

October 2,  
2023

**2023 Third Quarter (3<sup>rd</sup>) Groundwater Monitoring Report (July - September)  
DKL Energy - Cottonwood Facility (2RF-128) OGRID: 330291  
(Formally 3 Bear Energy, LLC)  
Eddy County, New Mexico**

Prepared for:



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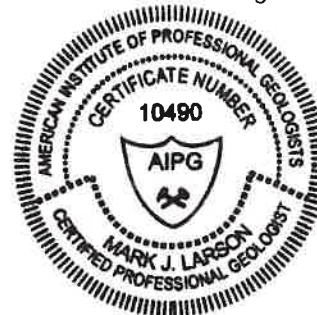
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22-0135-01

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## 1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) has prepared this report on behalf of DKL Energy (DKL) for submittal to the New Mexico Oil Conservation Division (NMOCD) District 2 in Artesia and Santa Fe, New Mexico. The report presents the results of the 2023 third (3<sup>rd</sup>) quarter (July - September) groundwater monitoring performed on September 12, 2023 at the Cottonwood Facility (Site). The Site is a produced water recycling facility permitted by the NMOCD (2RF-128) that was previously operated by 3 Bear Energy, LLC (3 Bear), until June 1, 2022, when DKL acquired operations. The Site is located in Unit N (SE/4, SW/4), Section 20, Township 26 South, and Range 26 East in Eddy County, New Mexico. The geodetic position is North 32.02104° and West -104.31879°. The surface and mineral owner is the U.S. Government administered by the Bureau of Land Management (BLM).

The following activities occurred on September 12, 2023:

- Gauged four (4) monitoring wells (MW-1 through MW-4) for light non-aqueous phase liquid (LNAPL) and depth to groundwater.
- Collected groundwater samples from four (4) wells (MW-1, MW-2, MW-3, and MW-4).
- Analyzed samples for benzene, toluene, ethylbenzene, xylenes (BTEX) and total petroleum hydrocarbons (TPH) by EPA SW-846 Methods 8021B and 8015, respectively, and chloride by EPA Method 300.0.

The following observations are documented in this report:

- Depth to groundwater ranged from 28.23 feet below ground surface (bgs) at MW-1 to 67.29 feet bgs at MW-4.
- Depth to groundwater increased (falling head) in wells MW-2 (0.13 feet) and MW-3 (2.52 feet) from the previous monitoring event on June 8, 2023.
- Depth to groundwater decreased (rising head) in wells MW-1 (0.03 feet) and MW-4 (1.02 feet) from the previous monitoring event on June 8, 2023.
- The groundwater potentiometric surface elevation ranged from 3,432.06 feet above mean sea level (MSL) at well MW-1 (up gradient) to 3,388.77 feet above MSL at MW-4 (cross gradient and down gradient).
- An apparent groundwater divide occurs in the area between monitoring wells MW-1 and MW-3 that causes groundwater to flow to the northeast towards well MW-2, east towards MW-3, and southeast towards well MW-4 at gradients between 0.029 and 0.192 feet per foot (ft/ft).
- No significant change in the groundwater flow direction, or gradient was observed during the third quarter 2023 groundwater monitoring event.
- BTEX and TPH were below the analytical method reporting limit (RL) in samples from MW-1, MW-3, and MW-4.
- Monitoring well MW-2 contained insufficient water to collect samples for TPH analysis and MW-3 contained insufficient water to collect samples.
- TPH as diesel range organics (>C12 to C28) was reported in the sample from MW-4 (0.144 milligrams per liter (mg/L), consistent with results reported during previous monitoring events.

Note: There is no New Mexico Water Quality Control Commission (NMWQCC) human health or domestic water quality standard for TPH.

- Chloride exceeded the NMWQCC domestic water quality standard of 250 mg/L in the groundwater sample MW-4 (17,800 mg/L) and is consistent with the previous monitoring events.
- The Site does not appear to be the source for the chloride reported in samples from monitoring well MW-4 based on the initial laboratory results from the groundwater samples collected on January 29, 2019.
- DKL routinely monitors the leak detection system and has found no fluid to indicate a leak from the pond.

DKL will continue to monitor the leak detection system, as required by the permit conditions, and immediately report any changes to the NMOCD. DKL will also continue monitoring groundwater on a quarterly (4 times per year) schedule. Notification will be provided to the NMOCD at least 7 working days prior to each monitoring event, and as soon as possible upon any significant change in analyte concentrations.

## 2.0 INTRODUCTION

LAI has prepared this report on behalf DKL for submittal to the NMOCD District 2 in Artesia and Santa Fe, New Mexico. The report presents the results of the 2023 third (3<sup>rd</sup>) quarter (July - September) groundwater monitoring at the Cottonwood Facility (Site) performed on September 12, 2023. Notification of the groundwater sampling event was submitted to the NMOCD on September 1, 2023. Appendix A presents NMOCD communications.

### 2.1 Background

The Site is a produced water recycling facility permitted by the NMOCD (2RF-128) that was owned and operated by 3 Bear Energy LLC, until June 1, 2022, when DKL acquired operations. The Site is located in Unit N (SE 1/4, SW 1/4), Section 20, Township 26 South, and Range 26 East, in Eddy County, New Mexico. The surface and mineral owner is the U.S. Government administered by the Bureau of Land Management (BLM). The geodetic position is North 32.02104° and West -104.31879°. Figure 1 presents a location and topographic map. Figure 2 presents an aerial map.

## 3.0 DEPTH TO GROUNDWATER AND GROUNDWATER ELEVATION

On September 12, 2023, LAI personnel gauged monitoring wells MW-1 through MW-4 for LNAPL and depth to groundwater. LNAPL was not present in the monitoring wells. Groundwater was gauged at 30.99 (MW-1), 56.84 (MW-2), 48.97 (MW-3) and 70.27 (MW-4) feet below top of casing (TOC). Depth to groundwater decreased (rising conditions) in monitoring wells MW-1 (0.03 feet) and MW-4 (1.02 feet) and increased (falling conditions) in MW-2 (0.13 feet) and MW-3 (2.52 feet) compared to the previous monitoring period on June 8, 2023.

The groundwater potentiometric surface elevation ranged from 3,432.06 feet above mean sea level (MSL) at well MW-1 (upgradient) to 3,388.77 feet above MSL at MW-4 (cross and down gradient). An apparent groundwater divide causes groundwater to flow to the northeast and east towards wells MW-2 and MW-3, respectively, and southeast towards well MW-4 at gradients between 0.029 and 0.192 ft/ft. No significant change in the groundwater flow direction or gradient was observed on September 12, 2023.

The groundwater potentiometric surface in well MW-2 and MW-3 has steadily declined over time from 3,415.74 to 3,401.42 feet above MSL or approximately 14.32 feet in well MW-2 and 3,416.17 to 3,409.36 feet above MSL or approximately 6.81 feet in well MW-3, between December 12, 2018, and September 12, 2023. The decline is likely due to decreased aquifer recharge in the fractured bedrock. Table 1 presents the groundwater gauging summary. Figure 3 presents the groundwater potentiometric map for September 12, 2023. Appendix B presents a control chart for groundwater elevation over time.

## 4.0 GROUNDWATER SAMPLES AND ANALYSIS

On September 12, 2023, LAI personnel collected groundwater samples from monitoring wells MW-1, MW-2, and MW-4. No samples were collected from monitoring well MW-3 due to insufficient water. LAI was not able to collect the sample for TPH from monitoring well MW-2 due to insufficient water. A duplicate sample (MW-1) was collected for laboratory quality assurance and quality control (QA/QC). The samples from MW-1 were collected using the low stress or low flow method, according to EPA protocol (EQASOP-GW4, Revision 4, September 19, 2017). The low stress or low flow method where an environmental pump was submerged near the middle of the water column and the well was pumped at a low rate until environmental parameters stabilized. Groundwater samples were collected from the discharge of the dedicated disposable Tygon® tubing. The tubing was discarded after each use and the pump was thoroughly cleaned with a solution potable water and laboratory grade detergent (Alconox®) and rinsed with distilled water. Samples from MW-2 through MW-4 were collected using dedicated disposable polyethylene bailers that were discarded after each use.

The samples were carefully transferred to labeled laboratory containers and delivered under preservation and chain-of-custody to DHL Analytical, Inc. (DHL), a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory, located in Round Rock, Texas. DHL analyzed the samples BTEX according to EPA SW-846 Method 8021B, by EPA SW-846 Method 8015M, including gasoline range organics (C6 to C10), diesel range organics (>C10 to C28) and oil range organics (>C28 to C35), and chloride by EPA Method 300. Table 2 presents the laboratory analytical data summary. Appendix C presents the laboratory report.

### 4.1 Organic Analysis

BTEX concentrations were below the analytical method reporting limit (RL) in the groundwater samples from MW-1, MW-2, and MW-4. The laboratory reported TPH as diesel range organics (>C12 to C28) in the sample from MW-4 at 0.144 mg/L, which is consistent with TPH results reported during previous monitoring periods. There is no NMWQCC standard for TPH. The source for the TPH is unknown. Monitoring well MW-2 contained insufficient water for TPH analysis. Monitoring well MW-3 contained insufficient water for BTEX and TPH analysis.

### 4.2 Inorganic Analysis

Chloride was reported above the NMWQCC domestic water quality standard of 250 mg/L in the groundwater sample from monitoring well MW-4 (17,800 mg/L) and is consistent with the previous and initial chloride concentration (22,300 mg/L) reported on January 29, 2019. DKL monitors the leak detection system and has not found any leaks in the system, therefore the source for the chloride is unknown. The QA/QC sample (Dup-1) from monitoring well MW-1 had a chloride concentration of 184 mg/L, and 0.55 percent difference of the original chloride value of 183 mg/L reported for MW-1. No data quality exceptions were noted in DHL case narratives. Figure 4 presents a chloride concentration in groundwater map on June 8, 2023.

On January 29, 2019, and May 15, 2019, the laboratory analyzed a precipitate layer that was observed in the groundwater samples from monitoring well MW-4. DHL analyzed the precipitate material and reported chloride at 87,700 mg/L and 25,900 mg/L, on January 29, 2019, and May 15, 2019, respectively. The precipitate is considered naturally occurring and is likely associated with evaporates (chloride) in the formation. Table 3 presents the precipitate sample analytical data summary.

## 5.0 CONCLUSIONS

The following observations are documented in this report:

- A hydrologic divide in the vicinity of monitoring well MW-1 causing groundwater to flow to the northeast, east and southeast at gradients between 0.029 and 0.192 ft/ft.
- No significant changes in the groundwater flow direction and gradient were observed on September 12, 2023.
- BTEX and TPH were below the laboratory method RLs in MW-1, MW-3, and MW-4.
- MW-2 did not contain sufficient water to analyze for BTEX and TPH.
- Chloride was above the NMWQCC domestic water quality standard in the sample collected from MW-4 (17,800 mg/L).
- The Site does not appear to be the source for the chloride reported in samples from monitoring well MW-4 based on laboratory results that are consistent with the initial groundwater sample results on January 29, 2019.
- DKL continues to monitor the leak detection system and has found no leaks in the system.

## 6.0 RECOMMENDATIONS

DKL will continue quarterly (4 times per year) groundwater monitoring at the Site. LAI will gauge and sample monitoring wells in the following order: MW-2, MW-3, MW-1, and MW-4. Groundwater samples will be collected using the low stress or low flow method and dedicated Tygon® tubing. Wells demonstrating insufficient water volume will not be sampled. Notification will be provided to the NMOCD at least 7 working days prior to each monitoring event, and as soon as possible upon any significant change in analyte concentrations.

## **Tables**



**Table 1**  
**Monitoring Well Completion and Gauging Summary**  
**DKL Energy, Cottonwood Facility**  
**Eddy County, New Mexico**

Well Information									Groundwater Information				
Well	Date	Well Depth (Feet TOC)	Drilled Depth (Feet BGS)	Well Diameter (Inches)	Surface Elevation (Feet AMSL)	Screen Interval (Feet BGS)	Casing Stickup (Feet)	TOC Elevation (Feet AMSL)	Date Gauged	Depth to Groundwater (Feet TOC)	Depth to Groundwater (Feet BGS)	Water Column (Feet)	Grounwater Elevation (Feet AMSL)
MW-1	08/15/2018	92.40	89.40	2	3,460.29	74.40 - 89.40	2.76	3,463.05	09/25/2018	31.85	29.09	60.55	3,431.20
									11/13/2018	31.81	29.05	60.59	3,431.24
									12/12/2018	31.69	28.93	60.71	3,431.36
									01/29/2019	32.62	29.86	59.78	3,430.43
									05/15/2019	32.50	29.74	59.90	3,430.55
									09/12/2019	31.51	28.75	60.89	3,431.54
									09/20/2019	32.40	29.64	60.00	3,430.65
									12/04/2019	31.73	28.97	60.67	3,431.32
									02/18/2020	31.50	28.74	60.90	3,431.55
									05/07/2020	31.72	28.96	60.68	3,431.33
									08/13/2020	31.82	29.06	60.58	3,431.23
									10/06/2020	31.89	29.13	60.51	3,431.16
									01/05/2021	31.47	28.71	60.93	3,431.58
									04/29/2021	31.45	28.69	60.95	3,431.60
									06/25/2021	31.84	29.08	60.56	3,431.21
									09/01/2021	31.31	28.55	61.09	3,431.74
									11/18/2021	31.48	28.72	60.92	3,431.57
									02/24/2022	31.40	28.64	61.00	3,431.65
									05/19/2022	30.74	27.98	61.66	3,432.31
									09/23/2022	31.02	28.26	61.38	3,432.03
									12/13/2022	30.42	27.66	61.98	3,432.63
									03/16/2023	31.62	28.86	60.78	3,431.43
									06/08/2023	31.02	28.26	61.38	3,432.03
									09/12/2023	30.99	28.23	61.41	3,432.06
MW-2	08/16/2018	58.7	61.70	2	3,455.22	40.70 - 55.70	3.04	3,458.26	09/25/2018 *	--	--	--	--
									11/13/2018 *	--	--	--	--
									12/12/2018	42.52	39.48	16.18	3,415.74
									01/29/2019	42.07	39.03	16.63	3,416.19
									05/15/2019	42.70	39.66	16.00	3,415.56
									09/12/2019	43.98	40.94	14.72	3,414.28

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									09/20/2019	44.78	41.74	13.92	3,413.48
									12/04/2019	45.01	41.97	13.69	3,413.25
									02/18/2020	45.10	42.06	13.60	3,413.16
									05/07/2020	49.30	46.26	9.40	3,408.96
									08/13/2020	51.69	48.65	7.01	3,406.57
									10/06/2020	52.00	48.96	6.70	3,406.26
									01/05/2021	52.21	49.17	6.49	3,406.05
									04/29/2021	54.75	51.71	3.95	3,403.51
									09/01/2021	56.93	53.89	1.77	3,401.33
									11/18/2021	57.94	54.90	0.76	3,400.32
									02/24/2022	56.88	53.84	1.82	3,401.38
									05/19/2022	56.93	53.89	1.77	3,401.33
									09/23/2022	56.44	53.40	2.26	3,401.82
									12/13/2022	56.62	53.58	2.08	3,401.64
									03/16/2023	56.32	53.28	2.38	3,401.94
									06/08/2023	56.71	53.67	1.99	3,401.55
									09/12/2023	56.84	53.80	1.86	3,401.42
MW-3	08/16/2018	52.9	49.90	2	3,455.52	34.90 - 49.90	3.00	3,458.33	09/25/2018	43.55	40.55	9.40	3,414.78
									11/13/2018	42.65	39.65	10.25	3,415.68
									12/12/2018	42.16	39.16	10.74	3,416.17
									01/29/2019	41.85	38.85	11.05	3,416.48
									05/15/2019	42.61	39.61	10.29	3,415.72
									09/12/2019	44.3	41.30	8.60	3,414.03
									09/20/2019	44.1	41.10	8.80	3,414.23
									12/04/2019	44.83	41.83	8.07	3,413.50
									02/18/2020	45.6	42.60	7.30	3,412.73
									05/07/2020	45.68	42.68	7.22	3,412.65
									08/13/2020	45.64	42.64	7.26	3,412.69
									10/06/2020	46.19	43.19	6.71	3,412.14

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									01/05/2021	46.66	43.66	6.24	3,411.67
									04/29/2021 *	--	--	--	--
									09/01/2021	47.59	44.59	5.31	3,410.74
									11/18/2021	46.98	43.98	5.92	3,411.35
									02/24/2022	45.85	42.85	7.05	3,412.48
									05/19/2022	47.88	44.88	5.02	3,410.45
									09/23/2022	47.76	44.76	5.14	3,410.57
									12/13/2022	46.51	43.51	6.39	3,411.82
									03/16/2023	48.11	45.11	4.79	3,410.22
									06/08/2023	46.45	43.45	6.45	3,411.88
									09/12/2023	48.97	45.97	3.93	3,409.36
MW-4	08/14/2018	78.1	75.10	2	3,456.06	60.10 - 75.00	2.98	3,459.04	09/25/2018 *	--	--	--	--
									11/13/2018 *	--	--	--	--
									12/12/2018	74.36	71.38	3.74	3,384.68
									01/29/2019	71.34	68.36	6.76	3,387.70
									05/15/2019	71.50	68.52	6.60	3,387.54
									09/12/2019	67.38	64.40	10.72	3,391.66
									09/20/2019	71.41	68.43	6.69	3,387.63
									12/04/2019	66.31	63.33	11.79	3,392.73
									02/18/2020	71.80	68.82	6.30	3,387.24
									05/07/2020	72.20	69.22	5.90	3,386.84
									08/13/2020	70.10	67.12	8.00	3,388.94
									10/06/2020	68.09	65.11	10.01	3,390.95
									01/05/2021	68.88	65.90	9.22	3,390.16
									04/29/2021	70.14	67.16	7.96	3,388.90
									06/25/2021	69.92	66.94	8.18	3,389.12
									09/01/2021	72.55	69.57	5.55	3,386.49
									11/18/2021	71.61	68.63	6.49	3,387.43
									02/24/2022	70.05	67.07	8.05	3,388.99
									05/19/2022	68.82	65.84	9.28	3,390.22
									09/23/2022	67.95	64.97	10.15	3,391.09

**Table 1**  
**Monitoring Well Completion and Gauging Summary**  
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**Eddy County, New Mexico**

Well Information									Groundwater Information				
Well	Date	Well Depth (Feet TOC)	Drilled Depth (Feet BGS)	Well Diameter (Inches)	Surface Elevation (Feet AMSL)	Screen Interval (Feet BGS)	Casing Stickup (Feet)	TOC Elevation (Feet AMSL)	Date Gauged	Depth to Groundwater (Feet TOC)	Depth to Groundwater (Feet BGS)	Water Column (Feet)	Grounwater Elevation (Feet AMSL)
									12/13/2022	68.58	65.60	9.52	3,390.46
									03/16/2023	71.71	68.73	6.39	3,387.33
									06/08/2023	71.29	68.31	6.81	3,387.75
									09/12/2023	70.27	67.29	7.83	3,388.77

Notes: monitoring wells installed by Environ-Drill, Albuquerque, New Mexico with 2 inch schedule 40 PVC casing and screen

bgs - below ground surface

TOC - top of casing

AMSL - denotes elevation in feet above mean sea level

\* - Well bore dry

Table 2  
Groundwater Sample Organic and Inorganic Analytical Data Summary  
DKL Energy, Cottonwood Facility  
Eddy County, New Mexico

Well	Collection Date	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Xylenes (mg/L)	GRO C6 - C10 (mg/L)	DRO >C10 - C28 (mg/L)	ORO >C28 - C35 (mg/L)	TPH C6 - C35 (mg/L)	Chloride (mg/L)
NMWQCC Standard:		*0.001	*0.75	*0.75	*0.62					**250
MW-1	09/25/2018	<0.000800	<0.00200	<0.00200	<0.00200	<0.556	<0.556	<0.556	<0.556	210
	11/13/2018	0.00124	<0.00200	<0.00200	<0.00200	<0.527	<0.527	<0.527	<0.527	1,220
	12/12/2018	0.0013	<0.00200	<0.00200	<0.00200	<0.537	<0.537	<0.537	<0.537	677
	01/29/2019	0.00489	<0.00400	<0.00400	<0.00400	<0.0600	<0.0789	<0.0789	<0.2178	1,750
	05/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0749	<0.0749	<0.7498	214
	09/20/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0730	<0.0730	<0.206	248
	12/04/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0739	<0.0739	<0.2078	224
	02/18/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0772	<0.0772	<0.2144	214
	05/07/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0787	<0.0787	<0.2174	246
	08/13/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	0.107	<0.0758	0.107	228
	10/06/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0782	<0.0782	<0.2164	218
	01/05/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0785	<0.0785	<0.2170	192
	04/29/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	2.33	0.783	3.113	201
	06/25/2021	--	--	--	--	<0.0600	<0.0790	<0.0790	<0.218	--
	09/01/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.149	<0.149	<0.358	202
	11/18/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0836	<0.0836	<0.0836	182
	02/24/2022	<0.008000	<0.00200	<0.00200	<0.00200	<0.0600	<0.0789	<0.0789	<0.0789	228
	05/19/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0787	<0.0787	<0.0787	194
	09/23/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0742	<0.0742	<0.0742	195
	12/13/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	0.184	<0.0988	0.184	196
	03/16/2023	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0778	<0.0778	<0.0778	275
	06/08/2023	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0748	<0.0748	<0.0748	180
	09/12/2023	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0760	<0.0760	<0.0760	183
MW-2	09/25/2018 ***	--	--	--	--	--	--	--	--	--
	11/13/2018 ***	--	--	--	--	--	--	--	--	--
	01/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0767	<0.0767	<0.0767	136
	05/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0744	<0.0744	<0.2088	106
	09/20/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0748	<0.0748	<0.2096	117
	12/04/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0751	<0.0751	<0.2102	105
	02/18/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0766	<0.0766	<0.2132	120
	05/07/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0823	<0.0823	<0.2246	121
	08/13/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0841	<0.0841	<0.2282	124

**Table 2**  
**Groundwater Sample Organic and Inorganic Analytical Data Summary**  
**DKL Energy, Cottonwood Facility**  
**Eddy County, New Mexico**

Well	Collection Date	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Xylenes (mg/L)	GRO C6 - C10 (mg/L)	DRO >C10 - C28 (mg/L)	ORO >C28 - C35 (mg/L)	TPH C6 - C35 (mg/L)	Chloride (mg/L)
<b>NMWQCC Standard:</b>		<b>*0.001</b>	<b>*0.75</b>	<b>*0.75</b>	<b>*0.62</b>					<b>**250</b>
	10/06/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0789	<0.0789	<0.2178	137
	01/05/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0874	<0.0874	<0.2348	130
	04/29/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0946	<0.0946	<0.24.92	132
	09/01/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.150	<0.150	<0.360	142
	11/18 & 22/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.00600	<b>1.07</b>	<0.494	<b>1.07</b>	149
	02/24/2022 ***	--	--	--	--	--	--	--	--	--
	05/19/2022 ***	--	--	--	--	--	--	--	--	--
	09/23/2022 ***	--	--	--	--	--	--	--	--	--
	12/13/2022 ***	--	--	--	--	--	--	--	--	--
	03/16/2023	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0808	<0.0808	<0.0808	128
	06/08/2023 ***	--	--	--	--	--	--	--	--	128
	09/12/2023 ***	<0.000800	<0.00200	<0.00200	<0.00200	--	--	--	--	134
<b>MW-3</b>	09/25/2018	<0.000800	<0.00200	<0.00200	<0.00200	<0.554	<0.554	<0.554	<0.554	101
	11/13/2018	<0.000800	<0.00200	<0.00200	<0.00200	<0.574	<0.574	<0.574	<0.574	103
	01/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0780	<0.0780	<0.0780	140
	05/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0758	<0.0758	<0.2116	121
	09/20/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0737	<0.0737	<0.2074	130
	12/04/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0752	<0.0752	<0.2104	111
	02/18/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0794	<0.0794	<0.2188	120
	05/07/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0997	<0.0997	<0.2594	<b>305</b>
	08/13/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0822	<0.0822	<0.2244	125
	10/06/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0787	<0.0787	<0.2174	111
	01/05/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0858	<0.0858	<0.2316	112
	04/29/2021 ***	--	--	--	--	--	--	--	--	--
	09/01/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.150	<0.150	<0.360	123
	11/18/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0878	<0.0878	<0.0878	120
	02/24/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0783	<0.0783	<0.0783	147
	05/19/2022 ***	--	--	--	--	--	--	--	--	--
	09/23/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0880	<0.0880	<0.0880	146
	12/13/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.104	<0.104	<0.104	169
	03/16/2023 ***	--	--	--	--	--	--	--	--	--
	06/08/2023	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0767	<0.0767	<0.0767	165

Table 2  
Groundwater Sample Organic and Inorganic Analytical Data Summary  
DKL Energy, Cottonwood Facility  
Eddy County, New Mexico

Well	Collection Date	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Xylenes (mg/L)	GRO C6 - C10 (mg/L)	DRO >C10 - C28 (mg/L)	ORO >C28 - C35 (mg/L)	TPH C6 - C35 (mg/L)	Chloride (mg/L)
NMWQCC Standard:		*0.001	*0.75	*0.75	*0.62					**250
	09/12/2023 ***	--	--	--	--	--	--	--	--	--
MW-4	09/25/2018 ***	--	--	--	--	--	--	--	--	--
	11/13/2018 ***	--	--	--	--	--	--	--	--	--
	01/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	0.216	<0.110	0.216	22,300
	05/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.762	<0.762	<0.2114	22,900
	09/20/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.741	<0.741	<0.082	26,000
	12/04/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.600	<0.752	<0.752	<2.104	24,400
	02/18/2020	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	<0.577	<0.577	<1.754	25,800
	05/07/2020	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	<0.110	<0.110	<0.820	25,400
	08/13/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.600	0.137	<0.0566	0.137	19,800
	10/06/2020	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	0.251	<0.0790	0.251	21,000
	01/05/2021	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	0.126	<0.0880	0.126	16,200
	04/29/2021	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	0.377	<0.0906	0.377	16,100
	06/25/2021	--	--	--	--	<0.600	<0.0900	<0.0900	<0.2400	--
	09/01/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.149	<0.149	<0.358	23,600
	11/18/2021	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	0.118	<0.0840	0.118	17,500
	02/24/2022	<0.00800	<0.0200	<0.0200	<0.0200	<0.0600	<0.0853	<0.0853	<0.0853	20,400
	05/19/2022	<0.00800	<0.0200	<0.0200	<0.0200	<0.6000	0.264	<0.0787	0.264	13,400
	09/23/2022	<0.00800	<0.0200	<0.0200	<0.0200	<0.0600	0.272	<0.0745	0.272	19,300
	12/13/2022	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	<0.106	<0.106	<0.106	21,900
	03/16/2023	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	0.167	<0.0935	0.167	23,600
	06/08/2023	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	<0.0820	<0.0820	<0.600	15,500
	09/12/2023	<0.00800	<0.0200	<0.0200	<0.0200	<0.0600	0.144	<0.0867	0.144	17,800
QA/QC (Duplicate) Samples										
Dup-1 (MW-1)	02/18/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0802	<0.0802	<0.2204	210
Dup-1 (MW-1)	05/07/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0800	<0.0800	<0.2200	221
Dup-1 (MW-1)	08/13/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0747	<0.0747	<0.2094	213
Dup-1 (MW-1)	10/06/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0785	<0.0785	<0.2170	196
Dup-1 (MW-1)	01/05/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0751	<0.0751	<0.2102	194
Dup-1 (MW-1)	04/29/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0918	<0.0918	<0.2436	199
Dup-1 (MW-1)	06/25/2021	--	--	--	--	<0.0600	<0.0775	<0.0775	<0.2150	--
Dup-1 (MW-1)	09/01/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.1490	<0.1490	<0.898	204
Dup-1 (MW-1)	11/18/2021	<0.000800	<0.00200	<0.00200	<0.00200	<0.00600	<0.0816	<0.0816	<0.0816	183

Table 2  
Groundwater Sample Organic and Inorganic Analytical Data Summary  
DKL Energy, Cottonwood Facility  
Eddy County, New Mexico

Well	Collection Date	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Xylenes (mg/L)	GRO C6 - C10 (mg/L)	DRO >C10 - C28 (mg/L)	ORO >C28 - C35 (mg/L)	TPH C6 - C35 (mg/L)	Chloride (mg/L)
NMWQCC Standard:		*0.001	*0.75	*0.75	*0.62					**250
Dup-1 (MW-1)	02/24/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0832	<0.0832	<0.0832	198
Dup-1 (MW-1)	05/19/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0786	<0.0786	<0.0786	236
Dup-1 (MW-1)	09/23/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0768	<0.0768	<0.0768	194
Dup-1 (MW-1)	12/13/2022	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	0.128	<0.0997	0.128	196
Dup-1 (MW-1)	03/20/2023	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0759	<0.0759	<0.0759	280
Dup-1 (MW-1)	06/08/2023	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0764	<0.0764	<0.0764	177
Dup-1 (MW-1)	09/12/2023	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0780	<0.0780	<0.0780	184

Notes: Analysis performed by DHL Analytical, Round Rock, Texas, by EPA SW-846 Method 8021B (BTEX), Method 8015M (TPH) and Method 300 (chloride)

All values reported in milligrams per liter (mg/L) equivalent to parts per million (ppm)

-- No data available

< - denotes concentration is less than analytical method reporting limit (RL).

\* - Human health standard

\*\* - Domestic water quality standard

\*\*\* - Insufficient water for sample collection

(<sup>1</sup>) - resampled on June 25, 2021 due to sample being collected from polyethylene tubing.



**Table 3**  
**Groundwater Precipitate Sample Analytical Data Summary**  
**DKL Energy, LLC Cottonwood Facility**  
**Eddy County, New Mexico**

Well No.	Collection Date	Barium (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Strontium (mg/L)
MW-4	1/29/2019	<0.463	347	46.9	20,500	894	87,700	8.87
	5/15/2019	--	333	--	50,500	2,370	25,900	--
Well No.	Collection Date	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Total mg/L			
MW-4	1/29/2019	--	--	--	--			
	5/15/2019	5140	<	<	5140			
MW-2	5/15/2019	116	<	<	116			

Notes: Analysis performed by DHL Analytical, Round Rock, Texas, by EPA SW-846 Method 8021B (BTEX), Method 8015M (TPH) and Method 300 (chloride)

Values reported in milligrams per liter (mg/L); equivalent to parts per million (ppm)

-- No data available

< - indicates parameter concentration is less than method reporting limit (RL).

\* - Human health standard

\*\* - Domestic water quality standard

## **Figures**

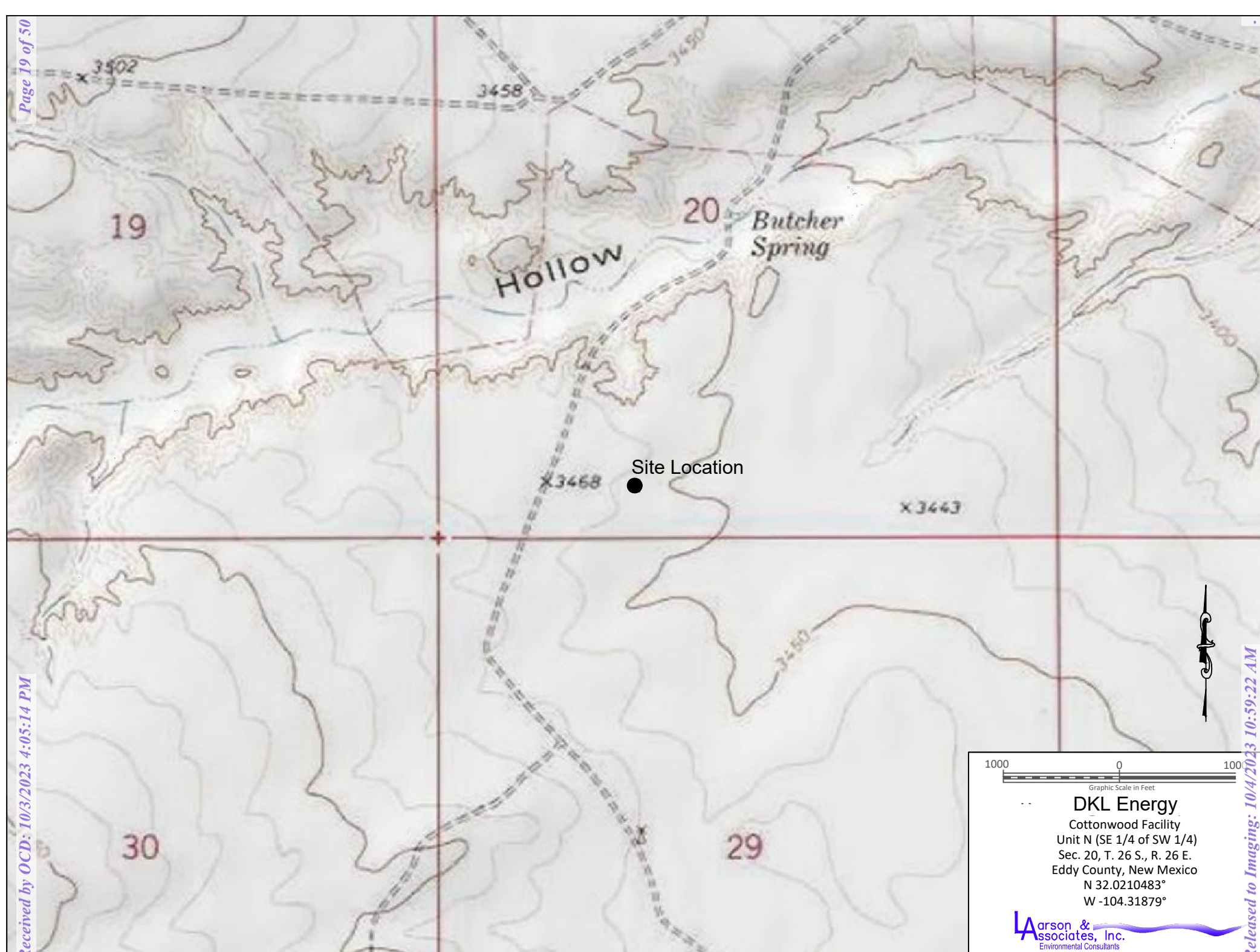
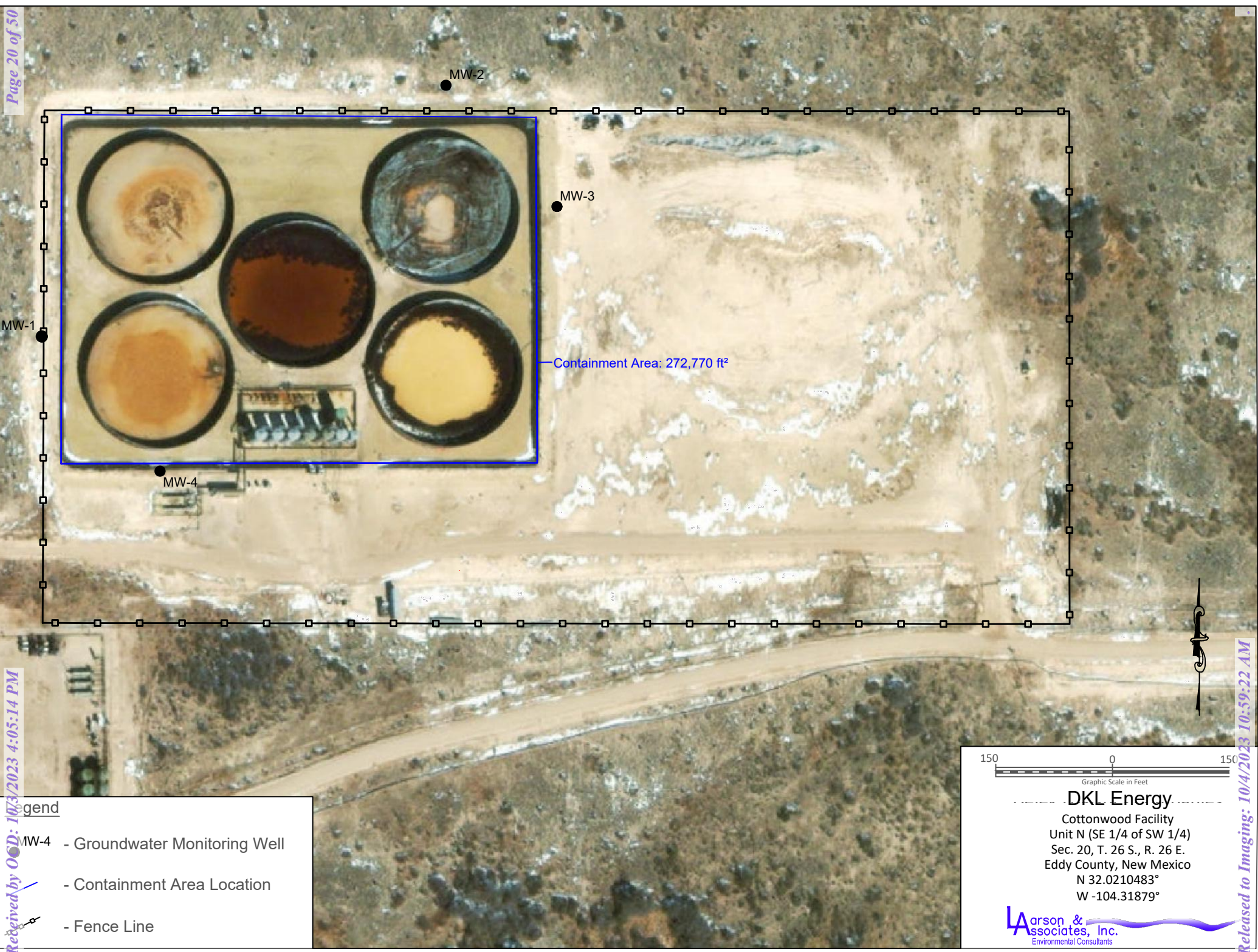
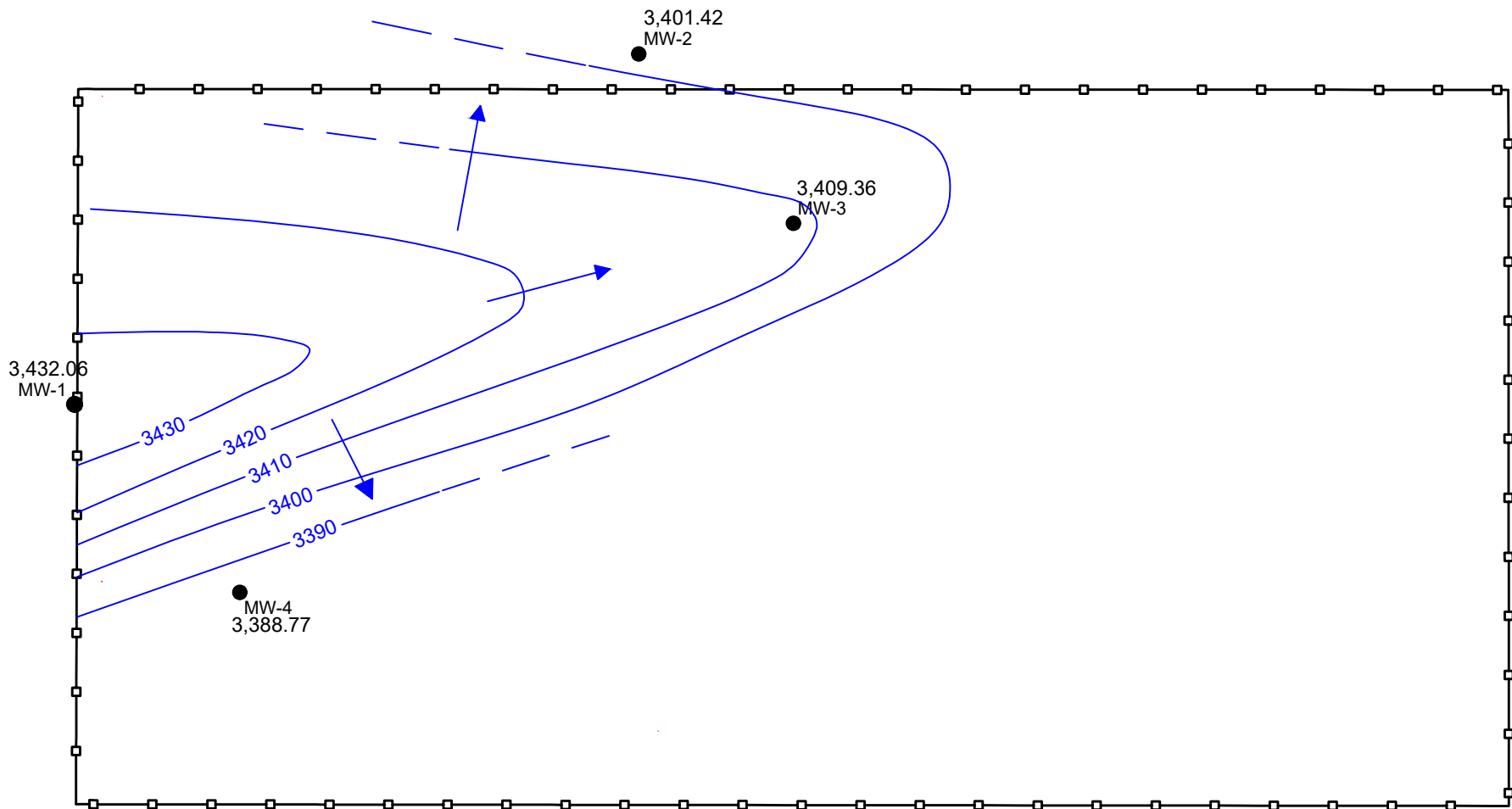


Figure 1 - Topographic Map



Figure 2 - Aerial Map





Legend

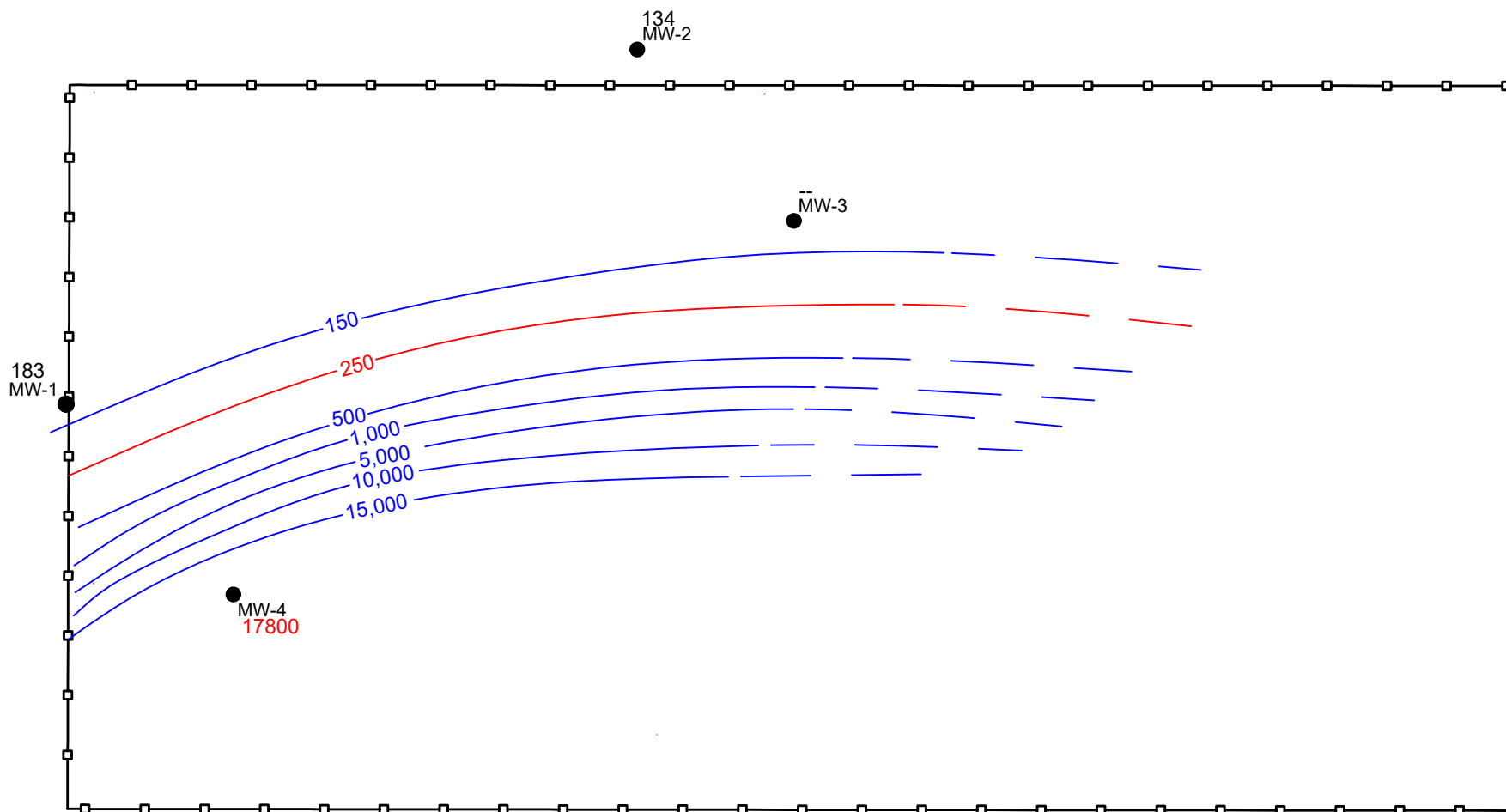
- MW-4 - Monitoring Well Location and Groundwater Potentiometric Surface Elevation, Feet AMSL, September 12, 2023
- 3420 - Contour of Groundwater Potentiometric Surface Elevation, Feet AMSL, September 12, 2023
- Blue arrow - Groundwater Flow Direction
- Fence line symbol - Fence



**DKL Energy**  
Cottonwood Facility  
Unit N (SE 1/4 of SW 1/4)  
Sec. 20, T. 26 S., R. 26 E.  
Eddy County, New Mexico  
N 32.0210483°  
W -104.31879°



Figure 3c - Groundwater Potentiometric Map, September 12, 2023



**Legend**

- 17800 MW-4 - Monitoring Well Location and Chloride Concentration in Groundwater, mg/L, September 12, 2023
- 150 - Contour of Chloride Concentration Elevation, mg/L, September 12, 2023
- 250 - NMWQCC Downstream Water Quality Limit: 250 mg/L
- Fence

150 0 150  
Graphic Scale in Feet

**DKL Energy**  
Cottonwood Facility  
Unit N (SE 1/4 of SW 1/4)  
Sec. 20, T. 26 S., R. 26 E.  
Eddy County, New Mexico  
N 32.0210483°  
W -104.31879°

**Larson & Associates, Inc.**  
Environmental Consultants

Figure 4c - Chloride Concentration in Groundwater, September 12, 2023



**Appendix A**  
**NMOCD Communications**

**From:** [Robert Nelson](#)  
**To:** [Velez, Nelson, EMNRD](#)  
**Cc:** [Harry Lewis](#); [James Young](#); [Brian O'Dell](#); [Mark Larson](#); [Daniel St. Germain](#)  
**Subject:** Delek Logistics - Cottonwood Facility (2RF-128) Groundwater Sampling Notice  
**Date:** Friday, September 1, 2023 10:15:00 AM  
**Attachments:** [image001.png](#)

---

Hello Mr. Velez,

This message is submitted to the New Mexico Oil Conservation Division (OCD) on behalf of Delek Logistics Companies (Delek) to provide notification that personnel from Larson & Associates, Inc. (LAI) will be at the Cottonwood Facility (2RF-128) on September 12, 2023 at approximately 10:00am MST for the purpose of collecting groundwater samples from four (4) monitoring wells. Please feel free to contact Harry Lewis with Delek at (469)704-7379 or [Harry.Lewis@deleklogistics.com](mailto:Harry.Lewis@deleklogistics.com), Mark Larson at (432)687-0901 or [mark@laenvironmental.com](mailto:mark@laenvironmental.com) or me if you have any questions.

Thank you,

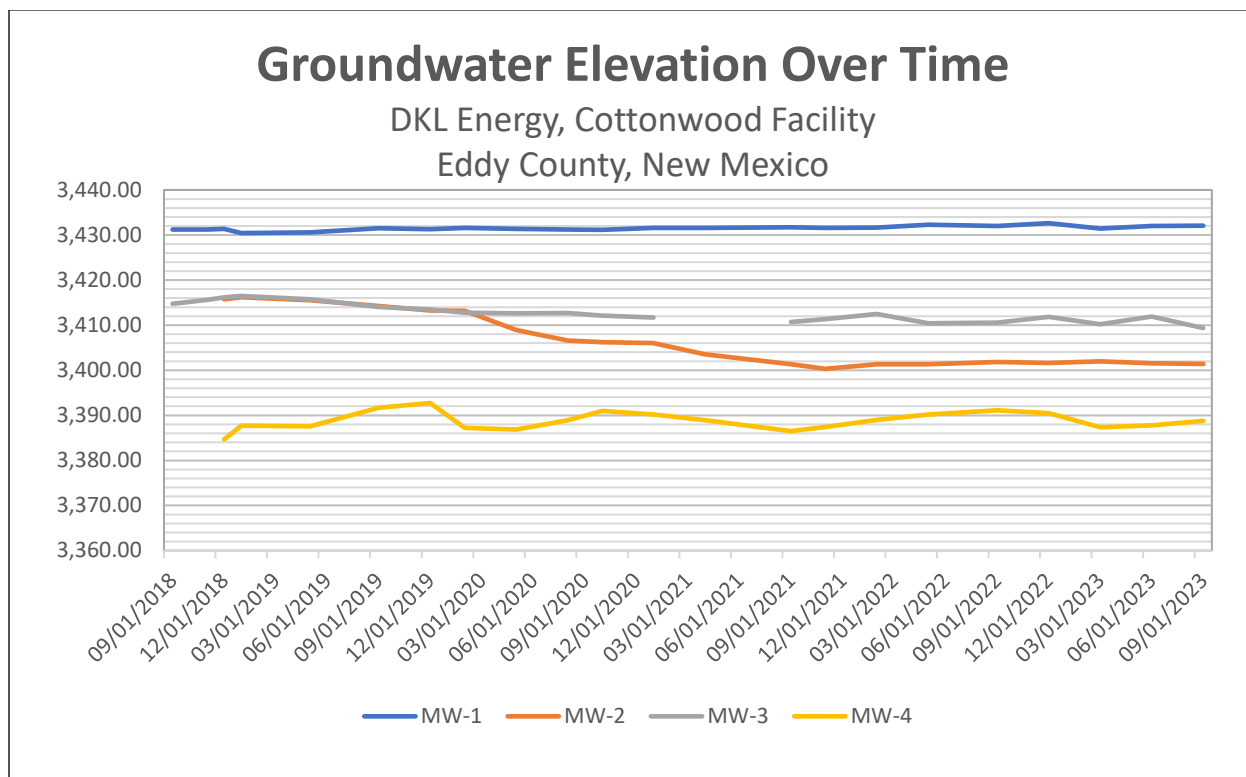
Robert Nelson  
Project Manager  
Office – 432-687-0901  
Cell – 432-664-4804  
[rnelson@laenvironmental.com](mailto:rnelson@laenvironmental.com)





## **Appendix B**

### **Groundwater Elevation Over Time Control Chart**



**Appendix C**  
**Laboratory Analytical Report**



September 21, 2023

Mark Larson  
Larson & Associates  
507 N. Marienfeld #205  
Midland, TX 79701  
TEL: (432) 687-0901  
FAX: (432) 687-0456  
RE: Cottonwood

Order No.: 2309092

Dear Mark Larson:

DHL Analytical, Inc. received 4 sample(s) on 9/14/2023 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read "John DuPont".

John DuPont  
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification  
Number: T104704211-23-29




## Table of Contents

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**La**arson &  
ssociates, Inc.  
Environmental Consultants

DATE: 9/13/2023 PAGE 1 OF 1  
PO#: \_\_\_\_\_ LAB WORK ORDER#: 2309092  
PROJECT LOCATION OR NAME: Cottonwood  
LAI PROJECT #: 22-0135-01 COLLECTOR: EW + DSL

[illegible]

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	9/13/2023 1440	Fed Ex
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Fed Ex	9/14/23 0845	Ex
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)

3

NORMAL ☒

1 DAY ☐

2 DAY ☐

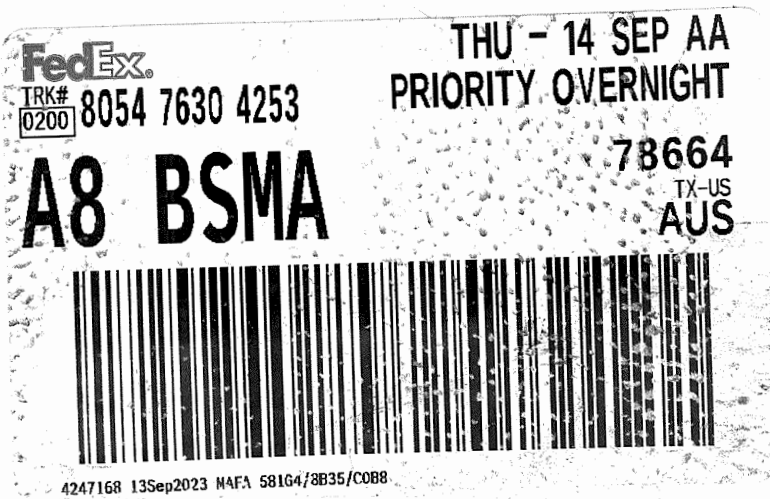
OTHER ☐

RECEIVING TEMP: 0.6°C THERM#: 78

CUSTODY SEALS - ☐ BROKEN ☒ INTACT ☐ NOT USED

☐ CARRIER BILL # Fed Ex

☐ HAND DELIVERED



**CUSTODY SEAL**



DATE 9/13/2023

SIGNATURE RW



## DHL Analytical, Inc.

## Sample Receipt Checklist

Client Name: **Larson & Associates**Date Received: **9/14/2023**Work Order Number: **2309092**Received by: **EL**Checklist completed by:  9/14/2023  
Signature DateReviewed by:  9/14/2023  
Initials DateCarrier name: FedEx 1day

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/> NA <input type="checkbox"/>
Water - pH<2 acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/> LOT # _____
	Adjusted? _____	Checked by _____	
Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/> LOT # _____
	Adjusted? _____	Checked by _____	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Cooler #	1		
Temp °C	0.6		
Seal Intact	Y		

Any No response must be detailed in the comments section below.

Client contacted: \_\_\_\_\_ Date contacted: \_\_\_\_\_ Person contacted: \_\_\_\_\_

Contacted by: \_\_\_\_\_ Regarding: \_\_\_\_\_

Comments: \_\_\_\_\_

Corrective Action: \_\_\_\_\_



**DHL Analytical, Inc.****Date:** 21-Sep-23**CLIENT:** Larson & Associates**Project:** Cottonwood**Lab Order:** 2309092**CASE NARRATIVE**

Samples were analyzed using the methods outlined in the following references:

Method SW8260D - Volatile Aromatics Analysis

Method E300 - Anions Analysis

Method M8015D - DRO Analysis

Method M8015V - GRO Analysis

**LOG IN**

The samples were received and log-in performed on 9/14/2023. A total of 4 samples were received and analyzed. The samples arrived in good condition and were properly packaged. The samples were collected in Mountain Standard Time.

**ANIONS ANALYSIS**

For Anions Analysis, the recovery of Chloride for the Matrix Spike and Matrix Spike Duplicate(s) (2309115-02 and 2309092-01 MS/MSD) was outside of the method control limits. These are flagged accordingly in the QC Summary Report. This anion was within method control limits in the associated LCS. No further corrective action was taken.

**DHL Analytical, Inc.****Date:** 21-Sep-23

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**CLIENT:** Larson & Associates  
**Project:** Cottonwood  
**Lab Order:** 2309092**Work Order Sample Summary**

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Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2309092-01	MW-2		09/12/23 10:58 AM	09/14/2023
2309092-02	MW-1		09/12/23 11:29 AM	09/14/2023
2309092-03	MW-4		09/12/23 11:40 AM	09/14/2023
2309092-04	Dup-1		09/12/23	09/14/2023

Lab Order: 2309092  
Client: Larson & Associates  
Project: Cottonwood

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2309092-01A	MW-2	09/12/23 10:58 AM	Aqueous	SW5030C	Purge and Trap Water GC/MS	09/14/23 12:46 PM	112147
2309092-01B	MW-2	09/12/23 10:58 AM	Aqueous	E300	Anion Preparation	09/15/23 02:15 PM	112160
2309092-02A	MW-1	09/12/23 11:29 AM	Aqueous	SW5030C	Purge and Trap Water GC/MS	09/14/23 12:46 PM	112147
2309092-02B	MW-1	09/12/23 11:29 AM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	09/15/23 08:51 AM	112155
2309092-02C	MW-1	09/12/23 11:29 AM	Aqueous	E300	Anion Preparation	09/15/23 02:15 PM	112160
2309092-02D	MW-1	09/12/23 11:29 AM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	09/18/23 10:40 AM	112187
2309092-03A	MW-4	09/12/23 11:40 AM	Aqueous	SW5030C	Purge and Trap Water GC/MS	09/14/23 12:46 PM	112147
2309092-03B	MW-4	09/12/23 11:40 AM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	09/15/23 08:51 AM	112155
2309092-03C	MW-4	09/12/23 11:40 AM	Aqueous	E300	Anion Preparation	09/15/23 02:15 PM	112160
2309092-03D	MW-4	09/12/23 11:40 AM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	09/18/23 10:40 AM	112187
2309092-04A	Dup-1	09/12/23	Aqueous	SW5030C	Purge and Trap Water GC/MS	09/14/23 12:46 PM	112147
2309092-04B	Dup-1	09/12/23	Aqueous	SW5030C	Purge and Trap Water GC-Gas	09/15/23 08:51 AM	112155
2309092-04C	Dup-1	09/12/23	Aqueous	E300	Anion Preparation	09/15/23 02:15 PM	112160
2309092-04D	Dup-1	09/12/23	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	09/18/23 10:40 AM	112187

## DHL Analytical, Inc.

21-Sep-23

**Lab Order:** 2309092  
**Client:** Larson & Associates  
**Project:** Cottonwood

## ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2309092-01A	MW-2	Aqueous	SW8260D	Volatile Aromatics by GC/MS	112147	1	09/14/23 05:11 PM	GCMS3_230914A
2309092-01B	MW-2	Aqueous	E300	Anions by IC method - Water	112160	10	09/16/23 03:14 AM	IC2_230915A
2309092-02A	MW-1	Aqueous	SW8260D	Volatile Aromatics by GC/MS	112147	1	09/14/23 05:34 PM	GCMS3_230914A
2309092-02B	MW-1	Aqueous	M8015V	TPH Purgeable by GC - Water	112155	1	09/15/23 03:02 PM	GC4_230915A
2309092-02C	MW-1	Aqueous	E300	Anions by IC method - Water	112160	10	09/16/23 04:08 AM	IC2_230915A
2309092-02D	MW-1	Aqueous	M8015D	TPH Extractable by GC - Water	112187	1	09/21/23 10:06 AM	GC15_230921A
2309092-03A	MW-4	Aqueous	SW8260D	Volatile Aromatics by GC/MS	112147	10	09/14/23 03:37 PM	GCMS3_230914A
2309092-03B	MW-4	Aqueous	M8015V	TPH Purgeable by GC - Water	112155	1	09/15/23 02:19 PM	GC4_230915A
2309092-03C	MW-4	Aqueous	E300	Anions by IC method - Water	112160	1000	09/15/23 07:08 PM	IC2_230915A
2309092-03D	MW-4	Aqueous	M8015D	TPH Extractable by GC - Water	112187	1	09/21/23 10:14 AM	GC15_230921A
2309092-04A	Dup-1	Aqueous	SW8260D	Volatile Aromatics by GC/MS	112147	1	09/14/23 05:58 PM	GCMS3_230914A
2309092-04B	Dup-1	Aqueous	M8015V	TPH Purgeable by GC - Water	112155	1	09/15/23 02:41 PM	GC4_230915A
2309092-04C	Dup-1	Aqueous	E300	Anions by IC method - Water	112160	10	09/16/23 04:26 AM	IC2_230915A
2309092-04D	Dup-1	Aqueous	M8015D	TPH Extractable by GC - Water	112187	1	09/21/23 10:23 AM	GC15_230921A

**DHL Analytical, Inc.****Date:** 21-Sep-23

**CLIENT:** Larson & Associates  
**Project:** Cottonwood  
**Project No:** 22-0135-01  
**Lab Order:** 2309092

**Client Sample ID:** MW-2  
**Lab ID:** 2309092-01  
**Collection Date:** 09/12/23 10:58 AM  
**Matrix:** AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>VOLATILE AROMATICS BY GC/MS</b>		<b>SW8260D</b>				Analyst: <b>JVR</b>	
Benzene	<0.000800	0.000800	0.00200		mg/L	1	09/14/23 05:11 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:11 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:11 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:11 PM
Surr: 1,2-Dichloroethane-d4	110	0	72-119		%REC	1	09/14/23 05:11 PM
Surr: 4-Bromofluorobenzene	99.4	0	76-119		%REC	1	09/14/23 05:11 PM
Surr: Dibromofluoromethane	109	0	85-115		%REC	1	09/14/23 05:11 PM
Surr: Toluene-d8	105	0	81-120		%REC	1	09/14/23 05:11 PM
<b>ANIONS BY IC METHOD - WATER</b>		<b>E300</b>				Analyst: <b>RA</b>	
Chloride	134	3.00	10.0		mg/L	10	09/16/23 03:14 AM

<b>Qualifiers:</b>	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

**DHL Analytical, Inc.**

Date: 21-Sep-23

**CLIENT:** Larson & Associates  
**Project:** Cottonwood  
**Project No:** 22-0135-01  
**Lab Order:** 2309092

**Client Sample ID:** MW-1  
**Lab ID:** 2309092-02  
**Collection Date:** 09/12/23 11:29 AM  
**Matrix:** AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>TPH EXTRACTABLE BY GC - WATER</b>		<b>M8015D</b>		Analyst: <b>BTJ</b>			
TPH-DRO C10-C28	<0.0760	0.0760	0.0950		mg/L	1	09/21/23 10:06 AM
TPH-ORO >C28-C35	<0.0760	0.0760	0.0950		mg/L	1	09/21/23 10:06 AM
Surr: Isopropylbenzene	39.8	0	25-124		%REC	1	09/21/23 10:06 AM
Surr: Octacosane	82.7	0	51-124		%REC	1	09/21/23 10:06 AM
<b>VOLATILE AROMATICS BY GC/MS</b>		<b>SW8260D</b>		Analyst: <b>JVR</b>			
Benzene	<0.000800	0.000800	0.00200		mg/L	1	09/14/23 05:34 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:34 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:34 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:34 PM
Surr: 1,2-Dichloroethane-d4	110	0	72-119		%REC	1	09/14/23 05:34 PM
Surr: 4-Bromofluorobenzene	98.7	0	76-119		%REC	1	09/14/23 05:34 PM
Surr: Dibromofluoromethane	110	0	85-115		%REC	1	09/14/23 05:34 PM
Surr: Toluene-d8	105	0	81-120		%REC	1	09/14/23 05:34 PM
<b>TPH PURGEABLE BY GC - WATER</b>		<b>M8015V</b>		Analyst: <b>BTJ</b>			
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	09/15/23 03:02 PM
Surr: Tetrachlorethene	87.8	0	74-138		%REC	1	09/15/23 03:02 PM
<b>ANIONS BY IC METHOD - WATER</b>		<b>E300</b>		Analyst: <b>RA</b>			
Chloride	183	3.00	10.0		mg/L	10	09/16/23 04:08 AM

<b>Qualifiers:</b>	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

**DHL Analytical, Inc.**

Date: 21-Sep-23

**CLIENT:** Larson & Associates  
**Project:** Cottonwood  
**Project No:** 22-0135-01  
**Lab Order:** 2309092

**Client Sample ID:** MW-4  
**Lab ID:** 2309092-03  
**Collection Date:** 09/12/23 11:40 AM  
**Matrix:** AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>TPH EXTRACTABLE BY GC - WATER</b>		<b>M8015D</b>		Analyst: <b>BTJ</b>			
TPH-DRO C10-C28	0.144	0.0867	0.108		mg/L	1	09/21/23 10:14 AM
TPH-ORO >C28-C35	<0.0867	0.0867	0.108		mg/L	1	09/21/23 10:14 AM
Surr: Isopropylbenzene	37.6	0	25-124		%REC	1	09/21/23 10:14 AM
Surr: Octacosane	90.8	0	51-124		%REC	1	09/21/23 10:14 AM
<b>VOLATILE AROMATICS BY GC/MS</b>		<b>SW8260D</b>		Analyst: <b>JVR</b>			
Benzene	<0.00800	0.00800	0.0200		mg/L	10	09/14/23 03:37 PM
Ethylbenzene	<0.0200	0.0200	0.0600		mg/L	10	09/14/23 03:37 PM
Toluene	<0.0200	0.0200	0.0600		mg/L	10	09/14/23 03:37 PM
Total Xylenes	<0.0200	0.0200	0.0600		mg/L	10	09/14/23 03:37 PM
Surr: 1,2-Dichloroethane-d4	111	0	72-119		%REC	10	09/14/23 03:37 PM
Surr: 4-Bromofluorobenzene	99.3	0	76-119		%REC	10	09/14/23 03:37 PM
Surr: Dibromofluoromethane	110	0	85-115		%REC	10	09/14/23 03:37 PM
Surr: Toluene-d8	105	0	81-120		%REC	10	09/14/23 03:37 PM
<b>TPH PURGEABLE BY GC - WATER</b>		<b>M8015V</b>		Analyst: <b>BTJ</b>			
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	09/15/23 02:19 PM
Surr: Tetrachlorethene	77.2	0	74-138		%REC	1	09/15/23 02:19 PM
<b>ANIONS BY IC METHOD - WATER</b>		<b>E300</b>		Analyst: <b>RA</b>			
Chloride	17800	300	1000		mg/L	1000	09/15/23 07:08 PM

<b>Qualifiers:</b>	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

**DHL Analytical, Inc.**

Date: 21-Sep-23

**CLIENT:** Larson & Associates  
**Project:** Cottonwood  
**Project No:** 22-0135-01  
**Lab Order:** 2309092

**Client Sample ID:** Dup-1  
**Lab ID:** 2309092-04  
**Collection Date:** 09/12/23  
**Matrix:** AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>TPH EXTRACTABLE BY GC - WATER</b>		<b>M8015D</b>		Analyst: <b>BTJ</b>			
TPH-DRO C10-C28	<0.0780	0.0780	0.0975		mg/L	1	09/21/23 10:23 AM
TPH-ORO >C28-C35	<0.0780	0.0780	0.0975		mg/L	1	09/21/23 10:23 AM
Surr: Isopropylbenzene	43.5	0	25-124		%REC	1	09/21/23 10:23 AM
Surr: Octacosane	84.9	0	51-124		%REC	1	09/21/23 10:23 AM
<b>VOLATILE AROMATICS BY GC/MS</b>		<b>SW8260D</b>		Analyst: <b>JVR</b>			
Benzene	<0.000800	0.000800	0.00200		mg/L	1	09/14/23 05:58 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:58 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:58 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	09/14/23 05:58 PM
Surr: 1,2-Dichloroethane-d4	110	0	72-119		%REC	1	09/14/23 05:58 PM
Surr: 4-Bromofluorobenzene	100	0	76-119		%REC	1	09/14/23 05:58 PM
Surr: Dibromofluoromethane	110	0	85-115		%REC	1	09/14/23 05:58 PM
Surr: Toluene-d8	105	0	81-120		%REC	1	09/14/23 05:58 PM
<b>TPH PURGEABLE BY GC - WATER</b>		<b>M8015V</b>		Analyst: <b>BTJ</b>			
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	09/15/23 02:41 PM
Surr: Tetrachlorethene	87.0	0	74-138		%REC	1	09/15/23 02:41 PM
<b>ANIONS BY IC METHOD - WATER</b>		<b>E300</b>		Analyst: <b>RA</b>			
Chloride	184	3.00	10.0		mg/L	10	09/16/23 04:26 AM

<b>Qualifiers:</b>	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified



DHL Analytical, Inc.

Date: 21-Sep-23

**CLIENT:** Larson & Associates  
**Work Order:** 2309092  
**Project:** Cottonwood

**ANALYTICAL QC SUMMARY REPORT****RunID: GC15\_230921A**

The QC data in batch 112187 applies to the following samples: 2309092-02D, 2309092-03D, 2309092-04D

Sample ID: <b>MB-112187</b>	Batch ID: <b>112187</b>	TestNo: <b>M8015D</b>	Units: <b>mg/L</b>							
SampType: <b>MBLK</b>	Run ID: <b>GC15_230921A</b>	Analysis Date: <b>9/21/2023 9:39:27 AM</b>	Prep Date: <b>9/18/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-DRO C10-C28 &lt;0.0800 0.100

TPH-ORO &gt;C28-C35 &lt;0.0800 0.100

Surr: Isopropylbenzene 0.0398 0.1000 39.8 25 124

Surr: Octacosane 0.0827 0.1000 82.7 51 124

Sample ID: <b>LCS-112187</b>	Batch ID: <b>112187</b>	TestNo: <b>M8015D</b>	Units: <b>mg/L</b>							
SampType: <b>LCS</b>	Run ID: <b>GC15_230921A</b>	Analysis Date: <b>9/21/2023 9:48:18 AM</b>	Prep Date: <b>9/18/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-DRO C10-C28 0.918 0.100 1.250 0 73.4 50 114

Surr: Isopropylbenzene 0.0426 0.1000 42.6 25 124

Surr: Octacosane 0.0823 0.1000 82.3 51 124

Sample ID: <b>LCSD-112187</b>	Batch ID: <b>112187</b>	TestNo: <b>M8015D</b>	Units: <b>mg/L</b>							
SampType: <b>LCSD</b>	Run ID: <b>GC15_230921A</b>	Analysis Date: <b>9/21/2023 9:57:10 AM</b>	Prep Date: <b>9/18/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-DRO C10-C28 0.930 0.100 1.250 0 74.4 50 114 1.30 30

Surr: Isopropylbenzene 0.0407 0.1000 40.7 25 124 0 0

Surr: Octacosane 0.0810 0.1000 81.0 51 124 0 0

**Qualifiers:** B Analyte detected in the associated Method Blank  
 J Analyte detected between MDL and RL  
 ND Not Detected at the Method Detection Limit  
 RL Reporting Limit  
 J Analyte detected between SDL and RL

DF Dilution Factor  
 MDL Method Detection Limit  
 R RPD outside accepted control limits  
 S Spike Recovery outside control limits  
 N Parameter not NELAP certified

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CLIENT: Larson &amp; Associates

Work Order: 2309092

Project: Cottonwood

## ANALYTICAL QC SUMMARY REPORT

RunID: GC15\_230921A

Sample ID: <b>ICV-230921</b>	Batch ID: <b>R129252</b>	TestNo: <b>M8015D</b>	Units: <b>mg/L</b>							
SampType: <b>ICV</b>	Run ID: <b>GC15_230921A</b>	Analysis Date: <b>9/21/2023 9:20:57 AM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	508	0.100	500.0	0	102	80	120			
TPH-ORO >C28-C35	0.313	0.100	0							
Surr: Isopropylbenzene	20.5		25.00		81.8	80	120			
Surr: Octacosane	22.5		25.00		90.2	80	120			

Sample ID: <b>CCV1-230921</b>	Batch ID: <b>R129252</b>	TestNo: <b>M8015D</b>	Units: <b>mg/L</b>							
SampType: <b>CCV</b>	Run ID: <b>GC15_230921A</b>	Analysis Date: <b>9/21/2023 10:52:16 AM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	244	0.100	250.0	0	97.6	80	120			
TPH-ORO >C28-C35	0.790	0.100	0							
Surr: Isopropylbenzene	10.5		12.50		83.7	80	120			
Surr: Octacosane	11.5		12.50		91.9	80	120			

**Qualifiers:** B Analyte detected in the associated Method Blank  
J Analyte detected between MDL and RL  
ND Not Detected at the Method Detection Limit  
RL Reporting Limit  
J Analyte detected between SDL and RL

DF Dilution Factor  
MDL Method Detection Limit  
R RPD outside accepted control limits  
S Spike Recovery outside control limits  
N Parameter not NELAP certified

Page 2 of 9

CLIENT: Larson &amp; Associates

Work Order: 2309092

Project: Cottonwood

## ANALYTICAL QC SUMMARY REPORT

RunID: GC4\_230915A

The QC data in batch 112155 applies to the following samples: 2309092-02B, 2309092-03B, 2309092-04B

Sample ID: <b>LCS-112155</b>	Batch ID: <b>112155</b>	TestNo: <b>M8015V</b>	Units: <b>mg/L</b>							
SampType: <b>LCS</b>	Run ID: <b>GC4_230915A</b>	Analysis Date: <b>9/15/2023 10:51:01 AM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	2.69	0.100	2.500	0	108	67	136			
Surr: Tetrachlorethene	0.338		0.4000		84.6	74	138			

Sample ID: <b>LCSD-112155</b>	Batch ID: <b>112155</b>	TestNo: <b>M8015V</b>	Units: <b>mg/L</b>							
SampType: <b>LCSD</b>	Run ID: <b>GC4_230915A</b>	Analysis Date: <b>9/15/2023 11:12:52 AM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	2.60	0.100	2.500	0	104	67	136	3.44	30	
Surr: Tetrachlorethene	0.346		0.4000		86.5	74	138	0	0	

Sample ID: <b>MB-112155</b>	Batch ID: <b>112155</b>	TestNo: <b>M8015V</b>	Units: <b>mg/L</b>							
SampType: <b>MBLK</b>	Run ID: <b>GC4_230915A</b>	Analysis Date: <b>9/15/2023 12:19:19 PM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	<0.0600	0.100								
Surr: Tetrachlorethene	0.333		0.4000		83.2	74	138			

Sample ID: <b>2309092-02BMS</b>	Batch ID: <b>112155</b>	TestNo: <b>M8015V</b>	Units: <b>mg/L</b>							
SampType: <b>MS</b>	Run ID: <b>GC4_230915A</b>	Analysis Date: <b>9/15/2023 3:25:21 PM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	2.52	0.100	2.500	0	101	67	136			
Surr: Tetrachlorethene	0.369		0.4000		92.2	74	138			

Sample ID: <b>2309092-02BMSD</b>	Batch ID: <b>112155</b>	TestNo: <b>M8015V</b>	Units: <b>mg/L</b>							
SampType: <b>MSD</b>	Run ID: <b>GC4_230915A</b>	Analysis Date: <b>9/15/2023 3:47:02 PM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	2.62	0.100	2.500	0	105	67	136	3.89	30	
Surr: Tetrachlorethene	0.367		0.4000		91.7	74	138	0	0	

**Qualifiers:**

B Analyte detected in the associated Method Blank

J Analyte detected between MDL and RL

ND Not Detected at the Method Detection Limit

RL Reporting Limit

J Analyte detected between SDL and RL

DF Dilution Factor

MDL Method Detection Limit

R RPD outside accepted control limits

S Spike Recovery outside control limits

N Parameter not NELAP certified

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CLIENT: Larson & Associates  
Work Order: 2309092  
Project: Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: GC4\_230915A

Sample ID: <b>ICV-230915</b>	Batch ID: <b>R129174</b>	TestNo: <b>M8015V</b>	Units: <b>mg/L</b>							
SampType: <b>ICV</b>	Run ID: <b>GC4_230915A</b>	Analysis Date: <b>9/15/2023 10:29:08 AM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	4.88	0.100	5.000	0	97.7	80	120			
Surr: Tetrachlorethene	0.371		0.4000		92.7	74	138			

Sample ID: <b>CCV1-230915</b>	Batch ID: <b>R129174</b>	TestNo: <b>M8015V</b>	Units: <b>mg/L</b>							
SampType: <b>CCV</b>	Run ID: <b>GC4_230915A</b>	Analysis Date: <b>9/15/2023 4:08:47 PM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	2.65	0.100	2.500	0	106	80	120			
Surr: Tetrachlorethene	0.439		0.4000		110	74	138			

Qualifiers: B Analyte detected in the associated Method Blank  
J Analyte detected between MDL and RL  
ND Not Detected at the Method Detection Limit  
RL Reporting Limit  
J Analyte detected between SDL and RL  
DF Dilution Factor  
MDL Method Detection Limit  
R RPD outside accepted control limits  
S Spike Recovery outside control limits  
N Parameter not NELAP certified

CLIENT: Larson &amp; Associates

Work Order: 2309092

Project: Cottonwood

## ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3\_230914A

The QC data in batch 112147 applies to the following samples: 2309092-01A, 2309092-02A, 2309092-03A, 2309092-04A

Sample ID: <b>LCS-112147</b>	Batch ID: <b>112147</b>	TestNo: <b>SW8260D</b>	Units: <b>mg/L</b>							
SampType: <b>LCS</b>	Run ID: <b>GCMS3_230914A</b>	Analysis Date: <b>9/14/2023 2:25:00 PM</b>	Prep Date: <b>9/14/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Benzene	0.0271	0.00200	0.0232	0	117	81	122			
Ethylbenzene	0.0239	0.00600	0.0232	0	103	73	127			
Toluene	0.0259	0.00600	0.0232	0	112	77	122			
Total Xylenes	0.0731	0.00600	0.0696	0	105	80	121			
Surr: 1,2-Dichloroethane-d4	219		200.0		109	72	119			
Surr: 4-Bromofluorobenzene	200		200.0		99.8	76	119			
Surr: Dibromofluoromethane	218		200.0		109	85	115			
Surr: Toluene-d8	206		200.0		103	81	120			

Sample ID: <b>MB-112147</b>	Batch ID: <b>112147</b>	TestNo: <b>SW8260D</b>	Units: <b>mg/L</b>							
SampType: <b>MBLK</b>	Run ID: <b>GCMS3_230914A</b>	Analysis Date: <b>9/14/2023 2:49:00 PM</b>	Prep Date: <b>9/14/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Benzene	<0.000800	0.00200								
Ethylbenzene	<0.00200	0.00600								
Toluene	<0.00200	0.00600								
Total Xylenes	<0.00200	0.00600								
Surr: 1,2-Dichloroethane-d4	217		200.0		109	72	119			
Surr: 4-Bromofluorobenzene	200		200.0		100	76	119			
Surr: Dibromofluoromethane	217		200.0		109	85	115			
Surr: Toluene-d8	205		200.0		103	81	120			

Sample ID: <b>2309091-01AMS</b>	Batch ID: <b>112147</b>	TestNo: <b>SW8260D</b>	Units: <b>mg/L</b>							
SampType: <b>MS</b>	Run ID: <b>GCMS3_230914A</b>	Analysis Date: <b>9/14/2023 6:23:00 PM</b>	Prep Date: <b>9/14/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Benzene	4.57	0.200	2.32	1.95	113	81	122			
Ethylbenzene	3.06	0.600	2.32	0.733	100	73	127			
Toluene	6.42	0.600	2.32	3.88	110	77	122			
Total Xylenes	9.65	0.600	6.96	2.47	103	80	121			
Surr: 1,2-Dichloroethane-d4	21700		20000		109	72	119			
Surr: 4-Bromofluorobenzene	20000		20000		99.8	76	119			
Surr: Dibromofluoromethane	21800		20000		109	85	115			
Surr: Toluene-d8	21100		20000		106	81	120			

Sample ID: <b>2309091-01AMSD</b>	Batch ID: <b>112147</b>	TestNo: <b>SW8260D</b>	Units: <b>mg/L</b>							
SampType: <b>MSD</b>	Run ID: <b>GCMS3_230914A</b>	Analysis Date: <b>9/14/2023 6:47:00 PM</b>	Prep Date: <b>9/14/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Benzene	4.54	0.200	2.32	1.95	112	81	122	0.669	20	
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**Qualifiers:**

B Analyte detected in the associated Method Blank

J Analyte detected between MDL and RL

ND Not Detected at the Method Detection Limit

RL Reporting Limit

J Analyte detected between SDL and RL

DF Dilution Factor

MDL Method Detection Limit

R RPD outside accepted control limits

S Spike Recovery outside control limits

N Parameter not NELAP certified

CLIENT: Larson &amp; Associates

Work Order: 2309092

Project: Cottonwood

## ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3\_230914A

Sample ID: <b>2309091-01AMSD</b>	Batch ID: <b>112147</b>	TestNo: <b>SW8260D</b>	Units: <b>mg/L</b>							
SampType: <b>MSD</b>	Run ID: <b>GCMS3_230914A</b>	Analysis Date: <b>9/14/2023 6:47:00 PM</b>	Prep Date: <b>9/14/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Ethylbenzene	3.09	0.600	2.32	0.733	102	73	127	1.08	20	
Toluene	6.36	0.600	2.32	3.88	107	77	122	1.02	20	
Total Xylenes	9.63	0.600	6.96	2.47	103	80	121	0.201	20	
Surr: 1,2-Dichloroethane-d4	21700		20000		108	72	119	0	0	
Surr: 4-Bromofluorobenzene	19800		20000		99.2	76	119	0	0	
Surr: Dibromofluoromethane	21500		20000		108	85	115	0	0	
Surr: Toluene-d8	21000		20000		105	81	120	0	0	

**Qualifiers:** B Analyte detected in the associated Method Blank  
J Analyte detected between MDL and RL  
ND Not Detected at the Method Detection Limit  
RL Reporting Limit  
J Analyte detected between SDL and RL

DF Dilution Factor  
MDL Method Detection Limit  
R RPD outside accepted control limits  
S Spike Recovery outside control limits  
N Parameter not NELAP certified

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CLIENT: Larson &amp; Associates

Work Order: 2309092

Project: Cottonwood

## ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3\_230914A

Sample ID: <b>ICV-230914</b>	Batch ID: <b>R129128</b>	TestNo: <b>SW8260D</b>	Units: <b>mg/L</b>							
SampType: <b>ICV</b>	Run ID: <b>GCMS3_230914A</b>	Analysis Date: <b>9/14/2023 2:02:00 PM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0533	0.00200	0.0464	0	115	70	130			
Ethylbenzene	0.0491	0.00600	0.0464	0	106	70	130			
Toluene	0.0519	0.00600	0.0464	0	112	70	130			
Total Xylenes	0.151	0.00600	0.139	0	109	70	130			
Surr: 1,2-Dichloroethane-d4	220		200.0		110	72	119			
Surr: 4-Bromofluorobenzene	204		200.0		102	76	119			
Surr: Dibromofluoromethane	217		200.0		108	85	115			
Surr: Toluene-d8	205		200.0		103	81	120			

**Qualifiers:** B Analyte detected in the associated Method Blank  
J Analyte detected between MDL and RL  
ND Not Detected at the Method Detection Limit  
RL Reporting Limit  
J Analyte detected between SDL and RL

DF Dilution Factor  
MDL Method Detection Limit  
R RPD outside accepted control limits  
S Spike Recovery outside control limits  
N Parameter not NELAP certified

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**CLIENT:** Larson & Associates  
**Work Order:** 2309092  
**Project:** Cottonwood

## ANALYTICAL QC SUMMARY REPORT

**RunID:** IC2\_230915A

The QC data in batch 112160 applies to the following samples: 2309092-01B, 2309092-02C, 2309092-03C, 2309092-04C

Sample ID: <b>MB-112160</b>	Batch ID: <b>112160</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>MBLK</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/15/2023 2:08:26 PM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	<0.300	1.00								
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Sample ID: <b>LCS-112160</b>	Batch ID: <b>112160</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>LCS</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/15/2023 2:26:28 PM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	9.57	1.00	10.00	0	95.7	90	110			
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Sample ID: <b>LCSD-112160</b>	Batch ID: <b>112160</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>LCSD</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/15/2023 2:44:26 PM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	9.54	1.00	10.00	0	95.4	90	110	0.387	20	
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Sample ID: <b>2309115-02CMS</b>	Batch ID: <b>112160</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>MS</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/15/2023 8:38:28 PM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	50.0	100	2000	0	2.50	90	110			S
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Sample ID: <b>2309115-02CMSD</b>	Batch ID: <b>112160</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>MSD</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/15/2023 8:56:28 PM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	49.5	100	2000	0	2.48	90	110	1.03	20	S
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Sample ID: <b>2309092-01BMS</b>	Batch ID: <b>112160</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>MS</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/16/2023 3:32:28 AM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	120	10.0	200.0	133.9	-6.80	90	110			S
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Sample ID: <b>2309092-01BMSD</b>	Batch ID: <b>112160</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>MSD</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/16/2023 3:50:28 AM</b>	Prep Date: <b>9/15/2023</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	121	10.0	200.0	133.9	-6.52	90	110	0.466	20	S
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**Qualifiers:**

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified



**CLIENT:** Larson & Associates  
**Work Order:** 2309092  
**Project:** Cottonwood

## ANALYTICAL QC SUMMARY REPORT

**RunID:** IC2\_230915A

Sample ID: <b>ICV-230915</b>	Batch ID: <b>R129179</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>ICV</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/15/2023 1:32:26 PM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.2	1.00	25.00	0	97.0	90	110			

Sample ID: <b>CCV1-230915</b>	Batch ID: <b>R129179</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>CCV</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/15/2023 9:50:28 PM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.57	1.00	10.00	0	95.7	90	110			

Sample ID: <b>CCV2-230915</b>		Batch ID: <b>R129179</b>		TestNo: <b>E300</b>		Units: <b>mg/L</b>				
SampType: <b>CCV</b>		Run ID: <b>IC2_230915A</b>		Analysis Date: <b>9/16/2023 2:02:28 AM</b>		Prep Date:				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.55	1.00	10.00	0	95.5	90	110			

Sample ID: <b>CCV3-230915</b>	Batch ID: <b>R129179</b>	TestNo: <b>E300</b>	Units: <b>mg/L</b>							
SampType: <b>CCV</b>	Run ID: <b>IC2_230915A</b>	Analysis Date: <b>9/16/2023 6:50:28 AM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.50	1.00	10.00	0	95.0	90	110			

**Qualifiers:** B Analyte detected in the associated Method Blank  
 J Analyte detected between MDL and RL  
 ND Not Detected at the Method Detection Limit  
 RL Reporting Limit  
 J Analyte detected between SDL and RL

DF Dilution Factor  
 MDL Method Detection Limit  
 R RPD outside accepted control limits  
 S Spike Recovery outside control limits  
 N Parameter not NELAP certified

**District I**  
1625 N. French Dr., Hobbs, NM 88240  
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**District II**  
811 S. First St., Artesia, NM 88210  
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**District III**  
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**District IV**  
1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico  
Energy, Minerals and Natural Resources  
Oil Conservation Division  
1220 S. St Francis Dr.  
Santa Fe, NM 87505

CONDITIONS

Action 272039

CONDITIONS

Operator: DKL Energy - Cottonwood, LLC 7102 Commerce Way Brentwood, TN 37027	OGRID: 330291
	Action Number: 272039
	Action Type: [C-147] Water Recycle Long (C-147L)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	None	10/4/2023