August, 2021

2021 Monitoring Report
ASAU 150 Site
Unit O of Section 14, T 18S, R26E
Eddy County, New Mexico

Prepared For:
Redwood Operating
Artesia, New Mexico

Review of the 2021 Monitoring Report for the ASAU 150 Site is accepted for the record.
Please provide the 2022, 2023 reports if they have not already been submitted to OCD in the online portal. Submit the 2024 Report by April 1 of 2025.

Prepared by
R.T. Hicks Consultants, Ltd.
Albuquerque, New Mexico

AUGUST 2021GROUNDWATER MONITORING REPORT

The ASAU 150 site is located in Section O of Section 14, T18S, R 26E in Eddy County. Five monitoring wells and one recovery/monitoring well are present at the pipeline release site. Table 1 presents the dates, depth to water, and analytical results from all groundwater samples obtained at the site. Quarterly sampling of MW-1 began in March 2017. Table 2 presents the results of remediation pumping/disposal.

GROUNDWATER MONITORING PROTOCOLS AND RESULTS

Beginning in November 2018 we ceased sampling by bailing and obtained all samples by low-flow sampling using an electric pump. During sampling, the pump intake is set 2 feet below the measured water table to ensure that the intake remains submerged and the pump motor cooled. We collected samples after stabilization of temperature and conductance of the withdrawn water, or 3 casing volumes were removed. Publications describing low flow sampling suggest that the pump collects water from the groundwater zone at the pump intake. Thus, consistency of the height of the pump intake between sampling events can be important.

The laboratory analyzed for TDS, chloride, sulfate, and BTEXN (benzene, toluene, ethylbenzene, total xylene, and naphthalene).

SITE CONDITIONS

Extent of Floating Hydrocarbons

MW-1 was drilled within 3-feet of the pipeline release where hydrocarbon liquids migrated to groundwater. As shown on Table 1, MW-1 initially exhibited 6 inches of floating hydrocarbons (3/8/2017) and floating hydrocarbons were detected in this well until the November 2018 monitoring event. MW-2 is 50 feet southeast (downgradient) from MW-1. As indicated in Table 1, we observed measurable oil (light non aqueous phase liquid, aka LNAPL) only once in MW-2, on 5/14/18. Observed floating hydrocarbon has only been observed in MW-1 and MW-2. We contend that the rare presence of LNAPL in MW-2 permits a conclusion that floating hydrocarbons on groundwater have not extended a significant distance down gradient from MW-2.

Groundwater Elevation and Flow Direction

Figure 1 shows groundwater elevation in all wells from 2017-2020. Groundwater elevations vary from 3 to 5-feet over the course of the year and all of the wells vary in unison. Prior to fall 2020, the majority of these measurements were taken during the quarterly sampling events. As such, the timings of the maximum and minimum elevations on Figure 1 are partly an artifact of the sampling dates. The minimum water table elevation is attained at the end of the irrigation season. After irrigation ceases, water levels begin their recovery. Obviously, the difference between the maximum and

minimum elevation is dependent on farming decisions and recharge to the aquifer during the year.

Figure 1 Groundwater elevation in all wells

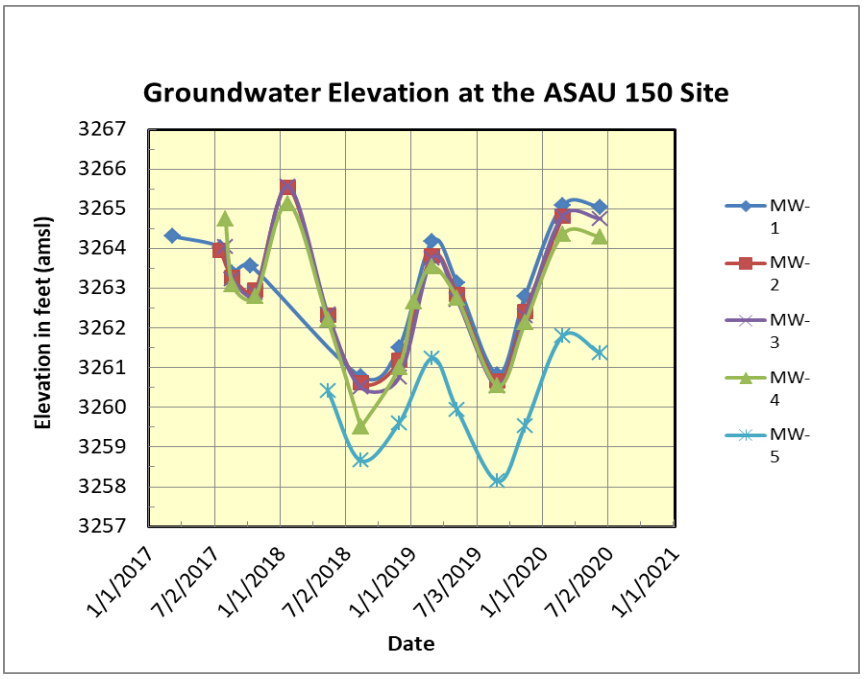


Figure 2 present groundwater elevation results for MW-4 from 2017 through August 2021 and Figure 3 shows depth to water measurements from January-June 2021. Based upon the measurements taken in the spring of 2021, the sampling date was chosen. It is shown as a red triangle in Figure 3.

Figure 2: Depth to water in MW-4

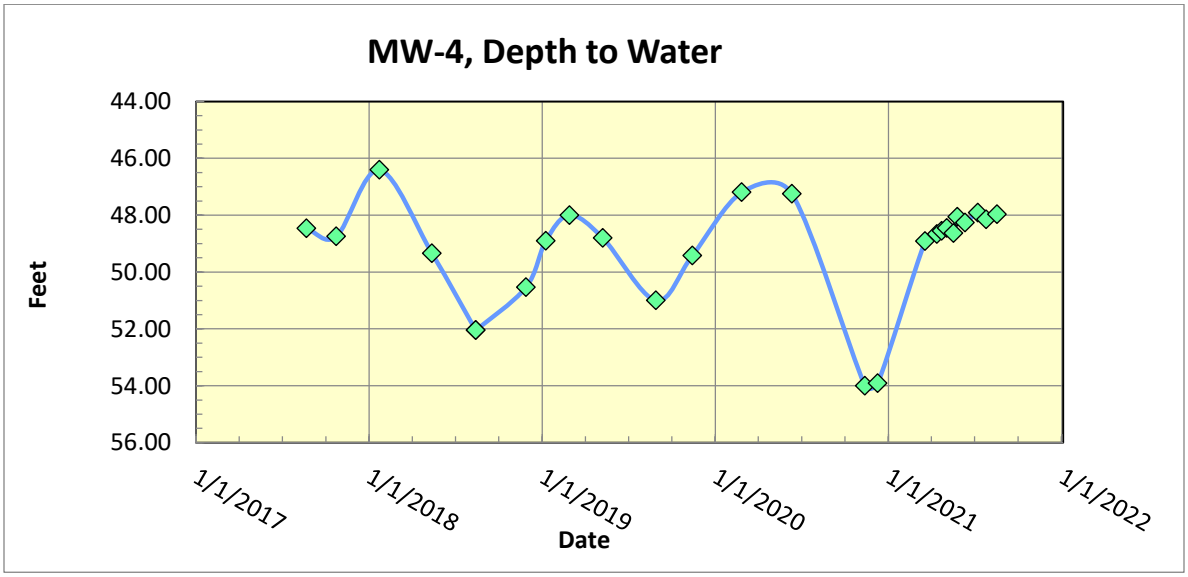
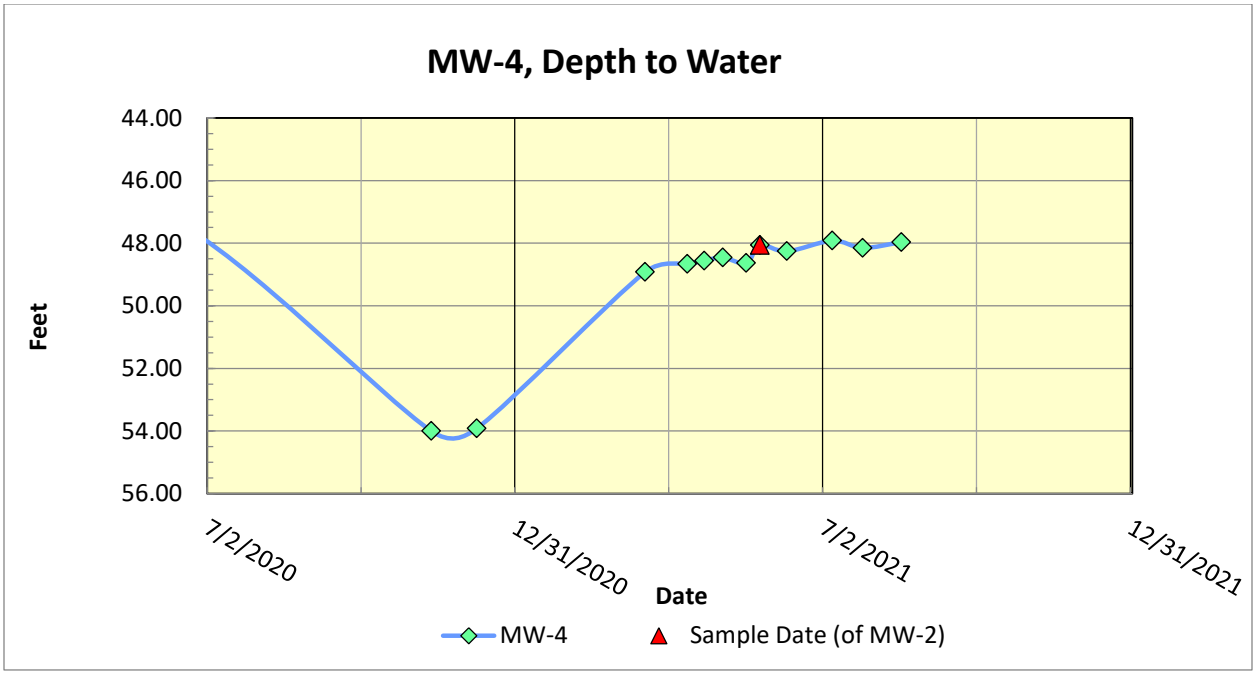


Figure 3 Depth to water in MW-4 from July 2020 to August 2021.



As presented in previous reports, regional groundwater flow direction is to the east and southeast (towards the Pecos River) when irrigation pumping is less active. During periods of high groundwater withdrawal, flow direction is more southerly towards the pumping wells south of the ASAU 150 site.

Reduction of Wells to be Sampled

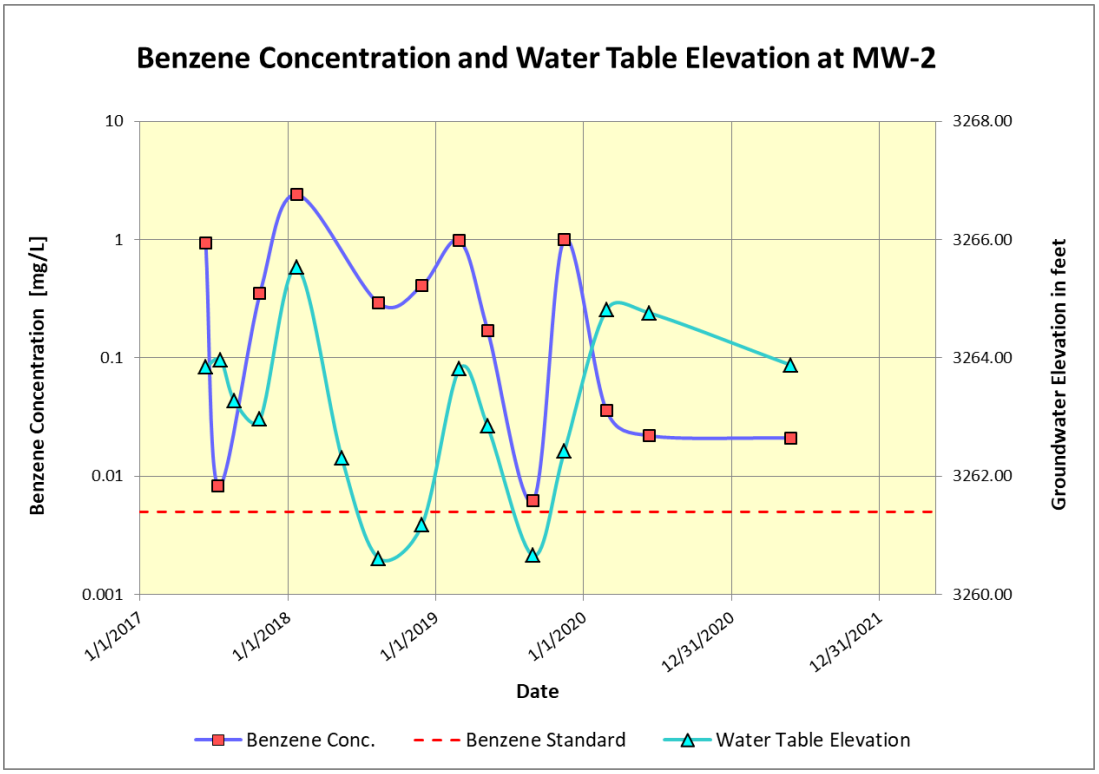
There are 5 monitoring wells at the site. As explained in the Corrective Action Report, concentrations are declining in all wells in which benzene has been detected. For the following reasons only MW-2 is currently being sampled.

- Highest concentrations of benzene have been observed in MW-1. Because MW-1 is directly up gradient of MW-2, conditions at MW-1 are indirectly monitored at MW-2
- At MW-3 and at MW-4, the previous nine monitoring samples have not exceeded the WQCC benzene standard.
- Of the 10 quarterly samples taken at MW-5, only one sample detected benzene. The concentration was below WQCC standards.
- We sampled RMW-1 seven times during pumping from 11/27/2019 to 5/15/2020 and on July 8, two months after pumping ceased. Benzene exceeded standards four times with the highest value of 0.039 mg/L. This well is not part of the compliance monitoring program.

Benzene Concentrations Correlate with Water Table Elevation

Figure 4 shows that benzene concentration and groundwater elevation for MW-2 have a strong correlation: concentrations are highest at times in which groundwater elevation is highest. MW-2 is 50 feet southeast (downgradient) from MW-1.

Figure 4



Within the Corrective Action Plan, we explain in detail the mechanism resulting in this effect. At high water levels, groundwater is exposed to a greater thickness of soil material containing produced water and crude. At lowest groundwater levels, groundwater is in contact with a lesser thickness of material saturated in produced water and crude.

As can be seen in Figure 4, benzene concentrations are 1 to 2 orders of magnitude lower at lowest groundwater elevations than at highest groundwater elevations.

Sampling Time Selection

The most appropriate method of predicting compliance with WQCC Standard is to collect samples only when the water table is highest, as we are currently implementing.

Because groundwater elevations at the site vary in unison and because MW-4 is the easiest well to access, during late 2020 and the first half of 2021, we obtained measurements frequently in order to establish the time of the maximum ground water elevation. Figures 2 and 3 present all of the depth to water measurements at MW-4.

Benzene Concentration in MW-2

Figure 5 and 6 present benzene concentration as a function of time in MW-2. Figure 5 presents the data using linear axes. The decaying exponential trendline for all samples has an R^2 correlation value of 0.1629. The same type of trendline is also shown applied to only the samples taken at times of highest groundwater elevation. These points are shown in red on the two figures. This line has an R^2 correlation value of 0.8578. Hence, using only the data from the highest groundwater elevations (and highest benzene concentrations) "fits" a decaying exponential model better than does applying that model to all of the data. This is not surprising in that at lower groundwater elevations, lesser amounts of the affected soil horizon are exposed to groundwater. Furthermore, the low flow sampling results are more comparable at times of high groundwater elevation when the pump inlet elevation is more consistent.

Figure 5 – Benzene concentrations shown with a linear axis.

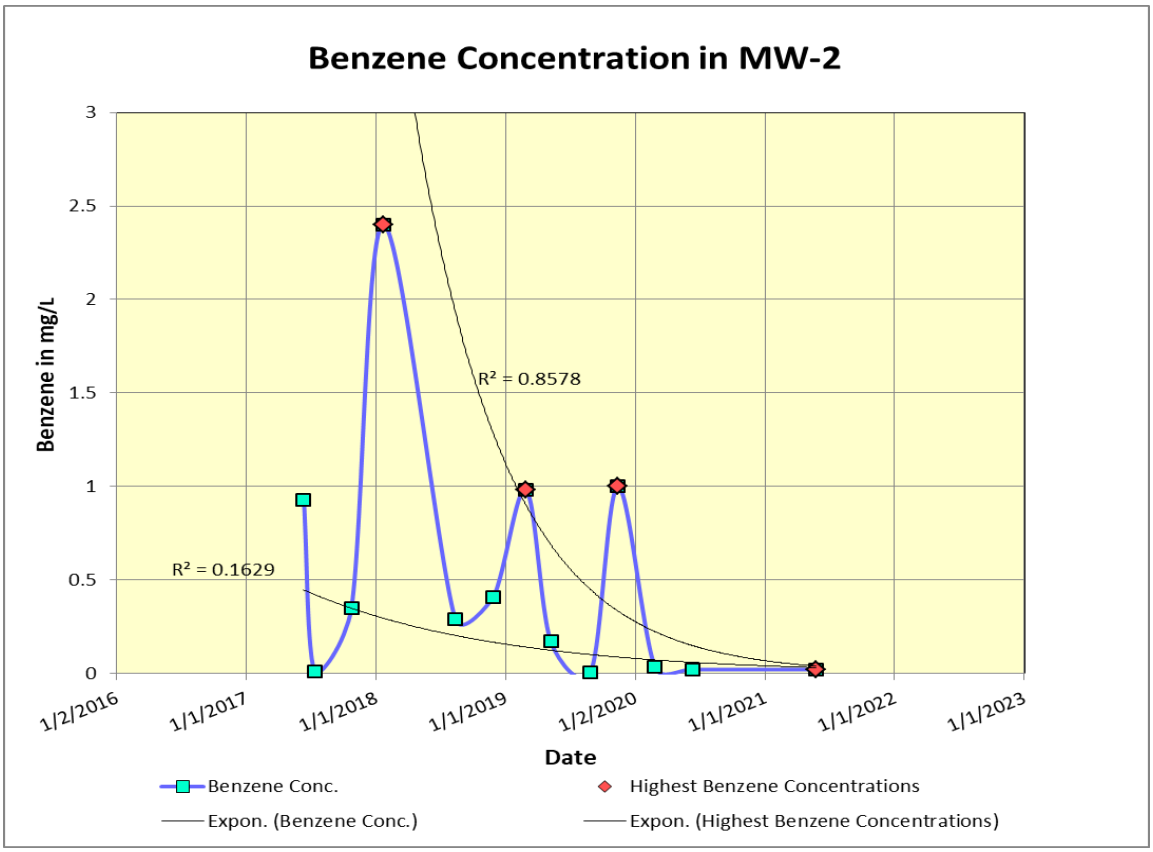


Figure 6: Benzene concentrations shown on a logarithmic axis.

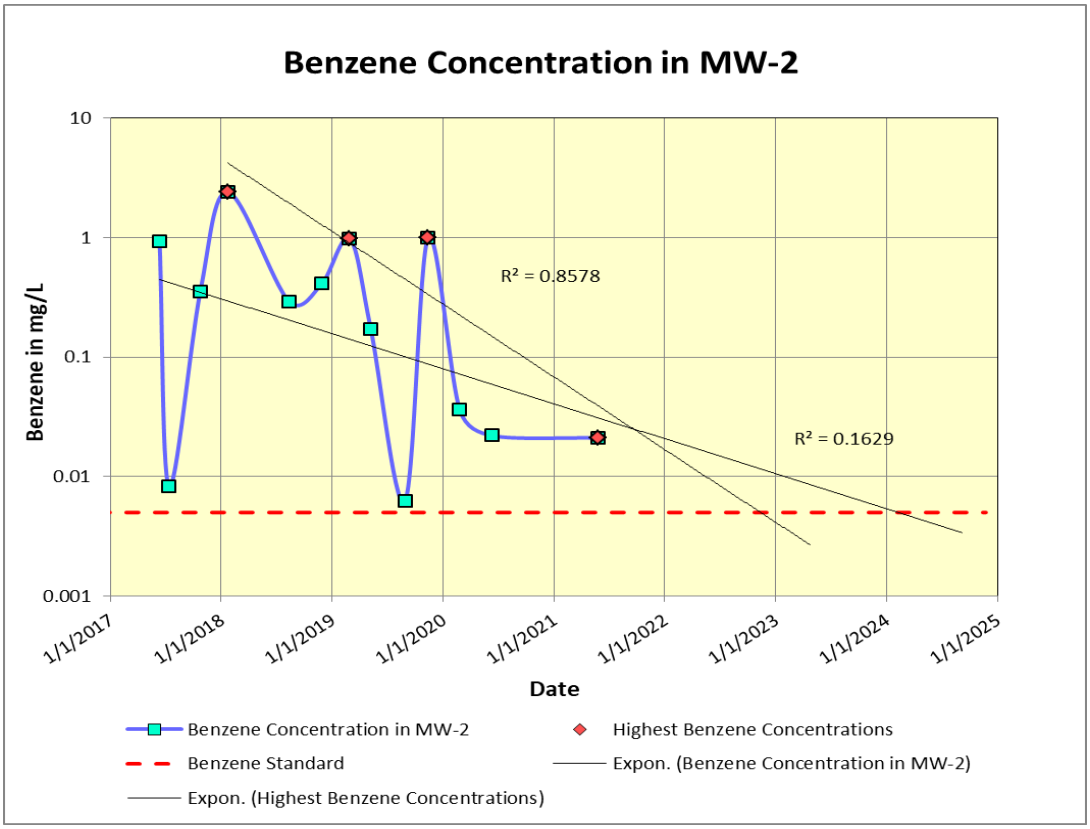


Figure 6 shows the same data using a logarithmic y-axis so that the viewer can see the relative differences between samples with low concentrations and can also see the benzene standard concentration. Because of the use of the logarithmic y-axis, the exponential trendlines plot as straight lines. The trendline fitted through all of the data (R^2 = 0.1629) predicts compliance with standards in early 2025. The trendline fitted through the highest concentrations (R^2 = 0.8578 with samples obtained at highest groundwater elevations) predicts compliance will be first attained in in late 2023. The point to note is that compliance with the benzene groundwater standard may occur in MW-2 within the next one to three years.

MONITORED NATURAL ATTENUATION REMEDY

As explained in the Corrective Action Report, we tested a pump and dispose remedy and found that the waste of fresh water did not justify the very small mass of benzene removed. Pumping floating hydrocarbons was not feasible because floating hydrocarbons have not been present in sufficient thickness for several years. Monitored natural attenuation is the remedy that provides the highest environmental benefit.

The monitoring schedule is planned so that MW-2 will be sampled at the time of highest groundwater elevation. Measurements will be taken at MW-4 due to its ease of access.

- Depth to water will be obtained monthly.

- Beginning in mid-March, this measurement will be taken every two-weeks to provide a finer definition of highest groundwater elevation.
- When a highest groundwater elevation is identified, MW-2 will be sampled.
- Monthly depth to water measurements at MW-4 will continue.

When data predict that benzene concentration in MW-2 will be below the groundwater standard, we will collect samples from MW-1, MW-2, and MW-4 at that next sampling time.

Should the laboratory results from the sampling of MW-1, MW-2, and MW-4 all meet groundwater standards; we will sample all wells at the site at the next annual sampling event. Should the laboratory concentration data meet groundwater standards at all wells, we will petition to close the regulatory file for the site.

Tables

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Lime Rock - ASAU #150 Release

Monitoring Well Analyses

Well ID	DTW ft (from TOC)	Sample Date	LNAPL in.	Benzene 0.01	Toluene 0.75	Ethylbenzene 0.75	Total Xylene 0.62	Naphthalene 0.03	Total BTEX	Chloride 250	Sulfate 600	TDS 1000	Sampling method	Lab	Notes
MW-1	51.62	3/8/2017	6.00	19.2	8.5	2.31	5.17	---	35.2	188	1460	2800	bail	Cardinal	by oil/water interface meter
	51.62	3/8/2017	6.24	---	---	---	---	---	---	---	---	---	---	---	baildown test
	51.90	7/19/2017	---	---	---	---	---	---	---	---	---	---	---	---	from nested measuring tube
	52.55	8/22/2017	---	---	---	---	---	---	---	---	---	---	---	---	"
	52.36	10/11/2017	1.50	---	---	---	---	---	---	---	---	---	bail		sampled LNAPL
	55.15	8/14/2018	0.60	12	0.022	0.410	0.290	.089					bail	Hall	by oil/water interface meter
	54.42	11/28/2018	0.00	1.2	0.024	0.023	0.023	.020		120	1900	3350	low-flow pump	Hall	Q4 2018
	51.75	2/28/2019	0.00	14	1.1	1.2	1.7	.093		190	240	1520	low-flow pump	Hall	Q1 2019, lt. skim on probe
	52.80	5/9/2019	0.00	9	0.042	1.5	0.58	.096		190	440	1780	low-flow pump	Hall	Q2 2019
	55.10	8/29/2019	heavy skim	0.24	0.04	0.130	0.042	.013		200	1800	3350	low-flow pump	Hall	Q3 2019, pump set at 57 feet, heavy skim on probe, lt film on water, grey hue to water, oder
	53.13	11/14/2019	light sheen	8.1	1.3	1.2	1.3	.074		150	490	1570	low-flow pump	Hall	Q4 2019, pump set at 55 feet, strong oder, lt sheen on water, cloudy and grey hue to water
	50.85	2/26/2020	0.00	7.0	0.7	1.3	1.6	0.077		200	700	2000	low-flow pump	Hall	Q1 2020: faint HC odor; gray silt on probe
	50.88	6/11/2020	0.00	4.6	0.7	1.2	0.69	ND		270	950	2370	low-flow pump	Hall	Q2 2020: clear with gray hue

Table 1

MW-2	51.11	6/12/2017	none	0.93	0.0047	0.011	0.034	---	0.0497	200	2100	381	bail	Hall	
	grab samples for comparison	7/13/2017	none	ND	ND	ND	ND	---	ND	---	---	---	low-flow pump	Hall	sampled at 54'
		7/13/2017	none	0.0082	ND	ND	ND	---	0.0082	---	---	---	low-flow pump	Hall	sampled at 59'
	51.0	7/19/2017	none	---	---	---	---	---	---	---	---	---	---	---	DTW only
	51.69	8/22/2017	none	---	---	---	---	---	---	---	---	---	---	---	DTW only
	52.00	10/24/2017	lt. film	0.35	0.0078	0.063	0.079	0.013	---	180	2200	---	low-flow pump	Hall	Q4 2017
	49.43	1/23/2018	film	2.4	ND	0.17	0.027	0.048	---	180	1400	3040	hand bail	Hall	Q1 2018
	52.65	5/14/2018	0.72	*No Sample; measurable LNAPL*											Q2 2018
	54.35	8/13/2018	none	0.290	ND	0.018	ND	ND					low-flow pump	Hall	Q3 2018
	53.78	11/28/2018	film	.410	ND	0.037	ND	.025		190	1900	3430	low-flow pump	Hall	Q4 2018
	51.15	2/28/2019	lt. film	.98	.028	0.100	.045	.029		180	1700	3350	low-flow pump	Hall	Q1 2019, very lt. skim on probe
	52.12	5/9/2019	lt. film	.170	ND	0.098	ND	.03		200	2100	3680	low-flow pump	Hall	Q2 2019, lt. skim on probe
	54.3	8/29/2019		.0062	ND	0.018	ND	.017		220	1800	3270	low-flow pump	Hall	Q3 2019, pump set at 56 feet, light grey hue to water, oder
	52.54	11/14/2019		1.0	.047	0.120	.055	.0043		160	1100	4400	low-flow pump	Hall	Q4 2019, pump set at 55 feet, probe covered in black gunk,light oder, grey, clear water
	50.15	2/26/2020	0.00	0.036	ND	0.240	ND	ND		210	1700	3100	low-flow pump	Hall	Q1 2020: Pump @52.5': Faint odor in well; gray sample
	50.20	6/11/2020	0.00	0.022	ND	0.041	0.0063	ND		260	2100	3660	low-flow pump	Hall	Q2 2020: Black sludge on probe; hydrocarbon odor; cloudy & gray
	51.08	5/26/2021		0.021											Annual Sampling

Table 1

MW-3	46.40	8/2/2017	none	0.061	ND	ND	ND	---	0.061	212	2010	3920	low-flow pump	Cardinal	
	47.22	8/22/2017	none	---	---	---	---	---	---	---	---	---	---	---	DTW only
	47.57	10/24/2017	none	0.02	ND	ND	ND	ND	---	190	2100	---	low-flow pump	Hall	Q4 2017
	44.88	1/23/2018	none	0.066	ND	ND	ND	ND	---	190	1900	3610	hand bail	Hall	Q1; silty
	48.10	5/14/2018	none	0.0017	ND	ND	ND	ND		180	1900	3570	hand bail	Hall	Q2 2018; slow recovery during bailing
	49.94	8/13/2018	none	ND	ND	ND	ND	ND		190	2000	3900	low-flow pump	Hall	Q3 2018
	49.70	11/28/2018	none	ND	ND	ND	ND	ND		190	2100	3750	low-flow pump	Hall	Q4 2018
	46.70	2/28/2019	none	ND	ND	ND	ND	ND		290	2300	4040	low-flow pump	Hall	Q1 2019
	47.75	5/9/2019	none	.0017	ND	ND	ND	ND		240	2400	4050	low-flow pump	Hall	Q2 2019, light film on pump
	49.92	8/29/2019	none	ND	ND	ND	ND	ND		200	2000	3670	low-flow pump	Hall	Q3 2019, pump set at 52 feet
	48.16	11/14/2019	none	ND	ND	ND	ND	ND		190	1500	3170	low-flow pump	Hall	Q4 2019, pump set at 50 feet
	45.64	2/26/2020	none	0.0028	0.0013	0.0015	ND	ND		330	2100	3820	low-flow pump	Hall	Q1 2020: Pump @48'clear
	45.70	6/11/2020	none	ND	ND	0.0019	ND	ND		290	2100	4020	low-flow pump	Hall	Q2 2020

Table 1

MW-4	46.80	8/2/2017	none	1.53	<0.020	0.101	<0.060	---	1.64	200	1840	3460	bail	Cardinal	Q3 2017
	48.47	8/22/2017	none	---	---	---	---	---	---	---	---	---	---	---	DTW only
	48.75	10/24/2017	none	0.13	ND	0.016	ND	0.0092	---	180	2000	---	low-flow pump	Hall	Q4 2017
	46.41	1/23/2018	none	0.95	ND	0.09	ND	0.022	---	190	1100	2560	hand bail	Hall	Q1; silty
	49.35	5/14/2018	none	1.7	ND	0.096	ND	0.033		190	1400	3060	hand bail	Hall	Q2 2018
	52.05	8/14/2018	none	1.2	ND	0.260	ND	.034					low-flow pump	Hall	Q3 2018, Pump set at 52.5 feet
	52.05	8/14/2018	none	0.710	ND	0.110	ND	.016					low-flow pump	Hall	Q3 2018, Pump set at 54.5 feet
	50.54	11/28/2018	none	ND	ND	ND	ND	ND		190	2000	3440	low-flow pump	Hall	Q4 2018 51.54 DTW more likely
	48.9	1/9/2019	none	---	---	---	---	---	---	---	---	---	---	---	DTW only
	48.0	2/28/2019	none	.018	ND	ND	ND	ND		190	2100	2100	low-flow pump	Hall	Q1 2019
	48.8	5/9/2019	none	.0045	ND	0.0035	ND	ND		190	2000	3540	low-flow pump	Hall	Q2 2019
	51.0	8/29/2019	none	.0034	ND	0.0093	ND	ND		190	1800	3360	low-flow pump	Hall	Q3 2019, pump set at 53 feet
	49.42	11/14/2019	none	.0013	ND	ND	ND	ND		180	1800	3590	low-flow pump	Hall	Q4 2019, pump set at 52 feet
	47.20	2/26/2020	none	0.099	0.0014	0.039	ND	0.0038		190	490	1500	low-flow pump	Hall	Q1 2020: Pump @ 50 feet; light film on probe
	47.25	6/11/2020	none	0.0015	ND	0.19	ND	0.0059		260	1600	3120	low-flow pump	Hall	Q2 2020

Table 1

Lime Rock - ASAU #150 Release

Monitoring Well Analyses

MW-5	51.72	5/14/2018	none	ND	ND	ND	ND	ND	ND	---	---	---	hand bail	Hall	NO PURGE; characterization only
	51.72	5/14/2018	none	ND	ND	ND	ND	ND	ND	180	1900	3710	hand bail	Hall	Q2 2018
	53.48	8/13/2018	none	ND	ND	ND	ND	ND	ND	200	2200	4200	low-flow pump	Hall	Q3 2018
	52.54	11/28/2018	none	ND	ND	ND	ND	ND		140	2500	4020	low-flow pump	Hall	Q4 2018
	50.90	2/28/2019	none	ND	ND	ND	ND	ND		130	2200	3920	low-flow pump	Hall	Q1 2019
	52.20	5/9/2019	none	.0019	ND	ND	ND	ND		200	2200	3780	low-flow pump	Hall	Q2 2019
	54.00	8/29/2019	none	ND	ND	ND	ND	ND		200	2300	3920	low-flow pump	Hall	Q3 2019
	52.60	11/14/2019	none	ND	ND	ND	ND	ND		180	2000	3800	low-flow pump	Hall	Q4 2019, pump set at 54 feet
	50.35	2/26/2020	none	0.0042	0.0013	0.002	ND	ND		190	2000	3350	low-flow pump	Hall	Q1 2020
	50.78	6/11/2020	none	ND	ND	ND	ND	ND		250	2000	3740	low-flow pump	Hall	Q2 2020: light gray; slightly cloudy
RMW-1	52.80	8/29/2019	none	ND	ND	ND	ND	ND		190	2100	3660	low-flow pump	Hall	Q3 2019, pump set at 54 feet
		11/14/2019	---	---	---	---	---	---	---	---	---	---	---	---	Q4 2019: No sample
		2/26/2020	none	0.012	ND	0.098	ND	ND		190	2000	3350	spigot	Hall	Q1 2020
		6/11/2020	none	0.0016	ND	0.003	ND			---	---	---	spigot	Hall	Q2 2020: slight hydrocarbon odor; clear w/rust flecks

entrations are mg/L

Table 1

Table 2 - Remediation Pump and Dispose Log

Date	Time	Personnel	Action	Volume Removed	Pump Rate (GPM)	Benzene (mg/L	gallons removed in interval	mg of benzene removed
8/17/2019		KP, Key, DH	Set pump in RMW-1 53.3' from TOC; Measure DTW in all MWs but MW-2					
11/22/2019	13:30	KP	Turn on pump and collect sample of pumped water; turn off pump			ND		
12/5/2019	11:30	KP	Set timer (1 hr ON, 2 hr OFF) and **begin pumping** approx. 1 GPM on auto mode					
12/11/2019		LRR	Did not haul any water	2016				
12/18/2019		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.471154			
12/26/2019		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.765625			
12/27/2019	8:30	KP	Check pump and settings (running fine)					
1/2/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
1/8/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	1.020833		13776	1729.700784
1/13/2020	8:45	KP	Collect sample during rest interval			0.035		
1/15/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
1/21/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	1.020833			
1/29/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.765625		8820	1235.327436
1/30/2020		KP	Collect sample during pump interval			0.039		
2/4/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	1.020833			
2/11/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
2/18/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
2/25/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
2/26/2020		DH, KP	Collect sample during pump interval (red flakes in samples--rust?)					
3/4/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.765625		14700	1293.476858

Table 2 - Remediation Pump and Dispose Log

Date	Time	Personnel	Action	Volume Removed	Pump Rate (GPM)	Benzene (mg/L	gallons removed in interval	mg of benzene removed
3/11/2020	8:11	KP	Collect sample during rest interval			0.00749		
3/11/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
3/18/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
3/25/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
4/1/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
4/8/2020		KP, LRR	Collect sample during rest interval; Hauled out 70 bbls (2940 gallons)	2940	0.875	0.002	14700	264.0373281
4/15/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
4/22/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
4/29/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
4/29/2020	13:30	KP, LRR	Collect sample during rest interval; Hauled out 70 bbls (2940 gallons)	2940	0.875	0.002	11760	89.032608
5/6/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
5/13/2020		LRR	Hauled out 70 bbls (2940 gallons)	2940	0.875			
5/15/2020		LRR	Turn off pump and wait for next quarterly sampling (June 11, 2020)					
6/11/2020		KP, DH	Q2 sampling: Not pumping, but turned on to collect sample					
7/8/2020	15:30	KP	Collect monitoring sample; not pumping			0.006	5880	89.032608
days				*gallons*	*avg. rate*	*acre-feet*		4700.607622
162			***CUMULATIVE***	67620	0.862197	0.207518		4.700607622

Laboratory Results

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June 07, 2021

DAVID HAMILTON

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ALBUQUERQUE, NM 87104

RE: ASAU #150 RELEASE

Enclosed are the results of analyses for samples received by the laboratory on 06/02/21 10:50.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-20-13. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

R T HICKS CONSULTANTS 901 RIO GRANDE BLVD SUITE F-142 ALBUQUERQUE NM, 87104	Project: ASAU #150 RELEASE Project Number: NONE GIVEN Project Manager: DAVID HAMILTON Fax To: NONE	Reported: 07-Jun-21 10:40

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW - 2	H211393-01	Water	26-May-21 12:15	02-Jun-21 10:50

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

R T HICKS CONSULTANTS 901 RIO GRANDE BLVD SUITE F-142 ALBUQUERQUE NM, 87104	Project: ASAU #150 RELEASE Project Number: NONE GIVEN Project Manager: DAVID HAMILTON Fax To: NONE	Reported: 07-Jun-21 10:40

MW - 2

H211393-01 (Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Chloride*	**364**		4.00	mg/L	1	1060207	GM	03-Jun-21	4500-Cl-B	
Sulfate*	**2080**		500	mg/L	50	1060307	GM	03-Jun-21	375.4	
TDS*	**4140**		5.00	mg/L	1	1052704	GM	04-Jun-21	160.1	
VOLATILES BY GC/MS										
Benzene*	**0.021**		0.0005	mg/L	1	1060304	MS	03-Jun-21	8260B	
Toluene*	<0.0005		0.0005	mg/L	1	1060304	MS	03-Jun-21	8260B	
Ethylbenzene*	**0.002**		0.0005	mg/L	1	1060304	MS	03-Jun-21	8260B	
m+p - Xylene*	<0.001		0.001	mg/L	1	1060304	MS	03-Jun-21	8260B	
Total Xylenes*	<0.0005		0.0005	mg/L	1	1060304	MS	03-Jun-21	8260B	
o-Xylene*	<0.0005		0.0005	mg/L	1	1060304	MS	03-Jun-21	8260B	
Naphthalene*	**0.0006**		0.0005	mg/L	1	1060304	MS	03-Jun-21	8260B	
Surrogate: Dibromofluoromethane			*111 %*	*82.4-141*		*1060304*	MS	*03-Jun-21*	*8260B*	
Surrogate: Toluene-d8			*103 %*	*87.1-110*		*1060304*	MS	*03-Jun-21*	*8260B*	
Surrogate: 4-Bromofluorobenzene			*101 %*	*76.4-114*		*1060304*	MS	*03-Jun-21*	*8260B*	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

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Analytical Results For:

R T HICKS CONSULTANTS 901 RIO GRANDE BLVD SUITE F-142 ALBUQUERQUE NM, 87104	Project: ASAU #150 RELEASE Project Number: NONE GIVEN Project Manager: DAVID HAMILTON Fax To: NONE	Reported: 07-Jun-21 10:40

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1052704 - Filtration										
Blank (1052704-BLK1)				Prepared: 27-May-21 Analyzed: 28-May-21						
TDS	ND	5.00	mg/L							
LCS (1052704-BS1)				Prepared: 27-May-21 Analyzed: 28-May-21						
TDS	517		mg/L	500		103	80-120			
Duplicate (1052704-DUP1)	**Source: H211352-01**			Prepared: 27-May-21 Analyzed: 28-May-21						
TDS	10200	5.00	mg/L		9450			7.23	20	
Batch 1060207 - General Prep - Wet Chem										
Blank (1060207-BLK1)				Prepared & Analyzed: 02-Jun-21						
Chloride	ND	4.00	mg/L							
LCS (1060207-BS1)				Prepared & Analyzed: 02-Jun-21						
Chloride	104	4.00	mg/L	100		104	80-120			
LCS Dup (1060207-BSD1)				Prepared & Analyzed: 02-Jun-21						
Chloride	104	4.00	mg/L	100		104	80-120	0.00	20	
Batch 1060307 - General Prep - Wet Chem										
Blank (1060307-BLK1)				Prepared & Analyzed: 03-Jun-21						
Sulfate	ND	10.0	mg/L							
LCS (1060307-BS1)				Prepared & Analyzed: 03-Jun-21						
Sulfate	20.6	10.0	mg/L	20.0		103	80-120			

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Analytical Results For:

R T HICKS CONSULTANTS 901 RIO GRANDE BLVD SUITE F-142 ALBUQUERQUE NM, 87104	Project: ASAU #150 RELEASE Project Number: NONE GIVEN Project Manager: DAVID HAMILTON Fax To: NONE	Reported: 07-Jun-21 10:40

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1060307 - General Prep - Wet Chem										
LCS Dup (1060307-BSD1)				Prepared & Analyzed: 03-Jun-21						
Sulfate	20.2	10.0	mg/L	20.0		101	80-120	1.96	20	

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Analytical Results For:

R T HICKS CONSULTANTS 901 RIO GRANDE BLVD SUITE F-142 ALBUQUERQUE NM, 87104	Project: ASAU #150 RELEASE Project Number: NONE GIVEN Project Manager: DAVID HAMILTON Fax To: NONE	Reported: 07-Jun-21 10:40

VOLATILES BY GC/MS - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1060304 - Volatiles										
Blank (1060304-BLK1)				Prepared & Analyzed: 03-Jun-21						
Benzene	ND	0.0005	mg/L							
Toluene	ND	0.0005	mg/L							
Ethylbenzene	ND	0.0005	mg/L							
m+p - Xylene	ND	0.001	mg/L							
Total Xylenes	ND	0.0005	mg/L							
o-Xylene	ND	0.0005	mg/L							
Naphthalene	ND	0.0005	mg/L							
Surrogate: Dibromofluoromethane	*0.0261*		mg/L	*0.0250*		*105*	*82.4-141*			
Surrogate: Toluene-d8	*0.0255*		mg/L	*0.0250*		*102*	*87.1-110*			
Surrogate: 4-Bromofluorobenzene	*0.0248*		mg/L	*0.0250*		*99.0*	*76.4-114*			
LCS (1060304-BS1)				Prepared & Analyzed: 03-Jun-21						
Benzene	0.023	0.0005	mg/L	0.0200		113	85.9-114			
Toluene	0.022	0.0005	mg/L	0.0200		108	78.8-121			
Ethylbenzene	0.022	0.0005	mg/L	0.0200		109	81.8-127			
m+p - Xylene	0.043	0.001	mg/L	0.0400		107	72.4-134			
o-Xylene	0.021	0.0005	mg/L	0.0200		105	76.2-135			
Total Xylenes	0.064	0.0005	mg/L	0.0600		106	74.3-134			
Naphthalene	0.023	0.0005	mg/L	0.0200		114	59.3-140			
Surrogate: Dibromofluoromethane	*0.0254*		mg/L	*0.0250*		*102*	*82.4-141*			
Surrogate: Toluene-d8	*0.0251*		mg/L	*0.0250*		*100*	*87.1-110*			
Surrogate: 4-Bromofluorobenzene	*0.0259*		mg/L	*0.0250*		*104*	*76.4-114*			
LCS Dup (1060304-BSD1)				Prepared & Analyzed: 03-Jun-21						
Benzene	0.023	0.0005	mg/L	0.0200		115	85.9-114	1.88	4.16	BS-3
Toluene	0.022	0.0005	mg/L	0.0200		110	78.8-121	2.02	5.67	
Ethylbenzene	0.022	0.0005	mg/L	0.0200		112	81.8-127	2.08	4.83	
m+p - Xylene	0.044	0.001	mg/L	0.0400		110	72.4-134	2.35	5.77	
Total Xylenes	0.065	0.0005	mg/L	0.0600		109	74.3-134	2.34	5.83	
o-Xylene	0.022	0.0005	mg/L	0.0200		108	76.2-135	2.30	6.29	
Naphthalene	0.023	0.0005	mg/L	0.0200		113	59.3-140	1.02	33.5	
Surrogate: Dibromofluoromethane	*0.0257*		mg/L	*0.0250*		*103*	*82.4-141*			

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Analytical Results For:

R T HICKS CONSULTANTS 901 RIO GRANDE BLVD SUITE F-142 ALBUQUERQUE NM, 87104	Project: ASAU #150 RELEASE Project Number: NONE GIVEN Project Manager: DAVID HAMILTON Fax To: NONE	Reported: 07-Jun-21 10:40

VOLATILES BY GC/MS - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1060304 - Volatiles										
LCS Dup (1060304-BSD1)				Prepared & Analyzed: 03-Jun-21						
Surrogate: Toluene-d8	*0.0252*		mg/L	*0.0250*		*101*	*87.1-110*			
Surrogate: 4-Bromofluorobenzene	*0.0258*		mg/L	*0.0250*		*103*	*76.4-114*			

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Notes and Definitions

BS-3	Blank spike recovery outside of lab established statistical limits, but still within method limits. Data is not adversely affected.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories
101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: RT Hicks Consultants
Project Manager: David Hamilton
Address: 901 Rio Grande Blvd NW, F-142
City: Albuquerque State: NM Zip: 87104
Phone #: 505 266-5004 Fax #:
Project #: Project Owner: Redwood
Project Name: ASAU #150 Release
Project Location: Fanning Rd
Sampler Name: Kristin Pope

BILL TO
P.O. #:
Company: RT Hicks
Attn: Randy
Address:
City:
State: Zip:
Phone #:
Fax #: R@...

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE: HCl	ICE / COOL	OTHER:	SAMPLING DATE	SAMPLING TIME	TDS	Chloride	Sulfate	BTEX N
H211393-1	MW-2	G	4	X						XX			5/26/21	1215	X	X	X	X

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequental damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Kristin Pope Date: 6-2-21 Time: 1050
Received By: Tamara Oldaker
Relinquished By: Date: Time:
Received By:

Verbal Result: ☐ Yes ☐ No Add'l Phone #:
All Results are emailed. Please provide Email address: david@rthicksconsult.com, kristin@...
REMARKS:

Delivered By: (Circle One) Sampler - UPS - Bus - Other:
Observed Temp. °C 22
Corrected Temp. °C
Sample Condition: Cool ☑ Yes ☐ No Intact ☑ Yes ☐ No
CHECKED BY: (Initials) V.D.

Turnaround Time: Standard ☒ Rush ☐
Thermometer ID #113
Correction Factor None
Bacteria (only) Sample Condition: Cool ☐ Yes ☐ No Intact ☐ Yes ☐ No
Observed Temp. °C
Corrected Temp. °C

FORM-006 R 3.1 06/04/20

† Cardinal cannot accept verbal changes. Please email changes to celey.keene@cardinallabsnm.com

District I
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District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
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 69342

CONDITIONS

Operator:	OGRID:
Roughhouse Operating, LLC 16051 Addison Road Addison, TX 75001	330608
	Action Number: 69342
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the 2021 Monitoring Report for the ASAU 150 Site is accepted for the record. Please provide the 2022, 2023 reports if they have not already been submitted to OCD in the online portal. Submit the 2024 Report by April 1 of 2025.	6/4/2024