October 30,

2019

Quarterly (2nd) Groundwater Monitoring Report (April – June 2019)
3 Bear Energy Services, LLC, Cottonwood Facility (2RF-128)
Eddy County, New Mexico

Prepared for:

3Bear Energy

415 W. Wall St., Suite 1212
Midland, TX 79701

Prepared by:

LArson & Associates, Inc.
Environmental Consultants

507 N. Marienfeld St., Suite 205
Midland, Texas 79701
(432) 687-0901

Mark J Larson
Certified Professional Geologist #10490

LAI Project No: 18-0167-01

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1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) submits this report to the New Mexico Oil Conservation Division (OCD) on behalf of 3 Bear Energy Services, LLC (3 Bear) to report the results of 2019 second (2nd) quarter (April – June) groundwater monitoring at the Cottonwood Facility (Site). The Ste is located in Unit N (SE/4, SW/4), Section 20, Township 20 South, and Range 26 East in Eddy County, New Mexico. The geodetic position is North 32.0210483° and West -104.31879°. The surface and mineral owner is the U.S. Government administered by the Bureau of Land Management (BLM). Figure 1 presents a topographic map.

The following activities occurred on May 15, 29, 2019:

- Gauge four (4) monitoring wells (MW-1 through MW-4) for light non-aqueous phase liquid (LNAPL) and depth to groundwater;
- Purge and collect groundwater samples from four (4) monitoring wells (MW-1 through MW-4);
- Analyze groundwater samples for benzene, toluene, ethylbenzene, xylenes (BTEX), total petroleum hydrocarbons (TPH) including gasoline range organics (C6-C12), diesel range organics (>C12-C28) and oil range organics (>C28-C35) and chloride; and
- Preparation of a report.

The following observations are documented in this report:

- Depth to groundwater ranged from 29.74 feet below ground surface (bgs) at MW-1 to 68.52 feet bgs at MW-4;
- The groundwater potentiometric surface elevation ranged from 3,430.55 feet above mean sea level (MSL) in monitoring well MW-1 to 3,387.54 feet above MSL in monitoring well MW-4;
- A hydrologic divide at well MW-1 causes groundwater to flow south and southeast towards well MW-4, northeast towards well MW-3 and northwest;
- BTEX and TPH were below the analytical method reporting limits in all wells on May 15, 2019;
- Chloride was below the New Mexico Water Quality Control Commission (WQCC) domestic water quality standard in all samples except from well MW-4 which was 22,900 milligrams per liter (mg/L) and consistent with the previous monitoring event;
- The source for the chloride in well MW-4 is assumed to be from naturally occurring conditions or unrelated to 3 Bear operations.
-

3 Bear will continue monitoring groundwater on a quarterly (4 times per year) schedule. Notification will be provided to the OCD 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

Larson & Associates, Inc. (LAI) submits this report to the New Mexico Oil Conservation Division (OCD) on behalf of 3 Bear Energy Services LLC (3 Bear) to present the quarterly (4 times per year) groundwater monitoring results from four (4) monitoring wells (MW-1, MW-2, MW-3 and MW-4) located at the Cottonwood Facility (Site) in Eddy County, New Mexico. This report is for groundwater samples collected during the second quarter (April through June 2019) on May 15, 2019. 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 32.02104833° and West -104.318793°. Figure 1 presents a location and topographic map. Figure 2 presents an aerial map.

2.0 GROUNDWATER POTENTIONMETRIC SURFACE ELEVATION

On May 15, 2019, monitoring wells MW-1 through MW-4 were gauged for light non-aqueous phase liquid (LNAPL) and depth to groundwater. LNAPL was not present in the monitoring wells. Groundwater was gauged in MW-1 at 32.50 feet below top of casing (TOC), MW-2 at 42.70 feet TOC, MW-3 at 42.61 feet TOC and MW-4 at 71.50 feet TOC. The groundwater potentiometric surface elevation ranged from 3,430.55 feet above mean sea level (MSL) at MW-1 to 3,387.54 feet AMSL at well MW-4. The groundwater elevation at well MW-1 causes a hydrologic divide with groundwater flowing to the south and southeast towards MW-4, northeast towards MW-2 and MW-3, and northwest. Table 1 presents the monitoring well gauging summary. Figure 3 presents the groundwater potentiometric map for May 15, 2019.

3.0 GROUNDWATER SAMPLES AND ANALYSIS

On May 15, 2019, groundwater samples were collected from all wells (MW-1, MW-, MW-3 and MW-4) after removing approximately three (3) well volumes of groundwater by pumping with an electric submersible pump and disposable polyethylene 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. The samples were collected with dedicated disposable polyethylene bailers and carefully transferred to laboratory containers that were labeled, sealed with custody labels, packed in an ice filled chest and delivered under chain of custody control to DHL Analytical, Inc. (DHL), a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory, located in Round Rock, Texas. DHL analyzed the samples for benzene, toluene, ethylbenzene, xylene (BTEX) according to EPA SW-846 Method SW-8021B and total petroleum hydrocarbons (TPH) including gasoline range organics (C6 to C12), diesel range organics (>C12 to C28) and oil range organics (>C28 to C35) according to EPA SW-846 Method 8015M and chloride by EPA Method 300. Table 2 presents the laboratory analytical data summary. Appendix A presents the laboratory report.

3.1 Organic Analysis

BTEX and TPH were not reported above the analytical method reporting limits (RL) in samples from MW-1 through MW-4. No data quality exceptions were noted in the DHL case narratives.

3.2 Inorganic Analysis

Chloride was reported at the following concentrations:

MW-1 – 214 mg/L	MW-2 – 106 mg/L

MW-3 – 121 mg/L	MW-4 – 22,900 mg/L

The chloride concentration in samples MW-4 (22,300 mg/L) exceed the New Mexico Water Quality Control Commission (WQCC) domestic water quality standard (250 mg/L) and was consistent with the chloride concentrations reported during previous monitoring period. The chloride concentration in well MW-4 appears to be naturally occurring or from a source unrelated to the Site. No data quality exceptions were noted in the DHL case narratives.

4.0 CONCLUSIONS

The following observations are documented in this report:

- A hydrologic divide at well MW-1 causes groundwater to flow south and southeast towards well MW-4, northeast towards MW-2 and MW-3 and northwest;
- BTEX and TPH were below the analytical method RL in all samples;
- Chloride exceeded the WQCC domestic water quality standard (250 mg/L) in well MW-4 (22,900 mg/L) and appears to be naturally occurring or unrelated to 3 Bear operations.

5.0 RECOMMENDATIONS

3 Bear does not have production and has found no leakage from the pit from daily leak detection system inspections concluding the chloride in well MW-4 is naturally occurring or unrelated to 3 Bear operations. 3 Bear will continue monitoring groundwater on a quarterly (4 times per year) schedule. Notification will be provided to the OCD 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
3 Bear Energy, LLC, Eddy County, New Mexico

Well Information									Groundwater Data				
Well No.	Date Drilled	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 Water (feet TOC)	Depth to Water (feet BGS)	Water Column Height (feet)	Groundwater Elevation (feet AMSL)
MW-1	8/15/2018	92.40	89.40	2	3,460.29	74.40 - 89.40	2.76	3,463.05	9/25/2018	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
									5/15/2019	32.50	29.74	59.90	3,430.55
MW-2	08/16/2018	58.70	61.70	2	3,455.22	40.70 - 55.70	3.04	3,458.26	09/25/2018			Dry	
									11/13/2018			Dry	
									12/12/2018	42.52	39.48	16.18	3,415.74
									01/29/2019	42.07	39.03	16.63	3,416.19
									5/15/2019	42.70	39.66	16.00	3,415.56
MW-3	08/16/2018	52.90	49.90	2	3,455.52	34.90 - 49.90	3.00	3,458.33	09/25/2018	43.55	40.55	9.35	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
									5/15/2019	42.61	39.61	10.29	3,415.72
MW-4	08/14/2018	78.10	75.10	2	3,456.06	60.10 - 75.00	2.98	3,459.04	09/25/2018			Dry	
									11/13/2018			Dry	
									12/12/2018	74.36	71.38	3.74	3,384.68
									01/29/2019	71.34	68.36	6.76	3,387.70
									5/15/2019	71.50	68.52	6.60	3,387.54

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

Table 2
Groundwater Organic and Inorganic Analytical Data Summary
3Bears Cottonwood Facility
Eddy County, New Mexico

Well No.	Collection Date Date	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Xylenex (mg/L)	C6 -C12 (mg/L)	>C12-C28 (mg/L)	>C28-C35 (mg/L)	C6-C35 (mg/L)	Chloride (mg/L)
WQCC Standard:		***0.01**	***0.75**	***0.75**	***0.62**	**--**	**--**	**--**	**--**	****250**
MW-1	9/25/2018	<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	0.00130	<0.00200	<0.00200	<0.00200	<0.537	<0.537	<0.537	<0.537	677
	1/29/2019	0.00489	<0.00400	<0.00400	<0.00400	<0.0600	<0.0789	<0.0789	<0.2178	1,750
	5/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	--	<0.0749	<0.0749	--	214
MW-2	9/25/2018					Dry				
	11/13/2018					Dry				
	1/29/2019	<0.000800	<0.00200	<0.00200	<0..00200	<0.0600	<0.0767	<0.0767	<0.0767	136
	5/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0744	<0.0744	<0.2088	106
MW-3	9/25/2018	<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
	1/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0780	<0.0780	<0.0780	140
	5/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0758	<0.0758	<0.2116	121
MW-4	9/25/2018					Dry				
	11/13/2018					Dry				
	1/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	0.216	<0.110	**0.216**	22,300
	5/15/2019	<0.000800	<0.0200	<0.0200	<0.0200	<0.0600	<0.762	<0.762	<0.2124	22,900
					QA/QC					
Duplicate (MW-1)	1/29/2019	0.00437	<0.00200	0.00234	<0.00200	<0.0600	<0.0743	<0.0743	<0.0743	2,340
Trip Blank	1/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	--	--	--	--	--

Table 2
Groundwater Organic and Inorganic Analytical Data Summary
3Bears Cottonwood Facility
Eddy County, New Mexico

Well No.	Collection Date	Benzene	Ethylbenzene	Toluene	Xylenex	C6 -C12	>C12-C28	>C28-C35	C6-C35	Chloride
	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
WQCC Standard:		***0.01**	***0.75**	***0.75**	***0.62**	**--**	**--**	**--**	**--**	****250**
					Precipitate					
Well No.	**Collection Date**	**Barium**	**Calcium**	**Iron**	**Magnesium**	**Potassium**	**Sodium**	**Strontium**		
	Date	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(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	--		
MW-2	5/15/2019	--	596	--	59.2	6.11	70.9	--		
MW-3	5/15/2019	--	590	--	41.1	5.3	81.9	--		
MW-1	5/15/2019	--	478	--	814	15.5	140	--		

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) equivelent to parts per million (ppm)
-- No data vailable
< values - denootes concentration is less than method reporting limit (RL).
* - Human health standard
** - Domestic water quality standard

Table 2
Groundwater Organic and Inorganic Analytical Data Summary
3Bears Cottonwood Facility
Eddy County, New Mexico

Well No.	Collection Date Date	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Xylenex (mg/L)	C6 -C12 (mg/L)	>C12-C28 (mg/L)	>C28-C35 (mg/L)	C6-C35 (mg/L)	Chloride (mg/L)
WQCC Standard:		***0.01**	***0.75**	***0.75**	***0.62**	**--**	**--**	**--**	**--**	****250**
Alkalinity										
Well No.	**Collection Date 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					
MW-3	5/15/2019	202	<	<	202					
MW-1	5/15/2019	72.7	<	<	72.7					

Figures

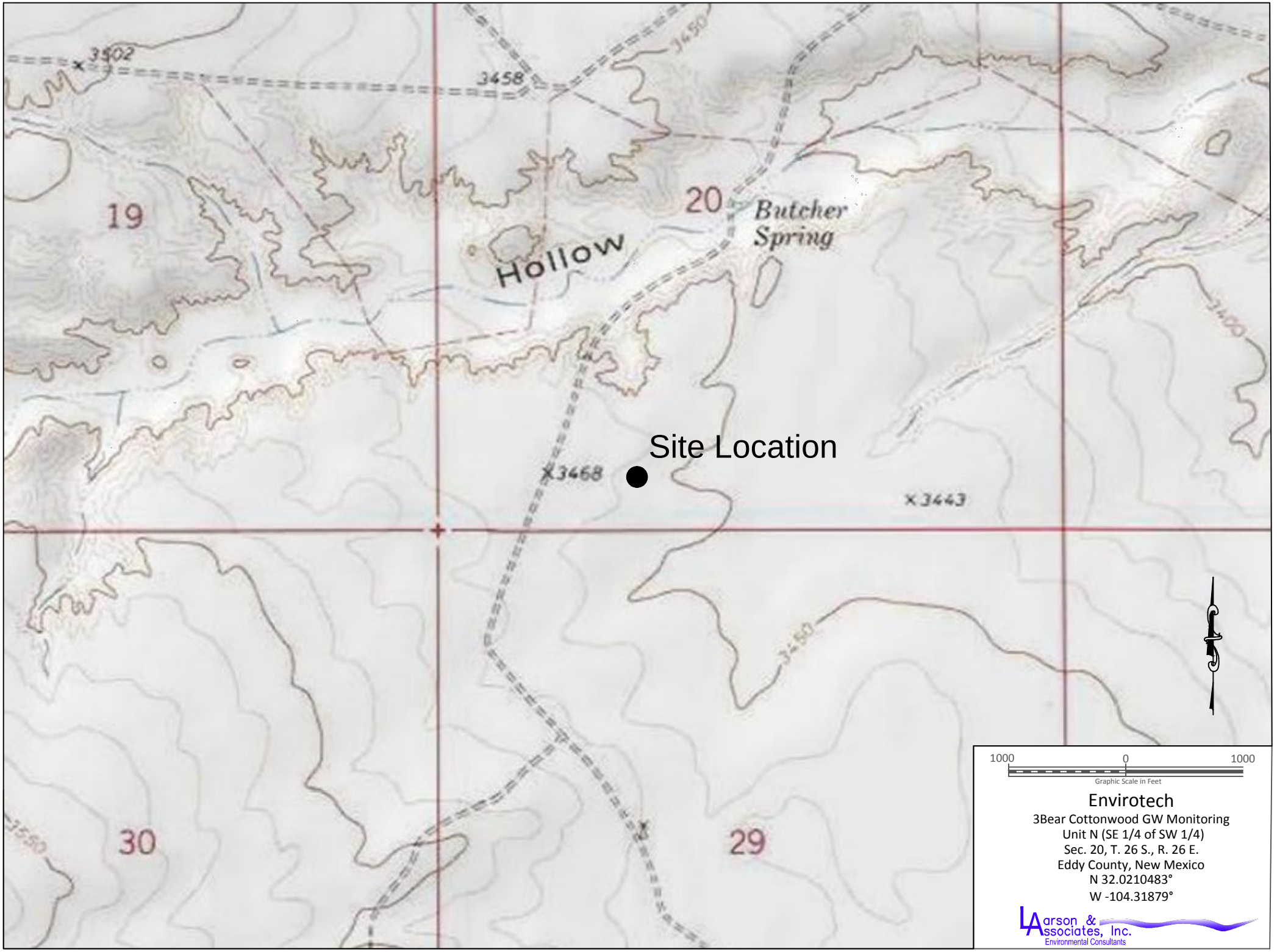


Figure 1 - Topographic Map

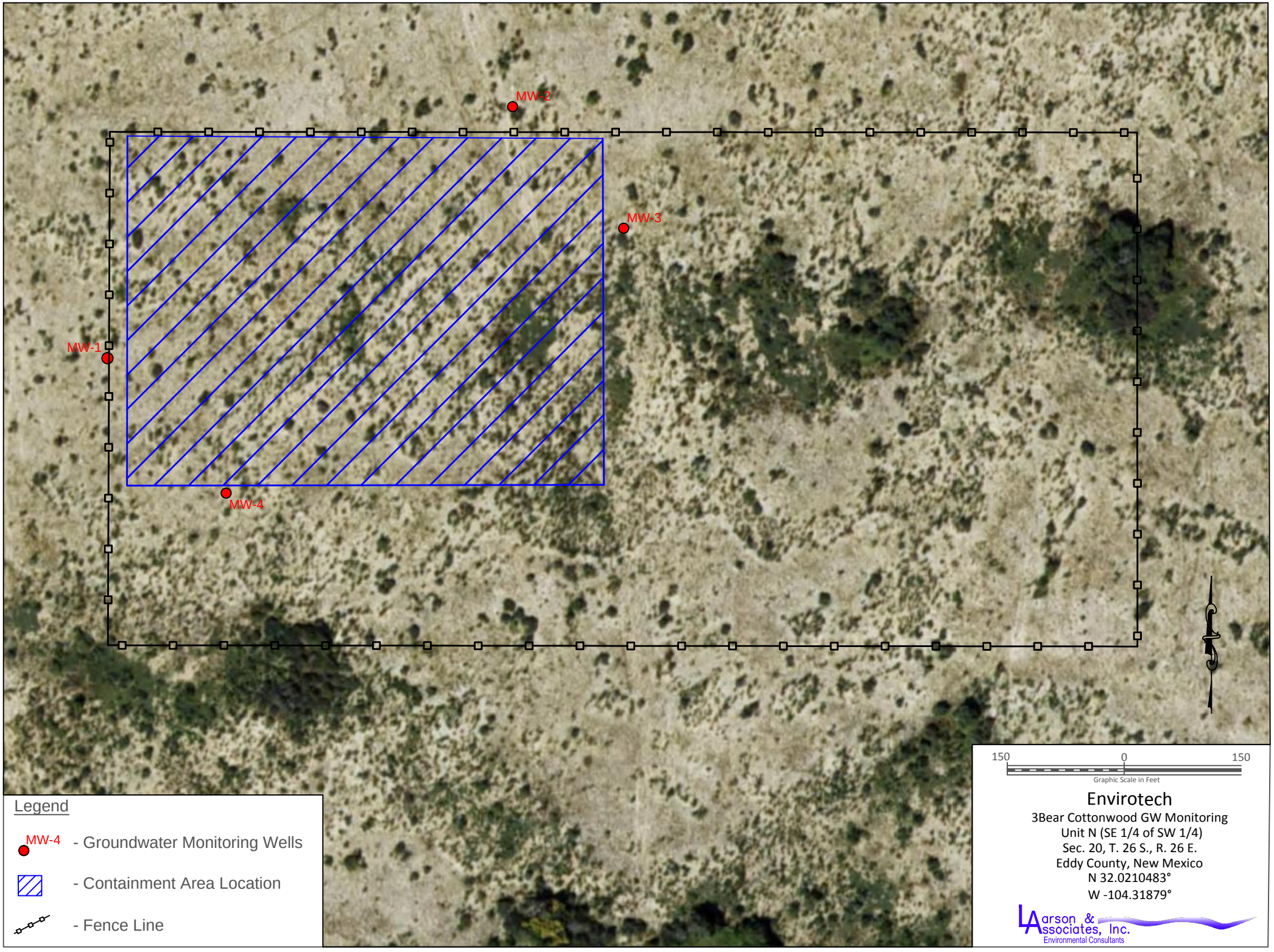
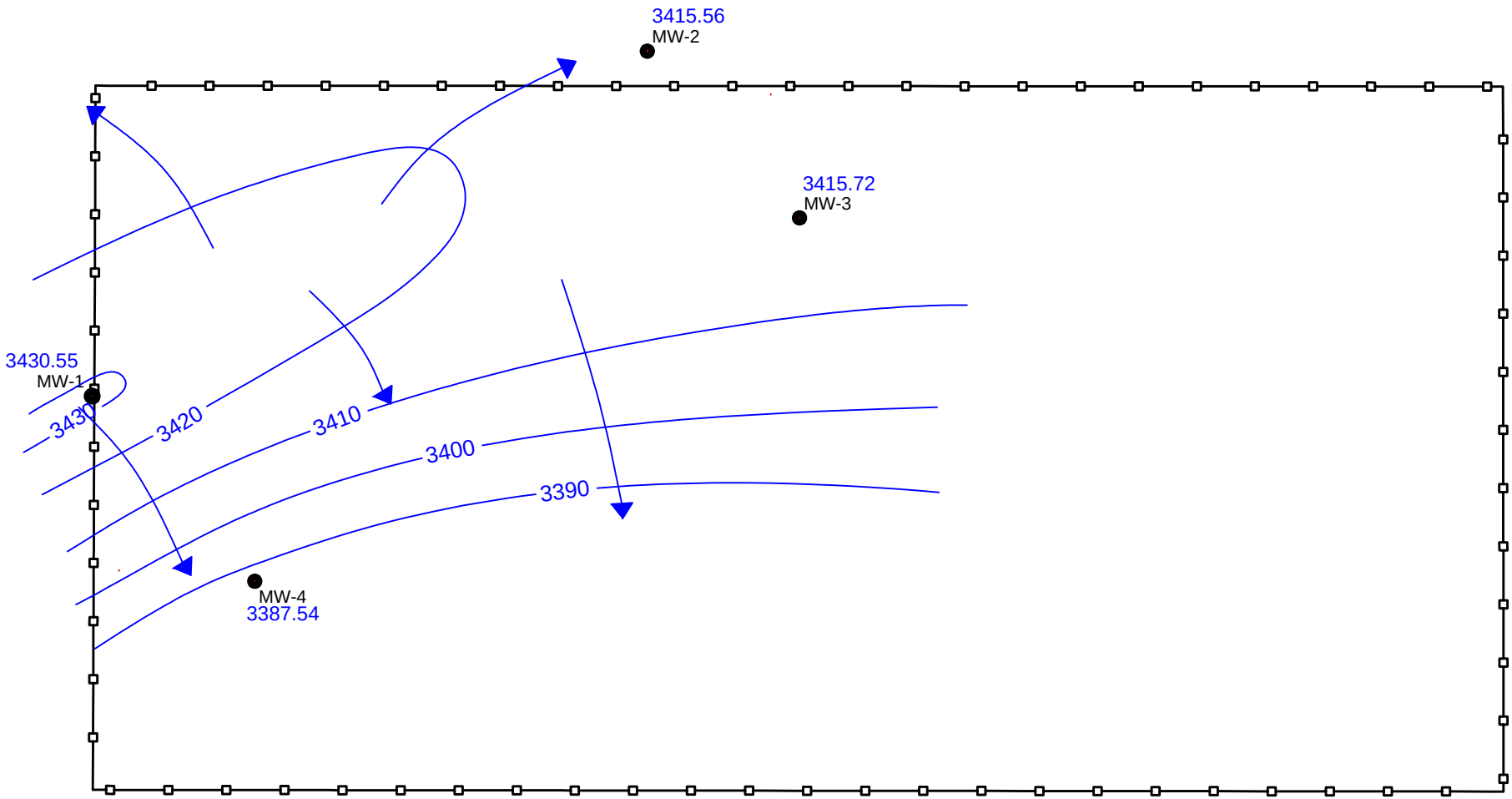


Figure 2 - Aerial Map



Legend

- MW-4 - Monitoring Well Location and Groundwater Potentiometric Surface Elevation, Feet AMSL, May 15, 2019
- 3350 - Contour of Groundwater Potentiometric Surface Elevation, Feet AMSL, May 15, 2019
- Groundwater Flow Direction
- Fence

150 0 150
Graphic Scale in Feet

3 Bear Energy LLC.,
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 3a - Groundwater Potentiometric Map, May 15, 2019

Appendix A

Laboratory Report

May 28, 2019

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

Order No.: 1905202

RE: 3 Bear Cottonwood GWM

Dear Mark Larson:

DHL Analytical, Inc. received 4 sample(s) on 5/17/2019 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,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24

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- Nº 0671

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
Data Reported to: Mark L & Rachael Owen

507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

DATE: 5/16/19 PAGE 1 OF 1
PO#: LAB WORK ORDER#: 1905202
PROJECT LOCATION OR NAME: 3bear Cottonwood GW M.
LAI PROJECT #: 18-176-01 COLLECTOR: KO

TRRP report? ☐ Yes ☑ No
TIME ZONE: Time zone/State: MST
S=SOIL W=WATER A=AIR P=PAINT SL=SLUDGE OT=OTHER

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES: BTEX ☐ MTBE ☐	TRPH 418.1 ☐	TPH 1005 ☐	TPH 1006 ☐	GASOLINE MOD 8015 ☐	DIESEL - MOD 8015 ☐	OIL - MOD 8015 ☐	VOC 8260 ☐	SVOC 8270 ☐	PAH 8270 ☐	HOLDPAH ☐	8081 PESTICIDES ☐	8151 HERBICIDES ☐	8082 PCBS ☐	TBLP - METALS (RCRA) ☐	TCLP - METALS (RCRA) ☐	TCLP - PEST ☐	TOTAL METALS (RCRA) ☐	HERB ☐	Semi-VOC ☐	LEAD - TOTAL ☐	D.W. 200.8 ☐	OTHER LIST ☐	RCI ☐	TOX ☐	FLASHPOINT ☐	TCLP ☐	TDS ☐	TSS ☐	% MOISTURE ☐	pH ☐	CYANIDE ☐	HEXAVALENT CHROMIUM ☐	EXPLOSIVES ☐	PECHLORATE ☐	CHLORIDE ☐	ANIONS ☐	ALKALINITY ☐	TM 3005	Other List	FIELD NOTES
MW-2	01	5/15/19	15:02	W	9	6			3		X		X		X	X	X																																
MW-3	02	5/15/19	15:45																																														+Sr, Alk, Cy, Mg
MW-4	03	5/15/19	16:05																																													K, Na
MW-1	04	5/15/19	16:40																																													
																																															Mg, Ca, Fe, Sr RO
Precipitate MW-4		5/15/19	16:55	Solid	#0																																										X
TOTAL																																															

RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
Rachael Owen	5-16-19 1545	LSO
LSO	5/17/19 0755	
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
LABORATORY: DHL		

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: 4.0 C THERM#: 78
CUSTODY SEALS - ☐ BROKEN ☒ INTACT ☐ NOT USED
☒ CARRIER BILL # LSO
☐ HAND DELIVERED

072695

LSO

WWW.LSO.COM
Questions? Call 800-800-8984

Airbill No. LSO065Y2

LSO065Y2

1. To: Print Name (Person) | Phone (Important)

Company Name

Street Address (No P.O. Box or P.O. Box Zip Code® Deliveries)

Suite / Floor

City | State | Zip

2. From: Print Name (Person) | Phone (Important)

Company Name

Street Address

Suite / Floor

City | State | Zip

3. Service: Visit www.lso.com for availability of services to your destination and enjoy added features by creating your shipping label online.

- ☒ **LSO Priority Overnight*** By 10:30 a.m. to most cities
- ☐ **LSO Early Overnight*** By 8:30 a.m. select cities.
- ☐ **LSO Economy Next Day*** By 3 p.m. to most cities
- ☐ **LSO 2nd Day***
- ☐ **LSO Ground**
- ☐ **LSO Saturday***
- ☐ Other_____

*Check commitment times and availability at www.lso.com

Assumed LSO Priority Overnight service unless otherwise noted.

☐ Deliver Without Delivery Signature (See Limits of Liability below)

Release Signature

L_____ x W_____ x H_____

4. Package: Weight: 50 lbs

Your Company's Billing Reference Information

Ship Date: (mm/dd/yy)

5. Payment:

FOR DRIVER USE ONLY

Driver Number

☐ Check here if LSO Supplies are used with LSO Ground Service.

Pick-up Location

Date:

Time:

City Code:

ILLEGIBLE HANDWRITING ON AIRBILL MAY DELAY TRANSIT TIMES OR RESULT IN NON-DELIVERY. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. "Signature Required" service is only available when printing a label online at LSO.com. **NO DELIVERY SIGNATURE WILL BE OBTAINED FOR LSO EARLY OVERNIGHT SERVICE. Packaging provided by LSO is for EXPRESS USE ONLY – NEVER TO BE USED FOR LSO GROUND Service. OVERSIZE RATES MAY APPLY. DELIVERY COMMITMENTS MAY VARY. ADDITIONAL FEES MAY APPLY.** See LSO Service Guide for further details.

072695

CUSTODY SEAL
DATE 5-16-19
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • www.qecusa.com

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name Larson & Associates | Date Received: 5/17/2019

Work Order Number 1905202 | Received by EL

Checklist completed by: _____ (Signature) 5/17/2019 (Date) | Reviewed by _____ (Initials) 5/17/2019 (Date)

Carrier name LoneStar

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	**4.0** °C
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH<2 acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted? _____		Checked by _____
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted? _____		Checked by _____

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

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Page 1 of 1

DHL Analytical, Inc. **Date:** *28-May-19*

CLIENT: Larson & Associates
Project: 3 Bear Cottonwood GWM
Lab Order: 1905202

CASE NARRATIVE

Sample was analyzed using the methods outlined in the following references:

Method SW8260C - Volatile Organics Analysis
Method E300 - Anions Analysis
Method SW6020A - Dissolved Metals Analysis
Method M8015V - GRO Analysis
Method M8015D - DRO Analysis
Method M2320 B - Alkalinity Analysis

LOG IN

The samples were received and log-in performed on 5/17/2019. 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-zone.

Sample MW-4 was diluted prior to analysis due to matrix.

ANIONS ANALYSIS

For Anions Analysis, the recovery of Sulfate for the Matrix Spike and Matrix Spike Duplicate (1905202-01 MS/MSD) was below the method control limits. This is flagged accordingly in the QC Summary Report. This anion was within method control limits in the associated LCS. No further corrective action was taken.

ALKALINITY ANALYSIS

For Alkalinity Analysis, the recovery of the Initial Calibration Verification (ICV-190521) was slightly above the method control limits. This is flagged accordingly in the QC Summary Report. The remaining bracketing CCVs were within method control limits. No further corrective action was taken.

DISSOLVED METALS ANALYSIS

For Dissolved Metals Analysis, the recoveries of four analytes for the Post Digestion Spike (1905193-01 PDS) were outside of the method control limits. These are flagged accordingly in the QC Summary Report. These analytes were within method control limits in the associated LCS. No further corrective action was taken.

For Dissolved Metals Analysis, the recovery of Sodium for the Low Level Calibration Verification (LCVL2-190524) was marginally above the method control limits. This is flagged accordingly in the

QC Summary Report. This analyte was detected in the associated samples CCV levels. No further corrective action was taken.

DHL Analytical, Inc.

Date: *28-May-19*

CLIENT: Larson & Associates
Project: 3 Bear Cottonwood GWM
Lab Order: 1905202

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1905202-01	MW-2		05/15/19 03:02 PM	5/17/2019
1905202-02	MW-3		05/15/19 03:45 PM	5/17/2019
1905202-03	MW-4		05/15/19 04:05 PM	5/17/2019
1905202-04	MW-1		05/15/19 04:40 PM	5/17/2019

Lab Order: 1905202
Client: Larson & Associates
Project: 3 Bear Cottonwood GWM

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905202-01A	MW-2	05/15/19 03:02 PM	Aqueous	SW5030C	Purge and Trap Water GC/MS	05/23/19 08:05 AM	91046
1905202-01B	MW-2	05/15/19 03:02 PM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	05/23/19 11:07 AM	91064
1905202-01C	MW-2	05/15/19 03:02 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024
	MW-2	05/15/19 03:02 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024
1905202-01D	MW-2	05/15/19 03:02 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	MW-2	05/15/19 03:02 PM	Aqueous	E300	Anion Preparation	05/21/19 09:23 AM	91011
	MW-2	05/15/19 03:02 PM	Aqueous	E300	Anion Preparation	05/22/19 09:07 AM	91034
1905202-01E	MW-2	05/15/19 03:02 PM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	05/21/19 01:28 PM	91023
1905202-02A	MW-3	05/15/19 03:45 PM	Aqueous	SW5030C	Purge and Trap Water GC/MS	05/23/19 08:05 AM	91046
1905202-02B	MW-3	05/15/19 03:45 PM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	05/23/19 11:07 AM	91064
1905202-02C	MW-3	05/15/19 03:45 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024
	MW-3	05/15/19 03:45 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024
1905202-02D	MW-3	05/15/19 03:45 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	MW-3	05/15/19 03:45 PM	Aqueous	E300	Anion Preparation	05/21/19 09:23 AM	91011
1905202-02E	MW-3	05/15/19 03:45 PM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	05/21/19 01:28 PM	91023
1905202-03A	MW-4	05/15/19 04:05 PM	Aqueous	SW5030C	Purge and Trap Water GC/MS	05/23/19 08:05 AM	91046
1905202-03B	MW-4	05/15/19 04:05 PM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	05/23/19 11:07 AM	91064
1905202-03C	MW-4	05/15/19 04:05 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024
	MW-4	05/15/19 04:05 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024
	MW-4	05/15/19 04:05 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024
1905202-03D	MW-4	05/15/19 04:05 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	MW-4	05/15/19 04:05 PM	Aqueous	E300	Anion Preparation	05/21/19 09:23 AM	91011
	MW-4	05/15/19 04:05 PM	Aqueous	E300	Anion Preparation	05/22/19 09:07 AM	91034
	MW-4	05/15/19 04:05 PM	Aqueous	E300	Anion Preparation	05/22/19 09:07 AM	91034
1905202-03E	MW-4	05/15/19 04:05 PM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	05/21/19 01:28 PM	91023
1905202-04A	MW-1	05/15/19 04:40 PM	Aqueous	SW5030C	Purge and Trap Water GC/MS	05/23/19 08:05 AM	91046
1905202-04B	MW-1	05/15/19 04:40 PM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	05/23/19 11:07 AM	91064
1905202-04C	MW-1	05/15/19 04:40 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024

Lab Order: 1905202
Client: Larson & Associates
Project: 3 Bear Cottonwood GWM

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905202-04C	MW-1	05/15/19 04:40 PM	Aqueous	SW3005A	Aq Prep Metals: Dissolved	05/21/19 01:48 PM	91024
1905202-04D	MW-1	05/15/19 04:40 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	MW-1	05/15/19 04:40 PM	Aqueous	E300	Anion Preparation	05/21/19 09:23 AM	91011
	MW-1	05/15/19 04:40 PM	Aqueous	E300	Anion Preparation	05/22/19 09:07 AM	91034
1905202-04E	MW-1	05/15/19 04:40 PM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	05/21/19 01:28 PM	91023

Lab Order: 1905202
Client: Larson & Associates
Project: 3 Bear Cottonwood GWM

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905202-01A	MW-2	Aqueous	SW8260C	Volatile Aromatics by GC/MS	91046	1	05/23/19 03:31 PM	GCMS3_190523A
1905202-01B	MW-2	Aqueous	M8015V	TPH Purgeable by GC - Water	91064	1	05/23/19 01:42 PM	GC4_190523A
1905202-01C	MW-2	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	100	05/24/19 12:34 PM	ICP-MS4_190524C
	MW-2	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	10	05/23/19 01:27 PM	ICP-MS5_190523A
1905202-01D	MW-2	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 01:05 PM	TITRATOR_190521A
	MW-2	Aqueous	E300	Anions by IC method - Water	91011	10	05/21/19 12:11 PM	IC4_190521A
	MW-2	Aqueous	E300	Anions by IC method - Water	91034	100	05/22/19 01:03 PM	IC4_190522A
1905202-01E	MW-2	Aqueous	M8015D	TPH Extractable by GC - Water	91023	1	05/23/19 10:46 AM	GC15_190523A
1905202-02A	MW-3	Aqueous	SW8260C	Volatile Aromatics by GC/MS	91046	1	05/23/19 03:54 PM	GCMS3_190523A
1905202-02B	MW-3	Aqueous	M8015V	TPH Purgeable by GC - Water	91064	1	05/23/19 02:06 PM	GC4_190523A
1905202-02C	MW-3	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	100	05/24/19 12:36 PM	ICP-MS4_190524C
	MW-3	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	10	05/23/19 01:29 PM	ICP-MS5_190523A
1905202-02D	MW-3	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 01:20 PM	TITRATOR_190521A
	MW-3	Aqueous	E300	Anions by IC method - Water	91011	10	05/21/19 12:59 PM	IC4_190521A
1905202-02E	MW-3	Aqueous	M8015D	TPH Extractable by GC - Water	91023	1	05/23/19 10:55 AM	GC15_190523A
1905202-03A	MW-4	Aqueous	SW8260C	Volatile Aromatics by GC/MS	91046	10	05/23/19 04:18 PM	GCMS3_190523A
1905202-03B	MW-4	Aqueous	M8015V	TPH Purgeable by GC - Water	91064	10	05/23/19 02:30 PM	GC4_190523A
1905202-03C	MW-4	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	5000	05/24/19 12:38 PM	ICP-MS4_190524C
	MW-4	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	500	05/24/19 12:40 PM	ICP-MS4_190524C
	MW-4	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	50	05/23/19 01:31 PM	ICP-MS5_190523A
1905202-03D	MW-4	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 03:16 PM	TITRATOR_190521A
	MW-4	Aqueous	E300	Anions by IC method - Water	91034	1000	05/22/19 01:51 PM	IC4_190522A
	MW-4	Aqueous	E300	Anions by IC method - Water	91011	100	05/21/19 01:15 PM	IC4_190521A
	MW-4	Aqueous	E300	Anions by IC method - Water	91034	10000	05/22/19 12:15 PM	IC4_190522A
1905202-03E	MW-4	Aqueous	M8015D	TPH Extractable by GC - Water	91023	1	05/23/19 11:13 AM	GC15_190523A
1905202-04A	MW-1	Aqueous	SW8260C	Volatile Aromatics by GC/MS	91046	1	05/23/19 04:41 PM	GCMS3_190523A
1905202-04B	MW-1	Aqueous	M8015V	TPH Purgeable by GC - Water	91064	1	05/23/19 02:54 PM	GC4_190523A
1905202-04C	MW-1	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	100	05/24/19 12:42 PM	ICP-MS4_190524C

Lab Order: 1905202
Client: Larson & Associates
Project: 3 Bear Cottonwood GWM

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905202-04C	MW-1	Aqueous	SW6020A	Metals-ICPMS (0.45µ filtered)	91024	10	05/23/19 01:33 PM	ICP-MS5_190523A
1905202-04D	MW-1	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 02:20 PM	TITRATOR_190521A
	MW-1	Aqueous	E300	Anions by IC method - Water	91011	100	05/21/19 01:31 PM	IC4_190521A
	MW-1	Aqueous	E300	Anions by IC method - Water	91034	100	05/22/19 01:19 PM	IC4_190522A
1905202-04E	MW-1	Aqueous	M8015D	TPH Extractable by GC - Water	91023	1	05/23/19 11:04 AM	GC15_190523A

DHL Analytical, Inc.

Date: *28-May-19*

CLIENT:	Larson & Associates	**Client Sample ID:**	MW-2
Project:	3 Bear Cottonwood GWM	**Lab ID:**	1905202-01
Project No:	18-176-01	**Collection Date:**	05/15/19 03:02 PM
Lab Order:	1905202	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		**M8015D**					Analyst: **BTJ**
TPH-DRO C10-C28	<0.0744	0.0744	0.0930		mg/L	1	05/23/19 10:46 AM
TPH-ORO >C28-C35	<0.0744	0.0744	0.0930		mg/L	1	05/23/19 10:46 AM
Surr: Isopropylbenzene	83.8	0	47-142		%REC	1	05/23/19 10:46 AM
Surr: Octacosane	83.5	0	51-124		%REC	1	05/23/19 10:46 AM
VOLATILE AROMATICS BY GC/MS		**SW8260C**					Analyst: **BTJ**
Benzene	<0.000800	0.000800	0.00200		mg/L	1	05/23/19 03:31 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 03:31 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 03:31 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 03:31 PM
Surr: 1,2-Dichloroethane-d4	108	0	72-119		%REC	1	05/23/19 03:31 PM
Surr: 4-Bromofluorobenzene	97.3	0	76-119		%REC	1	05/23/19 03:31 PM
Surr: Dibromofluoromethane	103	0	85-115		%REC	1	05/23/19 03:31 PM
Surr: Toluene-d8	101	0	81-120		%REC	1	05/23/19 03:31 PM
TPH PURGEABLE BY GC - WATER		**M8015V**					Analyst: **BTJ**
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	05/23/19 01:42 PM
Surr: Tetrachlorethene	108	0	74-138		%REC	1	05/23/19 01:42 PM
METALS-ICPMS (0.45µ FILTERED)		**SW6020A**					Analyst: **RO**
Dissolved Calcium	596	10.0	30.0		mg/L	100	05/24/19 12:34 PM
Dissolved Magnesium	59.2	1.00	3.00		mg/L	10	05/23/19 01:27 PM
Dissolved Potassium	6.11	1.00	3.00		mg/L	10	05/23/19 01:27 PM
Dissolved Sodium	70.9	1.00	3.00		mg/L	10	05/23/19 01:27 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	106	3.00	10.0		mg/L	10	05/21/19 12:11 PM
Sulfate	1550	100	300		mg/L	100	05/22/19 01:03 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	116	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 01:05 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 01:05 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 01:05 PM
Alkalinity, Total (As CaCO3)	116	20.0	20.0		mg/L @ pH 4.55	1	05/21/19 01:05 PM

Qualifiers:	*	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: *28-May-19*

CLIENT:	Larson & Associates	**Client Sample ID:**	MW-3
Project:	3 Bear Cottonwood GWM	**Lab ID:**	1905202-02
Project No:	18-176-01	**Collection Date:**	05/15/19 03:45 PM
Lab Order:	1905202	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		**M8015D**					Analyst: **BTJ**
TPH-DRO C10-C28	<0.0758	0.0758	0.0948		mg/L	1	05/23/19 10:55 AM
TPH-ORO >C28-C35	<0.0758	0.0758	0.0948		mg/L	1	05/23/19 10:55 AM
Surr: Isopropylbenzene	77.4	0	47-142		%REC	1	05/23/19 10:55 AM
Surr: Octacosane	83.3	0	51-124		%REC	1	05/23/19 10:55 AM
VOLATILE AROMATICS BY GC/MS		**SW8260C**					Analyst: **BTJ**
Benzene	<0.000800	0.000800	0.00200		mg/L	1	05/23/19 03:54 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 03:54 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 03:54 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 03:54 PM
Surr: 1,2-Dichloroethane-d4	108	0	72-119		%REC	1	05/23/19 03:54 PM
Surr: 4-Bromofluorobenzene	96.8	0	76-119		%REC	1	05/23/19 03:54 PM
Surr: Dibromofluoromethane	104	0	85-115		%REC	1	05/23/19 03:54 PM
Surr: Toluene-d8	101	0	81-120		%REC	1	05/23/19 03:54 PM
TPH PURGEABLE BY GC - WATER		**M8015V**					Analyst: **BTJ**
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	05/23/19 02:06 PM
Surr: Tetrachlorethene	115	0	74-138		%REC	1	05/23/19 02:06 PM
METALS-ICPMS (0.45µ FILTERED)		**SW6020A**					Analyst: **RO**
Dissolved Calcium	590	10.0	30.0		mg/L	100	05/24/19 12:36 PM
Dissolved Magnesium	41.1	1.00	3.00		mg/L	10	05/23/19 01:29 PM
Dissolved Potassium	5.30	1.00	3.00		mg/L	10	05/23/19 01:29 PM
Dissolved Sodium	81.9	1.00	3.00		mg/L	10	05/23/19 01:29 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	121	3.00	10.0		mg/L	10	05/21/19 12:59 PM
Sulfate	1470	10.0	30.0		mg/L	10	05/21/19 12:59 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	202	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 01:20 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 01:20 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 01:20 PM
Alkalinity, Total (As CaCO3)	202	20.0	20.0		mg/L @ pH 4.55	1	05/21/19 01:20 PM

Qualifiers:

*	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: *28-May-19*

CLIENT:	Larson & Associates	**Client Sample ID:**	MW-4
Project:	3 Bear Cottonwood GWM	**Lab ID:**	1905202-03
Project No:	18-176-01	**Collection Date:**	05/15/19 04:05 PM
Lab Order:	1905202	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		**M8015D**					Analyst: **BTJ**
TPH-DRO C10-C28	<0.762	0.762	0.952		mg/L	1	05/23/19 11:13 AM
TPH-ORO >C28-C35	<0.762	0.762	0.952		mg/L	1	05/23/19 11:13 AM
Surr: Isopropylbenzene	80.2	0	47-142		%REC	1	05/23/19 11:13 AM
Surr: Octacosane	85.1	0	51-124		%REC	1	05/23/19 11:13 AM
VOLATILE AROMATICS BY GC/MS		**SW8260C**					Analyst: **BTJ**
Benzene	<0.00800	0.00800	0.0200		mg/L	10	05/23/19 04:18 PM
Ethylbenzene	<0.0200	0.0200	0.0600		mg/L	10	05/23/19 04:18 PM
Toluene	<0.0200	0.0200	0.0600		mg/L	10	05/23/19 04:18 PM
Total Xylenes	<0.0200	0.0200	0.0600		mg/L	10	05/23/19 04:18 PM
Surr: 1,2-Dichloroethane-d4	112	0	72-119		%REC	10	05/23/19 04:18 PM
Surr: 4-Bromofluorobenzene	95.2	0	76-119		%REC	10	05/23/19 04:18 PM
Surr: Dibromofluoromethane	104	0	85-115		%REC	10	05/23/19 04:18 PM
Surr: Toluene-d8	99.5	0	81-120		%REC	10	05/23/19 04:18 PM
TPH PURGEABLE BY GC - WATER		**M8015V**					Analyst: **BTJ**
TPH-GRO (C6-C10)	<0.600	0.600	1.00		mg/L	10	05/23/19 02:30 PM
Surr: Tetrachlorethene	111	0	74-138		%REC	10	05/23/19 02:30 PM
METALS-ICPMS (0.45µ FILTERED)		**SW6020A**					Analyst: **RO**
Dissolved Calcium	333	5.00	15.0		mg/L	50	05/23/19 01:31 PM
Dissolved Magnesium	50500	500	1500		mg/L	5000	05/24/19 12:38 PM
Dissolved Potassium	2370	50.0	150		mg/L	500	05/24/19 12:40 PM
Dissolved Sodium	25900	500	1500		mg/L	5000	05/24/19 12:38 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	22900	300	1000		mg/L	1000	05/22/19 01:51 PM
Sulfate	255000	10000	30000		mg/L	10000	05/22/19 12:15 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	5140	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 03:16 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 03:16 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	05/21/19 03:16 PM
Alkalinity, Total (As CaCO3)	5140	20.0	20.0		mg/L @ pH 4.55	1	05/21/19 03:16 PM

Qualifiers:

*	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: *28-May-19*

CLIENT:	Larson & Associates	**Client Sample ID:**	MW-1
Project:	3 Bear Cottonwood GWM	**Lab ID:**	1905202-04
Project No:	18-176-01	**Collection Date:**	05/15/19 04:40 PM
Lab Order:	1905202	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		**M8015D**					Analyst: **BTJ**
TPH-DRO C10-C28	<0.0749	0.0749	0.0936		mg/L	1	05/23/19 11:04 AM
TPH-ORO >C28-C35	<0.0749	0.0749	0.0936		mg/L	1	05/23/19 11:04 AM
Surr: Isopropylbenzene	86.2	0	47-142		%REC	1	05/23/19 11:04 AM
Surr: Octacosane	84.5	0	51-124		%REC	1	05/23/19 11:04 AM
VOLATILE AROMATICS BY GC/MS		**SW8260C**					Analyst: **BTJ**
Benzene	<0.000800	0.000800	0.00200		mg/L	1	05/23/19 04:41 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 04:41 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 04:41 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	05/23/19 04:41 PM
Surr: 1,2-Dichloroethane-d4	109	0	72-119		%REC	1	05/23/19 04:41 PM
Surr: 4-Bromofluorobenzene	96.9	0	76-119		%REC	1	05/23/19 04:41 PM
Surr: Dibromofluoromethane	103	0	85-115		%REC	1	05/23/19 04:41 PM
Surr: Toluene-d8	102	0	81-120		%REC	1	05/23/19 04:41 PM
TPH PURGEABLE BY GC - WATER		**M8015V**					Analyst: **BTJ**
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	05/23/19 02:54 PM
Surr: Tetrachlorethene	117	0	74-138		%REC	1	05/23/19 02:54 PM
METALS-ICPMS (0.45µ FILTERED)		**SW6020A**					Analyst: **RO**
Dissolved Calcium	478	10.0	30.0		mg/L	100	05/24/19 12:42 PM
Dissolved Magnesium	814	10.0	30.0		mg/L	100	05/24/19 12:42 PM
Dissolved Potassium	15.5	1.00	3.00		mg/L	10	05/23/19 01:33 PM
Dissolved Sodium	140	1.00	3.00		mg/L	10	05/23/19 01:33 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	214	30.0	100		mg/L	100	05/21/19 01:31 PM
Sulfate	4640	100	300		mg/L	100	05/22/19 01:19 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	72.7	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 02:20 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 02:20 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 02:20 PM
Alkalinity, Total (As CaCO3)	72.7	20.0	20.0		mg/L @ pH 4.54	1	05/21/19 02:20 PM

Qualifiers:

*	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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: GC15_190523A

The QC data in batch 91023 applies to the following samples: 1905202-01E, 1905202-02E, 1905202-03E, 1905202-04E

Sample ID **MB-91023** Batch ID: **91023** TestNo: **M8015D** Units: **mg/L**
SampType: **MBLK** Run ID: **GC15_190523A** Analysis Date: **5/23/2019 10:19:22 AM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	<0.0800	0.100								
TPH-ORO >C28-C35	<0.0800	0.100								
Surr: Isopropylbenzene	0.0673		0.1000		67.3	47	142			
Surr: Octacosane	0.0719		0.1000		71.9	51	124			

Sample ID **LCSD-91023** Batch ID: **91023** TestNo: **M8015D** Units: **mg/L**
SampType: **LCSD** Run ID: **GC15_190523A** Analysis Date: **5/23/2019 10:37:29 AM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	0.999	0.100	1.250	0	79.9	50	114	8.39	30	
TPH-ORO >C28-C35	<0.0800	0.100	0					0	0	
Surr: Isopropylbenzene	0.0677		0.1000		67.7	47	142	0	0	
Surr: Octacosane	0.0750		0.1000		75.0	51	124	0	0	

Sample ID **LCS-91023** Batch ID: **91023** TestNo: **M8015D** Units: **mg/L**
SampType: **LCS** Run ID: **GC15_190523A** Analysis Date: **5/23/2019 11:29:57 AM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	0.918	0.100	1.250	0	73.5	50	114			
TPH-ORO >C28-C35	<0.0800	0.100	0							
Surr: Isopropylbenzene	0.0671		0.1000		67.1	47	142			
Surr: Octacosane	0.0756		0.1000		75.6	51	124			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: GC15_190523A

Sample ID **ICV-190523**	Batch ID: **R104235**	TestNo: **M8015D**	Units: **mg/L**
SampType: **ICV**	Run ID: **GC15_190523A**	Analysis Date: **5/23/2019 9:21:38 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	472	0.100	500.0	0	94.5	80	120			
TPH-ORO >C28-C35	0.329	0.100	0							
Surr: Isopropylbenzene	29.6		25.00		118	80	120			
Surr: Octacosane	21.4		25.00		85.6	80	120			

Sample ID **CCV1-190523**	Batch ID: **R104235**	TestNo: **M8015D**	Units: **mg/L**
SampType: **CCV**	Run ID: **GC15_190523A**	Analysis Date: **5/23/2019 11:41:32 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	210	0.100	250.0	0	84.0	80	120			
TPH-ORO >C28-C35	<0.0800	0.100	0							
Surr: Isopropylbenzene	12.8		12.50		102	80	120			
Surr: Octacosane	10.6		12.50		84.9	80	120			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: GC4_190523A

The QC data in batch 91064 applies to the following samples: 1905202-01B, 1905202-02B, 1905202-03B, 1905202-04B

Sample ID **LCS-91064**	Batch ID: **91064**	TestNo: **M8015V**	Units: **mg/L**
SampType: **LCS**	Run ID: **GC4_190523A**	Analysis Date: **5/23/2019 11:31:42 AM**	Prep Date: **5/23/2019**

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	4.15		4.000		104	74	138			

Sample ID **LCSD-91064**	Batch ID: **91064**	TestNo: **M8015V**	Units: **mg/L**
SampType: **LCSD**	Run ID: **GC4_190523A**	Analysis Date: **5/23/2019 11:55:38 AM**	Prep Date: **5/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	2.30	0.100	2.500	0	91.9	67	136	9.13	30	
Surr: Tetrachlorethene	4.15		4.000		104	74	138	0	0	

Sample ID **MB-91064**	Batch ID: **91064**	TestNo: **M8015V**	Units: **mg/L**
SampType: **MBLK**	Run ID: **GC4_190523A**	Analysis Date: **5/23/2019 1:06:43 PM**	Prep Date: **5/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	<0.0600	0.100								
Surr: Tetrachlorethene	4.41		4.000		110	74	138			

Sample ID **1905202-01BMS**	Batch ID: **91064**	TestNo: **M8015V**	Units: **mg/L**
SampType: **MS**	Run ID: **GC4_190523A**	Analysis Date: **5/23/2019 3:18:06 PM**	Prep Date: **5/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	2.12	0.100	2.500	0	84.8	67	136			
Surr: Tetrachlorethene	4.02		4.000		100	74	138			

Sample ID **1905202-01BMSD**	Batch ID: **91064**	TestNo: **M8015V**	Units: **mg/L**
SampType: **MSD**	Run ID: **GC4_190523A**	Analysis Date: **5/23/2019 4:06:43 PM**	Prep Date: **5/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	2.47	0.100	2.500	0	98.6	67	136	15.1	30	
Surr: Tetrachlorethene	4.25		4.000		106	74	138	0	0	

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: GC4_190523A

Sample ID **ICV-190523**	Batch ID: **R104279**	TestNo: **M8015V**	Units: **mg/L**
SampType: **ICV**	Run ID: **GC4_190523A**	Analysis Date: **5/23/2019 10:54:22 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	4.50	0.100	5.000	0	90.1	80	120			
Surr: Tetrachlorethene	4.17		4.000		104	74	138			

Sample ID **CCV1-190523**	Batch ID: **R104279**	TestNo: **M8015V**	Units: **mg/L**
SampType: **CCV**	Run ID: **GC4_190523A**	Analysis Date: **5/23/2019 4:33:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	2.03	0.100	2.500	0	81.4	80	120			
Surr: Tetrachlorethene	3.59		4.000		89.8	74	138			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_190523A

The QC data in batch 91046 applies to the following samples: 1905202-01A, 1905202-02A, 1905202-03A, 1905202-04A

Sample ID **LCS-91046**	Batch ID: **91046**	TestNo: **SW8260C**	Units: **mg/L**
SampType: **LCS**	Run ID: **GCMS3_190523A**	Analysis Date: **5/23/2019 10:09:00 AM**	Prep Date: **5/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0439	0.00200	0.0464	0	94.6	81	122			
Ethylbenzene	0.0461	0.00600	0.0464	0	99.5	73	127			
Toluene	0.0451	0.00600	0.0464	0	97.2	77	122			
Total Xylenes	0.135	0.00600	0.139	0	97.5	80	121			
Surr: 1,2-Dichloroethane-d4	54.3		50.00		109	72	119			
Surr: 4-Bromofluorobenzene	49.3		50.00		98.6	76	119			
Surr: Dibromofluoromethane	52.2		50.00		104	85	115			
Surr: Toluene-d8	49.7		50.00		99.5	81	120			

Sample ID **MB-91046**	Batch ID: **91046**	TestNo: **SW8260C**	Units: **mg/L**
SampType: **MBLK**	Run ID: **GCMS3_190523A**	Analysis Date: **5/23/2019 10:32:00 AM**	Prep Date: **5/23/2019**

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	54.7		50.00		109	72	119			
Surr: 4-Bromofluorobenzene	49.5		50.00		98.9	76	119			
Surr: Dibromofluoromethane	52.5		50.00		105	85	115			
Surr: Toluene-d8	49.9		50.00		99.8	81	120			

Sample ID **SB-190523**	Batch ID: **91046**	TestNo: **SW8260C**	Units: **mg/L**
SampType: **SBLK**	Run ID: **GCMS3_190523A**	Analysis Date: **5/23/2019 6:37:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	<0.000800	0.00200	0							
Ethylbenzene	<0.00200	0.00600	0							
Toluene	<0.00200	0.00600	0							
Total Xylenes	<0.00200	0.00600	0							
Surr: 1,2-Dichloroethane-d4	53.7		0							
Surr: 4-Bromofluorobenzene	47.4		0							
Surr: Dibromofluoromethane	51.2		0							
Surr: Toluene-d8	48.6		0							

Sample ID **1905240-04AMS**	Batch ID: **91046**	TestNo: **SW8260C**	Units: **mg/L**
SampType: **MS**	Run ID: **GCMS3_190523A**	Analysis Date: **5/23/2019 8:32:00 PM**	Prep Date: **5/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0441	0.00200	0.0464	0	95.1	81	122			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_190523A

Sample ID **1905240-04AMS**	Batch ID: **91046**	TestNo: **SW8260C**	Units: **mg/L**
SampType: **MS**	Run ID: **GCMS3_190523A**	Analysis Date: **5/23/2019 8:32:00 PM**	Prep Date: **5/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Ethylbenzene	0.0452	0.00600	0.0464	0	97.5	73	127			
Toluene	0.0462	0.00600	0.0464	0	99.6	77	122			
Total Xylenes	0.131	0.00600	0.139	0	94.2	80	121			
Surr: 1,2-Dichloroethane-d4	53.7		50.00		107	72	119			
Surr: 4-Bromofluorobenzene	48.6		50.00		97.2	76	119			
Surr: Dibromofluoromethane	51.6		50.00		103	85	115			
Surr: Toluene-d8	49.6		50.00		99.1	81	120			

Sample ID **1905240-04AMSD**	Batch ID: **91046**	TestNo: **SW8260C**	Units: **mg/L**
SampType: **MSD**	Run ID: **GCMS3_190523A**	Analysis Date: **5/23/2019 8:55:00 PM**	Prep Date: **5/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0440	0.00200	0.0464	0	94.9	81	122	0.202	20	
Ethylbenzene	0.0460	0.00600	0.0464	0	99.2	73	127	1.77	20	
Toluene	0.0460	0.00600	0.0464	0	99.1	77	122	0.481	20	
Total Xylenes	0.135	0.00600	0.139	0	96.8	80	121	2.71	20	
Surr: 1,2-Dichloroethane-d4	53.6		50.00		107	72	119	0	0	
Surr: 4-Bromofluorobenzene	49.0		50.00		98.0	76	119	0	0	
Surr: Dibromofluoromethane	51.3		50.00		103	85	115	0	0	
Surr: Toluene-d8	49.2		50.00		98.4	81	120	0	0	

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_190523A

Sample ID **ICV-190523**	Batch ID: **R104284**	TestNo: **SW8260C**	Units: **mg/L**
SampType: **ICV**	Run ID: **GCMS3_190523A**	Analysis Date: **5/23/2019 9:46:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0867	0.00200	0.0928	0	93.5	80	120			
Ethylbenzene	0.0905	0.00600	0.0928	0	97.5	80	120			
Toluene	0.0903	0.00600	0.0928	0	97.3	80	120			
Total Xylenes	0.267	0.00600	0.278	0	96.1	80	120			
Surr: 1,2-Dichloroethane-d4	54.0		50.00		108	72	119			
Surr: 4-Bromofluorobenzene	50.1		50.00		100	76	119			
Surr: Dibromofluoromethane	51.1		50.00		102	85	115			
Surr: Toluene-d8	50.2		50.00		100	81	120			

Sample ID **ICV2-190523**	Batch ID: **R104284**	TestNo: **SW8260C**	Units: **mg/L**
SampType: **ICV**	Run ID: **GCMS3_190523A**	Analysis Date: **5/23/2019 6:14:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0840	0.00200	0.0928	0	90.6	80	120			
Ethylbenzene	0.0865	0.00600	0.0928	0	93.2	80	120			
Toluene	0.0864	0.00600	0.0928	0	93.1	80	120			
Total Xylenes	0.252	0.00600	0.278	0	90.6	80	120			
Surr: 1,2-Dichloroethane-d4	53.3		50.00		107	72	119			
Surr: 4-Bromofluorobenzene	49.0		50.00		98.0	76	119			
Surr: Dibromofluoromethane	51.4		50.00		103	85	115			
Surr: Toluene-d8	49.3		50.00		98.6	81	120			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190524C

Sample ID **ICV-190524**	Batch ID: **R104271**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_190524C**	Analysis Date: **5/24/2019 10:39:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	2.63	0.300	2.50	0	105	90	110			
Dissolved Magnesium	2.44	0.300	2.50	0	97.7	90	110			
Dissolved Potassium	2.49	0.300	2.50	0	99.5	90	110			
Dissolved Sodium	2.52	0.300	2.50	0	101	90	110			

Sample ID **LCVL-190524**	Batch ID: **R104271**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190524C**	Analysis Date: **5/24/2019 10:44:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	0.104	0.300	0.100	0	104	70	130			
Dissolved Magnesium	0.0976	0.300	0.100	0	97.6	70	130			
Dissolved Potassium	0.0982	0.300	0.100	0	98.2	70	130			
Dissolved Sodium	0.0963	0.300	0.100	0	96.3	70	130			

Sample ID **CCV2-190524**	Batch ID: **R104271**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190524C**	Analysis Date: **5/24/2019 12:12:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	4.95	0.300	5.00	0	99.1	90	110			
Dissolved Magnesium	4.87	0.300	5.00	0	97.4	90	110			
Dissolved Potassium	4.88	0.300	5.00	0	97.6	90	110			
Dissolved Sodium	4.96	0.300	5.00	0	99.2	90	110			

Sample ID **LCVL2-190524**	Batch ID: **R104271**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190524C**	Analysis Date: **5/24/2019 12:18:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	0.107	0.300	0.100	0	107	70	130			
Dissolved Magnesium	0.0980	0.300	0.100	0	98.0	70	130			
Dissolved Potassium	0.0985	0.300	0.100	0	98.5	70	130			
Dissolved Sodium	0.131	0.300	0.100	0	131	70	130			S

Sample ID **CCV3-190524**	Batch ID: **R104271**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190524C**	Analysis Date: **5/24/2019 12:55:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	4.94	0.300	5.00	0	98.9	90	110			
Dissolved Magnesium	4.82	0.300	5.00	0	96.4	90	110			
Dissolved Potassium	4.86	0.300	5.00	0	97.3	90	110			
Dissolved Sodium	4.87	0.300	5.00	0	97.4	90	110			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190524C

Sample ID **LCVL3-190524** Batch ID: **R104271** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCVL** Run ID: **ICP-MS4_190524C** Analysis Date: **5/24/2019 1:02:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	0.0995	0.300	0.100	0	99.5	70	130			
Dissolved Magnesium	0.0953	0.300	0.100	0	95.3	70	130			
Dissolved Potassium	0.0961	0.300	0.100	0	96.1	70	130			
Dissolved Sodium	0.109	0.300	0.100	0	109	70	130			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190523A

The QC data in batch 91024 applies to the following samples: 1905202-01C, 1905202-02C, 1905202-03C, 1905202-04C

Sample ID **MB-91024** Batch ID: **91024** TestNo: **SW6020A** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS5_190523A** Analysis Date: **5/23/2019 1:11:00 PM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	<0.100	0.300								
Dissolved Magnesium	<0.100	0.300								
Dissolved Potassium	<0.100	0.300								
Dissolved Sodium	<0.100	0.300								

Sample ID **MB-90998-FILTER** Batch ID: **91024** TestNo: **SW6020A** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS5_190523A** Analysis Date: **5/23/2019 1:13:00 PM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	<0.100	0.300								
Dissolved Magnesium	<0.100	0.300								
Dissolved Potassium	<0.100	0.300								
Dissolved Sodium	<0.100	0.300								

Sample ID **LCS-91024** Batch ID: **91024** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS5_190523A** Analysis Date: **5/23/2019 1:15:00 PM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	4.91	0.300	5.00	0	98.2	80	120			
Dissolved Magnesium	4.96	0.300	5.00	0	99.1	80	120			
Dissolved Potassium	4.99	0.300	5.00	0	99.9	80	120			
Dissolved Sodium	4.79	0.300	5.00	0	95.8	80	120			

Sample ID **LCSD-91024** Batch ID: **91024** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS5_190523A** Analysis Date: **5/23/2019 1:18:00 PM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	5.03	0.300	5.00	0	101	80	120	2.51	15	
Dissolved Magnesium	5.02	0.300	5.00	0	100	80	120	1.18	15	
Dissolved Potassium	5.04	0.300	5.00	0	101	80	120	0.963	15	
Dissolved Sodium	4.87	0.300	5.00	0	97.4	80	120	1.67	15	

Sample ID **1905193-01B SD** Batch ID: **91024** TestNo: **SW6020A** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS5_190523A** Analysis Date: **5/23/2019 1:24:00 PM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	87.5	1.50	0	88.0				0.507	10	
Dissolved Magnesium	16.4	1.50	0	16.4				0.349	10	
Dissolved Potassium	23.3	1.50	0	23.4				0.470	10	
Dissolved Sodium	228	1.50	0	223				2.32	10	

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190523A

Sample ID **1905193-01B PDS**	Batch ID: **91024**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **PDS**	Run ID: **ICP-MS5_190523A**	Analysis Date: **5/23/2019 1:40:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	87.4	0.300	5.00	88.0	-11.5	80	120			S
Dissolved Magnesium	19.8	0.300	5.00	16.4	69.0	80	120			S
Dissolved Potassium	27.2	0.300	5.00	23.5	74.6	80	120			S
Dissolved Sodium	214	0.300	5.00	223	-165	80	120			S

Sample ID **1905193-01B MS**	Batch ID: **91024**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS5_190523A**	Analysis Date: **5/23/2019 1:42:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	92.3	0.300	5.00	88.0	86.9	80	120			
Dissolved Magnesium	21.1	0.300	5.00	16.4	94.1	80	120			
Dissolved Potassium	28.6	0.300	5.00	23.5	103	80	120			
Dissolved Sodium	227	0.300	5.00	223	84.7	80	120			

Sample ID **1905193-01B MSD**	Batch ID: **91024**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS5_190523A**	Analysis Date: **5/23/2019 1:45:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	93.0	0.300	5.00	88.0	100	80	120	0.730	15	
Dissolved Magnesium	21.1	0.300	5.00	16.4	94.4	80	120	0.073	15	
Dissolved Potassium	28.8	0.300	5.00	23.5	108	80	120	0.927	15	
Dissolved Sodium	227	0.300	5.00	223	94.1	80	120	0.206	15	

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190523A

Sample ID **ICV-190523**	Batch ID: **R104250**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS5_190523A**	Analysis Date: **5/23/2019 12:59:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	2.48	0.300	2.50	0	99.2	90	110			
Dissolved Magnesium	2.42	0.300	2.50	0	96.6	90	110			
Dissolved Potassium	2.46	0.300	2.50	0	98.5	90	110			
Dissolved Sodium	2.42	0.300	2.50	0	97.0	90	110			

Sample ID **LCVL-190523**	Batch ID: **R104250**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS5_190523A**	Analysis Date: **5/23/2019 1:03:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	0.108	0.300	0.100	0	108	70	130			
Dissolved Magnesium	0.0975	0.300	0.100	0	97.5	70	130			
Dissolved Potassium	0.0918	0.300	0.100	0	91.8	70	130			
Dissolved Sodium	0.0718	0.300	0.100	0	71.8	70	130			

Sample ID **CCV1-190523**	Batch ID: **R104250**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_190523A**	Analysis Date: **5/23/2019 1:56:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	4.86	0.300	5.00	0	97.1	90	110			
Dissolved Magnesium	4.94	0.300	5.00	0	98.9	90	110			
Dissolved Potassium	5.00	0.300	5.00	0	100	90	110			
Dissolved Sodium	4.91	0.300	5.00	0	98.1	90	110			

Sample ID **LCVL1-190523**	Batch ID: **R104250**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS5_190523A**	Analysis Date: **5/23/2019 2:10:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dissolved Calcium	0.0937	0.300	0.100	0	93.7	70	130			
Dissolved Magnesium	0.0967	0.300	0.100	0	96.7	70	130			
Dissolved Potassium	0.0931	0.300	0.100	0	93.1	70	130			
Dissolved Sodium	0.0997	0.300	0.100	0	99.7	70	130			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190521A

The QC data in batch 91011 applies to the following samples: 1905202-01D, 1905202-02D, 1905202-03D, 1905202-04D

Sample ID	**MB-91011**	Batch ID:	**91011**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**IC4_190521A**	Analysis Date:	**5/21/2019 10:15:01 AM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Sulfate	<1.00	3.00								

Sample ID	**LCS-91011**	Batch ID:	**91011**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**IC4_190521A**	Analysis Date:	**5/21/2019 10:31:01 AM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.45	1.00	10.00	0	94.5	90	110			
Sulfate	29.3	3.00	30.00	0	97.7	90	110			

Sample ID	**LCSD-91011**	Batch ID:	**91011**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**IC4_190521A**	Analysis Date:	**5/21/2019 10:47:01 AM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.56	1.00	10.00	0	95.6	90	110	1.08	20	
Sulfate	29.7	3.00	30.00	0	99.0	90	110	1.26	20	

Sample ID	**1905202-01DMS**	Batch ID:	**91011**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC4_190521A**	Analysis Date:	**5/21/2019 12:27:07 PM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	298	10.0	200.0	105.7	96.3	90	110			
Sulfate	1680	30.0	200.0	1545	66.4	90	110			S

Sample ID	**1905202-01DMSD**	Batch ID:	**91011**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC4_190521A**	Analysis Date:	**5/21/2019 12:43:07 PM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	299	10.0	200.0	105.7	96.7	90	110	0.243	20	
Sulfate	1680	30.0	200.0	1545	66.4	90	110	0.002	20	S

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190521A

Sample ID **ICV-190521**	Batch ID: **R104211**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_190521A**	Analysis Date: **5/21/2019 9:43:01 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.5	1.00	25.00	0	98.0	90	110			
Sulfate	74.7	3.00	75.00	0	99.7	90	110			

Sample ID **CCV1-190521**	Batch ID: **R104211**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190521A**	Analysis Date: **5/21/2019 3:55:07 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.62	1.00	10.00	0	96.2	90	110			
Sulfate	29.8	3.00	30.00	0	99.3	90	110			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190522A

The QC data in batch 91034 applies to the following samples: 1905202-01D, 1905202-03D, 1905202-04D

Sample ID	**MB-91034**	Batch ID:	**91034**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**IC4_190522A**	Analysis Date:	**5/22/2019 10:18:00 AM**	Prep Date:	**5/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Sulfate	<1.00	3.00								

Sample ID	**LCS-91034**	Batch ID:	**91034**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**IC4_190522A**	Analysis Date:	**5/22/2019 10:34:00 AM**	Prep Date:	**5/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.64	1.00	10.00	0	96.4	90	110			
Sulfate	29.8	3.00	30.00	0	99.3	90	110			

Sample ID	**LCSD-91034**	Batch ID:	**91034**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**IC4_190522A**	Analysis Date:	**5/22/2019 10:50:00 AM**	Prep Date:	**5/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.65	1.00	10.00	0	96.5	90	110	0.087	20	
Sulfate	30.0	3.00	30.00	0	100	90	110	0.764	20	

Sample ID	**1905202-03DMS**	Batch ID:	**91034**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC4_190522A**	Analysis Date:	**5/22/2019 12:31:56 PM**	Prep Date:	**5/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	221000	10000	200000	22410	99.2	90	110			
Sulfate	453000	30000	200000	255300	98.7	90	110			

Sample ID	**1905202-03DMSD**	Batch ID:	**91034**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC4_190522A**	Analysis Date:	**5/22/2019 12:47:56 PM**	Prep Date:	**5/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	219000	10000	200000	22410	98.3	90	110	0.793	20	
Sulfate	449000	30000	200000	255300	96.9	90	110	0.809	20	

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190522A

Sample ID **ICV-190522**	Batch ID: **R104226**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_190522A**	Analysis Date: **5/22/2019 9:46:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.4	1.00	25.00	0	97.8	90	110			
Sulfate	74.5	3.00	75.00	0	99.4	90	110			

Sample ID **CCV1-190522**	Batch ID: **R104226**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190522A**	Analysis Date: **5/22/2019 2:55:56 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.74	1.00	10.00	0	97.4	90	110			
Sulfate	30.0	3.00	30.00	0	100	90	110			

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190521A

The QC data in batch 91010 applies to the following samples: 1905202-01D, 1905202-02D, 1905202-03D, 1905202-04D

Sample ID **MB-91010**	Batch ID: **91010**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.17**
SampType: **MBLK**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 9:19:00 AM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID **LCS-91010**	Batch ID: **91010**	TestNo: **M2320 B**	Units: **mg/L @ pH 3.91**
SampType: **LCS**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 9:23:00 AM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	54.4	20.0	50.00	0	109	74	129			

Sample ID **LCSD-91010**	Batch ID: **91010**	TestNo: **M2320 B**	Units: **mg/L @ pH 3.97**
SampType: **LCSD**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 9:27:00 AM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	53.6	20.0	50.00	0	107	74	129	1.48	20	

Sample ID **1905205-01C DUP**	Batch ID: **91010**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.53**
SampType: **DUP**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 10:14:00 AM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	267	20.0	0	261.5				2.04	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	267	20.0	0	261.5				2.04	20	

Sample ID **1905229-02B DUP**	Batch ID: **91010**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.53**
SampType: **DUP**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 4:14:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	250	20.0	0	251.0				0.319	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	250	20.0	0	251.0				0.319	20	

Qualifiers:

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

CLIENT: Larson & Associates
Work Order: 1905202
Project: 3 Bear Cottonwood GWM

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190521A

Sample ID **ICV-190521**	Batch ID: **R104203**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.08**
SampType: **ICV**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 9:15:00 AM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	8.08	20.0	0							
Alkalinity, Carbonate (As CaCO3)	96.5	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	105	20.0	100.0	0	105	98	102			S

Sample ID **CCV1-190521**	Batch ID: **R104203**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.14**
SampType: **CCV**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 12:25:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	13.9	20.0	0							
Alkalinity, Carbonate (As CaCO3)	86.6	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	90	110			

Sample ID **CCV2-190521**	Batch ID: **R104203**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.2**
SampType: **CCV**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 4:19:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	16.2	20.0	0							
Alkalinity, Carbonate (As CaCO3)	82.9	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.0	20.0	100.0	0	99.0	90	110			

Sample ID **CCV3-190521**	Batch ID: **R104203**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.08**
SampType: **CCV**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 4:36:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	17.4	20.0	0							
Alkalinity, Carbonate (As CaCO3)	83.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	101	20.0	100.0	0	101	90	110			

Qualifiers:

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