

July 8, 2016

Mr. Shaun Lehman MDEQ-OOGM Lansing District Office Constitution Hall 2 South 525 West Allegan Street Lansing, MI 48913

Re: Groundwater Characterization Work Plan 2 Hartland 36 Gas Plant SE/NE/NW Section 36, T03N-R06E Hartland Township, Livingston County, Michigan

Dear Mr. Lehman:

This Groundwater Characterization Work Plan 2 (Work Plan) was compiled by Environmental Consulting & Technology, Inc. (ECT) and proposes additional groundwater assessment activities to address the sulfolane plume identified during facility decommissioning activities at the Hartland 36 Gas Plant (Site).

Project Location

The Site is located in the SE/NE/NW 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.

The closest surface waters to the Site are a pond located approximately 0.25 miles west, wetlands located approximately 180 feet southwest, 775 feet southeast, and 0.25 miles northeast, and a sand and gravel pit located approximately 0.5 miles north-northeast.

The closest water supply wells to the Site are located on the northern adjacent property (13390 Lone Tree Road) and consist of an irrigation well located approximately 950 feet north of the Site and the residential supply well located approximately 1,075 feet north of the Site. Additional discussion of residential supply wells are presented herein.

A Site Location Map, Site and Surrounding Properties Map, and Site Plan are attached as Figure 1, Figure 2, and Figure 3, respectively.

Project Background

Contaminated soil was discovered in September 2015 during facility decommissioning activities at the former sweetening plant/refrigeration building (sulfolane impact from the chemical sulfinol) and former inlet compressor building (used oil impact). Remediation activities (excavation) completed from September 2015 through December 2015 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 VSR sampling activities.*

3399 Veterans Drive Traverse City, MI 49684

(231) 946-8200

FAX (231) 946-8208 Sulfolane impacted soils extended to groundwater at the former sweetening plant/ refrigeration building (apparent source area). A groundwater sample (W-Pit) collected on October 15, 2015 from the excavation reported a concentration of sulfolane at 20,000 micrograms per liter (μ g/L).

In order to gather characteristics with regard to sulfolane impact in groundwater, and to determine groundwater flow characteristics, personnel from ECT oversaw and directed the installation of seven monitor wells (MW-1 through MW-7) and one temporary vertical profile monitor well (TMW-6) on October 29-30, 2015. Groundwater samples were collected from TMW-6 on October 30, 2015 from 65-70 feet below ground surface (ft bgs), 55-60 ft bgs, 45-50 ft bgs, and 35-40 ft bgs. Groundwater samples for laboratory analysis of sulfolane were collected from MW-1 through MW-7 on November 4-5, 2015 and January 27, 2016 (no sample was collected from MW-3 on January 27, 2016 due to the access issues) and from the excavation on November 13, 2015. Laboratory analytical results reported sulfolane as non-detect from all monitor wells except MW-7, which reported sulfolane concentrations of 880 μ g/L from the November 4-5, 2015 sampling event and 44 μ g/L from the January 27, 2016 sampling event. The groundwater sample collected from the excavation reported the concentration of sulfolane at 14,000 μ g/L.

A vertical and horizontal control survey of the monitor wells and excavations was completed by Gourdie-Fraser, Inc. on November 18, 2015. Static water levels and topof-casing (TOC) elevations from the monitor wells were utilized to calculate groundwater elevations for use with contouring software. The direction of groundwater flow, as determined from multiple monitor well gauging events, trends to the northeast.

For additional information regarding the initial groundwater characterization, please refer to the "Groundwater Characterization Work Plan" completed by ECT, dated February 23, 2016.

Preliminary Groundwater Characterization

In order to further refine the extent of groundwater impacted with sulfolane at the Site, and as a precursor to the installation of permanent monitor wells, personnel from ECT oversaw and directed the installation of eight shallow temporary monitor wells (TMW-01 through TMW-05 and TMW-07 through TMW-09) and two temporary vertical profile monitor wells (TMW-010 and TMW-011) on June 2, 2016. The TMW locations were incorporated into existing Site survey data by Gourdie-Fraser Associates (GFA) on June 9, 2016. *TMW locations are depicted on Figure 3*.

The shallow temporary monitor wells (TMWs) were installed using a direct-push drill rig. Soil samples were collected continuously from 15 ft bgs through the boring completion depths of 25 ft bgs, except boring TMW-01 which was advanced to 30 ft bgs, and were visually characterized and classified. Approximately five to ten feet of saturated silty/gravelly sand was identified in all of the shallow TMWs. Clay was encountered below the silty/gravelly sand layer at TMW-01 and TMW-03. Shallow temporary monitor wells were constructed of 1-inch PVC equipped with 5-foot long screens generally situated to straddle the groundwater table. Groundwater samples were collected from



the shallow TMWs immediately following installation using a peristaltic pump and new disposable polyethylene tubing. Subsequent to sample collection, the TMWs were removed and the borings were abandoned with bentonite.

The two temporary vertical profile monitor wells were installed using a truck mounted drill rig equipped with 4¼-inch ID hollow stem augers (HSAs). TMW-010, located generally downgradient of the apparent source area near the eastern boundary of the Site, was drilled to an approximate depth of 98 ft bgs. Two-foot split spoon samples were collected every five feet starting at 18 ft bgs. Gravelly and/or silty sands were encountered from 18 ft bgs to 94 ft bgs. A silt layer was encountered at 94 ft bgs to the remaining depth of the boring. Groundwater samples were collected from a 2-inch diameter temporary PVC monitor well from 90-95 ft bgs, 70-75 ft bgs, and 45-50 ft bgs using new disposable bailers. Prior to sample collection, approximately 200 gallons of groundwater was purged from each screened interval. Due to poor production from the surge bailer at the 45-50 ft bgs interval, a new disposable bailer was utilized to purge approximately 25 gallons of groundwater prior to sample collection. Subsequent to sample collection, TMW-010 was abandoned with bentonite.

TMW-011, located generally downgradient of the apparent source area adjacent to the excavation, was drilled to a completion depth of 36 ft bgs. Clay was encountered in two continuous 2-foot split spoon samples collected from 32-34 ft bgs and 34-36 ft bgs, thus confirming the presence of a confining layer at this location. Therefore, TMW-011 was screened above the clay at 27-32 ft bgs and a groundwater sample was collected using a new disposable bailer. Prior to sample collection, approximately 110 gallons of groundwater was purged from the well. Subsequent to sample collection, TMW-011 was abandoned with bentonite.

Interpolated cross section A-A' approximately bisects the Site from west to east and is attached as Figure 5. Interpolated cross section B-B' approximately bisects the Site from north to south and is attached as Figure 6. The cross sections depict soil lithology, the groundwater table, and groundwater contaminant concentrations. *Soil boring logs/monitor well construction diagrams are attached*.

In addition to the TMW sampling, static water levels and groundwater samples were collected from MW-1 through MW-7 on June 3, 2016. Static water levels were collected with an electronic water level meter (0.01 feet accuracy). Static water levels and top-of-casing (TOC) elevations from the monitor wells were utilized to calculate groundwater elevations for use with contouring software. The resulting groundwater flow direction is generally consistent with previous gauging events, trending to the northeast. It should be noted the groundwater elevation for MW-5 was not consistent with other elevations and was not utilized with the contouring software. The elevation discrepancy for MW-5 could be attributed to a clay layer identified at approximately 23 ft bgs (bottom of monitor well). Groundwater elevation data is included on the attached Table 1 and groundwater flow characteristics are depicted on the attached Figure 4 – Groundwater Flow Diagram.



Groundwater samples were collected from MW-1 through MW-7 using new disposable bailers. Prior to sample collection, approximately three times the water volume in the well casing at each monitor well was purged. Groundwater samples were collected into laboratory supplied containers, placed on ice, and shipped under chain-of-custody protocols to an independent/third party laboratory.

Groundwater Analytical Summary & Cleanup Criteria Comparison

No cleanup criteria for sulfolane have currently been established via Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (NREPA), Public Act 451 of 1994, as amended (Part 201). However, MDEQ-Remediation and Redevelopment Division (MDEQ-RRD) are in the process of developing cleanup criteria for sulfolane. An interim cleanup criteria for sulfolane of 90 µg/L was established by the MDEQ-Office of Oil, Gas, and Minerals (MDEQ-OOGM). The following presents a summary and comparison of groundwater analytical results to sulfolane cleanup criteria from permanent and temporary monitor well samples collected on June 2-3, 2016 at the Site:

Permanent monitor wells MW-1 through MW-7

- Sulfolane was reported as non-detect from MW-1 through MW-6.
- The concentration of sulfolane reported for MW-7 exceeded cleanup criteria. •

Temporary monitor wells TMW-01 through TMW-05 and TMW-07 through TMW-011

- Sulfolane was reported as non-detect from TMW-01, TMW-02, TMW-03, and • TMW-010.
- The concentration of sulfolane reported for TMW-04, TMW-05, TMW-07, TMW-08, TMW-09, and TMW-011 exceeded cleanup criteria.

Groundwater samples collected from MW-7, TMW-04, TMW-07, and TMW-08 from the June 2-3, 2016 sampling event were additionally analyzed for diisopropanolamine (DIPA). DIPA and sulfolane are constituents in sulfinol, a chemical that was used as part of gas plant operations at the Site. DIPA was reported as non-detect for each of the above mentioned groundwater samples.

Groundwater analytical results for the permanent monitor wells and the TMWs are summarized and compared to cleanup criteria on the attached Tables 2 and 3, respectively. Groundwater analytical results are also depicted on the attached Figure 7 -Groundwater Contaminant Concentration Diagram.

Residential Water Supply Well Sampling

Personnel from ECT collected samples from water supply wells at the following 12 residences in the vicinity of the Site:

- 13223 Lone Tree Road
- 13247 Lone Tree Road
- 13390 Lone Tree Road

- 900 Erin Lane
- 460 Jeni Lane
- 495 Jeni Lane
- 513 Jeni Lane
- 477 Jeni Lane
- 869 Pleasant Valley Road
- 13850 Cherry Blossom Ln
 13900 Cherry Blossom Ln
 13593 Sheila Lane



Sulfolane was reported as non-detect from all water supply well samples. Laboratory analytical reports from residential water supply well samples will be provided as a separate submittal.

Personnel from ECT completed a review of available water supply well records from the MDEQ GeoWebFace Application and Wellogic database (pre-2000 scanned records). Records were identified for the following wells that were sampled:

- 13390 Lone Tree Road (irrigation well)
- 477 Jeni Lane
- 495 Jeni Lane
- 869 Pleasant Valley Road

Information on the well records indicates static water levels ranged from 11 to 30 ft bgs and screened intervals ranged from 56-60 ft bgs to 74-78 ft bgs. Lithology was generally comprised of varying intervals of sand, gravel, and clay. *Well records for the four water supply wells noted above and additional water supply wells in the vicinity of the Site are attached.*

Installation of Additional Permanent Monitor Wells

In order to further refine and delineate the extent of groundwater impacted with sulfolane at the Site, as well as monitor groundwater contaminant plume characteristics, nine additional shallow permanent monitor wells and three additional vertical delineation permanent monitor wells are proposed.

The monitor wells will be installed using a truck mounted drill rig equipped with 4¼-inch ID hollow stem augers (HSAs). The monitor wells (2-inch diameter PVC) will be equipped with 5-foot screens. The shallow monitor wells will have the top of the screens situated near the groundwater table (approximately 20-25 ft bgs).

Two of the vertical delineation monitor wells will be installed along the eastern boundary of the Site generally downgradient of the apparent source area and will be screened from approximately 40-45 ft bgs. The third vertical delineation monitor well will be installed in the vicinity of the apparent source area. For this well, 2-foot split spoon samples will be collected every five feet beginning at 18 ft bgs until either a competent confining layer or a boring depth of 100 ft bgs has been reached. In the event that a competent confining layer is reached at a depth greater than 45 ft bgs, TMWs will be screened, purged, and sampled at distributed intervals from the boring depth up to 40-45 ft bgs, where the permanent monitor well will be set.

The proposed shallow monitor wells will be located as follows (refer to Figure 8):

- MW-8, MW-9, and MW-10 will be located to delineate and refine the extent of sulfolane impact identified at MW-7.
- MW-11 and MW-13 will be located for monitoring mid-gradient sulfolane concentrations.



- MW-12 will be located to monitor potential contaminant characteristics downgradient of the apparent source area at the eastern property boundary between monitor wells MW-4 and MW-6.
- MW-14 will be located to monitor sulfolane concentrations at the apparent source area.
- MW-15 and MW-16 will be located to further refine the extent of sulfolane impact reported from TMW-09.

New permanent monitor well locations and elevation data will be incorporated into existing data by GFA.

Groundwater Monitoring Activities

The nine shallow permanent monitor wells and 3 vertical permanent monitor wells will be sampled a minimum of three days following installation. Subsequently, quarterly groundwater monitoring of select monitor wells will be completed. At a minimum, monitoring will include collecting static water levels and groundwater samples.

Groundwater sampling will be completed in accordance with MDEQ-RRD Operational Memorandum No. 2, dated October 22, 2004 and USEPA EQASOP-GW 001 Region 1 Low-Stress (Low-Flow) SOP Revision 3, dated January 19, 2010. Groundwater samples will be submitted to an independent/third party laboratory for analysis of sulfolane by USEPA Method 8270D.

Project Status Reporting

Data obtained from permanent monitor well installation and sampling activities and quarterly groundwater monitoring will be summarized in Project Status/Update Reports. At a minimum, the reports will include a narrative summary of activities completed during the quarter, groundwater elevation and analytical summary tables, groundwater flow data, cleanup criteria comparisons, and conclusions and recommendations for project progression.

Schedule

Installation of permanent monitor wells will be scheduled within two weeks of MDEQ-OOGM concurrence with this Work Plan. The Project Status/Update Report summarizing permanent monitor well installation and sampling activities will be submitted to MDEQ-OOGM within two weeks of receiving the laboratory analytical report.



Closing

ECT sincerely appreciates the opportunity to provide our consulting services on this important project. Should you have questions or require additional information, please do not hesitate to contact me at your convenience at 231.946.8200 or jlewandowski@ectinc.com.

Sincerely, ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

Jeremy S. Lewandowski Senior Engineer

) in S Mon

Dirk S. Mammen Principal Scientist

CC: Sean Craven – Merit Energy Company

Attachments:

- Figure 1 Site Location Map
- Figure 2 Site and Surrounding Properties Map
- Figure 3 Site Plan
- Figure 4 Groundwater Flow Diagram
- Figure 5 Cross Section A-A'
- Figure 6 Cross Section B-B'
- Figure 7 Groundwater Contaminant Concentration Diagram
- Figure 8 Proposed Monitor Well Locations
- Table 1
 Groundwater Elevation Data
- Table 2 Sulfolane Analytical Summary & Cleanup Criteria Comparison Monitor Wells
- Table 3 Sulfolane Analytical Summary & Cleanup Criteria Comparison Temporary Monitor Wells

Boring/Monitor Well Logs

Residential Water Supply Well Records

Laboratory Analytical Report







Source: Google Earth, 2016.



Monitor Well

Temporary Monitor Well Location

Cross Section

Excavation Boundary

Fenceline



MERIT ENERGY COMPANY HARTLAND 36 NATURAL GAS PLANT

130685 - 2000 ECT PROJECT NUMBER

DESIGNED BY CHECKED BY

BJB JSL JSL APPROVED BY

SHEET TITLE

SITE PLAN

SCALE: 1" = 50 @ 11x17

25'



0

FIGURE

50'





Screened Interval (2" PVC 10-Slot)

----- Estimated Soil Layer Boundary

HORI	ΖO	ΝΤΑΙ	_ SCA	LE			
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MERIT ENERGY COMPANY HARTLAND 36 NATURAL GAS PLANT

130685 - 2000 ECT PROJECT NUMBER

DESIGNED BY CHECKED BY

BJB JSL APPROVED BY

SHEET TITLE

CROSS SECTION A-A'

SEE LEGEND FOR SCALE

FIGURE

5



Screened Interval (2" PVC 10-Slot)

----- Estimated Soil Layer Boundary

HOF	RIZ	олт	AL	SC	٩LE
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CROSS SECTION B-B'

SEE LEGEND FOR SCALE

FIGURE

6





 \odot Monitor Well

 \triangle Temporary Monitor Well

Proposed Monitor Well Location (Screened ~20-25' BGS)

Proposed Monitor Well Location (Screened ~20-25' BGS & ~40-45' BGS)

Excavation Boundary

Fenceline



MERIT ENERGY COMPANY **HARTLAND 36** NATURAL GAS PLANT

130685 - 2000 ECT PROJECT NUMBER

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SHEET TITLE

PROPOSED MONITOR WELL LOCATIONS

SCALE: 1" = 50 @ 11x17

25'



0

FIGURE 8

50'

TABLE 1											
	GROUNDWATER ELEVATION DATA										
Hartland 36 Cas Plant											
SE/NE/NW Section 36, TO3N-RO6E, Hartland Townshin Livingston County Michigan											
		,,	ЕСТ	Project #13-0685	·2000						
				30-0ct-15							
	TOC ELEVATION GROUND STATIC WATER GROUNDWATER WELL DEPTH WELL DEPTH STATIC WATER SCREENED										
LOCATION	(ft)	ELEVATION (FT)	LEVEL (ft btoc)	ELEVATION (fr)	(ft btoc)	(ft hgs)	LEVEL (ft høs)	INTERVAL (ft hgs)			
MW-1	1003.27	1000 5	20.84	982.43	27.9	25.1	18.07	20.1 - 25.1			
MW-2	1002.48	999.2	19.68	982.80	27.4	24.1	16.40	19.1 - 24.1			
MW-3	1005.07	1001.8	22.23	982.84	30.3	27.0	18.96	22.0 - 27.0			
MW-4	1005.00	1002.8	22.75	982.25	30.3	28.1	20.55	23.1 - 28.1			
			-	4-Nov-15		-					
	TOC ELEVATION	GROUND	STATIC WATER	GROUNDWATER	WELL DEPTH	WELL DEPTH	STATIC WATER	SCREENED			
LOCATION	(ft)	ELEVATION (FT)	LEVEL (ft btoc)	ELEVATION (ft)	(ft btoc)	(ft bgs)	LEVEL (ft bgs)	INTERVAL (ft bgs)			
MW-1	1003.27	1000.5	20.89	982.38	27.9	25.1	18.12	20.1 - 25.1			
MW-2	1002.48	999.2	19.76	982.72	27.4	24.1	16.48	19.1 - 24.1			
MW-3	1005.07	1001.8	22.31	982.76	30.3	27.0	19.04	22.0 - 27.0			
MW-4	1005.00	1002.8	22.80	982.20	30.3	28.1	20.60	23.1 - 28.1			
MW-5	1005.76	1003.5	23.20	982.56	25.3	23.0	20.94	18.0 - 23.0			
MW-6	1006.15	1003.7	24.00	982.15	32.8	30.4	21.55	25.4 - 30.4			
MW-7	1005.74	1002.9	23.45	982.29	30.4	27.6	20.61	22.6 - 27.6			
				13-Nov-15							
	TOC ELEVATION	GROUND	STATIC WATER	GROUNDWATER	WELL DEPTH	WELL DEPTH	STATIC WATER	SCREENED			
LOCATION	(ft)	ELEVATION (FT)	LEVEL (ft btoc)	ELEVATION (ft)	(ft btoc)	(ft bgs)	LEVEL (ft bgs)	INTERVAL (ft bgs)			
MW-1	1003.27	1000.5	20.99	982.28	27.9	25.1	18.22	20.1 - 25.1			
MW-2	1002.48	999.2	19.85	982.63	27.4	24.1	16.57	19.1 - 24.1			
MW-3	1005.07	1001.8	22.49	982.58	30.3	27.0	19.22	22.0 - 27.0			
MW-4	1005.00	1002.8	22.88	982.12	30.3	28.1	20.68	23.1 - 28.1			
MW-5	1005.76	1003.5	23.29	982.47	25.3	23.0	21.03	18.0 - 23.0			
MW-6	1006.15	1003.7	24.05	982.10	32.8	30.4	21.60	25.4 - 30.4			
MW-7	1005.74	1002.9	23.55	982.19	30.4	27.6	20.71	22.6 - 27.6			
				27-Jan-16							
	TOC ELEVATION	GROUND	STATIC WATER	GROUNDWATER	WELL DEPTH	WELL DEPTH	STATIC WATER	SCREENED			
LOCATION	(ft)	ELEVATION (FT)	LEVEL (ft btoc)	ELEVATION (ft)	(ft btoc)	(ft bgs)	LEVEL (ft bgs)	INTERVAL (ft bgs)			
MW-1	1003.27	1000.5	21.41	981.86	27.9	25.1	18.64	20.1 - 25.1			
MW-2	1002.48	999.2	20.38	982.10	27.4	24.1	17.10	19.1 - 24.1			
MW-3	1005.07	1001.8			30.3	27.0		22.0 - 27.0			
MW-4	1005.00	1002.8	23.30	981.70	30.3	28.1	21.10	23.1 - 28.1			
MW-5	1005.76	1003.5	23.78	981.98	25.3	23.0	21.52	18.0 - 23.0			
MW-6	1006.15	1003.7	24.49	981.66	32.8	30.4	22.04	25.4 - 30.4			
MW-7	1005.74	1002.9	23.96	981.78	30.4	27.6	21.12	22.6 - 27.6			
		-	-	3-Jun-16			-				
	TOC ELEVATION	GROUND	STATIC WATER	GROUNDWATER	WELL DEPTH	WELL DEPTH	STATIC WATER	SCREENED			
LOCATION	(ft)	ELEVATION (FT)	LEVEL (ft btoc)	ELEVATION (ft)	(ft btoc)	(ft bgs)	LEVEL (ft bgs)	INTERVAL (ft bgs)			
MW-1	1003.27	1000.5	20.15	983.12	27.9	25.1	17.38	20.1 - 25.1			
MW-2	1002.48	999.2	18.48	984.00	27.4	24.1	15.20	19.1 - 24.1			
MW-3	1005.07	1001.8	21.27	983.80	30.3	27.0	18.00	22.0 - 27.0			
MW-4	1005.00	1002.8	22.23	982.77	30.3	28.1	20.03	23.1 - 28.1			
MW-5	1005.76	1003.5	22.57	983.19	25.3	23.0	20.31	18.0 - 23.0			
MW-6	1006.15	1003.7	23.42	982.73	32.8	30.4	20.97	25.4 - 30.4			
MW-7	1005.74	1002.9	22.76	982.98	30.4	27.6	19.92	22.6 - 27.6			



TABLE	2

SULFOLANE ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON - MONITOR WELLS Hartland 36 Gas Plant

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

Hartland Township, Livingston County, Michigan

ECT Project #13-0685-2000

	Screened	Sulfolane by EPA Method 8270D (µg/L)					
Sample Location	Interval (ft bgs)	10/15/2015	11/4-5/2015	11/13/2015	1/27/2016	6/6/2016	
W-Pit		20,000		14,000			
MW-1	20.1-25.1		<10		<10	<10	
MW-2	19.1-24.1		<10		<10	<10	
MW-3	22.0-27.0		<10			<10	
MW-4	23.1-28.1		<10		<10	<10	
MW-5	18.0-23.0		<10		<10	<10	
MW-6	25.4-30.4		<10		<10	<10	
MW-7	22.6-27.6		880		44	450 (510) ⁹	
MDEQ-OOGM Cle	anup Criteria			90			
Collection N	Method	Grab	LF	LF	LF	Grab	

Notes

1) ft/bgs - Feet below ground surface.

2) Collection method - Grab (bailer or peristaltic pump), low flow (LF), Bailer.

3) µg/L - Micrograms per liter, equivalent to parts per billion (ppb).

4) (---) - Not sampled.

5) nd - Concentration not detected above reporting limit.

6) (###) - Concentration is for duplicate sample.

7) Cleanup criteria for sulfolane established by MDEQ-Office of Oil, Gas, and Minerals (MDEQ-OOGM).

8) Concentrations that are shaded and bold exceed cleanup criteria.

9) Sample also collected and reported "nd" for diisopropanolamine (DIPA).



SULFOLANE ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON - TEMPORARY MONITOR WELLS Hartland 36 Gas Plant SE/NE/NW Section 36, T03N-R06E, Hartland Township, Livingston County, Michigan ECT Project #13-0685-2000						
Sulfolane by EPA Method 8270D						
Sample Location	bgs)	10/30/2015	6/2/2016			
TMW-6	35-40	<10				
TMW-6	45-50	<10				
TMW-6	55-60	<10				
TMW-6	65-70	<10				
TMW-01	25-30		<11			
TMW-02	20-25		<10			
TMW-03	18-23		<10			
TMW-04 ⁹	19-24		2,600			
TMW-05	16.5-21.5		4,500			
TMW-07 ⁹	19-24		4,200 (3,900)			
TMW-08 ⁹	19-24		710			
TMW-09	18-23		5,900			
TMW-010	90-95		<10			
TMW-010	70-75		<10			
TMW-010	45-50		<10			
TMW-011	27-32		4,800			
MDEQ-OOGM Cleanu	up Criteria	9	0			
Collection Met	Gr	ab				

TABLE 3

Notes

1) ft/bgs - Feet below ground surface.

- 2) Collection method Grab (bailer or peristaltic pump), low flow (LF), Bailer.
- **3)** μ g/L Micrograms per liter, equivalent to parts per billion (ppb).
- 4) (---) Not sampled.
- 5) nd Concentration not detected above reporting limit.
- 6) (###) Concentration is for duplicate sample.

7) Cleanup criteria for sulfolane established by MDEQ-Office of Oil, Gas, and Minerals (MDEQ-OOGM).

8) Concentrations that are shaded and bold exceed cleanup criteria.

9) Sample also collected and reported "nd" for diisopropanolamine (DIPA).

































ECT Environmental Consulting & Technology, Inc.					ental & Inc.	BORING LOG DIAG	GRAM: TM	W-010		
www.ectinc.com						(Page 1 of 5)				
Merit Energy Company 1510 Thomas Road Kalkaska, Michigan 49646						Date Completed : 6/2/2016 Boring Location : Former Hartland 36 Gas Plant Hole Diameter : 8 inches : SE/NE/NW Section 36 Drilling Company : Shepler Well Drilling : T03N-R06E Drilling Method : 4.25" ID HSAs : Hartland Twp, Livingston Co, N				
	Proje	ect #13	-0685-	-1800 I		Drill Rig : Truck-mounted Mobile Drill B-57				
Depth in Feet	nscs	GRAPHIC	PID (ppm)	Blow Count	Recovery (in)	DESCRIPTION	Well: TOC	TMW-010 Elevation:		
	GP			19	16	Brown, fine to medium SAND with fine to coarse GRAVEL Brown, fine SAND, trace fine GRAVEL		—2" Sch 40 PVC Casing		
20-										

ECT Environmental Consulting & Technology, Inc.					ental & Inc.	BORING LOG DIAGRA	M: TM	IW-010
www.ectinc.com								(Page 2 of 5)
Merit Energy Company 1510 Thomas Road Kalkaska, Michigan 49646						Date Completed : 6/2/2016 Boring Hole Diameter : 8 inches Boring Drilling Company : Shepler Well Drilling Drilling Drilling Method : 4.25" ID HSAs Boring	g Location	: Former Hartland 36 Gas Plant : SE/NE/NW Section 36 : T03N-R06E : Hartland Twp, Livingston Co, MI
	Proje	ct #13	-0685 [.]	-1800		Drill Rig : Truck-mounted Mobile Drill B-57		
Depth in Feet	USCS	GRAPHIC	PID (ppm)	Blow Count	Recovery (in)	DESCRIPTION	Well: TOC	TMW-010 Elevation:
20-						No split spoon samples		
-								
25—	SP			7 4 4 8	12	Brown, fine to coarse SAND, trace fine GRAVEL, wet		
-						No split spoon samples	_	
30-	SP-GP			8 14 23 26	14	Brown, coarse SAND and fine to coarse GRAVEL, wet		— 2" Sch 40 PVC Casing
-						No split spoon samples		
35 —				70	0			
-						No split spoon samples		
40-	GP			8 19	18	Brown, fine to coarse GRAVEL, some fine to coarse SAND, wet		

Environmental Consulting & Technology, Inc.					ental & Inc.	BORING LOG DIAG	RAM: TMW-010	
	W	ww.ec	tinc.c	от			(Page 3 of 5)	
1510 Thomas Road Kalkaska, Michigan 49646						Date Completed : 6/2/2016 Hole Diameter : 8 inches Drilling Company : Shepler Well Drilling Drilling Method : 4.25" ID HSAs	Boring Location : Former Hartland 36 Gas Plant : SE/NE/NW Section 36 : T03N-R06E : Hartland Twp, Livingston Co, MI	
	Proje	ect #13	-0685	-1800		Drill Rig : Truck-mounted Mobile Drill B-57	1	
Depth in Feet	uscs	GRAPHIC	PID (ppm)	Blow Count	Recovery (in)	DESCRIPTION	Well: TMW-010 TOC Elevation:	
40-	GP			23 26	18	Brown, coarse GRAVEL with some fines, little fine to coarse SAND, wet		
						No split spoon samples		
	-							
45 -	GP			35 70	3	Brown, fine to coarse GRAVEL, trace coarse SAND, wet		
	-					No split spoon samples	10-Slot PVC Screen	
50-	GP			27 26	15	Brown, coarse GRAVEL, trace coarse SAND, wet		
50-	SP			24 23	15	Brown, fine to coarse SAND, trace fine GRAVEL, wet		
	-					No split spoon samples		
	SP			9 13		Brown, fine to coarse SAND, trace fine GRAVEL, wet		
55-	SP			23 23	12	Brown, fine to medium SAND, trace fine GRAVEL, wet		
						No split spoon samples		
60-	SP			8 14	14	Brown, fine to coarse SAND, trace fine GRAVEL, wet		
Ē	C	7	C	Environm onsulting chnology,	ental & Inc.	BORING LOG DIAG	RAM: TM	W-010
---------------------	------------------------	--------------------------	---------------------------	------------------------------------	--------------------	--	-----------------	---
	WV	ww.eci	tinc.c	om				(Page 4 of 5)
	Merit 151 Kalkas	Energ 0 Tho ka, Mi	gy Con mas R chigan	npany oad 149646		Date Completed : 6/2/2016 Hole Diameter : 8 inches Drilling Company : Shepler Well Drilling Drilling Method : 4.25" ID HSAs	Boring Location	: Former Hartland 36 Gas Plant : SE/NE/NW Section 36 : T03N-R06E : Hartland Twp, Livingston Co, MI
	Proje	ect #13	-0685 [.] I	-1800 I		Drill Rig : Truck-mounted Mobile Drill B-57		
Depth in Feet	USCS	GRAPHIC	PID (ppm)	Blow Count	Recovery (in)	DESCRIPTION	Well: TOC	TMW-010 Elevation:
60-	SM			19 21	14	Brown with gray hue, fine silty SAND, wet		
-						No split spoon samples		
65-	SP			9 23	15	Gray with brown hue, coarse SAND, trace fine GRAVEL, wet		
_	SM			33 33		Gray with brown hue, fine SAND, some SILT, wet		
	SP			9 19	17	Brown, fine to coarse SAND with fine GRAVEL		
_				23 27				
-						No split spoon samples		— 10-Slot PVC Screen
75-	SP			14 17 25 27	14	Gray with brown hue, fine to medium SAND, little SILT, wet		
-	SM			9	16	No split spoon samples Brown with gray hue, fine to medium, SILTY SANE trace fine GRAVEL work	D,	
80-				23	Ĵ			

Ē	C	7	Co Teo	Environm onsulting chnology	ental & Inc.	BORING LOG DIAGRAM: TMW-010					
	WW	ww.ect	tinc.co	om			(Page 5 of 5)				
	Merit 151 Kalkas	Energ 0 Thoi ka, Mie	y Corr mas R chigan	npany oad 49646		Date Completed : 6/2/2016 Hole Diameter : 8 inches Drilling Company : Shepler Well Drilling Drilling Method : 4.25" ID HSAs	Boring Location : Former Hartland 36 Gas Plant : SE/NE/NW Section 36 : T03N-R06E : Hartland Twp, Livingston Co, MI				
	FIUJE		-0065-	-1800							
Depth in Feet	NSCS	GRAPHIC	PID (ppm)	Blow Count	Recovery (in)	DESCRIPTION	Well: TMW-010 TOC Elevation:				
80-	SM			25	16	1					
-				28		No split spoon samples					
-											
85—	SM			9 19 24 27	14	Light gray with brown hue, fine to coarse SILTY SAND, trace fine GRAVEL, wet					
-						No split spoon samples					
90-	SM			9 13 17 21	17	Light gray with brown hue, fine to coarse SILTY SAND, some fine GRAVEL, wet					
-						No split spoon samples					
-	SP			9 17		Light gray, fine to medium SAND, trace fine GRAVEL, wet					
95 —	ML			21 24	23	Grey, soft SILT					
-	SM-ML			3 6 8 13	16	Light grey, very fine SAND, some SILT, trace fine GRAVEL, wet					
						End of Boring @ 98' bgs					
100-											



GEOLOGICAL SURVEY NO.

LTION OF

.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

WATER WELL AND PUMP RECORD

92–003N PERMIT NUMBER

į

County	Township Name		Fraction	Section Number Town Number Range Number
Livingston	Hartland		NW 1/4	NE 1/4 NE 1/4 36 3N N/S 6F E/A
Distance And Direction From Road Int	ersection		- 1 TALK	3 OWNER OF WELL: Lidsco Inc.
13390 Lone Tree Rd.	RE	K.Y.		P.O. Box 174
		CEIV		Address Logans Place West
	MAV	4	- Call	Traverse City, MI 49665
Street Address & City of Well Location	n	1 1 100	n	Address Same As Well Location? 🗌 Yes 🛛 🔀 No
Locate with "X" in Section Below	LIVINGS	etch Map:	٢	4 WELL DEPTH: Date Completed
	"EALTH D	EPACOUNT	v	73 FT. 1 6 92 Beplacement Well
		" AHTMEN	ir i	5 🖸 Cable tool 🕱 Rotary 🗌 Driven 🗌 Dug
				Bollow rod Auger Jetted
₩ <u></u> <u>+</u> <u></u> <u>+</u> <u>+</u> <u>+</u> = <u>+</u> <u>-</u> -				6 USE: Domestic Type I Public Type III Public
				Type IIa Public Heat pump
				Test Well Type IIb Public
				7 CASING: Steel Threaded Height: Above/Below
				KXPlastic X Welded Surface ft.
	BIPTIÓN	THICKNESS	DEPTH TO BOTTOM OF	5"PVC in to 63, ft. depth 1 Weight lbs./ft.SDR-
		STRATUM	STRATUM	in_toft. depth
				in, to ft, depth Drive Shoe Yes
Brown Clay		19	19	m. to ft. depth XX No
			** -	8 SCREEN: Not Installed
Gray Clay	······································	22	41	Type Diameter5"
				Slot/Gave Longth
Sand and Gravel		39	80	Sot between63 ft. and73 ft.
				FITTINGS: 🛄 K-Packer 🔲 Lead Packer 🛄 Bremer Check
				Blank above screen It. Other
				9 STATIC WATER LEVEL:
				ft. below land surface Flow
				10 PUMPING LEVEL: below land surface
				ft. after hrs. pumping at G.P.M.
				COMPLETION: Pilless adapter X 12" above grade
	<u></u>			Basement offset Approved pit
				No X Yes From to 40 f
· · · · · · · · · · · · · · · · · · ·	·····			
<u> </u>				IND. of bags of cement Additives I3 Nearest source of possible contamination
				Type Distance ^{fl} Direction
······································				Well disinfected upon completion?
				Was old well plugged?
				14 PUMP: Not lostallad
****	<u>a e 7</u>	: 511	C M	Madel sumber 500 Mater
	171 64 64 9.83.46 19.44	× λ., Γ. Υ 	ليا شا الأسمانيا ما	Provention of Drop Rice fragments and the constant
	инан. Бөрг	, v; r'uù	ne mean	H Congin of Drop Pipe It. capacity G,P.N
	£1.4 k	1 1 6 401	ካማ	PRESSURE TANK:
· · · · · · · · · · · · · · · · · · ·		1 T Q (Q)	٥٢.	Manufacturer's name
USE A 2ND SHEET IF	NEEDED			Model number Gallo
15. Remarks, elevation, source of	data, etc. BUREAU OF E	NVIRONME	NGAWATE	R WELL CONTRACTOR'S CERTIFICATION:
	GCCUPATIO	NAL HEAL	I H-GWA	ell was drilled under my jurisdiction and this report is true best of my knowledge and belief
				Second in the second seco
				BROWN DRILLING COMPANY, INC. 47-2072
17. Rig Operator's Name:		•	Address	ss 7215 E. M59 Howell. MI 48843
				the second in success
	· · · · · · · · · · · · · · · · · · ·		Signod	AUTHORIZED AEPRESENTATIVE
)67d 2/89				Authority: Act 368 PA 1978
				Completion: Required Penalty: Conviction of a violativ
	G	eologic	AL SURVE	EY COPY of any provision is a misdemeanor.

MICHIGAN	DEPART	MENT OF	
GEOLOGICAL SURVEY NO. WATER	WELL /	AND PU	
1 LOCATION OF WELL			FERMITAGMIDEN
County Township Name		Fraction	Section Number Town Number Range Number
Amenderten plante	in ba	NWh/4	SEVA NFVA = 36 3 (N/3 G (E/W
Distance And Direction From Road Intersection			3 OWNER OF WELL'O Calkins
In mile Hours y con	t-ye-ye-	0	Address 177 August and and a
in M. W. Corner 13 Q	mai	have	melhon approximately 580
Street Address & City of Well Location		/	Address Same As Well Location?
Locate with "X" in Soction Bolow Si	etch Map:		4 WELL DEPTH: Date Completed 1 Mo DAY - YEAR I New Well 1 MO OA E OOD
			5 Cable tool Repay Driven Dur
	×-1	.1	Hollow rod Auger Jetted
		V 27 27	6 USE: Morrastic Type I Public Type III Public
		<u>_</u>	🔲 Irrigation 🔲 Type IIa Public 🛛 🛄 Heat pump
F Comm	encel		7 CASING: Double Type IIb Public
			Diameter Steel Inreaded Height: Above/Below
	THICKNESS	DEPTH TO	5 in to 74 ft. depth Weight 15./ft.
	STRATUM	STRATUM	in toft. depth Grout%ty Druit Hole Diameter
Run loud	11	11	ft. depth Drive Sinde Drive Sinde
faller at		//	8 SCREEN:
Din, Claus	3	14	Type S. S. Diameter
R na Mara		(سر إسمد	Slot/GauzerLongth
Din. XIara Prew.	8	2A	Set betweenft. andft.
Bin David & Ala.	6	28	FITTINGS: 13, K-Packer 1, Lead Packer 1, Bremer Check
A AD AT			9 STATIC WATER LEVEL:
Due Clay & Fran.	18	46	ft. below land surface
Burn ala	9	5-	10 PUMPING LEVEL: below land surface
Dina Leau	/	82	$\frac{\partial K(f)}{\partial t}$ ft. after $\frac{\partial k}{\partial t}$ hrs. pumping at $\frac{\partial K(f)}{\partial t}$ G.P.M.
Than N. Frav.	23	18	
			11 WELL HEAD COMPLETION: Pitless adapter X 12° above grade
	-		Basement offset Approved pit
			No Yes From $\frac{100}{100}$ to $\frac{100}{100}$ ft.
			Neat cement Bentonite Othor
			No. of bags of cement Additives
			Type State Distance IDDAL Direction NE
La			Well disinfected upon completion?
			Was old woll plugged? Yes 🗋 No
			14 PUMP: Not Installed Pump Installation Only
			Manufacturer's name Theylo
			Madel number <u>E. P. 2007 (2004)</u> Volts <u>as 200</u>
REC	1 1 1 m		TYPE: X Submorsible Jet
Mich. Dept.			PRESSURE TANK: INOPLX-TILLE
) "UBIIC	Health	Model number 203 Canadity 60 Gallane
15. Remarks, elevation, source of data, etc.	8 1991	16. WATE	R WELL CONTRACTOR'S CERTIFICATION:
BUREAU OF	i ne ne j	This we to the b	II was drilled under my jurisdiction and this report is true $1.3.4874$ est of my knowledge and belief.
OCCUPATIONA.	ONMENTAL	AND 2.	long Well Drilling Ance.
17 Big Operator's Name:	ICALTH-GU	vas 7	REGISTERED BUSINESS NAME UREGISTRATION NO. 10 Cond
Carata 2:0 cm		Addres:	1048356
Dezd 2000		Signed	AUTHORIZED REPRESENTATIVE Date
			Authofity: Act 368 PA 1978 Completion: Required
'r	searactic	AL SUDVAY	Penalty: Conviction of a violation of any provision is a
•		OF OVITAL	miseener.





 $Completion \ is \ required \ under \ authority \ of \ Part \ 127 \ Act \ 368 \ PA \ 1978.$

Failure to comply is a misdemeanor.

Tax No: 4708-36-300-022	Permit No: 1003-01111	County: Living	ston		Township:	Hartland	
	22022	Town/Range: 03N 06E	Section: 36	Well Status: Active	WSSN	: Source	e ID/Well No:
)ZZÖZZ	Distance and D	irection from	m Road Inters	section:		
Elevation:		NORTH OF CO	MMERCE 1/	8 MILE OFF C	OF JENI LAN	E	
		Well Owner:					
		Well Address:			Owner Add	ress:	
Longitude: -83.68763		495 JENI LAN	E		56861 GR/	AND RIVER P	O BOX 328
Method of Collection: Interpolation	on-Map	HARTLAND, N	AI 48353		NEW HUD	SON, MI 4816	5
Drilling Method: Rotary		Pump Inst	alled: Yes	S	Pump In	stallation Onl	y: No
Well Depth: 65.00 ft. Wel	IUse: Household	Pump Inst	allation Date	e: 10/25/2003	3 HP: 0.50)	
Well Type: New Date	e Completed: 10/7/2003	Manufactu	irer: Red	Jacket	Pump Ty	pe: Submer	sible
Casing Type: PVC plastic	Model Nur	nber: 9BC	, 00.4	Pump Ca	apacity: 100	ЭРМ	
Casing Joint: Weided		Drop Pipe	Diameter:	.00 II. 40 00 in	Drilling F	Picage:	
Cusing Fitting. None		Draw Dow	n Seal Used	40.00 m.	Drining i		
Diameter: 5.00 in. to 61.00 ft. depth		Pressure 1	Tank Installe	ed: Yes			
4.00 in. to 65.00 ft. depth		Pressure 1	Fank Type:	Diaphragm/	bladder		
		Manufactu	irer: Chan	npion			
Borehole: 8.75 in. to 65.00 ft. depth		Model Nur	nber: CM8	3003	Tank Ca	apacity: 32.0) Gallons
		Pressure I	Relief Valve	Installed:	No		
Static Water Level: 10.00 ft. Below Gr	ade						Depth to
Well Yield Test:	Yield Test Method: Air		Formation	n Description		Inickness	Bottom
Pumping level 10.00 ft. after 2.00 hrs. at	35 GPM	Brown San	d & Gravel			8.00	8.00
		Brown Clay	/			7.00	15.00
Screen Installed: Yes Filte	r Packed Ves	Gray Clay	a			21.00	30.00 49.00
Screen Diameter: 4 00 in Blan		Gray Sand				16.00	65.00
Screen Material Type: PVC-slotted						10.00	00.00
Slot Length	Set Between						Ì
12.00 4.00 ft.	61.00 ft. and 65.00 ft.						
Fittings: None							
Well Grouted: Yes Grouting M	ethod: Grout pipe outside casi	ng				ł	ł
Grouting Material Bags Additiv	ves Depth	·9					
Bentonite slurry 6.00 None	0.00 ft. to 60.00 ft.	Geology R	emarks:				
Wellhead Completion: 12 inches abo	ve grade						
Nearest Source of Possible Contamina	ation:	Drilling Ma	achine Oper	ator Name:	RICH MINE	R	
Туре С	Distance Direction	Employme	ent: Employ	vee			
Septic tank 7	75 ft. West						
		Contracto	r Type: Wat	ter Well Drillin	g Contractor	Reg No:	47-1924
		Business	Name: Kell	er Well Drilling	g, Inc.		
		business .	Watar		road, Howell	n, IVII, 48843	
		This well w	as drilled un	der my superv	vision and this	s report is true	to the best of
		my knowle	dge and belie	ef.			
		Signature	of Registere	ed Contractor	r	Date	
General Remarks:		· •	-				
Other Remarks: Map Scale:Unknown							





Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Tax No: 008-35-200-018	Permit No:		County: Living	ston		Township:	Hartland	
			Town/Range: 03N 06E	Section: 35	Well Status:	WSSN	I: Source	e ID/Well No:
	JU15U16		Distance and D	irection fror	n Road Inters	section:		
Elevation: 1025 ft.			869 PLEASANT	VALLEY RD).			
Latitude: 42.6184420715			Well Owner: N	ICDONALD,	ROBERT			
Longitude: -83.6987349242			Well Address:			Owner Add	dress:	
Method of Collection: Interpo	olation-Map		869 PLEASAN MILFORD, MI	T VALLEY R 48042	D.	869 PLEA MILFORD	SANT VALLEY 9, MI 48042	′RD.
Drilling Method: Cable Tool			Pump Inst	alled: Yes	6	Pump Ir	stallation Onl	y: No
Well Depth: 60.00 ft.	Well Use: Househol	d	Pump Inst	allation Date):	HP:		
Well Type: Replacement	Date Completed: 1	0/13/1984	Manufactu	rer: Redu	Jacket	Pump I	ype: Submer	
Casing Joint: Welded	neight.		Drop Pipe	length: 4	3 00 ft	Pump V	oltage:	
Casing Fitting: Drive shoe			Drop Pipe	Diameter:	0.001	Drilling	Record ID:	
			Draw Dow	n Seal Used	: No			
Diameter: 4.00 in. to 56.00 ft. depth	1		Pressure 1 Pressure F	ank Installe Relief Valve	ed: No Installed:	No		
Borehole:								
Static Water Level: 30.00 ft. Below Well Yield Test:	v Grade Yield Test Metho	d: Unknown		Formation	Description		Thickness	Depth to Bottom
Pumping level 43.00 ft. after 1.00 hr	s. at 50 GPM		Brown Clay	& Gravel			18.00	18.00
			Brown San	d			34.00	52.00
			Gravel Coa	rse Water Be	earing		8.00	60.00
Screen Installed: Yes	Filter Packed: No							
Screen Diameter: 3.00 m.	DIANK: 1.00 IL ADOVE							
Slot Length	Set Between							
15.00 4.00 ft.	56.00 ft. and 60.0	0 ft.						
							-	
Fittings: Neoprene packer								
Well Grouted: No								
				-				
			Geology R	emarks:				
Wellhead Completion: Pitless ad	apter							
Nearest Source of Possible Conta	mination:		Drilling Ma	chine Opera	ator Name:			
Туре	Distance	Direction	Employme	nt: Unknow	vn			
Septic tank	75 ft.	Southeast	Contractor				Der Nei	45.0440
Abandoned Well Plugged: No			Business	Name:	nown		Reg No:	15-0413
Reason Not Plugged:			Business	Address:				
				Water V	Well Contra	actor's C	ertification	
			This well w my knowled	as drilled und Ige and belie	der my superv ef.	ision and th	is report is true	to the best of
			Signature	of Registere	ed Contractor		Date	
General Remarks:								
other Remarks:								

TAX ND:	PERMIT NO: 58-0817NW	Page of 1	· · · · · · · · · · · · · · · · · · ·				
1. LOCATION OF WELL County Township Name F LIVINGSTON HARTLAND D	Fraction NE 1/4 SW 1/4 SW 1/4	Section No 36	Town Na 3 N	Range Number 6 E			
Distance And Direction From Road Intersect 1/2 MILE NORTH OF COMMERCE RD AND 1/4 MILE Well Addr: 499 JENI LANE	Address AT Address 47 HI Address Same as M	W. CUTHRAN 1934 FERNWOOD APRT 1 IXON MI 48393 Well Location? NO	12112				
Locate with 'X' in Sec. Below - + - + - + - + - + - + - + - + - + - +	4. WELL DEPTH Dat 70 ft. 11/ 5. EQUIPMENT USED: F 6. WELL USE: HOUSEHO 7. CASING Type: PLAS Diam. 5 in. to 60 in. to BORE HOLE: 9.3/6 in to 70	 4. WELL DEPTH Date Compl This is a: 70 ft. 11/10/98 NEW WELL 5. EQUIPMENT USED: RDTARY 6. WELL USE: HOUSEHOLD 7. CASING Type: PLASTIC Connection: WELDED Diam. Height ABOVE 5 in. to 60 ft. Surface 1 ft in. to ft. Weight 1b./ft. BORE HOLE: Drive Shoe NO 0. 216 in. to 70 ft. Drive Shoe NO 					
Formation Description	Thickness Depth	= 8 3/4 1n. to /0 in. to	ft. Snaie ft.	Packer NJ			
BRGIAN CLAY GRAY CLAY GRAY SAND & GRAVEL		 8. Screen Type: SLOT SLOT 15 Set Between 60 Fittings: 9. Static Level: 25 10. Pumping Level bel 70 ft. after 1 [_3 Plunger 1] 11. Well Head Complet 12. Brouted from 57 No. of Bags 6 13. Nearest source of Tupe: SEDIC TOD 	TED Diam: Length ft. and 70 ft. [] Blank ft. Flow: low land surface: l hrs. 0 50] Bailer [X] Ai tion: PITLESS ADAPTM to 0 ft Mate bags Additives: Ei f possible contamina	5 [_] Not Inst. 1: 10 k above scrn: ft [N] GPM ir [_] Test Pump ER erial: BENGERL Z MUD ation: ft Dime EOST	RECEIVED NOV 2 4 1998 LIV. CTY. HEALTH DEPT.		
 15. Abandoned Well Plugged? NO PAC Casing Diameter in. Depth Plugging Material: No. of Bags Casing Removed? 16. Remarks, elevation, source of data, etc PUMP - JEFF BABINGER 17. Drilling Machine Operator: IXJ Employ Name PARL WENDLING 6W-2-228 9/93 Authority: Act 368 PA 1978 Completion: Required Penalty: Conviction of a violation is a misdemeanor. 	Ivpe: SEPIIC IAW Type: 14. Pump: [_] Not In: Manufacturer's Na Model: 75CNICN6CI Drop pipe: 40 Pump type: SUBMEI Pressure Tank Man Model: 251 WATER WELL CONTRACTO This well was drillo is true to the best Registered Bus. Nam Business Maress Signed Authorized Re	A Distance: AU Distance: Stalled [_] Install ame: RED JACKET C HP: 0.75 ft. Capacity: 18 RSIBLE nufacturer's Name : Capacity: 19 DR'S CERTIFICATION: ed under my jurisdin of my knowledge and e ED BIRKMEIER WELL 10655-Easton Road	rt. Dir: EASI ft. Dir: lation Only Voltage: 230 EPM WELL X-TROL Gal. Ction and this report d belief. DRILLING LTD 1607 New Lothrop MI 48460 Date				

Mich. Dept. of Public Health Ruth. No. 89-12-001 Geological Survey Copy

	MICHIGAN	DEPART	MENT OF	F PUBLIC HEA			[
GEOLOGICAL SURVEY NO.	WATER			JMP RECO	RD	PERMIT N	JMBER
1 LOCATION OF WELL	unchia Nama	PANT 127	Crastian	. 1978	ation Mumber	7	Decision No. 1
Livingston	Hartland		mw _{1/4}	ne 1/4 ne 1/4	36		Hange Number
Distance And Direction From Road Interse West of Tipsico Lai	ection ke Rd _a on sout	th side.		3 OWNER OF WI Address	Niles 13844 Milfør	Shelton Lone Tree H d, Mi 4804	id.
Street Address & City of Well Location				Address Same	As Well Location	17 🗷 Yes 🗋	No
Locate with "X" in Section Below	Sk	etch Map:		4 WELL DEPTH: 1	(completed) 5 ft.	Date of Completion	1984
				6 USE: A Domest	ic Дтуре I F	Public	Type III Public
				7 CASING Diameter St	el Type IIb eel X Threads	ed Height: Above	/Below
2 FORMATION DESCRIP	TIÓN	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	4 in. to in. to Grauted Drill Ha	81 It. depth ft. depth ble Diameter	Surface Weight]	(t. •lbs./ft. □¶971
Brown Sandy Clay		11	11	in. to	(I. depth	Drive Shoe	In Yes
Gray Clay & Gravel		17	28	8 SCREEN: JO	hason	Not Ins	talled
Brown Sandy& Gravel	- 4"	13	41	Slot/Geoze	.0 L L 	engthf	1.
Brown Gravel Coarse		31	72	FITTINGS:	K-Packer 🙀 I screen	ead Packer 🔲 8	remer Check
Gray Gravel		7	79	51	LEVEL: ft. below land a	surface	Elow
Gray Sand		6	85	(i. a	ofter hrs. p	iumping at iumping at	G.P.M. G.P.M.
· · · · · · · · · · · · · · · · · · ·				11 WELL HEAD COMPLETION:	Pitless ada	offsot Appro	oovo grade ved pit
					No D	Yes From	to ft. Mad Slarr
· 			<u>.</u>	No. of bags of c	ement A	Additives	
				Түре 	ntic Distant	ce <u>75 ^{ft.} Direc</u>	tion
Ëźi	KECEIVE! ichDeptof_Pub!) ic Neslik		Well disinfected	upon completion?	Yes	No
	<u> </u>	ő		Manufacturer's i Model number _	name <u>Mo'Do;</u> 18050%2	nald	lts 230
Бц Ос	reau-of-Environm coupational Hoalth	etter and • GWQS		Length of Drop	Pipe 70 Submersible	ft. capacity	15 G.P.M.
	L VISIM			Manufacturer's (Model number	name <u>A1r G</u>	uard	42 Gallons
15. Remarks, elevation, source of dat $JAN18$	ia, etc. 1985		16. WATE This we to the b	R WELL CONTRAC	TOR'S CERTIFIC ny jurisdiction and and bolie(.	ATION: this report is true	
Livingston Cou Departm	nty Health ent		B Address	REGISTERE BREISINES	ng Co., I	REGISTRATIO	26 T NO.
D67d (Rev. 10-80)	· · ·		Signed	AUTHORIZED	REPRESENTATIVE	Date	

GEOLOGICAL SURVEY COPY





Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Tax No: 008-35-200-003	Permit No:	County: Living	ston		Township:	Hartland	
		Town/Range:	Section:	Well Status:	WSSN	Source	e ID/Well No:
)15026	03N 06E	35	Deed Interv			
	10020	804 PI FASANT			section:		
Elevation: 1035 ft.							
Latitude: 42.6172200146		Well Owner:	TEFFT, BOB				
Longitude: -83.6982897207		Well Address:			Owner Add	ress:	
Method of Collection: Interpolation	on-Man	804 PLEASAN	IT VALLEY D	PR.	804 PLEAS	SANT VALLEY	′ DR.
		WILFORD, WI	46042		WIILFORD,	IVII 46042	
Drilling Method: Cable Tool		Pump Inst	alled: Yes	3	Pump In	stallation Onl	y: No
Well Depth: 74.00 ft. Wel	II Use: Household	Pump Inst	allation Date	9:	HP:		
Well Type: Replacement Dat	e Completed: 10/25/1975	Manufactu	irer: Flint a	& Walling	Pump Ty	pe: Submer	sible
Casing loint: Threaded & coupled	Height:	Drop Pine	nder:	5 00 ft	Pump Ca Pump Va	apacity: 0 G	PM
Casing Fitting: Drive shoe		Drop Pipe	Diameter:	0.00 11.	Drilling F	Record ID:	
		Draw Dow	n Seal Used	: No	5		
Diameter: 4.00 in. to 69.00 ft. depth		Pressure 7	Fank Installe	ed: No			
		Pressure I	Relief Valve	Installed:	No		
Boroholou							
Borenole:							
Static Water Level: 50.00 ft. Below Gr	ade		Formation			Thicknose	Depth to
Well Yield Test:	Yield Test Method: Unknown		Formation	Description		THICKNESS	Bottom
Pumping level 60.00 ft. after 3.00 hrs. at	t 20 GPM	Yellow Cla	y 			21.00	21.00
		Sand Wet/	y & Graver			29.00	50.00
Screen Installed: Yes Filte	er Packed: No		VIOISt			24.00	74.00
Screen Diameter: 4.00 in. Blar	1k: 0.00 ft. Above						
Screen Material Type:							
Slot Length	Set Between						
25.00 4.00 ft.	69.00 ft. and 73.00 ft.						
Fittings: Neoprene packer						1	
Well Grouted: Yes Grouting M	ethod: Unknown						
Grouting Material Bags Additiv	ves Depth						
Unknown 0.00 None	0.00 ft. to 0.00 ft.	Geology R	emarks:				
Wellhead Completion: Pitless adapte	er						
Nearest Source of Possible Contamin	ation:		achine Oper	ator Name:			
Septic tank	75 ft North	Employme	ent: Unknow	vn			
	North North	Contracto	r Type: Unk	nown		Rea No:	47-0687
Abandoned Well Plugged: No		Business	Name:			5 /	
Reason Not Plugged:		Business	Address:				
		This well w	Water as drilled und	Well Contr der my superv	actor's Co	ertification s report is true	to the best of
		my knowle	dge and belie	ef.			
		Signature	of Registere	ed Contractor		Date	
General Remarks: Other Remarks:							





Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Tax No: 008-35-200-022	Permit No:	County: Living	ston		Township:	Hartland	
		Town/Range:	Section:	Well Status:	WSSN	: Source	e ID/Well No:
Well ID 470000	15027	03N 06E	35	n Dood Inton			
	10021	777 PI FASANT		n Road Inters	section:		
Elevation: 1021 ft.							
Latitude: 42.6169386278		Well Owner: k	KOPCZYK, J	AMES			
Longitude: -83.6997526215		Well Address:			Owner Add	ress:	
Method of Collection: Interpolation	n-Map	777 PLEASAN	T VALLEY F	RD.	777 PLEAS		'RD.
	ii iiiqp		40042		WILFORD,	IVII 40042	
Drilling Method: Rotary		Pump Inst	alled: Yes	6	Pump In	stallation Onl	y: No
Well Depth: 85.00 ft. Well	Use: Household	Pump Inst	allation Date	e:	HP:		
Well Type: Replacement Date	e Completed: 11/9/1988	Manufactu	rer: Red	Jacket	Pump Ty	/pe: Submer	sible
Casing Type: Steel - black	Height:	Model Nun	nber:	00 #	Pump Ca	apacity:	
Casing Fitting: Drive shoe		Drop Pipe	Diameter	.00 n.	Drilling I	Record ID:	
buong mang. Drive shee		Draw Dow	n Seal Used	: No	Drining		
Diameter: 4.00 in. to 81.00 ft. depth		Pressure 1	Fank Installe	ed: No			
		Pressure F	Relief Valve	Installed:	No		
Borehole:							
Static Water Level: 40.00 ft. Below Gra	ade						Depth to
Well Yield Test:	Yield Test Method: Unknown		Formation	Description		Thickness	Bottom
Pumping level 70.00 ft. after 4.00 hrs. at	15 GPM	Clay				15.00	15.00
		Stones				11.00	26.00
	<u> </u>	Gravel Dry				26.00	52.00
Screen Installed: Yes Filte	r Packed: No	Clay & Stor	nes Sandy			13.00	65.00
Screen Diameter: 4.00 In. Bian	k: 1.50 ft. Above	Sand Wet/	VIOIST			20.00	85.00
Slot Length	Set Between					l	1
12.00 4.00 ft.	81.00 ft. and 85.00 ft.						l
Fittings: Neoprene packer							
	dhada llabaann						
Grouting Material Bags Additiv	es Denth						
Bentonite slurry 0.00 None	0.00 ft. to 25.00 ft.	Geology R	emarks:				
Wellhead Completion: Pitless adapter	r						
Nearest Source of Possible Contaming	ation:	Drilling Ma	chine Oper	ator Name:		-R	
	vistance Direction	Employme	ent: Unknow	vn			
Septic tank 75	5 ft. Northeast						
		Contractor	r Type: Unk	nown		Reg No:	47-0027
Abandoned Well Plugged: No		Business I	Name:				
Reason Not Plugged:		Business	Address:				
		This wall w	Water	Well Contr	actor's Co	ertification	to the bast of
		nis well w	as arilled une	ber my superv ef.	rision and thi	s report is true	to the pest of
		Signature	of Posister	d Contracto		Data	
General Remarks		signature	or Registere			Date	
Other Remarks:							





Completion is required under authority of Part 127 Act 368 PA 1978. Failure to comply is a misdemeanor.

Tax No: 008-36-400-008	Permit No:	County: Living	ston		Township:	Hartland	
		Town/Range: 03N 06E	Section: 36	Well Status:	WSSN	: Source	e ID/Well No:
	15035	Distance and D	irection from	n Road Inters	section:		
Elevation: 1030 ft.		478 JENI LANE					
Latitude: 42.6126916065		Well Owner:	INNEWETH	, MARY			
Longitude: -83.6855686561		Well Address:	_		Owner Add	ress:	
Method of Collection: Interpolatio	n-Map	478 JENI LANI MILFORD, MI	- 48042		478 JENI L MILFORD	_ANE , MI 48042	
Drilling Method: Rotary	llse Household	Pump Inst	alled: Yes	3 3	Pump In	stallation Onl	y: No
Well Type: Replacement Date	• Completed: 5/24/1973	Manufactu	rer: Red	Jacket	Pump T	/pe: Submer	sible
Casing Type: Unknown	Model Nur	nber:		Pump Ca	apacity: 0 G	PM	
Casing Joint: Threaded & coupled		Drop Pipe	Length: 6	3.00 ft.	Pump Vo	oltage:	
Casing Fitting: Drive shoe		Drop Pipe	Diameter:		Drilling I	Record ID:	
Diamator: 4.00 in to 70.00 ft donth		Draw Dow	n Seal Used	: NO			
Diameter. 4.00 m. to 79.00 m. depth		Pressure F	Relief Valve	Installed:	No		
Borehole:							
Static Water Level: 42.00 ft. Below Gra	ade		Formation	Description		Thickness	Depth to
Well Yield Test:	field Test Method: Unknown	Brown Son	4			10.00	Bottom
		Brown Clay	v & Gravel			20.00	30.00
		Sand & Gra	avel			25.00	55.00
Screen Installed: Yes Filte	r Packed: No	Gray Clay				17.00	72.00
Screen Diameter: 4.00 in. Blan	k: 0.00 ft. Above	Sand & Gra	avel			11.00	83.00
Screen Material Type:							
20.00 4.00 ft	Set Between						-
20.00 4.00 ft.	19.00 h. and 09.00 h.						
Fittings: None							
weil Grouted: No							
		Geology R	emarks:				
Wellbead Completion: Pitless adapted							
Weineau Completion. Thiess adapter		_					
Nearest Source of Possible Contamina	tion:	Drilling Ma	chine Opera	ator Name:			
Type D	istance Direction	Employme	nt: Unknov	vn			
Septic tank 7	5 ft.						
		Contractor	Type: Unk	nown		Reg No:	47-0026
Abandoned Well Plugged: No		Business	vame: Address:				
		Dusiliess /	Water V	Nell Contr	actor's C	ertification	
		This well w my knowled	as drilled und dge and belie	der my superv ef.	rision and thi	s report is true	to the best of
		Signature	of Registere	ed Contractor	·	Date	
General Remarks: 12" ABOVE GRADE			-				
Other Remarks:							





Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Tax No: 008-36-200-006	Permit No:	County: Living	ston		Township:	Hartland	
		Town/Range: 03N 06E	Section: 36	Well Status:	WSSN	: Source	e ID/Well No:
	15045	Distance and D	Direction from	n Road Inters	section:	•	
Elevation: 1030 ft.		13822 LONE TF	REE				
Latitude: 42.620373626		Well Owner:	ADAMS, JOH	IN			
Longitude: -83.6821048412		Well Address:	· · · ·		Owner Add	ress:	
Method of Collection: Interpolatio	n-Map	13822 LONE 1	TREE RD.		13822 LON	NE TREE RD.	
	······		40042		MILI ORD,	1011 40042	
Drilling Method: Rotary		Pump Inst	alled: Yes	3	Pump In	stallation Onl	y: No
Well Type: Replacement Date	Completed: 8/4/1988	Manufactu	irer: Red.	≠. Iacket	Pump Tv	/ne: Submer	sible
Casing Type: PVC plastic	Height:	Model Nur	nber:		Pump Ca	apacity:	
Casing Joint: Unknown		Drop Pipe	Length: 1	00.00 ft.	Pump Vo	oltage:	
Casing Fitting: Drive shoe		Drop Pipe	Diameter:	. No	Drilling F	Record ID:	
Diameter: 5.00 in. to 118.00 ft. depth		Pressure -	Tank Installe	d: No			
		Pressure I	Relief Valve	Installed:	No		
Borehole: 8.50 in. to 0.00 ft. depth							
Static Water Level: 50.00 ft. Below Gra	ade		Formatior	Description		Thickness	Depth to
Well Yield Test:	field Test Method: Unknown	Brown Gra	vel Coarse	•		80.00	Bottom
		Gray Clay				10.00	90.00
		Gravel				38.00	128.00
Screen Installed: Yes Filte	r Packed: No						
Screen Diameter: 5.00 in. Blan	k: 0.00 ft. Above						
Slot Length	Set Between						
15.00 10.00 ft.	118.00 ft. and 128.00 ft.						
Fittinge, Nego							
ritings: None							
Well Grouted: Yes Grouting Me	thod: Unknown						
Grouting Material Bags Additiv	es Depth						
Other 0.00 None	0.00 ft. to 128.00 f	ft. Geology R	Remarks:				
Wellhead Completion: Pitless adapter							
Nearest Source of Possible Contaming	tion:	Drilling Mr	achine Oner	ator Namo:	BARDVP		
Type D	istance Direction	Employme	ent: Unknow	vn			
Septic tank 7	5 ft. Northeast						
		Contracto	r Type: Unk	nown		Reg No:	78-1607
Abandoned Well Plugged: No Reason Not Plugged:		Business	Name: Address:				
			Water	Well Contr	actor's Co	ertification	
		This well w my knowle	as drilled und dge and belie	der my superv ef.	vision and thi	s report is true	to the best of
		Signature	of Registere	ed Contractor	r	Date	
General Remarks:							
Other Remarks: Grouting Material 1:Lis	ted as other in Wellkey						

GEOLOGICAL SURVEY NO.		R WELL /	AND PL	
1 LOCATION OF WELL	1			PERMIT NUMBER
County	Township Name		Fraction	Section Number Town Number Range Number
Livingston	Hartland	REA	NW 1/4	NW14 NE 14 36 3N N/S 6E E/W
Distance And Direction From Road	Intersection	-CE/L	om.	3 OWNER OF WELL: Lidsco Inc.
Giegler #1-36		MAY .	SD -	P.O. Box 174
Lone Tree Rd.	Lin	0 100	-	Address Logans Place West
Create Address & City of Mark Land	HEAL	VGSTON	3	Traverse City, MI 49665
Locate with "X" in Section Below		Skeich An S'VT		Address Same As Well Location? L Yos LA No
		MEN	r 7	94 rt 4 22 02 02 0
				5 Cable tool (X) Retary Drives The
				Hollow rod Auger Listed
[₩] ┝╴┯╺┩┅╴╴╪╴╴╶┨╴╴╶┨ [╒] _┱				6 USE: Domestic Type I Public Type III Public
				Type IIa Public Heat pump
$\begin{bmatrix}1 - m \mathbf{q} - m \mathbf{q} \end{bmatrix} = \begin{bmatrix} -1 + m \mathbf{q} \end{bmatrix} = \begin{bmatrix} -1 + m \mathbf{q} \end{bmatrix}$				Test Woll Type IIb Public
				7 CASING: Steel Threaded Height: Above/Below
				XPlastic XWelded Surface ft.
2 FORMATION DES	SCRIPTION	THICKNESS OF	DEPTH TO BOTIOM OF	S" <u>PVC</u> in to <u>74</u> ft. depth Weight lbs./ft.SDR-2
		STRATUM	STRATUM	Grouted Drill Hole Diameter
D				-8 ¹ / ₂ in to -40 ft. depth Drive Shoo L Yos
Brown Clay	<u> </u>		11	8 SCREEN:
Brown Gravel Sand		40	F1	
A WINE WAYNE DUNN		UR*		Type <u>FYL: Wrapped</u> Diameter <u>5"</u>
Gray Clay		19	70	Sat babying 71 th and 91 th
		· * 2*		HTTINGS: X-Packer Lead Packar Bremer Check
Sand Gravel	er = 17	30	100	Blank above screen ft. Other Directly
				9 STATIC WATER LEVEL: Attached
······································				ft. below land surface Flow
:				10-PUMPING LEVEL: below land surface
		h		ft. after hrs. pumping at60 G.P.M.
				ft. after hrs. pumping at G.P.M.
				COMPLETION: Basement offset Approved oit
				12 WELL GROUTED?
				🔄 Neat cement 🛛 🔀 Bentonite 🗌 Othor
·····	· · · · · · · · · · · · · · · · · · ·			No. of bags of cement Additives
				13 Nearest source of possible contamination
				Type None Distance 11 Direction
				weil disintectéd upon completion? LJ Yes LXNo Was old weil blugged? □ Vac □ N=
				Manufacturarit name
I	· · · · · · · · · · · · · · · · · · ·		··· · · ·	Model number HD Valia
······································	· · · ·			Length of Drop Proc ft_capacity G.P.M.
			' <u>.</u>	TYPE: Submersible Jet
			16 1 1 7 	PRESSURE TANK:
:		1.1.1	1997 D. 2017	Manufacturer's name
USE A 2ND SHEET	F.NEEDED	1 () And		Model number Capacity Gallons
To, nemarks, elevation, source c	n uata, etc.		1140. WATEF This wel	EVELL CONTRACTOR'S CERTIFICATION: I was drilled under my jurisdiction and this report is true
$\sim 10^{-5}$ Å	設計に利用	The straight of the	to the b	ast of my knowledge and belief.
N all the	A MORE THE	ALL MENT	B B	OWN DRILLING COMPANY, INC. 47-2072
17 Rig Operator's Name:	· · · · · · · · · · · · · · · · · · ·		ан на села, села, села ние Али - на села	TOTAL AND AND THE ADDARD
· · · · · · · · · · · · · · · · · · ·			Address	
			Signed .	AUTHORIZED REBERGENTATIVE Date 11-10-72
310 X(0A	sen de la companya de			Authority: Act 308 PA 1978
ă.	ъ	GEOLOGIC,	AL SURVE	Completion: Required Penalty: Conviction of a violation of any provision is a misdemeanor.



09-Jun-2016

Sean Craven Merit Energy 1510 Thomas Rd PO Box 910 Kalkaska, MI 49646

Re: Merit (Hartland Gas Plant)

Work Order: 1606258

Dear Sean,

ALS Environmental received 21 samples on 04-Jun-2016 08:00 AM for the analyses presented in the following report.

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

Sample results are compliant with NELAP standard requirements and QC 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 31.

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

Sincerely,

Gary Byar

Electronically approved by: Gary Byar

Environmental 🕽

Gary Byar Project Manager



Certificate No: MI: 0022

Report of Laboratory Analysis

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

www.alsglobal.com

NIGHT SOLUTIONS RIGHT PARTNER

Client:Merit EnergyProject:Merit (Hartland Gas Plant)Work Order:1606258

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	Tag Number	Collection Date	Date Received	<u>Hold</u>
1606258-01	TMW-03	Groundwater		6/2/2016 09:18	6/4/2016 08:00	
1606258-02	TMW-04	Groundwater		6/2/2016 10:00	6/4/2016 08:00	
1606258-03	TMW-05	Groundwater		6/2/2016 10:30	6/4/2016 08:00	
1606258-04	TMW-09	Groundwater		6/2/2016 11:25	6/4/2016 08:00	
1606258-05	TMW-07	Groundwater		6/2/2016 12:00	6/4/2016 08:00	
1606258-06	TMW-07 DUP	Groundwater		6/2/2016 12:00	6/4/2016 08:00	
1606258-07	TMW-010 (90-95')	Groundwater		6/2/2016 12:20	6/4/2016 08:00	
1606258-08	TMW-08	Groundwater		6/2/2016 12:45	6/4/2016 08:00	
1606258-09	TMW-010 (70-75;)	Groundwater		6/2/2016 13:00	6/4/2016 08:00	
1606258-10	TMW-011 (27-32')	Groundwater		6/2/2016 15:25	6/4/2016 08:00	
1606258-11	TMW-01	Groundwater		6/2/2016 15:40	6/4/2016 08:00	
1606258-12	MW-1	Groundwater		6/3/2016 06:30	6/4/2016 08:00	
1606258-13	MW-2	Groundwater		6/3/2016 07:25	6/4/2016 08:00	
1606258-14	MW-6	Groundwater		6/3/2016 08:20	6/4/2016 08:00	
1606258-15	MW-4	Groundwater		6/3/2016 09:05	6/4/2016 08:00	
1606258-16	TMW-010 (45-50')	Groundwater		6/3/2016 09:05	6/4/2016 08:00	
1606258-17	MW-5	Groundwater		6/3/2016 10:00	6/4/2016 08:00	
1606258-18	MW-3	Groundwater		6/3/2016 10:15	6/4/2016 08:00	
1606258-19	MW-7	Groundwater		6/3/2016 10:45	6/4/2016 08:00	
1606258-20	MW-7 DUP	Groundwater		6/3/2016 10:45	6/4/2016 08:00	
1606258-21	TWM-02	Groundwater		6/3/2016 11:10	6/4/2016 08:00	

Date: 09-Jun-16

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	TMW-03	Lab ID:	1606258-01
Collection Date:	6/2/2016 09:18 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	6 8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/7/2016 10:13 PM
Surr: 2,4,6-Tribromophenol	48.4		38-115	%REC	1	6/7/2016 10:13 PM
Surr: 2-Fluorobiphenyl	48.2		32-100	%REC	1	6/7/2016 10:13 PM
Surr: 2-Fluorophenol	26.5		22-59	%REC	1	6/7/2016 10:13 PM
Surr: 4-Terphenyl-d14	59.5		23-112	%REC	1	6/7/2016 10:13 PM
Surr: Nitrobenzene-d5	51.4		31-93	%REC	1	6/7/2016 10:13 PM
Surr: Phenol-d6	16.0		13-36	%REC	1	6/7/2016 10:13 PM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	TMW-04	Lab ID:	1606258-02
Collection Date:	6/2/2016 10:00 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Diisopropanolamine	ND		50	µg/L	1	6/7/2016 10:53 PM
Sulfolane	2,600		100	µg/L	10	6/8/2016 10:55 AM
Surr: 2,4,6-Tribromophenol	71.7		38-115	%REC	1	6/7/2016 10:53 PM
Surr: 2-Fluorobiphenyl	70.4		32-100	%REC	1	6/7/2016 10:53 PM
Surr: 2-Fluorophenol	40.4		22-59	%REC	1	6/7/2016 10:53 PM
Surr: 4-Terphenyl-d14	63.0		23-112	%REC	1	6/7/2016 10:53 PM
Surr: Nitrobenzene-d5	77.4		31-93	%REC	1	6/7/2016 10:53 PM
Surr: Phenol-d6	25.7		13-36	%REC	1	6/7/2016 10:53 PM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	TMW-05	Lab ID:	1606258-03
Collection Date:	6/2/2016 10:30 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	4,500		100	μg/L	10	6/8/2016 11:15 AM
Surr: 2,4,6-Tribromophenol	77.4		38-115	%REC	1	6/7/2016 11:13 PM
Surr: 2-Fluorobiphenyl	69.6		32-100	%REC	1	6/7/2016 11:13 PM
Surr: 2-Fluorophenol	44.3		22-59	%REC	1	6/7/2016 11:13 PM
Surr: 4-Terphenyl-d14	62.9		23-112	%REC	1	6/7/2016 11:13 PM
Surr: Nitrobenzene-d5	76.7		31-93	%REC	1	6/7/2016 11:13 PM
Surr: Phenol-d6	29.0		13-36	%REC	1	6/7/2016 11:13 PM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	TMW-09	Lab ID:	1606258-04
Collection Date:	6/2/2016 11:25 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed	
SEMI-VOLATILE ORGANIC COMPOUNDS		SW846 8270D		8270D	Prep: SW3510 / 6/6/16	Analyst: RM	
Sulfolane	5,900		100	μg/L	10	6/8/2016 11:36 AM	
Surr: 2,4,6-Tribromophenol	68.0		38-115	%REC	1	6/7/2016 11:33 PM	
Surr: 2-Fluorobiphenyl	67.1		32-100	%REC	1	6/7/2016 11:33 PM	
Surr: 2-Fluorophenol	40.5		22-59	%REC	1	6/7/2016 11:33 PM	
Surr: 4-Terphenyl-d14	67.7		23-112	%REC	1	6/7/2016 11:33 PM	
Surr: Nitrobenzene-d5	77.7		31-93	%REC	1	6/7/2016 11:33 PM	
Surr: Phenol-d6	27.6		13-36	%REC	1	6/7/2016 11:33 PM	

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	TMW-07	Lab ID:	1606258-05
Collection Date:	6/2/2016 12:00 PM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Diisopropanolamine	ND		50	µg/L	1	6/7/2016 11:53 PM
Sulfolane	4,200		100	µg/L	10	6/8/2016 11:56 AM
Surr: 2,4,6-Tribromophenol	74.6		38-115	%REC	1	6/7/2016 11:53 PM
Surr: 2-Fluorobiphenyl	65.8		32-100	%REC	1	6/7/2016 11:53 PM
Surr: 2-Fluorophenol	40.7		22-59	%REC	1	6/7/2016 11:53 PM
Surr: 4-Terphenyl-d14	57.5		23-112	%REC	1	6/7/2016 11:53 PM
Surr: Nitrobenzene-d5	74.8		31-93	%REC	1	6/7/2016 11:53 PM
Surr: Phenol-d6	25.9		13-36	%REC	1	6/7/2016 11:53 PM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	TMW-07 DUP	Lab ID:	1606258-06
Collection Date:	6/2/2016 12:00 PM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Diisopropanolamine	ND		50	µg/L	1	6/8/2016 12:14 PM
Sulfolane	3,900		100	µg/L	10	6/8/2016 12:16 PM
Surr: 2,4,6-Tribromophenol	70.0		38-115	%REC	1	6/8/2016 12:14 PM
Surr: 2-Fluorobiphenyl	62.9		32-100	%REC	1	6/8/2016 12:14 PM
Surr: 2-Fluorophenol	37.6		22-59	%REC	1	6/8/2016 12:14 PM
Surr: 4-Terphenyl-d14	58.5		23-112	%REC	1	6/8/2016 12:14 PM
Surr: Nitrobenzene-d5	71.6		31-93	%REC	1	6/8/2016 12:14 PM
Surr: Phenol-d6	24.1		13-36	%REC	1	6/8/2016 12:14 PM

Date: 09-Jun-16

Client:Merit EnergyProject:Merit (Hartland Gas Plant)Sample ID:TMW-010 (90-95')

Collection Date: 6/2/2016 12:20 PM

Work Order: 1606258 Lab ID: 1606258-07 Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 12:34 PM
Surr: 2,4,6-Tribromophenol	64.8		38-115	%REC	1	6/8/2016 12:34 PM
Surr: 2-Fluorobiphenyl	65.6		32-100	%REC	1	6/8/2016 12:34 PM
Surr: 2-Fluorophenol	37.5		22-59	%REC	1	6/8/2016 12:34 PM
Surr: 4-Terphenyl-d14	64.0		23-112	%REC	1	6/8/2016 12:34 PM
Surr: Nitrobenzene-d5	74.5		31-93	%REC	1	6/8/2016 12:34 PM
Surr: Phenol-d6	22.5		13-36	%REC	1	6/8/2016 12:34 PM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	TMW-08	Lab ID:	1606258-08
Collection Date:	6/2/2016 12:45 PM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Diisopropanolamine	ND		50	µg/L	1	6/8/2016 12:54 PM
Sulfolane	710		10	µg/L	1	6/8/2016 12:54 PM
Surr: 2,4,6-Tribromophenol	62.1		38-115	%REC	1	6/8/2016 12:54 PM
Surr: 2-Fluorobiphenyl	60.5		32-100	%REC	1	6/8/2016 12:54 PM
Surr: 2-Fluorophenol	34.3		22-59	%REC	1	6/8/2016 12:54 PM
Surr: 4-Terphenyl-d14	58.3		23-112	%REC	1	6/8/2016 12:54 PM
Surr: Nitrobenzene-d5	66.3		31-93	%REC	1	6/8/2016 12:54 PM
Surr: Phenol-d6	21.9		13-36	%REC	1	6/8/2016 12:54 PM

Date: 09-Jun-16

Client:Merit EnergyProject:Merit (Hartland Gas Plant)Sample ID:TMW-010 (70-75;)

Collection Date: 6/2/2016 01:00 PM

Work Order: 1606258 Lab ID: 1606258-09 Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 01:14 AM
Surr: 2,4,6-Tribromophenol	58.3		38-115	%REC	1	6/8/2016 01:14 AM
Surr: 2-Fluorobiphenyl	61.8		32-100	%REC	1	6/8/2016 01:14 AM
Surr: 2-Fluorophenol	32.3		22-59	%REC	1	6/8/2016 01:14 AM
Surr: 4-Terphenyl-d14	63.5		23-112	%REC	1	6/8/2016 01:14 AM
Surr: Nitrobenzene-d5	69.5		31-93	%REC	1	6/8/2016 01:14 AM
Surr: Phenol-d6	21.1		13-36	%REC	1	6/8/2016 01:14 AM

Client: Merit Energy

Project: Merit (Hartland Gas Plant)

Sample ID: TMW-011 (27-32')

Collection Date: 6/2/2016 03:25 PM

Work Order: 1606258 Lab ID: 1606258-10 Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Diisopropanolamine	ND		50	µg/L	1	6/8/2016 01:34 AM
Sulfolane	4,800		100	μg/L	10	6/8/2016 12:36 PM
Surr: 2,4,6-Tribromophenol	68.6		38-115	%REC	1	6/8/2016 01:34 AM
Surr: 2-Fluorobiphenyl	68.3		32-100	%REC	1	6/8/2016 01:34 AM
Surr: 2-Fluorophenol	43.7		22-59	%REC	1	6/8/2016 01:34 AM
Surr: 4-Terphenyl-d14	52.2		23-112	%REC	1	6/8/2016 01:34 AM
Surr: Nitrobenzene-d5	77.4		31-93	%REC	1	6/8/2016 01:34 AM
Surr: Phenol-d6	28.3		13-36	%REC	1	6/8/2016 01:34 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	TMW-01	Lab ID:	1606258-11
Collection Date:	6/2/2016 03:40 PM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		11	µg/L	1	6/8/2016 01:54 AM
Surr: 2,4,6-Tribromophenol	73.1		38-115	%REC	1	6/8/2016 01:54 AM
Surr: 2-Fluorobiphenyl	65.3		32-100	%REC	1	6/8/2016 01:54 AM
Surr: 2-Fluorophenol	46.8		22-59	%REC	1	6/8/2016 01:54 AM
Surr: 4-Terphenyl-d14	48.8		23-112	%REC	1	6/8/2016 01:54 AM
Surr: Nitrobenzene-d5	74.2		31-93	%REC	1	6/8/2016 01:54 AM
Surr: Phenol-d6	31.1		13-36	%REC	1	6/8/2016 01:54 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	MW-1	Lab ID:	1606258-12
Collection Date:	6/3/2016 06:30 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 02:14 AM
Surr: 2,4,6-Tribromophenol	67.5		38-115	%REC	1	6/8/2016 02:14 AM
Surr: 2-Fluorobiphenyl	59.1		32-100	%REC	1	6/8/2016 02:14 AM
Surr: 2-Fluorophenol	36.6		22-59	%REC	1	6/8/2016 02:14 AM
Surr: 4-Terphenyl-d14	56.8		23-112	%REC	1	6/8/2016 02:14 AM
Surr: Nitrobenzene-d5	66.0		31-93	%REC	1	6/8/2016 02:14 AM
Surr: Phenol-d6	22.9		13-36	%REC	1	6/8/2016 02:14 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	MW-2	Lab ID:	1606258-13
Collection Date:	6/3/2016 07:25 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 02:34 AM
Surr: 2,4,6-Tribromophenol	41.7		38-115	%REC	1	6/8/2016 02:34 AM
Surr: 2-Fluorobiphenyl	56.4		32-100	%REC	1	6/8/2016 02:34 AM
Surr: 2-Fluorophenol	23.9		22-59	%REC	1	6/8/2016 02:34 AM
Surr: 4-Terphenyl-d14	51.0		23-112	%REC	1	6/8/2016 02:34 AM
Surr: Nitrobenzene-d5	64.0		31-93	%REC	1	6/8/2016 02:34 AM
Surr: Phenol-d6	18.4		13-36	%REC	1	6/8/2016 02:34 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	MW-6	Lab ID:	1606258-14
Collection Date:	6/3/2016 08:20 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 02:54 AM
Surr: 2,4,6-Tribromophenol	54.3		38-115	%REC	1	6/8/2016 02:54 AM
Surr: 2-Fluorobiphenyl	56.7		32-100	%REC	1	6/8/2016 02:54 AM
Surr: 2-Fluorophenol	29.2		22-59	%REC	1	6/8/2016 02:54 AM
Surr: 4-Terphenyl-d14	34.4		23-112	%REC	1	6/8/2016 02:54 AM
Surr: Nitrobenzene-d5	64.5		31-93	%REC	1	6/8/2016 02:54 AM
Surr: Phenol-d6	18.5		13-36	%REC	1	6/8/2016 02:54 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	MW-4	Lab ID:	1606258-15
Collection Date:	6/3/2016 09:05 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 03:14 AM
Surr: 2,4,6-Tribromophenol	66.8		38-115	%REC	1	6/8/2016 03:14 AM
Surr: 2-Fluorobiphenyl	56.8		32-100	%REC	1	6/8/2016 03:14 AM
Surr: 2-Fluorophenol	37.0		22-59	%REC	1	6/8/2016 03:14 AM
Surr: 4-Terphenyl-d14	55.4		23-112	%REC	1	6/8/2016 03:14 AM
Surr: Nitrobenzene-d5	63.5		31-93	%REC	1	6/8/2016 03:14 AM
Surr: Phenol-d6	22.9		13-36	%REC	1	6/8/2016 03:14 AM

Date: 09-Jun-16

Client:Merit EnergyProject:Merit (Hartland Gas Plant)Sample ID:TMW-010 (45-50')

Collection Date: 6/3/2016 09:05 AM

Work Order: 1606258 Lab ID: 1606258-16 Matrix: GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 03:34 AM
Surr: 2,4,6-Tribromophenol	57.2		38-115	%REC	1	6/8/2016 03:34 AM
Surr: 2-Fluorobiphenyl	56.8		32-100	%REC	1	6/8/2016 03:34 AM
Surr: 2-Fluorophenol	38.0		22-59	%REC	1	6/8/2016 03:34 AM
Surr: 4-Terphenyl-d14	61.2		23-112	%REC	1	6/8/2016 03:34 AM
Surr: Nitrobenzene-d5	65.5		31-93	%REC	1	6/8/2016 03:34 AM
Surr: Phenol-d6	23.7		13-36	%REC	1	6/8/2016 03:34 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	MW-5	Lab ID:	1606258-17
Collection Date:	6/3/2016 10:00 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 03:55 AM
Surr: 2,4,6-Tribromophenol	59.0		38-115	%REC	1	6/8/2016 03:55 AM
Surr: 2-Fluorobiphenyl	58.9		32-100	%REC	1	6/8/2016 03:55 AM
Surr: 2-Fluorophenol	42.4		22-59	%REC	1	6/8/2016 03:55 AM
Surr: 4-Terphenyl-d14	51.3		23-112	%REC	1	6/8/2016 03:55 AM
Surr: Nitrobenzene-d5	65.9		31-93	%REC	1	6/8/2016 03:55 AM
Surr: Phenol-d6	26.0		13-36	%REC	1	6/8/2016 03:55 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	MW-3	Lab ID:	1606258-18
Collection Date:	6/3/2016 10:15 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 04:14 AM
Surr: 2,4,6-Tribromophenol	76.6		38-115	%REC	1	6/8/2016 04:14 AM
Surr: 2-Fluorobiphenyl	63.0		32-100	%REC	1	6/8/2016 04:14 AM
Surr: 2-Fluorophenol	41.3		22-59	%REC	1	6/8/2016 04:14 AM
Surr: 4-Terphenyl-d14	73.2		23-112	%REC	1	6/8/2016 04:14 AM
Surr: Nitrobenzene-d5	72.2		31-93	%REC	1	6/8/2016 04:14 AM
Surr: Phenol-d6	25.4		13-36	%REC	1	6/8/2016 04:14 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	MW-7	Lab ID:	1606258-19
Collection Date:	6/3/2016 10:45 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Diisopropanolamine	ND		56	µg/L	1	6/8/2016 04:35 AM
Sulfolane	450		11	µg/L	1	6/8/2016 04:35 AM
Surr: 2,4,6-Tribromophenol	68.8		38-115	%REC	1	6/8/2016 04:35 AM
Surr: 2-Fluorobiphenyl	63.5		32-100	%REC	1	6/8/2016 04:35 AM
Surr: 2-Fluorophenol	46.9		22-59	%REC	1	6/8/2016 04:35 AM
Surr: 4-Terphenyl-d14	65.4		23-112	%REC	1	6/8/2016 04:35 AM
Surr: Nitrobenzene-d5	73.1		31-93	%REC	1	6/8/2016 04:35 AM
Surr: Phenol-d6	30.7		13-36	%REC	1	6/8/2016 04:35 AM

Client:	Merit Energy		
Project:	Merit (Hartland Gas Plant)	Work Order:	1606258
Sample ID:	MW-7 DUP	Lab ID:	1606258-20
Collection Date:	6/3/2016 10:45 AM	Matrix:	GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/6/16	Analyst: RM
Diisopropanolamine	ND		50	µg/L	1	6/8/2016 04:54 AM
Sulfolane	510		10	μg/L	1	6/8/2016 04:54 AM
Surr: 2,4,6-Tribromophenol	68.8		38-115	%REC	1	6/8/2016 04:54 AM
Surr: 2-Fluorobiphenyl	62.4		32-100	%REC	1	6/8/2016 04:54 AM
Surr: 2-Fluorophenol	43.8		22-59	%REC	1	6/8/2016 04:54 AM
Surr: 4-Terphenyl-d14	70.7		23-112	%REC	1	6/8/2016 04:54 AM
Surr: Nitrobenzene-d5	73.3		31-93	%REC	1	6/8/2016 04:54 AM
Surr: Phenol-d6	27.6		13-36	%REC	1	6/8/2016 04:54 AM
Client:	Merit Energy					
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Project:	Merit (Hartland Gas Plant)	Work Order:	1606258			
Sample ID:	TWM-02	Lab ID:	1606258-21			
Collection Date:	6/3/2016 11:10 AM	Matrix:	GROUNDWATER			

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SEMI-VOLATILE ORGANIC COMPOUNDS			SW846	8270D	Prep: SW3510 / 6/7/16	Analyst: RM
Sulfolane	ND		10	µg/L	1	6/8/2016 05:14 AM
Surr: 2,4,6-Tribromophenol	70.9		38-115	%REC	1	6/8/2016 05:14 AM
Surr: 2-Fluorobiphenyl	57.6		32-100	%REC	1	6/8/2016 05:14 AM
Surr: 2-Fluorophenol	41.4		22-59	%REC	1	6/8/2016 05:14 AM
Surr: 4-Terphenyl-d14	67.8		23-112	%REC	1	6/8/2016 05:14 AM
Surr: Nitrobenzene-d5	71.0		31-93	%REC	1	6/8/2016 05:14 AM
Surr: Phenol-d6	25.9		13-36	%REC	1	6/8/2016 05:14 AM

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

Client:	Merit Energy
Work Order:	1606258
Project:	Merit (Hartland Gas Plant)

QC BATCH REPORT

Batch ID: 86917 In	strument ID: SVMS8		Metho	d: SW84	6 82	70D					
MBLK Sample	ID: SBLKW1-86917-86917	7			ι	Jnits: µg/l	L	Analysis	Date: 6	/7/2016 06	5:44 PM
Client ID:	Run ID:	SVMS8	_160607A		Se	eqNo: 386	6078	Prep Date: 6/6/20)16	DF: 1	
Analyte	Result	PQL	SPK Va	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Diisopropanolamine	ND	50									
Sulfolane	ND	10									
Surr: 2,4,6-Tribromopheno	1 29.94	0	50		0	59.9	38-115	0			
Surr: 2-Fluorobiphenyl	33.19	0	50		0	66.4	32-100	0			
Surr: 2-Fluorophenol	20.74	0	50		0	41.5	22-59	0			
Surr: 4-Terphenyl-d14	37.98	0	50		0	76	23-112	0			
Surr: Nitrobenzene-d5	36.62	0	50		0	73.2	31-93	0			
Surr: Phenol-d6	12.62	0	50		0	25.2	13-36	0			
LCS Sample	ID: SLCSW1-86917-8691	7			ι	Jnits: µg/l	L	Analysis	Date: 6/	/7/2016 07	':04 PM
Client ID:	Run ID:	SVMS8	_160607A		Se	eqNo: 386	6079	Prep Date: 6/6/20)16	DF: 1	
				SPK Ref			Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
Diisopropanolamine	8.78	50	100		0	8.78	5-40	0			
Sulfolane	46.4	10	100		0	46.4	30-100	0			
Surr: 2,4,6-Tribromopheno	I 27.05	0	50		0	54.1	38-115	0			
Surr: 2-Fluorobiphenyl	29.34	0	50		0	58.7	32-100	0			
Surr: 2-Fluorophenol	15.07	0	50		0	30.1	22-59	0			
Surr: 4-Terphenyl-d14	38.87	0	50		0	77.7	23-112	0			
Surr: Nitrobenzene-d5	30.78	0	50		0	61.6	31-93	0			
Surr: Phenol-d6	10.16	0	50		0	20.3	13-36	0			
MS Sample	ID: 1606258-01A MS				ι	Jnits: µg/I	L	Analysis	Date: 6/	/7/2016 09):53 PM
Client ID: TMW-03	Run ID:	SVMS8	_160607A		Se	eqNo: 386	6083	Prep Date: 6/6/20	016	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Diisopropanolamine	8.48	50	100		0	8.48	5-40	0			
Sulfolane	53.71	10	100		0	53.7	30-100	0			
Surr: 2,4,6-Tribromopheno	1 29.62	0	50		0	59.2	38-115	0			
Surr: 2-Fluorobiphenyl	32.61	0	50		0	65.2	32-100	0			
Surr: 2-Fluorophenol	17.67	0	50		0	35.3	22-59	0			
Surr: 4-Terphenyl-d14	28.72	0	50		0	57.4	23-112	0			
Surr: Nitrobenzene-d5	36.98	0	50		0	74	<u>31-93</u>	0			
Surr: Phenol-d6	10.77	0	50		0	21.5	13-36	0			

Merit Energy Work Order: 1606258 Merit (Hartland Gas Plant)

QC BATCH REPORT

Project:

Batch ID: 86917	Instrument ID: SVMS8	Method:	SW846 8270D

DUP Sample ID	: 1606258-02A DUP				ι	Jnits: µg/l	_	Analysi	s Date: 6/	7/2016 10	:33 PM
Client ID: TMW-04	Run ID: S	SVMS8	3_160607A		Se	qNo: 386	6085	Prep Date: 6/6/2	2016	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Diisopropanolamine	ND	50	0		0	0		0	0	50	
Surr: 2,4,6-Tribromophenol	33.94	0	50		0	67.9	38-115	35.86	5.5	40	
Surr: 2-Fluorobiphenyl	33.61	0	50		0	67.2	32-100	35.21	4.65	40	
Surr: 2-Fluorophenol	20.77	0	50		0	41.5	22-59	20.2	2.78	40	
Surr: 4-Terphenyl-d14	30.92	0	50		0	61.8	23-112	31.51	1.89	40	
Surr: Nitrobenzene-d5	38.11	0	50		0	76.2	31-93	38.69	1.51	40	
Surr: Phenol-d6	13.75	0	50		0	27.5	13-36	12.83	6.92	40	
DUP Sample ID	: 1606258-02A DUP				ι	Inits: µg/l	_	Analysi	s Date: 6/	8/2016 10	:35 AM
Client ID: TMW-04	Run ID: S	SVMS8	B_160607A		Se	qNo: 386	6103	Prep Date: 6/6/2	2016	DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfolane	2872	100	0		0	0		2581	10.7	50	
The following samples were	analyzed in this batch	: 10 10 10 10 10 10 10	506258-01A 506258-04A 506258-07A 506258-10A 506258-13A 506258-16A 506258-16A	10 10 10 10 10 10 10 10	6062 6062 6062 6062 6062 6062 6062	258-02A 258-05A 258-08A 258-11A 258-14A 258-17A 258-20A	160 160 160 160 160 160	06258-03A 06258-06A 06258-09A 06258-12A 06258-15A 06258-18A			

Project:

MBLK

Merit Energy Work Order: 1606258 Merit (Hartland Gas Plant)

QC BATCH REPORT

%RPD

DF: 1 RPD

Qual

Limit

Batch ID: 87000 Instrument ID: SVMS8 Method: SW846 8270D Sample ID: SBLKW1-87000-87000 Units: µg/L Analysis Date: 6/7/2016 08:04 PM Client ID: SeqNo: 3866080 Prep Date: 6/7/2016 Run ID: SVMS8_160607A RPD Ref SPK Ref Control Result SPK Val Value %REC Limit Value Analyte PQL

Sulfolane	ND	10						
Surr: 2,4,6-Tribromophenol	31.84	0	50	0	63.7	38-115	0	
Surr: 2-Fluorobiphenyl	34.21	0	50	0	68.4	32-100	0	
Surr: 2-Fluorophenol	21.01	0	50	0	42	22-59	0	
Surr: 4-Terphenyl-d14	40.1	0	50	0	80.2	23-112	0	
Surr: Nitrobenzene-d5	36.83	0	50	0	73.7	31-93	0	
Surr: Phenol-d6	13.09	0	50	0	26.2	13-36	0	

LCS	Sample ID:	SLCSW1-87	000-8700	D			ι	Jnits: µg/l	-	Anal	ysis Date: 6	6/7/2016 0	08:24 PM
Client ID:			Run ID:	SVMS8	_160607A		Se	eqNo: 386	6081	Prep Date: 6/	7/2016	DF: 1	
Analyte		F	Result	PQL	SPK Val	SPK Re Value	f	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfolane		:	57.74	10	100		0	57.7	30-100		0		
Surr: 2,4,6-Tribror	nophenol		30.92	0	50		0	61.8	38-115		0		
Surr: 2-Fluorobiph	nenyl		35.13	0	50		0	70.3	32-100		0		
Surr: 2-Fluorophe	nol		20.04	0	50		0	40.1	22-59		0		
Surr: 4-Terphenyl-	-d14		37.91	0	50		0	75.8	23-112		0		
Surr: Nitrobenzen	e-d5		37.17	0	50		0	74.3	31-93		0		
Surr: Phenol-d6			12.13	0	50		0	24.3	13-36		0		

LCSD Sa	ample ID:	SLCSDW1-87000-8700	0			ι	Jnits: µg/ I	L	Analysi	s Date: 6/	7/2016 08	:44 PM
Client ID:		Run ID:	SVMS8	_160607A		Se	eqNo: 386	6082	Prep Date: 6/7/	2016	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfolane		63.07	10	100		0	63.1	30-100	57.74	8.82	50	
Surr: 2,4,6-Tribromo	ohenol	33.1	0	50		0	66.2	38-115	30.92	6.81	40	
Surr: 2-Fluorobiphen	yl	35.7	0	50		0	71.4	32-100	35.13	1.61	40	
Surr: 2-Fluorophenol		23.08	0	50		0	46.2	22-59	20.04	14.1	40	
Surr: 4-Terphenyl-d1	4	37.99	0	50		0	76	23-112	37.91	0.211	40	
Surr: Nitrobenzene-c	15	38.93	0	50		0	77.9	31-93	37.17	4.63	40	
Surr: Phenol-d6		14.12	0	50		0	28.2	13-36	12.13	15.2	40	
The following sample	as woro	analyzod in this batch	. 40	00050 014								

The following samples were analyzed in this batch:

1606258-21A

Client: Project: WorkOrder:	Merit Energy Merit (Hartland Gas Plant) 1606258	QUALIFIERS, ACRONYMS, UNITS
Qualifier	Description	
*	Value exceeds Regulatory Limit	
a	Not accredited	
В	Analyte detected in the associated Method Blank above t	he Reporting Limit
Е	Value above quantitation range	
Н	Analyzed outside of Holding Time	
J	Analyte is present at an estimated concentration between	the MDL and Report Limit
n ND	Not offered for accreditation	
ND O	Sample amount is > 4 times amount spiked	
P	Dual Column results percent difference $> 40\%$	
R	RPD above laboratory control limit	
S	Spike Recovery outside laboratory control limits	
U	Analyzed but not detected above the MDL	
Х	Analyte was detected in the Method Blank between the M contamination at the observed level.	IDL and PQL, sample results may exhibit background or reas
Acronym	Description	
DUP	Method Duplicate	
LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate	
LOD	Limit of Detection (see MDL)	
LOQ	Limit of Quantitation (see PQL)	
MBLK	Method Blank	
MDL	Method Detection Limit	
MS	Matrix Spike	
MSD	Matrix Spike Duplicate	
PQL	Practical Quantitation Limit	
RPD	Relative Percent Difference	
TDL	Target Detection Limit	
TNTC	Too Numerous To Count	
А	APHA Standard Methods	
D	ASTM	
Е	EPA	
SW	SW-846 Update III	
Units Reported	Description	
μg/L	Micrograms per Liter	

Sample Receipt Checklist

Client Name: MERITENERGY		Date/Time R	Received:	<u>04-Jun-1</u>	6 08:00	
Work Order: 1606258		Received by	y:	<u>DS</u>		
Checklist completed by Diane Shaw	04-Jun-16 _{Date}	Reviewed by:	Gary Byar eSignature	-		05-Jun-16 Date
Matrices: Groundwater Carrier name: Courier						1
Shipping container/cooler in good condition?	Yes 🗹	No 🗆	Not Prese	nt 🗆		
Custody seals intact on shipping container/cooler?	Yes 🗌	No 🗆	Not Prese	nt 🗹		
Custody seals intact on sample bottles?	Yes 🗌	No 🗆	Not Prese	nt 🗹		
Chain of custody present?	Yes 🗹	No 🗆				
Chain of custody signed when relinquished and received?	Yes 🗹	No 🗆				
Chain of custody agrees with sample labels?	Yes 🗹	No 🗆				
Samples in proper container/bottle?	Yes 🗹	No 🗆				
Sample containers intact?	Yes 🗹	No 🗆				
Sufficient sample volume for indicated test?	Yes 🗹	No 🗆				
All samples received within holding time?	Yes 🗹	No 🗆				
Container/Temp Blank temperature in compliance?	Yes 🗹	No 🗆				
Sample(s) received on ice? Temperature(s)/Thermometer(s):	Yes 🗹 2.6/2.6, 2.0	No	/ <u>3.4 c</u> SR2			
Cooler(s)/Kit(s):						
Date/Time sample(s) sent to storage:	6/4/2016 9	:16:33 AM				
Water - VOA vials have zero headspace?	Yes 🗋	No 🗀	No VOA vials	submitted		
Water - pH acceptable upon receipt?	Yes 🖌	No 🗆	N/A			
pH adjusted? pH adjusted by:	Yes	No 🗹	N/A			

Login Notes:

Client Contacted:	Date Contacted:	Person Contacted:
Contacted By:	Regarding:	
Comments:		
CorrectiveAction		

SRC Page 1 of 1

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