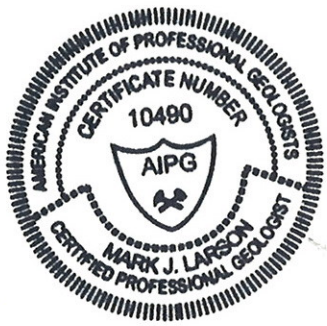
SEMI-ANNUAL
GROUNDWATER MONITORING REPORT
(January and April 2015)
Chamberlain Flow Line Leak and Historical Contamination
#1RP-1-10-2391

LAI Project No. 12-0126-01

June 4, 2015

Prepared for:
Legacy Reserves, L.P.
30 West Wall Street, Suite 1400
Midland, Texas 79701

Prepared by:
Larson & Associates, Inc.
507 North Marienfeld, Suite 205
Midland, Texas 79701



Kimberly Huckaba
Staff Geologist

Mark J. Larson, PG
Certified Professional Geologist No. 10490
President/Geologist

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 EXECUTIVE SUMMARY

This report has been prepared on behalf of Legacy Reserves, L.P. (Legacy) for submittal to the New Mexico Oil Conservation Division (OCD) to present the laboratory analysis of 2015 semi-annual (January and April 2015) groundwater sample resuls from a monitoring well (MW-1) near the Chamberlain Tank Battery (Site). The Site is located in Unit C (NE 1/4, NW 1/4), Section 14, Township 15 South, Range 37 East, in Lea County, New Mexico. The geodetic position is north 33° 01' 16.7" and west 103° 10' 13.6." The surface owner is Angell Ranch Co., LLC.

The following activities occurred during 2015:

- January 28, 2015 - First Quarter Gauging and Groundwater Sampling Event
- April 13, 2015 - Second Quarter Gauging and Groundwater Sampling Event

The following observations are documented in this report:

- BTEX concentrations were below the analytical reporting limit (RL) and the New Mexico Water Quality Control Commission (WQCC) human health standards during the January and April 2015 sampling events;
- Nitrate, chloride, sulfate and TDS were below WQCC human health and domestic water quality standards during the January and April 2015 sampling events.

Legacy will continue groundwater monitoring on a quarterly (4 times per year) schedule. Legacy will notify the OCD at least 48 hours prior to the annual monitoring events, and as soon as possible upon any significant change in analyte concentrations.

2.0 INTRODUCTION

Legacy Reserves, L.P. (Legacy) submits this reportto the New Mexico Oil Conservation Division (OCD) to present quarterly (4 times per year) groundwater monitoring results for a monitoring well (MW-1) located near the Chamberlain Tank Battery (Site), Lea County, New Mexico. This report is for groundwater monitoring performed during January and April 2015. The Site is located in Unit C (NE 1/4, NW 1/4), Section 14, Township 15 South, and Range 37 East, about 20 miles northeast of Lovington, New Mexico. The surface is owned by Angell Ranch Co., LLC. The geodetic position is north 33° 01' 16.7" and west 103° 10' 13.6". Figure 1 presents a location and topographic map. Figure 2 presents an aerial photograph. Figure 3 presents a Site drawing.

2.1 Background

In 2009, while remediating a non-reportable spill from a flow line south of the Site, a Legacy contractor encountered contamination from a historic release. The contractor excavated about 200 cubic yards of soil from the non-reportable spill to a depth of approximately 5 feet below ground surface (bgs).

In May 2010 Legacy retained Basin Environmental Consulting, LLC (Basin), located in Lovington, New Mexico, to investigate the historic contamination. Among other things Basin collected soil samples from five (5) exploratory trenches (main, east, west, north and south) and six (6) borings (SB-1 through SB-6). The trenches were excavated with a track hoe between approximately 3.5 (north) and 18 (main, west, south and east) feet bgs. On January 7, 2010, Legacy submitted the initial C-141 to the OCD District 1 office located in Hobbs, New Mexico. The OCD assigned remediation project number 1RP-2391 to the historic release.

Between April 2012 and September 2013, Larson & Associates, Inc (LAI) supervised excavation of additional soil, collected soil samples from 9 borings (BH-1 through BH-9) and installed 1 monitoring well (MW-1) about 100 feet southeast (down gradient) of the Site. Groundwater was encountered at approximately 65 feet bgs. Laboratory results from the initial groundwater sample collected on June 11, 2013 reported chloride and total dissolved solids (TDS) at 263 milligrams per liter (mg/L) and 1,180 mg/L, respectively. The OCD requested groundwater monitoring for 8 quarters (2 years) commencing in December 2013.

LAI supervised closure of the excavation during September 2013 including installing a 20 mil polyethylene (geomembrane) liner in the bottom of the excavation, approximately 38,000 square feet, and filling with approximately 10,308 cubic yards of clean soil. The surface will be seeded when adequate moisture is available, as determined by the landowner. A final report was submitted to the OCD on March 3, 2014 ("Excavation Closure Report, Chamberlain Flow Line and Historic Contamination, 1RP-10-1-2391") that included laboratory results of groundwater samples collected from the monitoring well on June 11, 2013 and December 26, 2013. The excavation closure and laboratory results of groundwater samples was documented in a report titled, *"Excavation Closure Report, Chamberlain Flow Line and Historic Contamination, #1RP1-10-2391, March 3, 2014".*

2.2 Setting

The surface elevation is approximately 3,791 feet above mean sea level (MSL) and slopes gently to the southeast. The soil is designated as "Kimbrough gravelly loam, 0 to 3 percent slopes (Kg)" which occurs on upland areas known locally as "scabland." The soil has a surface layer approximately 6 inches thick of dark grayish brown gravelly loam which is underlain by indurated caliche. The unit is comprised of approximately 85% Kimbrough soil with the remainder being Lea, Sharvana, Stegall and Slaughter soils.

The soil is too shallow for cropland therefore its main use is range and wildlife habitat. A well used for livestock watering is located about 1,600 feet southeast of the Site.

The Site is underlain by a thin layer of silty clay (loam) which is underlain by a resilient layer of caliche or caprock. The caliche is a hard, erosion resistant, pedogenic calcrete that between approximately 25 and 30 feet thick. The caliche grades into the Pliocene to Miocene-age Ogallala formation which is comprised of fluvial sand, silt, clay and localized gravel, with indistinct to massive crossbeds. The Ogallala sand is generally fine- to medium-grained quartz. The Ogallala formation is underlain by shale of the Triassic-age Chile formation of the Dockum Group.

Groundwater occurs in the Ogallala formation at approximately 63 feet bgs. The Triassic-age Chinle formation is the lower confining unit for the Ogallala formation and occurs at a depth of approximately 120 feet bgs according to records from the New Mexico Office of the State Engineer (OSE). The regional groundwater flow direction is to the southeast (Nativ, 1988).

3.0 GROUNDWATER SAMPLES AND LABORATORY ANALYSIS

On January 28, 2015 and April 13, 2015, groundwater samples were collected from the monitoring well during the first (1st) and second (2nd) quarterly event monitoring events, respectively. On January 28, 2015, groundwater was gauged in well MW-1 at 66.19 feet below top of casing (TOC) or about 63.41 feet bgs. On April 13, 2015, groundwater was gauged in well MW-1 at 67.25 feet below top of casing (TOC) or about 64.47 feet bgs. The groundwater samples were collected after removing approximately three (3) well volumes of groundwater or purging dry with dedicated disposable polyethylene bailers. The samples were 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 the laboratory. DHL Analytical, Inc. (DHL), a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory, located in Round Rock, Texas, analyzed samples from the first quarter sampling event. Permian Basin Environmental Laboratoy, located in Midland, Texas, analyzed samples during the second quarter sampling event. Cation analysis during the second quarter sampling event was subcontracted to Test America. All metals samples were filtered by the laboratory to exclude particles larger than 0.45µ and acidified with nitric acid within 24-hours of collection. Samples for benzene, toluene, ethylbenzene, xylene (BTEX) were analyzed by EPA Sw-846 ethod 8021B, filtered metals (calcium, magnesium, potassium, sodium) by EPA SW-846 ethod6020A, chloride, nitrate and sulfate by method E300, alkalinity,by method M2320B and total dissolved solids (TDS) by method M2540C. Purge water was contained in a portable tank and discharged to the Facility's process water system for disposal in a permitted Class II injection well. Table 1 presents monitoring well completion and gauging summary. Table 2 presents the laboratory organic analytical data summary. Table 3 presents the laboratory inorganic analytical data summary. Appendix A presents the laboratory reports.

3.1 Organic Analysis

All BTEX values were below the analytical test method detection limits or New Mexico Water Quality Control Commission (WQCC) human health standards during the first and second 2015 quarterly monitoring events. Case narrative was indicated at slightly below control limits for benzene and toluene in the matrix spike duplicate recovery. Also three compounds had RPD slightly above control limits for the matrix spike and matrix spike duplicate. All samples in the case narrative were flagged accordingly in the QC summary report. No further corrective actions were taken by DHL. No data quality exceptions were noted by PBELAB.

3.2 Inorganic Analysis

Chloride decreased from 263 mg/L (June 11, 2013) to 133 mg/L (January 28, 2015) and 148 mg/L (April 13, 2015). The TDS concentration decreased from 1,180 mg/L (June 11, 2013) to 672 mg/L (January 28, 2015) and 728 mg/L (April 13, 2015). The chloride and TDS concentrations are below the WQCC domestic water quality standards of 250 mg/L (chloride) and 1,000 mg/L (TDS). Nitrate and sulfate were below the WQCC human health and domestic water quality standards of 10 mg/L and 600 mg/L, respectively. The remaining inorganic constituents were within the range expected for the groundwater.

Case narrative was indicated for three analytes for the matrix spike recovery was slightly below the method control limits. These were flagged in the QC summary report however, the LCS was within control limits for these analytes and no further corrective actions were taken. Also the metal analysis on sample LCVL was slightly above control limits for sodium. Associated CCV sample was within control limits. All samples in the case narrative were flagged accordingly in the QC summary report. No further corrective actions were taken by DHL.

No data quality exceptions were noted in the DHL case narratives for chloride, sulfate, TDS, and nitrate. PBELAB noted nitrate was above the QC limits during the second quarter sampling event.

4.0 CONCLUSIONS

The following observations are documented in this report:

- BTEX was not reported above the RL or WQCC human health standards during the January and April 2015 sampling events;
- Chloride, nitrate, sulfate and TDS were below the WQCC humans health (nitrate) and domestic water quality (chloride, sulfate and TDS) water quality standards during the January and April 2015 sampling events;

5.0 RECOMMENDATIONS

Legacy will continue quarterly groundwater monitoring on a quarterly (4 times per year) schedule.. During each event groundwater samples will be collected as stated earlier and analyzed for BTEX, anions (sodium, magnesium, calcium), anions (sulfate, chloride, alkalinity), nitrate and TDS. The groundwater sample results will be submitted to the OCD in semi-annual (twice yearly) reports. Notice will be provided to the OCD in Hobbs and Santa Fe, New Mexico, at least 48 hours prior to each event.

TABLES

Table 1
Monitoring Well Drilling and Completion Summary
Legacy Reserves, L.P., Chamberlin Site , 1RP-2391
Lea County, New Mexico

Well Information									Groundwater Data	
Well ID	Date Drilled	Drilled Depth (feet bgs)	Well Depth (feet TOC)	Well Diameter (inches)	Surface Elevation	Screen Interval (feet bgs)	Casing Stickup (feet)	TOC Elevation	Date Gauged	Depth to Water (TOC)
MW-1	6/10/2013	75.42	78.40	2	--	54.77 - 74.72	2.78	--	06/10/2013	65.82
									06/11/2013	65.85
									12/26/2013	--
									03/11/2014	66.34
									11/17/2014	65.98
									12/11/2014	--
									1/28/2015	66.19
									4/13/2015	67.25

Notes: Monitoring well drilled using air rotary rig by Scarborough Drilling, Inc., Lamesa, Texas and constructed with 2-inch threaded schedule 40 PVC casing and screen
All values are in feet, unless otherwise noted.
bgs - below ground surface
TOC - top of casing
--: No data available

Table 2
Groundwater Organic Analytical Data Summary
Legacy Reserves, L.P., Chamberlin Site, 1RP-2391
Lea County, New Mexico

Sample ID	Date	Benzene	Toluene	Ethylbenzene	Xylene
WQCC Limit:		**0.01**	**0.75**	**0.75**	**0.62**
MW-1	1/28/2015	<0.002	<0.006	<0.006	**0.00368**
	4/13/2015	<0.001	<0.001	<0.001	<0.003

Notes: Analysis performed by DHL Analytical, Round Rock, Texas (January 28, 2015) and Permian Basin Environmental Lab, Midland, Texas (April 13, 2015).

Analysis performed by EPA SW 848 Method 8021B

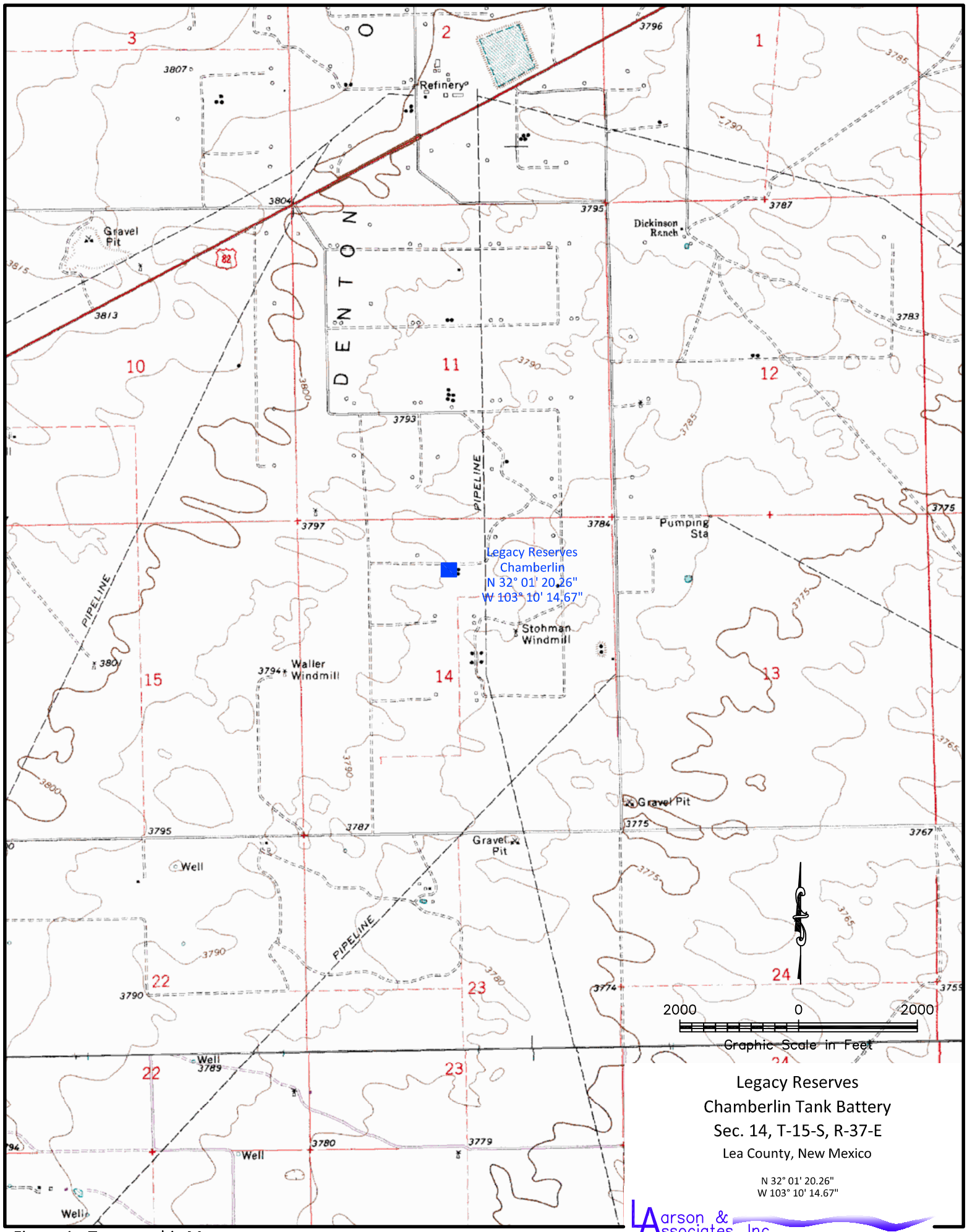
All values except pH reported in milligrams per Liter (mg/L) equivelent to parts per million (ppm).

Table 3
Groundwater Inorganic Analytical Data Summary
Legacy Reserves, L.P., Chamberlin Site, 1RP-2391
Lea County, New Mexico

Sample ID	Date	Alkalinity (mg/L)	Chloride (mg/L)	Nitrate - N (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)
WQCC Limit:			**250**	**10**	**1,000**	**600**				
MW-1	06/11/2013	272	263	8.53	1,180	206	94	230	7.20	51
	1/28/2015	330	133	1.71	672	78.8	309	14.1	3.02	226
	4/13/2015	190	148	1.80	728	74.8	52.0	9.20	2.60	200

Notes: Analysis performed by DHL Analytical, Round Rock, Texas (January 28, 2015) and Permian Basin Environmental Lab, Midland, Texas (April 13, 2015) accoring to EPA methods.

FIGURES



Legacy Reserves
Chamberlin Tank Battery
Sec. 14, T-15-S, R-37-E
Lea County, New Mexico

N 32° 01' 20.26"
W 103° 10' 14.67"

Larson & Associates, Inc.
Environmental Consultants

Figure 1 - Topographic Map

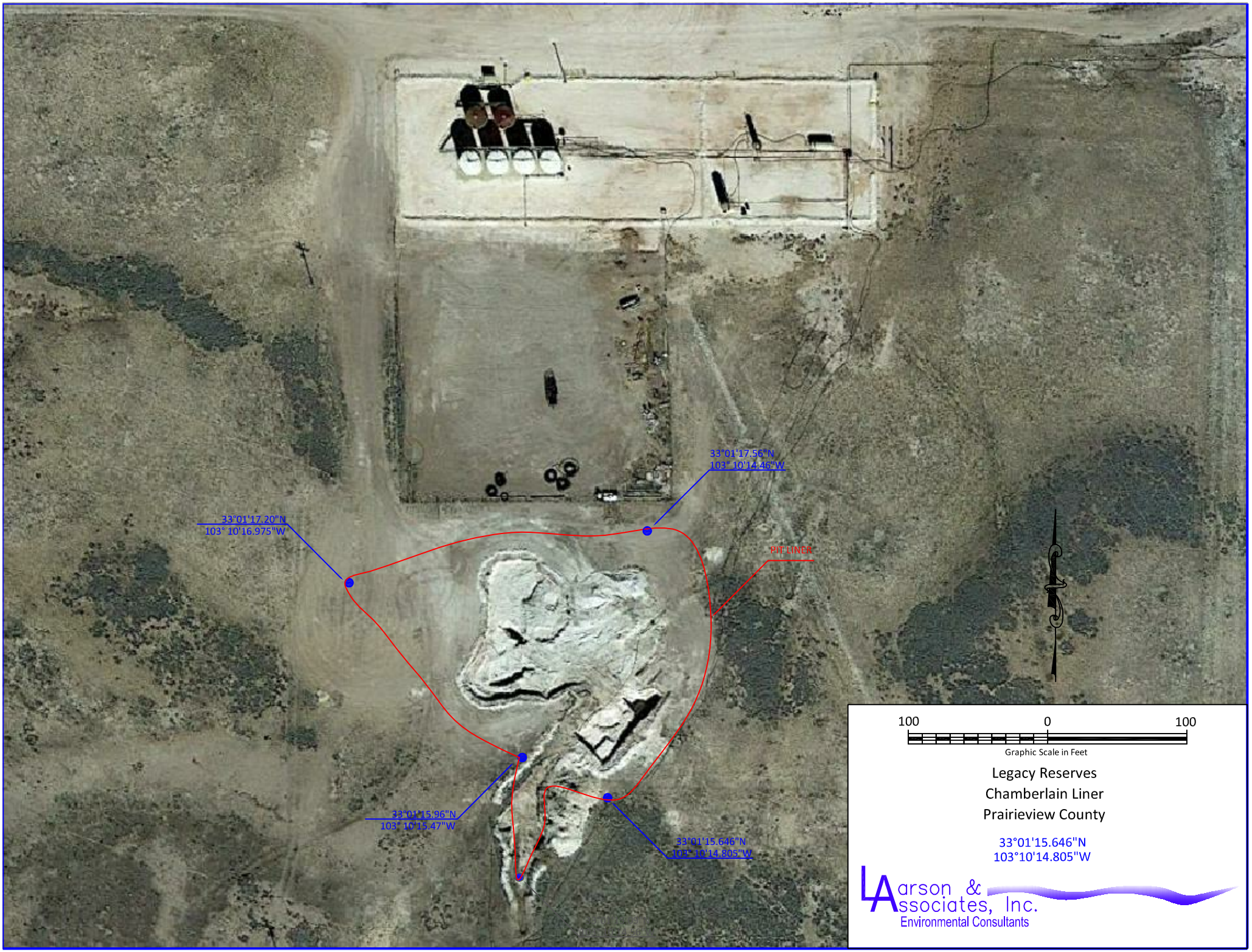


Figure 2- Aerial

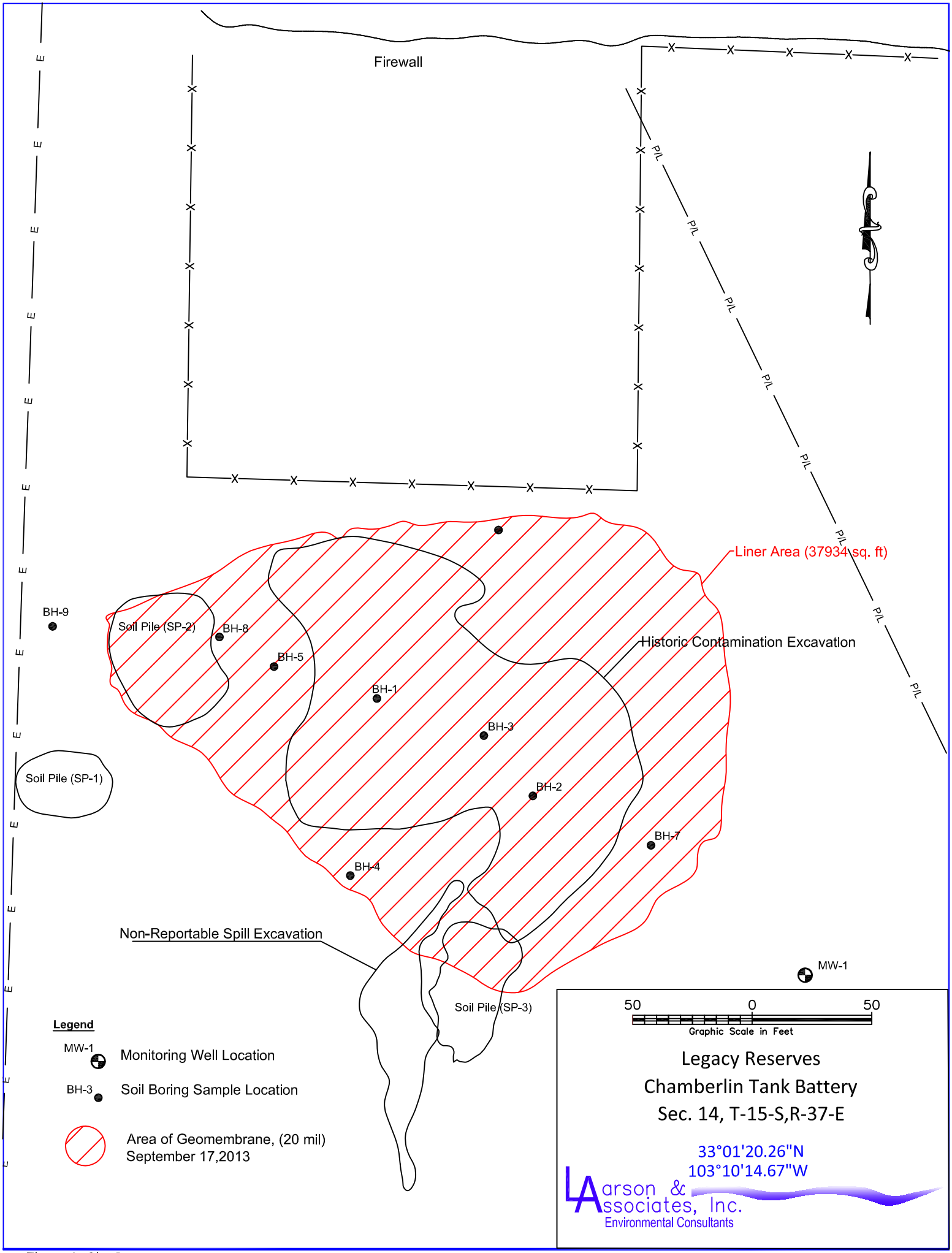


Figure 3- Site Drawing

APPENDIX A

LABORATORY ANALYTICAL REPORTS
AND
CHAIN OF CUSTODY DOCUMENTATION

February 05, 2015

Coty Woolf
Larson & Associates
507 N. Marienfeld #200
Midland, TX 79701
TEL: (432) 687-0901
FAX (432) 687-0456

Order No.: 1501282

RE: Legacy Chamberlain

Dear Coty Woolf:

DHL Analytical, Inc. received 1 sample(s) on 1/29/2015 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAC except where noted in the Case Narrative. All non-NELAC 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: T104704211-14-13

Table of Contents

DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 66477

CHAIN-OF-CUSTODY

CLIENT: Larson and Associates
ADDRESS: 507 N. Marienfeld Ste. 205 Midland, TX 79701
PHONE: (432) 687-0901 FAX/E-MAIL:
DATA REPORTED TO: Mark Larson
ADDITIONAL REPORT COPIES TO: Cory Wolf

DATE: 1/28/2015 PAGE 1 OF 1
PO #: DHL WORK ORDER #: 1501282
PROJECT LOCATION OR NAME: [redacted] Chamberlin
CLENT PROJECT #: 12-01 [redacted] COLLECTOR: Sarah Shirley

Authorize 5% surcharge for TRRP Report? ☐ Yes ☒ No

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR O=OTHER
L=LIQUID SO=SOLID

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
MW-1	01	1/28/15	12:00	W	Poly	1		X				BTEX ☒ MTBE ☐ (METHOD 8021) TPH 1005 ☐ TPH 1006 ☐ HOLD 1006 ☐ GRO (METHOD 8015) ☐ DRO (METHOD 8015) ☐ VOC 8260 ☐ VOC 624 ☐ VOC 8260/5035 ☐ SVOC 8270 ☐ PAH 8270 ☐ HOLD PAH ☐ SVOC 625 ☐ 8081 PEST ☐ 608 PEST/PCB ☐ 8270 PEST ☐ 8270 O-P PEST ☐ 608 PEST/PCB ☐ 8270 PCB ☐ 8321 HERB ☐ 8330 EXPL ☐ PERCHLORATE ☐ METALS 6020 ☐ METALS 200.8 ☐ DISS. METALS ☐ RCRA ☐ TX11 ☐ PH ☐ HEX CHROM ☐ ALKALINITY ☒ CHLORIDE ☒ ANIONS ☐ TCLP-SVOC ☐ VOC ☐ PEST ☐ HERB ☐ TCLP-METALS ☐ RCRA 8 ☐ TX-11 ☐ Pb ☐ RCI ☐ TOX ☐ FLASHPOINT ☐ TDS ☒ TSS ☐ % MOISTURE ☐ CYANIDE ☐ NO5 SO4 Ca, Na, K, Mg ☒	
"					↓	1				X			
"					VOA	3	X					X	

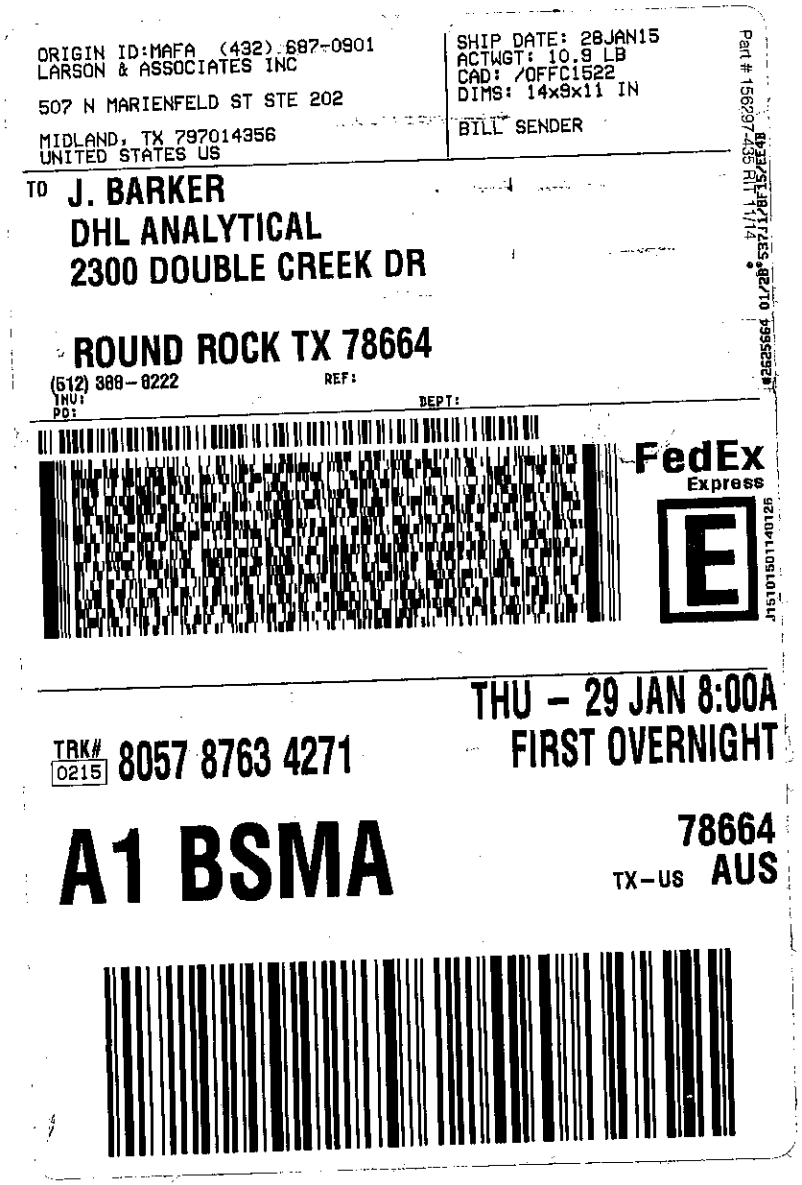
TOTAL

RELINQUISHED BY: (Signature) DATE/TIME 1/28/2015 5:00PM RECEIVED BY: (Signature) Fedex
RELINQUISHED BY: (Signature) DATE/TIME 1/29/15 833 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

☐ DHL DISPOSAL @ $5.00 each ☐ Return 3

TURN AROUND TIME
RUSH ☐ CALL FIRST
1 DAY ☐ CALL FIRST
2 DAY ☐
NORMAL ☐
OTHER ☐ _____

LABORATORY USE ONLY:
RECEIVING TEMP: 0.6 THERM #: 57
CUSTODY SEALS: ☐ BROKEN ☐ INTACT ☒ NOT USED
☐ CARRIER BILL #: Fedex
☐ APC DELIVERY
☐ HAND DELIVERED


ORIGIN ID:MAFA (432) 687-0901
LARSON & ASSOCIATES INC
507 N MARIENFELD ST STE 202
MIDLAND, TX 797014356
UNITED STATES US

SHIP DATE: 28JAN15
ACTWGT: 10.9 LB
CAD: /OFFC1522
DIMS: 14x9x11 IN
BILL SENDER

Part # 156297-435 RIT 11/14

TO J. BARKER
DHL ANALYTICAL
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664
(512) 388-8222 REF:
INV: DEPT:
PO:

FedEx Express

THU - 29 JAN 8:00A
FIRST OVERNIGHT

TRK# 0215 8057 8763 4271

A1 BSMA

78664
TX-US AUS

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name **Larson & Associates** Date Received: **1/29/2015**

Work Order Number **1501282** Received by **JB**

Checklist completed by: Signature 1/29/2015 Date Reviewed by SS Initials 1/29/2015 Date

Carrier name FedEx 1day

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 ☐	**0.6** °C
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 8086
	Adjusted? NO		Checked by
Water - ph>9 (S) or ph>12 (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 _____

DHL Analytical, Inc. **Date:** *05-Feb-15*

CLIENT: Larson & Associates
Project: Legacy Chamberlain
Lab Order: 1501282

CASE NARRATIVE

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

Method SW8021B - Volatile Organics by GC Analysis
Method SW6020A - Metals Analysis
Method E300 - Anions Analysis
Method M2320 B - Alkalinity Analysis
Method M2540C - TDS Analysis

LOG IN

The sample was received and log-in performed on 1/29/15. A total of 1 sample was received. The Time of Collection was Mountain Standard Time. The sample arrived in good condition and was properly packaged.

METALS ANALYSIS

For Metals analysis performed on 2/1/15 the matrix spike and matrix spike duplicate recoveries were below control limits for three analytes. These are flagged accordingly in the QC summary report. The reference sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

For Metals analysis performed on 2/2/15 LCVL8-150202 was above control limits for Sodium. This is flagged accordingly. The associated CCV8-150202 was within control limits for this analyte. No further corrective actions were taken.

ANIONS ANALYSIS

For Anions analysis performed on 1/29/15 the matrix spike recovery was slightly below control limits for Nitrate-N. This is flagged accordingly in the QC summary report. The reference sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

DHL Analytical, Inc.

Date: *05-Feb-15*

CLIENT: Larson & Associates
Project: Legacy Chamberlain
Lab Order: 1501282

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1501282-01	MW-1		01/28/15 12:00 PM	1/29/2015

Lab Order: 1501282
Client: Larson & Associates
Project: Legacy Chamberlain

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1501282-01A	MW-1	01/28/15 12:00 PM	Aqueous	SW5030C	Purge and Trap Water GC	01/29/15 10:08 AM	67975
1501282-01B	MW-1	01/28/15 12:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	01/30/15 08:42 AM	67999
	MW-1	01/28/15 12:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	01/30/15 08:42 AM	67999
1501282-01C	MW-1	01/28/15 12:00 PM	Aqueous	M2320 B	Alkalinity Preparation	02/02/15 09:34 AM	68041
	MW-1	01/28/15 12:00 PM	Aqueous	E300	Anion Preparation	01/29/15 12:45 PM	67992
	MW-1	01/28/15 12:00 PM	Aqueous	E300	Anion Preparation	01/29/15 12:45 PM	67992
	MW-1	01/28/15 12:00 PM	Aqueous	M2540C	TDS Preparation	01/29/15 09:44 AM	67984

Lab Order: 1501282
Client: Larson & Associates
Project: Legacy Chamberlain

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1501282-01A	MW-1	Aqueous	SW8021B	Volatile Organics by GC	67975	1	01/29/15 12:51 PM	GC8_150129A
1501282-01B	MW-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	67999	1	02/02/15 05:05 PM	ICP-MS4_150202E
	MW-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	67999	50	02/01/15 05:50 PM	ICP-MS4_150201C
1501282-01C	MW-1	Aqueous	M2320 B	Alkalinity	68041	1	02/02/15 10:37 AM	TITRATOR_150202B
	MW-1	Aqueous	E300	Anions by IC method - Water	67992	10	01/29/15 04:33 PM	IC_150129A
	MW-1	Aqueous	E300	Anions by IC method - Water	67992	1	01/29/15 02:40 PM	IC_150129A
	MW-1	Aqueous	M2540C	Total Dissolved Solids	67984	1	01/30/15 08:30 AM	WC_150129A

DHL Analytical, Inc.

Date: *05-Feb-15*

CLIENT:	Larson & Associates	**Client Sample ID:**	MW-1
Project:	Legacy Chamberlain	**Lab ID:**	1501282-01
Project No:	12-0126-01	**Collection Date:**	01/28/15 12:00 PM
Lab Order:	1501282	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC		**SW8021B**					Analyst: **LM**
Benzene	ND	0.000800	0.00200		mg/L	1	01/29/15 12:51 PM
Ethylbenzene	ND	0.00200	0.00600		mg/L	1	01/29/15 12:51 PM
Toluene	ND	0.00200	0.00600		mg/L	1	01/29/15 12:51 PM
Xylenes, Total	0.00368	0.00300	0.00900	J	mg/L	1	01/29/15 12:51 PM
Surr: a,a,a-Trifluorotoluene	100	0	87-113		%REC	1	01/29/15 12:51 PM
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Calcium	309	5.00	15.0		mg/L	50	02/01/15 05:50 PM
Magnesium	14.1	5.00	15.0	J	mg/L	50	02/01/15 05:50 PM
Potassium	3.02	0.100	0.300		mg/L	1	02/02/15 05:05 PM
Sodium	226	5.00	15.0		mg/L	50	02/01/15 05:50 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **AV**
Chloride	133	3.00	10.0		mg/L	10	01/29/15 04:33 PM
Nitrate-N	1.71	0.100	0.500		mg/L	1	01/29/15 02:40 PM
Sulfate	78.8	1.00	3.00		mg/L	1	01/29/15 02:40 PM
ALKALINITY		**M2320 B**					Analyst: **LM**
Alkalinity, Bicarbonate (As CaCO3)	330	10.0	20.0		mg/L @ pH 4.53	1	02/02/15 10:37 AM
Alkalinity, Carbonate (As CaCO3)	ND	10.0	20.0		mg/L @ pH 4.53	1	02/02/15 10:37 AM
Alkalinity, Hydroxide (As CaCO3)	ND	10.0	20.0		mg/L @ pH 4.53	1	02/02/15 10:37 AM
Alkalinity, Total (As CaCO3)	330	20.0	20.0		mg/L @ pH 4.53	1	02/02/15 10:37 AM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **PT**
Total Dissolved Solids (Residue, Filterable)	672	10.0	10.0		mg/L	1	01/30/15 08:30 AM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	B	Analyte detected in the associated Method Blank
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 NELAC certified		

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: GC8_150129A

The QC data in batch 67975 applies to the following samples: 1501282-01A

Sample ID **LCS-67975**	Batch ID: **67975**	TestNo: **SW8021B**	Units: **mg/L**
SampType: **LCS**	Run ID: **GC8_150129A**	Analysis Date: **1/29/2015 10:08:36 AM**	Prep Date: **1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0447	0.00200	0.0464	0	96.2	81	125			
Toluene	0.0451	0.00600	0.0464	0	97.1	84	123			
Ethylbenzene	0.0451	0.00600	0.0464	0	97.2	83	119			
Xylenes, Total	0.137	0.00900	0.139	0	98.2	81	117			
Surr: a,a,a-Trifluorotoluene	202		200.0		101	87	113			

Sample ID **MB-67975**	Batch ID: **67975**	TestNo: **SW8021B**	Units: **mg/L**
SampType: **MBLK**	Run ID: **GC8_150129A**	Analysis Date: **1/29/2015 10:29:54 AM**	Prep Date: **1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.00200								
Toluene	ND	0.00600								
Ethylbenzene	ND	0.00600								
Xylenes, Total	ND	0.00900								
Surr: a,a,a-Trifluorotoluene	201		200.0		101	87	113			

Sample ID **1501253-02AMS**	Batch ID: **67975**	TestNo: **SW8021B**	Units: **mg/L**
SampType: **MS**	Run ID: **GC8_150129A**	Analysis Date: **1/29/2015 2:49:24 PM**	Prep Date: **1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	5.13	0.200	4.64	0.158	107	81	125			
Toluene	14.1	0.600	4.64	8.98	110	84	123			
Ethylbenzene	6.15	0.600	4.64	0.802	115	83	119			
Xylenes, Total	19.4	0.900	13.9	3.64	113	81	117			
Surr: a,a,a-Trifluorotoluene	20100		20000		101	87	113			

Sample ID **1501253-02AMSD**	Batch ID: **67975**	TestNo: **SW8021B**	Units: **mg/L**
SampType: **MSD**	Run ID: **GC8_150129A**	Analysis Date: **1/29/2015 3:11:02 PM**	Prep Date: **1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	5.07	0.200	4.64	0.158	106	81	125	1.12	20	
Toluene	14.0	0.600	4.64	8.98	109	84	123	0.316	20	
Ethylbenzene	5.96	0.600	4.64	0.802	111	83	119	3.15	20	
Xylenes, Total	19.6	0.900	13.9	3.64	114	81	117	0.909	20	
Surr: a,a,a-Trifluorotoluene	19900		20000		99.5	87	113	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: GC8_150129A

Sample ID **ICV-150129**	Batch ID: **R77806**	TestNo: **SW8021B**	Units: **mg/L**
SampType: **ICV**	Run ID: **GC8_150129A**	Analysis Date: **1/29/2015 9:47:01 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0882	0.00200	0.0928	0	95.0	80	120			
Toluene	0.0883	0.00600	0.0928	0	95.1	80	120			
Ethylbenzene	0.0897	0.00600	0.0928	0	96.7	80	120			
Xylenes, Total	0.271	0.00900	0.278	0	97.5	80	120			
Surr: a,a,a-Trifluorotoluene	201		200.0		101	87	113			

Sample ID **CCV1-150129**	Batch ID: **R77806**	TestNo: **SW8021B**	Units: **mg/L**
SampType: **CCV**	Run ID: **GC8_150129A**	Analysis Date: **1/29/2015 3:53:46 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0453	0.00200	0.0464	0	97.7	80	120			
Toluene	0.0466	0.00600	0.0464	0	101	80	120			
Ethylbenzene	0.0464	0.00600	0.0464	0	99.9	80	120			
Xylenes, Total	0.141	0.00900	0.139	0	101	80	120			
Surr: a,a,a-Trifluorotoluene	199		200.0		99.7	87	113			

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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_150201C**

The QC data in batch 67999 applies to the following samples: 1501282-01B

Sample ID	**MB-67999**	Batch ID:	**67999**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**ICP-MS4_150201C**	Analysis Date:	**2/1/2015 5:20:00 PM**	Prep Date:	**1/30/2015**

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

Sample ID	**LCS-67999**	Batch ID:	**67999**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**ICP-MS4_150201C**	Analysis Date:	**2/1/2015 5:31:00 PM**	Prep Date:	**1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.09	0.300	5.00	0	102	80	120			
Magnesium	5.04	0.300	5.00	0	101	80	120			
Potassium	4.97	0.300	5.00	0	99.5	80	120			
Sodium	5.08	0.300	5.00	0	102	80	120			

Sample ID	**LCSD-67999**	Batch ID:	**67999**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**ICP-MS4_150201C**	Analysis Date:	**2/1/2015 5:38:00 PM**	Prep Date:	**1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.14	0.300	5.00	0	103	80	120	0.978	15	
Magnesium	5.09	0.300	5.00	0	102	80	120	0.996	15	
Potassium	4.98	0.300	5.00	0	99.5	80	120	0.059	15	
Sodium	5.14	0.300	5.00	0	103	80	120	1.15	15	

Sample ID	**1501203-02C SD**	Batch ID:	**67999**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**SD**	Run ID:	**ICP-MS4_150201C**	Analysis Date:	**2/1/2015 5:44:00 PM**	Prep Date:	**1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	2.19	1.50	0	2.23				1.53	10	

Sample ID	**1501203-02C PDS**	Batch ID:	**67999**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**PDS**	Run ID:	**ICP-MS4_150201C**	Analysis Date:	**2/1/2015 6:04:00 PM**	Prep Date:	**1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	7.66	0.300	5.00	2.23	109	80	120			

Sample ID	**1501203-02C MS**	Batch ID:	**67999**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**ICP-MS4_150201C**	Analysis Date:	**2/1/2015 6:06:00 PM**	Prep Date:	**1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	175	0.300	5.00	173	54.0	80	120			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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_150201C

Sample ID **1501203-02C MS**	Batch ID: **67999**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS4_150201C**	Analysis Date: **2/1/2015 6:06:00 PM**	Prep Date: **1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	43.1	0.300	5.00	39.4	74.1	80	120			S
Potassium	7.11	0.300	5.00	2.23	97.6	80	120			
Sodium	61.7	0.300	5.00	57.9	76.1	80	120			S

Sample ID **1501203-02C MSD**	Batch ID: **67999**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS4_150201C**	Analysis Date: **2/1/2015 6:08:00 PM**	Prep Date: **1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	175	0.300	5.00	173	56.4	80	120	0.069	15	S
Magnesium	42.9	0.300	5.00	39.4	70.0	80	120	0.475	15	S
Potassium	7.13	0.300	5.00	2.23	98.1	80	120	0.309	15	
Sodium	61.2	0.300	5.00	57.9	65.9	80	120	0.828	15	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_150201C

Sample ID **ICV-150201**	Batch ID: **R77824**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_150201C**	Analysis Date: **2/1/2015 3:32:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	2.49	0.300	2.50	0	99.6	90	110			
Magnesium	2.64	0.300	2.50	0	106	90	110			
Potassium	2.62	0.300	2.50	0	105	90	110			
Sodium	2.64	0.300	2.50	0	106	90	110			

Sample ID **LCVL-150201**	Batch ID: **R77824**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_150201C**	Analysis Date: **2/1/2015 3:37:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0974	0.300	0.100	0	97.4	70	130			
Magnesium	0.102	0.300	0.100	0	102	70	130			
Potassium	0.111	0.300	0.100	0	111	70	130			
Sodium	0.107	0.300	0.100	0	107	70	130			

Sample ID **CCV2-150201**	Batch ID: **R77824**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_150201C**	Analysis Date: **2/1/2015 5:09:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.12	0.300	5.00	0	102	90	110			
Magnesium	5.19	0.300	5.00	0	104	90	110			
Potassium	5.16	0.300	5.00	0	103	90	110			
Sodium	5.26	0.300	5.00	0	105	90	110			

Sample ID **LCVL2-150201**	Batch ID: **R77824**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_150201C**	Analysis Date: **2/1/2015 5:15:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.113	0.300	0.100	0	113	70	130			
Magnesium	0.101	0.300	0.100	0	101	70	130			
Potassium	0.104	0.300	0.100	0	104	70	130			
Sodium	0.114	0.300	0.100	0	114	70	130			

Sample ID **CCV3-150201**	Batch ID: **R77824**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_150201C**	Analysis Date: **2/1/2015 6:10:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.10	0.300	5.00	0	102	90	110			
Magnesium	5.19	0.300	5.00	0	104	90	110			
Potassium	5.15	0.300	5.00	0	103	90	110			
Sodium	5.24	0.300	5.00	0	105	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_150201C

Sample ID **LCVL3-150201** Batch ID: **R77824** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCVL** Run ID: **ICP-MS4_150201C** Analysis Date: **2/1/2015 6:14:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.100	0.300	0.100	0	100	70	130			
Magnesium	0.102	0.300	0.100	0	102	70	130			
Potassium	0.0946	0.300	0.100	0	94.6	70	130			
Sodium	0.122	0.300	0.100	0	122	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_150202E**

The QC data in batch 67999 applies to the following samples: 1501282-01B

Sample ID **1501203-02C SD** Batch ID: **67999** TestNo: **SW6020A** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS4_150202E** Analysis Date: **2/2/2015 4:57:00 PM** Prep Date: **1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	168	15.0	0	168				0.453	10	
Magnesium	40.0	15.0	0	39.8				0.432	10	
Sodium	58.0	15.0	0	57.6				0.686	10	

Sample ID **1501203-02C PDS** Batch ID: **67999** TestNo: **SW6020A** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS4_150202E** Analysis Date: **2/2/2015 4:59:00 PM** Prep Date: **1/30/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	219	3.00	50.0	168	102	80	120			
Magnesium	95.3	3.00	50.0	39.8	111	80	120			
Sodium	114	3.00	50.0	57.6	112	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 NELAC certified

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_150202E

Sample ID **ICV-150202**	Batch ID: **R77850**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_150202E**	Analysis Date: **2/2/2015 10:45:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	2.48	0.300	2.50	0	99.1	90	110			
Magnesium	2.64	0.300	2.50	0	106	90	110			
Sodium	2.62	0.300	2.50	0	105	90	110			

Sample ID **LCVL-150202**	Batch ID: **R77850**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_150202E**	Analysis Date: **2/2/2015 10:49:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0923	0.300	0.100	0	92.3	70	130			
Magnesium	0.101	0.300	0.100	0	101	70	130			
Sodium	0.100	0.300	0.100	0	100	70	130			

Sample ID **CCV7-150202**	Batch ID: **R77850**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_150202E**	Analysis Date: **2/2/2015 4:34:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.81	0.300	5.00	0	96.2	90	110			
Magnesium	5.00	0.300	5.00	0	99.9	90	110			
Sodium	4.96	0.300	5.00	0	99.3	90	110			

Sample ID **LCVL7-150202**	Batch ID: **R77850**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_150202E**	Analysis Date: **2/2/2015 4:38:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0991	0.300	0.100	0	99.1	70	130			
Magnesium	0.0997	0.300	0.100	0	99.7	70	130			
Sodium	0.101	0.300	0.100	0	101	70	130			

Sample ID **CCV8-150202**	Batch ID: **R77850**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_150202E**	Analysis Date: **2/2/2015 5:20:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.78	0.300	5.00	0	95.5	90	110			
Magnesium	4.93	0.300	5.00	0	98.6	90	110			
Sodium	4.97	0.300	5.00	0	99.3	90	110			

Sample ID **LCVL8-150202**	Batch ID: **R77850**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_150202E**	Analysis Date: **2/2/2015 5:31:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.103	0.300	0.100	0	103	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_150202E

Sample ID **LCVL8-150202**	Batch ID: **R77850**	TestNo: **SW6020A**	Units: **mg/L**		
SampType: **LCVL**	Run ID: **ICP-MS4_150202E**	Analysis Date: **2/2/2015 5:31:00 PM**	Prep Date:		

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	0.0985	0.300	0.100	0	98.5	70	130			
Sodium	0.148	0.300	0.100	0	148	70	130			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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: IC_150129A

The QC data in batch 67992 applies to the following samples: 1501282-01C

Sample ID	**MB-67992**	Batch ID:	**67992**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**IC_150129A**	Analysis Date:	**1/29/2015 1:55:22 PM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.00								
Nitrate-N	ND	0.500								
Sulfate	ND	3.00								

Sample ID	**LCS-67992**	Batch ID:	**67992**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**IC_150129A**	Analysis Date:	**1/29/2015 2:09:58 PM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.78	1.00	10.00	0	97.8	90	110			
Nitrate-N	4.90	0.500	5.000	0	97.9	90	110			
Sulfate	29.4	3.00	30.00	0	98.0	90	110			

Sample ID	**LCSD-67992**	Batch ID:	**67992**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**IC_150129A**	Analysis Date:	**1/29/2015 2:24:35 PM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.4	1.00	10.00	0	104	90	110	5.72	20	
Nitrate-N	4.87	0.500	5.000	0	97.4	90	110	0.549	20	
Sulfate	29.1	3.00	30.00	0	97.1	90	110	0.922	20	

Sample ID	**1501283-01AMS**	Batch ID:	**67992**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC_150129A**	Analysis Date:	**1/29/2015 3:35:19 PM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	5.30	0.500	4.516	1.357	87.3	90	110			S
Sulfate	134	3.00	20.00	111.8	109	90	110			

Sample ID	**1501283-01AMSD**	Batch ID:	**67992**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC_150129A**	Analysis Date:	**1/29/2015 3:49:55 PM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	5.57	0.500	4.516	1.357	93.2	90	110	4.91	20	
Sulfate	133	3.00	20.00	111.8	109	90	110	0.122	20	

Sample ID	**1501283-01AMS**	Batch ID:	**67992**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC_150129A**	Analysis Date:	**1/29/2015 4:04:31 PM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	272	10.0	200.0	71.32	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: IC_150129A

Sample ID **1501283-01AMSD**	Batch ID: **67992**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC_150129A**	Analysis Date: **1/29/2015 4:19:08 PM**	Prep Date: **1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	271	10.0	200.0	71.32	99.9	90	110	0.462	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: IC_150129A

Sample ID **ICV-150129**	Batch ID: **R77813**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC_150129A**	Analysis Date: **1/29/2015 12:55:17 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.8	1.00	25.00	0	99.3	90	110			
Nitrate-N	12.5	0.500	12.50	0	99.8	90	110			
Sulfate	74.0	3.00	75.00	0	98.7	90	110			

Sample ID **CCV1-150129**	Batch ID: **R77813**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC_150129A**	Analysis Date: **1/29/2015 5:19:15 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.86	1.00	10.00	0	98.6	90	110			
Nitrate-N	4.91	0.500	5.000	0	98.2	90	110			
Sulfate	29.4	3.00	30.00	0	98.1	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_150202B

The QC data in batch 68041 applies to the following samples: 1501282-01C

Sample ID **MB-68041**	Batch ID: **68041**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.49**
SampType: **MBLK**	Run ID: **TITRATOR_150202B**	Analysis Date: **2/2/2015 10:19:00 AM**	Prep Date: **2/2/2015**

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

Sample ID **LCS-68041**	Batch ID: **68041**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.52**
SampType: **LCS**	Run ID: **TITRATOR_150202B**	Analysis Date: **2/2/2015 10:24:00 AM**	Prep Date: **2/2/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	53.0	20.0	50.00	0	106	74	129			

Sample ID **1501296-06E DUP**	Batch ID: **68041**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.54**
SampType: **DUP**	Run ID: **TITRATOR_150202B**	Analysis Date: **2/2/2015 11:54:00 AM**	Prep Date: **2/2/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	41.5	20.0	0	42.40				2.15	20	
Alkalinity, Carbonate (As CaCO3)	0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	41.5	20.0	0	42.40				2.15	20	

Sample ID **1502001-05E DUP**	Batch ID: **68041**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.53**
SampType: **DUP**	Run ID: **TITRATOR_150202B**	Analysis Date: **2/2/2015 3:16:00 PM**	Prep Date: **2/2/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	241	20.0	0	241.1				0.221	20	
Alkalinity, Carbonate (As CaCO3)	0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	241	20.0	0	241.1				0.221	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_150202B

Sample ID **ICV-150202**	Batch ID: **R77870**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.51**
SampType: **ICV**	Run ID: **TITRATOR_150202B**	Analysis Date: **2/2/2015 10:17:00 AM**	Prep Date: **2/2/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	6.96	20.0	0							
Alkalinity, Carbonate (As CaCO3)	93.3	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	98	102			

Sample ID **CCV1-150202**	Batch ID: **R77870**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.52**
SampType: **CCV**	Run ID: **TITRATOR_150202B**	Analysis Date: **2/2/2015 12:01:00 PM**	Prep Date: **2/2/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	19.0	20.0	0							
Alkalinity, Carbonate (As CaCO3)	81.6	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	0	20.0	0							
Alkalinity, Total (As CaCO3)	101	20.0	100.0	0	101	90	110			

Sample ID **CCV2-150202**	Batch ID: **R77870**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.51**
SampType: **CCV**	Run ID: **TITRATOR_150202B**	Analysis Date: **2/2/2015 3:07:00 PM**	Prep Date: **2/2/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	8.64	20.0	0							
Alkalinity, Carbonate (As CaCO3)	91.8	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	90	110			

Sample ID **CCV3-150202**	Batch ID: **R77870**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.51**
SampType: **CCV**	Run ID: **TITRATOR_150202B**	Analysis Date: **2/2/2015 3:33:00 PM**	Prep Date: **2/2/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	13.3	20.0	0							
Alkalinity, Carbonate (As CaCO3)	86.1	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	0	20.0	0							
Alkalinity, Total (As CaCO3)	99.4	20.0	100.0	0	99.4	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 NELAC certified

CLIENT: Larson & Associates
Work Order: 1501282
Project: Legacy Chamberlain

ANALYTICAL QC SUMMARY REPORT

RunID: WC_150129A

The QC data in batch 67984 applies to the following samples: 1501282-01C

Sample ID	**MB-67984**	Batch ID:	**67984**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**WC_150129A**	Analysis Date:	**1/30/2015 8:30:00 AM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	ND	10.0								

Sample ID	**LCS-67984**	Batch ID:	**67984**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**WC_150129A**	Analysis Date:	**1/30/2015 8:30:00 AM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	783	10.0	745.6	0	105	90	113			

Sample ID	**1501246-01D-DUP**	Batch ID:	**67984**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**DUP**	Run ID:	**WC_150129A**	Analysis Date:	**1/30/2015 8:30:00 AM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	263	10.0	0	268.0				1.88	5	

Sample ID	**1501246-02D-DUP**	Batch ID:	**67984**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**DUP**	Run ID:	**WC_150129A**	Analysis Date:	**1/30/2015 8:30:00 AM**	Prep Date:	**1/29/2015**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	206	10.0	0	207.0				0.484	5	

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 NELAC certified

PERMIAN BASIN
ENVIRONMENTAL LAB, LP
10014 SCR 1213
Midland, TX 79706

PBELAB

Analytical Report

Prepared for:

Mark Larson

Larson & Associates, Inc.

P.O. Box 50685

Midland, TX 79710

Project: Legacy /Chamberlin

Project Number: 12-0126-01

Location: NM

Lab Order Number: 5D14001

NELAP ACCREDITED TNI LABORATORY

NELAP/TCEQ # T104704156-13-3

Report Date: 05/22/15

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Legacy /Chamberlin
Project Number: 12-0126-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	5D14001-01	Water	04/13/15 11:15	04-13-2015 17:15

Cation analysis was subcontracted to Test America. Their report is attached to the back of this report. Their certification number is T104704223-10-6-TX.

The BKS for Nitrate was above the QC limit for this sample, Subsequent analysis with Passing QC had the same basic result for Nitrate as the initial analysis, however the second analysis was outside of the regulatory Holding time, therefore, the initial analysis is reported as analyzed.

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Legacy /Chamberlin
Project Number: 12-0126-01
Project Manager: Mark Larson

Fax: (432) 687-0456

MW-1

5D14001-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	ND	0.00100	mg/L	1	P5D1510	04/14/15	04/15/15	EPA 8021B	
Toluene	ND	0.00100	mg/L	1	P5D1510	04/14/15	04/15/15	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/L	1	P5D1510	04/14/15	04/15/15	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/L	1	P5D1510	04/14/15	04/15/15	EPA 8021B	
Xylene (o)	ND	0.00100	mg/L	1	P5D1510	04/14/15	04/15/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*111 %*	*80-120*		*P5D1510*	*04/14/15*	*04/15/15*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*74.6 %*	*80-120*		*P5D1510*	*04/14/15*	*04/15/15*	*EPA 8021B*	*S-GC*
C6-C12	ND	3.00	mg/L	1	P5D1503	04/14/15	04/14/15	TX 1005	
>C12-C28	ND	3.00	mg/L	1	P5D1503	04/14/15	04/14/15	TX 1005	
>C28-C35	ND	3.00	mg/L	1	P5D1503	04/14/15	04/14/15	TX 1005	
Surrogate: 1-Chlorooctane		*88.7 %*	*70-130*		*P5D1503*	*04/14/15*	*04/14/15*	*TX 1005*	
Surrogate: o-Terphenyl		*106 %*	*70-130*		*P5D1503*	*04/14/15*	*04/14/15*	*TX 1005*	
General Chemistry Parameters by EPA / Standard Methods									
Total Alkalinity	**190**	2.00	mg/L	1	P5E0805	04/15/15	04/15/15	EPA 310.1M	
Carbonate Alkalinity	ND	0.100	mg/L	1	P5E0805	04/15/15	04/15/15	EPA 310.1M	
Bicarbonate Alkalinity	**190**	2.00	mg/L	1	P5E0805	04/15/15	04/15/15	EPA 310.1M	
Hydroxide Alkalinity	ND	0.100	mg/L	1	P5E0805	04/15/15	04/15/15	EPA 310.1M	
Chloride	**148**	12.5	mg/L	25	P5D1504	04/14/15	04/15/15	EPA 300.0	
Nitrate as N	**1.80**	0.0800	mg/L	1	P5D1504	04/14/15	04/15/15	EPA 300.0	QS-1
Total Dissolved Solids	**728**	20.0	mg/L	1	P5D1512	04/14/15	04/15/15	EPA 160.1	
Sulfate	**74.8**	1.00	mg/L	1	P5D1504	04/14/15	04/15/15	EPA 300.0	
Total Metals by EPA / Standard Methods									
Calcium	**52.0**	1.00	mg/L	1	P5D2408	04/16/15	04/20/15	EPA 6010B	SUB-1
Magnesium	**9.20**	1.00	mg/L	1	P5D2408	04/16/15	04/20/15	EPA 6010B	SUB-1
Potassium	**2.60**	1.00	mg/L	1	P5D2408	04/16/15	04/20/15	EPA 6010B	SUB-1
Sodium	**200**	1.00	mg/L	1	P5D2408	04/16/15	04/20/15	EPA 6010B	SUB-1

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Legacy /Chamberlin
Project Number: 12-0126-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P5D1503 - TX 1005										
Blank (P5D1503-BLK1)				Prepared & Analyzed: 04/14/15						
C6-C12	ND	3.01	mg/L							
>C12-C28	ND	3.01	"							
>C28-C35	ND	3.01	"							
Surrogate: 1-Chlorooctane	*12.0*		*"*	*9.38*		*128*	*70-130*			
Surrogate: o-Terphenyl	*7.05*		*"*	*4.69*		*150*	*70-130*			*S-GC*
LCS (P5D1503-BS1)				Prepared & Analyzed: 04/14/15						
C6-C12	90.5	3.01	mg/L	93.8		96.5	75-125			
>C12-C28	101	3.01	"	93.8		108	75-125			
Surrogate: 1-Chlorooctane	*10.7*		*"*	*9.38*		*114*	*70-130*			
Surrogate: o-Terphenyl	*5.36*		*"*	*4.69*		*114*	*70-130*			
LCS Dup (P5D1503-BSD1)				Prepared & Analyzed: 04/14/15						
C6-C12	97.8	3.01	mg/L	93.8		104	75-125	7.79	20	
>C12-C28	99.1	3.01	"	93.8		106	75-125	2.17	20	
Surrogate: 1-Chlorooctane	*11.8*		*"*	*9.38*		*126*	*70-130*			
Surrogate: o-Terphenyl	*5.82*		*"*	*4.69*		*124*	*70-130*			
Duplicate (P5D1503-DUP1)	**Source: 5D09011-02**			Prepared & Analyzed: 04/14/15						
C6-C12	ND	3.01	mg/L		ND				20	
>C12-C28	ND	3.01	"		ND				20	
Surrogate: 1-Chlorooctane	*9.44*		*"*	*9.38*		*101*	*70-130*			
Surrogate: o-Terphenyl	*5.70*		*"*	*4.69*		*122*	*70-130*			
Batch P5D1510 - General Preparation (GC)										
Blank (P5D1510-BLK1)				Prepared: 04/14/15 Analyzed: 04/15/15						
Benzene	ND	0.00100	mg/L							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 4-Bromofluorobenzene	*0.0672*		*"*	*0.0600*		*112*	*80-120*			
Surrogate: 1,4-Difluorobenzene	*0.0554*		*"*	*0.0600*		*92.4*	*80-120*			

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P5D1510 - General Preparation (GC)										
LCS (P5D1510-BS1)				Prepared: 04/14/15 Analyzed: 04/15/15						
Benzene	0.0923	0.00100	mg/L	0.100		92.3	80-120			
Toluene	0.106	0.00100	"	0.100		106	80-120			
Ethylbenzene	0.110	0.00100	"	0.100		110	80-120			
Xylene (p/m)	0.210	0.00200	"	0.200		105	80-120			
Xylene (o)	0.105	0.00100	"	0.100		105	80-120			
Surrogate: 4-Bromofluorobenzene	*0.0633*		*"*	*0.0600*		*106*	*80-120*			
Surrogate: 1,4-Difluorobenzene	*0.0620*		*"*	*0.0600*		*103*	*80-120*			
LCS Dup (P5D1510-BSD1)				Prepared: 04/14/15 Analyzed: 04/15/15						
Benzene	0.0969	0.00100	mg/L	0.100		96.9	80-120	4.91	20	
Toluene	0.109	0.00100	"	0.100		109	80-120	2.39	20	
Ethylbenzene	0.114	0.00100	"	0.100		114	80-120	3.78	20	
Xylene (p/m)	0.238	0.00200	"	0.200		119	80-120	12.4	20	
Xylene (o)	0.116	0.00100	"	0.100		116	80-120	9.98	20	
Surrogate: 4-Bromofluorobenzene	*0.0728*		*"*	*0.0600*		*121*	*80-120*			*S-GC*
Surrogate: 1,4-Difluorobenzene	*0.0558*		*"*	*0.0600*		*92.9*	*80-120*			
Matrix Spike (P5D1510-MS1)	**Source: 5D14001-01**			Prepared: 04/14/15 Analyzed: 04/15/15						
Benzene	0.0896	0.00100	mg/L	0.100	ND	89.6	80-120			
Toluene	0.0970	0.00100	"	0.100	ND	97.0	80-120			
Ethylbenzene	0.111	0.00100	"	0.100	ND	111	80-120			
Xylene (p/m)	0.219	0.00200	"	0.200	ND	109	80-120			
Xylene (o)	0.114	0.00100	"	0.100	ND	114	80-120			
Surrogate: 4-Bromofluorobenzene	*0.0734*		*"*	*0.0600*		*122*	*80-120*			*S-GC*
Surrogate: 1,4-Difluorobenzene	*0.0512*		*"*	*0.0600*		*85.3*	*80-120*			

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Legacy /Chamberlin
Project Number: 12-0126-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P5D1504 - * DEFAULT PREP *** **										
Blank (P5D1504-BLK1)				Prepared: 04/14/15 Analyzed: 04/15/15						
Nitrate as N	ND	0.0800	mg/L							
Chloride	ND	0.500	"							
Sulfate	ND	1.00	"							
LCS (P5D1504-BS1)				Prepared: 04/14/15 Analyzed: 04/15/15						
Nitrate as N	2.55	0.0800	mg/L	2.00		127	80-120			QS-1
Chloride	10.2	0.500	"	10.0		102	80-120			
Sulfate	10.2	1.00	"	10.0		102	80-120			
Duplicate (P5D1504-DUP1)	**Source: 5D14001-01**			Prepared: 04/14/15 Analyzed: 04/15/15						
Chloride	148	12.5	mg/L		148			0.523	20	
Sulfate	70.3	25.0	"		74.8			6.15	20	
Nitrate as N	ND	2.00	"		1.80				20	
Matrix Spike (P5D1504-MS1)	**Source: 5D14001-01**			Prepared: 04/14/15 Analyzed: 04/15/15						
Sulfate	357	25.0	mg/L	300	74.8	94.0	80-120			
Nitrate as N	69.3	2.00	"	60.0	1.80	113	80-120			
Chloride	487	12.5	"	300	148	113	80-120			
Batch P5D1512 - * DEFAULT PREP *** **										
Blank (P5D1512-BLK1)				Prepared: 04/14/15 Analyzed: 04/15/15						
Total Dissolved Solids	ND	20.0	mg/L							
Duplicate (P5D1512-DUP1)	**Source: 5D14001-01**			Prepared: 04/14/15 Analyzed: 04/15/15						
Total Dissolved Solids	724	20.0	mg/L		728			0.551	20	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Legacy /Chamberlin
Project Number: 12-0126-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

SUB-1	Subcontract of analyte/analysis to Test America TCEQ/NELAC # T104704223-10-6-TX
S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
QS-1	The spike recovery value is outside Laboratory historical or method prescribed QC limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Brent Barron Date: 5/22/2015

Brent Barron, Laboratory Director/Technical Director

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to: 5D14001

DATE: 4/13/2015 PAGE 1 OF 1

PO #: _____ LAB WORK ORDER #: 5D14001

PROJECT LOCATION OR NAME: Legacy Chamberlin

LAI PROJECT #: 12-0126-01 COLLECTOR: Sarah Ortiz

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: NM

S=SOIL W=WATER A=AIR P=PAINT SL=SLUDGE OT=OTHER

PRESERVATION: HCl | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE | UNPRESERVED

ANALYSES: BTEX ☒ MTBE ☐ 8021B, SW846 | TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐ | GASOLINE MOD 8015 ☐ | DIESEL - MOD 8015 ☐ | VOC 8260 ☐ | SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐ | 8081 PESTICIDES ☐ 8151 HERBICIDES ☐ | 8082 PCBS ☐ | TCLP - METALS (RCRA) ☐ TCLP VOC ☐ | TCLP - PEST ☐ HERB ☐ Semi-VOC ☐ | TOTAL METALS (RCRA) ☐ OTHER LIST ☐ | LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐ | RCI ☐ TOX ☐ FLASHPOINT ☐ | TDS ☒ TSS ☐ % MOISTURE ☐ CYANIDE ☐ | pH ☐ HEXAVALENT CHROMIUM ☐ | EXPLOSIVES ☐ PECHLORATE ☐ | CHLORIDES ☒ ANIONS ☒ ALKALINITY ☒ | Na, Ca, Mg, K | Nitrate, SW, 300.4, M03 | FIELD NOTES

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO_3	ICE	UNPRESERVED	BTEX	Nitrate	FIELD NOTES
MW-1	01	4/13/15	11:15	W	3	X		X		X		
" "		↓	↓	↓	1		X	X			X	
" "		↓	↓	↓	1			X			X	

TOTAL

RELINQUISHED BY:(Signature) Sarah Ortiz DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY:(Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY:(Signature) DATE/TIME 4/13/15 17:15 RECEIVED BY: (Signature)

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

LABORATORY USE ONLY: °C NCF
RECEIVING TEMP: 5.4 THERM #: _____
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL # _____
☐ HAND DELIVERED

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Tel: (713)690-4444

TestAmerica Job ID: 600-109911-1
Client Project/Site: 5d14001-01 4-13-15

For:
Permian Basin Environmental Lab LP
10014 South County Road 1213
Midland, Texas 79706

Attn: Brent Barron

C. Lance Tigrett

Authorized for release by:
4/21/2015 4:14:02 PM

Lance Tigrett, Project Manager I
(713)690-4444
lance.tigrett@testamericainc.com

Table of Contents

Case Narrative

Client: Permian Basin Environmental Lab LP
Project/Site: 5d14001-01 4-13-15

TestAmerica Job ID: 600-109911-1

Job ID: 600-109911-1

Laboratory: TestAmerica Houston

Narrative

Job Narrative
600-109911-1

Comments
No additional comments.

Receipt
The sample was received on 4/15/2015 10:18 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7º C.

Metals
Method 6010B: The method blank for Prep Batch 160342 contained Calcium and Magnesium above the method detection limit. These target analytes concentrations were less than the reporting limit (RL); therefore, re-analysis of samples was not performed.

Method Summary

Client: Permian Basin Environmental Lab LP
Project/Site: 5d14001-01 4-13-15

TestAmerica Job ID: 600-109911-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL HOU

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Sample Summary

Client: Permian Basin Environmental Lab LP
Project/Site: 5d14001-01 4-13-15

TestAmerica Job ID: 600-109911-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
600-109911-1	5d14001-01	Water	04/13/15 11:15	04/15/15 10:18

Client Sample Results

Client: Permian Basin Environmental Lab LP
Project/Site: 5d14001-01 4-13-15

TestAmerica Job ID: 600-109911-1

Client Sample ID: 5d14001-01
Date Collected: 04/13/15 11:15
Date Received: 04/15/15 10:18

Lab Sample ID: 600-109911-1
Matrix: Water

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	200		1.0	0.020	mg/L		04/16/15 12:19	04/20/15 13:56	1
Potassium	2.6		1.0	0.13	mg/L		04/16/15 12:19	04/20/15 13:56	1
Calcium	52	B	1.0	0.022	mg/L		04/16/15 12:19	04/20/15 13:56	1
Magnesium	9.2	B	1.0	0.019	mg/L		04/16/15 12:19	04/20/15 13:56	1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 600-160342/1-A
Matrix: Water
Analysis Batch: 160541

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 160342

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	0.020	U	1.0	0.020	mg/L		04/16/15 12:19	04/20/15 13:03	1
Potassium	0.13	U	1.0	0.13	mg/L		04/16/15 12:19	04/20/15 13:03	1
Calcium	0.179	J	1.0	0.022	mg/L		04/16/15 12:19	04/20/15 13:03	1
Magnesium	0.0584	J	1.0	0.019	mg/L		04/16/15 12:19	04/20/15 13:03	1

Lab Sample ID: LCS 600-160342/2-A
Matrix: Water
Analysis Batch: 160541

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 160342

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	10.0	10.5		mg/L		105	80 - 120
Potassium	10.0	10.5		mg/L		105	80 - 120
Calcium	10.0	10.9		mg/L		109	80 - 120
Magnesium	10.0	9.84		mg/L		98	80 - 120

Metals

Prep Batch: 160342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-109911-1	5d14001-01	Total/NA	Water	3010A	
LCS 600-160342/2-A	Lab Control Sample	Total/NA	Water	3010A	
MB 600-160342/1-A	Method Blank	Total/NA	Water	3010A	

Analysis Batch: 160541

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-109911-1	5d14001-01	Total/NA	Water	6010B	160342
LCS 600-160342/2-A	Lab Control Sample	Total/NA	Water	6010B	160342
MB 600-160342/1-A	Method Blank	Total/NA	Water	6010B	160342

Lab Chronicle

Client: Permian Basin Environmental Lab LP
Project/Site: 5d14001-01 4-13-15

TestAmerica Job ID: 600-109911-1

Client Sample ID: 5d14001-01
Date Collected: 04/13/15 11:15
Date Received: 04/15/15 10:18

Lab Sample ID: 600-109911-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	160342	04/16/15 12:19	NER	TAL HOU
Total/NA	Analysis	6010B		1	50 mL	50 mL	160541	04/20/15 13:56	DCL	TAL HOU

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Certification Summary

Client: Permian Basin Environmental Lab LP
Project/Site: 5d14001-01 4-13-15

TestAmerica Job ID: 600-109911-1

Laboratory: TestAmerica Houston

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Texas	NELAP	6	T104704223	10-31-15

PBELAB

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Permian Basin Environmental Lab, LP
10014 S. County Road 1213
Midland, Texas 79706

Phone: 432-661-4184

Project Manager: Brent Barron

Company Name: PBEL

Company Address: 10014 SCR 1213

City/State/Zip: Midland Texas

Telephone No: 432-661-4184 Fax No:

Sampler Signature: N/A e-mail: brentbarron@pbelab.com

Project Name: SUBCONTRACT

Proj

Project

600-109911 Chain of Custody

Report Format: Standard ☐ TRRP ☐ NPDES

(lab use only)

ORDER #:

LAB # (lab use only)	FIELD CODE	Beginning Depth	Ending Depth	Date Sampled	Time Sampled	Field Filtered	Total # of Containers	Preservation & # of Containers: Ice	HNO_3	HCl	H_2SO_4	NaOH	$Na_2S_2O_3$	None	NaOH/ZnAc	Matrix: DW=Drinking Water SL=Sludge GW = Groundwater S=Soil/Solid NP=Non-Potable Specify Other	Analyze For: TCLP Na, Ca, Mg, K	TOTAL	4 DAY tat
	5d14001-01			04/13/15	1115		1	x	x							W	x		X

Special Instructions:

Relinquished by	Date	Time		Date	Time
Brent Barron	03/25/15	1400			
Relinquished by	Date	Time	Received by	Date	Time
				4-15-15	1019
Relinquished by:	Date	Time	Received by:	Date	Time

Laboratory Comments:

Sample Containers Intact?	Y	N
VOCs Free of Headspace?	Y	N
Labels on container(s)	Y	N
Custody seals on container(s)	Y	N
Custody seals on cooler(s)	Y	N
Sample Hand Delivered	Y	N
by Sampler/Client Rep. ?	Y	N

by Courier? UPS DHL FedEx Lone Star

Temperature Upon Receipt:
Received: °C
Adjusted: °C Factor

TestAmerica Houston

Sample Receipt Checklist

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Date/Time Received: _____

JOB NUMBER: Loc: 600 109911 ____ CLIENT: PBE lab

UNPACKED BY: _____ CARRIER/DRIVER: Fed Ex

Custody Seal Present: ☐ YES ☒ NO Number of Coolers Received: 1

Cooler ID	Temp Blank	Trip Blank	Observed Temp (°C)	Therm ID	Them CF	Corrected Temp (°C)
RW	Y / N	Y / N	1.8	599	-.1	1.7
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				

CF = correction factor

Samples received on ice? ☒ YES ☐ NO

LABORATORY PRESERVATION OF SAMPLES REQUIRED: ☒ NO ☐ YES

Base samples are>pH 12: ☐ YES ☐ NO Acid preserved are<pH 2: ☒ YES ☐ NO

pH paper Lot # HC4326054

VOA headspace acceptable (5-6mm): ☐ YES ☐ NO ☒ NA

	YES	NO
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?		☒

COMMENTS:

DC 4/15/15

Login Sample Receipt Checklist

Client: Permian Basin Environmental Lab LP

Job Number: 600-109911-1

Login Number: 109911
List Number: 1
Creator: Capps, Dana R

List Source: TestAmerica Houston

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.7
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	Check done at department level as required.