

3399 Veterans Drive, Traverse City, Michigan 49684

## QUARTERLY PROJECT UPDATE REPORT 3<sup>rd</sup> QUARTER 2020

HARLTAND 36 GAS PLANT PORTION OF E<sup>1</sup>/<sub>2</sub> of NW <sup>1</sup>/<sub>4</sub> of SECTION 36, T03N-R06E, HARTLAND TWP, LIVINGSTON COUNTY, MICHIGAN

LAMBDA ENERGY RESOURCES, LLC 1510 THOMAS ROAD KALKASKA, MICHIGAN 49646

December 17, 2020

ECT No. 130685-2000

#### **DOCUMENT REVIEW**

The dual signatory process is an integral part of Environmental Consulting & Technology, Inc.'s (ECT's) Document Review Policy No. 9.03. All ECT documents undergo technical/peer review prior to dispatching these documents to any outside entity.

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#### TABLE OF CONTENTS

<u>Section</u>	<u>P</u>	Page
1.0	INTRODUCTION	. 1
2.0	PROJECT LOCATION	. 1
3.0	PROJECT SUBMITTALS	. 1
4.0	PROJECT OVERVIEW	2
5.0	REMEDIATION SYSTEM OPERATION AND MAINTENANCE	3
6.0	PERFORMANCE MONITORING SUMMARY	3
	<ul> <li>6.1 PERFORMANCE MONITORING EVENTS</li> <li>6.2 LABORATORY ANALYSIS</li> <li>6.3 CLEANUP GOALS</li> <li>6.4 GROUNDWATER ANALYTICAL SUMMARY &amp; CLEANUP CRITERIA COMPARISON</li> </ul>	3
7.0	CONCLUSIONS AND RECOMMENDATIONS	5
8.0	SCHEDULE	.6
	LIST OF APPENDICES	

### **Appendix**

- A FIGURES
- B TABLES
- C LABORATORY ANALYTICAL REPORTS
- D LOW-FLOW SAMPLING FIELD FORMS



#### 1.0 INTRODUCTION

This Quarterly Project Update Report was compiled by Environmental Consulting & Technology, Inc. (ECT), on behalf of Lambda Energy Resources, LLC (LER) and details remediation system operations and performance monitoring through the 3<sup>rd</sup> Quarter 2020 (July 1, 2020 through September 30, 2020) for the Hartland 36 Gas Plant location, herein referenced as the "Site".

#### 2.0 PROJECT LOCATION

The Site is a former natural gas processing plant which operated from 1999 to 2015. The property is located in a portion of the East ½ of the Northeast ¼ of Section 36, T03N-R06E, on the south side of Lone Tree Road between North Pleasant Valley Road and South Tipsico Lake Road in Hartland Township, Livingston County, Michigan. A Site Location Map and Site and Surrounding Properties Map are included as Figure 1 and Figure 2, respectively, in Appendix A.

#### 3.0 PROJECT SUBMITTALS

The following presents a chronological summary of previous documents submitted to the Michigan Department of Environment, Great Lakes, and Energy – Oil, Gas, and Minerals Division (EGLE-OGMD) by ECT for the Site:

- Soil Closure Report dated February 15, 2016
- Groundwater Characterization Work Plan dated February 23, 2016
- Groundwater Characterization Work Plan 2 dated July 8, 2016
- Project Update Report dated September 26, 2016
- Groundwater Characterization Work Plan 3 dated October 14, 2016
- Additional Groundwater Characterization Work Plan dated December 29, 2016
- Groundwater Characterization Work Plan 5 dated March 2, 2017
- Biosparging Pilot Study Work Plan dated April 5, 2017
- Groundwater Characterization Report dated July 3, 2017
- Technical Memorandum Biosparging Pilot Study dated July 28, 2017
- Remediation System Design Plan dated August 11, 2017
- Quarterly Project Update Report 1<sup>st</sup> Quarter 2018 dated April 24, 2018
- Quarterly Project Update Report 2<sup>nd</sup> Quarter 2018 dated August 8, 2018
- Quarterly Project Update Report 3<sup>rd</sup> Quarter 2018 dated October 26, 2018
- Quarterly Project Update Report 4<sup>th</sup> Quarter 2018 dated April 8, 2019
- Quarterly Project Update Report 1<sup>st</sup> Quarter 2019 dated April 10, 2019
- Quarterly Project Update Report 2<sup>nd</sup> Quarter 2019 dated August 19, 2019
- Quarterly Project Update Report 3<sup>rd</sup> Quarter 2019 dated November 25, 2019
- Quarterly Project Update Report 4<sup>th</sup> Quarter 2020 dated May 5, 2020
- Quarterly Project Update Report 1st Quarter 2020 dated July 17, 2020
- Quarterly Project Update Report 2<sup>nd</sup> Quarter 2020 dated September 10, 2020



#### 4.0 PROJECT OVERVIEW

KCS Michigan Resources developed the Site in 1999 and operated the natural gas processing plant into 2006. Merit Energy Company acquired the Site in 2006 and operated the plant until August 2015, when facility decommissioning commenced. LER acquired the Site from Merit Energy Company in July 2018.

In general, operations at the Site included crude oil and brine separation and storage, natural gas compression, dehydration, sweetening (hydrogen sulfide [H<sub>2</sub>S] removal), carbon dioxide (CO<sub>2</sub>) removal (amine process), and refrigeration for natural gas liquid (NGL) extraction and storage.

Contaminated soil was discovered in September 2015 during facility decommissioning activities at the former sweetening plant/refrigeration building; sulfolane impacts are from the gas treatment chemical Sulfinol®. Remediation activities (excavation and off-Site disposal) completed from September 2015 through December 2016 resulted in disposal of 13,481.4 tons of soil at the Venice Park Landfill in Lennon, Michigan. Verification of soil remediation (VSR) samples collected from the excavations confirmed remediation of impacted soils. Refer to the Soil Closure Report dated February 15, 2016 for a detailed summary of soil remediation and sampling activities.

Groundwater investigation activities commenced on October 29, 2015 and were completed on March 7, 2017. Seven soil borings, 13 temporary monitor wells, including two vertical aquifer profile (VAP) locations, and 37 permanent monitor wells, including 20 shallow screened monitor wells and 17 deep screened monitor wells, have been installed at the Site. The lateral and vertical extents of groundwater impacted with sulfolane have been delineated to non-detectable concentrations (laboratory reporting limit of 10 micrograms per liter,  $\mu g/L$ ). The maximum sulfolane concentration reported from a monitor well at the Site was 11,000 micrograms per liter ( $\mu g/L$ ) from MW-20D on the June 19-21, 2017 sampling event. Refer to the Groundwater Characterization Report dated July 3, 2017 for a detailed summary of groundwater characterization and assessment activities.

A biosparging pilot study was conducted at the Site from May 1, 2017 through June 16, 2017. The pilot study included three tests to evaluate the effectiveness of biosparging to enhance bioremediation of sulfolane dissolved in groundwater at the Site. Data obtained from the pilot study indicates biosparging is an effective remedial alternative for the Site. Concentrations of sulfolane were reduced by 100% within five feet of the biosparge point and 97% to 99% at a distance of 20 feet from the biosparge point. Dissolved oxygen (DO) influence of 4.2-10 milligrams per liter (mg/L) was observed at monitoring locations situated 40 feet from the biosparge point. Refer to the Technical Memorandum – Biosparging Pilot Study dated July 28, 2017 for a summary of pilot study activities and results.

Information obtained from the pilot study was utilized to compile the Remediation System Design Plan dated August 11, 2017. The Remediation System Design Plan presented the biosparge point (BSP) array, remediation system equipment, anticipated remediation system operation and maintenance (O&M), and performance monitoring activities. Biosparge system installation activities commenced at the Site on August 21, 2017 and concluded with startup of the remediation system on November 16, 2017. Remediation system equipment and components were generally consistent with



details and specifications provided in the Remediation System Design Plan and included 41 biosparge points (BSPs). Refer to the Quarterly Project Update Report – 1<sup>st</sup> Quarter 2018 dated April 24, 2018 for a summary of remediation system installation activities, O&M, and results of performance monitoring events completed through the 1<sup>st</sup> Quarter 2018.

Performance monitoring results from the 2<sup>nd</sup> Quarter 2020 indicate the remediation system continues to mitigate concentrations of sulfolane in groundwater with all ten of the monitor wells that reported a concentration of sulfolane above the cleanup goal from the pre-startup sampling event reporting sulfolane non-detect from the monitoring event completed June 1-2, 2020. A supplemental performance monitoring event was completed on April 2, 2020 and included collecting groundwater samples from MW7D, MW-13D, MW-14D, and MW-19D. Concentrations of sulfolane were reported above the cleanup goal from MW-7D (330 μg/L) and MW-13D (16 μg/L) and non-detect from MW-14D and MW-19D for the supplemental monitoring event. The remediation system was shut down on February 17, 2020 and has not operated since. Refer to the Quarterly Project Update Report – 2<sup>nd</sup> Quarter 2020 dated September 10, 2020 for a summary of remediation system O&M and results of performance monitoring events completed through the 2<sup>nd</sup> Quarter 2020.

#### 5.0 REMEDIATION SYSTEM OPERATION AND MAINTENANCE

The remediation system was shut down on February 17, 2020 for scheduled maintenance of the air sparge compressor skid. The remediation system has remained shut down since February 17, 2020.

#### 6.0 PERFORMANCE MONITORING SUMMARY

The following sections detail performance monitoring activities completed at the Site in the 3<sup>rd</sup> Quarter 2020.

#### 6.1 PERFORMANCE MONITORING EVENTS

Personnel from ECT completed the following performance monitoring event at the Site in the 3<sup>rd</sup> Quarter 2020:

- September 9-10, 2020 Quarterly groundwater monitoring event of the following 14 monitor wells:
  - o MW-7, MW-7D, MW-13, MW-13D, MW-14S, MW-14D, MW-15D, MW-17S, MW-17D, MW-18, MW-19S, MW-19D, MW-20S, and MW-20D

#### 6.2 LABORATORY ANALYSIS

Groundwater samples from the September 9-10, 2020 monitoring event were collected via low-stress sampling methods in general accordance with USEPA Region 1 Low-Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, Revision Date September 19, 2017. Groundwater samples, including QA/QC samples, were collected and analyzed in general accordance with currently applicable EGLE-RRD guidance documents.



The samples were collected into laboratory supplied containers, placed on ice, and shipped under chain-of-custody protocols to the ALS Environmental laboratory facility located in Holland, Michigan for analysis of the following:

- Sulfolane by USEPA Method 8270D
- Sulfate by Method A4500-SO4 E-11

Copies of laboratory analytical reports are included in Appendix C. Copies of low-flow sampling field forms are included in Appendix D.

#### 6.3 CLEANUP GOALS

The EGLE-OGMD established an interim drinking water criterion for sulfolane of 90  $\mu$ g/L which has been considered the cleanup goal for sulfolane dissolved in groundwater at the Site. However, per the June 28, 2020 EGLE-OGMD response to the Quarterly Project Update Report – 1st Quarter 2020, the Draft EGLE Part 201 Residential Generic Cleanup Criteria and Screening Level (Part 201 Residential GCCSL) for Drinking Water for sulfolane (5.9  $\mu$ g/L), published in the Comprehensive Cleanup Criteria Update 2017, is now considered the basis for final site closure. Per footnote (M) of the proposed cleanup criteria tables, since the calculated health-based criteria of 5.9  $\mu$ g/L is below the analytical target detection limit of 10  $\mu$ g/L, the analytical target detection limit of 10  $\mu$ g/L is considered the criterion.

The cleanup goal for sulfate, resulting from the biodegradation of sulfolane, was established in previous project submittals and is the EGLE Part 201 Residential GCCSL Drinking Water Criterion of 250 mg/L.

## 6.4 GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON

The following presents a summary and comparison of groundwater analytical results to the cleanup goal for sulfolane through the quarterly groundwater sampling event completed September 9-10, 2020.

#### Monitor wells located west beyond the extent of the lower clay confining layer

 Monitor well clusters MW-6/6D and MW-12S/12D reported sulfolane non-detect from all associated sampling events.

#### Monitor wells screened below the lower clay confining layer

- Monitor wells MW-19DD and MW-21D reported sulfolane non-detect from all associated sampling events.
- Concentrations of sulfolane were reported below applicable cleanup criteria from MW-15DD from the pre-remediation system startup sampling event (September 11-13, 2017) and a confirmation sampling event (September 21, 2018). The concentration of sulfolane detected in MW-15DD is suspected to be the result of drilling activities completed on August 28, 2017. Sulfolane was reported non-detect from MW-15DD from all subsequent sampling events.



Monitor wells screened within the limits of the clay confining layer (area of sulfolane impact)

- The following monitor wells reported sulfolane non-detect from all associated sampling events:
  - ➤ MW-1, MW-2, MW-2D, MW-3, MW-3D, MW-4, MW-5, MW-8, MW-9, MW-10, MW-11, MW-15, MW-16, MW-16D, MW-22D, and MW-23D
- The following monitor wells previously reported sulfolane above the cleanup goal prior to the pre-remediation system startup event, below the cleanup goal at the pre-remediation system startup event, and currently report sulfolane non-detect:
  - ➤ MW-19S and MW-20S
- The following monitor wells previously reported sulfolane above the cleanup goal prior to the
  pre-remediation system startup event and non-detect at and subsequent to the pre-remediation
  system startup event:
  - ➤ MW-7 and MW-13
- The following presents percent reductions to the concentration of sulfolane (relative to the highest concentration from/after the pre-remediation system startup sampling event) for monitor wells that reported sulfolane above the cleanup goal from the pre-remediation system startup sampling event:
  - September 9-10, 2020:
    - o MW-7D, MW-13D, MW-14S, MW-14D, MW-15D, MW-17D, MW-18, MW-19D, and MW-20D: Non-detect 100%
    - o MW-17S: 190 μg/L 93.9%
- Prior to the 2<sup>nd</sup> Quarter 2020 monitoring event, MW-13D was the only monitor well at the Site that reported concentrations of sulfate above the cleanup goal (250 mg/L). MW-17D has reported sulfate above the cleanup goal since the 2<sup>nd</sup> Quarter 2020 monitoring event. Sulfate concentrations were reported at 510 mg/L for MW-13D and 290 mg/L for MW-17D from the 3<sup>rd</sup> Quarter 2020 monitoring event. As noted in the Technical Memorandum Biosparging Pilot Study dated July 28, 2017, natural attenuation/biodegradation (i.e sulfate reduction) of sulfate is expected once biosparging has ceased. In consideration of the remediation system being shut down since mid-February 2020, natural attenuation/biodegradation appears to be occurring as supported by the decrease to the concentration of sulfate at MW-13D from the peak concentration of 920 μg/L reported from the 1<sup>st</sup> Quarter 2020 monitoring event.

Monitor well locations are illustrated on Figure 3 in Appendix A. Please refer to Table 1 and Table 2 in Appendix B for a summary of groundwater monitoring data for the Site. The cleanup goal for sulfolane has been updated on Table 1 and Table 2.

#### 7.0 CONCLUSIONS AND RECOMMENDATIONS

As supported by the data presented herein, the remediation system has been effective at reducing concentrations of sulfolane after approximately three years (34 months) of operation. 13 of the 14 monitor wells that previously reported a concentration of sulfolane above the cleanup goal were reported non-detect at the September 9-10, 2020 monitoring event. Sulfolane was reported above the cleanup goal from MW-17S for the first time since the 3<sup>rd</sup> Quarter 2018 monitoring event.



The concentration of sulfate reported from MW-13D and MW-17D remains above the cleanup goal. However, the concentration of sulfate at MW-13D decreased to 510 µg/L from 920 µg/L from the 1<sup>st</sup> Quarter 2020 monitoring event, thus indicating natural attenuation/biodegradation (i.e sulfate reduction) of sulfate is likely occurring. Prior to the 2<sup>nd</sup> Quarter 2020 monitoring event, MW-13D was the only monitor well to have reported a concentration of sulfate above the cleanup goal. In addition to MW-13D, MW-17D reported sulfate above the cleanup goal for the two most recent monitoring events.

As a result of the concentration of sulfolane reported from MW-17S, a groundwater sample will be collected from MW-17S in October 2020. Pending the laboratory result, consideration will be given to operate select biosparge points in the immediate vicinity of MW-17S during the 4<sup>th</sup> Quarter 2020.

Per recommendations presented in the Quarterly Project Update Report  $-3^{\rm rd}$  Quarter 2018 dated October 26, 2018, and correspondence with EGLE-OGMD staff, three performance monitoring events per year were to include the 14 monitor wells with current/previous detections of sulfolane and one performance monitoring event per year was to include all (37) monitor wells. As a result of sulfolane reported non-detect from two of the 2020 quarterly sampling events, thus indicating that the majority of the plume has been remediated and minimal concerns remain, sampling the remaining 23 monitor wells is no longer warranted.

#### 8.0 SCHEDULE

The following schedule of activities is proposed/anticipated for the 4th Quarter 2020:

- The following performance monitoring events are proposed to be completed during the 4<sup>th</sup> Quarter 2020:
  - Supplemental monitoring event in October 2020 at MW-17S.
  - ➤ Quarterly monitoring event in December 2020 to include the 14 monitor wells with current/previous detections of sulfolane.
- The remediation system continues to be shut down pending the result for MW-17S from the October 2020 monitoring event.
- A quarterly project update report will be submitted subsequent to receipt of analytical data from the December 2020 monitoring event.



# APPENDIX A FIGURES



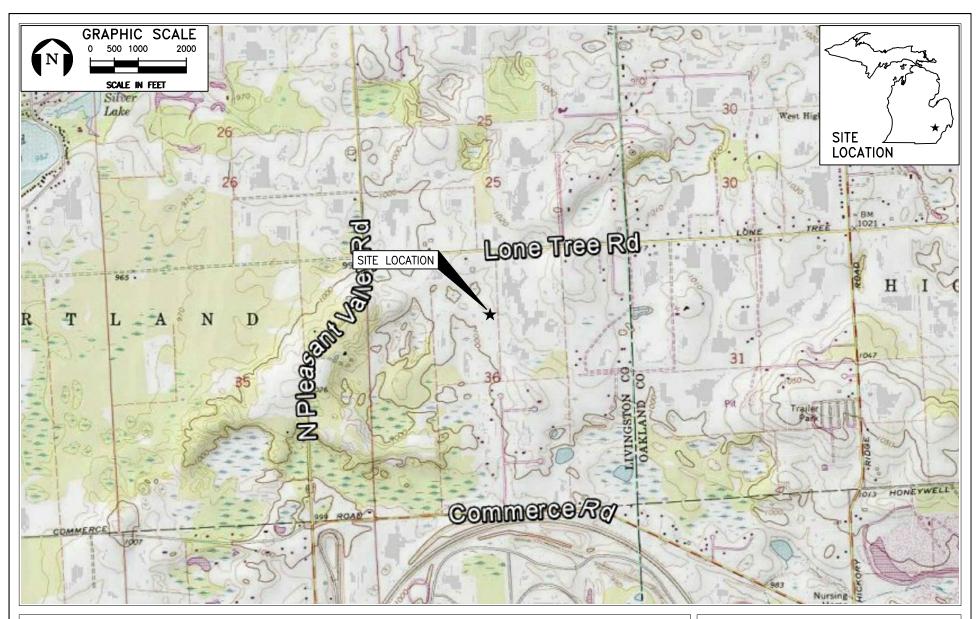


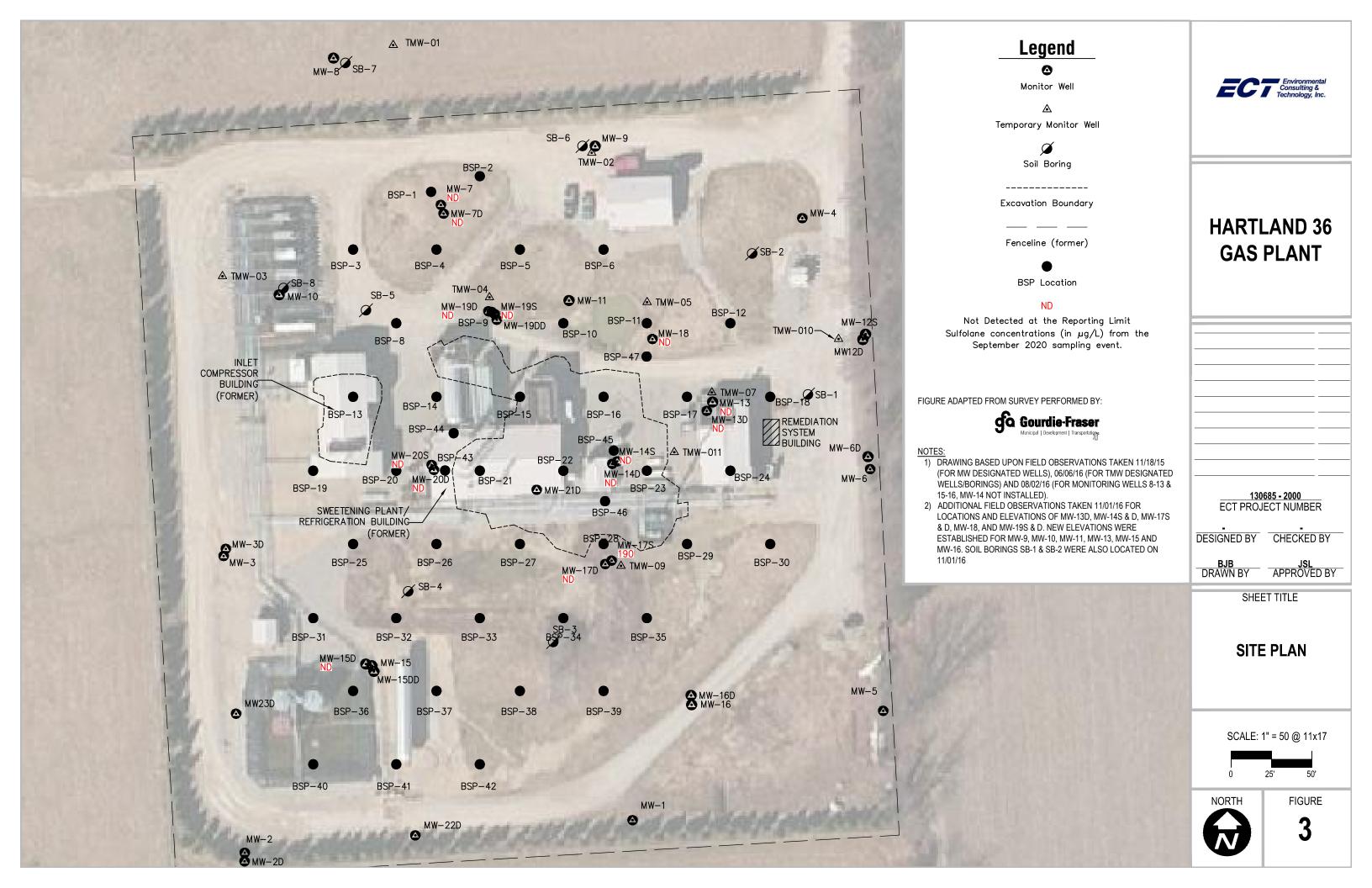
FIGURE 1
SITE LOCATION MAP
HARTLAND 36 GAS PLANT
PORTION OF E 1/2 OF NE 1/4 OF SECTION 36, T03N-R06E
HARTLAND TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN
Source: USGS QUad: Kent Lake, 2015; West Highland, 2015; ECT, 2016.





FIGURE 2 SITE AND SURROUNDING PROPERTIES MAP HARTLAND 36 GAS PLANT PORTION OF E 1/2 OF NE 1/4 OF SECTION 36, T03N-R06E HARTLAND TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN Source: Google Earth, 2016; ECT, 2016.





## **APPENDIX B**

**TABLES** 



														TABL	E 1															
										GROUND	WATER	ANALY	TICAL SU	JMMAR	Y & CLE	ANUP CR	ITERIA	COMPA	RISON											
															Gas Plant															
												Portio	n of E1/2 of	NW1/4 of	Section 3	6, T03N-R06	ε,													
													ECT	Project #1	3-0685-200	00														
		MW-1			MW-2			MW-2D			MW-3			MW-3D			MW-4			MW-5			MW-6			MW-6D			MW-7	
Date	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate
9/11-13/17	ND	8.08		ND	4.14		ND	5.36		ND	6.96		ND	1.03		ND	7.75		ND	7.31		ND	2.77		ND	5.90		ND	1.55	
9/21/17											-												-			-				
12/19-20/17	ND	8.83	6.4	ND	8.76	16	ND	5.02	21	ND	9.81	41	ND	1.90	27	ND	7.10	24	ND	6.85	24	ND	2.99	42	ND	9.26	19	ND	10.07	46
1/25/18	1/25/18																													
2/27/18																														
3/28-29/18	3/28-29/18 ND 7.87 5.0 ND 7.79 14 ND 4.05 17 ND 11.53 26 ND 1.31 30 ND 9.77 29 ND 6.31 24 ND 3.22 41 ND 6.92 20 ND 9.75 31																													
6/19-21/18	6/19-21/18 ND 15.96 9.3 ND 10.66 15 ND 7.87 18 ND 8.43 11 ND 1.06 28 ND 9.86 21 ND 12.49 28 ND 10.58 56 ND 10.91 10 ND 10.49 17																													
9/18-20/18	7/8-20/16 ND 9.98 8.5 ND 12.08 15 ND 10.21 21 ND 9.56 16 ND 1.87 34 ND 11.86 23 ND 11.26 25 ND 5.56 57 ND 8.27 22 ND 13.67 24																													
12/17-18/18	2/17-18/18																													
3/25-26/19	3/25-26/19																													
6/24-26/19																														
9/23-24/19																												ND	12.78	25
12/3-4/19																												ND	9.65	29
1/2/20																														
2/13/20																														
3/5-6/20																												ND	49.87	22
4/2/20																														
6/1-2/20																												ND	18.32	23
9/9-10/20																												ND	8.50	21
% Decrease											-												-			-				
Sulfolane Criterion (µg/L)															Non-de	tect - <10														
Sulfate Criterion (mg/L)															2	250														
		MW-7D			MW-8			MW-9			MW-10			MW-11			MW-12S			MW-12D			MW-13			MW-13D		1		
Date	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	1		
9/11-13/17	1,900	0.79		ND	9.09		ND	0.73		ND	7.42		ND	3.69		ND	2.65		ND	1.36		ND	0.94		660 (730)	0.52	330			
9/21/17																														
12/19-20/17	4,100	0.89	46	ND	6.34	8	ND	0.57	21	ND	7.95	36	ND	5.04	20	ND	3.98	19	ND	4.00	32	ND	13.79	80	480	0.51	240			
1/25/19															-										400	2 12	240	1		

		MW-7D			MW-8			MW-9			MW-10			MW-11			MW-12S			MW-12D			MW-13			MW-13D	
Date	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate
9/11-13/17	1,900	0.79		ND	9.09		ND	0.73		ND	7.42		ND	3.69		ND	2.65		ND	1.36		ND	0.94		660 (730)	0.52	330
9/21/17																											
12/19-20/17	4,100	0.89	46	ND	6.34	8	ND	0.57	21	ND	7.95	36	ND	5.04	20	ND	3.98	19	ND	4.00	32	ND	13.79	80	480	0.51	240
1/25/18															-										400	2.13	240
2/27/18	1,200	1.47	96												-										ND	9.90	210
3/28-29/18	820	0.61	81	ND	9.65	12	ND	1.32	26	ND	10.34	48	ND	5.17	16	ND	7.70	18	ND	3.45	33	ND	10.12	63	ND	8.41	220
6/19-21/18	180 (170)	1.09	61 (57)	ND	8.58	30	ND	3.36	21	ND	9.98	39	ND	10.94	18	ND	9.09	22	ND	5.26	36	ND	8.08	93	180	2.42	480
9/18-20/18	170	1.32	58	ND	7.88	9.4	ND	1.66	29	ND	11.83	18	ND	11.00	45	ND	3.52	55	ND	4.27	34	ND	9.36	69	ND	5.06	650
12/17-18/18	270 (300)	12.68	37																			ND	10.41	94	ND	0.38	740
3/25-26/19	1,700	0.19	53																			ND	11.46	110	16	1.95	740
6/24-26/19	510	0.81	84	ND	12.70	17	ND	1.20	26	ND	8.50	61	ND	11.21	40	ND	5.84	27	ND	2.96	37	ND	8.54	140	19	2.61	740
9/23-24/19	140	2.58	57																			ND	8.93	140	ND	5.07	750
12/3-4/19	1,200	4.02	48																			ND	10.09	120	37	0.82	660
1/2/20	2,400																										
2/13/20	1,500																										
3/5-6/20	ND	12.14	32																			ND	28.96	91	ND	7.08	920
4/2/20	330																								16		
6/1-2/20	ND	15.88	30																			ND	4.51	86	ND	6.56	560
9/9-10/20	ND	12.56	27																			ND	3.70	92	ND	2.92	510
% Decrease	100%																								100%		
Sulfolane Criterion (µg/L)													No	n-detect - <	:10												
Sulfate Criterion (mg/L)														250													_

- Notes

  1) Concentrations of sulfolane reported in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
- 2) DO: discoved coyen.

  3) Concentrations of discoved coyen and sulfate reported in milligrams per liter (mg/L), equivalent to parts per million (ppm).

  4) (---) Not sampled.
- 5) ND Concentration not detected above reporting limit.

- 5) NU Concentration not retected above reporting limit.
  6) Concentrations shown in parenthesis are from duplicate sample.
  7) % Decrease of sulfidane is the most recent sampling event relative to highest reported concentration since the pre-system startup event (9/11-13/17).
  8) Sulfolane criterion established by EGLE-OII, Gas, and Minerals Division (EGLE-OGMD).
  9) Sulfate criterion Part 201 Residential Generic Cleanup Criteria and Screening Levels (Part 201 Residential GCCSLs), dated January 10, 2018, per R299.44 (Table 1) of the Michigan Administrative Code.
  10) Concentrations that are shaded \_\_\_\_\_\_ and bold exceed cleanup criteria.



	TABLE 1  GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON  Hartland 36 Gas Plant  Portion of E1/2 of NW1/4 of Section 36, T03N-R06E,  ECT Project #13-0685-2000  MW-145 MW-14D MW-15 MW-15D MW-15D MW-16 MW-16D MW-175 MW-17D																										
												Т	ABLE 1														
								GRO	OUNDWA	TER ANA	ALYTICA	L SUMN	IARY & C	LEANU	P CRITE	RIA COM	PARISC	ON									
												Hartlan	d 36 Gas P	lant													
										Р	ortion of E				N-R06E,												
												ECT Proje	ct #13-068														
						_	ļ		_							ļ.,,						ļ					
Date	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate
9/11-13/17	120	0.85		7,700	0.22		ND	4.39		230	0.22		33	0.23		ND	3.31		ND	0.28		3,100	0.25		380	0.36	
9/21/17 12/19-20/17	100	2.05	91	7.100	0.45	39	ND	11.02	14	ND	4.22	46	48 ND	0.64	37	ND	8.42	16	ND	5.99	24	2,400	0.88	49	 51	8.10	33
1/25/18	85	3.35	56	5,400	0.43	44	IND	11.02		IND	4.22	40	IND	0.56		IND	0.42		IND	5.99	24	510	0.00	53	ND ND	10.07	38
2/27/18	ND	9.63	110	4,000	0.50	48			-													460	0.96	53	ND	11.02	38
3/28-29/18	ND	8.61	120	3,000 (5,100)	0.22	50 (51)	ND	7.96	16	ND	6.86	29	ND	0.54	37	ND	8.73	19	ND	3.88	25	52 (52)	3.28	64	ND	9.68	36
6/19-21/18	52	0.28	67	2,600 (2,800)	0.09	77 (77)	ND	7.98	39	ND	3.80	27	ND	0.53	42	ND	16.43	43	ND	8.12	24	55	8.61	68	ND (ND)	10.63	42 (41)
9/18-20/18	18         ND         4.90         140         680         2.89         110         ND         8.25         32         ND         7.45         20         ND         0.60         41         ND         8.12         21         ND         2.08         22         32         3.07         65         ND         3.83         49           1/8         ND         9.20         220         230         3.49         120           ND         6.77         22              ND         9.30         61         ND         9.75         47																										
12/17-18/18	17-18/18 ND 9.20 220 290 3.49 120 ND 6.77 22 ND 9.30 61 ND 9.75 47 15-26/19 ND 11.08 180 ND 5.71 120 ND 7.53 23																										
3/25-26/19	3/25-26/19 ND 11.08 180 ND 5.71 120 ND 7.53 23																										
	6/24-26/19 ND 9.88 160 110 5.82 120 ND 8.58 55 ND 5.65 28 ND 0.53 65 ND 11.24 23 ND 6.78 33 ND 1.43 69 ND 10.93 65 9/23-24/19 ND 5.96 100 71 2.83 150 ND 22.96 26																										
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	123-419 ND 8.66 93 71 10.21 150 ND 6.29 21 ND 7.98 61 ND 8.87 80 17/20																										
	1/2/20																										
4/2/20	2/13/20																										
6/1-2/20	20 ND 8.44 100 ND 11.39 130 ND 5.66 21																										
9/9-10/20	ND	17.85	88	ND	10.57	100				ND	8.34	21										190	1.09	67	ND	1.25	290
% Decrease	100%			100%						1009/			4000/		_							00.070/			10001		
										10076	***		100%				***	***				93.87%			100%		
	% Decrease 100% 100% 100% 100% 100% 100% 93.87% 100% 100% Non-detect <10																										
Sulfolane Criterion (µg/L) Sulfate Criterion (mg/L)	lane Criterion (µg/L) Non-detect -<10																										
										100%		***		on-detect - « 250					***		***	93.87%			100%		
Sulfate Criterion (mg/L)		MW-18			MW-19S			MW-19D	<u>'</u>		MW-19DD		No	250 MW-20S	<10		MW-20D			MW-21D			MW-22D			MW-23D	
Sulfate Criterion (mg/L)  Date	Sulfolane	DO	Sulfate	Sulfolane	MW-19S DO	Sulfate	Sulfolane	MW-19D DO	Sulfate	Sulfolane	MW-19DD DO	Sulfate	No Sulfolane	250 MW-20S	<10 Sulfate	Sulfolane	MW-20D DO	Sulfate	Sulfolane	MW-21D DO	Sulfate	Sulfolane	MW-22D DO	Sulfate	Sulfolane	MW-23D DO	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17	2,200	DO 1.16		Sulfolane 29	MW-19S DO 1.64	Sulfate	Sulfolane 5,900	MW-19D DO 0.60	Sulfate	Sulfolane ND	MW-19DD DO 3.82	Sulfate	Sulfolane	250 MW-20S DO 1.50	Sulfate	Sulfolane	MW-20D DO 0.45	Sulfate	Sulfolane ND	MW-21D DO 6.08	Sulfate	Sulfolane ND	MW-22D DO 7.76	Sulfate	Sulfolane ND	MW-23D DO 2.87	Sulfate
Sulfate Criterion (mg/L)  Date	2,200	1.16		Sulfolane 29	MW-19S DO 1.64	Sulfate	Sulfolane 5,900	MW-19D DO 0.60	Sulfate	Sulfolane ND	MW-19DD DO 3.82	Sulfate	Sulfolane 63	250 MW-20S DO 1.50	Sulfate	Sulfolane 12,000	MW-20D DO 0.45	Sulfate	Sulfolane ND	MW-21D DO 6.08	Sulfate	Sulfolane ND	MW-22D DO 7.76	Sulfate	Sulfolane ND	MW-23D DO 2.87	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17	2,200	DO 1.16		Sulfolane 29	MW-19S DO 1.64	Sulfate	Sulfolane 5,900	MW-19D DO 0.60	Sulfate	Sulfolane ND	MW-19DD DO 3.82	Sulfate	Sulfolane	250 MW-20S DO 1.50	Sulfate	Sulfolane	MW-20D DO 0.45	Sulfate	Sulfolane ND	MW-21D DO 6.08	Sulfate	Sulfolane ND	MW-22D DO 7.76	Sulfate	Sulfolane ND	MW-23D DO 2.87	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17	2,200  660	1.16  0.67	  37	Sulfolane 29 ND	MW-19S DO 1.64  10.32	Sulfate	Sulfolane 5,900  3,200	MW-19D DO 0.60  0.38	Sulfate 73	Sulfolane ND	MW-19DD DO 3.82  7.16	Sulfate 22	Sulfolane 63 49	MW-20S DO 1.50	Sulfate 45	Sulfolane 12,000  12,000	MW-20D DO 0.45  0.52	Sulfate 43	Sulfolane ND ND	MW-21D DO 6.08  7.58	Sulfate 22	Sulfolane ND 	MW-22D DO 7.76  5.74	Sulfate	Sulfolane ND  ND	MW-23D DO 2.87  2.48	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18	2,200  660 2,300	1.16  0.67 0.74	  37 34	Sulfolane 29 ND	MW-19S DO 1.64  10.32	Sulfate 44	Sulfolane 5,900  3,200 ND	MW-19D DO 0.60 0.38 0.77	Sulfate 73 74	Sulfolane ND ND	MW-19DD DO 3.82  7.16	Sulfate 22	Sulfolane 63 49 ND	MW-20S DO 1.50  4.04 3.76	Sulfate 45 45	Sulfolane 12,000 12,000 10,000	MW-20D DO 0.45  0.52 1.61	Sulfate	Sulfolane ND ND	MW-21D DO 6.08  7.58	Sulfate 22	Sulfolane ND	MW-22D DO 7.76 5.74	Sulfate 12	Sulfolane ND ND	MW-23D DO 2.87  2.48	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18	2,200  660 2,300 2,000 980 14	0.67 0.74 0.39 0.71 3.13	37 34 33 34 39	Sulfolane 29 ND ND ND	MW-19S DO 1.64  10.32  9.45 11.14	Sulfate 44 43 36	Sulfolane 5,900  3,200 ND ND ND 290 750	MW-19D  DO  0.60 0.38 0.77 0.57 0.47 1.08	Sulfate 73 74 51 54 63	Sulfolane ND ND ND ND ND	MW-19DD DO 3.82 7.16 6.27 5.25	Sulfate	Sulfolane 63 49 ND ND ND	MW-20S DO 1.50 4.04 3.76 2.03 4.80	Sulfate 45 45 52 57 (58) 56	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600	MW-20D DO 0.45  0.52 1.61 0.61 2.00 3.99	Sulfate	Sulfolane ND ND ND ND ND ND ND ND	MW-21D DO 6.08  7.58  4.13 4.22	Sulfate 22 22 21	Sulfolane ND ND ND ND ND	MW-22D DO 7.76 	Sulfate	Sulfolane ND ND ND ND ND ND ND	MW-23D DO 2.87  2.48  3.03 5.72	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18	2,200  660 2,300 2,000 980 14 ND (ND)	0.67 0.74 0.39 0.71 3.13 0.67	37 34 33 34 39 49 (49)	Sulfolane 29 ND ND ND ND ND	MW-19S DO 1.64  10.32  9.45 11.14 12.84	Sulfate 44 43 36 44	Sulfolane 5,900  3,200 ND ND 290 750 170 (150)	MW-19D  DO  0.60  0.38  0.77  0.57  0.47  1.08  0.86	Sulfate 73 74 51 54 63 77 (77)	Sulfolane ND ND ND	MW-19DD DO 3.82  7.16  6.27 5.25 6.89	Sulfate	Sulfolane 63 49 ND ND ND ND	MW-20S DO 1.50  4.04 3.76  2.03 4.80 9.28	Sulfate 45 45 52 57 (58) 56 63	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600 22 (34)	MW-20D DO 0.45  0.52 1.61 0.61 2.00 3.99 5.37	Sulfate	Sulfolane ND ND ND ND ND ND ND ND ND	MW-21D DO 6.08  7.58  4.13 4.22 5.77	Sulfate	Sulfolane ND ND ND ND ND ND ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65	Sulfate 12 9.4 8.0 6.8	Sulfolane ND ND ND ND ND ND ND ND	MW-23D DO 2.87  2.48  3.03	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/12/1/7 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18	2,200  660 2,300 2,000 980 14 ND (ND)	0.67 0.67 0.74 0.39 0.71 3.13 0.67 2.28	37 34 33 34 39 49 (49) 53	Sulfolane 29 ND ND ND ND ND ND ND	MW-19S DO 1.64  10.32  9.45 11.14 12.84 8.95	Sulfate 44 43 36 44 47	Sulfolane 5,900  3,200 ND ND 290 750 170 (150)	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02	Sulfate	Sulfolane ND ND ND ND ND	MW-19DD DO 3.82  7.16  6.27 5.25 6.89	Sulfate 22 26 23 20	Sulfolane 63 49 ND ND ND ND ND ND	MW-20S DO 1.50 4.04 3.76 2.03 4.80 9.28 9.77	Sulfate	Sulfolane 12,000  12,000 10,000 9,300 10,000 6,600 22 (34) 19	MW-20D DO 0.45  0.52 1.61 0.61 2.00 3.99 5.37 5.32	Sulfate 43 41 46 51 58 80 (81) 90	Sulfolane ND ND ND ND ND ND ND ND	MW-21D DO 6.08  7.58  4.13 4.22 5.77	Sulfate 22 22 21	Sulfolane ND ND ND ND ND ND ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65	Sulfate	Sulfolane ND	MW-23D DO 2.87  2.48  3.03 5.72 3.12	Sulfate 20 19 20 21
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 3/25-26/19	2,200  660 2,300 2,000 980 14 ND (ND) ND	0.67 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09	37 34 33 34 39 49 (49) 53 47	Sulfolane 29 ND	MW-19S DO 1.64  10.32  9.45 11.14 12.84 8.95 14.18	Sulfate 44 43 36 44 47 47	Sulfolane 5,900 3,200 ND ND ND 290 170 (150) 440 350	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02 0.24	Sulfate	Sulfolane ND ND ND ND ND ND ND ND	MW-19DD DO 3.82  7.16  6.27 5.25 6.89	Sulfate	Sulfolane   63     49   ND   ND   ND   ND   ND   ND   ND   N	MW-20S DO 1.50  4.04 3.76  2.03 4.80 9.28 9.77 12.20	Sulfate 45 45 52 57 (58) 56 63 48 62	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600 22 (34) 19 ND (ND)	MW-20D DO 0.45  0.52 1.61 0.61 2.00 3.99 5.37 5.32 10.35	Sulfate	Sulfolane ND	MW-21D DO 6.08  7.58  4.13 4.22 5.77	Sulfate	Sulfolane ND ND ND ND ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65	Sulfate 12 9.4 8.0 6.8	Sulfolane  ND   ND  ND  ND  ND  ND  ND  ND  N	MW-23D DO 2.87  2.48  3.03 5.72 3.12	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 3/25-26/19 6/24-26/19	2,200  660 2,300 2,000 980 14 ND (ND) ND ND (ND)	DO 1.16 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.97	37 34 33 34 39 49 (49) 53 47 45 (44)	Sulfolane 29 ND	MW-19S DO 1.64  10.32  9.45 11.14 12.84 8.95 14.18 10.42	Sulfate	Sulfolane 5,900 3,200 ND ND 290 750 170 (150) 440 350 98 (73)	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02 0.24 0.17	Sulfate	Sulfolane ND	MW-19DD DO 3.82 7.16 6.27 5.25 6.89 7.27	Sulfate	Sulfolane   63	MW-20S DO 1.50  4.04 3.76  2.03 4.80 9.28 9.77 12.20 20.73	Sulfate	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600 22 (34) 19 ND (ND) ND (ND)	MW-20D DO 0.45  0.52 1.61 0.61 2.00 3.99 5.37 5.32 10.35	Sulfate	Sulfolane ND	MW-21D DO 6.08  7.58  4.13 4.22 5.77  5.66	Sulfate 22 22 21 24	Sulfolane ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65 9.20	Sulfate	Sulfolane ND	MW-23D DO 2.87 2.48 3.03 5.72 3.12 6.39	Sulfate 20 19 20 21 30
Sulfate Criterion (mg/L)  Date  9/11-13/17  9/21/17  12/19-20/17  1/25/18  2/27/18  3/28-29/18  6/19-21/18  9/18-20/18  12/17-18/18  3/25-26/19  9/23-24/19	2,200  660 2,300 2,000 980 14 ND (ND) ND (ND) ND (ND) ND (ND)	0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.97	37 34 33 34 39 49 (49) 53 47 45 (44)	Sulfolane 29 ND	MW-19S DO 1.64  10.32  9.45 11.14 12.84 8.95 14.18 10.42 9.79	Sulfate 44 43 36 44 47 47 62 58	Sulfolane 5,900 3,200 ND ND ND 1750 170 (150) 440 350 98 (73) ND	MW-19D DO 0.60 0.57 0.47 1.08 0.86 3.02 0.24 0.17 8.39	Sulfate	Sulfolane ND	MW-19DD DO 3.82  7.116  6.27 5.25 6.89  7.27	Sulfate	Sulfolane 63 ND	m-detect - 250  MW-20S  DO  1.50 4.04 3.76 2.03 4.80 9.28 9.77 12.20 20.73 6.06	Sulfate	Sulfolane 12,000 	MW-20D DO 0.45 0.52 1.61 0.61 2.00 3.99 5.37 5.32 10.35 10.86 6.26	Sulfate 43 41 46 51 58 80 (81) 90 494 (94) 84 (79)	Sulfolane ND ND ND ND ND ND ND ND ND	MW-21D DO 6.08  7.58  4.13 4.22 5.77 	Sulfate 22 21 21 24	Sulfolane ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65 9.20	Sulfate	Sulfolane ND	MW-23D DO 2.87  2.48  3.03 5.72 3.12  6.39	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 3/25-26/19 6/24-26/19	2,200  660 2,300 2,000 980 14 ND (ND) ND ND (ND)	DO 1.16 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.97	37 34 33 34 39 49 (49) 53 47 45 (44)	Sulfolane 29 ND	MW-19S DO 1.64  10.32  9.45 11.14 12.84 8.95 14.18 10.42	Sulfate	Sulfolane 5,900 3,200 ND ND 290 750 170 (150) 440 350 98 (73)	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02 0.24 0.17	Sulfate	Sulfolane ND	MW-19DD DO 3.82 7.16 6.27 5.25 6.89 7.27	Sulfate	Sulfolane   63	MW-20S DO 1.50  4.04 3.76  2.03 4.80 9.28 9.77 12.20 20.73	Sulfate	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600 22 (34) 19 ND (ND) ND (ND)	MW-20D DO 0.45  0.52 1.61 0.61 2.00 3.99 5.37 5.32 10.35	Sulfate	Sulfolane ND	MW-21D DO 6.08  7.58  4.13 4.22 5.77  5.66	Sulfate 22 22 21 24	Sulfolane ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65 9.20	Sulfate	Sulfolane ND	MW-23D DO 2.87 2.48 3.03 5.72 3.12 6.39	Sulfate 20 19 20 21 30
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 3/25-26/19 6/24-26/19 9/23-24/19	2,200 660 2,300 2,000 980 14 ND (ND) ND	DO 1.16 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.97 1.60 0.93	37 34 33 34 39 49 (49) 53 47 45 (44) 43	Sulfolane 29 ND	MW-19S DO 1.64 10.32 9.45 11.14 12.84 8.95 14.18 10.42 9.79 11.40	Sulfate	Sulfolane 5,900 3,200 ND ND 290 750 440 350 98 (73) ND	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02 0.24 0.17 8.39 0.57	Sulfate	Sulfolane ND	MW-19DD DO 3.82 7.16 6.27 5.25 6.89 7.27	Sulfate	Sulfolane   63	MW-20S DO 1.50 4.04 3.76 2.03 4.80 9.28 9.77 12.20 20.73 6.06 7.23	Sulfate	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600 22 (34) 19 ND (ND) ND (ND) ND (ND) ND (ND)	MW-20D DO 0.45 0.52 1.61 2.00 3.99 5.37 5.32 10.35 10.86 6.26 6.15	Sulfate 43 41 46 51 59 90 89 (84) 94 (94) 84 (79) 84 (80)	Sulfolane ND ND ND ND ND ND ND ND	MW-21D DO 6.08  7.58  4.13 4.22 5.77  5.66	Sulfate	Sulfolane ND ND ND ND ND ND ND	MW-22D DO 7.76  5.74  5.32 12.97 7.65  9.20	Sulfate	Sulfolane ND	MW-23D DO 2.87 2.48 3.03 5.72 3.12 6.39	Sulfate 20 19 20 21 30
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 12/59-20/17 12/59/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 3/25-26/19 6/24-26/19 9/23-24/19 12/25-4/19 12/25-4/19	2,200 660 2,300 2,000 980 14 ND (ND) ND ND ND ND (ND) ND	0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.93	37 34 33 34 39 49 (49) 53 47 45 (44) 43	Sulfolane 29 ND	MW-19S DO 1.64 10.32 9.45 11.14 12.84 8.95 14.18 10.42 9.79 11.40	Sulfate	Sulfolane 5,900 ND ND ND 759 170 (150) 440 350 98 (73) ND	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02 0.24 0.17 8.39 0.57	Sulfate	Sulfolane ND	MW-19DD DO 3.82 6.27 5.25 6.89 7.27	Sulfate	Sulfolane 63 ND	MW-20S DO 1.50 4.04 3.76 2.03 4.80 9.77 12.20 20.73 6.06 7.23	Sulfate	Sulfolane 12,000 12,000 9,300 10,000 9,500 22 (34) 19 ND (ND) ND (ND) ND (ND) ND (ND)	MW-20D DO 0.45 0.52 1.61 2.00 3.99 5.37 10.35 10.86 6.26 6.15	Sulfate	Sulfolane ND	MW-21D DO 6.08 4.13 4.22 5.77 5.66	Sulfate	Sulfolane ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65 9.20	Sulfate	Sulfolane ND	MW-23D DO 2.87 2.48 3.03 5.72 3.12 6.39	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/25-29/18 6/19-21/18 9/18-20/18 12/17-18/18 3/25-26/19 6/24-26/19 9/23-24/19 12/25-4/19 1/27-4/19	2,200 660 2,300 2,000 980 14 ND (ND) ND	0.67 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.97 1.60	37 34 33 34 39 49 (49) 53 47 45 (44) 43 49	Sulfolane 29 ND	MW-19S DO 1.64 10.32 9.45 11.14 12.84 8.95 14.18 10.42 9.79 11.40	Sulfate	Sulfolane 5,900  3,200 ND ND 290 750 170 (150) 440 350 98 (73) ND	MW-19D DO 0.60 0.57 0.47 1.08 0.86 3.02 0.24 0.17 8.39 0.57	Sulfate	Sulfolane ND ND ND ND ND ND ND ND ND	MW-19DD DO 3.82 7.16 6.27 5.25 6.89 7.27	Sulfate	No   Suffolane   63     49   ND   ND   ND   ND   ND   ND   ND   N	MW-20S DO 1.50 2.03 4.80 9.28 9.77 12.20 20.73 6.06 7.23	Sulfate     45   45   52   57 (58)   56   63   48   62   72   66   64	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600 22 (34) 19 ND (ND) ND (ND) ND (ND) ND (ND)	MW-20D DO 0.45 1.61 0.61 2.00 3.99 5.37 5.32 10.36 6.26 6.15	Sulfate	Sutfolane ND	MW-21D DO 6.08 7.58 4.13 4.22 5.66	Sulfate	Sulfolane ND ND ND ND ND ND ND ND ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65	Sulfate	Sulfolane	MW-23D DO 2.87 2.48 3.03 5.72 3.12 6.39	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 3/25-26/19 6/24-26/19 9/23-24/19 12/20 2/13/20 3/5-6/20 4/2/20 6/1-2/20	2,200 660 2,300 2,000 980 14 ND (ND) ND ND ND (ND) ND	DO 1.16 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.97 1.60 0.93 7.25 6.08		Sulfolane 29 ND	MW-19S DO 1.64 	Sulfate	Sulfolane 5,900 3,200 ND ND 290 170 (150) 440 350 98 (73) ND 92 ND	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02 0.24 0.17 8.39 0.57 9.24 15.02	Sulfate	Sulfolane ND	MW-19DD DO 3.82 7.16 6.27 5.25 6.89	Sulfate 22 22	Sulfolane 63 49 ND	MW-20S DO 1.50 4.04 3.76 2.03 4.80 9.28 9.77 12.20 9.73 6.06 7.23 9.74 11.51	Sulfate	Sulfolane 12,000 10,000	MW-20D DO 0.45 0.52 1.61 2.00 3.99 5.37 5.32 10.35 10.86 6.26 6.15 4.20 7.29	Sulfate	Sulfolane ND ND ND ND ND ND ND ND	MW-21D DO 6.08 7.58 4.13 4.22 5.77 5.66	Sulfate	Sulfolane ND ND ND ND ND ND ND ND ND	MW-22D DO 7.76	Sulfate 12 9.4 8.0 6.8 8.3	Sulfolane ND ND ND ND ND ND ND ND	MW-23D DO 2.87 2.48 3.03 5.72 3.12 6.39	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 11/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 12/17-18/18 12/17-18/18 12/17-18/19 12/2-26/19 9/2-22-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19	2,200 660 2,300 2,000 980 14 ND (ND) ND	DO 1.16 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.97 1.60 0.93 7.25		Sulfolane   29	MW-19S DO 1.64 10.32 9.45 11.14 12.84 8.95 14.18 10.42 9.79 11.40 13.19	Sulfate	Sulfolane 5,900 3,200 ND ND ND 170 (150) 440 350 98 (73) ND	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 3.02 0.24 0.17 8.39 0.57 9.24	Sulfate 73 74 51 54 63 77 (77) 83 88 100 (94) 110 92 100 92 84	Suffolane ND	MW-19DD DO 3.82	Sulfate	Sulfolane 63 49 .ND	MW-20S DO 1.50 4.04 3.76 1.20 20.73 6.06 7.23 9.74	Sulfate 45 52 57 (58) 56 63 48 62 72 66 64 33 3 37	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600 22 (34) 19 ND (ND)	MW-20D DO 0.45 0.52 1.61 0.61 2.00 3.99 5.37 5.32 10.35 10.86 6.26 6.15 4.20	Sulfate 43 41 46 51 58 80 (81) 90 89 (84) (79) 84 (80) 88 (91) 88 (91)	Sulfolane ND ND ND ND ND ND ND ND	MW-21D DO 6.08 7.58 4.13 4.22 5.77 5.66	Sulfate	Sulfolane ND ND ND ND ND ND ND ND ND	MW-22D DO 7.76 5.74 5.32 12.97 7.65 9.20	Sulfate 12 9.4 8.0 6.8 8.3	Sulfolane ND	MW-23D DO 2.87	Sulfate
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 1/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 3/28-26/19 6/24-26/19 9/23-24/19 1/2/20 2/13/20 3/5-6/20 4/2/20 6/1-2/20 9/9-10/20 % Decrease	2,200 660 2,300 2,000 980 14 ND (ND) ND ND ND (ND) ND	DO 1.16 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 0.97 1.60 0.93 7.25 6.08		Sulfolane 29 ND	MW-19S DO 1.64 	Sulfate	Sulfolane 5,900 3,200 ND ND 290 170 (150) 440 350 98 (73) ND 92 ND	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02 0.24 0.17 8.39 0.57 9.24 15.02	Sulfate	Sulfolane ND	MW-19DD DO 3.82 7.16 6.27 5.25 6.89 7.27	Sulfate 22 22 26 23 20 20 20 20 20 20 20 20 20 20 20 20 20	No   No   No   No   No   No   No   No	MW-20S DO 1.50 1.50 3.76 4.04 4.80 9.28 9.77 12.20 20.73 6.06 7.23 9.74 11.51 7.91	Sulfate	Sulfolane 12,000 10,000	MW-20D DO 0.45 0.52 1.61 2.00 3.99 5.37 5.32 10.35 10.86 6.26 6.15 4.20 7.29	Sulfate	Sulfolane ND ND ND ND ND ND ND ND	MW-21D DO 6.08 7.58 4.13 4.22 5.77 5.66	Sulfate	Sulfolane ND	MW-22D DO 7.76  5.74  5.32 12.97 7.65  9.20	Sulfate	Sulfolane ND	MW-23D DO 2.87 2.48 3.03 5.72 3.12 6.39	Sulfate 20 19 20 30
Sulfate Criterion (mg/L)  Date 9/11-13/17 9/21/17 12/19-20/17 11/25/18 2/27/18 3/28-29/18 6/19-21/18 9/18-20/18 12/17-18/18 12/17-18/18 12/17-18/18 12/17-18/19 12/2-26/19 9/2-22-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19 12/2-4/19	2,200 660 2,300 2,000 980 14 ND (ND) ND	DO 1.16 0.67 0.74 0.39 0.71 3.13 0.67 2.28 1.09 1.60 0.93 7.25 6.08 0.56		Sulfolane   29	MW-19S DO 1.64	Sulfate	Sulfolane 5,900 3,200 ND ND ND 170 (150) 440 350 98 (73) ND	MW-19D DO 0.60 0.38 0.77 0.57 0.47 1.08 0.86 3.02 0.24 0.17 8.39 0.57 9.24 15.02 13.48	Sulfate 73 74 51 54 63 77 (77) 83 88 100 (94) 110 92 100 92 84	Sulfolane	MW-19DD DO 3.82	Sulfate	No   No   No   No   No   No   No   No	MW-20S DO 1.50 4.04 3.76 2.03 9.28 9.77 12.20 20.73 6.06 7.23 9.74 11.51 7.91	Sulfate	Sulfolane 12,000 12,000 10,000 9,300 10,000 6,600 22 (34) 19 ND (ND)	MW-20D DO 0.45 0.52 1.61 2.00 3.99 5.37 5.32 10.86 6.26 6.15 4.20 7.29 2.79	Sulfate	Sulfolane	MW-21D DO 6.08 5.66	Sulfate	Sulfolane ND ND ND ND ND ND ND ND	MW-22D DO 7.76 5.74 9.20	Sulfate	Sulfolane ND	MW-23D DO 2.87 2.48 3.03 5.72 3.12	Sulfate

- Notes

  1) Concentrations of sulfolane reported in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
- 2) DO-dissolved oxygen.

  3) Concentrations of dissolved oxygen and sulfate reported in milligrams per liter (mg/L), equivalent to parts per million (ppm).

  4) (---) Not sampled.
- 5) ND Concentration not detected above reporting limit.

- 5) NU Concentration not elected above reporting limit.
  6) Concentrations shown in parenthesis are from duplicate sample.
  7) % Decrease of sulfolane is the most recent sampling event relative to highest reported concentration since the pre-system startup event (9/11-13/17).
  8) Sulfolane criterion established by EGLE-Oil, Cas, and Minerals Division (EGLE-OGMD).
  9) Sulfate criterion Part 201 Residential Generic Cleanup Criteria and Screening Levels (Part 201 Residential GCCSLs), dated January 10, 2018, per R299.44 (Table 1) of the Michigan Administrative Code.
  10) Concentrations that are shaded \_\_\_\_\_and bold exceed cleanup criteria.



#### TABLE 2

#### SULFOLANE GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON

Hartland 36 Gas Plant

Portion of E1/2 of NW1/4 of Section 36, T03N-R06E, Hartland Township, Livingston County, Michigan ECT Project #13-0685-2000

	Screened								or Froject#1										
Sample Location		11/4-5/15	1/27/16	6/3/2016	8/3-4/16	9/21-22/16	10/12/16	11/3/16	12/8/16	12/21-23/16	2/14/17	3/14-16/2017	4/27/17; 5/1/17	5/11/2017	5/30-31/17	6/19-21/17	9/11-13/17	9/21/2017	12/19-20/2017
MW-1	20.1 - 25.1	ND	ND	ND		ND						ND				ND	ND		ND
MW-2	19.1 - 24.1	ND	ND	ND		ND						ND				ND	ND		ND
MW-2D	27.7 - 29.7											ND				ND	ND		ND
MW-3	22.0 - 27.0	ND		ND		ND				ND		ND				ND	ND		ND
MW-3D	30.0 - 32.0										ND	ND				ND	ND		ND
MW-4	23.1 - 28.1	ND	ND	ND	ND	ND	ND	ND		ND		ND				ND	ND		ND
MW-5	18.0 - 23.0	ND	ND	ND		ND	ND			ND		ND				ND	ND		ND
MW-6	25.4 - 30.4	ND	ND	ND	ND	ND	ND	ND		ND		ND			ND	ND	ND		ND
MW-6D	39.4 - 44.4			-	ND	ND	ND	ND		ND		ND			ND	ND	ND		ND
MW-7	25.2 - 30.2	880	44	510	ND	210				ND		ND				12	ND		ND
MW-7D	39.2 - 44.2			-					3,100			3,000				2,600	1,900		4,100
MW-8	24.6 - 29.6				ND	ND				ND		ND				ND	ND		ND
MW-9	23.6 - 28.6				ND	ND				ND		ND				ND	ND		ND
MW-10	21.2 - 26.2				ND	ND				ND		ND				ND	ND		ND
MW-11	21.7 - 26.7			-	ND	ND				ND		ND				ND	ND		ND
MW-12S	20.5 - 25.5				ND	ND	ND	ND		ND		ND			ND	ND	ND		ND
MW-12D	39.7 - 44.7				ND	ND	ND	ND		ND		ND			ND	ND	ND		ND
MW-13	19.1 - 24.1				6,600	8,800				3,500		5,100	7,000	3,700	97	ND	ND		ND
MW-13D	27.7 - 29.7							7,800		8,300		5,400	6,900	1,100	420	290	730		480
MW-14S	18.6 - 23.6			-				46		460		540	490	160	520	94	120		100
MW-14D	36.7 - 41.7							7,900		10,000		7,600	9,800	8,600	8,200	7,800	7,700		7,100
MW-15	19.3 - 24.3			-	ND	ND				ND		ND				ND	ND		ND
MW-15D	37.9 - 42.9										4,600	3,200				670	230		ND
MW-15DD	50 - 55																33	48	ND
MW-16	19.5 - 24.5			-	ND	ND				ND		ND	ND	ND	ND	ND	ND		ND
MW-16D	31.4 - 33.4										ND	ND				ND	ND		ND
MW-17S	19.9 - 24.9							3,900		5,100		3,000				5,300	3,100		2,400
MW-17D	35.4 - 37.4							440		510		400				390	400		51
MW-18	19.9 - 24.9							6,800		6,800		4,300		2,100	4,800	3,800	2,200		660
MW-19S	22.6 - 27.6							2,700		1,500		1,300				24	33		ND
MW-19D	43.0 - 48.0							7,000		7,600		4,300				7,000	5,900		3,200
MW-19DD	57 - 62																ND		ND
MW-20S	17.8 - 22.8								25			97				160	63		49
MW-20D	31.0 - 33.0								8,700			8,300				11,000	12,000		12,000
MW-21D	52.3 - 57.3								ND			ND				ND	ND		ND
MW-22D	36.4 - 41.4											ND				ND	ND		ND
MW-23D	28.1 - 30.1											ND				ND	ND		ND
EGLE-OGMD Clean	nup Criteria									Non-de	tect - <10 μg/	L							

#### Notes

- 1) ft bgs Feet below ground surface.
- 2) Collection method Grab, peristaltic pump (PP), low flow (LF), Bailer.
- 3) µg/L Micrograms per liter, equivalent to parts per billion (ppb).
- 4) (---) Not sampled.

Collection Method

- 5) ND Concentration not detected above reporting limit.
- 6) Sulfolane concentrations included on the table are for the higher concentration from samples submitted for duplicate analysis.

Bailer/PP

- 7) Cleanup criteria for sulfolane established by EGLE-Oil, Gas, and Minerals Division (EGLE-OGMD).
- 8) Concentrations that are shaded \_\_\_\_\_ and bold exceed cleanup criteria.
- 9) MW-7 sampled on 8/11/2016 for the 8/3-4/2016 sample event.



#### TABLE 2

#### SULFOLANE GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON

Hartland 36 Gas Plant

SE/NE/NW Section 36, T03N-R06E,

Hartland Township, Livingston County, Michigan ECT Project #13-0685-2000

							ECI	Project #13-	0685-2000								
	Screened		1	1	1				1				1	1			
Sample Location	Interval (ft bgs)	1/25/2018	2/27/2018				12/17-18/2018	3/25-26/19	6/24-26/2019	9/23-24/2019	12/3-4/19	1/2/2020	2/13/2020	3/5-6/2020	4/2/2020	6/1-2/2020	9/9-10/2020
MW-1	20.1 - 25.1			ND	ND	ND			ND								
MW-2	19.1 - 24.1			ND	ND	ND			ND								
MW-2D	27.7 - 29.7			ND	ND	ND			ND						-		
MW-3	22.0 - 27.0			ND	ND	ND			ND								
MW-3D	30.0 - 32.0			ND	ND	ND			ND								
MW-4	23.1 - 28.1			ND	ND	ND			ND								
MW-5	18.0 - 23.0			ND	ND	ND			ND								
MW-6	25.4 - 30.4			ND	ND	ND			ND								
MW-6D	39.4 - 44.4			ND	ND	ND			ND								
MW-7	25.2 - 30.2			ND	ND	ND	ND	ND	ND	ND	ND			ND		ND	ND
MW-7D	39.2 - 44.2		1,200	820	180	170	300	1,700	510	140	1,200	2,400	1,500	ND	330	ND	ND
MW-8	24.6 - 29.6			ND	ND	ND			ND								
MW-9	23.6 - 28.6			ND	ND	ND			ND								
MW-10	21.2 - 26.2			ND	ND	ND			ND								
MW-11	21.7 - 26.7			ND	ND	ND			ND								
MW-12S	20.5 - 25.5			ND	ND	ND			ND								
MW-12D	39.7 - 44.7			ND	ND	ND			ND								
MW-13	19.1 - 24.1			ND	ND	ND	ND	ND	ND	ND	ND			ND		ND	ND
MW-13D	27.7 - 29.7	400	ND	ND	180	ND	ND	16	19	ND	37			ND	16	ND	ND
MW-14S	18.6 - 23.6	85	ND	ND	52	ND	ND	ND	ND	ND	ND			ND		ND	ND
MW-14D	36.7 - 41.7	5,400	4,000	5,100	2,800	680	290	ND	110	71	71			ND	ND	ND	ND
MW-15	19.3 - 24.3			ND	ND	ND			ND								
MW-15D	37.9 - 42.9			ND	ND	ND	ND	ND	ND	ND	ND			ND		ND	ND
MW-15DD	50 - 55			ND	ND	ND			ND								
MW-16	19.5 - 24.5			ND	ND	ND			ND								
MW-16D	31.4 - 33.4			ND	ND	ND			ND								
MW-17S	19.9 - 24.9	510	460	52	55	32	ND	ND	ND	ND	ND			ND		ND	190
MW-17D	35.4 - 37.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND		ND	ND
MW-18	19.9 - 24.9	2,300	2,000	980	14	ND	ND	ND	ND	ND	ND			ND		ND	ND
MW-19S	22.6 - 27.6			ND	ND	ND	ND	ND	ND	ND	ND			ND		ND	ND
MW-19D	43.0 - 48.0	ND	ND	290	750	170	440	350	98	ND	92			ND	ND	ND	ND
MW-19DD	57 - 62			ND	ND	ND			ND								
MW-20S	17.8 - 22.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND		ND	ND
MW-20D	31.0 - 33.0	10,000	9,300	10,000	6,600	34	19	ND	ND	ND	ND			ND		ND	ND
MW-21D	52.3 - 57.3			ND	ND	ND			ND								
MW-22D	36.4 - 41.4			ND	ND	ND			ND								
MW-23D	28.1 - 30.1			ND	ND	ND			ND								
EGLE-OGMD Clea	nup Criteria		•	•	•				Non-detec	t - <10 μg/L			•	•			
Collection Method						L	.F					Ba	iler	LF	Bailer	l	LF

#### Notes

- 1) ft bgs Feet below ground surface.
- 2) Collection method Grab, peristaltic pump (PP), low flow (LF), Bailer.
- 3)  $\mu g/L$  Micrograms per liter, equivalent to parts per billion (ppb).
- 4) (---) Not sampled.
- 5) ND Concentration not detected above reporting limit.
- 6) Sulfolane concentrations included on the table are for the higher concentration from samples submitted for duplicate analysis.
- 7) Cleanup criteria for sulfolane established by EGLE-Oil, Gas, and Minerals Division (EGLE-OGMD).
- 8) Concentrations that are shaded and bold exceed cleanup criteria.
- 9) MW-7 sampled on 8/11/2016 for the 8/3-4/2016 sample event.



## **APPENDIX C**

## LABORATORY ANALYTICAL REPORTS





18-Sep-2020

Nick Summerland Lambda Energy Resources 1510 Thomas Rd Kalkaska, MI 49646

Re: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

Dear Nick,

ALS Environmental received 13 samples on 10-Sep-2020 10:00 AM for the analyses presented in the following report.

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

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

The total number of pages in this report is 24.

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

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

Sincerely,

## **Gary Byar**

Electronically approved by: Gary Byar

Gary Byar Project Manager

#### **Report of Laboratory Analysis**

Certificate No: MI: 0022

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

Environmental 🚴

ALS Group, USA

Date: 18-Sep-20

Client: Lambda Energy Resources
Project: Lambda (Hartland 36 Gas Plant)

Work Order: 20090803

## **Work Order Sample Summary**

Lab Samp ID Client Sample ID	Matrix Tag Number	Collection Date Da	te Received Hold
20090803-01 MW-7S	Groundwater	9/9/2020 10:25 9/1	0/2020 10:00
20090803-02 MW-15D	Groundwater	9/9/2020 10:45 9/1	0/2020 10:00
20090803-03 MW-7D	Groundwater	9/9/2020 11:05 9/1	0/2020 10:00
20090803-04 MW-19S	Groundwater	9/9/2020 11:55 9/1	0/2020 10:00
20090803-05 MW-19D	Groundwater	9/9/2020 12:35 9/1	0/2020 10:00
20090803-06 MW-20S	Groundwater	9/9/2020 11:47 9/1	0/2020 10:00
20090803-07 MW-20D	Groundwater	9/9/2020 12:30 9/1	0/2020 10:00
20090803-08 MW-18	Groundwater	9/9/2020 13:20 9/1	0/2020 10:00
20090803-09 MW-DUPE	Groundwater	9/9/2020 9/1	0/2020 10:00
20090803-10 MW-17S	Groundwater	9/9/2020 14:35 9/1	0/2020 10:00
20090803-11 MW-17D	Groundwater	9/9/2020 13:55 9/1	0/2020 10:00
20090803-12 MW-13D	Groundwater	9/9/2020 14:20 9/1	0/2020 10:00
20090803-13 MW-13S	Groundwater	9/9/2020 15:05 9/1	0/2020 10:00

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-7S **Lab ID:** 20090803-01

Collection Date: 9/9/2020 10:25 AM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	;		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/15/2020 09:16 PM
Surr: 2-Fluorobiphenyl	51.4		26-79	%REC	1	9/15/2020 09:16 PM
Surr: 4-Terphenyl-d14	74.8		43-106	%REC	1	9/15/2020 09:16 PM
Surr: Nitrobenzene-d5	50.1		29-80	%REC	1	9/15/2020 09:16 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	21		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-15D **Lab ID:** 20090803-02

Collection Date: 9/9/2020 10:45 AM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	;		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/15/2020 09:37 PM
Surr: 2-Fluorobiphenyl	54.3		26-79	%REC	1	9/15/2020 09:37 PM
Surr: 4-Terphenyl-d14	79.3		43-106	%REC	1	9/15/2020 09:37 PM
Surr: Nitrobenzene-d5	53.3		29-80	%REC	1	9/15/2020 09:37 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	21		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-7D **Lab ID:** 20090803-03

Collection Date: 9/9/2020 11:05 AM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	5		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/15/2020 09:59 PM
Surr: 2-Fluorobiphenyl	57.7		26-79	%REC	1	9/15/2020 09:59 PM
Surr: 4-Terphenyl-d14	83.6		43-106	%REC	1	9/15/2020 09:59 PM
Surr: Nitrobenzene-d5	56.0		29-80	%REC	1	9/15/2020 09:59 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	27		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-19S **Lab ID:** 20090803-04

Collection Date: 9/9/2020 11:55 AM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	;		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/15/2020 10:20 PM
Surr: 2-Fluorobiphenyl	57.5		26-79	%REC	1	9/15/2020 10:20 PM
Surr: 4-Terphenyl-d14	83.4		43-106	%REC	1	9/15/2020 10:20 PM
Surr: Nitrobenzene-d5	55.3		29-80	%REC	1	9/15/2020 10:20 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	72		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-19D **Lab ID:** 20090803-05

Collection Date: 9/9/2020 12:35 PM Matrix: GROUNDWATER

Analyses	Result	Report Result Qual Limit U		Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	5		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/15/2020 10:41 PM
Surr: 2-Fluorobiphenyl	52.3		26-79	%REC	1	9/15/2020 10:41 PM
Surr: 4-Terphenyl-d14	82.8		43-106	%REC	1	9/15/2020 10:41 PM
Surr: Nitrobenzene-d5	49.3		29-80	%REC	1	9/15/2020 10:41 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	84		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-20S **Lab ID:** 20090803-06

Collection Date: 9/9/2020 11:47 AM Matrix: GROUNDWATER

Analyses			Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	;		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/15/2020 11:03 PM
Surr: 2-Fluorobiphenyl	63.6		26-79	%REC	1	9/15/2020 11:03 PM
Surr: 4-Terphenyl-d14	86.2		43-106	%REC	1	9/15/2020 11:03 PM
Surr: Nitrobenzene-d5	60.4		29-80	%REC	1	9/15/2020 11:03 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	110		4.0	mg/L	4	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-20D **Lab ID:** 20090803-07

Collection Date: 9/9/2020 12:30 PM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	;		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/15/2020 11:24 PM
Surr: 2-Fluorobiphenyl	55.1		26-79	%REC	1	9/15/2020 11:24 PM
Surr: 4-Terphenyl-d14	90.0		43-106	%REC	1	9/15/2020 11:24 PM
Surr: Nitrobenzene-d5	50.1		29-80	%REC	1	9/15/2020 11:24 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	83		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-18 **Lab ID:** 20090803-08

Collection Date: 9/9/2020 01:20 PM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	S		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		20	μg/L	1	9/15/2020 08:55 PM
Surr: 2-Fluorobiphenyl	46.0		26-79	%REC	1	9/15/2020 08:55 PM
Surr: 4-Terphenyl-d14	77.4		43-106	%REC	1	9/15/2020 08:55 PM
Surr: Nitrobenzene-d5	43.5		29-80	%REC	1	9/15/2020 08:55 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	50		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-DUPE **Lab ID:** 20090803-09

Collection Date: 9/9/2020 Matrix: GROUNDWATER

Analyses	Result	Result Qual		Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	6		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/15/2020 11:46 PM
Surr: 2-Fluorobiphenyl	63.4		26-79	%REC	1	9/15/2020 11:46 PM
Surr: 4-Terphenyl-d14	87.2		43-106	%REC	1	9/15/2020 11:46 PM
Surr: Nitrobenzene-d5	59.0		29-80	%REC	1	9/15/2020 11:46 PM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	80		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-17S **Lab ID:** 20090803-10

Collection Date: 9/9/2020 02:35 PM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	190		10	μg/L	1	9/16/2020 12:07 AM
Surr: 2-Fluorobiphenyl	53.0		26-79	%REC	1	9/16/2020 12:07 AM
Surr: 4-Terphenyl-d14	83.5		43-106	%REC	1	9/16/2020 12:07 AM
Surr: Nitrobenzene-d5	50.3		29-80	%REC	1	9/16/2020 12:07 AM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	67		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-17D **Lab ID:** 20090803-11

Collection Date: 9/9/2020 01:55 PM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	5		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/16/2020 12:28 AM
Surr: 2-Fluorobiphenyl	54.4		26-79	%REC	1	9/16/2020 12:28 AM
Surr: 4-Terphenyl-d14	81.6		43-106	%REC	1	9/16/2020 12:28 AM
Surr: Nitrobenzene-d5	51.8		29-80	%REC	1	9/16/2020 12:28 AM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	290		4.0	mg/L	4	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-13D **Lab ID:** 20090803-12

Collection Date: 9/9/2020 02:20 PM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	;		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/16/2020 12:49 AM
Surr: 2-Fluorobiphenyl	56.0		26-79	%REC	1	9/16/2020 12:49 AM
Surr: 4-Terphenyl-d14	91.5		43-106	%REC	1	9/16/2020 12:49 AM
Surr: Nitrobenzene-d5	51.2		29-80	%REC	1	9/16/2020 12:49 AM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	510		10	mg/L	10	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090803

**Sample ID:** MW-13S **Lab ID:** 20090803-13

Collection Date: 9/9/2020 03:05 PM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	6		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/16/2020 01:11 AM
Surr: 2-Fluorobiphenyl	53.0		26-79	%REC	1	9/16/2020 01:11 AM
Surr: 4-Terphenyl-d14	79.8		43-106	%REC	1	9/16/2020 01:11 AM
Surr: Nitrobenzene-d5	49.2		29-80	%REC	1	9/16/2020 01:11 AM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	92		1.0	mg/L	1	9/10/2020 04:43 PM

**Date:** 18-Sep-20

Date: 18-Sep-20

**Client:** Lambda Energy Resources **Project:** Lambda (Hartland 36 Gas Plant)

20090803 Work Order:

**Case Narrative** 

Batch R297857 The MS/MSD recovery for Sulfate was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte. Client Sample ID: MW-18

Client: Lambda Energy Resources

**Work Order:** 20090803

**Project:** Lambda (Hartland 36 Gas Plant)

QC BATCH REPORT

Date: 18-Sep-20

Batch ID: <b>164244</b>	Instrument ID S	/MS8		Method	d: <b>SW84</b>	6 82	70D					
MBLK	Sample ID: <b>SBLKW1-</b>	164244-1642	244				Units: µg/L		Analysis	Date: 9/15	/2020 06:	46 PM
Client ID:		Run ID	SVMS8	_200915A		S	eqNo: <b>671</b> 0	0325	Prep Date: 9/15	/2020	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref	f	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qua
Sulfolane		ND	10									
Surr: 2-Fluorobiphei	nyl	32.04	0	50		0	64.1	26-79	0			
Surr: 4-Terphenyl-d	•	42.88	0	50		0	85.8	43-106	0			
Surr: Nitrobenzene-	d5	30.65	0	50		0	61.3	29-80	0			
LCS	Sample ID: SLCSW1-	164244-1642	244				Units: µg/L		Analysis	Date: 9/15	/2020 07:	08 PM
Client ID:				200915A			eqNo: <b>671</b> (		Prep Date: 9/15		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qua
Analyte				SFR Vai			/// // // // // // // // // // // // //			/0KFD		Qua
Sulfolane		72.18	10	100		0	72.2	30-100	0			
Surr: 2-Fluorobiphei		33.65	0	50		0	67.3	26-79	0			
Surr: 4-Terphenyl-d		35.92	0	50		0	71.8	43-106				
Surr: Nitrobenzene-	d5	31.75	0	50		0	63.5	29-80	0			
мѕ	Sample ID: <b>20090803</b> -	-08A MS				Units: µg/L			Analysis	/2020 08:	12 PM	
Client ID: MW-18		Run ID	SVMS8	_200915A		S	eqNo: <b>671</b> 0	0327	Prep Date: 9/15	/2020	DF: <b>1</b>	
Analyte		Result	PQL	SPK Val	SPK Ref	f	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qua
•										70		
Sulfolane		171.3	20	200		0	85.6	30-100	0			
Surr: 2-Fluorobiphei		64.8	0	100		0	64.8	26-79	0			
Surr: 4-Terphenyl-d Surr: Nitrobenzene-		90.38	0	100		0	90.4	43-106	0			
Surr. Milroberizerie-		00.74	0	100		0	60.7	29-80	0			
MSD	Sample ID: 20090803-	-08A MSD					Units: µg/L	•	Analysis	Date: 9/15	/2020 08:	33 PM
Client ID: MW-18		Run ID	SVMS8	_200915A		S	eqNo: <b>671(</b>	0328	Prep Date: 9/15	/2020	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref	f	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qua
Sulfolane		163.2	20	200		0	81.6	30-100	171.3	4.83	30	
Surr: 2-Fluorobiphei	nyl	61.8	0	100		0	61.8	26-79	64.8	4.74	40	
Surr: 4-Terphenyl-d	14	85.4	0	100		0	85.4	43-106	90.38	5.67	40	
Surr: Nitrobenzene-	d5	59.08	0	100		0	59.1	29-80	60.74	2.77	40	
The following sample	es were analyzed in th	nis batch:	20 20 20	090803-01/ 090803-04/ 090803-07/ 090803-10/ 090803-13/	A 2 A 2 A 2	0090 0090	0803-02A 0803-05A 0803-08A 0803-11A	20 20	090803-03A 090803-06A 090803-09A 090803-12A			

QC BATCH REPORT

Client: Lambda Energy Resources

**Work Order:** 20090803

**Project:** Lambda (Hartland 36 Gas Plant)

Batch ID: <b>R297857</b>	Instrument ID GA	LLERY		Method	A4500	-SO4 E-11					
MBLK	Sample ID: MB-R29785	57-R29785	7			Units: mg/	/L	Analy	/sis Date: <b>9/10</b>	)/2020 04:	:43 PM
Client ID:		Run ID	GALLE	RY_200910 <i>A</i>	<b>\</b>	SeqNo: 669	7158	Prep Date:		DF: <b>1</b>	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate		ND	1.0								
MS	Sample ID: <b>20090803-0</b>	8BMS				Units: <b>mg</b>	/L	Analy	/sis Date: <b>9/10</b>	)/2020 04:	:43 PM
Client ID: MW-18		Run ID	: GALLE	RY_200910 <i>A</i>	<b>\</b>	SeqNo: 669	7174	Prep Date:		DF: <b>1</b>	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate		91.63	1.0	50	50.	18 82.9	95-118		0		S
MSD	Sample ID: 20090803-0	8BMSD				Units: mg/	/L	Analy	/sis Date: <b>9/10</b>	)/2020 04:	:43 PM
Client ID: MW-18		Run IE	GALLE	RY_200910 <i>A</i>	<b>\</b>	SeqNo: 669	7175	Prep Date:		DF: <b>1</b>	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate		92.49	1.0	50	50.	18 84.6	95-118	91.	63 0.934	10	S
LCS1	Sample ID: LCS1-R297	857				Units: mg/	/L	Analy	/sis Date: <b>9/10</b>	/2020 04:	:43 PM
Client ID:		Run ID	GALLE	RY_200910 <i>A</i>	<b>\</b>	SeqNo: 669	7159	Prep Date:		DF: <b>1</b>	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate		10.54	1.0	10		0 105	90-119		0		
LCS2	Sample ID: LCS2-R297	857				Units: mg/	/L	Analy	/sis Date: <b>9/10</b>	/2020 04	:43 PM
Client ID:		Run ID	GALLE	RY_200910 <i>A</i>	<b>\</b>	SeqNo:669	7181	Prep Date:		DF: <b>1</b>	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate		51.88	1.0	50		0 104	95-118		0		
The following samp	oles were analyzed in thi	s batch:	20 20 20	0090803-01B 0090803-04B 0090803-07B 0090803-10B 0090803-13B	20 20	0090803-02B 0090803-05B 0090803-08B 0090803-11B	20 20	090803-03B 090803-06B 090803-09B 090803-12B			

ALS Group, USA

Date: 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant)

Wash Ondered: ACRONYMS, UNITS

WorkOrder: 20090803

**Units Reported** 

 $\mu g/L$ 

mg/L

Description

Micrograms per Liter

Milligrams per Liter

#### Qualifier **Description** Value exceeds Regulatory Limit \*\* Estimated Value a Analyte is non-accredited Analyte detected in the associated Method Blank above the Reporting Limit B Е Value above quantitation range Н Analyzed outside of Holding Time Hr BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated. J Analyte is present at an estimated concentration between the MDL and Report Limit ND Not Detected at the Reporting Limit O Sample amount is > 4 times amount spiked Dual Column results percent difference > 40% R RPD above laboratory control limit S Spike Recovery outside laboratory control limits U Analyzed but not detected above the MDL X Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level. **Acronym** Description DUP Method Duplicate LCS Laboratory Control Sample LCSD Laboratory Control Sample Duplicate LOD Limit of Detection (see MDL) LOQ Limit of Quantitation (see PQL) MBLK Method Blank MDL Method Detection Limit MS Matrix Spike MSD Matrix Spike Duplicate POL Practical Quantitation Limit RPD Relative Percent Difference TDL Target Detection Limit TNTC Too Numerous To Count APHA Standard Methods A D ASTM **EPA** Е SW SW-846 Update III

QF Page 1 of 1

Client Name: LAMBDA-KAL

### Sample Receipt Checklist

Date/Time Received:

10-Sep-20 10:00

Work Order:	20090803				Received b	y:	<u>DS</u>		
Checklist compl	leted by Diane Shaw  eSignature	1	10-Sep-20 Date	R	eviewed by:	Gary Bya	ar		10-Sep-20
Matrices: Carrier name:	Groundwater UPS		Julio			oolgilalaro			
Shipping contain	ner/cooler in good condition?		Yes	<b>✓</b>	No 🗌	Not Prese	nt 🗌		
Custody seals in	ntact on shipping container/coole	r?	Yes	<b>✓</b>	No 🗌	Not Prese	nt 🗌		
Custody seals in	ntact on sample bottles?		Yes		No 🗌	Not Prese	nt 🗸		
Chain of custod	ly present?		Yes	<b>✓</b>	No 🗌				
Chain of custod	ly signed when relinquished and	received?	Yes	<b>✓</b>	No 🗌				
Chain of custod	ly agrees with sample labels?		Yes	<b>✓</b>	No 🗌				
Samples in prop	per container/bottle?		Yes	<b>✓</b>	No 🗌				
Sample contain	ers intact?		Yes	<b>✓</b>	No 🗌				
Sufficient samp	le volume for indicated test?		Yes	<b>✓</b>	No 🗌				
All samples rece	eived within holding time?		Yes	<b>✓</b>	No 🗌				
Container/Temp	Blank temperature in compliance	e?	Yes	<b>✓</b>	No 🗌				
Sample(s) recei	ived on ice? /Thermometer(s):			, 3.6/3.	No ☐	<u>IR1</u>			
Cooler(s)/Kit(s):	:								
	ple(s) sent to storage:			020 11:	04:43 AM	N. V(0A : 1	1 20 1		
	als have zero headspace?		Yes		No 🗆	No VOA vials	submitted	<b>✓</b>	
	eptable upon receipt?		Yes	<b>✓</b>	No L	N/A $\square$			
pH adjusted? pH adjusted by:			Yes		No 🗸	N/A 📙			
Login Notes:								ī	
3									
	- — — — — — — — -				- <del> </del>				
	- — — — — — — — -								
Client Contacte	d:	Date Contacted:			Person	Contacted:			
Contacted By:		Regarding:							
· · · · · · · · · · · · · · · · · · ·		3 · · · · <del>3</del> ·							
Comments:									
Correction And								] 1	
CorrectiveAction	II.							000	5 4 6 4



Cincinnati, OH +1 513 733 5336

Everett, WA +1 425 356 2600 Fort Collins, CO +1 970 490 1511

### **Chain of Custody Form**

+1 281 530 5656 Middletown, PA

Houston, TX

Spring City, PA +1 610 948 4903

South Charleston, WV +1 304 356 3168

Salt Lake City, UT +1 717 944 5541 +1 801 266 7700

York, PA +1 717 505 5280

Holland, MI +1 616 399 6070

				ALS Pro	oject Manager:						Order #:			803
	Customer Information		Projec	t Information				Param	eter/Mo	ethod F	Request f	or Analy	/sis	
Purchase Order		Project Na	ime ##X7	TUND 36 GA	rs plant	Α ;	Su/+	olane		U	) such	er_li	itex	
Work Order		Project Num	ber			В	Sul F	rte		(1	) 125	- poly	************	
Company Name	ECT. Inc	Bill To Comp	any Lau	bda Evere	ey .	C								
Send Report To	Jenemy Lewandowski	Invoice	Attn Nick	- Summerla	rud	D								
Address	3399 Veterans	Addr	ess 1510	Thomas		E F	***************************************							
City/State/Zip	Traverse City, MI 49684	/ City/State	Zip Ka/K	kaska, All	49646	G					<i>,,,,</i> ,,			
	231-946-8200		46654 <b>"</b>	. 258. 641		н				-,-,				
	231-946-8208		Fax			I								
	ileum dowskie ectine co	e-Mail Addı	ess michi	gan - invoice	es@lambb	Jen	ergy.	llc.co	ч					
No.	Sample Description	Date	Time	Matrix Pro		A	8'	C D			G P	1	J	Hold
1 MW-7	5	919/2020	10:25	6W	1	×	×						-	
2 MW-15	D	91912020	10:45	5W	2	۶۲	×							
3 MW-	70	9/9/2020	11:05	6W	2	Ø	X							
4 MW-	195	9/9/2020	11:55	GW	2	N	X						***************************************	
5 MW-	19 D	9/9/2000	12:35	GW	2	Ø	10							
	-205	919/2020	(1:47	Ger	2	×	X							
7 MW-		9/9/2020	12:30	6W	2_	×	У							AND THE PROPERTY OF THE PROPER
8 MW.		9/9/2020		GW	2	D	X							WATER CONTROL OF THE
24/09/20/0	1-18 MS/MSD	9/9/2020		GW	2	Ø	1							A CONTRACTOR OF THE CONTRACTOR
9 MW-DU	ope	9/9/2020		6W	2	۶	×							
Sampler(s) Please	Print & Sign	Shipmer	nt Method PS <b>one</b>	Turnaround	d Time in Business <b>X</b> 5 BD		(BD) 3 BD	☐ Other ☐ 2 B	ם			lts Due D	ate:	
	ECT / Date/9/200	Time: 00	Received by	ζ		Notes		and the state of the state of						
Relinquished by:	UPS 9/1/0/20		Received by (La			Co	oler ID	Cooler Te		_	e: (Check Or			
Logged by (Laborator	0FS 9/10/20	Time: 1100	Checked by (La	ibiora	3	Щ	2] 2H22	44.0		-	Std QC Std QC/Raw SW846/CLP	Date		P Checklist P Level IV
Preservative Kev:		OH 5-Na <sub>2</sub> S <sub>2</sub> O	6-NaHSC	7-Other 8	-4°C 9-5035	1	***	3.6		Other _				

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.

3. The Chain of Custody is a legal document. All information must be completed accurately.



ALS Environmental 781 Industrial Cir, Ste 3 Traverse City, Michigan 49686 (Tel) 231.421.3204 (Cell) 231.944.3459

# **Chain of Custody Form**

Page	2	of	

# 384374

RETURN SAMPLES TO:
ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

								ALS Project	Manager:	Gary I	Byar		AL	S Wor	k Orde	r#:	20	$\sim$ 40	<u> </u>	3_1
	Custo	mer Informa	tion			Projec	t Informa	tion		Parameter/Method Request for Analysis										
Purch	ase Order			Pro	ject Nan	ne Hartland	36 Gas Pla	ınt			Sulfolane	)						Amber	Liter	
W	ork Order			Proje	ct Numb	er				В	Sulfate						(1)	125 p		
Comp	any Name	ECT, Inc.	·	Bill To	Compa	ny Lambda	Energy			С										
Send	Report To	Jeremy Lewan	dowski	lnv	oice Att	tn. Nick Sun	nmerland			D E										
	Address	3399 Veterans	Dr.		Addre	ss 1510 Tho														
City	y/State/Zip	Traverse City,	MI 49684	City	//State/Z	ip Kalkaska	, Mi 49646			G										
	Phone	231-946-8200			Pho	ne 231-258-	6411			Н										
	Fax	231-946-8208			F	ах				ı										
e-Ma	il Address	jlewandowski(	@ectinc.com			michiga	n.invoices@	@lambdaen	ergyllc.com	J										
No.		Sample Descrip	ption	Da	te	Time	Matrix	Pres. Key Numbers	# Bottles	Α	В	С	D	E	F	G	Н	I	J	Hold
10	mw-	173		9/9	2020 -	4012	GW		2	<i>\</i> ∕⁄	$ \mathcal{X} $									
1)	Nw-			9/9/	7000	1355	Gas		Z	X	<b>×</b>									
12	MW-		***	· · · · · · · · · · · · · · · · · · ·	7	1420	GW		2	X	تعار ا									
12	MW-			9/4/		15:05	GW		2	N	D									
3   -	7-10-			7.7.		. ,	<u> </u>													
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							Q					╂	<del></del>							
		****		ļ									<u> </u>							
Sampler(s	s): Please	Print & Sign			Shipr	nent Method	i: Req	uired Turna	round Time:	(Chec	k Box)		Other _			Re	sults D	ue Date	:	
Tim A	enalis	a CATH	>		UP	S Ground		.0 Wk Days 🖸	5-7 Wk Days	3 W	k Days	2 V	Vk Days	<u></u> 24	Hour					
Relinquishe	glby:	ECT,	Date: (9/4/2016)	Time:	R	eceived by:			Date:	Time:	Notes:									
Relinquishe	CHARS II	1/:	9/4/2016)	16:	00	1 N	2_				ALS P	roject: N	MERITEN	ERGY -	- Misc					
Relinquishe	ed by:		Date:	Time:	R	ecejved by (La	boratop):		Date:	Time:	ALS	Cooler	Coole	. loc	Packa	ne: /C	heck B	ox Belo	w)	
	,·	UPS	Date: 9/10/20	10	$\infty$	$\mathcal{L}$	っごり	V				D D	Temp					Level III:		ata
Logged by	(Laboratory):		Date:	Time		hecked by (La	poratory):				, . I.	21	4.4.		RRP LRC			TRRP Lev		
	(	DES		li	00	- •	•-	1	<b>7</b> .2			H)2			evel IV:	SW846	Methods/C	LP like		
			יין כ ייין ב	'  !	100			Co			#	11114	ے . <sub>(1)</sub>		Other:		•			
						<u> </u>	U- C C	e N-UC		iba-	8-4°C	ln	ote: Any	_		t be m	ade in w	riting o	nce sar	nples
Preserv	ative Ke	y: 1-HCl :	<b>2-HNO<sub>3</sub> 3-H<sub>2</sub></b>	5U <sub>4</sub>	4-Na	UH 5-1	Va <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	6-NaHS	O <sub>4</sub> 7-0	uiei	<b>0</b> =4 C		nd COC							•

FROM: LISA ZUBER (517) 272-9200 ECT, INC. 3125 SOVEREIGN DRIVE LANSING MI 48911-4240

SHIP TO:

**HOLLAND MI 49424-9263** (616) 399-6070 ALS ENVIRONMENTAL 3352 128TH AVENUE SAMPLE RECEIVING

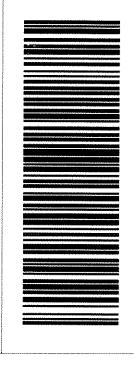


1 OF 1

**50 LBS** 

495 9-04





BILLING: 3RD PARTY

REF 1:130685, 2000

Fold here and place in label pouch

http://www.alsglobal.com **Custody Seal** 

3352 128th Avenue Holland, Michigan 49424-92 Phone: 616-399-6070 Attn. Sample Receiving

FROM:

LISA ZUBER (517) 272-9200 ECT, INC. 3125 SOVEREIGN DRIVE LANSING MI 48911-4240

SHIP TO:

**HOLLAND MI 49424-9263** (616) 399-6070 ALS ENVIRONMENTAL 3352 128TH AVENUE SAMPLE RECEIVING

REF 1:130685, 2000



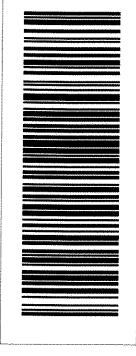
1 OF 1

**50 LBS** 

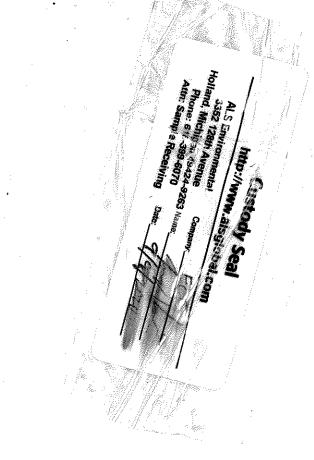
495 9-04



UPS NEXT DAY AIR
TRACKING #: 12 V54 9W4 01 5183 6415



BILLING: 3RD PARTY



Fold here and place in label pouch

Total Andrew



18-Sep-2020

Nick Summerland Lambda Energy Resources 1510 Thomas Rd Kalkaska, MI 49646

Re: Lambda (Hartland 36 Gas Plant) Work Order: 20090904

Dear Nick,

ALS Environmental received 2 samples on 11-Sep-2020 10:30 AM for the analyses presented in the following report.

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

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

The total number of pages in this report is 11.

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

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

Sincerely,

## **Gary Byar**

Electronically approved by: Gary Byar

Gary Byar Project Manager

#### **Report of Laboratory Analysis**

Certificate No: MI: 0022

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

Environmental 🚴

ALS Group, USA

Date: 18-Sep-20

Client: Lambda Energy Resources
Project: Lambda (Hartland 36 Gas Plant)

Work Order: 20090904

**Work Order Sample Summary** 

Lab Samp ID Client Sample ID	<u>Matrix</u>	Tag Number	<b>Collection Date</b>	<b>Date Received</b>	<u>Hold</u>
20090904-01 MW-14S	Groundwater		9/10/2020 09:40	9/11/2020 10:30	
20090904-02 MW-14D	Groundwater		9/10/2020 10:25	9/11/2020 10:30	

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090904

**Sample ID:** MW-14S **Lab ID:** 20090904-01

Collection Date: 9/10/2020 09:40 AM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	;		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/16/2020 01:32 AM
Surr: 2-Fluorobiphenyl	55.6		26-79	%REC	1	9/16/2020 01:32 AM
Surr: 4-Terphenyl-d14	83.2		43-106	%REC	1	9/16/2020 01:32 AM
Surr: Nitrobenzene-d5	52.8		29-80	%REC	1	9/16/2020 01:32 AM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	88		2.0	mg/L	2	9/16/2020 02:59 PM

**Date:** 18-Sep-20

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

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant) Work Order: 20090904

**Sample ID:** MW-14D **Lab ID:** 20090904-02

Collection Date: 9/10/2020 10:25 AM Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS	6		SW846	8270D	Prep: SW3510 9/15/20 17:12	Analyst: <b>EE</b>
Sulfolane	ND		10	μg/L	1	9/16/2020 01:53 AM
Surr: 2-Fluorobiphenyl	53.6		26-79	%REC	1	9/16/2020 01:53 AM
Surr: 4-Terphenyl-d14	79.8		43-106	%REC	1	9/16/2020 01:53 AM
Surr: Nitrobenzene-d5	49.6		29-80	%REC	1	9/16/2020 01:53 AM
SULFATE			A4500-	SO4 E-11		Analyst: JDR
Sulfate	100		2.0	mg/L	2	9/16/2020 02:59 PM

**Date:** 18-Sep-20

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

Date: 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant)

**Work Order:** 20090904

**Case Narrative** 

Batch R298294 The MS/MSD data for Sulfate is not related to this project. No qualification is needed.

Client: Lambda Energy Resources

**Work Order:** 20090904

**Project:** Lambda (Hartland 36 Gas Plant)

QC BATCH REPORT

Date: 18-Sep-20

Batch ID: <b>164244</b>	Instrument ID S	VMS8		Metho	d: <b>SW84</b> 6	82	70D					
MBLK	Sample ID: SBLKW1-	164244-164	244			ι	Units: <b>µg/L</b>	-	Analysi	s Date: <b>9/1</b> 5	5/2020 06:	46 PM
Client ID:		Run ID	: SVMS8	_200915A		SeqNo: <b>6710325</b>		Prep Date: 9/1	5/2020	DF: 1		
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfolane		ND	10									
Surr: 2-Fluorobiphe	enyl	32.04	0	50		0	64.1	26-79	C	)		
Surr: 4-Terphenyl-c	-	42.88	0	50		0	85.8	43-106	C	)		
Surr: Nitrobenzene		30.65	0	50		0	61.3	29-80	C	)		
LCS	Sample ID: SLCSW1-	164244-164	244			Ų	Units: µg/L	_	Analysi	s Date: 9/15	5/2020 07:	08 PM
Client ID:		Run ID	: SVMS8	_200915A		Se	eqNo: <b>671</b> (	0326	Prep Date: 9/1	5/2020	DF: <b>1</b>	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfolane		72.18	10	100		0	72.2	30-100	C	)		
Surr: 2-Fluorobiphe	envl	33.65	0	50		0	67.3	26-79	C			
Surr: 4-Terphenyl-c	•	35.92	0	50		0	71.8	43-106	C			
Surr: Nitrobenzene		31.75	0	50		0	63.5	29-80	C	)		
MS	Sample ID: 20090803	-08A MS				ι	Units: µg/L	_	Analysi	s Date: 9/15	5/2020 08:	12 PM
Client ID:		Run ID	: SVMS8	_200915A		Se	eqNo: <b>671</b>	0327	Prep Date: 9/1	5/2020	DF: <b>1</b>	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfolane		171.3	20	200		0	85.6	30-100	C	)		
Surr: 2-Fluorobiphe	enyl	64.8	0	100		0	64.8	26-79	C	)		
Surr: 4-Terphenyl-c	-	90.38	0	100		0	90.4	43-106	C	)		
Surr: Nitrobenzene	-d5	60.74	0	100		0	60.7	29-80	C	)		
MSD	Sample ID: <b>20090803</b>	-08A MSD				ι	Units: µg/L	-	Analysi	s Date: 9/15	5/2020 08:	33 PM
Client ID:		Run ID	: SVMS8	_200915A		Se	eqNo: <b>671</b> 0	0328	Prep Date: 9/1:	5/2020	DF: 1	
					SPK Ref			Control	RPD Ref		RPD	
Analyte		Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
Sulfolane		163.2	20	200		0	81.6	30-100	171.3	3 4.83	30	
Surr: 2-Fluorobiphe	enyl	61.8	0	100		0	61.8	26-79	64.8	3 4.74	40	
Surr: 4-Terphenyl-c	114	85.4	0	100		0	85.4	43-106	90.38	5.67	40	
Surr: Nitrobenzene	-d5	59.08	0	100		0	59.1	29-80	60.74	2.77	40	
The following sampl	es were analyzed in tl	his batch:	20	0090904-01	A 20	0090	904-02A					

Client: Lambda Energy Resources

**Work Order:** 20090904

**Project:** Lambda (Hartland 36 Gas Plant)

QC BATCH REPORT

Sample ID: MB-R298294 Sample ID: 20090850-02			RY_200916		Units: mg/			s Date: 9/16	/2020 02:	59 PM
Sample ID: <b>20090850-0</b>	Result		_		SeqNo: 6714	14.40				
Sample ID: <b>20090850-0</b>		PQL			•	1142	Prep Date:		DF: <b>1</b>	
Sample ID: <b>20090850-0</b> 2	ND		SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sample ID: 20090850-02		1.0								
	2AMS				Units: mg/	L	Analysi	s Date: 9/16	/2020 02:	59 PM
	Run ID	GALLE	RY_200916	A	SeqNo: 6714	1146	Prep Date:		DF: <b>4</b>	
	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
	227.1	4.0	50	213	3.1 28.1	95-118	(	)		so
Sample ID: 20090850-02	2AMSD				Units: mg/	L	Analysi	s Date: 9/16	/2020 02:	59 PM
	Run ID	GALLE	RY_200916	A	SeqNo: 6714	1147	Prep Date:		DF: 4	
	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
	231.4	4.0	50	213	36.7	95-118	227.1	1 1.89	10	so
Sample ID: LCS1-R2982	294				Units: mg/	L	Analysi	s Date: <b>9/16</b>	/2020 02:	59 PM
	Run ID	GALLE	RY_200916	A	SeqNo: 6714	1143	Prep Date:		DF: 1	
	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qua
	10.21	1.0	10		0 102	90-119	(	)		
Sample ID: LCS2-R2982	294				Units: mg/	L	Analysi	s Date: 9/16	/2020 02:	59 PM
	Run ID	GALLE	RY_200916	A	SeqNo: 6714	1162	Prep Date:		DF: 1	
	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
	53.72	1.0	50		0 107	95-118		 )		
les were analyzed in this	s batch:	20	090904-01F	3 20	090904-02R					
	Sample ID: LCS1-R2982	Result  227.1  Sample ID: 20090850-02AMSD  Run ID  Result  231.4  Sample ID: LCS1-R298294  Run ID  Result  10.21  Sample ID: LCS2-R298294  Run ID  Result	Result   PQL   227.1   4.0	Result   PQL   SPK Val   227.1   4.0   50	Result       PQL       SPK Val       Value         227.1       4.0       50       213         Sample ID: 20090850-02AMSD         Run ID: GALLERY_200916A         SPK Ref Value         231.4       4.0       50       213         Sample ID: LCS1-R298294         Result       PQL       SPK Val       SPK Ref Value         10.21       1.0       10       SPK Ref Value         Sample ID: LCS2-R298294         Result       PQL       SPK Val       SPK Ref Value         Result       PQL       SPK Val       SPK Ref Value         53.72       1.0       50	Result         PQL         SPK Val         SPK Ref Value         %REC           227.1         4.0         50         213.1         28.1           Sample ID: 20090850-02AMSD         Fun ID: GALLERY_200916A         SeqNo: 6714           Result         PQL         SPK Ref Value         %REC           231.4         4.0         50         213.1         36.7           Sample ID: LCS1-R298294         Units: mg/l           Result         PQL         SPK Ref Value         %REC           10.21         1.0         10         0         102           Sample ID: LCS2-R298294         Units: mg/l           Run ID: GALLERY_200916A         SPK Ref Value         %REC           Sample ID: LCS2-R298294         Units: mg/l           Result         PQL         SPK Ref Value         %REC           Sample ID: LCS2-R298294         SPK Ref Value         %REC           Sample ID: LCS3-R298294         SPK Ref Value         %REC           SPK Ref Value         %REC <td>  Result   PQL   SPK Val   SPK Ref Value   %REC   Limit    </td> <td>Result         PQL         SPK Val         Value         %REC         Control Limit         RPD Ref Value           227.1         4.0         50         213.1         28.1         95-118         0           Sample ID: 20090850-02AMSD         Run ID: GALLERY_200916A         SeqNo:671±147         Prep Date:           Result         PQL         SPK Val         SPK Ref Value         Control Value         RPD Ref Value           231.4         4.0         50         213.1         36.7         95-118         227.1           Sample ID: LCS1-R298294         Fun ID: GALLERY_200916A         SPK Ref Value         SPK Ref Value         SeqNo:671±143         Prep Date:           Sample ID: LCS2-R298294         Fun ID: GALLERY_200916A         SPK Ref Value         Units:mg/L         Analysi           Sample ID: LCS2-R298294         Fun ID: GALLERY_200916A         SPK Ref Value         SPK Ref Value         Control Cont</td> <td>Result         PQL         SPK Val         SPK Ref Value         %REC         Control Limit         RPD Ref Value         %RPD           227.1         4.0         50         213.1         28.1         95-118         0           Sample ID: 20090850-02AMSD         Units:mg/L         Analysis Date: 9/16           Result PQL         SALLERY_200916X         SPK Ref Value         Control Limit         RPD Ref Value         %RPD           SPK Ref Value         Value         WREC         Control Limit         RPD Ref Value         %RPD           Sample ID: LCS1-R298294         SPK Ref Value         SPK Ref Value         SPK Ref Value         VREC         Control RPD Ref Value         %RPD Ref Value           10.21         1.0         10         0         102         90-119         0         Analysis Date: 9/16           Sample ID: LCS2-R298294         Units:mg/L         Analysis Date: 9/16           Result         PQL         SPK Val         SPK Ref Value         %REC         Control Climit         Analysis Date: 9/16           Sample ID: LCS2-R298294         SPK Ref Value         SeqNo: 671±162         Prep Date:         Pr</td> <td>  Result   PQL   SPK Val   Value   RPD Ref Va</td>	Result   PQL   SPK Val   SPK Ref Value   %REC   Limit	Result         PQL         SPK Val         Value         %REC         Control Limit         RPD Ref Value           227.1         4.0         50         213.1         28.1         95-118         0           Sample ID: 20090850-02AMSD         Run ID: GALLERY_200916A         SeqNo:671±147         Prep Date:           Result         PQL         SPK Val         SPK Ref Value         Control Value         RPD Ref Value           231.4         4.0         50         213.1         36.7         95-118         227.1           Sample ID: LCS1-R298294         Fun ID: GALLERY_200916A         SPK Ref Value         SPK Ref Value         SeqNo:671±143         Prep Date:           Sample ID: LCS2-R298294         Fun ID: GALLERY_200916A         SPK Ref Value         Units:mg/L         Analysi           Sample ID: LCS2-R298294         Fun ID: GALLERY_200916A         SPK Ref Value         SPK Ref Value         Control Cont	Result         PQL         SPK Val         SPK Ref Value         %REC         Control Limit         RPD Ref Value         %RPD           227.1         4.0         50         213.1         28.1         95-118         0           Sample ID: 20090850-02AMSD         Units:mg/L         Analysis Date: 9/16           Result PQL         SALLERY_200916X         SPK Ref Value         Control Limit         RPD Ref Value         %RPD           SPK Ref Value         Value         WREC         Control Limit         RPD Ref Value         %RPD           Sample ID: LCS1-R298294         SPK Ref Value         SPK Ref Value         SPK Ref Value         VREC         Control RPD Ref Value         %RPD Ref Value           10.21         1.0         10         0         102         90-119         0         Analysis Date: 9/16           Sample ID: LCS2-R298294         Units:mg/L         Analysis Date: 9/16           Result         PQL         SPK Val         SPK Ref Value         %REC         Control Climit         Analysis Date: 9/16           Sample ID: LCS2-R298294         SPK Ref Value         SeqNo: 671±162         Prep Date:         Pr	Result   PQL   SPK Val   Value   RPD Ref Va

ALS Group, USA

Date: 18-Sep-20

Client: Lambda Energy Resources

Project: Lambda (Hartland 36 Gas Plant)

Wash Ondered 20000004

Client: QUALIFIERS,
ACRONYMS, UNITS

WorkOrder: 20090904

mg/L

Milligrams per Liter

#### Qualifier **Description** Value exceeds Regulatory Limit \*\* Estimated Value a Analyte is non-accredited Analyte detected in the associated Method Blank above the Reporting Limit B Е Value above quantitation range Н Analyzed outside of Holding Time Hr BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated. J Analyte is present at an estimated concentration between the MDL and Report Limit ND Not Detected at the Reporting Limit O Sample amount is > 4 times amount spiked Dual Column results percent difference > 40% R RPD above laboratory control limit S Spike Recovery outside laboratory control limits U Analyzed but not detected above the MDL X Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level. **Acronym** Description DUP Method Duplicate LCS Laboratory Control Sample LCSD Laboratory Control Sample Duplicate LOD Limit of Detection (see MDL) LOQ Limit of Quantitation (see PQL) MBLK Method Blank MDL Method Detection Limit MS Matrix Spike MSD Matrix Spike Duplicate POL Practical Quantitation Limit RPD Relative Percent Difference TDL Target Detection Limit TNTC Too Numerous To Count APHA Standard Methods A D ASTM **EPA** Е SW SW-846 Update III **Units Reported** Description $\mu g/L$ Micrograms per Liter

### Sample Receipt Checklist

Client Name:				Date/Time I	Received:	11-Sep-20	10:30		
Work Order:	20090904				Received by	y:	<u>DS</u>		
Checklist comp	oleted by Diane Shaw esignature		11-Sep-20	)	Reviewed by:	Nathan Vesignature	Williams	5	11-Sep-20
Matrices: Carrier name:	Groundwater UPS					Ü			
Shipping contain	iner/cooler in good condition?		Yes	✓	No 🗌	Not Prese	ent 🗌		
Custody seals i	intact on shipping container/coole	r?	Yes	<b>✓</b>	No 🗌	Not Prese	ent 🗌		
Custody seals i	ntact on sample bottles?		Yes		No 🗌	Not Prese	ent 🗹		
Chain of custoo	dy present?		Yes	<b>~</b>	No 🗌				
Chain of custoo	dy signed when relinquished and	received?	Yes	<b>✓</b>	No 🗌				
Chain of custoo	dy agrees with sample labels?		Yes	<b>~</b>	No 🗌				
Samples in pro	per container/bottle?		Yes	<b>✓</b>	No 🗌				
Sample contain	ners intact?		Yes	<b>✓</b>	No 🗌				
Sufficient samp	le volume for indicated test?		Yes	<b>✓</b>	No 🗌				
All samples rec	eived within holding time?		Yes	<b>~</b>	No 🗌				
Container/Tem	p Blank temperature in complianc	e?	Yes	<b>✓</b>	No 🗌				
Sample(s) rece Temperature(s)	vived on ice? n/Thermometer(s):		Yes 3.0/3.0	<b>✓</b> 1 c	No 🗆	IR1	_		
Cooler(s)/Kit(s)	:								
Date/Time sam	ple(s) sent to storage:			020 1	10:57:54 AM				
Water - VOA vi	als have zero headspace?		Yes		No L	No VOA vials	submitted	<b>✓</b>	
	eptable upon receipt?		Yes	<b>✓</b>		N/A 📙			
pH adjusted? pH adjusted by	:		Yes -		No 🗸	N/A			
Login Notes:									
====	========	====	====		====	====	===:	====	=====
Client Contacte	d:	Date Contacted	:		Person	Contacted:			
Contacted By:		Regarding:							
Comments:									
CorrectiveActio	n:								



Cincinnati, OH +1 513 733 5336

Everett, WA +1 425 356 2600 Fort Collins, CO +1 970 490 1511

+1 616 399 6070

Holland, MI

### **Chain of Custody Form**

Page of \_

Houston, TX +1 281 530 5656 Middletown, PA

+1 717 944 5541

+1 610 948 4903

Salt Lake City, UT
+1 801 266 7700

Spring City, PA

South Charleston, WV +1 304 356 3168 York, PA +1 717 505 5280

coc ID: 37034

Environmental 25590904 **ALS Project Manager:** ALS Work Order #: **Customer Information Project Information** Parameter/Method Request for Analysis **Purchase Order** HANTLAND 36 GAS PLANT **Project Name** (1) Amber liter Sulfolane (1) 125 poly Work Order **Project Number** В ECT, INC. Company Name **Bill To Company** LAMBOA ENERGY C Send Report To Jenemy Lew AN dowski Invoice Attn D NICK SUMMERLAND 3399 Vetermus Dr. 1510 Thomas Zd E Address Address F G City/State/Zip City/State/Zip Turnasé City, MI 49684 Kalkaska, MI 49646 Н Phone 231-258-6411 231-946-8ZOD Fax 231-946-8208 Fax e-Mail Address michigan. invoices @ lambde energy 1/c. com e-Mail Address J'/cwandowski @ectirc.com Date Time Matrix Pres. # Bottles F G Sample Description Hold 9:40 60 X X MW-145 9/10/2020 10:25 2 6W MW-14D XX 3 6 9 Sampler(s) Please Print & Sign Shipment Method Turnaround Time in Business Days (BD) Results Due Date: ☐ Other \_ UPS Exound ☐ 10 BD D 5 BD □3BD □2BD M1 BD Relinquished by: BLT Time: //:00 Received by: Notes: 9/10/2020 Relinquished by: Received by ILaboratory Cooler ID Cooler Temp QC Package: (Check One Box Below) 1030 Level II Std QC ☐ TRRP Checklist Checked by Laborat Logged by (Laboratory): 3.Occ Level III Std QC/Raw Date TRRP Level IV NOO <u> دد ۲ ه</u> ☐ Level IV SW846/CLP Preservative Key: 4-NaOH 5-Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 6-NaHSO 9-5035 ☐ Other

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.

3. The Chain of Custody is a legal document. All information must be completed accurately.

FROM:
LISA ZUBER
(517) 272-9200
ECT, INC.
3125 SOVEREIGN DRIVE
LANSING MI 48911-4240

SHIP TO:

**HOLLAND MI 49424-9263** ÀLS ENVIRONMENTAL 3352 128TH AVENUE SAMPLE RECEIVING (616) 399-6070

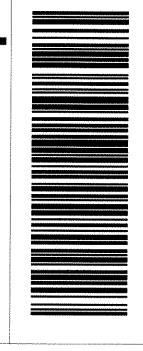


1 OF 1

**50 LBS** 

MI 495 9-04

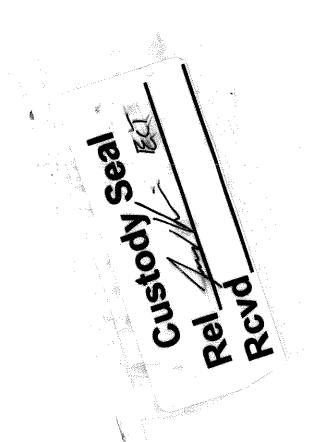
UPS NEXT DAY AIR
TRACKING #: 12 V54 9W4 01 5087 7623



BILLING: 3RD PARTY

REF 1:130685, 2000

Fold here and place in label pouch



## **APPENDIX D**

# **LOW-FLOW SAMPLING FIELD FORMS**



CLIENT:	Lambda Ener	rav			Monitorii	ng Location:		Hartland #36	
LOCATION:	13390 Lone T					Sample ID:		_MW	
Location	Hartland Tow		igan			Well Type:		2" PVC	
PROJECT:	130685.2000								
INSPECTION		2						<u></u>	
Label on well?		NO REMEDIE	ED.		Is cement pad in g		(	YES NO REMEDI	
Is reference mark v		~ ~			Is protective casing			YES NO REMEDI	
Standing water pre-		YES NO REMEDIE			Is well casing in vis		amig wen:	TES NO REMEDI	
Indication of surface Repair Notes:	e runon in weir	TES NO REWEDIE							
STATIC WAT	ER LEVEL				26	/	a.	52	
					Date: 9/9/	/20	Time:9:	12	
Top of Casing B	Elevation:				,				
Depth to Water	:	23.65		Measured with		XX	E CHALKED TAPE	OTHER	
Elevation of Wa	ater:			Well depth ve	rified?	YES NO			
WELL PURG	ING				,	,			- Tribal
Purge Method:	PERISTALTIC	BLADDER (	OTHER		Date: 9/9	/20	Start Time:	9:54	
Purge Metriou.		: <del></del>	0111E11	~	•				
Measured Well	Depth: 33.00	)	Screen Length	:		Depth to Scre	en Midpoint: _		
Wicasarca Tron	Dopan		7-11-2-11-11-11-11-1-1-1-1-1-1-1-1-1-1-1						
	Water Level	Drawdown I	Pumping Rate	Temp	Spec Cond.	Diss Oxy	pН	ORP	Turbidity
Time	(feet)	(feet)	(ml/mjn)	(°C)	(umho/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
10:10	23.72	0.05	250	11.4	5300	7.82	7.51	348.9	0.39
10:15	23.72	0.00	250	11.8	5391	7.87	7.34	341.9	0.02
10:20	23.72	0.05	250	11.9	_538	8.50	7.38	340.3	0.20
Final	23.72								-
				-					
							S <del></del>	-	
				-					-
						-		-	
								-	
					5 <del></del> .				
		Stabiliz	ation Criteria:	+1-3%	+1-3%	F/- 10%	+/- Ø.1 Units	+/- 10 mV	F/- 10%
Total Volume P	urged (gal): 2	gul				(if > 0.5  mg/l)			(if > 5 NTU)
		•			Stabiliza	tion Criteria Referen	ce Doc. USEPA EQA	ASOP-GW 001 Rev	#3, January 19, 201
FIELD ANAL		10:20				CALIDDAT	ION CHECK		Mark if
	Time:	11.9			-	Standard (conc.)	ION CHECK Reading		Recalibrated
12:	Temperature:		deg. C		Specific Cond.:		umho	s/cm	
2.104.10(3)	ific Conductance:	4 -4	umhos/cm	,	Dissolved Oxygen:		mg/L	S. S	
l D	issolved Oxygen:	-21	mg/L S.U.	,			S.U.		
	pH: ORP:				A-04/16/0		mV		
l	Turbidity:		NTU				NTU		
	Turbialty.				907525-2574264 <b>5</b> 528				
SAMPLE CO	LLECTION	Time: _	10:25			Sample Dupli	Julio	U6	
Appearance of S		Clear, us	odor			Sample Metho	od:	v Flow	-
CONTRACTOR OF THE STATE OF THE					DDESER	RVATIVE:		PARAMETER:	
NO./BOTTLES:	SIZE: 1000 ml	TYPE:	yes no	None HCL HN	NO3, NaOH, H <sub>2</sub> SO <sub>4</sub>				
1		glass plastic	yes no	None HCl, HN	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> ,	ZnAc, TSP, BAK		Sulfate	
	ml	glass plastic	yes no	None, HCI, HN	NO3, NaOH, H2SO4	, ZnAc, TSP, BAK			
	ml	glass plastic	yes no	None, HCI, HN	NO3, NaOH, H2SO4	ZnAc, TSP, BAK			
	ml	glass plastic	yes no		NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> ,				
	ml	glass plastic	yes no		10 <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> ,				
	ml	glass plastic	yes no	None, HCI, HN	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> ,	ZnAc TSP BAK			)
-	ml	glass plastic	yes no yes no		10 <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , 10 <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> ,				
	ml	glass plastic	yes no		10 <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> ,				
8	ml	glass plastic	yes no /		NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>				
SAMPLING F	PERSONNEL	1	11	Chain	of Custody No				
	F. 0.124	//	M	<b>-</b> 11 (2000)	SIGNATURE):	Marine I service and the			
Name (SIGNA	TURE):	In	1/	raine (			- Walter		

CLIENT: Lambda Ene LOCATION: 13390 Lone Hartland Tov PROJECT: 130685.2000	Tree Road wnship, Michigan	Monitoring Location: Sample ID: Well Type:	MW/5D
INSPECTION  Label on well? Is reference mark visible? Standing water present? Indication of surface runoff in well? Repair Notes:	YES NO REMEDIED YES NO REMEDIED YES NO REMEDIED YES NO REMEDIED	Is cement pad in good repair? Is protective casing locked and in go Is inner cap in place and properly se Is well casing in visibly good repair?	ealing well? YES NO REMEDIED
Top of Casing Elevation: Depth to Water: Elevation of Water:	1	Date: 9/9/2020  Measured with:  Well depth verified?  ELECTRONIC TAP  YES NO	Time: _/0.'03
WELL PURGING	OTUED	Date: 9/9/2020	Start Time: 10:05
Purge Method: PERISTALTIC	BLADDER OTHER	Date. //// C=	otal Time.
Measured Well Depth: <u>46.0</u>	(soft) Screen Length:		en Midpoint:
Time (feet)  70:10 19.31  10:15 19.31  10:20 19.31  10:25 19.31  10:30 19.32  10:35 19.32  10:40 19.32	Drawdown (feet) Pumping Rate (feet) (ml/min)  0.06' 200  0.06' 200  0.06' 200  0.06' 200  0.07' 200  0.07' 200  0.07' 200	Temp Spec Cond. Diss Oxy (°C) (umho/cm) (mg/l)  10.12 503 12.73  10.02 502 12.40  9.85 495 9.70  9.84 494 9.22  9.82 493 8.54  9.83 492 8.34  9.86 494 8.40	pH ORP Turbidity (S.U.) (mV) (NTU)  5.00
Total Volume Purged (gal):_/.	Stabilization Criteria: clean no obs.	particulates (if > 0.5 mg/l)	+/- 0.1 Units +/- 10 mV +/- 10 % (if > 5 NTU) nce Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010
FIELD ANALYSIS Time	1046	CALIBRAT	TION CHECK Mark if
Temperature Specific Conductance Dissolved Oxygen pH ORP	9.85 deg. C 493 umhos/cm	Standard (conc.)  Specific Cond.:  Dissolved Oxygen:  pH:  Eh:  Turbidity:	Reading   Recalibrated
SAMPLE COLLECTION	Time: 1045		cate ?: No od: Low Flow
Appearance of Sample:	TYPE: FILTERED: glass plastic yes no	PRESERVATIVE:  None HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK  None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	PARAMETER: Sulfolane Sulfate
	. ISSNER OF THE SEC	None, HCI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
SAMPLING PERSONNEL	us then Q I	Chain of Custody No Name (SIGNATURE):	
Name (SIGNATURE):	* polytubeng jostled	Haille (GIOHATONE).	

LOCATION: 13390 L	a Energy one Tree Road d Township, Michie 2000	gan	Samp	ation: ole ID: Type:	Hartland #36, MW- 7 2 2" PVC	
INSPECTION  Label on well?  Is reference mark visible?  Standing water present? Indication of surface runoff in we Repair Notes:	YES NO REMEDIED YES NO REMEDIED YES NO REMEDIED YES NO REMEDIED	1	Is cement pad in good repails protective casing locked is inner cap in place and prolife well casing in visibly good	and in good repair? operly sealing well?	NO REMEDIED NO REMEDIED NO REMEDIED NO REMEDIED	
Top of Casing Elevation: Depth to Water: Elevation of Water:	24.14	Measured Well dept	Date: 9k/20  I with: ELEC RO h verified? YES	Time: 10:		
WELL PURGING Purge Method: PERISTAL	TIC BLADDER O	THER	Date: 9/0/20	Start Time:	10:36	
Measured Well Depth:	48.50 s	creen Length:	Depth t	to Screen Midpoint:		
Time (fee 10:50 24.0 11:00 24.0 24.0 24.0 24.0 24.0 24.0 24.0 24	t) (feet) 0.03 7 0.03	Temping Rate	Spec Cond. Diss (umho/cm) (mg. 445 ) [2.5]	(S.U.) 17 17 17 17 17 17 18 17 18 17 18	ORP Turbid (mV) (NTU 350.0 5.4 357.9 4.9 357.4 4.50	J) 12 17
Total Volume Purged (gal)	: Z gal Stabilizat	ion Criteria: +/- 3%	(if > 0.		+/-(10 mV +// 10 (if > 5 N ASOP-GW 001 Rev #3, January 15	<b>)</b> % ITU) 9, 201
FIELD ANALYSIS	Time: ((:00	_	CA	LIBRATION CHECK	Mark if	
Tempe		deg. C	Standard Standard	d (conc.) Reading umbo	Recalibrate	∌d
Specific Conductor Dissolved O	17	umhos/cm mg/L	Specific Cond.:  Dissolved Oxygen:	mg/L	s/ciii	
Dissolved	pH: 7.45	S.U.	pH:	S,U.		
	ORP: 357.4	mV	Eh:	mv		
Tu	rbidity: 4.50	NTU	Turbidity:	NTU	I	
SAMPLE COLLECTION	ON Time:	11:05	Sample	Duplicate ?:		
Appearance of Sample:	Char, no	oder	Sample	Method: Low	Plow	
	ml glass plastic		PRESERVATIVE: CI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TS CI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TS			e e
	ml glass plastic	yes no None, HO	CI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TS	SP, BAK	Comoto	2
	ml glass plastic	yes no None, HO	CI, HNO3, NaOH, H2SO4, ZnAc, TS	SP, BAK		
	ml glass plastic	yes no None, HO	CI, HNO₃, NaOH, H₂SO₄, ZnAc, TS CI, HNO₃, NaOH, H₂SO₄, ZnAc, TS	SP, BAK		=
	ml glass plastic ml glass plastic		CI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZNAC, TS			
	ml glass plastic	yes no None, HO	CI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TS	SP, BAK		-
	ml glass plastic		CI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TS CI, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TS			
	ml glass plastic ml glass plastic		CI, $HNO_3$ , $NaOH$ , $H_2SO_4$ , $ZNAC$ , $TSO_4$ , $ZNAC$ , $TSO_4$ , $ZNAC$ , $TSO_4$ , $ZNAC$ , $TSO_4$			
SAMPLING PERSON	1000		hain of Custody No			
Name (SIGNATURE):		// .	ne (SIGNATURE):			
Hame (SIGNATURE).	Juny		and the second			

CLIENT: LOCATION: PROJECT:	Lambda Ene 13390 Lone T Hartland Tow 130685.2000	Tree Road	higan		Monitori	ng Location: Sample ID: Well Type:		Hartland #36 MW- ZOS 2" PVC	
INSPECTION	1								
Label on well? Is reference mark v Standing water pre- Indication of surface Repair Notes:	sent?	YES NO REMED YES NO REMED YES NO REMED YES NO REMED	NED		Is inner cap in place	good repair? ng locked and in go ce and properly sea isibly good repair?	od repair?	YES NO REMEDIE YES NO REMEDIE YES NO REMEDIE	D D
STATIC WAT	ER LEVEL				21-1	,	2000		
Top of Casing E Depth to Water Elevation of Wa	:	20.96		Measured wit Well depth ve		ELECTRONIC TAPE	Time: 20	20000000	
WELL PURG	ING								
Purge Method:	PERISTALTIO	BLADDER	OTHER		Date: 9/9/	2020	Start Time:	11:15	
Accorded Measured Well	Depth: 25.19		Screen Length	Ľ	15/cm	Depth to Screen	en Midpoint: _		<u></u>
Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
initial 11:20	20.96	0.05	150	11.33	579	24.08	6.84	68.9	8.78
11:25	21.01	0.05	150	11.24	578	15.14	6.70	74.9	8.31
11:30	21.03	0.07	150	11.06	569	8.92	6.8Z	68.6	7.56
11:35	21.03	0.07	150	11.03	566	8.43	6.95	61.9	6.30
71.70									
	-				-				
	-	-							
Total Volume Po	urged (gal): 2/.	O Clea	zation Criteria:	+1-3% = 0 % 5.	+/- 3% -	+/- 10% (if > 0.5 mg/l)	+/- 0.1 Units		(if > 5 NTU)
FIELD ANAL	YSIS	ola col	>			111			
	Time:					CALIBRATI			Mark if
0	Temperature:		deg. C		Consider Cond	Standard (conc.)	Reading umhos	lem	Recalibrated
- 12	ific Conductance: issolved Oxygen:		umhos/cm mg/L		Dissolved Oxygen:		mg/L	J'GIII	
~	pH:	100	S.U.				S.U.		
	ORP:		mV				mV		
	Turbidity:	6.49	NTU		Turbidity:		NTU		l
SAMPLE CO	LLECTION	Time:	11:47			Sample Duplic	cate ?: Ne	2	
Appearance of S	Sample:		obs part	culate	5_		od: Low		
NO./BOTTLES:	SIZE:	TYPE:	FILTERED:			RVATIVE:		PARAMETER:	
1		glass plastic	yes no	None, HCI, H	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>			Sulfolane	
1	125ml				NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>				
) 3 <del></del>	ml		yes no		$NO_3$ , NaOH, $H_2SO_4$ $NO_3$ , NaOH, $H_2SO_4$				
	ml	- 1 Table 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	yes no		$NO_3$ , $NaOH$ , $H_2SO_4$ $NO_3$ , $NaOH$ , $H_2SO_4$				
8	ml		yes no	None, HCI, H	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	, ZnAc, TSP, BAK			
8 <del></del>	ml		yes no		NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>				
-	ml		yes no		$NO_3$ , NaOH, H $_2SO_4$ $NO_3$ , NaOH, H $_2SO_4$				
· ·	ml	glass plastic	yes no	None, HCI, H	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	, ZnAc, TSP, BAK			
	ml	glass plastic	yes no		NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>				
	PERSONNEL	1	200		of Custody No				
Name (SIGNA	ATURE): Quill	19mal	(11)	Name (	SIGNATURE):				Tall - Mosa - History

			Monitori			Hartland #36 MW- /95 2" PVC	
PROJECT: 130685.2000 INSPECTION Label on well? Is reference mark visible? Standing water present? Indication of surface runoff in well? Repair Notes:	NO REMEDIED  NO REMEDIED  YES REMEDIED  YES NO REMEDIED		Is inner cap in place	good repair?  ng locked and in go ce and properly se isibly good repair?	aling well?	NO REMEDIE NO REMEDIE NO REMEDIE	D D
Top of Casing Elevation: Depth to Water: Elevation of Water:	21.67	Measured wi		ELECTRONIC TAP	Time:		
Purge Method: PERISTALTIC	BLADDER OTHER		Date: 9/9/2	20	Start Time:	11:19	
Measured Well Depth:  Water Level  Time (feet)  11:45  11:45  71:87  II:50  Pinal 21:47  Total Volume Purged (gal): 1.7  FIELD ANALYSIS  Time:		Temp (°C) (!.4    !.4    !.4	Spec Cond. (umho/cm) 443 444 445 445 445	CALIBRAT	pH (S.U.) 7.50 7.60 7.60 7.60 7.60 100 CHECK	ORP (mV) 344.9 341.0 341.6	Mark if
Temperature: Specific Conductance: Dissolved Oxygen: pH: ORP: Turbidity:	70.66 mg/L 341.6 mV	1	B	$\rightarrow$	Reading umhor mg/L S.U. mV	s/cm	Recalibrated
SAMPLE COLLECTION	Cher, us oder			Sample Dupli Sample Metho	- ,	UD V PloW	
Appearance of Sample:    NO./BOTTLES: SIZE:   1   1000   ml	TYPE: glass plastic yes no	None, HCI, H	INO3, NaOH, H <sub>2</sub> SO <sub>4</sub>	RVATIVE: , Znac, TSP, BAK		PARAMETER: Sulfolane Sulfate	
SAMPLING PERSONNEL Name (SIGNATURE):	Jan M	/	n of Custody No (SIGNATURE):				

CLIENT: LOCATION: PROJECT:	Lambda Ene 13390 Lone T Hartland Tow 130685.2000	ree Road	igan		Monitori	ing Location: Sample ID: Well Type:		Hartland #36 MW- <u>Z                                   </u>	) + MW-
INSPECTION									,
Label on well? Is reference mark v Standing water pre- Indication of surface Repair Notes:	sent?	YES NO REMEDIE YES NO REMEDIE YES NO REMEDIE	ED ED		Is inner cap in pla	good repair?  ng locked and in gooce and properly seisibly good repair?	ood repair?	YES NO REMEDI YES NO REMEDI YES NO REMEDI	ED ED
STATIC WAT	ER LEVEL				a /a	, -	- 7		
Top of Casing E Depth to Water Elevation of Wa	7	20.8/		Measured with Well depth ve			Time:/Z		
WELL PURG	ING				247. 237				
Purge Method:	PERISTALTIC	BLADDER	OTHER		Date: 9/9/2	2070	Start Time: /	2:05	
reconded		- /							
Measured Well	Depth: 35.2	2	Screen Lengtl	n:	5	Depth to Scre	en Midpoint: _		=
Time	Water Level (feet)	Drawdown (feet)	Oumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1210	21.85	1.04	150	10.85	596	3.46	7.10	52.8	
1215	21.85	1.04	150	10.82	597	3.29	6.93	59.7	23.1
1220	21.85	1.04	150	10.65	598	2.92	6.93	55.0	21.7
1225	21.05	7.07	130	10.3/	400	6.78	_0./5_		
		· · · · · · · · · · · · · · · · · · ·					:		
		·						#	
Total Volume Po	urged (gal): <sup>3</sup> /.0	BRAY	ation Criteria:	144 6	+/- 3% /	(if > 0.5 mg/l)	+/- 0.1 Units		(if > 5 NTU)
FIELD ANAL	YSIS								
		12:27				CALIBRAT	ION CHECK		Mark if
	Temperature:		deg. C			Standard (conc.)	1		Recalibrated
	ific Conductance:		umhos/cm					/cm	
l	issolved Oxygen:	6.95	mg/L S.U.	1	Dissolved Oxygen: pH:				
	ORP:		mV						
	Turbidity:		NTU		Turbidity:		NTU		
									5 100
SAMPLE CO	Sample: 940	Time: _	12:30	s colon	and	Sample Dupli Sample Meth	cate ?: Yes	Flow	-DUPE
Appearance of S	Sample:	ops. Na	Witeular	es		Sample Metri	ou	7,000	-
NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	_		RVATIVE:		PARAMETER:	dent-Buse
2 (31)		glass plastic	yes no	None, HCI, HN	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	, ZnAc, TSP, BAK		Sulfolane 🗲	MW-DUPE
	ml	glass plastic	yes no						
	ml	glass plastic	yes no	None, HCI, HN	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	, ZnAc, TSP, BAK			
-	ml		yes no						
	ml		yes no		15 15 16 16 16 16 16 16 16 16 16 16 16 16 16				
	ml	glass plastic	yes no						
<u> </u>	ml	45 IB	yes no						
	ml	glass plastic	yes no						
CAMPUNIC		glass plastic	yes no		01:00 N N N N N N N N N N N N N N N N N N				
	PERSONNEL	1	200						
Name (SIGNA	ATURE): 941111)	Mari	(111)	Name (	SIGNATURE):				-

CLIENT: LOCATION: PROJECT:	Lambda Ener 13390 Lone T Hartland Tow 130685.2000	ree Road	gan		Monitori	ng Location: Sample ID: Well Type:		Hartland #36 MW-  9 d 2" PVC	
INSPECTION Label on well? Is reference mark v Standing water pres Indication of surface Repair Notes:	risible? sent?	NO REMEDIEI YES NO REMEDIEI YES REMEDIEI	)		Is inner cap in pla	good repair?  ng locked and in go ce and properly se isibly good repair?	aling well?	NO REMEDIE NO REMEDIE NO REMEDIE YES NO REMEDIE	D
STATIC WAT	ER LEVEL				Date: 9/9/	1.0	Time: 12	:02	
Top of Casing E Depth to Water Elevation of Wa		21.55		Measured wit Well depth ve	h:	ELECTRONIC TAP			
WELL PURG		0140050	THER		Date: 9/9/	20	Start Time:	12:04	
Purge Method:  Measured Well	TO M	4	Screen Length	5'	- Date:		100		
Time 12:20 12:25 12:30 Final	Water Level (feet) 21.63 21.63 21.63 21.63	Drawdown P	umping Rate (ml/min) 250 250 250	Temp (°C) (2.3 (2.3 12.4	Spec Cond. (umho/cm) C44 C44 C43	Diss Oxy (mg/l) 12.34 12.43	pH (S.U.) 7.34 7.42	ORP (mV) 354.1 358.C 354.5	Turbidity (NTU) 2.41 1.98 2.06
Total Volume Po	urged (gal):	Stabiliza	tion Criteria:	+/- 3%	1-3% Stabiliza	+/- 10% (if > 0.5 mg/l)	+/- 0(1 Units	+/-10 pV DASOP-GW 001 Rev #	+/- 10 % (if 5 NTU) 3, January 19, 2010
FIELD ANAL		12:30 12:4 652 13:48 7:42 354:5 2.08	deg. C umhos/cm mg/L S.U. mV NTU		Eh:	Standard (conc.)	1	os/cm	Mark if Recalibrated
SAMPLE CO		Time:_	12:35			Sample Dupli Sample Metho		Ve I Plow	
Appearance of S  NO./BOTTLES:  1  1	SIZE:   1000 ml   125 ml   ml   ml   ml   ml   ml   ml   ml	TYPE: glass plastic	FILTERED: yes no	None, HCI, H	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	RVATIVE:  1. Znac, TSP, BAK		PARAMETER: Sulfolane Sulfate	
SAMPLING P		giass piastic	1//		of Custody No	THE CONTRACTOR OF THE CONTRACT			
Name (SIGNA	TURE):	-/-	the	Name (	SIGNATURE):				

CLIENT: LOCATION:	Lambda Ener 13390 Lone T Hartland Tow	ree Road	nigan		Monitor	ing Location: Sample ID: Well Type:		Hartland #36 MW [9] 2" PVC	ms/uso
PROJECT:	130685.2000								-
INSPECTION	l							<i>a</i>	
Label on well? Is reference mark v Standing water presented indication of surface	sent?	NO REMEDI S NO REMEDI YES NO REMEDI YES NO REMEDI	ED ED		Is inner cap in pla	good repair? ing locked and in go ace and properly se visibly good repair?	aling well?	NO REMEDIE NO REMEDIE NO REMEDIE YES NO REMEDIE	D D
Repair Notes:	e ration in weir	TES O KEMEDI							
STATIC WAT	ER LEVEL				2/1		10.	ul	
	100				Date: 9/9/	20	Time: 12:	46	
Top of Casing B Depth to Water		20.57		Measured wit	h:	ELECTRONIC TAP	E CHALKED TAP	E OTHER	
Elevation of Wa				Well depth ve		YES 🔊			
WELL PURG	ING /				Date: 9/a	40		17.46	
Purge Method:	PERSTALTIC		OTHER	-1	Date: 4/9	20	Start Time:_	12.10	
Measured Well	Depth: 27.50	<u>'</u>	Screen Length	n:	-	Depth to Scre	en Midpoint:		6
	Water Level		Pumping Rate		Spec Cond.	Diss Oxy	pH	ORP	Turbidity
Time	20.5%	(feet)	(ml/min)	(°C)	(umho/cm)	0.6Z	(S.U.)	(mV) 237.Z	(NTU) 4.74
13:05	20.5%	0.06	300	12.0	700	0.58	7.11	232.6	3.27
13:10	20.38	0.06	300	11.9	500	0.56	7.10	235.3	2.58
Finel	20.58	0.00		11.0					
Library	20.10			1214					
	· ·								
		2							
					(n)				
								H <del></del>	
		-				-			
	-	- Ctabilia	ation Critoria:	+1=3%	(+/- 3%)	+/- 10%	+/- 0.1 Units	+//10 mV	+/- 101%
Total Volume Pu	urged (gal): 2.2	5 gal Stabiliz	ation Criteria.	+(-3/6)		(if > 0.5 mg/l)		ASOP-GW 001 Rev#	(it > 5 NTU)
FIELD ANAL					Stabiliz	ation Criteria Referen	ce Doc. USEPA EQ	ASOF-GW 001 Rev #	3, January 19, 2010
	Time:	13:15				CALIBRAT	ION CHECK	-	Mark if
1	Temperature:	11.9	deg. C			Standard (conc.)	Reading		Recalibrated
	ific Conductance:	700	umhos/cm		Specific Cond.		umbo		
D	issolved Oxygen:	214	mg/L		Dissolved Oxygen		mg/L		
1	pH:		S.U.		pH		S.U. mV		_
1	ORP:	2.56	mV		En		NTU		_
	Turbidity:	2.70	NTU		Turbidity				/
SAMPLE CO	LIECTION	Time:	13:20		7200 141 150	Sample Duplie	cate ?:	es us/m	SD
Appearance of S		Clear	no odor		_		od: Low Flow	J 1	
	To II				PDESE	DVATIVE.		PARAMETER:	
NO./BOTTLES:	SIZE: 	TYPE:	yes no	None HCL H		RVATIVE: 4, ZnAc, TSP, BAK			
12		glass plastic	yes no			4, ZnAc, TSP, BAK		400	
	ml	glass plastic	yes no						
	ml	glass plastic	yes no						
	ml	glass plastic	yes no						
	ml	glass plastic	yes no						
	ml	glass plastic glass plastic	yes no						
	ml	glass plastic	yes no		보고 10~~ 10~~ 10~ 10~ 10~ 10~ 10~ 10~ 10~ 1	4, ZnAc, TSP, BAK			
	mi	glass plastic	yes no	None, HCI, HI	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO	4, ZnAc, TSP, BAK			
	ml	glass plastic	yes no	None, HCI, HI	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO	4, ZnAc, TSP, BAK			
SAMPLING P	ERSONNEL	1	Kl.	Chain	of Custody No	)			
Name (SIGNA	TURE):	my	//~	Name (	SIGNATURE):				- CHAV TON

	$\sim$ 1.10. MW/////							
	one Tree Road		Sample ID Well Type		-			
	d Township, Michig	gan	well Type					
	2000							
INSPECTION  Label on well?	NO REMEDIED		Is cement pad in good repair?	YES NO REMED	DIED NA			
Is reference mark visible?	VES NO REMEDIED		Is protective casing locked and in g					
Standing water present?	YES NO REMEDIED		Is inner cap in place and properly s					
Indication of surface runoff in wel	1? YES NO REMEDIED		Is well casing in visibly good repair	TES NO REWELL	JED .			
Repair Notes: STATIC WATER LEV	EL T		- / /					
STATIO WATER EEV			Date: 9/9/2020	Time: 13:12				
Top of Casing Elevation:								
Depth to Water:	19.11	Measured wit		PE CHALKED TAPE OTHER				
Elevation of Water:		Well depth ve	erified? YES NO					
WELL PURGING			-1.1	. 2				
Purge Method: PERISTAL	TIO BLADDER O'	THER	Date: 9/9/2020	Start Time: 13:15				
a nedad								
Measured Well Depth:	40.75 S	creen Length:	Depth to Scr	een Midpoint:				
0.507 a 107		umping Data Town	Spec Cond. Diss Oxy	pH ORP	Turbidity			
Water L	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	umping Rate Temp (ml/min) (°C)	Spec Cond. Diss Oxy (umho/cm) (mg/l)	(S.U.) (mV)	(NTU)			
Time (fee		(ml/min) (°C)	(mg/l)	V				
1220 19.3		200 10.62	975 3.60	6.91 63.9	NR			
1725 19.3	~ ~ ~ (	200 10.49	947 2.21	6.52 78.7	33.0			
1330 19.3		200 10.26	972 1.57	656 72.0	29.4			
1335 19.3	31 0.2'	200 10.27	976 1.52	4.59 69.7	8.55			
1340 19.3	31 0.21	200 10.11	982 1.32	6.72 60.1	7.28			
13K5 19.		200 10.10	983 1.30	6.76 57.9	7.07			
1350 19.	3/ 0.2/	200 10.12	784 1.26	4.00 34.1				
	Stabiliza	tion Criteria: +/- 3%	+/- 3% +/- 10%	+/- 0.1 Units +/- 10 mV				
Total Volume Purged (gal)	punge sta	t; frace bubb	(if > 0.5 mg/l)	) ence Doc. USEPA EQASOP-GW 001 Rev	(if > 5 NTU) #3, January 19, 2010			
FIELD ANALYSIS	punge sta	, years pool	Otabilization Officina (1000)					
FIELD ANALTSIS	Time: /353		CALIBRA	TION CHECK	Mark if			
Tempe	rature: 10.11	deg. C	Standard (conc	) Reading	Recalibrated			
Specific Conduc	Baul	umhos/cm	Specific Cond.:	umhos/cm				
Dissolved O	xygen: /.25	mg/L	Dissolved Oxygen:	mg/L				
	pH:	S.U.	pH:	1000				
2005	ORP: 54.9	mV	Eh:	20200				
Tu	rbidity: 7.20	NTU	Turbidity:	_ NTU	I			
SAMPLE COLLECTION	ON Time: _/	3.55	Sample Dup	licate ?:				
Appearance of Sample:	alean slin	Lt gruy trut	Sample Meti	nod: Low Flow				
Appearance of Sample	- July							
NO./BOTTLES: SIZE		FILTERED:	PRESERVATIVE:	PARAMETER: K Sulfolane				
	0 ml glass plastic 25 ml glass plastic	yes no None, HCl, H	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BA	K Sulfate				
	ml glass plastic	yes no None, HCl, Hi	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BA	к	· ·			
	ml glass plastic	yes no None, HCl, H	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BA	к				
	ml glass plastic	yes no None, HCl, H	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BA	K				
	ml glass plastic		NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BA NO <sub>2</sub> , NaOH, H <sub>2</sub> SO <sub>2</sub> , ZnAc, TSP, BA	к				
	ml glass plastic ml glass plastic			K				
	ml glass plastic	yes no None, HCI, H	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BA	к				
	ml glass plastic			K				
	ml glass plastic	73	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BA					
SAMPLING PERSON	NEL //	Chain	of Custody No					
Name (SIGNATURE):	um grant	Name (	SIGNATURE):					
		from 1200 h	us to 1300 Lus	(JK)				

5/29/2020, 12:46 PM

CLIENT: Lambda Energy LOCATION: 13390 Lone Tree Road Hartland Township, Michigan					Monitor	[일기 : 10 ] [기 : 10 ]		Hartland #36 MW- 13 2" PVC	
PROJECT:	130685.2000							- Van de	
INSPECTION  Label on well?  Is reference mark vi Standing water pres Indication of surface	isible? sent?	YES NO REMEDI YES NO REMEDI YES NO REMEDI	ED ED		Is inner cap in pla	good repair? ing locked and in g ace and properly se visibly good repair?	ealing well?	VE NO REMEDIE VE NO REMEDIE VE NO REMEDIE	D D
Repair Notes:	ER LEVEL				21	1	1045000		
STATIC WAT	LIVELVEE				Date: 9/9	/20	Time: _ [3:	34	
Top of Casing E		10.40				$\alpha$		SE 071150	
Depth to Water:		19.40		Measured with Well depth ve		YES NO TAP	E CHALKED TAP	E OTHER	
Elevation of Wa	ter:			vveii deptii ve	ermeur	TES (NO			
WELL PURG	ING _				alal	100	rea ven	17.7/	
Purge Method:	PERISTALTIC	BLADDER	OTHER		Date: 9/9/		Start Time:_	13:36	
Measured Well [	Depth: 32.7	<u>0</u>	Screen Lengt	h:	_	Depth to Scre	een Midpoint:		-
1	Water Level	Drawdown	Pumping Rate	Temp	Spec Cond.	Diss Oxy	pН	ORP	Turbidity
Time	(feet)	(feet)	(ml/min)	(°C)	(umho/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
13:50	20.00	0.20	250	12.4	1290	3.52	7.33	253.2	14.0
13:55	20.00	0.20	250	12.4	1290	3.36	2.34	261-6	9.93
14:00	20.00	0.20	250	12.2	1300	3.41	7.32	206.0	5.96
14:05	20.01	0.21	250	12.4	1300	3.25	2.31	ZCE	2.33
14:10	20.01	0.21	250	12.3	1300	3.10	7.30	264.7	1.01
14:15	20.02	0.22	250	127	1300	2.92	7.30	257.8	0.02
Final	20.03						-		:
	( <del></del>		·				V.		-
	-	-		-			8		
		-	-	7		6 (A)			
		Stabiliz	ation Criteria:	41-3%	W-39/2	+/- 10%	+/- Ø.1 Ohits	+/- 10 pNV	1-10%
Total Volume Pu	rged (gal): 2.5	gal	adon ontona.			(if > 0.5 mg/l)			(if > 5 NTU)
		0	-		Stabiliz	ation Criteria Referer	nce Doc. USEPA EQ	ASOP-GW 001 Rev #	3, January 19, 2010
FIELD ANALY		11000							Mark if
	Time:	14:15					ION CHECK	_	Recalibrated
	Temperature:	12.3	deg. C			Standard (conc.)	7.115/04/4/10/2019/6/4	os/cm	Recalibrated
- 0	fic Conductance:	2.92	umhos/cm		Specific Cond.: Dissolved Oxygen:		mg/L		
Dis	ssolved Oxygen:	7.30	mg/L S.U.		AND AND DESCRIPTION OF THE PROPERTY OF THE PRO		S.U.		
1	pH: ORP:	-2050 Z					mV		
1	Turbidity:	0.07	NTU				NTU		
	rarbialty.	0.02					,		
SAMPLE COL	LECTION	Time: _	14:20			Sample Dupli		JO	
Appearance of S	ample:	Cleen	, no oder			Sample Meth	od:Low	Plov	
NO IDOTTI FO	8175	TYPE:	FILTERED:		PRESE	RVATIVE:		PARAMETER:	
NO./BOTTLES:	SIZE: 1000 ml	glass plastic	yes no	None HCI, H		, ZnAc, TSP, BAK		Sulfolane	
1	125ml	glass plastic	yes no			, ZnAc, TSP, BAK		Sulfate	
	ml	glass plastic	yes no						
	ml	glass plastic	yes no						
	ml	glass plastic	yes no						
	ml	glass plastic glass plastic	yes no						
	ml	glass plastic	yes no						
	ml	glass plastic	yes no						
	ml	glass plastic	yes no	None, HCI, HI	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	, ZnAc, TSP, BAK			
	ml	glass plastic	yes no	None, HCI, HI	NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	, ZnAc, TSP, BAK			
SAMPLING P	ERSONNEL	1	1 1/	Chain	of Custody No	)			
Name (SIGNAT	TURE):	1/2	M	Name (	SIGNATURE):				

CLIENT: LOCATION: PROJECT:	Lambda Ener 13390 Lone T Hartland Tow 130685.2000	ree Road	higan		Monitorii	ng Location: Sample ID: Well Type:		Hartland #36 MW- / 7S 2" PVC	
Label on well? Is reference mark vi Standing water pres Indication of surface Repair Notes:	isible? sent?	YES NO REMED YES NO REMED YES NO REMED YES NO REMED	IED IED		Is cement pad in g Is protective casin Is inner cap in plac Is well casing in vis	g locked and in go ce and properly sea	od repair?	ES NO REMEDI ES NO REMEDI ES NO REMEDI	ED ED
Top of Casing E Depth to Water: Elevation of Wa	Elevation:	18.76		Measured wit Well depth ve		ELECTRONIC TAPE	Time: _//		
a conder	PERISTALLIC	BLADDER	OTHERScreen Length		Date: <u>9/9/</u>	Depth to Screen	Start Time:	405	
FIELD ANAL	Water Level (feet) /8.76 /8.72 /8.72 /8.72 /8.73 /8.73 /8.73 /8.73	(feet)  0.06  0.06  0.06'  0.07'  Stabiliz  Clea  1436  10.83  740	Pumping Rate (ml/min)  200 250 250 250 250 250 250 250 250 25	Temp (°C)  11.18  11.05  10.83  10.83  10.83  10.83  10.83	Spec Cond. (umho/cm)  747  746  743  739  740  +/- 3%	Diss Oxy (mg/l)  2.0 / /. 7 8 /.0 3 0.9 7 /.00  +/- 10% (if > 0.5 mg/l) tion Criteria Reference CALIBRATI Standard (conc.)	pH (S.U.)  7.30 6.97 6.78 6.80 6.83  +/- 0.1 Units  DON CHECK Reading umbos/	OP-GW 001 Rev	(if > 5 NTU)
Di	pH:	42.4	S.U. mV NTU		pH: Eh: Turbidity:		S.U. mV NTU		
SAMPLE CO			1435			Sample Duplic	ate ?: //o	You	
Appearance of S  NO./BOTTLES:  1 1	Sample:	TYPE: glass plastic	FILTERED: yes no	None, HCI, Hi None, HCI, Hi	PRESER NO3, NaOH, H <sub>2</sub> SO <sub>4</sub> ,	VATIVE: ZnAc, TSP, BAK		PARAMETER: Sulfolane Sulfate	
SAMPLING P	ERSONNEL			Chain	of Custody No.				
Name (SIGNA	TURE): O	2 Dom	CHI)	Name (	SIGNATURE):			and the second	100

CLIENT: L	ambda Ener	gy			Monitori	ng Location:		Hartland #36	
	3390 Lone T					Sample ID:		MW- 135	
ŀ	lartland Tow	nship, Mich	higan			Well Type:		2" PVC	
	30685.2000								
INSPECTION		NO REMEDI	IED		Is cement pad in g	good repair?		PET NO REMEDI	ED
Label on well? Is reference mark visit	ble?	NO REMEDI			Is protective casin	100	ood repair?	TES NO REMEDI	ED
Standing water preser		YES NO REMEDI			Is inner cap in place	ce and properly se	aling well?	NO REMEDI	
Indication of surface re		YES REMEDI	IED		Is well casing in vi	isibly good repair?		(ES) NO REMEDI	ED
Repair Notes:								- V	J
STATIC WATE	R LEVEL				Date: 9/9/2	20	Time: 14:	50	
					Date: 17-11		rille		
Top of Casing Ele	evation:	20.45		Measured wi	th:	ELECTRONIC TAP	E CHALKED TAPE	OTHER	
Depth to Water: Elevation of Wate	· ·	2020		Well depth v		YES NO			
Elevation of water	JI.	- T		770 σορι		<u> </u>			
WELL PURGIN	IG _				101	Name of the last o		111	
		BLADDER	OTHER		Date: a/a/	20	Start Time:	14:32	
u.go memo		0							
Measured Well De	epth:	_	Screen Length	n:	_	Depth to Scre	en Midpoint: _		-
1				000	12100111210111	5: 0	200	ODD	Turbidity
l .	Water Level		Pumping Rate		Spec Cond.	Diss Oxy	pH (S.II.)	ORP (m)()	Turbidity
Time	(feet)	(feet)	(ml/min)	(°C)	(umho/cm)	(mg/l)	(S.U.) <b>7.36</b>	(mV) 302.Z	(NTU)
14:50	20.56	0.11	250	12.9	830	3.71	7.36	304.3	0.36
14:55	20.56	0.11	250	12.4	430	3.57	7.37	306.0	0.02
15:00	20.57	0.12	250	12.1		_3.70	1.37	700.0	0-02
Finel	20.56								
		-						-	
				- Alle					
						-			
							-		
					-	0	-		
	-		·			>			
		Stabiliz	zation Criteria:	+(-3%	+(- 3%	+(-10%)	+/- Q.1 Units	+/-(10 m)	+/-(10 %)
Total Volume Purg	ged (gal): 2	pal			_	(if > 0.5 mg/l)	$\overline{}$		(if > 5 NTU)
	AND DESCRIPTION OF THE PERSON				Stabiliza	tion Criteria Referen	ice Doc. USEPA EQA	SOP-GW 001 Rev	#3, January 19, 201
FIELD ANALY		15:00				CALIBRAT	ION CHECK		Mark if
l	Time:	12.9			(	Standard (conc.)			Recalibrated
	Temperature:	430	deg. C		Specific Cond.:		umho	s/cm	1
	Conductance:		umhos/cm		Dissolved Oxygen:		mg/L		
Diss	solved Oxygen:		mg/L S.U.				S.U.		
	pH: ORP:	306.0					mV		
	Turbidity:	0.02	- NTU		Turbidity:		NTU		
	Turbidity.	200000	1110						
SAMPLE COL	LECTION	Time:	15:05			Sample Dupli			
Appearance of Sa	The second secon	Cher	no oder		<u></u>	Sample Metho	od: Low	Flow	-
								DADAMETER	
NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	(No. 1)	PRESER INO₃, NaOH, H₂SO₄	RVATIVE:		PARAMETER: Sulfolane	
1 1	1000 ml	glass plastic	yes no	None, HCI, H	INO3, NaOH, H2SO4 INO3, NaOH, H2SO4	Znac TSP BAK		Sulfate	
_1	ml	glass plastic	yes no	None HCI H	INO3, NaOH, H <sub>2</sub> SO <sub>4</sub> INO3, NaOH, H <sub>2</sub> SO <sub>4</sub>	ZnAc, TSP, BAK		Condito	
	ml	glass plastic	yes no		INO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>				
	ml	glass plastic	yes no	None, HCI, H	INO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	, ZnAc, TSP, BAK			
	ml	glass plastic	yes no	None, HCI, H	INO3, NaOH, H2SO4	, ZnAc, TSP, BAK			
	ml	glass plastic	yes no	None, HCI, H	INO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>	, ZnAc, TSP, BAK			
	ml	glass plastic	yes no	None, HCI, H	INO <sub>3</sub> , NaOH, H₂SO <sub>4</sub>	, ZnAc, TSP, BAK			
	ml	glass plastic	yes no		INO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>				
	ml	glass plastic	yes no		INO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>				
	ml	glass plastic	yes no		INO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub>				
SAMPLING PE	RSONNEL	1	// .	Chair	n of Custody No				
Name (SIGNATI	URE):	In	M	Name	(SIGNATURE):				
		// //	,						

Hartland	ne Tree Road Township, Michigan	Mor	nitoring Location: Sample ID: Well Type:	MW <i>l</i> ts
PROJECT: 130685.2	000			
INSPECTION				<b>an</b>
Label on well? Is reference mark visible? Standing water present? Indication of surface runoff in well? Repair Notes:	NO REMEDIED NO REMEDIED YES NO REMEDIED YES NO REMEDIED	Is protective Is inner cap	pad in good repair? e casing locked and in good repair in place and properly sealing wing in visibly good repair?	7)
STATIC WATER LEVE	- 1		. / /	9.15
Top of Casing Elevation: Depth to Water: Elevation of Water:	19.55	Date:	1	es: 9:05
WELL PURGING	<u> </u>		11	
Purge Method: PERISTAL	C BLADDER OTHER_	Date:	//10/20 Star	t Time: <b>9:0%</b>
Measured Well Depth: _ 20	Screen I	ength:	Depth to Screen M	idpoint:
Water Le  Time (feet)  9:25  9:30  9:35  19.64  Final	(feet) (ml/m 0.09 250 4 0.09 250 4 0.09 250	in) (°C) (umho) 980 7 10.44 983	(cm) (mg/l) 21.90 719.56	pH ORP Turbidity (S.U.) (my) (NTY) 6.39 66.5 (.03 6.46 61.1 0.93 6.49 56.3 7.31
Total Volume Purged (gal):_	2.5 gal Stabilization Cri	$\circ$	(if > 0.5 mg/l)	1 Upits +/-10 bV +/- 10 % (if 5.N/U) . USEPA EQASOP-GW 001 Rev #3, January 19, 2010
FIELD ANALYSIS				
Tempera Specific Conducta Dissolved Oxy	nce: 984 umb gen: 17.15 mg/ pH: 6.49 s.U DRP: 56.3 mV	os/cm Specific Dissolved O	Cond.	HECK Mark if Reading Recalibrated  umhos/cm mg/L S.U. mV NTU
SAMPLE COLLECTION	Time: 4:40	5	Sample Duplicate	
Appearance of Sample:	Clear, no od	er	Sample Method: _	LOW Flow
	ml glass plastic yes	None, HCI, HNO <sub>3</sub> , NaOH,	H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfate
	ml glass plastic yes	None, HCI, HNO <sub>3</sub> , NaOH,	H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
SAMPLING PERSONN Name (SIGNATURE):	EL //	Chain of Custon Name (SIGNATU	dy No	
N (SIGNATURE)	// //.	Name (SIGNATI	IRF)	

CLIENT: Lambda Ener LOCATION: 13390 Lone T Hartland Tow PROJECT: 130685.2000	Sample ID:MW			Hartland #36 MW/4 D 2" PVC			
INSPECTION  Label on well? Is reference mark visible? Standing water present? Indication of surface runoff in well? Repair Notes:	NO REMEDIED NO REMEDIED YES NO REMEDIED REMEDIED REMEDIED		Is cement pad in go Is protective casing Is inner cap in place Is well casing in visi	locked and in goo e and properly sea		NO REMEDIER YES NO REMEDIER YES NO REMEDIER	)
Top of Casing Elevation: Depth to Water: Elevation of Water:	<u>19.44</u>	Measured wit Well depth ve		ELECTRONIC TAPE	Time: <b>9:5</b>		
100	BLADDER OTHE		Date: 9/10/20	Depth to Scree	July 1 11101	9:54	
Water Level   Time   (feet)	Drawdown Pum (feet) (n 0.04	ping Rate Temp nl/min) (°C) 200 4.14 200 9.19 300 9.30	Spec Cond. (umho/cm) #### #### #####	Diss Oxy (mg/l) [1.34 [1.12 [1.5]	pH (S.U.) 6.60 6.64 6.68	ORP (mV) 51.3 49.0	Turbidity (NTU) 2.24 1.98 2.10
Total Volume Purged (gal): 2.4	Stabilization	n Criteria: +(-3%)		(if > 0.5 mg/l)	+/- 0.1 LANI)s e Doc. USEPA EQA	+ 10 mV SOP-GW 001 Rev #	(i 5NTU) 3, January 19, 2010
Time: Temperature: Specific Conductance: Dissolved Oxygen: pH: ORP: Turbidity:	10.57 6.68 45.7	deg. C umhos/cm mg/L S.U. mV NTU	Specific Cond.: _ Dissolved Oxygen: _ pH: _ Eh: _		N CHECK Reading umhos mg/L S.U. mV	s/cm	Mark if Recalibrated
SAMPLE COLLECTION Appearance of Sample:	Time: 10:	der der		Sample Duplica			
NO./BOTTLES:   SIZE:   1000 ml   1 125 ml   ml   ml   ml   ml   ml   ml   ml	TYPE: FIL	None, HCl, HN no None, HCl, HN	PRESERV. NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z NO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , Z	ATIVE: ZnAc, TSP, BAK		PARAMETER: Sulfolane Sulfate	
SAMPLING PERSONNEL Name (SIGNATURE):	1	Chain	of Custody No SIGNATURE):				