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Project 4480
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Kerr-McGee Oil & Gas Onshore LP
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June 10, 2016

Mr. Peter Gintautas
Environmental Protection Specialist
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, Colorado 80203

Re: No Further Action Status Request
Karich Helen E Unit #2/ Herman 32-9K / Herman 32-10K
API # 05-123-10830
COGCC Remediation # 4480
SWSE Sec 32-T3N-R66W
Weld County, Colorado

Dear Mr. Gintautas:

Kerr-McGee Oil and Gas Onshore LP (Kerr-McGee) is submitting this letter report as an update to the Form 27, submitted on June 22, 2009, for Karich Helen E Unit #2/ Herman 32-9K / Herman 32-10K dumphine release. We are requesting a No Further Action (NFA) status for this site.

Background

On January 19, 2009, produced water was discovered where it surfaced above a corroded dumphine. An unknown volume of oil and produced water were released. The petroleum hydrocarbon impacted soil was excavated. Kerr-McGee contracted LT Environmental, Inc. (LTE) to document excavation activities, collect confirmation soil and groundwater samples from the excavation, assess the groundwater impact, and implement a groundwater monitoring program. A topographic Site Location Map showing the geographical setting of the release is provided as Figure 1.

On January 21, 2009, confirmation soil samples were collected from the excavation sidewalls for total extractable petroleum hydrocarbons (TEPH) analysis by United States Environmental Protection Agency (USEPA) Method 8015. Laboratory analytical results indicated that the TEPH concentrations were less than the Colorado Oil and Gas Conservation Commission (COGCC) sensitive area allowable level of 1,000 milligrams per kilogram (mg/kg) at the extent of excavation. The soil samples were not analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) as they were collected prior to the COGCC rule changes that took effect on April 1, 2009. Approximately 160 cubic yards of impacted soil were removed from the excavation and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. The confirmation soil sample analytical results are summarized in Table 1.

Groundwater was encountered in the excavation at approximately 8 feet below ground surface. On January 21, 2009, one groundwater sample (GW01) was collected from the open excavation and submitted for laboratory analysis of BTEX by USEPA Method 8260B. Laboratory results for excavation groundwater sample GW01 indicated that the benzene concentration exceeded the Colorado Groundwater Quality Standard (CGWQS) of 5.0 microgram per liter ($\mu\text{g/L}$) at a concentration of 1,500 $\mu\text{g/L}$. Based on the excavation groundwater sample results, approximately 15 barrels of impacted groundwater were removed from the open excavation and transported to a licensed injection facility for disposal using a vacuum truck. Five gallons of MicroBlaze[®], a concentrated solution of facultative microbes, nutrients, and surfactants designed to bioremediate petroleum hydrocarbons, were applied to the excavation groundwater immediately prior to backfilling the excavation. An Excavation Site Map depicting the excavation extent and the excavation soil and groundwater sample locations is provided as Figure 2. The excavation groundwater sample analytical results are summarized in Table 2.

Groundwater Assessment and Monitoring

In order to assess the extent and magnitude of the residual dissolved-phase groundwater impacts, ten monitoring wells (MW01 through MW10) were installed at the site between February 2009 and November 2010. Analytical results for the groundwater monitoring events conducted between February 2009 and November 2010 indicated that the benzene concentrations in MW01 and MW05 through MW07 exceeded the CGWQS for benzene. BTEX concentrations in MW02 through MW04 and MW08 through MW10 were less than the CGWQS and the laboratory reporting limit of 1.0 $\mu\text{g/L}$. Based on the analytical results, MW02 through MW04 and MW08 through MW10 were designated as point of compliance wells. Groundwater monitoring continued on a quarterly basis. A Site Map depicting the monitoring well locations is provided as Figure 3. Soil boring logs with monitoring well completion diagrams are provided in Appendix A.

In a letter dated June 8, 2011, COGCC approved the removal of monitoring wells MW03 and MW04 from the monitoring program, based on four or more consecutive quarters of compliant groundwater analytical results. Monitoring well MW07 was destroyed as of the January 2013 monitoring event. Monitoring wells MW05, MW09, and MW10 were destroyed as of the October 2013 monitoring event.

On November 18, 2013, monitoring wells MW01, MW02, MW03, MW06, and MW08 were surveyed to obtain relative groundwater and well elevation data. The relative elevation data indicated the groundwater flow direction at the site is to the west. The relative groundwater elevation data are provided in Table 2.

On May 18, 2015, four replacement monitoring wells (MW05R, MW07R, MW09R, and MW10R) were installed. Soil boring logs with monitoring well completion diagrams for the replacement wells are provided in Appendix A.

On May 4, 2016, monitoring wells MW01, MW02, MW05R, MW06, MW07R, MW08, MW09R, and MW10R were surveyed to confirm relative groundwater and well elevation data. The relative groundwater elevation data indicated the groundwater flow direction at the site is to the northwest.

A groundwater Elevation Contour Map for each of the four compliant quarterly monitoring events (third quarter 2015 through second quarter 2016) is provided as Figure 4A through Figure 4D, respectively. The relative groundwater elevation data are provided in Table 2.

As of the April 2016 quarterly monitoring event, BTEX concentrations in monitoring wells MW01, MW02, and MW05R through MW10R have been compliant with the CGWQS for four or more consecutive quarterly groundwater monitoring events. The groundwater analytical results are summarized in Table 2. The laboratory analytical reports for the four compliant groundwater monitoring events are provided in Appendix B.

Conclusions

Remedial actions employed at the site have included excavation of the source area, removal of impacted groundwater from the excavation, and application of the MicroBlaze[®] groundwater amendment to the excavation groundwater. Based on these remedial actions and analytical data showing BTEX concentrations in site groundwater in compliance with the CGWQS for four consecutive quarterly monitoring events, Kerr-McGee is requesting an NFA status for this site.

Feel free to contact me at 970-929-6726 if you have any questions regarding this information.

Sincerely,

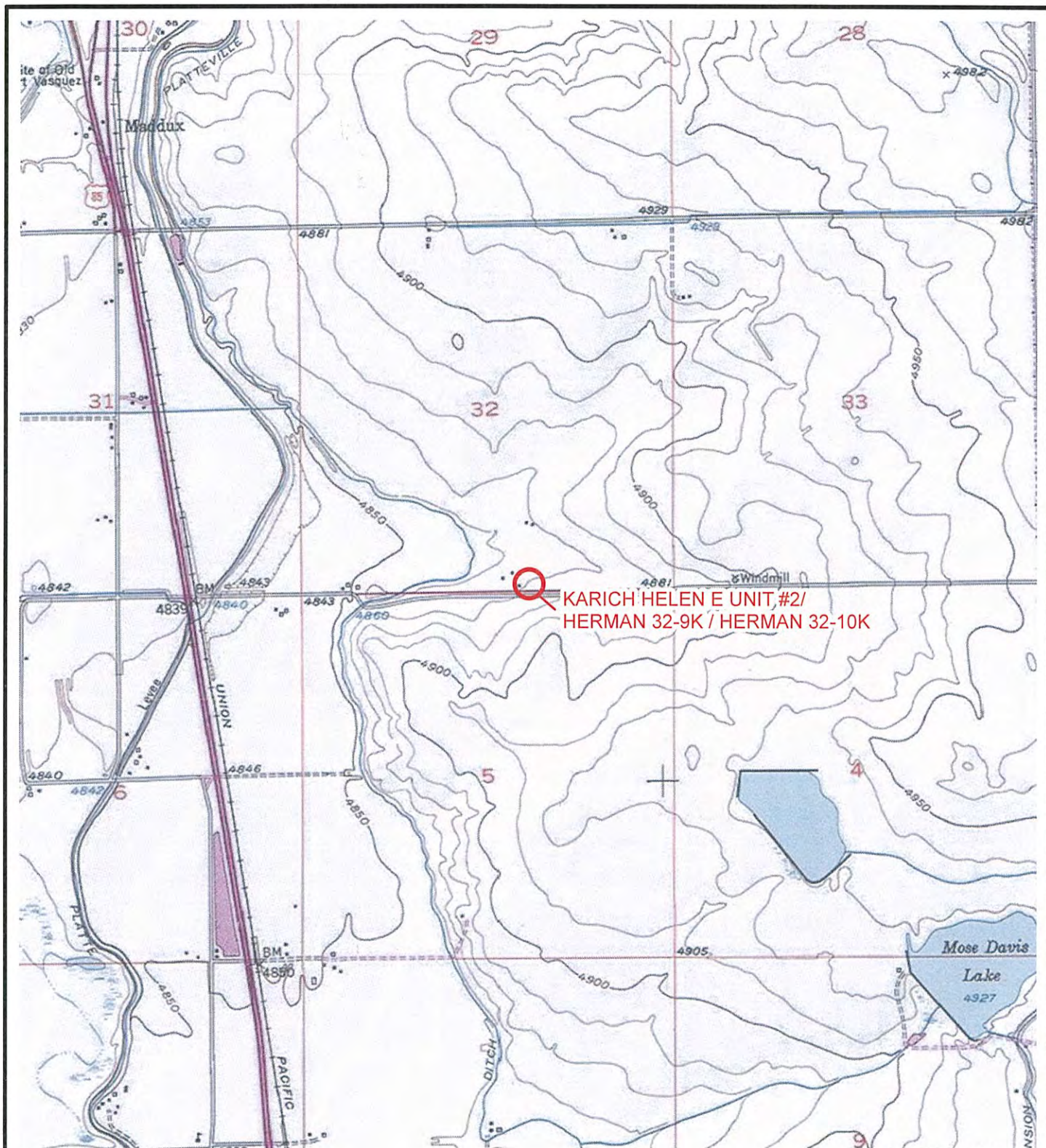
Kerr-McGee Oil & Gas Onshore LP



Paul D. Schneider, P.G.
HSE Manager

Attachments

FIGURES



LEGEND

○ SITE LOCATION

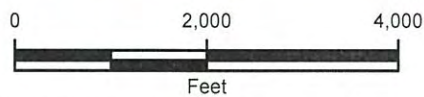
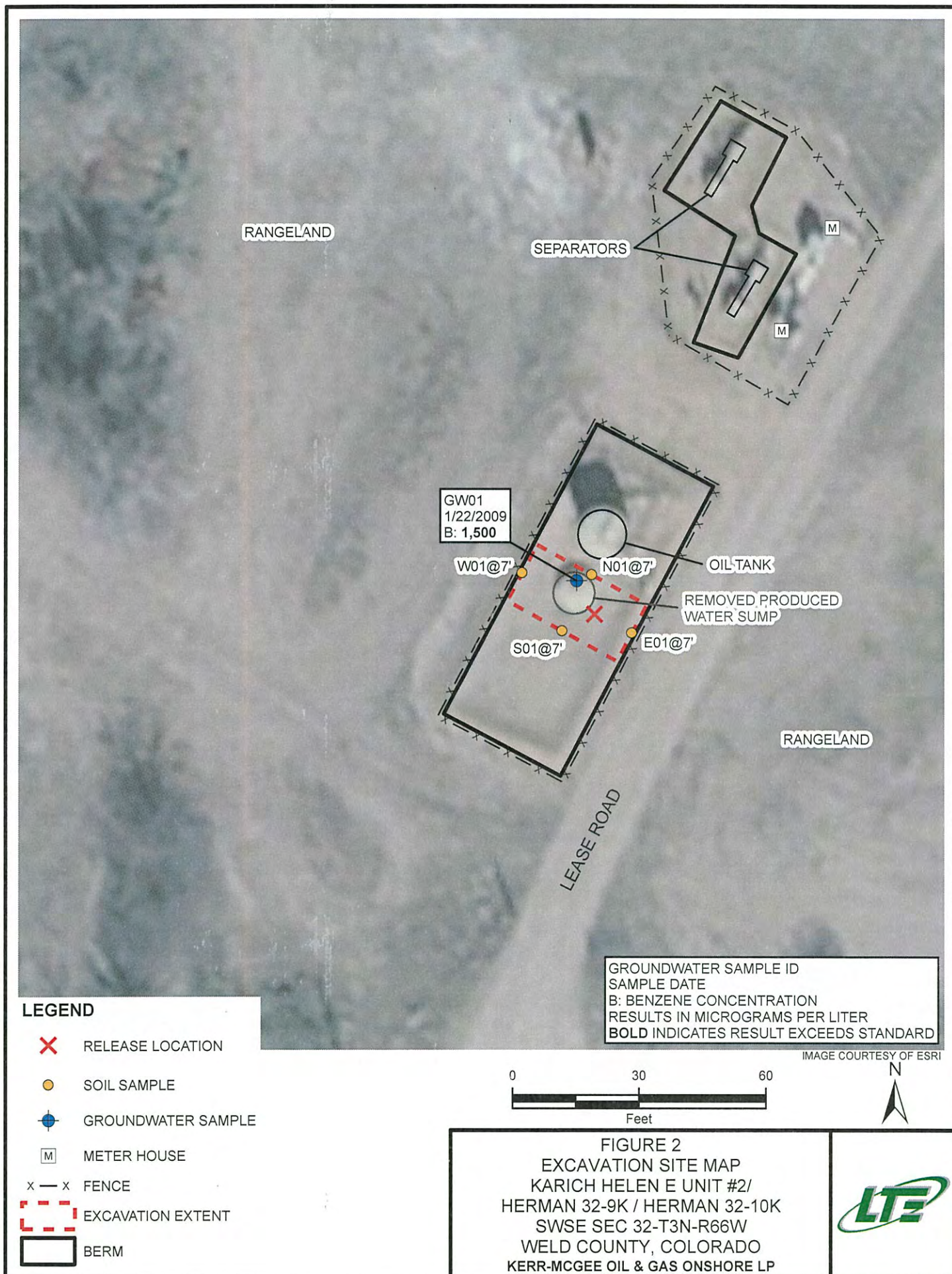


FIGURE 1
 SITE LOCATION MAP
 KARICH HELEN E UNIT #2/
 HERMAN 32-9K / HERMAN 32-10K
 SWSE SEC 32-T3N-R66W
 WELD COUNTY, COLORADO
 KERR-MCGEE OIL & GAS ONSHORE LP







LEGEND

- RELEASE LOCATION
- MONITORING WELL
- DESTROYED MONITORING WELL
- REMOVED FROM MONITORING PROGRAM
- GROUNDWATER SAMPLE
- METER HOUSE
- SURVEYED GROUNDWATER FLOW DIRECTION
- FENCE
- EXCAVATION EXTENT
- BERM

GROUNDWATER SAMPLE ID
SAMPLE DATE
B: BENZENE CONCENTRATION
RESULTS IN MICROGRAMS PER LITER
BOLD INDICATES RESULT EXCEEDS STANDARD

IMAGE COURTESY OF ESRI

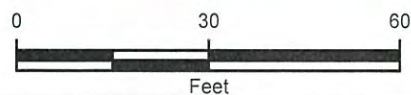


FIGURE 3
SITE MAP
KARICH HELEN E UNIT #2/
HERMAN 32-9K / HERMAN 32-10K
SWSE SEC 32-T3N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



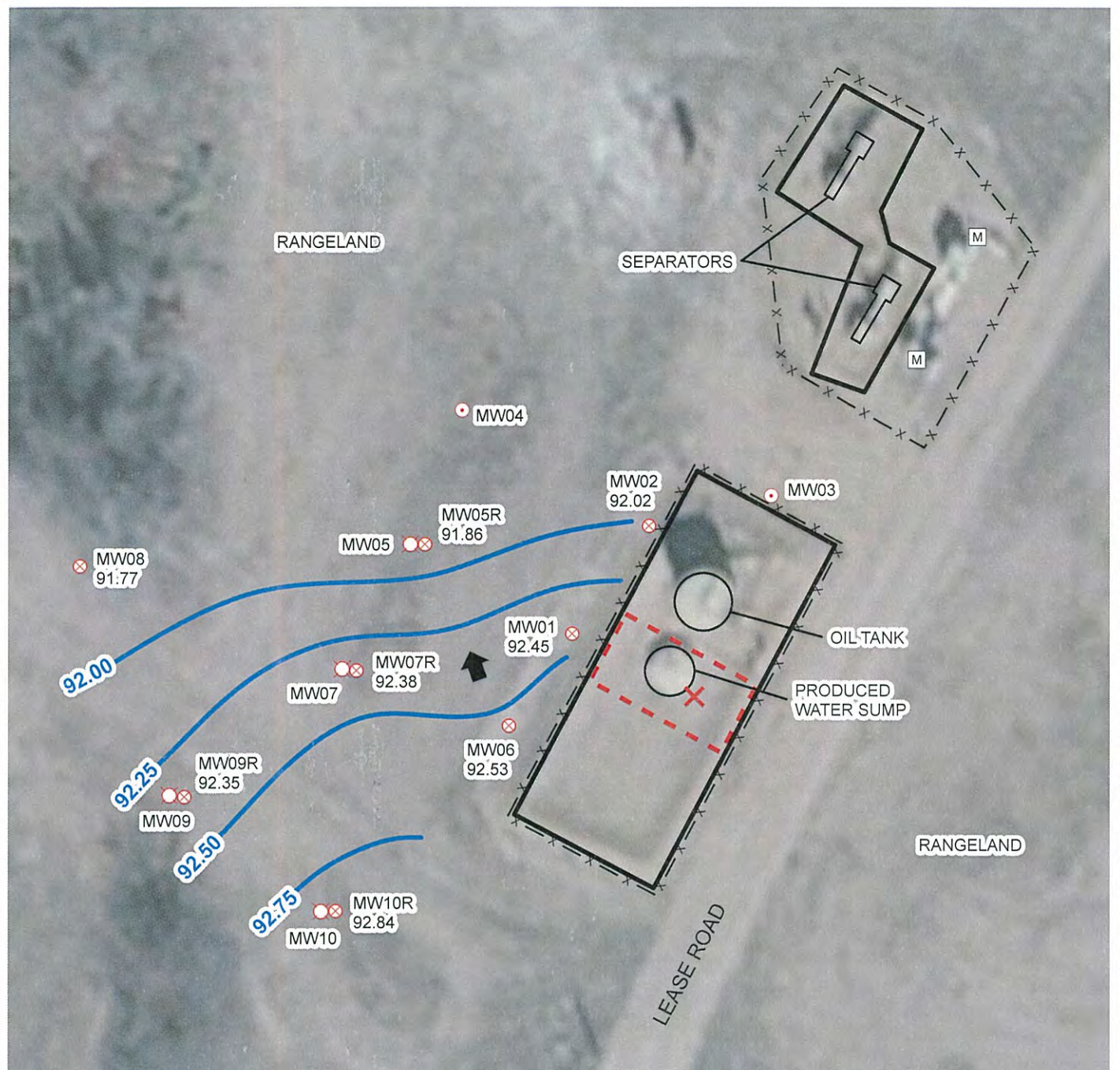
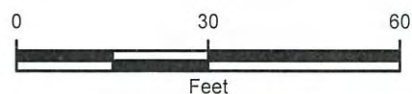


IMAGE COURTESY OF ESRI

LEGEND

- X RELEASE LOCATION
- ⊗ MONITORING WELL
- ⊗ DESTROYED MONITORING WELL
- ⊙ REMOVED FROM MONITORING PROGRAM
- M METER HOUSE
- ↑ SURVEYED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
CONTOUR INTERVAL = 0.25 FEET
GRADIENT = 0.01 FEET/FOOT

- x — x FENCE
- - - EXCAVATION EXTENT
- BERM



GROUNDWATER ELEVATIONS WERE
MEASURED ON JULY 15, 2015.

FIGURE 4A
GROUNDWATER ELEVATION CONTOUR MAP
THIRD QUARTER 2015
KARICH HELEN E UNIT #2/
HERMAN 32-9K / HERMAN 32-10K
SWSE SEC 32-T3N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



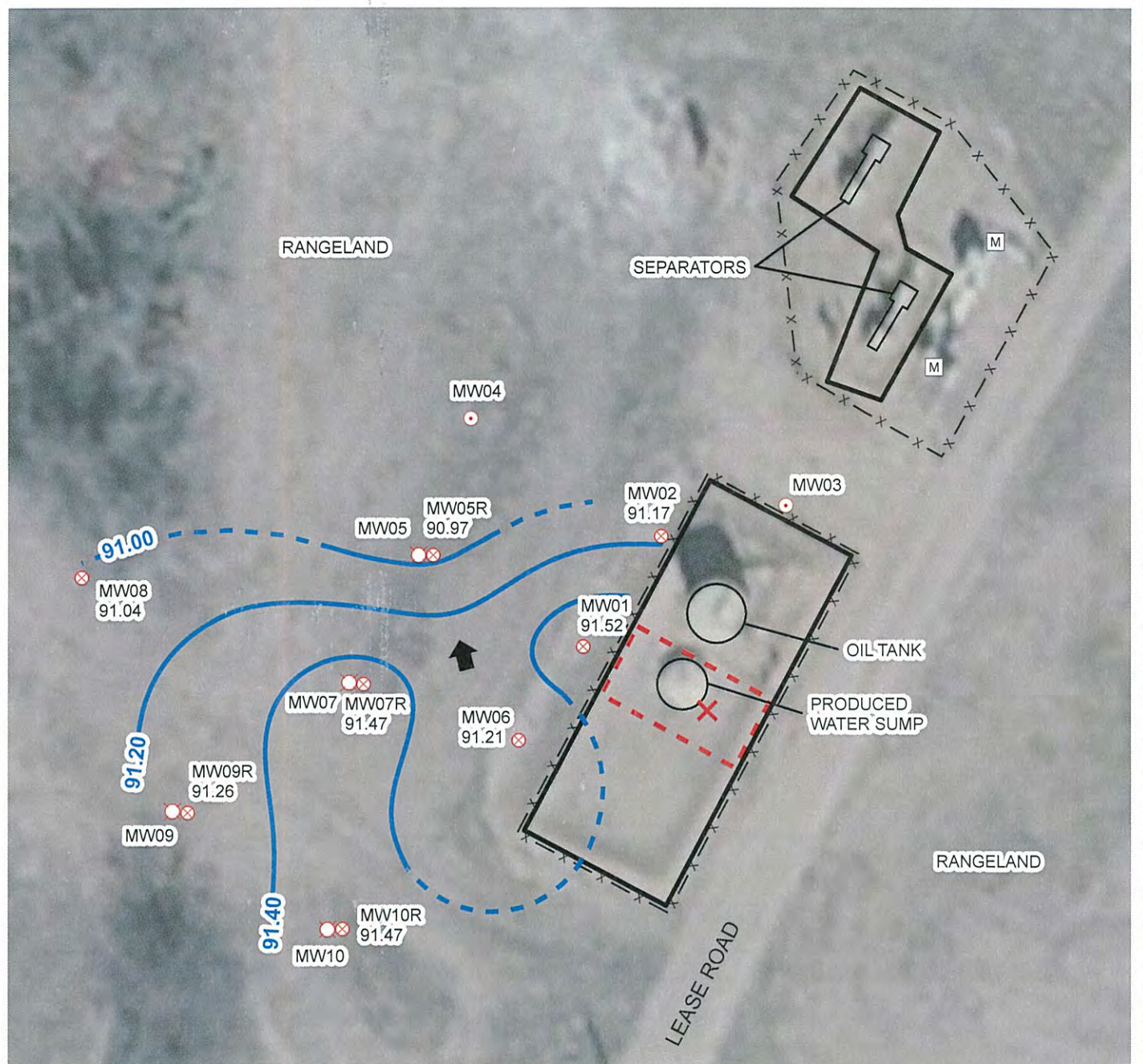


IMAGE COURTESY OF ESRI

LEGEND

- X RELEASE LOCATION
- ⊗ MONITORING WELL
- ⊗ DESTROYED MONITORING WELL
- REMOVED FROM MONITORING PROGRAM
- M METER HOUSE
- ↑ SURVEYED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
- - - DASHED WHERE INFERRED
- CONTOUR INTERVAL = 0.20 FEET
- GRADIENT = 0.01 FEET/FOOT

- x — x FENCE
- - - EXCAVATION EXTENT
- BERM

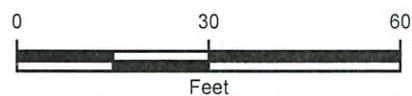


FIGURE 4B
GROUNDWATER ELEVATION CONTOUR MAP
FOURTH QUARTER 2015
KARICH HELEN E UNIT #2/
HERMAN 32-9K / HERMAN 32-10K
SWSE SEC 32-T3N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



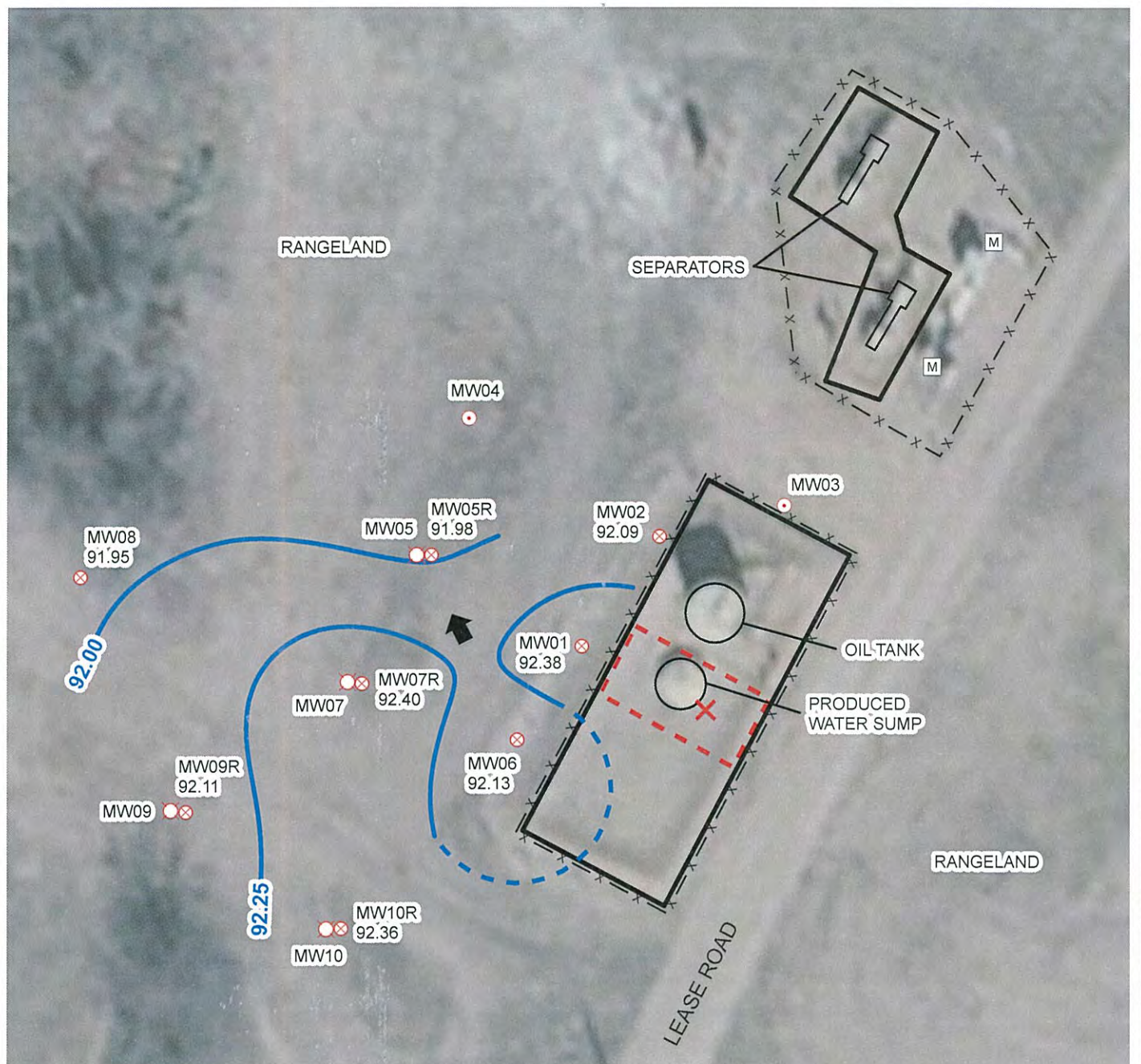


IMAGE COURTESY OF ESRI

LEGEND

✕ RELEASE LOCATION

⊗ MONITORING WELL

⊗ DESTROYED MONITORING WELL

○ REMOVED FROM MONITORING PROGRAM

[M] METER HOUSE

↑ SURVEYED GROUNDWATER FLOW DIRECTION

— RELATIVE GROUNDWATER ELEVATION CONTOUR

- - - DASHED WHERE INFERRED
CONTOUR INTERVAL = 0.25 FEET
GRADIENT = 0.01 FEET/FOOT

GROUNDWATER ELEVATIONS WERE
MEASURED ON JANUARY 5, 2016.

x — x FENCE

- - - EXCAVATION EXTENT

▭ BERM

0 30 60
Feet



FIGURE 4C
GROUNDWATER ELEVATION CONTOUR MAP
FIRST QUARTER 2016
KARICH HELEN E UNIT #2/
HERMAN 32-9K / HERMAN 32-10K
SWSE SEC 32-T3N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



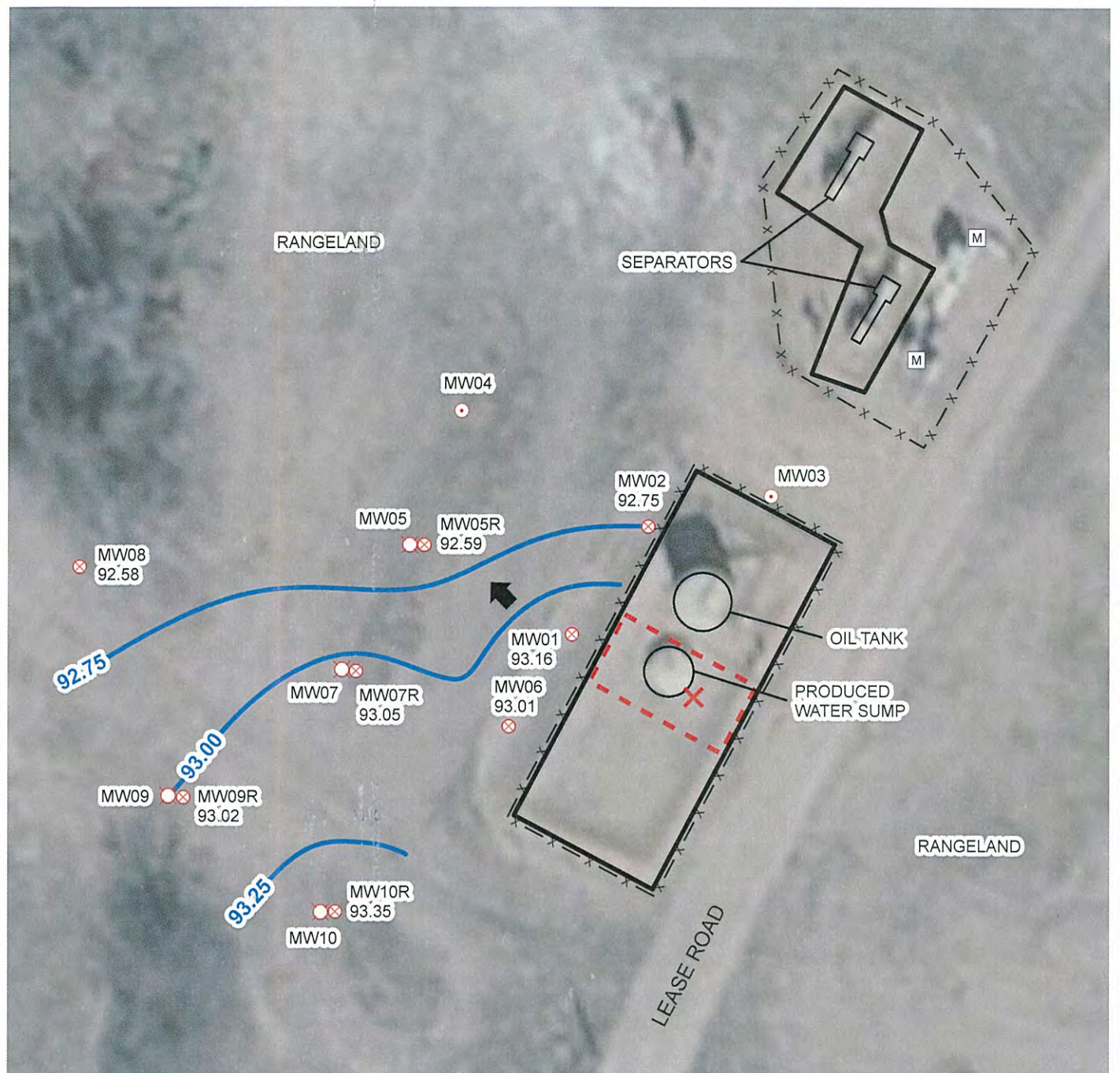
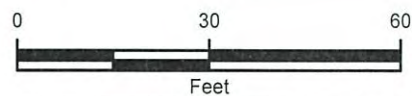


IMAGE COURTESY OF ESRI

LEGEND

- X RELEASE LOCATION
- ⊗ MONITORING WELL
- ⊗ DESTROYED MONITORING WELL
- ⊙ REMOVED FROM MONITORING PROGRAM
- M METER HOUSE
- ↑ SURVEYED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
CONTOUR INTERVAL = 0.25 FEET
GRADIENT = 0.01 FEET/FOOT

- x — x FENCE
- EXCAVATION EXTENT
- BERM



GROUNDWATER ELEVATIONS WERE
MEASURED ON APRIL 13, 2016.

FIGURE 4D
GROUNDWATER ELEVATION CONTOUR MAP
SECOND QUARTER 2016
KARICH HELEN E UNIT #2/
HERMAN 32-9K / HERMAN 32-10K
SWSE SEC 32-T3N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



TABLES

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
KARICH HELEN E UNIT #2/HERMAN 32-9K/HERMAN 32-10K
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Soil Sample ID	Depth (bgs)	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	DRO (mg/kg)	GRO (mg/kg)	ORO (mg/kg)
E01@7'	7'	01/22/2009	NA	NA	NA	NA	<50	<50	<50
N01@7'	7'	01/22/2009	NA	NA	NA	NA	<50	<50	<50
S01@7'	7'	01/22/2009	NA	NA	NA	NA	<50	<50	<50
W01@7'	7'	01/22/2009	NA	NA	NA	NA	<50	<50	<50
COGCC Allowable Levels			0.17	85	100	175	500*	500*	500*

Notes: bgs - below ground surface

COGCC - Colorado Oil and Gas Conservation Commission

DRO - diesel range organics

GRO - gasoline range organics

mg/kg - milligrams per kilogram

NA - not analyzed/not available

ORO - oil range organics

* - Standard applies to combined DRO-GRO-ORO

< - less than laboratory reporting limit

Bold indicates result exceeds allowable level



TABLE 2
GROUNDWATER ANALYTICAL AND FIELD RESULTS
KARICH HELEN E UNIT #2/HERMAN 32-9K/HERMAN 32-10K
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
GW01	01/22/2009	1500	210	26	210	8.00	NA
MW01	02/25/2009	10000	580	280	1200	5.60	91.50
	04/24/2009	2300	3.3	94	300	4.21	92.89
	07/13/2009	55	<1.0	1.9	<1.0	4.12	92.98
	10/13/2009	<1.0	<1.0	<1.0	<1.0	6.22	90.88
	01/22/2010	150	<1.0	<1.0	<1.0	5.57	91.53
	04/01/2010	95	<1.0	<1.0	<1.0	4.82	92.28
	07/22/2010	6.9	<1.0	1.5	6.9	3.98	93.12
	10/07/2010	1.8	<1.0	<1.0	<1.0	5.32	91.78
	01/20/2011	13	<1.0	<1.0	<1.0	5.66	91.44
	04/07/2011	<1.0	<1.0	<1.0	<1.0	5.48	91.62
	07/18/2011	21	<1.0	18	46	4.51	92.59
	10/07/2011	<1.0	<1.0	<1.0	<1.0	6.58	90.52
	01/18/2012	5.7	<1.0	<1.0	<1.0	5.67	91.43
	04/13/2012	2.2	<1.0	8.7	32	5.35	91.75
	07/12/2012	<1.0	<1.0	<1.0	<1.0	5.13	91.97
	10/25/2012	<1.0	<1.0	<1.0	<1.0	6.65	90.45
	01/08/2013	<1.0	<1.0	<1.0	<1.0	6.20	90.90
	04/18/2013	26	<1.0	87	210	5.45	91.65
	07/16/2013	<1.0	<1.0	<1.0	<1.0	6.37	90.73
	10/03/2013	1.3	<1.0	<1.0	<1.0	5.70	91.40
	11/18/2013	Surveyed - Not Sampled				5.71	91.29
	01/31/2014	<4.0	<4.0	<4.0	<4.0	5.57	91.53
	04/01/2014	1.4	<1.0	<1.0	<1.0	5.31	91.69
	07/24/2014	<1.0	<1.0	8.4	61.8	4.29	92.71
	10/17/2014	<1.0	<1.0	<1.0	<1.0	5.07	91.93
	01/09/2015	<1.0	<1.0	<1.0	<1.0	NM	NA
	04/03/2015	<1.0	<1.0	1.0	6.1	4.82	92.18
	07/15/2015	<1.0	<1.0	<1.0	<1.0	4.55	92.45
	10/15/2015	<1.0	<1.0	<1.0	<1.0	5.48	91.52
	01/05/2016	<1.0	<1.0	<1.0	<1.0	4.62	92.38
	04/13/2016	<1.0	<1.0	<1.0	<1.0	3.84	93.16
	05/04/2016	Surveyed - Not Sampled				2.83	94.11



TABLE 2 (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
KARICH HELEN E UNIT #2/HERMAN 32-9K/HERMAN 32-10K
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW02	02/25/2009	<1.0	<1.0	<1.0	<1.0	5.25	91.66
	04/24/2009	<1.0	<1.0	<1.0	<1.0	3.71	93.20
	07/13/2009	<1.0	<1.0	<1.0	<1.0	3.85	93.06
	10/13/2009	<1.0	<1.0	<1.0	<1.0	5.88	91.03
	01/22/2010	<1.0	<1.0	<1.0	<1.0	5.19	91.72
	04/01/2010	<1.0	<1.0	<1.0	<1.0	4.30	92.61
	07/22/2010	<1.0	<1.0	<1.0	<1.0	3.56	93.35
	10/07/2010	<1.0	<1.0	<1.0	<1.0	4.92	91.99
	01/20/2011	<1.0	<1.0	<1.0	<1.0	5.30	91.61
	04/07/2011	<1.0	<1.0	<1.0	<1.0	5.20	91.71
	07/18/2011	<1.0	<1.0	<1.0	<1.0	4.17	92.74
	10/07/2011	<1.0	<1.0	<1.0	<1.0	6.27	90.64
	01/18/2012	<1.0	<1.0	<1.0	<1.0	5.42	91.39
	04/13/2012	<1.0	<1.0	<1.0	<1.0	5.07	91.84
	07/12/2012	<1.0	<1.0	<1.0	<1.0	4.58	92.33
	10/25/2012	<1.0	<1.0	<1.0	<1.0	6.30	90.61
	01/08/2013	<1.0	<1.0	<1.0	<1.0	5.88	91.03
	04/18/2013	<1.0	<1.0	<1.0	<1.0	5.03	91.88
	07/16/2013	<1.0	<1.0	<1.0	<1.0	6.20	90.71
	10/03/2013	<1.0	<1.0	<1.0	<1.0	5.45	91.46
	11/18/2013	Surveyed - Not Sampled				5.53	91.44
	01/31/2014	<4.0	<4.0	<4.0	<4.0	5.25	91.66
	04/01/2014	<1.0	<1.0	<1.0	<1.0	5.20	91.77
	07/24/2014	<1.0	<1.0	<1.0	<1.0	4.06	92.91
	10/17/2014	<1.0	<1.0	<1.0	<1.0	4.87	92.10
	01/09/2015	<1.0	<1.0	<1.0	<1.0	NM	NA
	04/03/2015	<1.0	<1.0	<1.0	<1.0	4.69	91.82
	07/15/2015	<1.0	<1.0	<1.0	<1.0	4.49	92.02
	10/15/2015	<1.0	<1.0	<1.0	<1.0	5.34	91.17
	01/05/2016	<1.0	<1.0	<1.0	<1.0	4.42	92.09
	04/13/2016	<1.0	<1.0	<1.0	<1.0	3.76	92.75
	05/04/2016	Surveyed - Not Sampled				2.74	93.78
MW03	02/25/2009	<1.0	<1.0	<1.0	<1.0	5.55	91.86
	04/24/2009	<1.0	<1.0	<1.0	<1.0	3.84	93.57



TABLE 2 (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
KARICH HELEN E UNIT #2/HERMAN 32-9K/HERMAN 32-10K
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW03	07/13/2009	<1.0	<1.0	<1.0	<1.0	4.10	93.31
	10/13/2009	<1.0	<1.0	<1.0	<1.0	6.15	91.26
	01/22/2010	<1.0	<1.0	<1.0	<1.0	5.51	94.60
	04/01/2010	<1.0	<1.0	<1.0	<1.0	4.60	92.81
	07/22/2010	<1.0	<1.0	<1.0	<1.0	3.75	93.66
	10/07/2010	<1.0	<1.0	<1.0	<1.0	5.19	92.22
	01/20/2011	<1.0	<1.0	<1.0	<1.0	5.54	91.87
	04/07/2011	<1.0	<1.0	<1.0	<1.0	5.45	91.96
	07/18/2011	Removed from Monitoring Program				NM	NA
	11/18/2013	Surveyed - Not Sampled				5.88	91.59
	05/04/2016	Surveyed - Not Sampled				3.02	94.39
MW04	04/24/2009	<1.0	<1.0	<1.0	<1.0	3.58	NA
	07/13/2009	<1.0	<1.0	<1.0	<1.0	4.33	NA
	10/13/2009	<1.0	<1.0	<1.0	<1.0	5.21	NA
	01/22/2010	<1.0	<1.0	<1.0	<1.0	4.45	NA
	04/01/2010	<1.0	<1.0	<1.0	<1.0	3.61	NA
	07/22/2010	<1.0	<1.0	<1.0	<1.0	2.98	NA
	10/07/2010	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA
	01/20/2011	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA
	04/07/2011	<1.0	<1.0	<1.0	<1.0	4.62	NA
	07/18/2011	Removed from Monitoring Program				NM	NA
MW05	04/24/2009	<1.0	<1.0	<1.0	<1.0	5.29	NA
	07/13/2009	<1.0	<1.0	<1.0	<1.0	3.73	NA
	10/13/2009	1.4	<1.0	<1.0	<1.0	5.65	NA
	01/22/2010	8.5	<1.0	<1.0	<1.0	5.03	NA
	04/01/2010	1.8	<1.0	<1.0	<1.0	4.20	NA
	07/22/2010	<1.0	<1.0	<1.0	<1.0	3.61	NA
	10/07/2010	<1.0	<1.0	<1.0	<1.0	4.85	NA
	01/20/2011	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA
	04/07/2011	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA
	07/18/2011	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA
	10/07/2011	12	<1.0	<1.0	<1.0	6.11	NA
	01/18/2012	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA



TABLE 2 (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
KARICH HELEN E UNIT #2/HERMAN 32-9K/HERMAN 32-10K
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW05	04/13/2012	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA
	07/12/2012	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA
	11/01/2012	<1.0	<1.0	<1.0	<1.0	6.65	NA
	01/08/2013	<1.0	<1.0	<1.0	<1.0	5.44	NA
	04/18/2013	<1.0	<1.0	<1.0	<1.0	4.66	NA
	07/16/2013	Damaged - Not Sampled				Damaged	NA
	MW05 destroyed as of 10/3/2013						
MW05R	04/03/2015	<1.0	<1.0	<1.0	<1.0	6.91	91.65
	07/15/2015	<1.0	<1.0	<1.0	<1.0	6.70	91.86
	10/15/2015	<1.0	<1.0	<1.0	<1.0	7.59	90.97
	01/05/2016	<1.0	<1.0	<1.0	<1.0	6.58	91.98
	04/13/2016	<1.0	<1.0	<1.0	<1.0	5.97	92.59
	05/04/2016	Surveyed - Not Sampled				2.32	93.58
MW06	07/22/2010	190	<1.0	240	5.8	4.24	93.14
	10/07/2010	170	<1.0	200	<1.0	5.37	91.92
	01/20/2011	30	<1.0	90	<1.0	5.83	91.46
	04/07/2011	56	<1.0	290	<1.0	5.77	91.52
	07/18/2011	110	<1.0	140	<1.0	4.76	92.53
	10/07/2011	19	<1.0	15	<1.0	6.12	91.17
	01/18/2012	6.7	<1.0	9.8	<1.0	6.01	91.28
	04/13/2012	3.0	<1.0	<1.0	<1.0	5.20	92.09
	07/12/2012	29	<1.0	21	<1.0	5.59	91.70
	10/25/2012	8.0	<1.0	<1.0	<1.0	6.83	90.46
	01/08/2013	5.1	<1.0	<1.0	<1.0	6.42	90.87
	04/18/2013	5.3	<1.0	1.0	<1.0	5.66	91.63
	07/16/2013	9.6	<1.0	<1.0	<1.0	6.39	90.90
	10/03/2013	1.2	<1.0	<1.0	<1.0	5.78	91.51
	11/18/2013	Surveyed - Not Sampled				5.86	91.37
	01/31/2014	<4.0	<4.0	<4.0	<4.0	5.71	91.58
	04/01/2014	4.9	<1.0	5.8	<1.0	5.42	91.81
	07/24/2014	5.4	<1.0	<1.0	<1.0	4.57	92.66
	10/17/2014	3.4	<1.0	1.4	<1.0	5.22	92.01
	01/09/2015	2.4	<1.0	3.2	<1.0	NM	NA
	04/03/2015	5.4	<1.0	13.7	<1.0	4.95	92.07



TABLE 2 (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
KARICH HELEN E UNIT #2/HERMAN 32-9K/HERMAN 32-10K
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW06	07/15/2015	2.6	<1.0	2.8	<1.0	4.49	92.53
	10/15/2015	1.0	<1.0	<1.0	<1.0	5.81	91.21
	01/05/2016	3.0	<1.0	4.0	<1.0	4.89	92.13
	04/13/2016	4.0	<1.0	3.8	<1.0	4.01	93.01
	05/04/2016	Surveyed - Not Sampled				2.92	94.01
MW07	07/22/2010	46	<1.0	<1.0	<1.0	3.74	NA
	10/07/2010	5.3	<1.0	<1.0	<1.0	4.96	NA
	01/20/2011	<1.0	<1.0	1.2	<1.0	PVC Blocked	NA
	04/07/2011	3.4	<1.0	<1.0	<1.0	PVC Blocked	NA
	07/18/2011	2.0	<1.0	2.9	5.8	PVC Blocked	NA
	10/07/2011	<1.0	<1.0	<1.0	<1.0	4.71	NA
	01/18/2012	<1.0	<1.0	<1.0	<1.0	PVC Blocked	NA
	04/13/2012	18	<1.0	32	31	PVC Blocked	NA
	07/12/2012	<1.0	<1.0	<1.0	<1.0	3.50	NA
	10/25/2012	Damaged - Not Sampled				NM	NA
MW07 destroyed as of 1/7/2013							
MW07R	04/03/2015	<1.0	<1.0	<1.0	<1.0	7.11	92.07
	07/15/2015	<1.0	<1.0	<1.0	<1.0	6.80	92.38
	10/15/2015	<1.0	<1.0	<1.0	<1.0	7.71	91.47
	01/05/2016	<1.0	<1.0	<1.0	<1.0	6.78	92.40
	04/13/2016	<1.0	<1.0	<1.0	<1.0	6.13	93.05
	05/04/2016	Surveyed - Not Sampled				2.73	94.01
MW08	11/29/2010	<1.0	<1.0	<1.0	<1.0	5.11	91.09
	01/20/2011	<1.0	<1.0	<1.0	<1.0	5.30	90.90
	04/07/2011	<1.0	<1.0	<1.0	<1.0	5.28	90.92
	07/18/2011	<1.0	<1.0	<1.0	<1.0	4.24	91.96
	10/07/2011	<1.0	<1.0	<1.0	<1.0	6.32	89.88
	01/18/2012	<1.0	<1.0	<1.0	<1.0	5.37	90.83
	04/13/2012	<1.0	<1.0	<1.0	<1.0	4.81	91.39
	07/12/2012	<1.0	<1.0	<1.0	<1.0	5.09	91.11
	10/25/2012	<1.0	<1.0	<1.0	<1.0	6.32	89.88
	01/08/2013	<1.0	<1.0	<1.0	<1.0	5.89	90.31
	04/18/2013	<1.0	<1.0	<1.0	<1.0	5.15	91.05



TABLE 2 (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
KARICH HELEN E UNIT #2/HERMAN 32-9K/HERMAN 32-10K
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW08	07/16/2013	<1.0	<1.0	<1.0	<1.0	6.20	90.00
	10/03/2013	<1.0	<1.0	<1.0	<1.0	6.25	89.95
	11/18/2013	Surveyed - Not Sampled				5.24	90.88
	01/31/2014	<4.0	<4.0	<4.0	<4.0	5.04	91.16
	04/01/2014	<1.0	<1.0	<1.0	<1.0	4.84	91.28
	07/24/2014	<1.0	<1.0	<1.0	<1.0	4.03	92.09
	10/17/2014	<1.0	<1.0	<1.0	<1.0	4.68	91.44
	01/09/2015	<1.0	<1.0	<1.0	<1.0	NM	NA
	04/03/2015	<1.0	<1.0	<1.0	<1.0	4.47	91.64
	07/15/2015	<1.0	<1.0	<1.0	<1.0	4.34	91.77
	10/15/2015	<1.0	<1.0	<1.0	<1.0	5.07	91.04
	01/05/2016	<1.0	<1.0	<1.0	<1.0	4.16	91.95
	04/13/2016	<1.0	<1.0	<1.0	<1.0	3.53	92.58
	05/04/2016	Surveyed - Not Sampled				2.69	93.57
MW09	11/29/2010	<1.0	<1.0	<1.0	<1.0	6.14	NA
	01/20/2011	<1.0	<1.0	<1.0	<1.0	6.50	NA
	04/07/2011	<1.0	<1.0	<1.0	<1.0	6.39	NA
	07/18/2011	<1.0	<1.0	<1.0	<1.0	5.36	NA
	10/07/2011	<1.0	<1.0	<1.0	<1.0	7.28	NA
	01/18/2012	<1.0	<1.0	<1.0	<1.0	6.67	NA
	04/13/2012	<1.0	<1.0	<1.0	<1.0	6.25	NA
	07/12/2012	<1.0	<1.0	<1.0	<1.0	6.37	NA
	10/25/2012	<1.0	<1.0	<1.0	<1.0	6.45	NA
	01/08/2013	<1.0	<1.0	<1.0	<1.0	6.64	NA
	04/18/2013	<1.0	<1.0	<1.0	<1.0	5.95	NA
	07/16/2013	Damaged - Not Sampled				Damaged	NA
	MW09 destroyed as of 10/3/2013						
MW09R	04/03/2015	<1.0	<1.0	<1.0	<1.0	8.01	91.97
	07/15/2015	<1.0	<1.0	<1.0	<1.0	7.63	92.35
	10/15/2015	<1.0	<1.0	<1.0	<1.0	8.72	91.26
	01/05/2016	<1.0	<1.0	<1.0	<1.0	7.87	92.11
	04/13/2016	<1.0	<1.0	<1.0	<1.0	6.96	93.02
	05/04/2016	Surveyed - Not Sampled				3.49	93.88



TABLE 2 (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
KARICH HELEN E UNIT #2/HERMAN 32-9K/HERMAN 32-10K
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW10	11/29/2010	<1.0	<1.0	<1.0	<1.0	6.75	NA
	01/20/2011	<1.0	<1.0	<1.0	<1.0	7.00	NA
	04/07/2011	<1.0	<1.0	<1.0	<1.0	6.98	NA
	07/18/2011	<1.0	<1.0	<1.0	<1.0	6.04	NA
	10/07/2011	<1.0	<1.0	<1.0	<1.0	7.50	NA
	01/18/2012	<1.0	<1.0	<1.0	<1.0	7.10	NA
	04/13/2012	<1.0	<1.0	<1.0	<1.0	6.15	NA
	07/12/2012	<1.0	<1.0	<1.0	<1.0	6.80	NA
	10/25/2012	<1.0	<1.0	<1.0	<1.0	7.01	NA
	01/08/2013	<1.0	<1.0	<1.0	<1.0	7.16	NA
	04/18/2013	<1.0	<1.0	<1.0	<1.0	6.56	NA
	07/16/2013	Damaged - Not Sampled				Damaged	NA
MW10 destroyed as of 10/3/2013							
MW10R	04/03/2015	<1.0	<1.0	<1.0	<1.0	8.50	92.25
	07/15/2015	<1.0	<1.0	<1.0	<1.0	7.91	92.84
	10/15/2015	1.4	1.5	<1.0	<1.0	9.28	91.47
	01/05/2016	<1.0	<1.0	<1.0	<1.0	8.39	92.36
	04/13/2016	<1.0	<1.0	<1.0	<1.0	7.40	93.35
	05/04/2016	Surveyed - Not Sampled				3.96	94.22
CGWQS		5	1000	700	1400		

Notes: CGWQS - Colorado Groundwater Quality Standards
Elev. - elevation
ft bgs - feet below ground surface
GW - groundwater
NA - not analyzed/not available

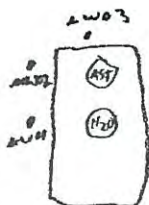
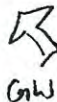
NM - not measured
µg/L - micrograms per liter
< - less than laboratory reporting limit
Bold indicates result exceeds allowable level
Excavation groundwater depth is approximate



APPENDIX A
SOIL BORING LOGS

Well Location Sketch:

AN



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4600 W. 60th Avenue

Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

MW 07

Project:

Karch Helen E unit #2

Date:

2-20-09

Project Number:

CMG 09460

Logged By:

MD

Drilled By:

Prilla

Elevation:

Detector:

Drilling Method:

Direct push

Sampling Method:

Continuous

Gravel Pack:

10-20 Silica sand

Casing Type:

PVC

Screen Type:

PVC

Slot:

0.010

Seal:

Bentonite chips

Diameter:

1"

Length:

2'

Grout:

N/A

Hole Diameter:

2.5"

Depth to Liquid:

—

Total Depth:

12'

Depth to Water:

6'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
Low	dry		No		0				0-2 sand, f-m brown, dry, no odor	
	moist	0.5			2		3'		2-6 AA, moist	
					4				6-7 AA, wet	
	wet	2.5			6		3'		7-9 AA, black staining odor	
MED			Yes		8				9-10 clay, some sand wet, black staining odor	
	moist		No		10		4'		10-12 AA, no odor, no stain	
					12					
					14					
					16					
					18					
					20					
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

Well Location Sketch:

See MW01



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

RW302

Project:

Karich Helen E Unit #2

Date:

12-20-09

Project Number:

09460

Logged By:

MO

Drilled By:

Drill PCO

Elevation:

Detector:

Drilling Method:

Direct push

Sampling Method:

Continuous

Gravel Pack:

10-20 Silica sand

1-12' bgs

Seal:

Bentonite chips

0'-1' bgs

Grout:

N/A

Casing Type:

PVC

Diameter:

1"

Length:

2'

Hole Diameter:

2.5"

Depth to Liquid:

Screen Type:

PVC

Slot:

0.010

Diameter:

1"

Length:

1'

Total Depth:

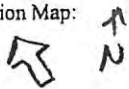
12'

Depth to Water:

5.5'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
LOW	Dry	2.9	NO		0				0-1.5 Sand F-A, dry, no odor, brown	
	Moist	2.9			2		3'		1.5-3' AA, some clay	
		2.9			4				3-5.5 Sand F-m, moist no odor, brown	
	Wet				6		3'		5.5-8' sand m-c, wet, no odor, brown	
MED					8				8'-10' clay, wet, no odor, gray-brown	
	moist	4.5			10		3'		10-12 AA, moist	
					12					
					14					
					16					
					18					
					20					
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

Location Map:



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 Denver, Colorado 80212

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: **MW04** Project: **KARICH HELEN UNIT #2**

Date: **3/19/09** Project Number: **KME09460**

Logged By: **J. SOLOMON** Drilled By: **DRILL PRO**

Elevation: Detector: **MINIRAE 2000 PIP** Drilling Method: **DIRECT PUSH** Sampling Method: **CONTINUOUS**

Gravel Pack: **10-20 SILICA SAND** Seal: **BENTONITE CHIP** Grout: **NA**

Casing Type: **SCH 40 PVC** Diameter: **1"** Length: **2'** Hole Diameter: **2"** Depth to Liquid: **—**

Screen Type: **SCH 40 PVC** Slot: **0.01** Diameter: **1"** Length: **10'** Total Depth: **12'** Depth to Water: **N5'**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0				
LOW	MOIST				2	2.5'		SAND, FINE TO MED, BROWN, MOIST NO STAIN / ODOOR	
		0.3			4				
LOW	SAT				6	2.5'		SAND, FINE, LITTLE TO NO FINES, SAT @ 4.5-5'; NO STAIN / ODOOR	
		0.0			8				
MED	MOIST				10	4'		SILTS - CLAY, MED PLAST, MOIST, FAT CLAY, NO STAIN / ODOOR	
					12				
					14			TD = 12'	
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:

SEE MW84 MAP



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 Denver, Colorado 80212

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW05	Project: KARICH HELEN UNIT #2
Date: 3/15/09	Project Number: KMG09460
Logged By: J. SOLOMON	Drilled By: DRILL PRO
Elevation:	Drilling Method: DIRECT PUSH
Detector: MINI RAE 2000 PID	Sampling Method: CONTINUOUS
Gravel Pack:	Seal: BENTONITE CHIP
Casing Type:	GROUT: NA
Screen Type: SCH 40 PVC	Diameter: 1" Length: 2'
Slot: 0.01	Hole Diameter: 2" Depth to Liquid:
Diameter: 1" Length: 10'	Total Depth: 12' Depth to Water: ~5'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
LOW	MOIST	0.6			0			CLAYS - SAND, MOIST, BROWN, NO STAIN / ODOR, SLIGHT PLAST	
LOW	WET	0.0			2	2'			
					4				
LOW	WET				6	2.5'		POORLY GRADED SAND, MED GRAIN, SAT @ 4-5-5.0', SLIGHT STAIN W/ MILD HC ODOR 7.5-8.0'.	
					8				
					10	4'		SILTS - CLAY, VERT MOIST, MED. HIGH PLAST, FAT CLAY, NO STAIN / ODOR.	
MED	VERY MOIST				12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Well Location Sketch:



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: **MW06** Project: **Karich Helen E Unit #2**Date: **5/5/2010** Project # **KMG09460**Logged By: **John Brown - LTE** Drilled By: **Terrence Apodaca (DP)**Elevation: **NM** Detector: **MiniRAE-2000 (10.6)** Drilling Method: **Direct Push** Sampling Method: **4' MacroCore**Gravel Pack: **10-20 Sand / 1-11.7' BGS** Seal: **Not Applicable** Grout: **Bentonite / 0-1' BGS**Casing Type: **Schedule 40 PVC** Diameter: **1"** Length: **5'** Hole Diameter: **2"** Depth to Water: **4.08' BGS**Screen Type: **Sch. 40 PVC** Slot: **0.010"** Diameter: **1"** Length: **10'** Total Depth: **11.7'**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample Interval	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram	
0											
Not Applicable - Direct Push	Moist	ND	NONE	None Collected	1	36"	X	SM	0-0.5' Brown Fine Silty-Sand, Moist, Loose, No Staining, No Odor		
		ND			CL			0.5-2' Brown Silty-Clay, Moist, Stiff, No Staining, No Odor			
		ND			33"			X	SP		2-3' Brown Fine Sand, Trace Silt, Moist, Medium-Dense, No Staining, No Odor
	ND	4-5.2' Same As Above, <u>Wet</u> , No Staining, No Odor									
	ND	5.2-6.9' Black-Stained Fine Sand, Wet, Loose, Moderate Odor									
	ND	8-8.5' Same As Above									
	Wet	ND	BLACK		5	33"	X	SP	5.2-6.9' Black-Stained Fine Sand, Wet, Loose, Moderate Odor		
		ND			6				8-8.5' Same As Above		
		119			7				48"		X
	526	8									
	864	9									
	---	10									
	---	11									
	Moist	70	NONE		12	48"	X	CL	8.5-12' Brown Silty-Clay, Stiff, Moist, No Staining, Slight Odor from 8.5-9' Only, Then No Odor		
		18			13					Bottom of Boring at 12' BGS	
		14			14						
		40			15						
		3.2			16						TD = 11.7' BGS
		5.1			17						
		1.2			18						
5.3		19									
		20									



= Well Screen



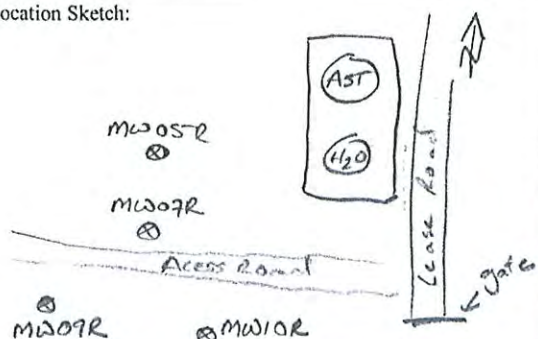
= Sodium Bentonite Grout



= 10-20 Silica Sand Pack

BGS = Below Ground Surface

Well Location Sketch:



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW05R	Project: Karich Helen E Unit #2
Date: 1/22/2015	Project Number: KMG09460
Logged By: Kris Shepherd	Drilled By: Drill Pro

Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
------------	-------------------------	--	---------------------------------------

Gravel Pack: Silica Sand	Seal: Bentonite	Grout:
------------------------------------	---------------------------	--------

Casing Type: PVC	Diameter: 1"	Length: 5'	Hole Diameter: 3"	Depth to Liquid:
----------------------------	------------------------	----------------------	-----------------------------	------------------

Screen Type: PVC	Slot: 0.01	Diameter: 1"	Length: 10'	Total Depth: 12'	Depth to Water: 6'
----------------------------	----------------------	------------------------	-----------------------	----------------------------	------------------------------

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
					2				Hydrovac, Not Logged	
					4					
					6					
	wet ↓ moist ↓	0.0 0.0 0.0	none ↓		8	2	2	SM	6' → 10.5' Silty fine grain to medium grain sand, brown no odor, no stain, wet	
					10	4	4	CH	10.5' → 12' Clay, brown, high cohesion, high plasticity, no stain, no odor, moist	
					12					
					14					
					16					
					18					
					20					
					22				Completed As PK Stick up	
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

Well Location Sketch:



Compliance • Engineering • Remediation

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

MW09R

Project:

Karich Helen E Unit #2

Date:

1/22/2015

Project Number:

KMG09460

Logged By:

Kris Shepherd

Drilled By:

Drill Pro

Elevation:

Detector:

PID

Drilling Method:

Direct Push

Sampling Method:

Continuous

Gravel Pack:

Silica Sand

Seal:

Bentonite

Grout:

-

Casing Type:

PVC

Diameter:

1"

Length:

5'

Hole Diameter:

3"

Depth to Liquid:

-

Screen Type:

PVC

Slot:

0.01

Diameter:

1"

Length:

10'

Total Depth:

12'

Depth to Water:

6'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
					2				Hydrovac, Not Logged	
					4					
					6					
	wet ↓ moist ↓	43.1 9.7 0.2	Black ↓ none ↓		8	2	2	SM	6' → 10' Silty fine grained to medium grain sand, black stain, odor, wet	
					10	4	4	CH	10' → 12' Clay, brown, High plasticity, high cohesion, no odor, no stain	
					12				- Some gray mottling from 10.5' → 12'	
					14					
					16					
					18					
					20					
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

NOTES

Page 1 of 1

Well Location Sketch:



Compliance • Engineering • Remediation

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

MW092

Project:

Karich Helen E Unit #2

Date:

1/22/2015

Project Number:

KMG09460

Logged By:

Kris Shepherd

Drilled By:

Drill Pro

Elevation:

Detector:

PID

Drilling Method:

Direct Push

Sampling Method:

Continuous

Gravel Pack:

Silica Sand

Seal:

Bentonite

Grout:

Casing Type:

PVC

Diameter:

1"

Length:

5'

Hole Diameter:

3"

Depth to Liquid:

-

Screen Type:

PVC

Slot:

0.01

Diameter:

1"

Length:

10'

Total Depth:

12'

Depth to Water:

6'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
					2				Hydrovac, Not Logged	
					4					
					6					
	wet ↓ moist	0.0 0.0 0.0	none ↓ gray		8	2	2	SM	6' → 10' Silty fine grained to medium grain sand, brown, wet, no odor, no stain	
					10	4	3	CH	10' → 12' Clay, gray, high plasticity, high cohesion, no odor, moist.	
					12					
					14					
					16					
					18					
					20					
					22				★ Completed as A PVC Stick up	
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

Well Location Sketch:



Compliance • Engineering • Remediation

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

MW10R

Project:

Karich Helen E Unit #2

Date:

1/22/2015

Project Number:

KMG09460

Logged By:

Kris Shepherd

Drilled By:

Drill Pro

Elevation:

Detector:

PID

Drilling Method:

Direct Push

Sampling Method:

Continuous

Gravel Pack:

Silica Sand

Seal:

Bentonite

Grout:

-

Casing Type:

PVC

Diameter:

1"

Length:

5'

Hole Diameter:

3"

Depth to Liquid:

-

Screen Type:

PVC

Slot:

0.01

Diameter:

1"

Length:

10'

Total Depth:

12'

Depth to Water:

~6'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
					2				Hydrovac, Not Logged	
					4					
					6					
	Wet ↓ moist ↓	0.0 0.3 0.0	none ↓ gray ↓		8	2		SW	6' → 9' V. fine grain to medium grain sand, brown, no odor, no stain, wet.	
					10	4		CH	9' → 12' Clay, gray, mod. cohesion, high plasticity, no odor, moist.	
					12					
					14					
					16					
					18					
					20					
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

★ Completed as PVC
pick up.

APPENDIX B
LABORATORY ANALYTICAL REPORTS

July 20, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

**Project Name - KMG - Helen Karich UT #2, Herman Project Number - KMG09460
32-10K**

Attached are your analytical results for KMG - Helen Karich UT #2, Herman 32-10K received by Origins Laboratory, Inc. July 15, 2015. This project is associated with Origins project number X507206-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



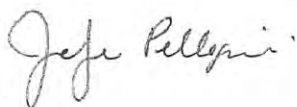
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X507206-01	Water	July 15, 2015 16:00	07/15/2015 17:42
MW02	X507206-02	Water	July 15, 2015 16:05	07/15/2015 17:42
MW05R	X507206-03	Water	July 15, 2015 16:10	07/15/2015 17:42
MW06	X507206-04	Water	July 15, 2015 16:15	07/15/2015 17:42
MW07R	X507206-05	Water	July 15, 2015 16:20	07/15/2015 17:42
MW08	X507206-06	Water	July 15, 2015 16:25	07/15/2015 17:42
MW09R	X507206-07	Water	July 15, 2015 16:30	07/15/2015 17:42
MW10R	X507206-08	Water	July 15, 2015 16:35	07/15/2015 17:42

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

ORIGINS
LABORATORY, INC

X507206

1725 Elk Place, Denver, CO 80211
Laboratory # - 303.433.1322

Client: LT Environmental, Inc.		Project Manager: John Cocroft						
Project: KMG - Helen Karich UT #2, Herman 32-10K		Project Number: KMG09460						
Number	Sample Identification	Matrix	Sample Date	Sample Time	Sampled By	Container	Qty	Analyses
01-001	MW01	Water	7/15/15	16:00	JE	01_40mL Amber VOA Val - HCL	3	BTEX by EPA 8250C
02-001	MW02	Water		16:05		01_40mL Amber VOA Val - HCL	3	BTEX by EPA 8250C
03-001	MW05R	Water		16:10		01_40mL Amber VOA Val - HCL	3	BTEX by EPA 8250C
04-001	MW06	Water		16:15		01_40mL Amber VOA Val - HCL	3	BTEX by EPA 8250C
05-001	MW07R	Water		16:20		01_40mL Amber VOA Val - HCL	3	BTEX by EPA 8250C
06-001	MW08	Water		16:25		01_40mL Amber VOA Val - HCL	3	BTEX by EPA 8250C
07-001	MW09R	Water		16:30		01_40mL Amber VOA Val - HCL	3	BTEX by EPA 8250C
08-001	MW10R	Water		16:35		01_40mL Amber VOA Val - HCL	3	BTEX by EPA 8250C

Temperature on Receipt: 5.6

Ice present? ☒ Yes ☐ No

Turn Around Time: ☐ Same Day ☐ 24-hr ☒ 48-hr

Relinquished By: [Signature] Date / Time: 7/15/15 17:42

Received By: [Signature] Date / Time: 7/15/15 17:42

Origins Laboratory, Inc.

Jefe Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: XS07206

Client: LTE

Client Project ID: KMG - Helen Karich

Checklist Completed by: Jen Pellegrini

Shipped Via: H/D
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 7/16/15

Airbill #: 214

Matrix(s) Received: (Check all that apply): Soil/Solid Y Water Other: (Describe)

Cooler Number/Temperature: 1 15.6 °C / °C / °C / °C

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	<u>Y</u>			
Is there ice present (document if blue ice is used)	<u>X</u>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<u>X</u>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<u>Y</u>		
Were all samples received intact ⁽¹⁾ ?	<u>Y</u>			
Was adequate sample volume provided ⁽¹⁾ ?	<u>X</u>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		<u>X</u>		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<u>X</u>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<u>Y</u>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<u>Y</u>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<u>X</u>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		<u>X</u>		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity) (pH < 2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)	<u>X</u>			<u>HCL</u>
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

John Cocroft
Reviewed by (Project Manager)

7/16/15
Date/Time Reviewed

Origins Laboratory, Inc.

Jen Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW01

7/15/2015 4:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

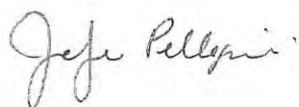
Origins Laboratory, Inc.
X507206-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5G16018	07/16/2015	07/17/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	98.9 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	99.3 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.7 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW02

7/15/2015 4:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

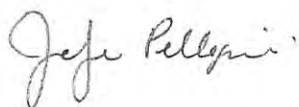
Origins Laboratory, Inc.
X507206-02 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5G16018	07/16/2015	07/17/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	105 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	98.2 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW05R

7/15/2015 4:10:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

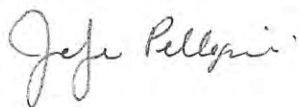
Origins Laboratory, Inc.
X507206-03 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5G16018	07/16/2015	07/17/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	106 %	87.3-113			"	"	"
Surrogate: Toluene-d8	99.6 %	90.9-108			"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	88.6-111			"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW06

7/15/2015 4:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

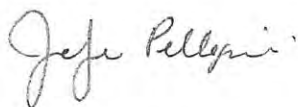
Origins Laboratory, Inc.
X507206-04 (Water)

BTEX by EPA 8260C

Benzene	2.6	1.0	ug/L	1	5G16018	07/16/2015	07/17/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	2.8	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	106 %	87.3-113	"	"	"
Surrogate: Toluene-d8	101 %	90.9-108	"	"	"
Surrogate: 4-Bromofluorobenzene	96.0 %	88.6-111	"	"	"

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in
accordance with the chain of custody document. This
analytical report must be reproduced in its entirety.*

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW07R**7/15/2015 4:20:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

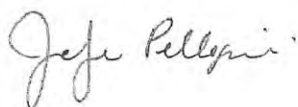
Origins Laboratory, Inc.
X507206-05 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5G16018	07/16/2015	07/17/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	106 %	87.3-113			"	"	"
Surrogate: Toluene-d8	97.6 %	90.9-108			"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	88.6-111			"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW08

7/15/2015 4:25:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

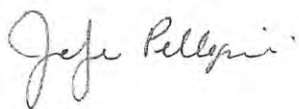
Origins Laboratory, Inc.
X507206-06 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5G16018	07/16/2015	07/17/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	105 %	87.3-113	"	"	"
Surrogate: Toluene-d8	98.3 %	90.9-108	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	88.6-111	"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW09R

7/15/2015 4:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

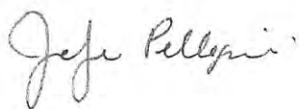
Origins Laboratory, Inc. X507206-07 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5G16018	07/16/2015	07/17/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	102 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	98.3 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.3 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW10R

7/15/2015 4:35:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

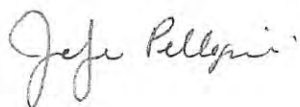
Origins Laboratory, Inc.
X507206-08 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5G16018	07/16/2015	07/17/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	103 %	87.3-113	"	"	"
Surrogate: Toluene-d8	98.5 %	90.9-108	"	"	"
Surrogate: 4-Bromofluorobenzene	98.4 %	88.6-111	"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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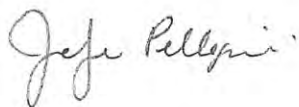
Batch 5G16018 - EPA 5030B (Water)

Blank (5G16018-BLK1)

Prepared: 07/16/2015 Analyzed: 07/17/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	87.3-113			
Surrogate: Toluene-d8	62		"	62.5		98.5	90.9-108			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.6	88.6-111			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

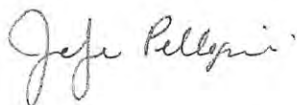
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5G16018 - EPA 5030B (Water)										
LCS (5G16018-BS1)					Prepared: 07/16/2015 Analyzed: 07/17/2015					
Benzene	46.6	1.0	ug/L	50.0		93.2	75-126			
Toluene	41.9	1.0	"	50.0		83.7	78.7-126			
Ethylbenzene	46.7	1.0	"	50.0		93.4	80-130			
m,p-Xylene	89.1	2.0	"	100		89.1	77.2-133			
o-Xylene	43.2	1.0	"	50.0		86.4	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5		104	87.3-113			
Surrogate: Toluene-d8	56		"	62.5		90.2	90.9-108			
Surrogate: 4-Bromofluorobenzene	56		"	62.5		89.5	88.6-111			

Origins Laboratory, Inc.



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LT Environmental, Inc.
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Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

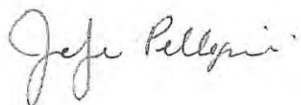
Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5G16018 - EPA 5030B (Water)

Matrix Spike (5G16018-MS1)		Source: X507206-01			Prepared: 07/16/2015 Analyzed: 07/17/2015					
Benzene	46.4	1.0	ug/L	50.0	ND	92.7	74-130			
Toluene	46.1	1.0	"	50.0	ND	92.1	73-131			
Ethylbenzene	48.2	1.0	"	50.0	ND	96.5	76-132			
m,p-Xylene	96.4	2.0	"	100	ND	96.4	69-139			
o-Xylene	49.7	1.0	"	50.0	ND	99.3	74-131			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.5	87.3-113			
Surrogate: Toluene-d8	64		"	62.5		102	90.9-108			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	88.6-111			

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5G16018 - EPA 5030B (Water)

Matrix Spike Dup (5G16018-MSD1)			Source: X507206-01			Prepared: 07/16/2015 Analyzed: 07/17/2015				
Benzene	51.8	1.0	ug/L	50.0	ND	104	74-130	11.2	20	
Toluene	52.0	1.0	"	50.0	ND	104	73-131	12.2	20	
Ethylbenzene	54.1	1.0	"	50.0	ND	108	76-132	11.4	20	
m,p-Xylene	108	2.0	"	100	ND	108	69-139	11.3	20	
o-Xylene	51.8	1.0	"	50.0	ND	104	74-131	4.24	20	
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.0	87.3-113			
Surrogate: Toluene-d8	61		"	62.5		96.8	90.9-108			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.3	88.6-111			

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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

John Cocroft

Project Number: KMG09460

Project: KMG - Helen Karich UT #2, Herman
32-10K

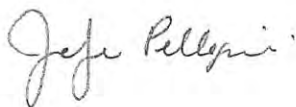
Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

October 21, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada CO 80003

**Project Name - KMG - Helen Karich UT #2, Herman Project Number - KMG09460/WO#880198
32-10K**

Attached are your analytical results for KMG - Helen Karich UT #2, Herman 32-10K received by Origins Laboratory, Inc. October 15, 2015. This project is associated with Origins project number X510183-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



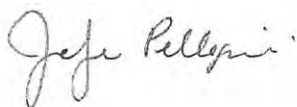
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X510183-01	Water	October 15, 2015 14:15	10/15/2015 16:40
MW02	X510183-02	Water	October 15, 2015 14:20	10/15/2015 16:40
MW05R	X510183-03	Water	October 15, 2015 14:25	10/15/2015 16:40
MW06	X510183-04	Water	October 15, 2015 14:50	10/15/2015 16:40
MW07R	X510183-05	Water	October 15, 2015 14:35	10/15/2015 16:40
MW08	X510183-06	Water	October 15, 2015 14:40	10/15/2015 16:40
MW09R	X510183-07	Water	October 15, 2015 14:45	10/15/2015 16:40
MW10R	X510183-08	Water	October 15, 2015 14:50	10/15/2015 16:40

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

ORIGINS
LABORATORY, INC

X510183

1725 Elk Place, Denver, CO 80211
Laboratory # - 303.433.1322

Client: LT Environmental, Inc.		Project Manager: John Cocroft		Project Number: KMG09460/WO#88019814	
Project: KMG - Helen Karich UT #2, Herman 32-10K		Sample Date		Sample Time	
Number	Sample Identification	Matrix	Sample Date	Sample Time	Sampled By
01-001	MM01	Water	12/15/15	1415	CT/Em
02-001	MM02	Water		1420	
03-001	MM03R	Water		1425	
04-001	MM04	Water		1430	
05-001	MM05R	Water		1435	
06-001	MM06	Water		1440	
07-001	MM07R	Water		1445	
08-001	MM08	Water		1450	

Container	Qty	Analysis
01_40mL Amber VOA Vol-HCL	3	BTEX by EPA 8260C
01_40mL Amber VOA Vol-HCL	3	BTEX by EPA 8260C
01_40mL Amber VOA Vol-HCL	3	BTEX by EPA 8260C
01_40mL Amber VOA Vol-HCL	3	BTEX by EPA 8260C
01_40mL Amber VOA Vol-HCL	3	BTEX by EPA 8260C
01_40mL Amber VOA Vol-HCL	3	BTEX by EPA 8260C
01_40mL Amber VOA Vol-HCL	3	BTEX by EPA 8260C
01_40mL Amber VOA Vol-HCL	3	BTEX by EPA 8260C

Relinquished By: John Cocroft Date / Time: 12/15/15 1640

Received By: John Cocroft Date / Time: 12/15/15 1640

Temperature on Receipt: 5.3

Ice present? (Yes) ☐ (No) ☒

Turn Around Time: Same Day ☐ 24-hr ☐ 48-hr ☐ 72-hr ☐ Standard ☒

Origins Laboratory, Inc.

Jen Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: XS10183

Client: LTE

Client Project ID: Helen Karich UT #2

Checklist Completed by: Jeff Smith

Shipped Via: H/D

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 10/16/15

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid ☒ Water ☐ Other: ☐

Cooler Number/Temperature: 1 15.3 °C 1 °C 1 °C (Describe) °C

Thermometer ID: T203

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		X		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)(pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)	X			HCL
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 10/19/15

Origins Laboratory, Inc.

Jefi Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW01

10/15/2015 2:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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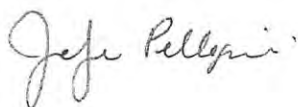
Origins Laboratory, Inc.
X510183-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5J19006	10/19/2015	10/19/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.9 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.7 %	84-114			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW02

10/15/2015 2:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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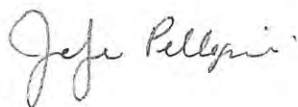
Origins Laboratory, Inc. X510183-02 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5J19006	10/19/2015	10/19/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	105 %	84-121			"	"	"	
Surrogate: Toluene-d8	102 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.7 %	84-114			"	"	"	

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW05R

10/15/2015 2:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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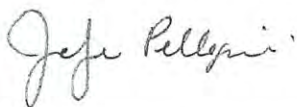
Origins Laboratory, Inc.
X510183-03 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5J19006	10/19/2015	10/19/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	101 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	99.5 %	84-114			"	"	"	

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW06

10/15/2015 2:50:00PM

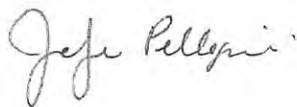
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X510183-04 (Water)

BTEX by EPA 8260C

Benzene	1.0	1.0	ug/L	1	5J19006	10/19/2015	10/19/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4	101 %	84-121			"	"	"
Surrogate: Toluene-d8	101 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	100 %	84-114			"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW07R

10/15/2015 2:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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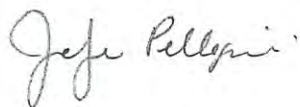
Origins Laboratory, Inc.
X510183-05 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5J19006	10/19/2015	10/19/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121	"	"	"
Surrogate: Toluene-d8	99.7 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	84-114	"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in
accordance with the chain of custody document. This
analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW08

10/15/2015 2:40:00PM

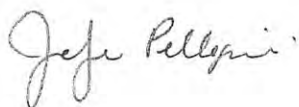
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. X510183-06 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5J19006	10/19/2015	10/19/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	101 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.8 %	84-114			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW09R

10/15/2015 2:45:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

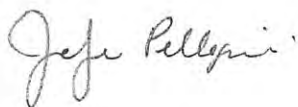
Origins Laboratory, Inc.
X510183-07 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5J19006	10/19/2015	10/19/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	107 %	84-121	"	"	"
Surrogate: Toluene-d8	100 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	97.0 %	84-114	"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW10R

10/15/2015 2:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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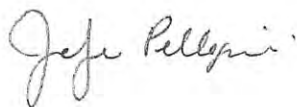
Origins Laboratory, Inc.
X510183-08 (Water)

BTEX by EPA 8260C

Benzene	1.4	1.0	ug/L	1	5J19006	10/19/2015	10/19/2015
Toluene	1.5	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	107 %	84-121	"	"	"
Surrogate: Toluene-d8	102 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	84-114	"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

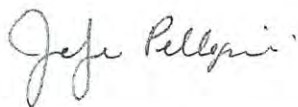
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5J19006 - EPA 5030B (Water)										
Blank (5J19006-BLK1)					Prepared: 10/19/2015 Analyzed: 10/19/2015					
Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5		103	84-121			
Surrogate: Toluene-d8	61		"	62.5		98.3	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.4	84-114			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

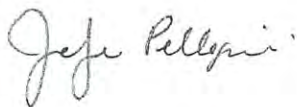
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5J19006 - EPA 5030B (Water)										
LCS (5J19006-BS1)					Prepared: 10/19/2015 Analyzed: 10/19/2015					
Benzene	46.9	1.0	ug/L	50.0		93.8	75-126			
Toluene	46.9	1.0	"	50.0		93.8	78.7-126			
Ethylbenzene	52.0	1.0	"	50.0		104	80-130			
m,p-Xylene	107	2.0	"	100		107	77.2-133			
o-Xylene	44.3	1.0	"	50.0		88.7	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		102	84-121			
Surrogate: Toluene-d8	64		"	62.5		102	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		102	84-114			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

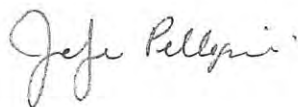
Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5J19006 - EPA 5030B (Water)

Matrix Spike (5J19006-MS1)		Source: X510183-01			Prepared: 10/19/2015 Analyzed: 10/19/2015					
Benzene	49.7	1.0	ug/L	50.0	ND	99.4	74-130			
Toluene	50.0	1.0	"	50.0	ND	100	73-131			
Ethylbenzene	56.2	1.0	"	50.0	ND	112	76-132			
m,p-Xylene	117	2.0	"	100	ND	117	69-139			
o-Xylene	48.3	1.0	"	50.0	ND	96.6	74-131			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	84-114			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

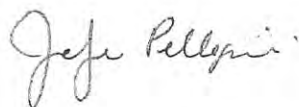
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5J19006 - EPA 5030B (Water)										
Matrix Spike Dup (5J19006-MSD1)			Source: X510183-01		Prepared: 10/19/2015 Analyzed: 10/19/2015					
Benzene	51.3	1.0	ug/L	50.0	ND	103	74-130	3.11	20	
Toluene	51.2	1.0	"	50.0	ND	102	73-131	2.37	20	
Ethylbenzene	58.3	1.0	"	50.0	ND	117	76-132	3.65	20	
m,p-Xylene	120	2.0	"	100	ND	120	69-139	2.33	20	
o-Xylene	51.1	1.0	"	50.0	ND	102	74-131	5.75	20	
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.8	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

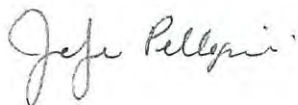
Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

January 11, 2016

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

**Project Name - KMG - Helen Karich UT #2, Herman Project Number - KMG09460/WO#880198
32-10K**

Attached are your analytical results for KMG - Helen Karich UT #2, Herman 32-10K received by Origins Laboratory, Inc. January 05, 2016. This project is associated with Origins project number X601030-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



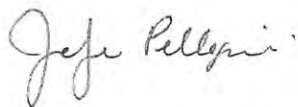
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X601030-01	Water	January 5, 2016 11:30	01/05/2016 16:10
MW02	X601030-02	Water	January 5, 2016 11:40	01/05/2016 16:10
MW05R	X601030-03	Water	January 5, 2016 11:50	01/05/2016 16:10
MW06	X601030-04	Water	January 5, 2016 12:00	01/05/2016 16:10
MW07R	X601030-05	Water	January 5, 2016 12:10	01/05/2016 16:10
MW08	X601030-06	Water	January 5, 2016 12:20	01/05/2016 16:10
MW09R	X601030-07	Water	January 5, 2016 12:30	01/05/2016 16:10
MW10R	X601030-08	Water	January 5, 2016 12:40	01/05/2016 16:10

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

ORIGINS

LABORATORY, INC

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman 32-10K

ORIGINS
LABORATORY, INC

X601030

1725 Elk Place, Denver, CO 80211
Laboratory # - 303.433.1322

AIR-PAH ANALYSIS

Client: LT Environmental, Inc.		Project Manager: John Cocroft					
Project: KMG - Helen Karich UT #2, Herman 32-10K		Project Number: -KMG09460/WO#88019814					
Number	Sample Identification	Matrix	Sample Date	Sample Time	Container	Qty	Analysis
01-001	MW01	Water	11/7/16	11:30	02_40ml Amber VOA Vial -HCL	3	BTEX by EPA 8260C
02-001	MW02	Water		11:40	02_40ml Amber VOA Vial -HCL	3	BTEX by EPA 8260C
03-001	MW05R	Water		11:50	02_40ml Amber VOA Vial -HCL	3	BTEX by EPA 8260C
04-001	MW06	Water		12:00	02_40ml Amber VOA Vial -HCL	3	BTEX by EPA 8260C
05-001	MW07R	Water		12:10	02_40ml Amber VOA Vial -HCL	3	BTEX by EPA 8260C
06-001	MW08	Water		12:20	02_40ml Amber VOA Vial -HCL	3	BTEX by EPA 8260C
07-001	MW09R	Water		12:30	02_40ml Amber VOA Vial -HCL	3	BTEX by EPA 8260C
08-001	MW10R	Water		12:40	02_40ml Amber VOA Vial -HCL	3	BTEX by EPA 8260C

Temperature on Receipt: 4.2
Ice present? Yes No
Turn Around Time:
Same Day: ☐ 24-hr: ☐ 72-hr: ☒ Standard: ☐

Relinquished By: *[Signature]* Date / Time: 11/5/16 16:10
Received By: *[Signature]* Date / Time: 11/5/16 16:10

Origins Laboratory, Inc.

Jen Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: X601030

Client: LTE

Client Project ID: Helen Karich UT #2

Checklist Completed by: Jef Smith

Shipped Via: HD
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 1/5/16

Airbill #: N/A

Matrix(s) Received: (Check all that apply): Soil/Solid X Water Other:

Cooler Number/Temperature: 1 4.2 °C 1 °C 1 °C (Describe)

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	<u>X</u>			
Is there ice present (document if blue ice is used)	<u>X</u>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<u>X</u>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<u>X</u>		
Were all samples received intact ⁽¹⁾ ?	<u>X</u>			
Was adequate sample volume provided ⁽¹⁾ ?	<u>X</u>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		<u>X</u>		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<u>X</u>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<u>X</u>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<u>X</u>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<u>X</u>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		<u>X</u>		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄ / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH).	<u>X</u>			
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager)

Date/Time Reviewed

Origins Laboratory, Inc.

Jef Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW01

1/5/2016 11:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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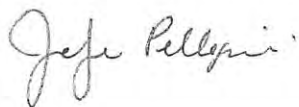
Origins Laboratory, Inc. X601030-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6A0603	01/06/2016	01/07/2016	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	93.8 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	104 %	84-114			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW02

1/5/2016 11:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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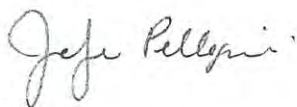
Origins Laboratory, Inc.
X601030-02 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6A0603	01/06/2016	01/07/2016	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	105 %	84-121			"	"	"	
Surrogate: Toluene-d8	93.0 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	108 %	84-114			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW05R
1/5/2016 11:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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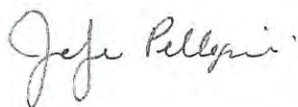
Origins Laboratory, Inc.
X601030-03 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6A0603	01/06/2016	01/07/2016
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121	"	"	"
Surrogate: Toluene-d8	91.7 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	84-114	"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW06

1/5/2016 12:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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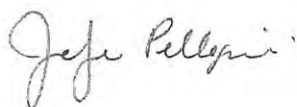
Origins Laboratory, Inc. X601030-04 (Water)

BTEX by EPA 8260C

Benzene	3.0	1.0	ug/L	1	B6A0603	01/06/2016	01/07/2016	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	4.0	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	106 %	84-121			"	"	"	
Surrogate: Toluene-d8	93.6 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	84-114			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW07R
1/5/2016 12:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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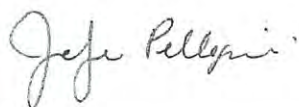
Origins Laboratory, Inc.
X601030-05 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6A0603	01/06/2016	01/07/2016	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	95.3 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	104 %	84-114			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW08

1/5/2016 12:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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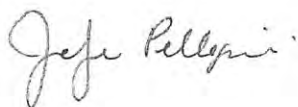
Origins Laboratory, Inc.
X601030-06 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6A0603	01/06/2016	01/07/2016	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	95.4 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	84-114			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW09R
1/5/2016 12:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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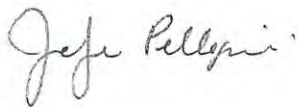
Origins Laboratory, Inc.
X601030-07 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6A0603	01/06/2016	01/07/2016	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	94.7 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	84-114			"	"	"	

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW10R
1/5/2016 12:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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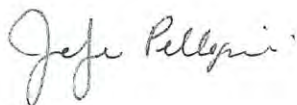
Origins Laboratory, Inc.
X601030-08 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6A0603	01/06/2016	01/07/2016
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"
Surrogate: Toluene-d8	93.7 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	105 %	84-114			"	"	"

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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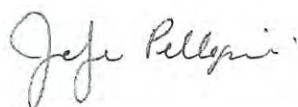
Batch B6A0603 - EPA 5030B (Water)

Blank (B6A0603-BLK1)

Prepared: 01/06/2016 Analyzed: 01/07/2016

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	84-121			
Surrogate: Toluene-d8	58		"	62.5		93.4	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		107	84-114			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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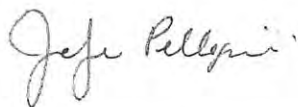
Batch B6A0603 - EPA 5030B (Water)

LCS (B6A0603-BS1)

Prepared: 01/06/2016 Analyzed: 01/07/2016

Benzene	48.1	1.0	ug/L	50.0		96.2	73.3-129			
Toluene	46.7	1.0	"	50.0		93.3	76.2-123			
Ethylbenzene	47.8	1.0	"	50.0		95.5	73.6-130			
m,p-Xylene	95.0	2.0	"	100		95.0	76.1-126			
o-Xylene	46.7	1.0	"	50.0		93.4	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		101	84-121			
Surrogate: Toluene-d8	59		"	62.5		93.9	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	84-114			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

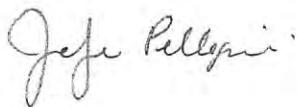
Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B6A0603 - EPA 5030B (Water)

Matrix Spike (B6A0603-MS1)		Source: X601030-02			Prepared: 01/06/2016 Analyzed: 01/07/2016					
Benzene	43.8	1.0	ug/L	50.0	ND	87.6	74-130			
Toluene	42.6	1.0	"	50.0	ND	85.1	73-131			
Ethylbenzene	43.0	1.0	"	50.0	ND	86.0	76-132			
m,p-Xylene	86.5	2.0	"	100	ND	86.5	69-139			
o-Xylene	44.0	1.0	"	50.0	ND	87.9	74-131			
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		100	84-121			
Surrogate: Toluene-d8	59		"	62.5		94.3	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		107	84-114			

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

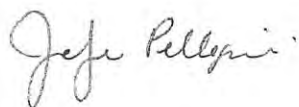
Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B6A0603 - EPA 5030B (Water)

Matrix Spike Dup (B6A0603-MSD1)		Source: X601030-02			Prepared: 01/06/2016 Analyzed: 01/07/2016					
Benzene	44.7	1.0	ug/L	50.0	ND	89.3	74-130	1.94	20	
Toluene	42.4	1.0	"	50.0	ND	84.7	73-131	0.448	20	
Ethylbenzene	43.6	1.0	"	50.0	ND	87.2	76-132	1.48	20	
m,p-Xylene	87.4	2.0	"	100	ND	87.4	69-139	1.00	20	
o-Xylene	44.6	1.0	"	50.0	ND	89.2	74-131	1.40	20	
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		101	84-121			
Surrogate: Toluene-d8	58		"	62.5		93.5	85-115			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	84-114			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

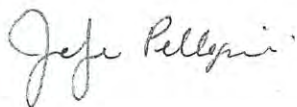
Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

April 20, 2016

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

**Project Name - KMG - Helen Karich UT #2, Herman Project Number - KMG09460/WO#880198
32-10K**

Attached are your analytical results for KMG - Helen Karich UT #2, Herman 32-10K received by Origins Laboratory, Inc. April 13, 2016. This project is associated with Origins project number X604153-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



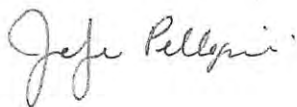
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X604153-01	Water	April 13, 2016 13:00	04/13/2016 16:14
MW02	X604153-02	Water	April 13, 2016 13:05	04/13/2016 16:14
MW05R	X604153-03	Water	April 13, 2016 13:10	04/13/2016 16:14
MW06	X604153-04	Water	April 13, 2016 13:15	04/13/2016 16:14
MW07R	X604153-05	Water	April 13, 2016 13:20	04/13/2016 16:14
MW08	X604153-06	Water	April 13, 2016 13:25	04/13/2016 16:14
MW09R	X604153-07	Water	April 13, 2016 13:30	04/13/2016 16:14
MW10R	X604153-08	Water	April 13, 2016 13:35	04/13/2016 16:14

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

ORIGINS
LABORATORY, INC

X100 4/15/14

1725 Elk Place, Denver, CO 80211
Laboratory # - 303.433.1322

Client: LT Environmental, Inc.		Project Manager: John Cocroft		Project Number: KMG09460/WO#88019814	
Project: KMG - Helen Karich UT #2, Herman 32-10K		Sample Date		Sample Time	
Number	Sample Identification	Matrix	Sample Date	Sample Time	Container
01-001	MW01	Water	4/13/14	1300	02_40mL Amber VOA Vial - HCL
02-001	MW02	Water		1305	02_40mL Amber VOA Vial - HCL
03-001	MW03R	Water		1310	02_40mL Amber VOA Vial - HCL
04-001	MW06	Water		1315	02_40mL Amber VOA Vial - HCL
05-001	MW07R	Water		1320	02_40mL Amber VOA Vial - HCL
06-001	MW08	Water		1325	02_40mL Amber VOA Vial - HCL
07-001	MW09R	Water		1330	02_40mL Amber VOA Vial - HCL
08-001	MW10R	Water		1335	02_40mL Amber VOA Vial - HCL
		Analyses		Qty	
		BTEX by EPA 8260C		3	
		BTEX by EPA 8260C		3	
		BTEX by EPA 8260C		3	
		BTEX by EPA 8260C		3	
		BTEX by EPA 8260C		3	
		BTEX by EPA 8260C		3	
		BTEX by EPA 8260C		3	
		BTEX by EPA 8260C		3	

Temperature on Receipt: 8.9
Ice present? Yes No
Turn Around Time:
Same Day ☐ 24-hr ☐ 48-hr ☒ Standard

Relinquished By: [Signature] Date / Time: 4/13/14 1614
Received By: [Signature] Date / Time: 4/13/14 1614

Relinquished By: [Signature] Date / Time: 4/13/14 1614
Received By: [Signature] Date / Time: 4/13/14 1614

Origins Laboratory, Inc.

Jefe Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: X604153

Client: LTE

Client Project ID: KMG-Helen Karich

Checklist Completed by: Jeff Smith

Shipped Via 141D
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 5/18/16

Airbill #: N/A

Matrix(s) Received: (Check all that apply): Soil/Solid ☒ Water ☐ Other: ☐ (Describe)

Cooler Number/Temperature: 1 / 8.9 °C 1 °C 1 °C 1 °C

Thermometer ID: TOCB

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ^{1/2} ?		<input checked="" type="checkbox"/>		<u>Sampled Same Day</u>
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact ^{1/2} ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ^{1/2} ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ^{1/2} ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely ^{1/2} ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ^{1/2} ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ^{1/2} ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ^{1/2} ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> 1/4 inch bubble) present? If yes, contact client and note in narrative.		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation and was it checked ^{1/2} ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity) (pH < 2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)	<input checked="" type="checkbox"/>			<u>HCL</u>
Additional Comments (if any):				

^{1/2}If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Jeff Smith
Reviewed by (Project Manager)

7/18/16
Date/Time Reviewed

Origins Laboratory, Inc.

Jefi Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW01

4/13/2016 1:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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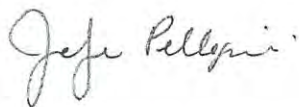
Origins Laboratory, Inc.
X604153-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6D1808	04/18/2016	04/19/2016	U
Toluene	ND	1.0	"	"	"	"	"	U
Ethylbenzene	ND	1.0	"	"	"	"	"	U
Xylenes, total	ND	1.0	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	109 %	84-121	"	"	"
Surrogate: Toluene-d8	98.9 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	98.0 %	84-114	"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW02

4/13/2016 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. X604153-02 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6D1808	04/18/2016	04/19/2016	U
Toluene	ND	1.0	"	"	"	"	"	U
Ethylbenzene	ND	1.0	"	"	"	"	"	U
Xylenes, total	ND	1.0	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	97.6 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	95.7 %	84-114			"	"	"	

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW05R

4/13/2016 1:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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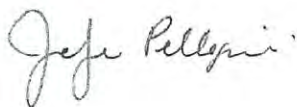
Origins Laboratory, Inc.
X604153-03 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6D1808	04/18/2016	04/19/2016	U
Toluene	ND	1.0	"	"	"	"	"	U
Ethylbenzene	ND	1.0	"	"	"	"	"	U
Xylenes, total	ND	1.0	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	105 %	84-121			"	"	"
Surrogate: Toluene-d8	99.3 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	99.2 %	84-114			"	"	"

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW06
4/13/2016 1:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X604153-04 (Water)

BTEX by EPA 8260C

Benzene	4.0	1.0	ug/L	1	B6D1808	04/18/2016	04/19/2016	
Toluene	ND	1.0	"	"	"	"	"	U
Ethylbenzene	3.8	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	107 %	84-121			"	"	"	
Surrogate: Toluene-d8	101 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.5 %	84-114			"	"	"	

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW07R
4/13/2016 1:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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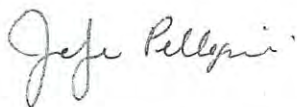
Origins Laboratory, Inc.
X604153-05 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6D1808	04/18/2016	04/19/2016	U
Toluene	ND	1.0	"	"	"	"	"	U
Ethylbenzene	ND	1.0	"	"	"	"	"	U
Xylenes, total	ND	1.0	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.2 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.8 %	84-114			"	"	"	

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW08

4/13/2016 1:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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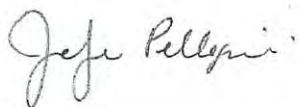
Origins Laboratory, Inc.
X604153-06 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6D1808	04/18/2016	04/19/2016	U
Toluene	ND	1.0	"	"	"	"	"	U
Ethylbenzene	ND	1.0	"	"	"	"	"	U
Xylenes, total	ND	1.0	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	103 %	84-121	"	"	"
Surrogate: Toluene-d8	97.7 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	96.6 %	84-114	"	"	"

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW09R
4/13/2016 1:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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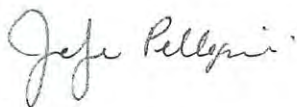
Origins Laboratory, Inc.
X604153-07 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6D1808	04/18/2016	04/19/2016	U
Toluene	ND	1.0	"	"	"	"	"	U
Ethylbenzene	ND	1.0	"	"	"	"	"	U
Xylenes, total	ND	1.0	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	105 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.9 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	95.8 %	84-114			"	"	"	

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

MW10R
4/13/2016 1:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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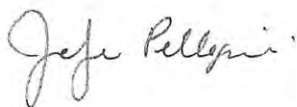
Origins Laboratory, Inc.
X604153-08 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B6D1808	04/18/2016	04/19/2016	U
Toluene	ND	1.0	"	"	"	"	"	U
Ethylbenzene	ND	1.0	"	"	"	"	"	U
Xylenes, total	ND	1.0	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	109 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.5 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.5 %	84-114			"	"	"	

Origins Laboratory, Inc.



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4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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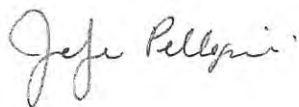
Batch B6D1808 - EPA 5030B (Water)

Blank (B6D1808-BLK1)

Prepared: 04/18/2016 Analyzed: 04/19/2016

Benzene	ND	1.0	ug/L							U
Toluene	ND	1.0	"							U
Ethylbenzene	ND	1.0	"							U
Xylenes, total	ND	1.0	"							U
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5		102	84-121			
Surrogate: Toluene-d8	62		"	62.5		98.7	85-115			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		95.3	84-114			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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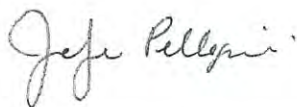
Batch B6D1808 - EPA 5030B (Water)

LCS (B6D1808-BS1)

Prepared: 04/18/2016 Analyzed: 04/19/2016

Benzene	53.3	1.0	ug/L	50.0		107	73.3-129			
Toluene	52.8	1.0	"	50.0		106	76.2-123			
Ethylbenzene	49.4	1.0	"	50.0		98.8	73.6-130			
m,p-Xylene	98.4	2.0	"	100		98.4	76.1-126			
o-Xylene	49.1	1.0	"	50.0		98.2	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		99.9	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

Origins Laboratory, Inc.



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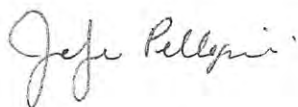
LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B6D1808 - EPA 5030B (Water)										
Matrix Spike (B6D1808-MS1)			Source: X604153-01		Prepared: 04/18/2016 Analyzed: 04/19/2016					
Benzene	52.8	1.0	ug/L	50.0	ND	106	74-130			
Toluene	52.3	1.0	"	50.0	ND	105	73-131			
Ethylbenzene	51.1	1.0	"	50.0	ND	102	76-132			
m,p-Xylene	102	2.0	"	100	ND	102	69-139			
o-Xylene	50.2	1.0	"	50.0	ND	100	74-131			
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5		102	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.7	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		102	84-114			

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4600 West 60th Avenue
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John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B6D1808 - EPA 5030B (Water)

Matrix Spike Dup (B6D1808-MSD1)		Source: X604153-01			Prepared: 04/18/2016 Analyzed: 04/19/2016					
Benzene	55.8	1.0	ug/L	50.0	ND	112	74-130	5.43	20	
Toluene	54.7	1.0	"	50.0	ND	109	73-131	4.52	20	
Ethylbenzene	53.0	1.0	"	50.0	ND	106	76-132	3.58	20	
m,p-Xylene	105	2.0	"	100	ND	105	69-139	2.68	20	
o-Xylene	51.2	1.0	"	50.0	ND	102	74-131	1.99	20	
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5		102	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.2	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	84-114			

Origins Laboratory, Inc.



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Arvada CO 80003

John Cocroft
Project Number: KMG09460/WO#88019814
Project: KMG - Helen Karich UT #2, Herman
32-10K

Notes and Definitions

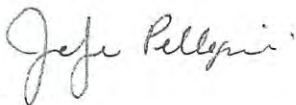
U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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