment Used: Pump Type *Pari* Tubing (Type/Length) *m well* Bailor Type \_\_\_\_\_  
 Water Level Meter *SLR 100'* Multi-Parameter Meter (Make/SN#) *KSI 07L100513*  
 Turbidity Meter (Make/SN#) *Hach 11741* Filter Lot # \_\_\_\_\_

IDW Disposal:  Discharged to surface  Treated (how?)  Other: *Given to MLP*





# Groundwater Sampling Form

*Tubing left in well* *AKC 4/25/15*

Site/Client Name: <i>ML+P</i>	Well ID: <del>AW-8</del> <i>MW-5TS</i>
Project #:	Sample ID: <i>MW-5TS</i>
Sampled By: <i>A. Knudson, K. Johnson</i>	Sample Time: <i>1342</i> Sample Date: <i>4/25/15</i>
Weather Conditions: <i>cloudy Light Rain</i>	Duplicate ID: _____
Sampling Method: <input type="checkbox"/> Low Flow <input type="checkbox"/> Other _____	MS/MSD <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Trip Blank Required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Well Information	
Well Type: <input checked="" type="checkbox"/> Permanent <input type="checkbox"/> Temporary	Well Diameter: <i>2 in</i> ft
Well Condition: <input type="checkbox"/> Good <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Poor (if fair or poor explain in Notes)	Screen Interval: _____ ft. BTOC to _____ ft BTOC
	Stickup <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No; if yes, _____ ft above ground

Gauging/Purging Information	
Depth to Water (ft BTOC): <i>4.88</i>	Tubing/Pump Depth (ft. BTOC): <i>12.77</i>
Total Depth (ft BTOC): <i>13.77</i>	Purge Start Time (24-hr) <i>1316</i>
Depth to Product (ft. BTOC) _____	Purge End Time (24-hr) <i>1345</i>
Product Thickness (ft) <i>0</i>	Total Purge Time (min) <i>29 min</i>

**LOW FLOW:** Max Draw Down = \_\_\_\_\_ (Tubing Depth - Top of Screen Depth in ft) X 0.25 = \_\_\_\_\_ (ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.; achieve stable parameter for 3 consecutive reading (each reading taken after pumping a minimum of 1 flow through cell volume).

**OTHER:** Purge Volume minimum of 3 casing volume and stable parameters for 3 consecutive readings, or maximum of 10 casing volumes purged. Purge Volume = 3.14 X \_\_\_\_\_ (well radius squared in ft.) X \_\_\_\_\_ (water column in ft.) X \_\_\_\_\_ (number of casing volume to be purge) X 28.3 = \_\_\_\_\_ (liters) (1 gallon = 3.79 liters)

1" Casing Vol (liters) = 0.154 \* Water Column (ft)    2" Casing Vol (liters) = 0.617 \* Water Column (ft)    4" Casing Vol (liters) = 2.47 \* Water Column (ft)

Water Quality Parameters										
Time (24-hr)	Flow Rate (liters or gal/minute)	Purge Volume (liters or gal)	Temp (°C) (± 3%)	Specific Conductance (µS/cm²) (± 3%)	DO (mg/L) (± 10%)	ORP (mV) (± 10mV)	pH (± 0.1)	Turbidity (NTU) (± 10%)	DTW (ft BTOC)	Drawdown (ft) (Max <i>33 ft.</i> <i>AKC 4/25/15</i> )
<i>1319</i>	<i>300</i>	<i>600 ml</i>	<i>7.71</i>	<i>622</i>	<i>6.53</i>	<i>34.3</i>	<i>7.29</i>	<i>7.88</i>	<i>5.20</i>	<i>0.32</i>
<i>1322</i>	<i>250</i>	<i>0.3 gal</i>	<i>7.91</i>	<i>616</i>	<i>6.02</i>	<i>48.7</i>	<i>7.10</i>	<i>7.93</i>	<i>5.09</i>	<i>0.21</i>
<i>1325</i>	<i>250</i>	<i>0.5</i>	<i>8.18</i>	<i>613</i>	<i>6.00</i>	<i>36.5</i>	<i>7.08</i>	<i>4578</i>	<i>5.11</i>	<i>0.23</i>
<i>1328</i>	<i>250</i>	<i>0.7</i>	<i>8.50</i>	<i>610</i>	<i>6.02</i>	<i>23.8</i>	<i>7.11</i>	<i>6.10</i>	<i>5.16</i>	<i>0.28</i>
<i>1331</i>	<i>250</i>	<i>1.0</i>	<i>8.81</i>	<i>607</i>	<i>5.94</i>	<i>17.1</i>	<i>7.13</i>	<i>4.30</i>	<i>5.17</i>	<i>0.29</i>
<i>1334</i>	<i>250</i>	<i>1.2</i>	<i>8.99</i>	<i>608</i>	<i>5.66</i>	<i>12.8</i>	<i>7.10</i>	<i>3.12</i>	<i>5.17</i>	<i>0.29</i>
<i>1337</i>	<i>250</i>	<i>1.5</i>	<i>9.08</i>	<i>610</i>	<i>5.54</i>	<i>9.3</i>	<i>7.08</i>	<i>2.47</i>	<i>5.18</i>	<i>0.30</i>
<i>1340</i>	<i>250</i>	<i>1.7</i>	<i>9.13</i>	<i>610</i>	<i>5.47</i>	<i>7.8</i>	<i>7.06</i>	<i>2.08</i>	<i>5.19</i>	<i>0.31</i>
<i>1342 Sample Time</i>										

Sample Color: *Clear*    Sample Odor: *None*    Sheen:  none  light  med  heavy

Analytical Sampling					
Analyses	Number/Type of Bottle	Preservative/Comments	Analyses	Number/Type of Bottle	Preservative/Comments
GRO/BTEX	<i>3x40ml</i>	<i>HCl</i>	Total Metals		
DRO	<i>2x200ml</i>	<i>HCL</i>	Dissolved Metals		
RRO					
VOCs					
SVOCs					
PAHs					

Notes: *Well PVC jacked to side in casing.*

Equipment Used: Pump Type *Peri*    Tubing (Type/Length) *in well*    Bailer Type \_\_\_\_\_  
 Water Level Meter *SLR 100'*    Multi-Parameter Meter (Make/SN#) *07L100573*  
 Turbidity Meter (Make/SN#) *Hach 11741*    Filter Lot # \_\_\_\_\_

IDW Disposal:  Discharged to surface  Treated (how?) \_\_\_\_\_  Other: *ML+P disposal*

Tubing left in well

Site/Client Name: <u>ML&amp;P</u>	Well ID: <u>MW-9TS</u>
Project #:	Sample ID: <u>MW-9TS</u>
Sampled By: <u>K. Johnson A. Knudson</u>	Sample Time: <u>905</u> Sample Date: <u>9/26/15</u>
Weather Conditions: <u>Overcast 58°F</u>	Duplicate ID: <u>MW-99TS</u>
Sampling Method: <input checked="" type="checkbox"/> Low Flow <input type="checkbox"/> Other	MS/MSD <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Trip Blank Required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Well Information	
Well Type: <input checked="" type="checkbox"/> Permanent <input type="checkbox"/> Temporary	Well Diameter: <u>2</u> #"
Well Condition: <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor (if fair or poor explain in Notes)	Screen Interval: _____ ft. BTOC to _____ ft BTOC
	Stickup <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No; if yes, _____ ft above ground

Gauging/Purging Information	
Depth to Water (ft BTOC): <u>4.23</u>	Tubing/Pump Depth (ft. BTOC): <u>7.72</u> moved 2" from bottom in 8.70
Total Depth (ft BTOC): <u>8.72</u> Hard bottom	Purge Start Time (24-hr) <u>953</u>
Depth to Product (ft. BTOC)	Purge End Time (24-hr) <u>1026</u>
Product Thickness (ft)	Total Purge Time (min) <u>33 min = Dry</u>

**LOW FLOW:** Max Draw Down = \_\_\_\_\_ (Tubing Depth - Top of Screen Depth in ft) X 0.25 = \_\_\_\_\_ (ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.; achieve stable parameter for 3 consecutive reading (each reading taken after pumping a minimum of 1 flow through cell volume).

**OTHER:** Purge Volume minimum of 3 casing volume and stable parameters for 3 consecutive readings, or maximum of 10 casing volumes purged. Purge Volume = 3.14 X \_\_\_\_\_ (well radius squared in ft.) X \_\_\_\_\_ (water column in ft.) X \_\_\_\_\_ (number of casing volume to be purge) X 28.3 = \_\_\_\_\_ (liters) (1 gallon = 3.79 liters)

1" Casing Vol (liters) = 0.154 \* Water Column (ft)    2" Casing Vol (liters) = 0.617 \* Water Column (ft)    4" Casing Vol (liters) = 2.47 \* Water Column (ft)

Water Quality Parameters										
Time (24-hr)	Flow Rate (liters or gal/minute)	Purge Volume (liters or gal)	Temp (°C) (± 3%)	Specific Conductance (µS/cm²) (± 3%)	DO (mg/L) (± 10%)	ORP (mV) (± 10mV)	pH (± 0.1)	Turbidity (NTU) (± 10%)	DTW (ft BTOC)	Drawdown (ft) (Max _____ ft.)
957	450ml	0.5	14.64	1097	1.44	46.9	6.84	12.7	4.64	0.41
1001	350ml	1.0	15.20	1055	0.91	17.2	6.64	11.8	5.32	1.09
1005	450ml	2.0	14.71	1030	0.79	-4.1	6.63	9.85	5.68	1.45
1011	450ml	2.5	13.97	1063	0.72	-25.3	6.67	13.8	6.32	2.09
1019	450	2.5	13.09	1222	0.73	-19.2	6.92	13.3	6.95	2.0
1023	450	3.0	12.47	1299	0.95	-77.2	7.03	23.4	7.69	
DRY										

Sample Color: Clear    Sample Odor: Hydrocarbon    Sheen:  none  light  med  heavy

Analytical Sampling					
Analyses	Number/Type of Bottle	Preservative/Comments	Analyses	Number/Type of Bottle	Preservative/Comments
GRO/BTEX			Total Metals		
DRO			Dissolved Metals		
RRO					
VOCs					
SVOCs					
PAHs					

Notes: tubing set 1 foot from bottom

Equipment Used: Pump Type Peri    Tubing (Type/Length) \_\_\_\_\_    Bailer Type \_\_\_\_\_

Water Level Meter \_\_\_\_\_    Multi-Parameter Meter (Make/SN#) \_\_\_\_\_

Turbidity Meter (Make/SN#) Z100PH    Filter Lot # \_\_\_\_\_

IDW Disposal:  Discharged to surface  Treated (how?) \_\_\_\_\_  Other: Given to ML&P

4.99  
3.5  
Strange hydrocarbon

2.77  
per in casing



Site/Client Name: <u>MLAP</u>	Well ID: <u>MW-9TS</u>
Project #:	Sample ID: <u>MW-9TS</u>
Sampled By: <u>K. Johnson A. Knudson</u>	Sample Time: <u>0905</u> Sample Date: <u>6/26/15</u>
Weather Conditions: <u>overcast 55°F</u>	Duplicate ID: <u>MW-99TS</u>
Sampling Method: <input checked="" type="checkbox"/> Low Flow <input type="checkbox"/> Other _____	MS/MSD <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Trip Blank Required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Well Information	
Well Type: <input checked="" type="checkbox"/> Permanent <input type="checkbox"/> Temporary	Well Diameter <u>2" #1</u> Screen Interval: _____ ft. BTOC to _____ ft. BTOC
Well Condition: <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor (if fair or poor explain in Notes)	Stickup <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No; if yes, <u>Flush</u> ft above ground

Gauging/Purging Information	
Depth to Water (ft BTOC): <u>6.54</u>	Tubing/Pump Depth (ft. BTOC): <u>6"</u>
Total Depth (ft BTOC): <u>8.72</u>	Purge Start Time (24-hr): <u>0905</u>
Depth to Product (ft. BTOC) _____	Purge End Time (24-hr): <u>0911</u>
Product Thickness (ft) _____	Total Purge Time (min): <u>6 minutes</u>

**LOW FLOW:** Max Draw Down = \_\_\_\_\_ (Tubing Depth – Top of Screen Depth in ft.) X 0.25 = \_\_\_\_\_ (ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.; achieve stable parameter for 3 consecutive reading (each reading taken after pumping a minimum of 1 flow through cell volume).

**OTHER:** Purge Volume minimum of 3 casing volume and stable parameters for 3 consecutive readings, or maximum of 10 casing volumes purged. Purge Volume = 3.14 X \_\_\_\_\_ (well radius squared in ft.) X \_\_\_\_\_ (water column in ft.) X \_\_\_\_\_ (number of casing volume to be purge) X 28.3 = \_\_\_\_\_ (liters) (1 gallon = 3.79 liters)

1" Casing Vol (liters) = 0.154 \* Water Column (ft)      2" Casing Vol (liters) = 0.617 \* Water Column (ft)      4" Casing Vol (liters) = 2.47 \* Water Column (ft)

Water Quality Parameters										
Time (24-hr)	Flow Rate (liters or gal/minute)	Purge Volume (liters or gal)	Temp (°C) (± 3%)	Specific Conductance (µS/cm²) (± 3%)	DO (mg/L) (± 10%)	ORP (mV) (± 10mV)	pH (± 0.1)	Turbidity (NTU) (± 10%)	DTW (ft BTOC)	Drawdown (ft) (Max _____ ft.)
0910	N/A	—	13.71	1.063	5.56	185.7	6.86	7.10	7.03	
to										

Sample Color:	Sample Odor: <u>hydrocarbon</u>	Sheen: <input type="checkbox"/> none <input checked="" type="checkbox"/> light <input checked="" type="checkbox"/> med <input type="checkbox"/> heavy
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Analytical Sampling					
Analyses	Number/Type of Bottle	Preservative/Comments	Analyses	Number/Type of Bottle	Preservative/Comments
GRO/BTEX	<u>3 x 40 mL</u>	<u>HCl</u>	Total Metals		
DRO	<u>2 x 250 mL</u>	<u>HCl</u>	Dissolved Metals		
RRO					
VOCs					
SVOCs					
PAHs					

Notes: well recovered only 50% sampled with enough water in well. Sheen observed on Meniscus of BOD vials on fill sample, hydrocarbon smell

Equipment Used: Pump Type SLR Tubing (Type/Length) In well Bailer Type \_\_\_\_\_  
 Water Level Meter SLR 100 ft Multi-Parameter Meter (Make/SN#) P7L100 513 SLR  
 Turbidity Meter (Make/SN#) Hach 11741 Filter Lot # \_\_\_\_\_ MP5 556

IDW Disposal:  Discharged to surface  Treated (how?) \_\_\_\_\_  Other: MLAP Disposal

K. Johnson A. Knudson

6/25/15  
sunny

0900 Arrive onsite and speak to Steve Stungel, receive DeKT Purge water buckets.

0913 - Calibrate YSI 074100513

0930 - Safety meeting

0935 - locate MW-9TS note: take 1/2 inch Socket to remove Flush mounts.

0945 - Setup at MW-9TS

0953 start purge at MW-9TS

1023 well gone Dry return after others sampled.

well recovers approx .10 ft every

6-7 min, well should take

3-4 hours to recovery full.

1118 arrive and set up @ MW-6TS

1120 DTW 15.75

Total ~~20~~.98 moderate hard

1121 Purge start time MW-6TS

1154 Sample MW-6TS

1158 Finish move onto MW-7TS

1207 set up at MW-7TS

1212 start purging MW-7TS

1239 sample MW-7TS

1245 Finish purging

1255 head over to MW-5TS

*into the rain*

6/25/15 continued...

1310 well jacked to the side in casing.

1315 DTW 4.88 MW-5TS  
Total 13.77 hard bottom

1342 Sample time MW-5TS

1345 stop purge take down site.

1406 check recover in MW-9TS

~~in correct~~ DTW 5.58 dif. 3.34 only at 75% recover go to MW-5TS then come back.

1414 MW-3TS DTW 15.61

Total 17.15 soft water level meter has bentrite on it. Push tubing into bottom 1.5 inches six inches of tubing covered. throw out tubing.

1453 Return to MW-9TS water only at 7.37 previous reading wrong. Leave well to recover over night.

6/26/15

overcast 50°F

K. Johnson A. Knudson

0830 Arrive at site MW-9TS, check in with Steve Stangel.

0840 - Safety Meeting

0842 - calibrate YSI 07L100513

0905 - MW-9TS Sample  
MW-9TS Sample

0926 - check in with Steve and show where purge water stored & labeled.

0940 - take samples to SGS lab.

1026 - cut down PVC at MW-6TS so flush w/cay on Road. took approx. 1" off casing well PVC.

1037 - Attempt <sup>KT</sup> Water level at MW-8 Flush mount lid needs special tool for removal of lid.

AK

6/26/15



### Water Parameter YSI 556 Meter Calibration Log

Date: 6/25/15 Time: 0913 Calibration By: K. Johnson  
Meter Identification and Identification #: 07L100513

Parameter	Standard	True Value	Lot #	Date Opened	Expiration Date	PreCalibration Reading	Reading Calibration Reading	Calibration Acceptance Criteria
pH	4.00	<del>4.00</del> 4.00	SV1	6/22/15	04/2016	4.14	4.00	± 0.10
	7.00	7.01	SV1	6/22/15	02/2016	6.97	7.01	± 0.10
	10.00	10.06	SV1	6/22	05/2016	9.89	10.03	± 0.10
Sp Cond (mS/cm)	1.413	1.413	TY2	6/22	02/2017	1.473	1.413	± 10%
ORP	240	240	4118	10/4/12	03/2017	223.5	240.0	-----
DO	760.2	760.2				99.2	100.0	± 2%

If parameter not included in sampling event, fill in box with NA (not applicable)

### Water Parameter YSI 556 Meter Calibration Log

Date: 6/26/15 Time: 0842 Calibration By: A Knudson  
Meter Identification and Identification #: 07L100513

Parameter	Standard	True Value	Lot #	Date Opened	Expiration Date	PreCalibration Reading	Reading Calibration Reading	Calibration Acceptance Criteria
pH	4.00	4.00	SV1	6/22/15	04/16	4.21	4.00	± 0.10
	7.00	7.01	SV1	6/22/15	2/16	7.31	7.01	± 0.10
	10.00	10.06	SV1	6/22	5/16	7.31 <sup>10.02</sup>	7.01 <sup>10.01</sup>	± 0.10
Sp Cond (mS/cm)	1.413	1.413	TY2	6/22	02/17	1.384	1.413	± 10%
ORP	240	240	4118	10/4/12	03/17	239.0	240.5	-----
DO	760.1	760.1						± 2%

If parameter not included in sampling event, fill in box with NA (not applicable)

### Water Parameter YSI 556 Meter Calibration Log

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Calibration By: \_\_\_\_\_  
Meter Identification and Identification #: \_\_\_\_\_

Parameter	Standard	True Value	Lot #	Date Opened	Expiration Date	PreCalibration Reading	Reading Calibration Reading	Calibration Acceptance Criteria
pH	4.00							± 0.10
	7.00							± 0.10
	10.00							± 0.10
Sp Cond (mS/cm)	1.413							± 10%
ORP	240							-----
DO								± 2%

If parameter not included in sampling event, fill in box with NA (not applicable)