BW - 8

MONITORING REPORTS

DATE: 2005 - Present

April 14, 2020

Mr. Carl Chavez
New Mexico Oil Conservation Division
Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505-4225

Re: Semiannual Groundwater Monitoring and O&M Report
July 1 through December 31, 2020
Salty Dog Brine Station, Lea County, New Mexico

Dear Mr. Chavez:

On behalf of PAB Services, Inc., Daniel B. Stephens & Associates, Inc. (DBS&A) is submitting the enclosed groundwater monitoring and operation and maintenance (O&M) report for the Salty Dog brine station located in Lea County, New Mexico. Semiannual groundwater monitoring activities were completed at the site on December 17 and 18, 2019.

Please call us at (505) 822-9400 if you have any questions or require additional information.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

John Ayarbe, P.G.
Senior Hydrogeologist

JA/rpf
Enclosure
cc: Pieter Bergstein, PAB Services, Inc.
Jim Sayre, Salty Dog, Inc.

Second Semiannual 2019 Groundwater Monitoring and O&M Report

Salty Dog Brine Station

Lea County, New Mexico

Prepared for **New Mexico Energy, Minerals and Natural Resources Department**
Oil Conservation Division

April 14, 2020

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

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Semiannual Groundwater Monitoring and O&M Report
July 1 through December 31, 2019
Salty Dog Brine Station, Lea County, New Mexico

1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this groundwater monitoring and operation and maintenance (O&M) report for submission to the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD) Environmental Bureau on behalf of PAB Services, Inc. (PAB) for the Salty Dog brine station (the site) located in Lea County, New Mexico (Figure 1). The report summarizes activities conducted at the site during the reporting period of July 1 through December 31, 2019. Groundwater monitoring and O&M during the reporting period was conducted in accordance with discharge permit BW-8 (DP-BW-8), which was last renewed on May 17, 2019 (NMEMNRD OCD, 2019).

The site consists of a northern portion, where the brine pond was located prior to closure in October 2008, and a southern portion, where the brine well is located. The brine pond area and the brine well area are separated by approximately 2,500 feet, joined by a dirt road (Figure 1). Injection water for the brine well comes from two fresh water supply wells (FWS-1 and FWS-2) and from remedial pumping at a recovery well in the brine well area (RW-2).

Brine that is produced for sale is stored at a tank battery on the southern boundary of the former brine pond area. The tank battery consists of six 750-barrel aboveground storage tanks (ASTs) surrounded by a berm (Figure 1). A concrete truck loading pad with two brine filling stations is located north of the tank battery. An operations shed is located adjacent to the loading pad to the west.

The former brine pond area contains 6 monitor wells (PMW-1, DBS-1R, and DBS-2 through DBS-5), 1 nested well (NW-1), 1 fresh water supply well (FWS-1), and a former recovery well (RW-1). The brine well area contains 10 monitor wells (MW-2 through MW-6, DBS-6 through

DBS-10), 1 nested well (NW-2), 1 fresh water supply well (FWS-2), and 1 recovery well (RW-2) (Figure 1).

In April 2012, DBS&A installed groundwater extraction systems at the site to provide hydraulic containment and removal of chloride-impacted groundwater in the former brine pond and brine well areas (DBS&A, 2009a and 2009b). The extraction systems consist of wells, submersible pumps, conveyance lines, electrical power, and controls to extract impacted groundwater. Extracted groundwater is conveyed to the on-site ASTs for reinjection at the brine well. Although groundwater extraction at well RW-1 was stopped in 2015, pumping at well FWS-1 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area; well FWS-1 is located approximately 50 feet southeast of RW-1. Extraction at RW-1 was stopped because the water level at the well had declined and was near the bottom of the well. Pumping at RW-2 provides hydraulic containment and removal of chloride-impacted groundwater in the brine well area.

2. Scope of Work

The scope of work for semiannual groundwater monitoring conducted in December 2019 consisted of (1) measuring groundwater levels in and collecting groundwater samples from 12 monitor wells, and (2) performing maintenance on the groundwater extraction systems, as necessary. Groundwater samples were collected and submitted to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico for chloride analysis using U.S. Environmental Protection Agency (EPA) method 300.0. Section 2A.1 of DP-BW-8 requires that PAB collect one groundwater sample to be analyzed for general chemistry and other inorganic groundwater constituents in addition to chloride. In consultation with Carl Chavez (OCD), DBS&A selected monitor well MW-3 for this additional analysis. Appendices A and B provide the laboratory report and field notes, respectively.

The monitor wells included in the sampling program were selected in October 2010 in consultation with Jim Griswold, the OCD Project Manager for the site at that time. The sampled monitor wells are shown in Figures 2 through 5.

3. Monitoring Activities

3.1 Fluid Level Measurement

On December 17, 2019, DBS&A measured water levels in monitor wells DBS-1R, DBS-2 through DBS-5, and PMW-1 in the former brine pond area (Figure 2) and in wells DBS-6, DBS-8 through DBS-10, MW-3, and MW-5 in the brine well area (Figure 3) using a properly decontaminated electronic water level meter. Table 1 reports water level measurements and groundwater elevations. Appendix C provides historical groundwater level data.

Table 1. Fluid Level Measurements, December 17, 2019

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-1R	58.0–78.0	3,817.00 [b]	70.41	3,746.59
DBS-2	58.0–78.0	3,820.50	72.43	3,748.07
DBS-3	56.0–76.72	3,816.66	66.96	3,749.70
DBS-4	56.0–76.0	3,820.37	72.90	3,747.47
DBS-5	56.9–76.9	3,820.66	69.13	3,751.53
DBS-6	56.7–76.7	3,812.65	67.95	3,744.40
DBS-8	55.2–75.2	3,810.70	66.12	3,744.58
DBS-9	48.0–68.0	3,806.26	59.25	3,747.01
DBS-10	57.2–77.2	3,807.48	65.80	3,741.68
PMW-1	63–78	3,821.17	76.25	3,744.92
MW-3	NA	3,812.05	67.38	3,744.67
MW-5	112–132	3,808.96	65.57	3,743.39

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

During this monitoring event, the average depths to water beneath the former brine pond area and brine well area were 71.35 feet below ground surface (bgs) and 65.35 feet bgs, respectively. On average, water levels in the former brine pond area declined by approximately 1.82 feet since the last monitoring event in June 2019, while water levels in the brine well area rose by 0.10 foot.

Figures 2 and 3 present potentiometric surface maps for the former brine pond area and the brine well area, respectively. The direction of groundwater flow beneath the former brine pond area remains to the southeast; the hydraulic gradient was approximately 0.011 foot per foot (ft/ft) during this reporting period (Figure 2). The direction of groundwater flow beneath the brine well area also remains to the southeast; the hydraulic gradient in this area was approximately 0.005 ft/ft during this reporting period (Figure 3).

From July through December 2019, well FWS-1 was the primary pumping well used to provide fresh water for brine production. FWS-1 was pumping when groundwater levels were measured; as a result, a cone of depression is seen in the potentiometric surface (Figure 2). Well RW-2 was pumping before the groundwater monitoring event; however, the pump was down for maintenance at the time water levels were measured. Therefore, a cone of depression is not seen in the potentiometric surface (Figure 3). Little groundwater was extracted from well FWS-2 during this reporting period.

3.2 Groundwater Sampling

On December 17 and 18, 2019, groundwater samples were collected from monitor wells DBS-1R, DBS-2 through DBS-6, DBS-8 through DBS-10, MW-3, MW-5, and PMW-1. The samples were collected following standard sampling procedures developed from EPA guidance. Before sampling, each well was purged of a minimum of three casing volumes using a submersible pump to ensure that a representative groundwater sample was collected. While purging, DBS&A measured water quality field parameters consisting of temperature, specific conductance, and pH. Sample containers were filled, labeled, and placed in an ice-filled cooler. Groundwater samples were submitted under chain of custody to HEAL for analysis.

Samples of the brine well injection water and the produced brine were also collected to meet requirements under DP-BW-8. Analytical results of these samples will be presented in the 2019 annual Class III well report.

4. Analytical Results

Table 2 summarizes chloride analytical results for the collected groundwater samples. Figures 4 and 5 show the distribution of chloride in groundwater beneath the former brine pond area and the brine well area, respectively. The laboratory report and chain of custody documentation are provided in Appendix A. Field notes recorded during groundwater monitoring activities are provided in Appendix B. Historical groundwater quality data are provided in Appendix C.

Table 2. Chloride Groundwater Analytical Data, December 2019

Monitor Well	Date	Chloride Concentration (mg/L)
NMWQCC Standard		*250*
DBS-1R	12/18/2019	210
DBS-2	12/17/2019	68
DBS-3	12/17/2019	48
DBS-4	12/17/2019	35
DBS-5	12/18/2019	160
DBS-6	12/17/2019	220
DBS-8	12/17/2019	30
DBS-9	12/17/2019	220
DBS-10	12/17/2019	**540**
PMW-1	12/18/2019	**3,400**
MW-3	12/18/2019	**7,400**
MW-5	12/18/2019	**550**

Bold indicates that value exceeds the applicable standard.
All samples analyzed using EPA method 300.0.
NMWQCC = New Mexico Water Quality Control Commission
mg/L = Milligrams per liter

4.1 Former Brine Pond Area Wells

During this reporting period, the most significant change in chloride concentration occurred at well PMW-1, located just upgradient of the fresh water supply well FWS-1. Well PMW-1 continues to exhibit chloride concentrations above the New Mexico Water Quality Control Commission (NMWQCC) standard of 250 milligrams per liter (mg/L) (Figure 4); however, the

chloride concentration decreased from 11,000 mg/L in June 2019 to 3,400 mg/L in December 2019 (Appendix C).

The chloride concentration at well DBS-1R, located downgradient of well PMW-1, was 210 mg/L during this reporting period—below the NMWQCC standard (Figure 4). An increase in chloride concentration was observed at upgradient monitor well DBS-5 in June 2019, but the chloride concentration in December 2019 was 160 mg/L, which is more consistent with historical concentrations and below the NMWQCC standard.

The chloride plume in the former brine pond area remains bounded by the existing monitor well network (Figure 4). The chloride concentration at downgradient monitor well DBS-4 remains below the NMWQCC standard, as do chloride concentrations at the two cross-gradient monitor wells, DBS-2 and DBS-3.

4.2 Brine Well Area Wells

Since the last monitoring event in June 2019, minor changes in chloride concentrations were observed at the monitor wells in the brine well area (Appendix C). Monitor wells MW-3 (the well closest to extraction well RW-2) and downgradient monitor wells MW-5 and DBS-10 continue to exhibit chloride concentrations above the NMWQCC standard (Figure 5).

The chloride concentration at cross-gradient monitor well DBS-6, which had exceeded the NMWQCC standard until June 2017, remained below the NMWQCC standard during this reporting period at 220 mg/L.

The chloride concentration at upgradient monitor well DBS-9 was 220 mg/L during this reporting period. Chloride concentration has fluctuated at DBS-9 (Appendix C).

Section 2A.1 of DP-BW-8 requires that PAB collect one groundwater sample to be analyzed for general chemistry and several other groundwater constituents. Monitor well MW-3 was selected for this additional analysis because it is located downgradient of the brine well. Groundwater at

MW-3 has historically shown chloride impacts. Analytical results for the MW-3 sample are provided in Table 3.

Table 3. Groundwater Analytical Results, MW-3

Constituent	Concentration (mg/L [a])	
	NMWQCC Standard	MW-3 (12/18/2019)
Alkalinity, total	NS	326.4
Bicarbonate	NS	326.4
Calcium, total	NS	1,200
Carbonate	NS	<2.0
Bromide	NS	<1.0
Chloride	250	**7,400**
Fluoride	1.6	<1.0
Magnesium, total	NS	200
Nitrate (as N)	1.0	<1.0
Nitrite (as N)	10.0	<1.0
Orthophosphate (as P)	NS	<5.0
pH (s.u.)	6–9	7.12
Potassium, total	NS	18
Sodium, total	NS	3,600
Sulfate	600	500
Total dissolved solids	1,000	**15,600**

Bold indicates that value exceeds New Mexico Water Quality Control Commission (NMWQCC) standard.
[a] Unless otherwise noted
NS = No standard
s.u. = Standard units

5. Groundwater Extraction System O&M

Groundwater extraction from fresh water supply well FWS-1 and recovery well RW-2 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area and brine well area, respectively. PAB began remedial groundwater extraction in April 2012 (Appendix C). Extracted groundwater is used as injection water at the brine well.

Table 4 shows the average groundwater extraction rates for the two wells during this reporting period. The rates were determined using fresh water production records and totalizer flow meter readings.

Table 4. Average Groundwater Extraction Rates

Recovery Well	Date	Average Extraction Rate [a] (gpm)
FWS-1	12/18/2019	27.6
RW-2	12/18/2019	14.9

[a] Average extraction rates based on totalizer flow meter readings and/or fresh water production records.
gpm = Gallons per minute

5.1 Former Brine Pond Area

Based on Salty Dog production records from July through December 2019, the average pumping rate at well FWS-1 during this reporting period was 27.6 gallons per minute (gpm) (Table 3). Pumping at FWS-1 increased slightly this reporting period due to increased brine sales. A cone of depression is seen in the potentiometric surface for this reporting period (Figure 2).

In the former brine pond area, monitor well PMW-1 is currently the only well to exhibit a chloride concentration above the NMWQCC standard (Figure 4). Pumping at FWS-1 is preventing the downgradient migration of chloride-impacted groundwater. The chloride concentrations at wells DBS-1R and DBS-4, both located downgradient of well PMW-1, are below the NMWQCC standard (Figure 4).

5.2 Brine Well Area

During this reporting period, the average pumping rate at well RW-2 was 14.9 gpm (Table 3), which is more than double the average pumping rate recorded in June 2019 (7.0 gpm). According to PAB site manager Jim Sayer, well RW-2 was operating at a reduced capacity due to intermittent electrical failure at the pump. Well RW-2 was not actively pumping during the

week preceding the groundwater monitoring event, resulting in a flattening of the hydraulic gradient in the brine well area (Figure 3).

Downgradient monitor wells DBS-10 and MW-5 exhibit chloride concentrations above the NMWQCC standard (Figure 5). The chloride concentration at DBS-10 increased from 510 mg/L (June 2019) to 540 mg/L (December 2019), while the chloride concentration at MW-5 continues to decrease (Appendix C), dropping from 610 mg/L (June 2019) to 550 mg/L (December 2019). The chloride concentration at cross-gradient monitor well DBS-6 met the NMWQCC standard during this reporting period (Table 2). Water quality samples collected at this well have exceeded the NMWQCC standard in the past (Appendix C).

Pumping at well RW-2 is providing hydraulic containment and removal of chloride-impacted groundwater originating from the area upgradient of the recovery well. Pumping at this recovery well is preventing further degradation of downgradient and cross-gradient water quality. Chloride concentrations at monitor wells MW-5 and DBS-6 have decreased since PAB began remedial groundwater extraction at well RW-2 (Appendix C).

5.3 Facility and System Maintenance

In December 2019, PAB serviced the pump at extraction well RW-2. The pump was not operating when groundwater monitoring was conducted for this reporting period.

On December 12, 2019, Basin Surveys surveyed the five surface subsidence monitoring points that were installed at the site in March 2018 (DBS&A, 2018). The survey was conducted in accordance with Condition 2.B.1 of DP-BW-8 (NMEMNRD OCD, 2019). Results of the survey will be included in the 2019 annual Class III well report.

6. Recommendations

Based on the current groundwater monitoring results and site O&M activities, DBS&A has the following recommendations:

- Continue groundwater extraction at FWS-1 to provide hydraulic containment and removal of the chloride plume in the former brine pond area.
- Continue groundwater extraction at RW-2 to provide hydraulic containment and removal of the chloride plume in the brine well area.
- To the extent practical, attempt to balance groundwater extraction between FWS-1 and RW-2. During this reporting period, the pumping rate at FWS-1 was approximately twice as high as the pumping rate at RW-2. Increased pumping at RW-2 will provide more removal of chloride-impacted groundwater in the brine well area.

In addition, DBS&A and PAB will complete the following activities at the site in 2020 to meet the requirements of DP BW-8:

- Continue to conduct semiannual groundwater monitoring and O&M of the extraction systems at the site.
- Conduct semiannual surveys of the surface subsidence survey monitoring points.
- Prepare a 2019 annual Class III well report for submittal to OCD.

References

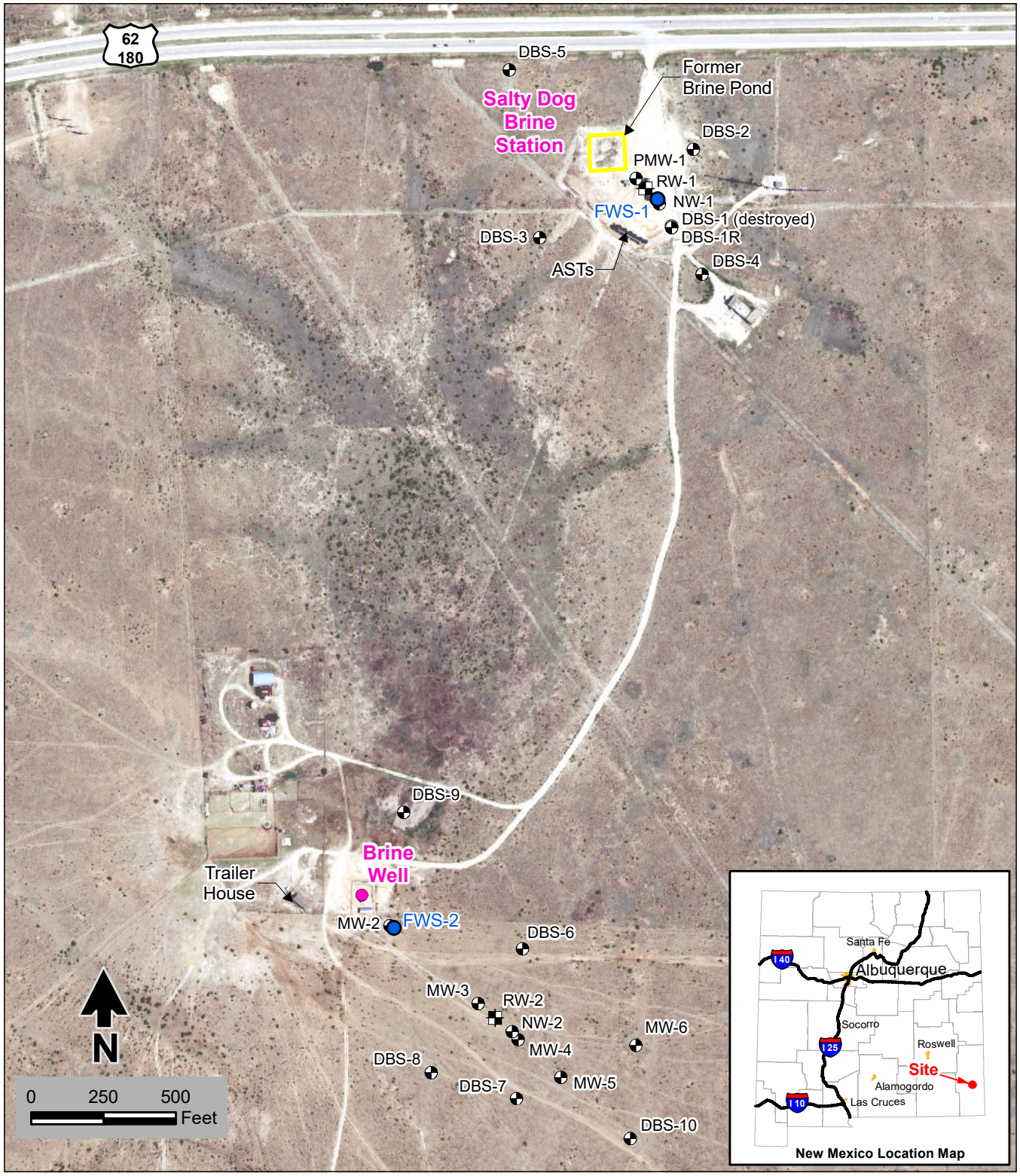
Daniel B. Stephens & Associates (DBS&A). 2009a. *Recovery well installation and pump test report, Salty Dog Brine Station, Lea County, New Mexico.* Prepared for New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, Environmental Bureau. November 20, 2009.

DBS&A. 2009b. *Preliminary conceptual remedial design report, Salty Dog Brine Station, Lea County, New Mexico.* Prepared for New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, Environmental Bureau. December 31, 2009.

DBS&A. 2018. Letter report from John Ayarbe and Michael D. McVey to Carl Chavez, New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, Environmental Bureau, regarding Installation of a monitor well and subsidence survey monitoring points at the Salty Dog Brine Station (API No. 30-025-26307). June 25, 2018.

New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Department (NMEMNRD OCD). 2019. *Discharge Permit (BW-8), Standard Energy, UIC Class III Brine Well Brine Supply Well No.1 API No. 30-025-26307 UL: J Section 5 Township 19 South, Range 36 East, Lea County, New Mexico.* May 17, 2019.

Figures



Note: AST = Aboveground storage tank

Source: NAIP aerial imagery dated June 18, 2018

Explanation

- Fresh water supply well
- Monitor well
- Recovery well
- Well destroyed

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_2SA\FIG01_SITE_LOCATION_MAP.MXD

Daniel B. Stephens & Associates, Inc.

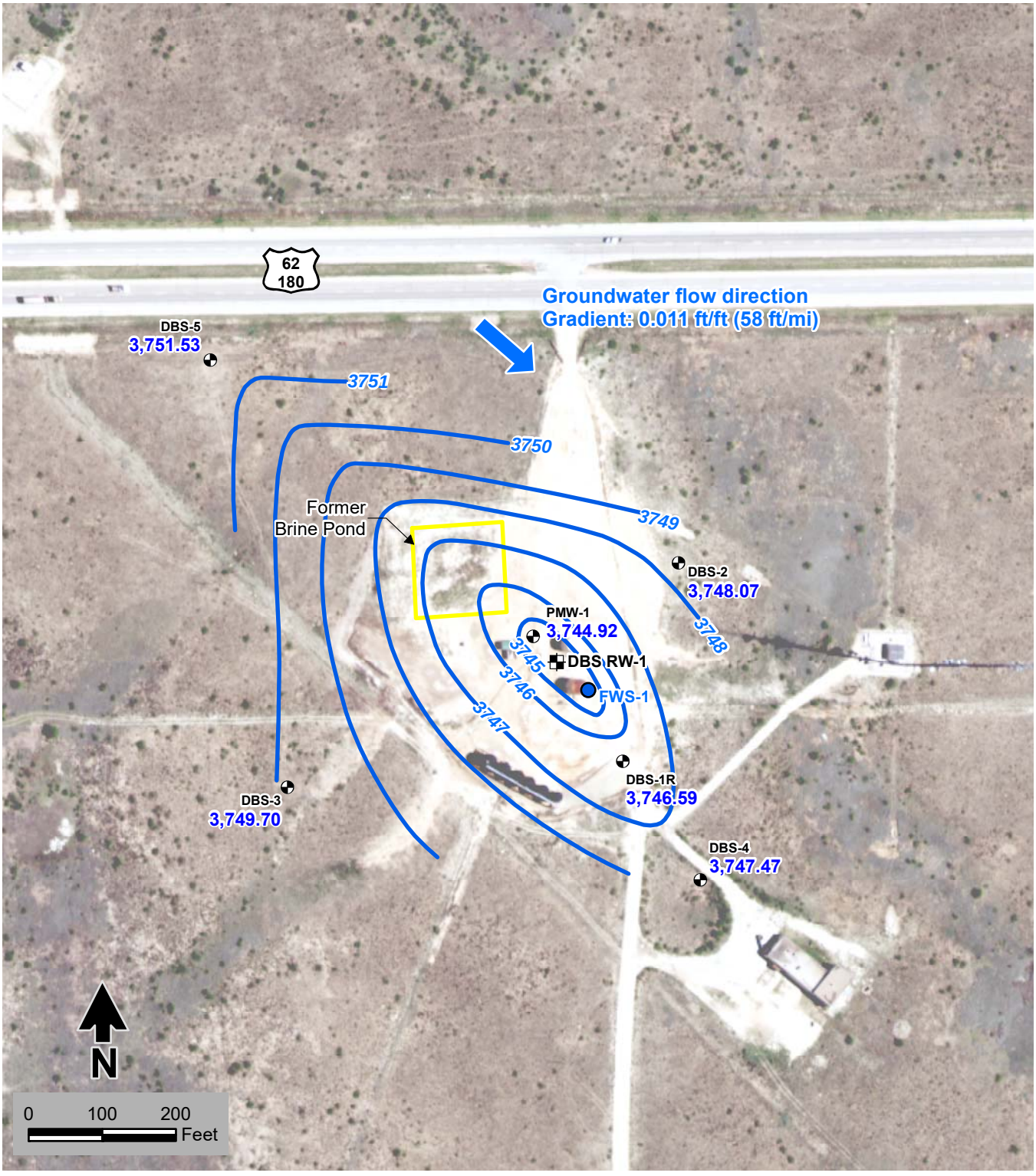
3/19/2020

JN DB19.1198.00

SALTY DOG BRINE STATION

Site Location Map

Figure 1



Source: NAIP aerial imagery dated June 18, 2018

Explanation

DBS-1R Well designation

3,746.59 Groundwater elevation, ft msl

- Monitor well
- Recovery well
- Fresh water supply well
- Potentiometric surface elevation contour (ft msl), dashed where inferred
- Groundwater flow direction

SALTY DOG BRINE STATION

Former Brine Pond Area Potentiometric Surface Elevations December 2019

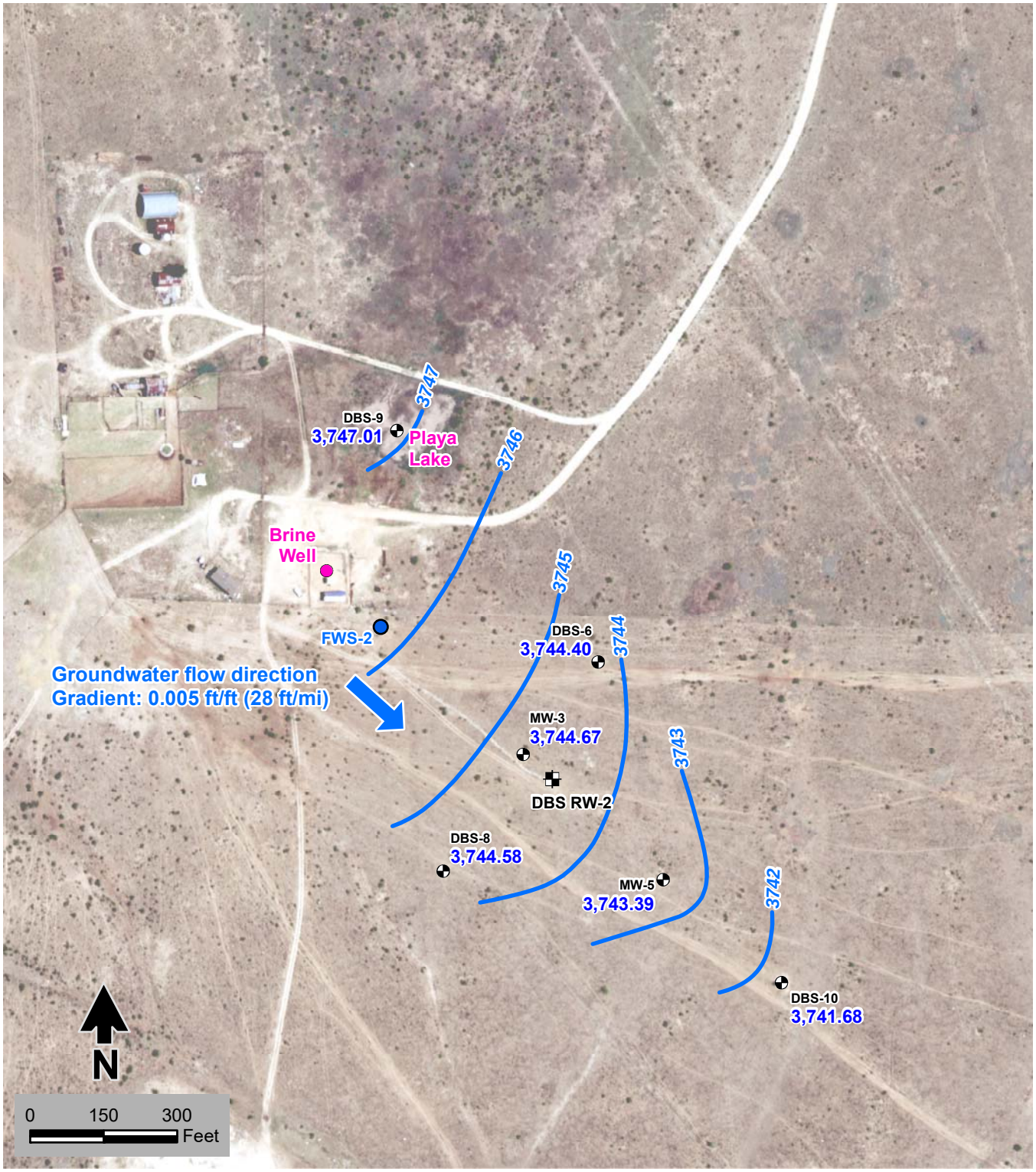
Daniel B. Stephens & Associates, Inc.

4/8/2020

JN DB19.1198.00

Figure 2

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_2SAIFIG02_GWE_201912_BRINE_STATION.MXD



Source: NAIP aerial imagery dated June 18, 2018

Explanation

MW-3 Well designation

3,744.67 Groundwater elevation, ft msl

- Monitor well
- Recovery well
- Fresh water supply well
- Potentiometric surface elevation contour (ft msl), dashed where inferred
- Groundwater flow direction

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area Potentiometric Surface Elevations December 2019

Daniel B. Stephens & Associates, Inc.

4/8/2020

JN DB19.1198.00

Figure 3

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_2SAIFIG03_GWE_201912_BRINE_WELL.MXD

Source: NAIP aerial imagery dated June 18, 2018

Explanation

DBS-2 Well designation

68 Chloride concentration (mg/L)

Monitor well

Recovery well

Fresh water supply well

Red indicates concentration equal to or greater than the NMWQCC standard.

SALTY DOG BRINE STATION

Former Brine Pond Area
Chloride Concentrations in Groundwater
December 2019

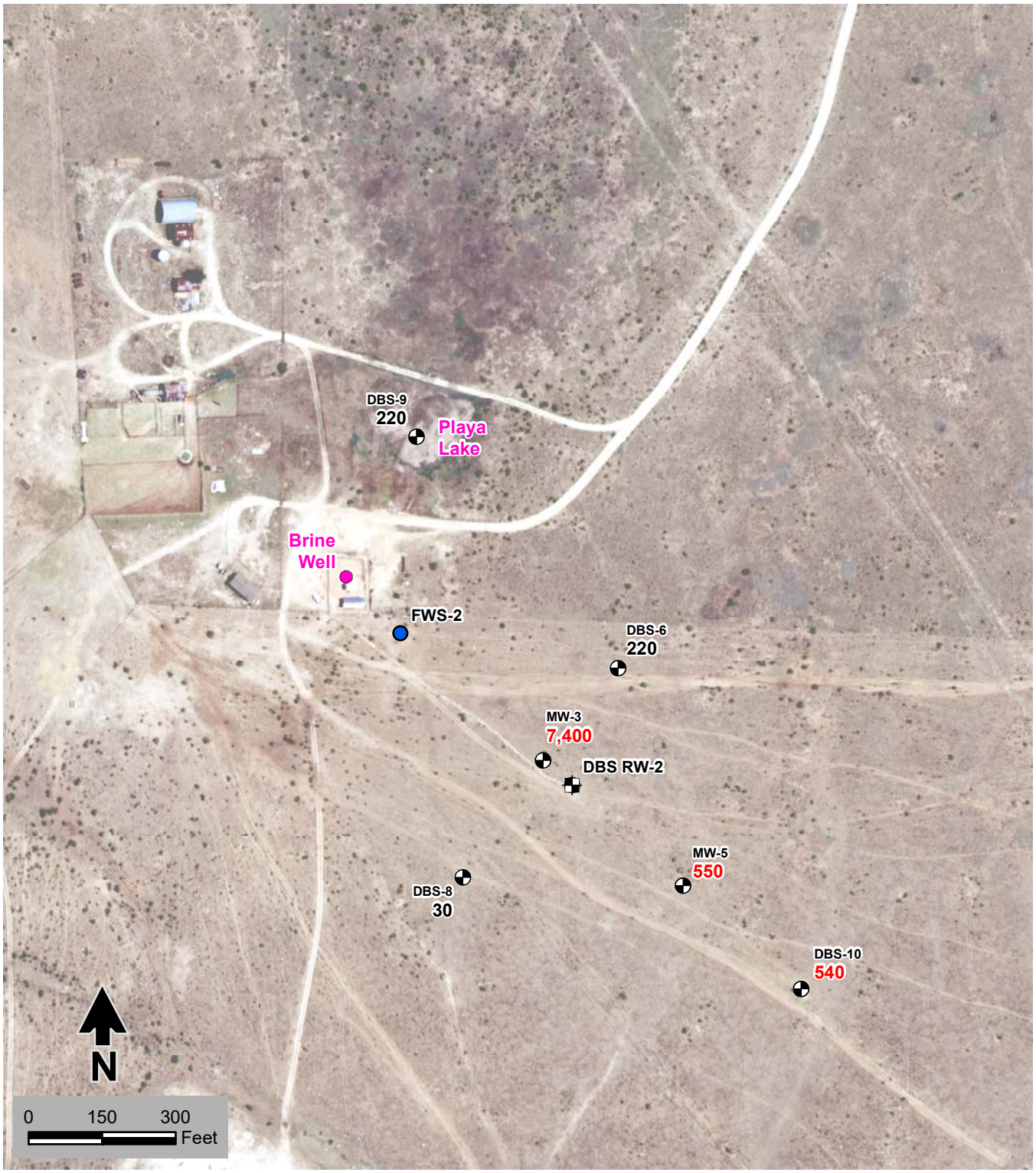
Daniel B. Stephens & Associates, Inc.

3/29/2020

JN DB19.1198.00

Figure 4

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_2SA\FIG04_CL_GW_201912_BRINE_STATION.MXD



Explanation

DBS-6 Well designation

220 Chloride concentration (mg/L)

Monitor well

Recovery well

Fresh water supply well

Red indicates concentration equal to or greater than the NMWQCC standard.

Source: NAIP aerial imagery dated June 18, 2018

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area
Chloride Concentrations in Groundwater
December 2019

Daniel B. Stephens & Associates, Inc.

3/29/2020

JN DB19.1198.00

Figure 5

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_2SA\FIG05_CL_GW_201912_BRINE_WELL.MXD

Appendix A

Laboratory Analytical Report

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 14, 2020

John Ayarbe

Daniel B. Stephens & Assoc.
6020 Academy NE Suite 100
Albuquerque, NM 87109
TEL:
FAX:

RE: Salty Dog OrderNo.: 1912A30

Dear John Ayarbe:

Hall Environmental Analysis Laboratory received 14 sample(s) on 12/19/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: Brine
Project: Salty Dog
Collection Date: 12/18/2019 7:00:00 AM
Lab ID: 1912A30-001 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	1.199	0			1	12/30/2019 1:29:00 PM	R65470
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	170000	10000	*	mg/L	2E+	12/27/2019 2:17:27 PM	R65460
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	343000	2000	*D	mg/L	1	12/24/2019 7:03:00 PM	49489
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.30		H	pH units	1	12/20/2019 11:50:28 AM	R65332
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Sodium	91000	2000		mg/L	2E+	1/9/2020 10:13:26 AM	49581

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: Injection
Project: Salty Dog
Collection Date: 12/18/2019 12:20:00 PM
Lab ID: 1912A30-002 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	0.9956	0			1	12/30/2019 1:29:00 PM	R65470
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	200	50		mg/L	100	12/27/2019 3:08:56 PM	R65460
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	618	40.0	*D	mg/L	1	12/24/2019 7:03:00 PM	49489
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.62		H	pH units	1	12/20/2019 11:54:55 AM	R65332
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Sodium	150	5.0		mg/L	5	1/9/2020 10:01:50 AM	49581

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-1R
Project: Salty Dog
Collection Date: 12/18/2019 9:12:00 AM
Lab ID: 1912A30-003 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	210	50		mg/L	100	12/27/2019 3:34:40 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-2
Project: Salty Dog
Collection Date: 12/17/2019 3:58:00 PM
Lab ID: 1912A30-004
Matrix: AQUEOUS
Received Date: 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	68	5.0		mg/L	10	12/27/2019 3:47:32 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-3
Project: Salty Dog
Collection Date: 12/17/2019 4:55:00 PM
Lab ID: 1912A30-005 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	48	5.0		mg/L	10	12/27/2019 4:13:16 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-4
Project: Salty Dog
Collection Date: 12/17/2019 3:15:00 PM
Lab ID: 1912A30-006 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	35	5.0		mg/L	10	12/27/2019 4:38:59 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-5
Project: Salty Dog
Collection Date: 12/18/2019 8:32:00 AM
Lab ID: 1912A30-007
Matrix: AQUEOUS
Received Date: 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	160	5.0		mg/L	10	12/27/2019 5:30:27 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-6
Project: Salty Dog
Collection Date: 12/17/2019 11:30:00 AM
Lab ID: 1912A30-008
Matrix: AQUEOUS
Received Date: 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	220	50		mg/L	100	12/27/2019 6:09:04 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-8
Project: Salty Dog
Collection Date: 12/17/2019 1:15:00 PM
Lab ID: 1912A30-009
Matrix: AQUEOUS
Received Date: 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	30	5.0		mg/L	10	12/27/2019 6:21:56 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-9
Project: Salty Dog
Collection Date: 12/17/2019 2:05:00 PM
Lab ID: 1912A30-010 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	220	50		mg/L	100	12/27/2019 7:26:14 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-10
Project: Salty Dog
Collection Date: 12/17/2019 12:25:00 PM
Lab ID: 1912A30-011 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	540	50	*	mg/L	100	12/27/2019 11:17:56 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: PMW-1
Project: Salty Dog
Collection Date: 12/18/2019 12:10:00 PM
Lab ID: 1912A30-012 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	3400	500	*	mg/L	1E+	12/27/2019 11:30:48 PM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** MW-3
Project: Salty Dog **Collection Date:** 12/18/2019 11:15:00 AM
Lab ID: 1912A30-013 **Matrix:** AQUEOUS **Received Date:** 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	1.005	0			1	12/30/2019 1:29:00 PM	R65470
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Fluoride	ND	1.0		mg/L	10	12/20/2019 12:51:44 AM	A65303
Chloride	7400	250	*	mg/L	500	12/27/2019 11:56:31 PM	A65303
Nitrogen, Nitrite (As N)	ND	10		mg/L	100	12/20/2019 1:04:09 AM	A65303
Bromide	ND	1.0		mg/L	10	12/20/2019 12:51:44 AM	A65303
Nitrogen, Nitrate (As N)	ND	1.0		mg/L	10	12/20/2019 12:51:44 AM	A65303
Phosphorus, Orthophosphate (As P)	ND	5.0		mg/L	10	12/20/2019 12:51:44 AM	A65303
Sulfate	500	5.0	*	mg/L	10	12/20/2019 12:51:44 AM	A65303
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	26000	25		µmhos/c	5	12/20/2019 3:43:18 PM	R65332
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	326.4	20.00		mg/L Ca	1	12/20/2019 11:58:57 AM	R65332
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	12/20/2019 11:58:57 AM	R65332
Total Alkalinity (as CaCO3)	326.4	20.00		mg/L Ca	1	12/20/2019 11:58:57 AM	R65332
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	15600	100	*D	mg/L	1	12/24/2019 7:03:00 PM	49489
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.12		H	pH units	1	12/20/2019 11:58:57 AM	R65332
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Calcium	1200	20		mg/L	20	1/9/2020 10:15:16 AM	49581
Magnesium	200	5.0		mg/L	5	1/9/2020 10:06:53 AM	49581
Potassium	18	5.0		mg/L	5	1/9/2020 10:06:53 AM	49581
Sodium	3600	100		mg/L	100	1/9/2020 10:17:05 AM	49581

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: MW-5
Project: Salty Dog
Collection Date: 12/18/2019 10:32:00 AM
Lab ID: 1912A30-014
Matrix: AQUEOUS
Received Date: 12/19/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	550	50	*	mg/L	100	12/28/2019 12:22:14 AM	R65460

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 27, 2019

Hall Environmental Analysis Laboratory

Sample Delivery Group: L1173514

Samples Received: 12/21/2019

Project Number:

Description:

Report To:

4901 Hawkins NE

Albuquerque, NM 87109

Entire Report Reviewed By:

Brittnie L Boyd
Project Manager

TABLE OF CONTENTS

1912A30-013C MW-3 L1173514-01 GW

Collected by	Collected date/time	Received date/time
	12/18/19 11:15	12/21/19 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2580	WG1402385	1	12/26/19 16:45	12/26/19 16:45	BAM	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brittnie L Boyd
Project Manager

Wet Chemistry by Method 2580

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	mV			date / time	
ORP	35.0	T8	1	12/26/2019 16:45	WG1402385

L1173514-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1173514-01 12/26/19 16:45 • (DUP) R3486097-2 12/26/19 16:45

Analyte	Original Result	DUP Result	Dilution	DUP Diff	DUP Qualifier	DUP Diff Limits
	mV	mV		mV		mV
ORP	35.0	34.0	1	2.90		20

Laboratory Control Sample (LCS)

(LCS) R3486097-1 12/26/19 16:45

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mV	mV	%	%	
ORP	105	104	99.0	86.0-105	

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
T8	Sample(s) received past/too close to holding time expiration.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

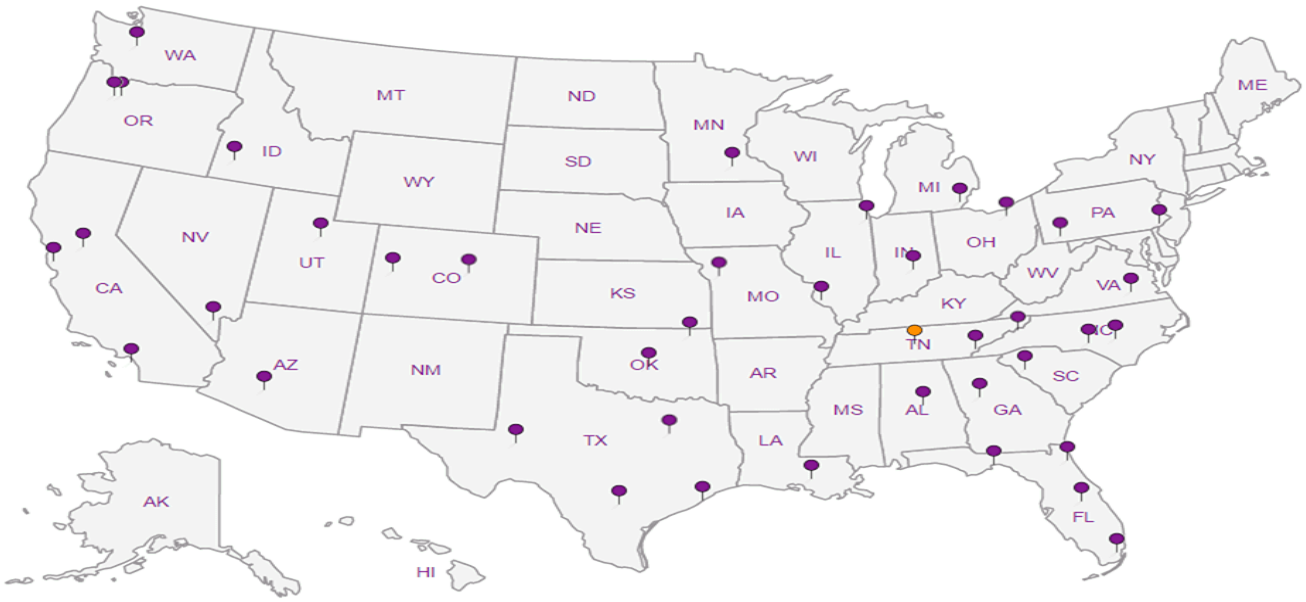
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



HALL ENVIRONMENTAL ANALYSIS LABORATORY

CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975
FAX: 505-345-4107
Website: www.hallenvironmental.com

SUB CONTRATOR: **ESC PACE**	COMPANY: **ESC PACE**	PHONE: **(800) 767-5859**	FAX: **(615) 758-5859**
ADDRESS: **12065 Lebanon Rd**		ACCOUNT #:	EMAIL:
CITY, STATE, ZIP: **Mt. Juliet, TN 37122**			

B020

L1173514

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	1912A30-013C	MW-3	125HDP	Aqueous	12/18/2019 11:15:00 AM	1	ORP -01

COC SI

RAD SCREEN: <0.5 mR/hr

SPECIAL INSTRUCTIONS / COMMENTS: Tracking # 5704 6067 3065 Containers Received 2

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By:	Date: 12/19/2019	Time: 3:44 PM	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By: W Tay Gn	Date: 12/21/19	Time: 0830

TAT: Standard [X] **RUSH** Next BD [ ] 2nd BD [ ] 3rd BD [ ]

REPORT TRANSMITTAL DESIRED:

[ ] HARDCOPY (extra cost) [ ] FAX [ ] EMAIL [ ] ONLINE

FOR LAB USE ONLY

Temp of samples 0.2-.3+0.5 °C Attempt to Cool ? Y

Comments:

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client:	L1173514	
Cooler Received/Opened On: 12/21/19 Temperature: 0.5		
Received By: WILLIE TAYLOR 1030		
Signature: Willie Taylor		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?		✓	
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912A30**

14-Jan-20

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A65303**	RunNo: **65303**
Prep Date:	Analysis Date: **12/19/2019**	SeqNo: **2243077** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A65303**	RunNo: **65303**
Prep Date:	Analysis Date: **12/19/2019**	SeqNo: **2243078** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.55	0.10	0.5000	0	109	90	110			
Chloride	4.8	0.50	5.000	0	96.2	90	110			
Nitrogen, Nitrite (As N)	0.95	0.10	1.000	0	94.9	90	110			
Bromide	2.5	0.10	2.500	0	98.6	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			
Phosphorus, Orthophosphate (As P	4.9	0.50	5.000	0	97.8	90	110			
Sulfate	9.7	0.50	10.00	0	97.3	90	110			

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R65460**	RunNo: **65460**
Prep Date:	Analysis Date: **12/27/2019**	SeqNo: **2248796** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R65460**	RunNo: **65460**
Prep Date:	Analysis Date: **12/27/2019**	SeqNo: **2248797** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1912A30**
14-Jan-20

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **lcs-1 99.9uS eC**	SampType: **lcs**	TestCode: **SM2510B: Specific Conductance**
Client ID: **LCSW**	Batch ID: **R65332**	RunNo: **65332**
Prep Date:	Analysis Date: **12/20/2019**	SeqNo: **2244258** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	98	5.0	99.90	0	98.6	85	115			

Sample ID: **1912a30-013a dup**	SampType: **dup**	TestCode: **SM2510B: Specific Conductance**
Client ID: **MW-3**	Batch ID: **R65332**	RunNo: **65332**
Prep Date:	Analysis Date: **12/20/2019**	SeqNo: **2244266** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	26000	25						2.39	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912A30**

14-Jan-20

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID: **MB-49581** SampType: **MBLK** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **PBW** Batch ID: **49581** RunNo: **65605**

Prep Date: **12/31/2019** Analysis Date: **1/7/2020** SeqNo: **2253387** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								

Sample ID: **LCS-49581** SampType: **LCS** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **LCSW** Batch ID: **49581** RunNo: **65605**

Prep Date: **12/31/2019** Analysis Date: **1/7/2020** SeqNo: **2253389** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	50	1.0	50.00	0	99.6	80	120			
Magnesium	49	1.0	50.00	0	98.1	80	120			
Potassium	49	1.0	50.00	0	97.3	80	120			

Sample ID: **MB-49581** SampType: **MBLK** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **PBW** Batch ID: **49581** RunNo: **65667**

Prep Date: **12/31/2019** Analysis Date: **1/9/2020** SeqNo: **2255586** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID: **LCS-49581** SampType: **LCS** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **LCSW** Batch ID: **49581** RunNo: **65667**

Prep Date: **12/31/2019** Analysis Date: **1/9/2020** SeqNo: **2255590** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	49	1.0	50.00	0	97.0	80	120			

Sample ID: **1912A30-002BMS** SampType: **MS** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **Injection** Batch ID: **49581** RunNo: **65667**

Prep Date: **12/31/2019** Analysis Date: **1/9/2020** SeqNo: **2255604** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	200	5.0	50.00	145.3	99.9	75	125			

Sample ID: **1912A30-002BMSD** SampType: **MSD** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **Injection** Batch ID: **49581** RunNo: **65667**

Prep Date: **12/31/2019** Analysis Date: **1/9/2020** SeqNo: **2255605** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	190	5.0	50.00	145.3	98.4	75	125	0.378	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1912A30**
14-Jan-20

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **1912a30-013a dup**	SampType: **dup**			TestCode: **SM4500-H+B / 9040C: pH**						
Client ID: **MW-3**	Batch ID: **R65332**			RunNo: **65332**						
Prep Date:	Analysis Date: **12/20/2019**			SeqNo: **2244279**		Units: **pH units**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.12									H

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1912A30**
14-Jan-20

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **mb-1 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R65332**	RunNo: **65332**							
Prep Date:	Analysis Date: **12/20/2019**	SeqNo: **2244235**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: **lcs-1 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R65332**	RunNo: **65332**							
Prep Date:	Analysis Date: **12/20/2019**	SeqNo: **2244236**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	79.24	20.00	80.00	0	99.0	90	110			

Sample ID: **1912a30-013a dup**	SampType: **dup**	TestCode: **SM2320B: Alkalinity**							
Client ID: **MW-3**	Batch ID: **R65332**	RunNo: **65332**							
Prep Date:	Analysis Date: **12/20/2019**	SeqNo: **2244238**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	327.2	20.00						0.220	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1912A30**
14-Jan-20

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **1912A30-001ADUP**	SampType: **DUP**	TestCode: **Specific Gravity**							
Client ID: **Brine**	Batch ID: **R65470**	RunNo: **65470**							
Prep Date:	Analysis Date: **12/30/2019**	SeqNo: **2249072**	Units:						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	1.197	0						0.159	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912A30**

14-Jan-20

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID: **MB-49489**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **49489**	RunNo: **65394**
Prep Date: **12/23/2019**	Analysis Date: **12/24/2019**	SeqNo: **2246446** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: **LCS-49489**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **49489**	RunNo: **65394**
Prep Date: **12/23/2019**	Analysis Date: **12/24/2019**	SeqNo: **2246447** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1030	20.0	1000	0	103	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **DBS** Work Order Number: **1912A30** RcptNo: 1

Received By: **Desiree Dominguez** **12/19/2019 10:05:00 AM** DD

Completed By: **Erin Melendrez** **12/19/2019 2:52:19 PM** EM

Reviewed By: DM 12/19/19

Chain of Custody

1. Is Chain of Custody sufficiently complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Client		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☑	NA ☐
	Samples not frozen.		
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 4 (<2 or >12 unless noted)

Adjusted? no

Checked by: YG 12/19/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	-0.1	Good				

Chain-of-Custody Record

Client: Daniel B. Stephens

Mailing Address: ABQ office

Phone #: 505-822-9400

email or Fax#: JAyoube@geologic.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Salty Dog

Project #: DB19.1198.00 Ph1 T2

Project Manager: John Ayoube

Sampler: Y. Morga

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): -0.1 -0.0 = -0.1 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1912A30	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Specific gravity, TDS, pH	Sodium 6010B	Cl only 300.0
12-18-19	0700	GW	Brine	3 poly	Varies	-001											X	X	X
"	1330		Injection	3 poly	varies	-002											X	X	X
"	0912		DBS-1R	1 poly	N/A	-003													X
12-17-19	1558		DBS-2			-004													X
"	1655		DBS-3			-005													X
"	1515		DBS-4			-006													X
12-18-19	0832		DBS-5			-007													X
12-17-19	11:30		DBS-6			-008													X
"	13:15		DBS-8			-009													X
"	14:05		DBS-9			-010													X
"	12:35		DBS-10			-011													X
12-18-19	12:10		PMW-1		N/A	-012													X

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
12-19-19	10:05			CDO	12/19/19	10:05
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks: Page 1 of 2 NOT FROZEN

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: DBS + A

Mailing Address: ABQ office

Phone #: 505-822-9400

email or Fax#:

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Salty Dog

Project #: DB19.1198.00.Ph 72

Project Manager: John Aylsbe

Sampler:

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): -0.1 -0.0 = 0.1 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1912A30	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals All 200	Cl, F, Br, NO_3, NO_2, PO_4, SO_4 ORP	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Cl only 300.0	Specific gravity	Specific Conductivity	Bicarbonate, Carbonate, Total Alkalinity	TDS, pH	Ca, Mg, K, Na, Gold B
12-19	1115	GW	MW-3 ✓	4 Poly	Rates	-013							X	X			X	X	X	X	X	X
"	1032	GW	MW-5 ✓	1 Poly	N/A	-014										X						

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
12-19-19	1005			CDO	12/19/19	10:05
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks: Page 2 of 2 NOT FROZEN

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Appendix B

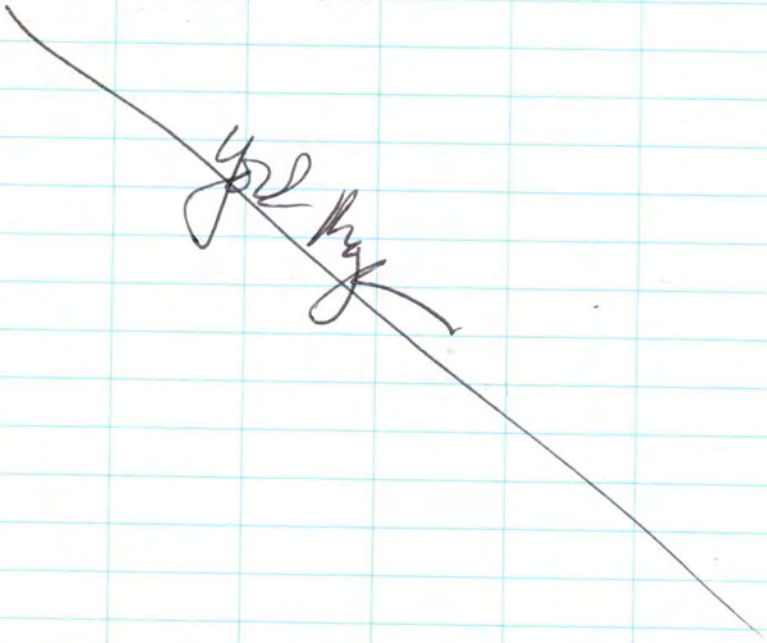
Field Notes

Location Salty Dog - Hobbs Date 12-10-19

Project / Client V. Morgan

100% clear, 40°, calm

- 0750 - Arrive onsite - review scope/maps
- Start gauging wells. meet w/ Jim
- Jim says he has been pumping a lot. FW5-2 running well but FW5-1 not running - has persistent problems w/ electrical.
- No pump in Fed EX boxes. Call Geotech to ship another to hotel. Will return late this week.
- 1300 - Leave site



Location Date

Project / Client

Location C&S Dora Date 12-15-19

Project / Client High 57, Clear, Lt wind
↳ becoming Cold

- 0740 - Arrive on site
  - Calibrate pH meter, prep gear
  - Collect GW samples From 12 wells
- 1715 - Leave site

C&S Dora 12-16-19

High 31°, clear

- 0720 - Check out of hotel - load gear & hotel
- 0745 - Arrive onsite, photos of gasoline spot 10' upgradient of MW-5 For Tom. Switch PVC cap @ 5 w/ nearby well ↳ slightly deformed
- 1530 - Finish Sampling 8 remaining wells Decon & to Hobbs

YZ Morgan

Location Salty Dog Date 12-17-19

Project / Client High 40°, clear, Lt wind

- 0630 - Leave hotel - Hobbs
- 0650 - Arrive on site
- Calibrate WQ meter - DO sensor bad - troubleshoot, Δ membrane - Zero still bad readings
- Troubleshoot power to pump
- DBS-8 Not enough water to fill tubing evidently. Troubleshoot. Collect sample from water trapped in tubing
- DBS-2 - Same as DBS-8 - sampled w/ bailer. Troubleshoot pump - apparently overheated (?) trying to sample DBS-2.
- Collected 7 GW Samples Decon'd between each sample
  Lots of delays w/ equipment

Yael Ey

Location Salty Dog Date 12-18-19

Project / Client 30° on arrival, High 45°
Clear, 5-10 mph

- 0630 – Check out of Hobbs hotel
- 0650 – Arrive onsite
- 0700. Collect Brine Samples from Fill station pipe.
- Calibrate pH meter DO sensor still won't calibrate
- Collect remaining 5 GW Samples
- Sit onsite w/ electricians. Still having trouble w/ pump near brine well. Repairs made. Heavy pumping recently w/ both wells. intermittently due to electrical problems
- 1220 Collect Injection (fresh water) @ brown tanks near PMW-1
- Decon & Stowe all gear
- 1315 – Leave Site to ABQ via Roswell

Location Date

Project / Client

Daniel B. Stephens & Associates, Inc.

GROUNDWATER ELEVATION DATA SHEET

Project Name: Salty Dog   Sampler: V. Rogan

Project #: DB19.1198   Sample Date: ~~12/10/19~~ & 12/17/19 & 12/18/19

Project Manager: John Ayarbe   Sheet # 1 of 1

12/10/19   12/17/19 - All WLs

Well ID	previous (06/19)	Depth to Water	Total Depth	Comments: (well dia., sampled, condition)
DBS-1R	68.25	~~68.16~~ 69.09	74.42	70.41 @ 07:02
DBS-2	70.94	~~72.36~~ 71.10 (circled)	75.35	72.43 07:08
DBS-3	66.10	66.78	74.76	66.96 07:22
DBS-4	71.66	72.36	78.81	72.90 07:12
DBS-5	68.44	69.07	75.38	69.13 07:17
DBS-6	67.24	68.13	76.02	67.95 08:05
DBS-7	65.99	66.82		WL only Not on map 66.61 07:58
DBS-8	65.52	66.40	69.91	66.12 07:54
DBS-9	58.53	59.27	67.55	59.25 07:22
DBS-10	65.11	65.78	78.11	65.80 07:50
MW-2	65.45	66.93	--	Not on map 66.65 07:26 WL only
MW-3	68.18	69.09	147.13	67.38 07:30
MW-4	68.12	68.98		WL only Not on map 67.40 07:35
MW-5	65.30	66.09	128.78	65.57 07:39
MW-6	66.70	~~68.13~~ 67.48		WL only Not on map 67.29 07:44
PMW-1	71.76	73.28	77.73	76.25 0655

Comments: DBS RW-1 68.16   DBS RW-2 - 70.12

FWS-2 151493 barrels pumping
FWS-1 155933 barrels Not pumping

S:\Projects\ES08.0118.06_Salty_Dog_2016\Field Forms\SD GW Elevation.docx

BBL
0700 ~~59.27~~ FWS-1 1619151.8 Pumping
0725 FWS-2 155128.5 Not pumping

Daniel B. Stephens & Associates, Inc.

GROUNDWATER METER CALIBRATION SHEET

Project Name: Salty Dog Sampler: Y. Rogan

Project #: DBG 1198.00 Date: 12-12-19

Project Manager: J. Agrabe

Geotech YSI Pro Plus

pH	Temp (°C)	Comments
(4) 4.04	4.7	No cal needed
(7) 7.12	4.4	"
(10) 10.18	5.0	"
SpCon (µs/cm)	**Temp (°C)**	**Comments**
(1413) 1432 → 1413	5.3	
ORP (mv)	**Temp (°C)**	**Comments**
221.0	5.0	
Dissolved O_2	**Temp (°C)**	**Comments**
(%) —	—	Bad sensor
(mg/L) —	—	
Pressure	**Temp (°C)**	**Comments**
(mmHg) 672.9	6.5	

Comments: DO sensor is bad. New membrane & zeroed yesterday. Out of range anyway. Geotech rental unit

Daniel B. Stephens & Associates, Inc.

1475602

GROUNDWATER METER CALIBRATION SHEET

Project Name: Salty Dog Sampler: V. Moya

Project #: DB.11198.00 1.4.2 Date: 12-17-19

Project Manager: J. Hyde

Geotech YSI Pro Plus

pH	Temp (°C)	Comments
(4) 4.00	10.5	No cal needed
(7) 7.00	7.7	↓
(10) 10.20	9.4	↓
SpCon (µs/cm)	**Temp (°C)**	**Comments**
1442 → 1413 (1413)	7.7	
ORP (mv)	**Temp (°C)**	**Comments**
236.1 → 220	8.1	
Dissolved O_2	**Temp (°C)**	**Comments**
94.5 → 91.1 (%)	7.8	Was reading ~150% initially. Out of range - would not calibrate. Installed new membrane per instructions
10.58 (mg/L)	3.9	
Pressure	**Temp (°C)**	**Comments**
(mmHg) 674.7	8.0	

Comments: Geotech Serial unit

W/ New DO membrane readings remain out of range. Tested DO & readings continued to rise until >100 again. Re-calibrated 3 times - unstable readings persist

Cannot use flow cell because adapters are too small for tubing

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: V. Morgan

Project #: DB19.1198.00 Sample Date: 12-18-19

Project Manager: John Ayarbe Sample Time: 0912

Well #: DBS-1R

Well Diameter: 2" (inches) Height of Water Column: 4.01 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 0.64 (gal)

Depth to Water: 70.41 (feet btoc) Purge Volume: 1.93 (gal)

Total Depth of Well: 74.42 (feet) Purge Method: ~~Grab~~ Pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Bad Sensor

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	8.30	14.2	1361	234.1	—	Turbid
1	7.84	18.1	1148	227.0	—	"
2	7.76	20.0	1222	226.5	—	Slightly turbid
3	7.71	20.2	1268	226.2	—	Not Slightly turbid

Sample Description: 1 poly

Physical Observations: No odor, Slightly turbid

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: Y. Rojas

Project #: DB19.1198.00 Sample Date: 12-17-19

Project Manager: John Ayarbe Sample Time: 1558

Well #: DBS-2

Well Diameter: 2" (inches) Height of Water Column: ~~7.92~~ 2.92 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: ~~0.47~~ 0.47 (gal)

Depth to Water: ~~72.43~~ 72.43 (feet btoc) Purge Volume: ~~1.40~~ 1.40 (gal)

Total Depth of Well: 75.35 (feet) Purge Method: ~~Grab~~ ~~pump~~ bailer

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters: ~~xfcd~~ Sensor

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial 0.5gallon	7.43	18.2	672	192.2	16.74	very turbid
1						
2						
3						

Sample Description: 1 poly

Well column only ~2.4' in bailer - pump kept shutting off due (?) to ~~water~~ well going dry. Used new bailer to collect sample

Physical Observations: Turbid, no odor

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: Y. Morgan

Project #: DB19.1198.00 Sample Date: 12-17-19

Project Manager: John Ayarbe Sample Time: 1655

Well #: DBS-3

Well Diameter: 2" (inches) Height of Water Column: 7.8 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 1.25 (gal)

Depth to Water: 66.96 (feet btoc) Purge Volume: 3.75 (gal)

Total Depth of Well: 74.76 (feet) Purge Method: ~~Grab~~ Pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	Bad Sensor D.O. (mg/L)	Turbidity (NTU)
Initial	7.88	16.2	572.4	271.0	15.42	Turbid
1	7.62	18.6	589	257.2	13.96	"
2	7.54	19.7	585	234.7	13.32	"
3	7.52	20.1	579	211.0	15.32	"

Sample Description: 1 poly

Physical Observations: Turbid, no odor

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: VM

Project #: DB19.1198.00 Sample Date: 12.17.19

Project Manager: John Ayarbe Sample Time: 1515

Well #: DBS-4 645

Well Diameter: 2" (inches) Height of Water Column: ~~9.38~~ (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: ~~1.02~~ 1.03 (gal)

Depth to Water: ~~72.43~~ 72.36 (feet btoc) Purge Volume: ~~3.06~~ 3.09 (gal)

Total Depth of Well: 78.81 (feet) Purge Method: ~~Grab~~ Pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters: Red Sensor

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	~~D.O.~~ D.O. (mg/L)	Turbidity (NTU)
Initial	7.79	17.0	~~637~~ 537	176.4	13.17	Turbid
1	7.59	19.5	539	139.5	14.30	"
2	7.57	19.9	539	113.6	13.89	"
3	7.54	19.9	539	113.5	14.34	Sl. turbid

Sample Description: 1 poly

Physical Observations: Slightly turbid, No odor

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: Y. Morgan
Project #: DB19.1198.00
Sample Date: 12-18-19
Project Manager: John Ayarbe
Sample Time: 0832

Well #: DBS-5
Well Diameter: 2" (inches) Height of Water Column: 6.75 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.0 (gal)
Depth to Water: 69.13 (feet btoc) Purge Volume: 3.0 (gal)
Total Depth of Well: 75.38 (feet) Purge Method: ~~Grab~~ Pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	7.33	18.0	1390	118.0	—	Turbid
1	7.12	20.1	1482	143.6	—	Sl. turbid
2	7.06	20.4	1169	156.0	—	"
3	7.05	20.4	1172	161.2	—	"

Sample Description: 1 poly

Physical Observations: Slightly turbid, No odor

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: J. Rigan
Project #: DB19.1198.00
Sample Date: 12-17-19
Project Manager: John Ayarbe
Sample Time: 11:30

Well #: DBS-6

Well Diameter: 2" (inches) Height of Water Column: 8.07 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.291 x 3 = 3.87 (gal)
Depth to Water: 67.95 (feet btoc) Purge Volume: ~~3.87~~ 4.0 (gal)
Total Depth of Well: 76.02 (feet) Purge Method: ~~Grab~~ pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters: Bad Sensor

Casing Volume	pH	Temp °C	Conductivity (µS/cm)	ORP (mv)	~~X~~ D.O. (mg/L)	Turbidity (NTU)
Initial	6.95	18.3	1310	208.3	14.67	Very turbid
1	7.10	19.3	1262	192.8	15.25	turbid
2	7.11	19.8	1264	170.2	15.40	"
3	7.15	20.0	1285	154.5	15.21	"

Sample Description: 1 poly

Physical Observations: Turbid, Light brown, no odor
Purged 7 8 gallons - water removed, turbid

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: U. Borga
Project #: DB19.1198.00
Sample Date: 12-17-19
Project Manager: John Ayarbe
Sample Time: 1315

Well #: DBS-8

Well Diameter: 2" (inches)
Height of Water Column: 3.51 (feet)
Depth to NAPL: --- (feet btoc)
Casing Volume: 0.56 (gal)
Depth to Water: 66.40 (feet btoc)
Purge Volume: 1.69 (gal)
Total Depth of Well: 69.91 (feet)
Purge Method: ~~Grab~~ pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp °C	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	NA					
1						
2						
3						

Sample Description: 1 poly
well going dry before purge tubing fills. Collected sample from water trapped in tubing after pulling pump. Not enough water to take GW parameters
Physical Observations: Turbid, no odor

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: J Morgan

Project #: DB19.1198.00 Sample Date: 12-17-19

Project Manager: John Ayarbe Sample Time: 1405

Well #: DBS-9

Well Diameter: 2" (inches) Height of Water Column: 8.3 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 1.33 (gal)

Depth to Water: 59.25 (feet btoc) Purge Volume: 3.98 (gal)

Total Depth of Well: 67.55 (feet) Purge Method: ~~Grab~~ Pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters: Rad Sensor

Casing Volume	pH	Temp (°F) °C	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	7.57	14.2	1972	220.0	15.08	Turbid
1	7.30	17.5	1802	188.1	14.73	Turbid
2	7.31	19.0	1524	154.7	13.70	Turbid
3	7.27	19.6	1439	124.1	13.64	Slightly turbid

Sample Description: 1 poly

Physical Observations: No odor, Slightly turbid

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: Y. Morgan

Project #: DB19.1198.00 Sample Date: 10-17-19

Project Manager: John Ayarbe Sample Time: 1225

Well #: DBS-10

Well Diameter: 2" (inches) Height of Water Column: 12.31 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 1.97 (gal)

Depth to Water: 65.80 (feet btoc) Purge Volume: 5.91 (gal)

Total Depth of Well: 78.11 (feet) Purge Method: ~~Grab~~ Pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters: Ext Sensor

Casing Volume	pH	Temp ~~°F~~ °C	Conductivity (µS/cm)	ORP (mv)	~~%~~ D.O. (mg/L)	Turbidity (NTU)
Initial	7.11	19.2	2271	207.9	14.50	Turbid
1	7.05	19.6	2354	191.7	15.35	Turbid
2	7.01	19.9	2453	173.0	16.25	Turbid
3	7.00	20.0	2447	123.9	17.02	Non turbid

Sample Description: 1 poly

Physical Observations: No odor, Non turbid

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Project #: DB19.1198.00
Project Manager: John Ayarbe

Sampler: Y. Mogen
Sample Date: 12-18-19
Sample Time: 12:10

Well #: PMW-1

Well Diameter: 2" (inches)
Depth to NAPL: --- (feet btoc)
Depth to Water: 76.25 (feet btoc)
Total Depth of Well: 77.73 (feet)

Height of Water Column: 1.48 (feet)
Casing Volume: 0.24 (gal)
Purge Volume: 0.73 actual ~ 0.75 (gal)
Purge Method: ~~Grab~~ ~~Pump~~ Bailer

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Field Sensor

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	7.45	18.3	12,990	159.3	—	Non turbid
1	—					
2	—					
3	—					

Sample Description: 1 poly

Physical Observations: WC very salt - Pump drawing down had to use bailer to get sample. Non turbid, no odor

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: J Morgan
Project #: DB19.1198.00
Sample Date: 12-18-19
Project Manager: John Ayarbe
Sample Time: 1115

Well #: MW-3

Well Diameter: 2" (inches) Height of Water Column: 79.75 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 12.76 (gal)
Depth to Water: 67.38 (feet btoc) Purge Volume: 38.28 (gal)
Total Depth of Well: 147.13 (feet) Purge Method: ~~Grab~~ pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters: * Rad Sensor

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	7.36	18.9	19810	182.7	—	Non turbid
1	7.00	19.6	19225	171.4	—	"
2	7.00	19.7	21908	155.5	—	"
3	7.00	19.7	22337	151.2	—	"

Sample Description: 1 poly (unpreserved Chloride), Water Quality Suite 4 Containers

Physical Observations: Non turbid, No odor

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: Y. Reyes

Project #: DB19.1198.00 Sample Date: 12-18-19

Project Manager: John Ayarbe Sample Time: 1032

Well #: MW-5

Well Diameter: 2" (inches) Height of Water Column: 63.21 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 10.11 (gal)

Depth to Water: 65.57 (feet btoc) Purge Volume: 30.34 (gal)

Total Depth of Well: 128.78 (feet) Purge Method: ~~Grab~~ Pump

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters: Bad sensor

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	8.06	14.3	1969	235.2	—	Non turbid
1	7.08	19.7	2378	166.7	—	"
2	7.07	19.8	2358	141.2	—	"
3	7.06	19.8	2334	135.3	—	"

Sample Description: 1 poly

Physical Observations: Non turbid, No odor

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: V. Rogers

Project #: DB19.1198.00 Sample Date: 12-18-19

Project Manager: John Ayarbe Sample Time: 0700

Well #: Brine

Well Diameter: 2" (inches) Height of Water Column: — (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: — (gal)

Depth to Water: — (feet btoc) Purge Volume: — (gal)

Total Depth of Well: — (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	7.33	-4.7	256,498	164.8	7.68	Non turbid
1						
2						
3						

Sample Description: 3 poly
Grab From pit that fills trucks

Physical Observations: Salt deposits on pipe

Analytical Method(s): Sodium, Chloride, TDS, Spec Gravity, pH

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: J. Moga
Project #: DB19.1198.00
Sample Date: 12-8-19
Project Manager: John Ayarbe
Sample Time: 1020

Well #: Injection

Well Diameter: 2" (inches) Height of Water Column: — (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: — (gal)
Depth to Water: — (feet btoc) Purge Volume: — (gal)
Total Depth of Well: — (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	7.80	96	1415	93.7	—	Non turbid
1						
2						
3						

Sample Description: 3 poly

Physical Observations: Road from Fill pile & brown tanks near mailbox & PMW-1, opened valve for sample

Analytical Method(s): Chloride, TDS, Spec Gravity, pH, and Na

Appendix C

Historical Data

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 9

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-1	56.0–76.0	3,817.09	4/08/2009	62.38	3,754.71
			5/11/2011	64.70	3,752.39
			10/04/2011	Well destroyed	
DBS-1R	58.0–78.0	3,817.00 [b]	4/30/2012	63.60	3,753.40
			9/10/2012	65.65	3,751.35
			6/23/2013	64.40	3,752.60
			1/09/2014	67.23	3,749.77
			4/07/2014	66.36	3,750.64
			3/20/2015	67.17	3,749.83
			7/01/2015	67.92	3,749.08
			9/29/2015	67.07	3,749.93
			12/16/2015	67.54	3,749.46
			3/22/2016	66.61	3,750.39
			6/08/2016	66.23	3,750.77
			9/13/2016	67.43	3,749.57
			12/01/2016	67.31	3,749.69
			6/20/2017	69.60	3,747.40
			12/19/2017	67.80	3,749.20
			6/18/2018	67.45	3,749.55
			11/07/2018	68.71	3,748.29
			6/03/2019	68.25	3,748.75
			12/17/2019	70.41	3,746.59
DBS-2	58.0–78.0	3,820.50	4/08/2009	65.45	3,755.05
			5/11/2011	66.80	3,753.70
			10/04/2011	65.87	3,754.63
			2/08/2012	65.96	3,754.54
			4/30/2012	66.26	3,754.24
			9/10/2012	67.45	3,753.05
			6/23/2013	67.03	3,753.47
			1/09/2014	69.08	3,751.42
			4/07/2014	68.67	3,751.83
			3/20/2015	69.32	3,751.18

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface
btoc = Below top of casing
msl = Above mean sea level
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 9

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-2 (cont.)	58.0–78.0	3,820.50	6/30/2015	69.29	3,751.21
			9/29/2015	69.41	3,751.09
			12/16/2015	69.71	3,750.79
			3/22/2016	69.13	3,751.37
			6/08/2016	68.91	3,751.59
			9/13/2016	69.76	3,750.74
			12/01/2016	69.73	3,750.77
			6/20/2017	71.33	3,749.17
			12/19/2017	70.42	3,750.08
			6/18/2018	70.25	3,750.25
			11/07/2018	71.07	3,749.43
			6/03/2019	70.94	3,749.56
			12/17/2019	72.43	3,748.07
DBS-3	56.0–76.72	3,816.66	4/08/2009	60.67	3,755.99
			5/11/2011	61.25	3,755.41
			10/04/2011	61.25	3,755.41
			2/08/2012	61.11	3,755.55
			4/30/2012	61.41	3,755.25
			9/10/2012	61.81	3,754.85
			6/23/2013	62.08	3,754.58
			1/09/2014	63.30	3,753.36
			4/07/2014	63.43	3,753.23
			3/20/2015	63.93	3,752.73
			6/30/2015	63.99	3,752.67
			9/29/2015	64.17	3,752.49
			12/16/2015	64.41	3,752.25
			3/22/2016	63.88	3,752.78
			6/08/2016	63.92	3,752.74
			9/13/2016	64.56	3,752.10
			12/01/2016	64.59	3,752.07
			6/20/2017	65.52	3,751.14
			12/19/2017	65.54	3,751.12

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 3 of 9

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-3 (cont.)	56.0–76.72	3,816.66	6/18/2018	65.60	3,751.06
			11/07/2018	66.11	3,750.55
			6/03/2019	66.10	3,750.56
			12/17/2019	66.96	3,749.70
DBS-4	56.0–76.0	3,820.37	4/08/2009	66.27	3,754.10
			5/11/2011	67.23	3,753.14
			10/04/2011	66.67	3,753.70
			2/08/2012	66.76	3,753.61
			4/30/2012	67.02	3,753.35
			9/10/2012	67.78	3,752.59
			6/23/2013	67.70	3,752.67
			1/09/2014	69.37	3,751.00
			4/07/2014	69.23	3,751.14
			3/20/2015	69.81	3,750.56
			6/30/2015	69.85	3,750.52
			9/29/2015	70.00	3,750.37
			12/16/2015	70.25	3,750.12
			3/22/2016	69.74	3,750.63
			6/08/2016	69.62	3,750.75
			9/13/2016	70.35	3,750.02
			12/01/2016	70.38	3,749.99
			6/20/2017	71.67	3,748.70
			12/19/2017	71.08	3,749.29
			6/18/2018	70.98	3,749.39
			11/07/2018	71.61	3,748.76
			6/03/2019	71.66	3,748.71
			12/17/2019	72.90	3,747.47
DBS-5	56.9–76.9	3,820.66	4/08/2009	62.99	3,757.67
			5/11/2011	63.45	3,757.21
			10/04/2011	63.41	3,757.25
			2/08/2012	63.46	3,757.20
			4/30/2012	63.70	3,756.96

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-5 (cont.)	56.9–76.9	3,820.66	9/10/2012	63.92	3,756.74
			6/23/2013	64.30	3,756.36
			1/09/2014	65.28	3,755.38
			4/07/2014	65.48	3,755.18
			3/20/2015	65.90	3,754.76
			7/01/2015	66.18	3,754.48
			9/29/2015	66.25	3,754.41
			12/16/2015	66.47	3,754.19
			3/22/2016	66.08	3,754.58
			6/08/2016	66.16	3,754.50
			9/13/2016	66.64	3,754.02
			12/01/2016	66.72	3,753.94
			6/20/2017	67.60	3,753.06
			12/19/2017	67.88	3,752.78
			6/18/2018	68.04	3,752.62
			11/07/2018	68.47	3,752.19
			6/03/2019	68.44	3,752.22
			12/17/2019	69.13	3,751.53
DBS-6	56.7–76.7	3,812.65	4/07/2009	62.75	3,749.90
			5/11/2011	63.11	3,749.54
			10/04/2011	63.16	3,749.49
			2/08/2012	63.20	3,749.45
			4/30/2012	63.43	3,749.22
			9/10/2012	63.60	3,749.05
			6/23/2013	63.74	3,748.91
			1/09/2014	64.00	3,748.65
			4/07/2014	64.22	3,748.43
			3/19/2015	64.78	3,747.87
			7/01/2015	64.81	3,747.84
			9/29/2015	65.48	3,747.17
			12/16/2015	65.26	3,747.39
			3/22/2016	65.38	3,747.27

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-6 (cont.)	56.7–76.7	3,812.65	6/08/2016	65.37	3,747.28
			9/13/2016	65.51	3,747.14
			12/01/2016	65.51	3,747.14
			6/20/2017	65.81	3,746.84
			12/19/2017	66.29	3,746.36
			6/18/2018	66.45	3,746.20
			11/07/2018	66.62	3,746.03
			6/03/2019	67.24	3,745.41
			12/17/2019	67.95	3,744.70
DBS-7	55.1–75.1	3,810.21	4/07/2009	61.74	3,748.47
DBS-8	55.2–75.2	3,810.70	4/07/2009	61.20	3,749.50
			5/11/2011	61.67	3,749.03
			10/04/2011	61.71	3,748.99
			2/08/2012	61.77	3,748.93
			4/30/2012	62.00	3,748.70
			9/10/2012	62.15	3,748.55
			6/23/2013	62.28	3,748.42
			1/09/2014	62.47	3,748.23
			4/07/2014	62.67	3,748.03
			3/19/2015	63.19	3,747.51
			6/30/2015	63.25	3,747.45
			9/29/2015	63.82	3,746.88
			12/16/2015	63.58	3,747.12
			3/22/2016	63.76	3,746.94
			6/08/2016	63.72	3,746.98
			9/13/2016	63.83	3,746.87
			12/01/2016	63.79	3,746.91
			6/20/2017	64.09	3,746.61
			12/19/2017	64.53	3,746.17
			6/18/2018	64.70	3,746.00
			11/07/2018	64.82	3,745.88

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
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NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-8	55.2–75.2	3,810.70	6/03/2019	65.52	3,745.18
			12/17/2019	66.12	3,744.58
DBS-9	48.0–68.0	3,806.26	4/08/2009	53.93	3,752.33
			5/11/2011	54.39	3,751.87
			10/04/2011	54.59	3,751.67
			2/08/2012	54.53	3,751.73
			4/30/2012	54.68	3,751.58
			9/10/2012	54.77	3,751.49
			6/23/2013	55.04	3,751.22
			1/09/2014	55.27	3,750.99
			4/07/2014	55.56	3,750.70
			3/19/2015	55.95	3,750.31
			7/01/2015	56.14	3,750.12
			9/29/2015	56.49	3,749.77
			12/16/2015	56.52	3,749.74
			3/22/2016	56.51	3,749.75
			6/08/2016	56.64	3,749.62
			9/13/2016	56.81	3,749.45
			12/01/2016	56.88	3,749.38
			6/20/2017	57.28	3,748.98
			12/19/2017	57.67	3,748.59
			6/18/2018	57.98	3,748.28
			11/07/2018	58.22	3,748.04
			6/03/2019	58.53	3,747.73
			12/17/2019	59.25	3,747.01
DBS-10	57.2–77.2	3,807.48	6/18/2018	64.46	3,743.02
			11/07/2018	64.66	3,742.82
			6/03/2019	65.11	3,742.37
			12/17/2019	65.80	3,741.68
NW-1s	52.95–72.95	3,817.33	4/08/2009	62.35	3,754.98
NW-1m	99.31–119.31	3,817.35	4/08/2009	62.25	3,755.10
NW-1d	149.45–169.45	3,817.35	4/08/2009	62.04	3,755.31

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
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Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
NW-2s	53.35–73.35	3,812.50	4/08/2009	63.08	3,749.42
NW-2m	93.72–113.72	3,812.45	4/08/2009	63.27	3,749.18
NW-2d	126.87–146.87	3,812.46	4/08/2009	66.41	3,746.05
PMW-1	63–78	3,821.17	6/23/2008	67.51	3,753.66
			4/08/2009	65.97	3,755.20
			5/11/2011	68.70	3,752.47
			10/04/2011	66.95	3,754.22
			2/08/2012	66.69	3,754.48
			4/30/2012	67.27	3,753.90
			9/10/2012	69.77	3,751.40
			6/23/2013	68.40	3,752.77
			1/09/2014	71.24	3,749.93
			4/07/2014	69.97	3,751.20
			3/20/2015	70.78	3,750.39
			7/01/2015	71.41	3,749.76
			9/29/2015	70.76	3,750.41
			12/16/2015	71.03	3,750.14
			3/22/2016	70.30	3,750.87
			6/08/2016	69.65	3,751.52
			9/13/2016	71.08	3,750.09
			12/01/2016	70.97	3,750.20
			6/20/2017	73.06	3,748.11
			12/19/2017	71.19	3,749.98
			6/18/2018	70.97	3,750.20
			11/07/2018	72.52	3,748.65
			6/03/2019	71.76	3,749.41
			12/17/2019	76.25	3,744.92
MW-1	120–140	NA	6/23/2008	59.90	NA
MW-2	127–147	3,812.68	6/23/2008	61.42	3,751.26
			4/07/2009	61.65	3,751.03
MW-3	NA	3,812.05	6/23/2008	62.06	3,749.99
			4/07/2009	62.02	3,750.03

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface
btoc = Below top of casing
msl = Above mean sea level
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
MW-3 (cont.)	NA	3,812.05	5/11/2011	62.91	3,749.14
			10/04/2011	62.91	3,749.14
			2/08/2012	62.95	3,749.10
			4/30/2012	63.39	3,748.66
			9/10/2012	63.50	3,748.55
			6/23/2013	63.36	3,748.69
			1/09/2014	63.55	3,748.50
			4/07/2014	63.88	3,748.17
			3/19/2015	64.27	3,747.78
			7/01/2015	64.34	3,747.71
			9/29/2015	67.94	3,744.11
			12/16/2015	64.75	3,747.30
			3/22/2016	64.84	3,747.21
			6/08/2016	64.89	3,747.16
			9/13/2016	66.33	3,745.72
			12/01/2016	66.66	3,745.39
			6/20/2017	65.56	3,746.49
			12/19/2017	65.70	3,746.35
			6/18/2018	66.52	3,745.53
			11/07/2018	66.09	3,745.96
			6/03/2019	68.18	3,743.87
			12/17/2019	67.38	3,744.67
MW-4	111–131	3,811.33	6/23/2008	62.12	3,749.21
			4/07/2009	62.51	3,748.82
MW-5	112–132	3,808.96	6/23/2008	60.60	3,748.36
			4/07/2009	60.79	3,748.17
			5/11/2011	61.17	3,747.79
			10/04/2011	61.72	3,747.24
			2/08/2012	61.23	3,747.73
			4/30/2012	61.50	3,747.46
			9/10/2012	61.65	3,747.31
			6/23/2013	61.75	3,747.21

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
MW-5 (cont.)	112–132	3,808.96	1/09/2014	61.90	3,747.06
			4/07/2014	62.18	3,746.78
			3/19/2015	62.96	3,746.00
			6/30/2015	62.71	3,746.25
			9/29/2015	63.92	3,745.04
			12/16/2015	63.02	3,745.94
			3/22/2016	63.14	3,745.82
			6/08/2016	63.47	3,745.49
			9/13/2016	63.66	3,745.30
			12/01/2016	63.70	3,745.26
			6/21/2017	63.62	3,745.34
			12/19/2017	65.02	3,743.94
			6/18/2018	64.32	3,744.64
			11/07/2018	64.34	3,744.62
			06/03/2019	65.30	3,743.66
			12/17/2019	65.57	3,743.39
MW-6	NA	3,810.17	6/23/2008	62.17	3,748.00
			4/07/2009	62.41	3,747.76

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.

bgs = Below ground surface
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msl = Above mean sea level
NA = Not available

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-1	4/08/2009	**320**
	5/12/2011	**940**
	10/04/2011	Well destroyed
DBS-1R	5/01/2012	**3,000**
	9/11/2012	**3,200**
	6/25/2013	**3,300**
	1/10/2014	**1,000**
	4/08/2014	**1,700**
	3/20/2015	**1,200**
	7/01/2015	**860**
	9/30/2015	**670**
	12/17/2015	**760**
	3/23/2016	**560**
	6/09/2016	**570**
	09/14/2016	**360**
	12/01/2016	**360**
	6/20/2017	**320**
	12/20/2017	190
	6/19/2018	190
	11/08/2018	180
	6/03/2019	190
	12/18/2019	210
DBS-2	4/08/2009	14
	5/12/2011	25
	10/05/2011	18
	2/09/2012	22
	5/01/2012	24
	9/11/2012	44
	6/25/2013	36
	1/10/2014	45
	4/08/2014	22

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-2 (cont.)	3/20/2015	29
	6/30/2015	28
	9/30/2015	40
	12/17/2015	35
	3/23/2016	46
	6/09/2016	41
	9/14/2016	41
	12/02/2016	53
	6/20/2017	59
	12/20/2017	37
	6/18/2018	47
	11/08/2018	47
	6/03/2019	42
	12/17/2019	68
DBS-3	4/08/2009	36
	5/12/2011	35
	10/05/2011	34
	2/09/2012	34
	5/01/2012	33
	9/11/2012	34
	6/24/2013	32
	1/10/2014	34
	4/08/2014	32
	3/20/2015	35
	6/30/2015	35
	9/30/2015	34
	12/17/2015	34
	3/23/2016	36
	6/09/2016	35
	9/14/2016	37
	12/02/2016	37

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-3 (cont.)	6/20/2017	39
	12/20/2017	42
	6/18/2018	47
	11/08/2018	46
	6/03/2019	46
	12/17/2019	48
DBS-4	4/08/2009	38
	5/12/2011	33
	10/05/2011	32
	2/09/2012	32
	5/01/2012	31
	9/11/2012	32
	6/25/2013	31
	1/10/2014	32
	4/08/2014	30
	3/20/2015	33
	6/30/2015	31
	9/30/2015	33
	12/17/2015	35
	3/23/2016	38
	6/09/2016	35
	9/14/2016	37
	12/02/2016	41
	6/20/2017	35
	12/20/2017	32
	6/19/2018	39
	11/08/2018	35
	6/03/2019	30
	12/17/2019	35
DBS-5	4/08/2009	65
	5/12/2011	140

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-5 (cont.)	10/05/2011	140
	2/09/2012	140
	4/30/2012	150
	9/11/2012	160
	6/24/2013	160
	1/10/2014	180
	4/08/2014	160
	3/20/2015	140
	7/01/2015	140
	9/30/2015	150
	12/17/2015	160
	3/23/2016	150
	6/09/2016	150
	9/14/2016	170
	12/02/2016	170
	6/20/2017	170
	12/20/2017	170
	6/18/2018	180
	11/08/2018	170
	6/03/2019	**280**
	12/18/2019	160
DBS-6	4/07/2009	**380**
	5/12/2011	**410**
	10/05/2011	**400**
	2/09/2012	**380**
	4/30/2012	**400**
	9/11/2012	**390**
	6/24/2013	**340**
	1/10/2014	**390**
	4/07/2014	**400**
	3/19/2015	**370**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-6 (cont.)	7/01/2015	**360**
	9/30/2015	**370**
	12/17/2015	**380**
	3/23/2016	**310**
	6/09/2016	**300**
	9/14/2016	**290**
	12/02/2016	**300**
	6/21/2017	240
	12/19/2017	200
	6/19/2018	210
	11/08/2018	190
	6/03/2019	180
	12/17/2019	220
DBS-7	4/07/2008	**570**
DBS-8	4/07/2009	58
	5/12/2011	36
	10/05/2011	140
	2/09/2012	41
	4/30/2012	41
	9/10/2012	42
	6/24/2013	45
	1/09/2014	38
	4/07/2014	36
	3/19/2015	36
	7/01/2015	34
	9/30/2015	35
	12/17/2015	33
	3/23/2016	35
	6/09/2016	34
	9/14/2016	34
	12/02/2016	33

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-8 (cont.)	6/21/2017	33
	12/19/2017	28
	6/19/2018	33
	11/08/2018	30
	6/03/2019	35
	12/17/2019	30
DBS-9	4/08/2009	210
	5/12/2011	**600**
	10/05/2011	**440**
	2/09/2012	**290**
	4/30/2012	**330**
	9/11/2012	**320**
	6/24/2013	200
	1/10/2014	170
	4/07/2014	220
	3/19/2015	**260**
	7/01/2015	210
	9/30/2015	**260**
	12/17/2015	230
	3/23/2016	200
	6/09/2016	190
	9/14/2016	190
	12/02/2016	180
	6/21/2017	200
	12/20/2017	230
	6/19/2018	**260**
	6/03/2019	160
	12/17/2019	220
DBS-10	6/19/2018	**690**
	11/08/2018	**590**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-10 (cont.)	6/03/2019	**510**
	12/17/2019	**540**
NW-1s	4/08/2009	**630**
NW-1m	4/08/2009	57
NW-1d	4/08/2009	38
NW-2s	4/08/2009	**410**
NW-2m	4/08/2009	**570**
NW-2d	4/08/2009	**4,700**
PMW-1	2/27/2008	**9,500** [b]
	5/30/2008	**8,600** [b]
	6/23/2008	**12,700**
	4/08/2009	**11,000**
	5/12/2011	**13,000**
	10/05/2011	**12,000**
	2/09/2012	**12,000**
	5/01/2012	**12,000**
	9/11/2012	**14,000**
	6/25/2013	**14,000**
	1/10/2014	**11,000**
	4/08/2014	**12,000**
	3/20/2015	**8,500**
	7/01/2015	**8,600**
	9/30/2015	**9,700**
	12/17/2015	**9,800**
	3/23/2016	**8,200**
	6/09/2016	**8,500**
	9/14/2016	**9,300**
	12/01/2016	**8,300**
	6/20/2017	**13,000**
	12/20/2017	**12,000**
	6/19/2018	**9,600**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
PMW-1 (cont.)	11/08/2018	**10,000**
	6/03/2019	**11,000**
	12/18/2019	**3,400**
MW-1	5/30/2008	75 [b]
	6/23/2008	243
MW-2	2/27/2008	120 [b]
	5/30/2008	80 [b]
	6/23/2008	**1,480**
	4/07/2009	**1,200**
	6/19/2018	**390**
MW-3	2/27/2008	**348** [b]
	5/30/2008	**360** [b]
	6/23/2008	**1,090**
	4/07/2009	**17,000**
	5/12/2011	**16,000**
	10/05/2011	**14,000**
	2/09/2012	**15,000**
	4/30/2012	**14,000**
	9/10/2012	**16,000**
	6/24/2013	**12,000**
	1/10/2014	**10,000**
	4/07/2014	**12,000**
	3/19/2015	**9,700**
	7/01/2015	**10,000**
	9/30/2015	**9,600**
	12/17/2015	**5,100**
	3/23/2016	**8,200**
	6/09/2016	**9,400**
	9/14/2016	**9,100**
	12/02/2016	**11,000**
	6/21/2017	**10,000**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
MW-3 (cont.)	12/20/2017	**8,300**
	6/19/2018	**7,300**
	11/08/2018	**8,000**
	6/03/2019	**8,000**
	12/18/2019	**7,400**
MW-4	2/27/2008	**476** [b]
	5/30/2008	**512** [b]
	6/23/2008	**5,730**
	4/07/2009	**6,600**
MW-5	2/27/2008	**1,280** [b]
	5/30/2008	**1,220** [b]
	6/23/2008	**1,260**
	4/07/2009	**1,300**
	5/12/2011	**1,500**
	10/05/2011	**1,500**
	2/09/2012	**1,500**
	4/30/2012	**1,400**
	9/10/2012	**1,500**
	6/24/2013	**1,300**
	1/10/2014	**1,300**
	4/07/2014	**1,300**
	3/19/2015	**1,200**
	7/01/2015	**1,200**
	9/30/2015	**1,000**
	12/17/2015	**1,000**
	3/23/2016	**980**
	6/09/2016	**970**
	9/14/2016	**1,000**
	12/02/2016	**710**
	6/21/2017	**870**
	12/19/2017	**850**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
	NMWQCC Standard	*250*
MW-5 (cont.)	6/19/2018	**840**
	11/08/2018	**680**
	6/03/2019	**610**
	12/18/2019	**550**
MW-6	2/27/2008	32 [b]
	5/30/2008	36 [b]
	6/23/2008	31.4
	4/07/2009	25
Ranch Headquarters Supply Well	6/23/2008	35.4
Brine Station Fresh Water Supply Well	2/27/2008	**630** [b]
	5/30/2008	**590** [b]
	6/23/2008	**650**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-3. Historical Average Groundwater Extraction Rates
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 2

Recovery Well	Date	Average Extraction Rate [a] (gpm)
RW-1	4/07/2012	Groundwater extraction started
	5/01/2012	2.1
	9/11/2012	2.9
	6/25/2013	4.1
	11/15/2013	3.6
	3/20/2015 [b]	2.4
	6/30/2015	—
FWS-1	12/17/2015	—
	3/22/2016	12.8
	6/08/2016	33.9
	9/13/2016	5.4
	12/02/2016	39.7
	6/20/2017	32.7
	12/19/2017	37.3
	6/18/2018	15.4
	11/08/2018	22.4
	6/03/2019 [c]	23.9
	12/18/2019	27.7
RW-2	4/06/2012	Groundwater extraction started
	5/01/2012	2.5
	9/11/2012	4.3
	12/14/2012	3.9
	6/25/2013 [d]	—
	9/21/2013 [e]	2.9
	9/30/2015	68
	12/17/2015	44

[a] Average extraction rates based on totalizer flow meter readings and/or fresh water production records.

[b] Pumping at RW-1 stopped because pumping of FWS-1 lowered groundwater levels at RW-1, precluding groundwater extraction at RW-1. Pumping at FWS-1 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area.

[c] New meter on December 3, 2019; well stopped pumping on May 11, 2019.

[d] New pump installed in RW-2 and started on June 25, 2013.

[e] Meter and pump were removed from RW-2 on approximately September 21, 2013 by facility manager to install a new, larger-capacity pump.

[f] Meter was inoperable because it was damaged. Meter was replaced in November 2017.

[g] Meter read on November 8, 2018, but well had not been pumped since October 10, 2018; average extraction rate between June 18 and October 10, 2018 is reported.

gpm = Gallons per minute

Table C-3. Historical Average Groundwater Extraction Rates
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 2

Recovery Well	Date	Average Extraction Rate [a] (gpm)
RW-2 (cont.)	3/22/2016	32
	6/08/2016	9.0
	9/13/2016	5.7
	12/01/2016 [f]	—
	6/20/2017 [f]	—
	12/19/2017	12.4
	6/19/2018	5.2
	10/10/2018 [g]	3.4
	6/3/2019	7.0
	12/18/2019	14.9

[a] Average extraction rates based on totalizer flow meter readings and/or fresh water production records.

[b] Pumping at RW-1 stopped because pumping of FWS-1 lowered groundwater levels at RW-1, precluding groundwater extraction at RW-1. Pumping at FWS-1 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area.

[c] New meter on December 3, 2019; well stopped pumping on May 11, 2019.

[d] New pump installed in RW-2 and started on June 25, 2013.

[e] Meter and pump were removed from RW-2 on approximately September 21, 2013 by facility manager to install a new, larger-capacity pump.

[f] Meter was inoperable because it was damaged. Meter was replaced in November 2017.

[g] Meter read on November 8, 2018, but well had not been pumped since October 10, 2018; average extraction rate between June 18 and October 10, 2018 is reported.

gpm = Gallons per minute

Chavez, Carl J, EMNRD

From: Ayarbe, John <jayarbe@geo-logic.com>
Sent: Monday, October 14, 2019 1:13 PM
To: Chavez, Carl J, EMNRD
Cc: 'Pieter Bergstein (pieter@bergsteinenterprises.com)'; 'susan@thestandardenergy.com'; 'Jim Sayre (jim@thestandardenergy.com)'; Zbrozek, Michael
Subject: [EXT] SUBMITTAL of First Semiannual 2019 GW Monitoring and O&M Report, Salty Dog Brine
Attachments: 1st Semiannual 2019 Rpt_Salty Dog_10-14-2019.pdf

Hi Carl,

Attached is the Semiannual Groundwater Monitoring and O&M Report for the Salty Dog Brine Station for the period January 1 through June 30, 2019. I'm submitting the report to you on behalf of PAB Services, Inc.

Please let me know if you have questions.

Sincerely,

John P. Ayarbe
Senior Hydrogeologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company
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October 14, 2019

Mr. Carl Chavez
New Mexico Oil Conservation Division
Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505-4225

Re: Semiannual Groundwater Monitoring and O&M Report
January 1 through June 30, 2019
Salty Dog Brine Station, Lea County, New Mexico

Dear Mr. Chavez:

On behalf of PAB Services, Inc., Daniel B. Stephens & Associates, Inc. (DBS&A) is submitting the enclosed groundwater monitoring and operation and maintenance (O&M) report for the Salty Dog brine station located in Lea County, New Mexico. Semiannual groundwater monitoring activities were completed at the site on June 3, 2019.

Please call us at (505) 822-9400 if you have any questions or require additional information.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

John Ayarbe, P.G.
Senior Hydrogeologist

JA/rpf
Enclosure
cc: Pieter Bergstein, PAB Services, Inc.
Jim Sayre, Salty Dog, Inc.

First Semiannual 2019 Groundwater Monitoring and O&M Report

Salty Dog Brine Station

Lea County, New Mexico

Prepared for **New Mexico Energy, Minerals and Natural Resources Department**
Oil Conservation Division

October 14, 2019

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

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Semiannual Groundwater Monitoring and O&M Report
January 1 through June 30, 2019
Salty Dog Brine Station, Lea County, New Mexico

1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this groundwater monitoring and operation and maintenance (O&M) report for submission to the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD) Environmental Bureau on behalf of PAB Services, Inc. (PAB) for the Salty Dog brine station (the site) located in Lea County, New Mexico (Figure 1). The report summarizes activities conducted at the site during the reporting period of January 1 through June 30, 2019. Groundwater monitoring and O&M during the reporting period was conducted in accordance with discharge permit BW-8 (DP-BW-8), which was last renewed on May 17, 2019 (NMEMNRD OCD, 2019).

The site consists of a northern portion, where the brine pond was located prior to closure in October 2008, and a southern portion, where the brine well is located. The brine pond area and the brine well area are separated by approximately 2,500 feet, joined by a dirt road (Figure 1). Injection water for the brine well comes from two fresh water supply wells (FWS-1 and FWS-2) and from remedial pumping at a recovery well in the brine well area (RW-2).

Brine that is produced for sale is stored at a tank battery on the southern boundary of the former brine pond area. The tank battery consists of six 750-barrel aboveground storage tanks (ASTs) surrounded by a berm (Figure 1). A concrete truck loading pad with two brine filling stations is located north of the tank battery. An operations shed is located adjacent to the loading pad to the west.

The former brine pond area contains 6 monitor wells (PMW-1, DBS-1R, and DBS-2 through DBS-5), 1 nested well (NW-1), 1 fresh water supply well (FWS-1), and a former recovery well (RW-1). The brine well area contains 10 monitor wells (MW-2 through MW-6, DBS-6 through

DBS-10), 1 nested well (NW-2), 1 fresh water supply well (FWS-2), and 1 recovery well (RW-2) (Figure 1).

In April 2012, DBS&A installed groundwater extraction systems at the site to provide hydraulic containment and removal of chloride-impacted groundwater in the former brine pond and brine well areas (DBS&A, 2009a and 2009b). The extraction systems consist of wells, submersible pumps, conveyance lines, electrical power, and controls to extract impacted groundwater. Extracted groundwater is conveyed to the on-site ASTs for reinjection at the brine well. Although groundwater extraction at well RW-1 was stopped in 2015, pumping at well FWS-1 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area; well FWS-1 is located approximately 50 feet southeast of RW-1. Pumping at RW-2 provides hydraulic containment and removal of chloride-impacted groundwater in the brine well area.

2. Scope of Work

The scope of work for the semiannual groundwater monitoring conducted on June 3, 2019 consisted of (1) measuring groundwater levels in and collecting groundwater samples from 12 monitor wells, and (2) performing maintenance on the groundwater extraction systems, as necessary. Groundwater samples were collected and submitted to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico for chloride analysis using U.S. Environmental Protection Agency (EPA) method 300.0. Section 2A.1 of DP-BW-8 requires that PAB collect one groundwater sample to be analyzed for general chemistry and other inorganic groundwater constituents in addition to chloride. In consultation with Carl Chavez (OCD), DBS&A selected monitor well MW-3 for this additional analysis. Appendices A and B provide the laboratory report and field notes, respectively.

The monitor wells included in the sampling program were selected in October 2010 in consultation with Jim Griswold, the OCD Project Manager for the site at that time. The sampled monitor wells are shown in Figures 2 through 5.

3. Monitoring Activities

3.1 Fluid Level Measurement

On June 3, 2019, DBS&A measured water levels in monitor wells DBS-1R, DBS-2 through DBS-5, and PMW-1 in the former brine pond area (Figure 2) and in wells DBS-6, DBS-8 through DBS-10, MW-3, and MW-5 in the brine well area (Figure 3) using a properly decontaminated electronic water level meter. Table 1 reports water level measurements and groundwater elevations. Appendix C provides historical groundwater level data.

Table 1. Fluid Level Measurements, June 3, 2019

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-1R	58.0–78.0	3,817.00 [b]	68.25	3,748.75
DBS-2	58.0–78.0	3,820.50	70.94	3,749.56
DBS-3	56.0–76.72	3,816.66	66.10	3,750.56
DBS-4	56.0–76.0	3,820.37	71.66	3,748.71
DBS-5	56.9–76.9	3,820.66	68.44	3,752.22
DBS-6	56.7–76.7	3,812.65	67.24	3,745.41
DBS-8	55.2–75.2	3,810.70	65.52	3,745.18
DBS-9	48.0–68.0	3,806.26	58.53	3,747.73
DBS-10	57.2–77.2	3,807.48	65.11	3,742.37
PMW-1	63–78	3,821.17	71.76	3,749.41
MW-3	NA	3,812.05	68.18	3,743.87
MW-5	112–132	3,808.96	65.30	3,743.66

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

During this monitoring event, the average depths to water beneath the former brine pond area and brine well area were 69.53 feet below ground surface (bgs) and 65.45 feet bgs, respectively. On average, water levels in the former brine pond area rose by approximately 0.22 foot since the last monitoring event in November 2018, while water levels in the brine well area declined by 1.33 feet.

Figures 2 and 3 present potentiometric surface maps for the former brine pond area and the brine well area, respectively. The direction of groundwater flow beneath the former brine pond area remains to the southeast; the hydraulic gradient was approximately 0.005 foot per foot (ft/ft) during this reporting period (Figure 2). The direction of groundwater flow beneath the brine well area also remains to the southeast; the hydraulic gradient in this area was approximately 0.006 ft/ft during this reporting period (Figure 3).

From January through June 2019, well FWS-1 was the primary pumping well used to provide fresh water for brine production. However, FWS-1 was not pumping when groundwater levels were measured. The direction of groundwater flow in the vicinity of FWS-1 is toward the well (Figure 2). Well RW-2 was pumping preceding the groundwater monitoring event. Increased pumping at RW-2 during this reporting period steepened the hydraulic gradient in the brine well area and caused a bending of groundwater elevation contours near RW-2 (Figure 3).

3.2 Groundwater Sampling

On June 3, 2019, groundwater samples were collected from monitor wells DBS-1R, DBS-2 through DBS-6, DBS-8 through DBS-10, MW-3, MW-5, and PMW-1. The samples were collected following standard sampling procedures developed from EPA guidance. Before sampling, each well was purged of a minimum of three casing volumes using a submersible pump to ensure that a representative groundwater sample was collected. While purging, DBS&A measured water quality field parameters consisting of temperature, specific conductance, and pH. Sample containers were filled, labeled, and placed in an ice-filled cooler. Groundwater samples were submitted under chain of custody to HEAL for analysis.

Samples of the brine well injection water and the produced brine were also collected to meet requirements under DP-BW-8. Analytical results of these samples will be presented in the 2019 annual Class III well report.

4. Analytical Results

Table 2 summarizes chloride analytical results for the collected groundwater samples. Figures 4 and 5 show the distribution of chloride in groundwater beneath the former brine pond area and the brine well area, respectively. The laboratory report and chain of custody documentation are provided in Appendix A. Field notes recorded during groundwater monitoring activities are provided in Appendix B. Historical groundwater quality data are provided in Appendix C.

Table 2. Chloride Groundwater Analytical Data, June 2019

Monitor Well	Date	Chloride Concentration (mg/L)
NMWQCC Standard		*250*
DBS-1R	6/03/2019	190
DBS-2	6/03/2019	42
DBS-3	6/03/2019	46
DBS-4	6/03/2019	30
DBS-5	6/03/2019	**280**
DBS-6	6/03/2019	180
DBS-8	6/03/2019	35
DBS-9	6/03/2019	160
DBS-10	6/03/2019	**510**
PMW-1	6/03/2019	**11,000**
MW-3	6/03/2019	**8,000**
MW-5	6/03/2019	**610**

Bold indicates that value exceeds the applicable standard.
All samples analyzed using EPA method 300.0.
NMWQCC = New Mexico Water Quality Control Commission
mg/L = Milligrams per liter

4.1 Former Brine Pond Area Wells

Since the last monitoring event in November 2018, minor changes in chloride concentrations were observed at the former brine pond area monitor wells, with the exception of upgradient monitor well DBS-5 (Appendix C). Well PMW-1 continues to exhibit chloride concentrations above the New Mexico Water Quality Control Commission (NMWQCC) standard of

250 milligrams per liter (mg/L) (Figure 4). The chloride concentration at well DBS-1R, located downgradient of well PMW-1, was 190 mg/L—below the NMWQCC standard. An increase in chloride concentration was observed at upgradient monitor well DBS-5. The chloride concentrations at the well increased from 170 mg/L (November 2018) to 280 mg/L (June 2019). The increase in chloride concentration is likely due to an off-site source, as the well is located upgradient of the Salty Dog site.

The chloride plume in the former brine pond area remains bounded by the existing monitor well network (Figure 4). The chloride concentration at downgradient monitor well DBS-4 remains below the NMWQCC standard, as do chloride concentrations at the two cross-gradient monitor wells, DBS-2 and DBS-3.

4.2 Brine Well Area Wells

Since the last monitoring event in November 2018, minor to no changes in chloride concentrations were observed at the monitor wells in the brine well area (Appendix D). Monitor wells MW-3 (the well closest to extraction well RW-2) and downgradient monitor wells MW-5 and DBS-10 continue to exhibit chloride concentrations above the NMWQCC standard (Figure 5).

The chloride concentration at cross-gradient monitor well DBS-6, which had exceeded the NMWQCC standard until June 2017, remained below the NMWQCC standard during this reporting period at 180 mg/L.

The chloride concentration at upgradient monitor well DBS-9 was 160 mg/L this reporting period. Chloride concentration has fluctuated at DBS-9 (Appendix C).

Section 2A.1 of DP-BW-8 requires that PAB collect one groundwater sample to be analyzed for general chemistry and several other groundwater constituents. Monitor well MW-3 was selected for this additional analysis because it is located downgradient of the brine well. Groundwater at MW-3 has historically shown chloride impacts. Analytical results for the MW-3 sample are provided in Table 3.

Table 3. Groundwater Analytical Results, MW-3

Constituent	Concentration (mg/L [a])	
	NMWQCC Standard	MW-3 (6/03/2019)
Alkalinity, total	NS	313.7
Bicarbonate	NS	313.7
Calcium, total	NS	1,200
Carbonate	NS	<2.0
Bromide	NS	<10
Chloride	250	**8,000**
Fluoride	1.6	<10
Magnesium, total	NS	200
Nitrate (as N)	1.0	<0.5
Nitrite (as N)	10.0	<10
Orthophosphate (as P)	NS	<2.5
pH (s.u.)	6–9	7.21
Potassium, total	NS	18
Sodium, total	NS	3,700
Sulfate	600	440
Total dissolved solids	1,000	**16,200**

Bold indicates that value exceeds New Mexico Water Quality Control Commission (NMWQCC) standard.
[a] Unless otherwise noted
NS = No standard
s.u. = Standard units

5. Groundwater Extraction System O&M

Groundwater extraction from fresh water supply well FWS-1 and recovery well RW-2 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area and brine well area, respectively. PAB began remedial groundwater extraction in April 2012 (Appendix C). Extracted groundwater is used as injection water at the brine well.

Table 4 shows the average groundwater extraction rates for the two wells during this reporting period. The rates were determined using fresh water production records and totalizer flow meter readings.

Table 4. Average Groundwater Extraction Rates

Recovery Well	Date	Average Extraction Rate [a] (gpm)
FWS-1 [b, c]	5/11/2019	23.9
RW-2	6/3/2019	7.0

[a] Average extraction rates based on totalizer flow meter readings and/or fresh water production records.
[b] Meter read on June 3, 2019, but well had not been pumped since May 11, 2019; average extraction rate between December 3, 2018 and May 11, 2019 is reported.
[c] New totalizer installed December 3,2018.
gpm = Gallons per minute

5.1 Former Brine Pond Area

Based on Salty Dog production records from January through June 2019, the average pumping rate at well FWS-1 during this reporting period was 23.9 gallons per minute (gpm) (Table 3). At the time of groundwater monitoring, FWS-1 had not been pumping for a period of 2 weeks because the pump was scheduled to be replaced. Nonetheless, the direction of groundwater flow in the vicinity of FWS-1 is toward the well, as indicated by the bending of groundwater elevation contours (Figure 2).

In the former brine pond area, monitor well PMW-1 is currently the only well to exhibit a chloride concentration above the NMWQCC standard (Figure 4). Pumping at FWS-1 is preventing the downgradient migration of chloride-impacted groundwater. The chloride concentrations at wells DBS-1R and DBS-4, both located downgradient of well PMW-1, are below the NMWQCC standard (Figure 4).

5.2 Brine Well Area

During this reporting period, the average pumping rate at well RW-2 was 7.0 gpm (Table 3). This average is based on totalizer readings and production records, and represents the average extraction rate between November 8, 2018 and June 3, 2019. Well RW-2 was the only active pumping well for the few weeks preceding the groundwater monitoring event, resulting in a

steepening of the hydraulic gradient in the brine well area and bending of groundwater elevation contours near RW-2 (Figure 3).

Chloride concentrations at downgradient monitor wells DBS-10 and MW-5 were less than those measured during the previous monitoring event (Appendix C). The chloride concentration at DBS-10 decreased from 590 mg/L (November 2018) to 510 mg/L (June 2019), while the chloride concentration at MW-5 decreased from 680 mg/L (November 2018) to 610 mg/L (June 2019). The chloride concentration at cross-gradient monitor well DBS-6 met the NMWQCC standard during this reporting period (Table 2). Water quality samples collected at this well have exceeded the NMWQCC standard in the past (Appendix C).

Pumping at well RW-2 is providing hydraulic containment and removal of chloride-impacted groundwater originating from the area upgradient of the recovery well. Pumping at this recovery well is preventing further degradation of downgradient and cross-gradient water quality. Chloride concentrations at monitor wells MW-5 and DBS-6 have decreased since PAB began remedial groundwater extraction at well RW-2 (Appendix C).

5.3 Facility and System Maintenance

In May 2019, the pump at FWS-1 burned out. This pump was subsequently replaced in July 2019. PAB attributes difficulties with the pumps, such as them burning out, to the high total dissolved solids (TDS) content of the extracted groundwater.

On June 10, 2019, Basin Surveys surveyed the five surface subsidence monitoring points that were installed at the site in March 2018 (DBS&A, 2018). The survey was conducted in accordance with Condition 2.B.1 of DP-BW-8 (NMEMNRD OCD, 2019). Results of the survey will be included in the 2019 annual Class III well report.

6. Recommendations

Based on the current groundwater monitoring results and site O&M activities, DBS&A has the following recommendations:

- Continue groundwater extraction at FWS-1 to provide hydraulic containment and removal of the chloride plume in the former brine pond area.
- Continue groundwater extraction at RW-2 to provide hydraulic containment and removal of the chloride plume in the brine well area.
- To the extent practical, attempt to balance groundwater extraction between FWS-1 and RW-2. During this reporting period, the pumping rate at FWS-1 was 3 times higher than at RW-2. Increased pumping at RW-2 will provide more removal of chloride-impacted groundwater in the brine well area.

In addition, DBS&A and PAB will complete the following activities at the site in 2019 to meet the requirements of DP BW-8:

- Continue to conduct semiannual groundwater monitoring and O&M of the extraction systems at the site.
- Conduct semiannual surveys of the surface subsidence survey monitoring points.
- Prepare a 2019 annual Class III well report for submittal to OCD.

References

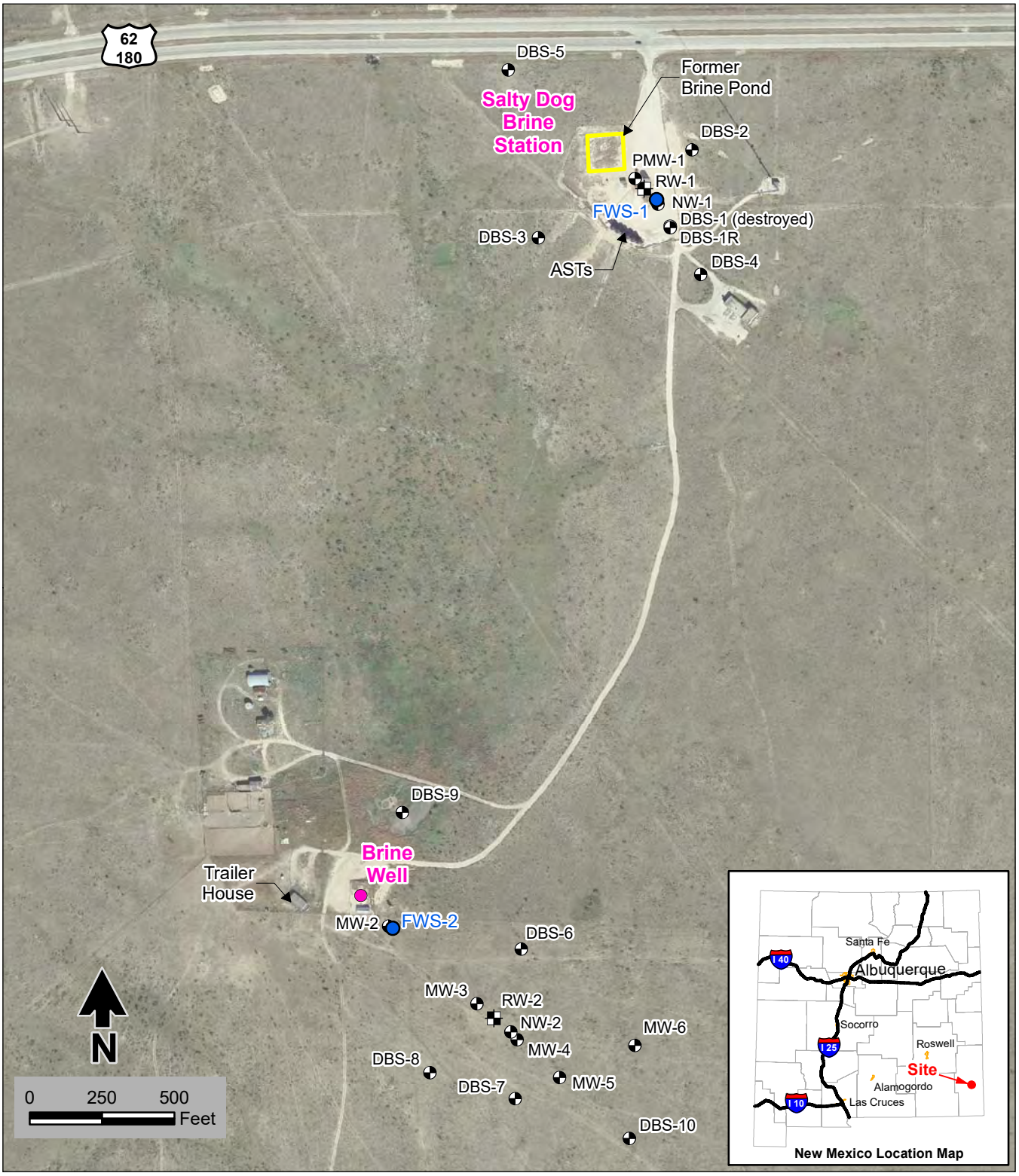
Daniel B. Stephens & Associates (DBS&A). 2009a. *Recovery well installation and pump test report, Salty Dog Brine Station, Lea County, New Mexico.* Prepared for New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, Environmental Bureau. November 20, 2009.

DBS&A. 2009b. *Preliminary conceptual remedial design report, Salty Dog Brine Station, Lea County, New Mexico.* Prepared for New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, Environmental Bureau. December 31, 2009.

DBS&A. 2018. Letter report from John Ayarbe and Michael D. McVey to Carl Chavez, New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, Environmental Bureau, regarding Installation of a monitor well and subsidence survey monitoring points at the Salty Dog Brine Station (API No. 30-025-26307). June 25, 2018.

New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Department (NMEMNRD OCD). 2019. *Discharge Permit (BW-8), Standard Energy, UIC Class III Brine Well Brine Supply Well No.1 API No. 30-025-26307 UL: J Section 5 Township 19 South, Range 36 East, Lea County, New Mexico.* May 17, 2019.

Figures



Note: AST = Aboveground storage tank

Source: Google Earth aerial imagery dated November 2, 2017

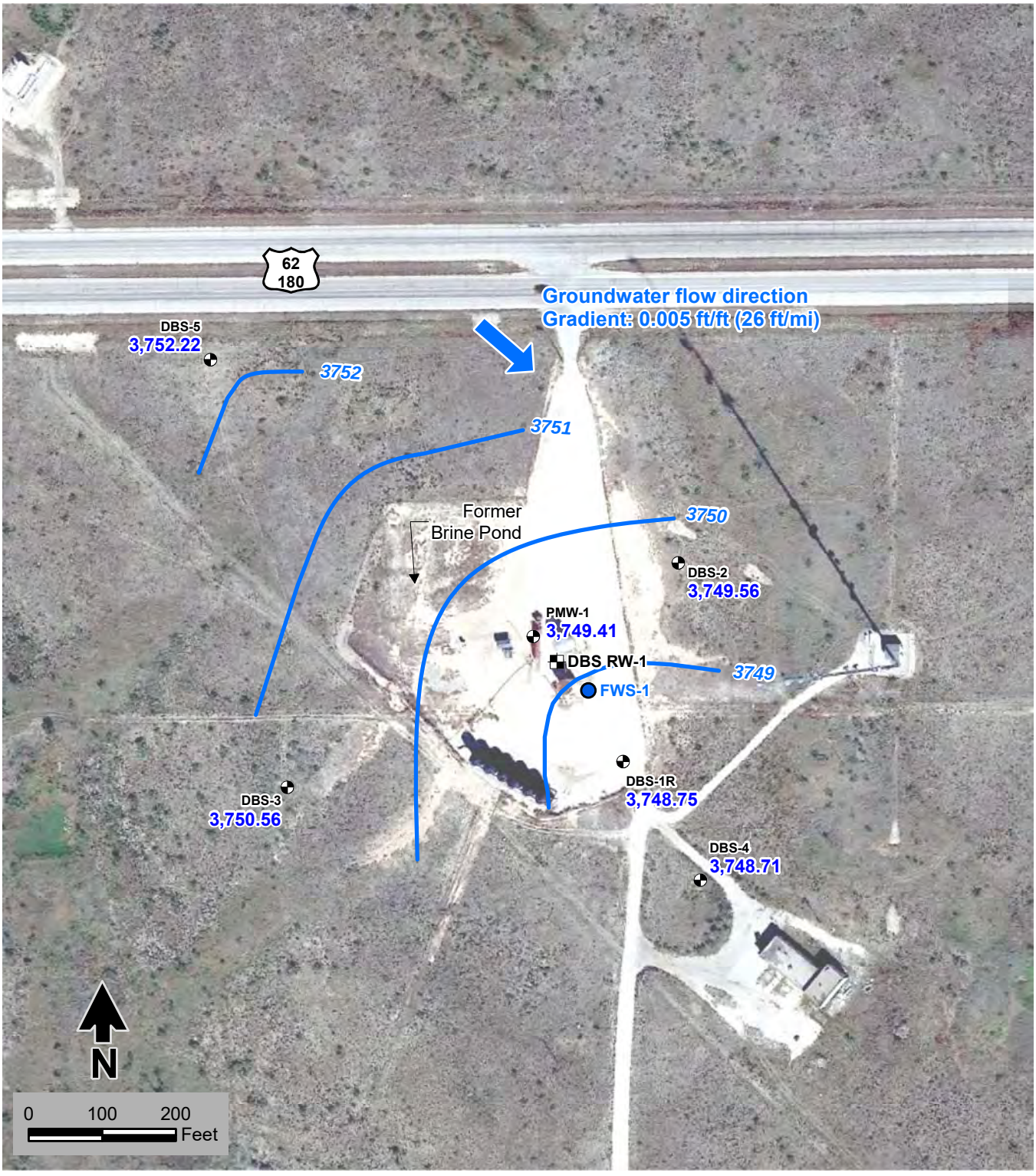
Explanation

- Fresh water supply well
- Monitor well
- Recovery well
- Well destroyed

\\SS6ABQ\DATA\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_1SA\NEW FOLDER\FIG01_SITE_LOCATION_MAP.MXD

Daniel B. Stephens & Associates, Inc.
10/1/2019
JN DB19.1198.00

SALTY DOG BRINE STATION
Site Location Map
Figure 1



Source: Google Earth aerial imagery dated November 2, 2017

Explanation

DBS-1R Well designation

3,748.75 Groundwater elevation, ft msl

- Monitor well
- Recovery well
- Fresh water supply well
- Potentiometric surface elevation contour (ft msl), dashed where inferred
- Groundwater flow direction

SALTY DOG BRINE STATION

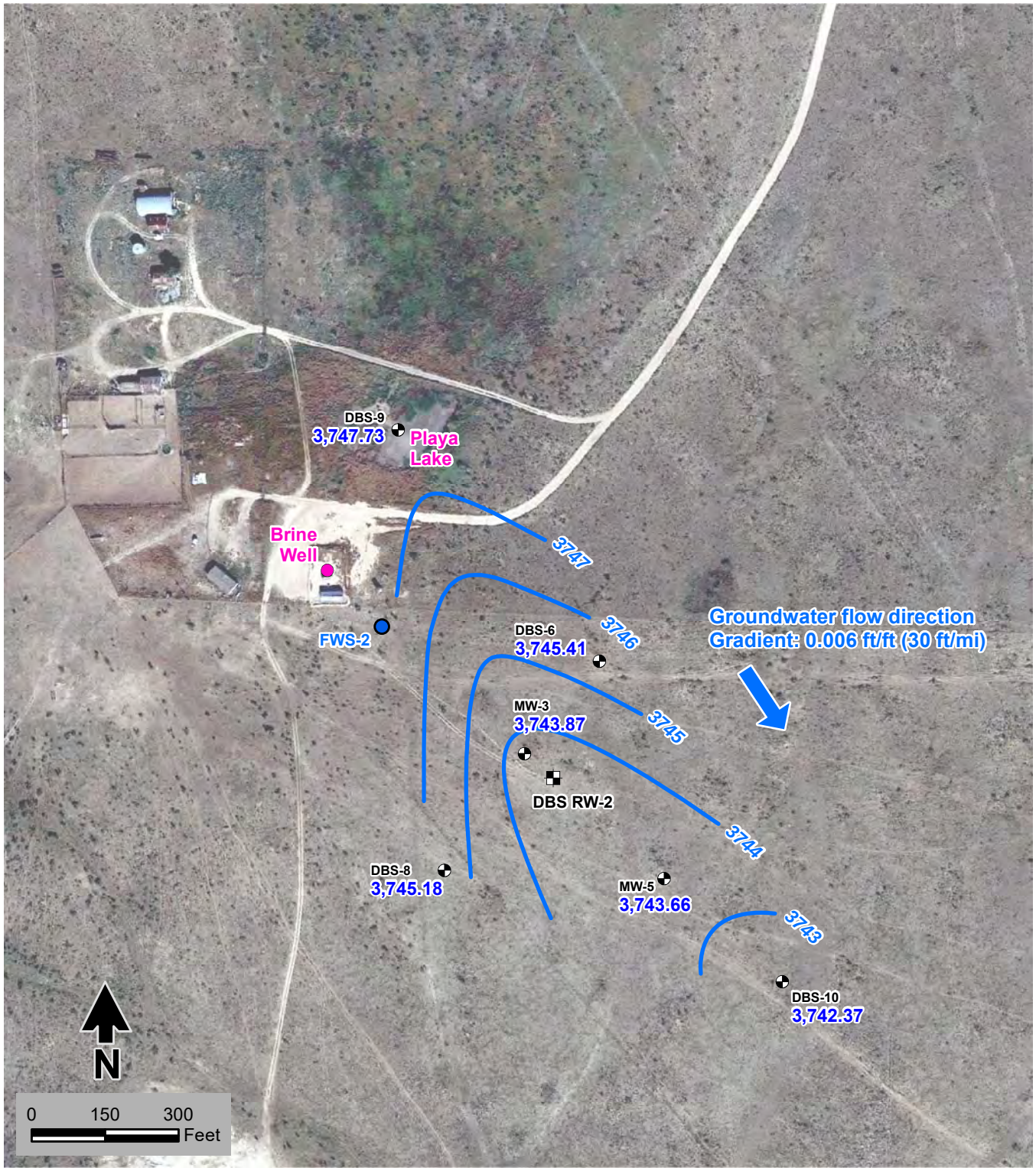
Former Brine Pond Area Potentiometric Surface Elevations June 2019

Daniel B. Stephens & Associates, Inc.

10/9/2019 JN DB19.1198.00

Figure 2

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_1SAINEW FOLDER\201906\FIG02_GWE_201906_BRINE_STATION.MXD



Source: Google Earth aerial imagery dated November 2, 2017

Explanation

MW-3 Well designation

3,745.96 Groundwater elevation, ft msl

- Monitor well
- Recovery well
- Fresh water supply well
- Potentiometric surface elevation contour (ft msl), dashed where inferred
- Groundwater flow direction

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area Potentiometric Surface Elevations June 2019

Daniel B. Stephens & Associates, Inc.

10/9/2019 JN DB19.1198.00

Figure 3

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_1SA\NEW FOLDER\201906\FIG03_GWE_201906_BRINE_WELL.MXD

Source: Google Earth aerial imagery dated November 2, 2017

Explanation

DBS-2 Well designation

42 Chloride concentration (mg/L)

Monitor well

Recovery well

Fresh water supply well

Red indicates concentration equal to or greater than the NMWQCC standard.

SALTY DOG BRINE STATION

Former Brine Pond Area
Chloride Concentrations in Groundwater
June 2019

Daniel B. Stephens & Associates, Inc.

10/10/2019 JN DB19.1198.00

Figure 4

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_1SA\NEW FOLDER\201906\FIG04_CL_GW_201906_BRINE_STATION.MXD

Source: Google Earth aerial imagery dated November 2, 2017

Explanation

DBS-6 Well designation

190 Chloride concentration (mg/L)

Monitor well

Recovery well

Fresh water supply well

Red indicates concentration equal to or greater than the NMWQCC standard. NS = Not sampled

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area
Chloride Concentrations in Groundwater
June 2019

Daniel B. Stephens & Associates, Inc.

10/10/2019 JN DB19.1198.00

Figure 5

S:\PROJECTS\DB19.1198_SALTY_DOG_2019\GIS\MXDS\REPORT\2019_1SA\NEW FOLDER\201906\FIG05_CL_GW_201906_BRINE_WELL.MXD

Appendix A

Laboratory Analytical Report

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 24, 2019

John Ayarbe

Daniel B. Stephens & Assoc.
6020 Academy NE Suite 100
Albuquerque, NM 87109
TEL:
FAX

RE: Salty Dog OrderNo.: 1906171

Dear John Ayarbe:

Hall Environmental Analysis Laboratory received 14 sample(s) on 6/5/2019 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued June 18, 2019.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: PMW-1
Project: Salty Dog
Collection Date: 6/3/2019 5:20:00 PM
Lab ID: 1906171-001
Matrix: GROUNDWA
Received Date: 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	11000	5000	*	mg/L	1E+	6/12/2019 11:28:50 AM	R60620

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** DBS-1R
Project: Salty Dog **Collection Date:** 6/3/2019 5:00:00 PM
Lab ID: 1906171-002 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	190	5.0		mg/L	10	6/9/2019 6:14:37 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** DBS-2
Project: Salty Dog **Collection Date:** 6/3/2019 3:50:00 PM
Lab ID: 1906171-003 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	42	5.0		mg/L	10	6/9/2019 7:04:15 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** DBS-3
Project: Salty Dog **Collection Date:** 6/3/2019 4:45:00 PM
Lab ID: 1906171-004 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	46	5.0		mg/L	10	6/9/2019 9:08:22 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-4
Project: Salty Dog
Collection Date: 6/3/2019 4:10:00 PM
Lab ID: 1906171-005
Matrix: GROUNDWA
Received Date: 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	30	5.0		mg/L	10	6/9/2019 8:18:43 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-5
Project: Salty Dog
Collection Date: 6/3/2019 4:30:00 PM
Lab ID: 1906171-006
Matrix: GROUNDWA
Received Date: 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	280	50	*	mg/L	100	6/9/2019 8:55:57 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-6
Project: Salty Dog
Collection Date: 6/3/2019 2:05:00 PM
Lab ID: 1906171-007
Matrix: GROUNDWA
Received Date: 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	180	50		mg/L	100	6/9/2019 8:06:18 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** DBS-8
Project: Salty Dog **Collection Date:** 6/3/2019 1:00:00 PM
Lab ID: 1906171-008 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	35	5.0		mg/L	10	6/9/2019 9:33:10 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** DBS-9
Project: Salty Dog **Collection Date:** 6/3/2019 12:32:00 PM
Lab ID: 1906171-009 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	160	5.0		mg/L	10	6/9/2019 10:22:49 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-10
Project: Salty Dog
Collection Date: 6/3/2019 1:30:00 PM
Lab ID: 1906171-010
Matrix: GROUNDWA
Received Date: 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	510	50	*	mg/L	100	6/9/2019 11:00:02 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** MW-5
Project: Salty Dog **Collection Date:** 6/3/2019 2:45:00 PM
Lab ID: 1906171-011 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	610	50	*	mg/L	100	6/9/2019 11:24:52 PM	R60519

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** MW-3
Project: Salty Dog **Collection Date:** 6/3/2019 3:20:00 PM
Lab ID: 1906171-012 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	1.009	0			1	6/12/2019 11:09:00 AM	R60579
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Fluoride	ND	10		mg/L	100	6/9/2019 11:37:16 PM	R60519
Chloride	8000	500	*	mg/L	1E+	6/9/2019 11:49:40 PM	R60519
Nitrogen, Nitrite (As N)	ND	10	H	mg/L	100	6/9/2019 11:37:16 PM	R60519
Bromide	ND	10		mg/L	100	6/9/2019 11:37:16 PM	R60519
Nitrogen, Nitrate (As N)	ND	0.50	H	mg/L	5	6/13/2019 2:40:10 PM	R60644
Phosphorus, Orthophosphate (As P)	ND	2.5	H	mg/L	5	6/13/2019 2:40:10 PM	R60644
Sulfate	440	50	*	mg/L	100	6/9/2019 11:37:16 PM	R60519
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	26000	25		µmhos/c	5	6/10/2019 5:44:12 PM	R60535
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	313.7	20.00		mg/L Ca	1	6/10/2019 12:01:18 PM	R60535
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	6/10/2019 12:01:18 PM	R60535
Total Alkalinity (as CaCO3)	313.7	20.00		mg/L Ca	1	6/10/2019 12:01:18 PM	R60535
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	16200	200	*D	mg/L	1	6/10/2019 4:44:00 PM	45439
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.21		H	pH units	1	6/10/2019 12:01:18 PM	R60535
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Calcium	1200	50		mg/L	50	6/12/2019 11:16:51 AM	45452
Magnesium	200	5.0		mg/L	5	6/12/2019 9:42:30 AM	45452
Potassium	18	1.0		mg/L	1	6/12/2019 9:40:30 AM	45452
Sodium	3700	50		mg/L	50	6/12/2019 11:16:51 AM	45452

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Injection
Project: Salty Dog **Collection Date:** 6/3/2019 10:21:00 AM
Lab ID: 1906171-013 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	0.9991	0			1	6/12/2019 11:09:00 AM	R60579
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	370	50	*	mg/L	100	6/10/2019 12:14:30 AM	R60519
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	915	100	*D	mg/L	1	6/10/2019 4:44:00 PM	45439
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.56		H	pH units	1	6/6/2019 12:00:11 PM	R60464
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Sodium	250	5.0		mg/L	5	6/12/2019 11:18:32 AM	45452

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Brine
Project: Salty Dog **Collection Date:** 6/3/2019 10:16:00 AM
Lab ID: 1906171-014 **Matrix:** GROUNDWA **Received Date:** 6/5/2019 10:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	1.206	0			1	6/12/2019 11:09:00 AM	R60579
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	220000	10000	*	mg/L	2E+	6/12/2019 12:18:12 PM	R60620
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	312000	2000	*D	mg/L	1	6/10/2019 4:44:00 PM	45439
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.09		H	pH units	1	6/6/2019 12:08:47 PM	R60464
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Sodium	67000	1000		mg/L	1E+	6/12/2019 11:28:57 AM	45452

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Wet Chemistry by Method 2580

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	mV			date / time	
ORP	231	T8	1	06/15/2019 12:00	WG1296217

L1106550-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1106550-01 06/15/19 12:00 • (DUP) R3421337-2 06/15/19 12:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mV	mV		%		%
ORP	231	228	1	1.31		20

Laboratory Control Sample (LCS)

(LCS) R3421337-1 06/15/19 12:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mV	mV	%	%	
ORP	228	229	100	95.7-104	

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
T8	Sample(s) received past/too close to holding time expiration.

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1906171**
24-Sep-19

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **MB** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW** Batch ID: **R60519** RunNo: **60519**
Prep Date: Analysis Date: **6/9/2019** SeqNo: **2047402** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Sulfate	ND	0.50								

Sample ID: **LCS** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW** Batch ID: **R60519** RunNo: **60519**
Prep Date: Analysis Date: **6/9/2019** SeqNo: **2047403** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.54	0.10	0.5000	0	108	90	110			
Chloride	4.7	0.50	5.000	0	93.9	90	110			
Nitrogen, Nitrite (As N)	0.93	0.10	1.000	0	92.8	90	110			
Bromide	2.3	0.10	2.500	0	93.9	90	110			
Sulfate	9.6	0.50	10.00	0	96.5	90	110			

Sample ID: **1906171-002AMS** SampType: **ms** TestCode: **EPA Method 300.0: Anions**
Client ID: **DBS-1R** Batch ID: **R60519** RunNo: **60519**
Prep Date: Analysis Date: **6/9/2019** SeqNo: **2047407** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	6.2	1.0	5.000	1.510	94.7	61.6	129			
Bromide	24	1.0	25.00	0	94.2	81.9	109			
Sulfate	180	5.0	100.0	80.86	98.1	84.2	122			

Sample ID: **1906171-002AMSD** SampType: **msd** TestCode: **EPA Method 300.0: Anions**
Client ID: **DBS-1R** Batch ID: **R60519** RunNo: **60519**
Prep Date: Analysis Date: **6/9/2019** SeqNo: **2047408** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	6.2	1.0	5.000	1.510	94.4	61.6	129	0.257	20	
Bromide	23	1.0	25.00	0	93.8	81.9	109	0.464	20	
Sulfate	180	5.0	100.0	80.86	96.1	84.2	122	1.14	20	

Sample ID: **MB** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW** Batch ID: **R60620** RunNo: **60620**
Prep Date: Analysis Date: **6/12/2019** SeqNo: **2051022** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1906171**
24-Sep-19

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R60620**	RunNo: **60620**
Prep Date:	Analysis Date: **6/12/2019**	SeqNo: **2051022** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R60620**	RunNo: **60620**
Prep Date:	Analysis Date: **6/12/2019**	SeqNo: **2051023** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	95.4	90	110			

Sample ID: **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R60644**	RunNo: **60644**
Prep Date:	Analysis Date: **6/13/2019**	SeqNo: **2052029** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								

Sample ID: **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R60644**	RunNo: **60644**
Prep Date:	Analysis Date: **6/13/2019**	SeqNo: **2052030** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			
Phosphorus, Orthophosphate (As P	4.9	0.50	5.000	0	97.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1906171**
24-Sep-19

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **lcs-1 99.0uS eC**	SampType: **lcs**	TestCode: **SM2510B: Specific Conductance**
Client ID: **LCSW**	Batch ID: **R60535**	RunNo: **60535**
Prep Date:	Analysis Date: **6/10/2019**	SeqNo: **2048171** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	98	5.0	99.00	0	99.4	85	115			

Sample ID: **1906171-012a dup**	SampType: **dup**	TestCode: **SM2510B: Specific Conductance**
Client ID: **MW-3**	Batch ID: **R60535**	RunNo: **60535**
Prep Date:	Analysis Date: **6/10/2019**	SeqNo: **2048185** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	26000	25						1.07	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1906171**
24-Sep-19

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **MB-45452**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **PBW**	Batch ID: **45452**	RunNo: **60581**
Prep Date: **6/7/2019**	Analysis Date: **6/12/2019**	SeqNo: **2049712** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID: **LCS-45452**	SampType: **LCS**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW**	Batch ID: **45452**	RunNo: **60581**
Prep Date: **6/7/2019**	Analysis Date: **6/12/2019**	SeqNo: **2049713** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	48	1.0	50.00	0	95.7	80	120			
Magnesium	48	1.0	50.00	0	95.9	80	120			
Potassium	48	1.0	50.00	0	95.5	80	120			
Sodium	47	1.0	50.00	0	94.1	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1906171**
24-Sep-19

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **1906171-012a dup**	SampType: **dup**	TestCode: **SM4500-H+B / 9040C: pH**							
Client ID: **MW-3**	Batch ID: **R60535**	RunNo: **60535**							
Prep Date:	Analysis Date: **6/10/2019**	SeqNo: **2048231**	Units: **pH units**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.18									H

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1906171**
24-Sep-19

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **mb-1 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R60535**	RunNo: **60535**							
Prep Date:	Analysis Date: **6/10/2019**	SeqNo: **2048188**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: **lcs-1 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R60535**	RunNo: **60535**							
Prep Date:	Analysis Date: **6/10/2019**	SeqNo: **2048189**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.60	20.00	80.00	0	95.8	90	110			

Sample ID: **1906171-012a dup**	SampType: **dup**	TestCode: **SM2320B: Alkalinity**							
Client ID: **MW-3**	Batch ID: **R60535**	RunNo: **60535**							
Prep Date:	Analysis Date: **6/10/2019**	SeqNo: **2048191**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	314.7	20.00						0.318	20	

Sample ID: **mb-2 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R60535**	RunNo: **60535**							
Prep Date:	Analysis Date: **6/10/2019**	SeqNo: **2048211**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: **lcs-2 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R60535**	RunNo: **60535**							
Prep Date:	Analysis Date: **6/10/2019**	SeqNo: **2048212**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.76	20.00	80.00	0	97.2	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1906171**
24-Sep-19

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **1906171-012ADUP**	SampType: **DUP**	TestCode: **Specific Gravity**							
Client ID: **MW-3**	Batch ID: **R60579**	RunNo: **60579**							
Prep Date:	Analysis Date: **6/12/2019**	SeqNo: **2049587**	Units:						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	1.011	0						0.238	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1906171**
24-Sep-19

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog

Sample ID: **MB-45439**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **45439**	RunNo: **60528**
Prep Date: **6/7/2019**	Analysis Date: **6/10/2019**	SeqNo: **2047649** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: **LCS-45439**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **45439**	RunNo: **60528**
Prep Date: **6/7/2019**	Analysis Date: **6/10/2019**	SeqNo: **2047650** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1010	20.0	1000	0	101	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **DBS** Work Order Number: **1906171** RcptNo: 1

Received By: **Erin Melendrez** **6/5/2019 10:05:00 AM**

Completed By: **Isaiah Ortiz** **6/5/2019 12:34:49 PM**

Reviewed By:

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Client

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: 3 (<2 or >12 unless noted)
Adjusted? No
Checked by: TMM 6-5-19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	15.3	Good	Yes			

Chain-of-Custody Record

Client: DBSA

Mailing Address: 6020 Academy Rd NE 87109

Phone #: 505-822-9400

email or Fax#: MZbrozek@Geo-logic.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: Salty Dog

Project #: ES08.0118.16

Project Manager: J. Ayache

Sampler: M. Ebrozek

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 14.8+0.5(CF)=15.3°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1906171	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	TDS, See Attached
6.3.19	1720	GW	PMW-1	1 Poly	NA	-001											
	1700		DBS-1R			-002											
	1550		DBS-2			-003											
	1645		DBS-3			-004											
	1610		DBS-4			-005											
	1630		DBS-5			-006											
	1405		DBS-6			-007											
	1300		DBS-8			-008											
	1232		DBS-9			-009											
	1330		DBS-10			-0010											
	1445		MW-5			-011											
	1520	↓	MW-3	4 Poly	HNO_3 H_2SO_4	-017											X

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
6/5/19	1005			GDO	6/5/19	1005
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks: Temp Approved - ENM 6/5/19

TDS, See Attached

1/2

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: DBSA

Mailing Address: 6020 Academy Rd NE 87123

Phone #: 505-822-9400

email or Fax#: MZbrozek@Geo-Logic.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Salty Dog

Project #: ES08.0118.06

Project Manager: J. Ayarbe

Sampler: M. Zbrozek

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 14.8+0.5(CF)=15.3°

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1906171	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	TDS, pH, Spec Grav	Na				
6.03.19	1021	GW	Injection	3 poly	1 HNO3 2 non	-013							X				X	X				
6.03.19	1016	W	Brine	2 poly	1 HNO3	-014							X				X	X				

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
6/5/19	1005			CDO	6/5/19	1005
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks: Brine Cl analysis from tall unpreserved bottle.

Temp approved-ENM 6/5/19

2/2

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Appendix B

Field Notes

6/3/19 Salty Dog MZ

0830 M. Zbozek onsite

Meet w/ Jim discussed operations

1000 start gauging wells w/ PNW

Well ID	DTW	Notes & sample time
DBS-1R	68.25	1700
DBS-2	70.94	1550
DBS-3	66.10	1645
DBS-4	71.66	1610
DBS-5	68.44	1630
DBS-6	67.24	1405
DBS-7	65.99	WL only
DBS-8	65.82	1300
DBS-9	58.53	1232
DBS-10	65.11	1330
MW-3	64.18	1520
MW-4	64.12	WL only
MW-5	65.30	1445
MW-6	66.70	WL only
PMW-1	71.76	1720

1130 RW-2

Totalizer reading - 52973.7 bbl

824.2 bbl/day

1200 ~~mw~~ FWS-2 Totalizer out to be ~~re~~ replaced in the coming days.

6/3/19

1230 Jim says that the bulk of pumping is taking place on the back side at RW-2

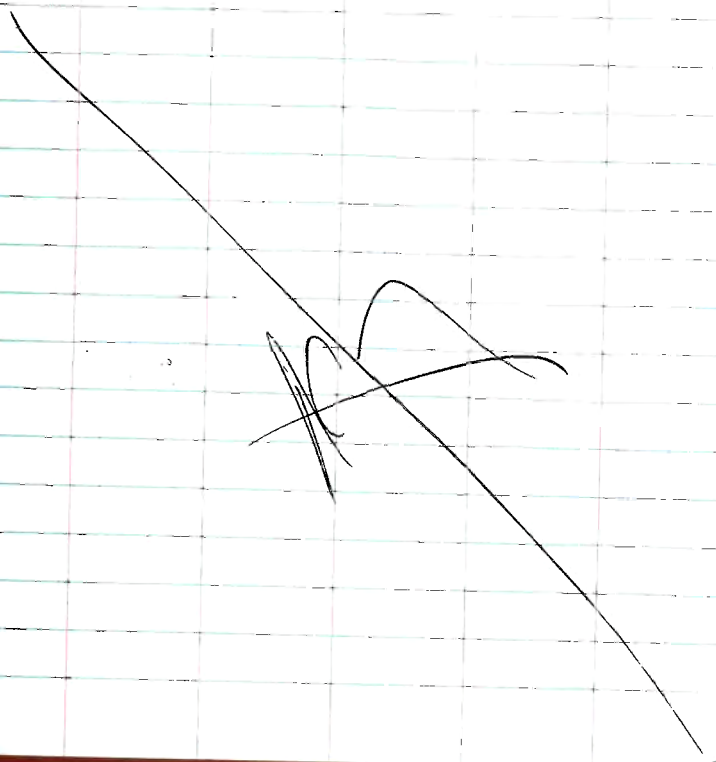
1240 New totalizer on FWS-1 not pumping 130159 bbl

1300 Start sampling at DBS-8 see sample sheets for details

1720 Sample at PMW-1

1740 Decon equipment

1905 M. Zbozek offsite



Daniel B Stephens & Associates, Inc

GROUNDWATER ELEVATION DATA SHEET

Project Name: Salty Dog Sampler: M. Zbrozek

Project #: ES08.0118.06 SampleDate: 06.03.2019

Project Manager: John Ayarbe Sheet # 1 of 1

Well ID	previous (11/19)	Depth to Water	Total Depth	Comments: (well dia., sampled, condition)
DBS-1R	68.71	64.25	74.42	1700
DBS-2	71.07	70.94	75.35	1550
DBS-3	66.11	66.10	74.76	1645
DBS-4	71.61	71.66	78.81	1610
DBS-5	68.47	68.44	75.38	1630
DBS-6	66.62	67.24	76.02	Sample @ 1405
DBS-7	65.30	65.99		WL only
DBS-8	64.82	65.52	69.91	Sample 1300
DBS-9	58.22	58.53	67.55	Sample 1232
DBS-10	64.66	65.11	78.11	Sample @ 1330
MW-2	65.45		--	—
MW-3	66.09	68.18	147.13	1520
MW-4	66.11	68.12		WL only
MW-5	64.34	65.30	128.78	1445
MW-6	66.06	66.70		WL only
PMW-1	72.52	71.76	77.73	1720

Comments:

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: M. Zbrozek

Project #: ES08.0118.06 Sample Date: 6.3.2019

Project Manager: John Ayarbe Sample Time: 1700

Well #: DBS-1R

Well Diameter: 2" (inches) Height of Water Column: 6.17 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 0.98 (gal)

Depth to Water: 68.25 (feet btoc) Purge Volume: 2.96 (gal)

Total Depth of Well: 74.42 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC) 2.0" ID casing = 0.16 gal/ft; 4 0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)		
Initial	9.46	21.2	1159	240.30	6.99	47.80	749	0.87
1	8.35	19.2	1170	237.1	7.03	27.91	757	0.58
1.5		ø						
2	8.35	19.1	1172	235.7	7.00	27.84	760	0 58
2.5								
3	8.34	19.1	1147	234.3	7.08	13.53	738	0 57
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 6.3.2019
Project Manager: John Ayarbe
Sample Time: 1645

Well #: DBS-3

Well Diameter: 2" (inches) Height of Water Column: 8.66 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.38 (gal)
Depth to Water: 66.10 (feet btoc) Purge Volume: 4.15 (gal)
Total Depth of Well: 74.76 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2 0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O (mg/L)	Turbidity (NTU)		
Initial	8.35	21.2	597	232.7	7.37	251.43	387	0.29
1	8.22	19.7	595	237.1	7.44	287.44	387	0.29
1.5								
2	8.17	19.5	595	241.5	7.43	101.86	387	0.29
2.5								
3	8.18	19.5	594	239.0	7.67	89.03	386	0.29
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations.

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 6.3.2019
Project Manager: John Ayarbe
Sample Time: 1630

Well #: DBS-5

Well Diameter: 2" (inches) Height of Water Column: 6.94 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.11 (gal)
Depth to Water: 68.44 (feet btoc) Purge Volume: 3.33 (gal)
Total Depth of Well: 75.38 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)		
Initial	7.75	24.3	1236	192.6	6.43	199.44	798	0.61
1	7.72	20.4	1226	77.6	6.17	20.03	797	0.61
1.5								
2	7.73	19.9	1226	128.6	6 06	89.92	799	0,61
2.5								
3	7.73	19.6	1214	165.1	6 33	43 11	785	0.60
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations.

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M Zbrozek
Project #: ES08.0118.06
Sample Date: 6.3.2019
Project Manager: John Ayarbe
Sample Time: 1610

Well #: DBS-4

Well Diameter: 2" (inches) Height of Water Column: 7.15 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.14 (gal)
Depth to Water: 71.66 (feet btoc) Purge Volume: 3.43 (gal)
Total Depth of Well: 78.81 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)		
Initial	8.43	24.4	566	238.7	7.03	150.48	379	0.28
1	8.27	19.8	555	245.7	7.60	24.24	361	0.27
1.5	8.24	19.6	555	247.9	7.61	15.08	361	0.27
2	8.24	19.5	555	248.7	7.61	11.54	361	0.27
2.5								
3	8.24	19.6	555	249.6	7.61	9.65	361	0.27
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations.

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 6.3.2019
Project Manager: John Ayarbe
Sample Time: 1550

Well #: DBS-2

Well Diameter: 2" (inches) Height of Water Column: 4.41 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 0.70 (gal)
Depth to Water: 70.94 (feet btoc) Purge Volume: 2.11 (gal)
Total Depth of Well: 75.35 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O (mg/L)	Turbidity (NTU)		
Initial	8.77	27.0	887	207.1	5.96	42.01	455	0.34
1	8.65	23.9	624	208.6	5.74	34.76	404	0.30
1.5	8.44	19.8	601	214.9	5.93	8.73	397	0.30
2	8.38	19.4	624	218.5	5.93	71.77	408	0.31
2.5								
3	8.31	19.3	625	219.4	5.76	74.44	398	0.30
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: M. Zbrozek

Project #: ES08.0118.06 Sample Date: 6.3.2019

Project Manager: John Ayarbe Sample Time: 1520

Well #: MW-3

Well Diameter: 2" (inches) Height of Water Column: 78.95 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 12.63 (gal)

Depth to Water: 68.18 (feet btoc) Purge Volume: 37.89 (gal)

Total Depth of Well: 147.13 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)	TDS	521
Initial	8.15	19.8	2215	264.2	3.55	4.21	1440	1.14
1	8.01	19.4	4487	252.4	2.95	2.31	2735	2.27
1.5	7.80	19.4	16429	265.3	2.72	2.20	11096	10.15
2	7.79	19.4	20263	259.3	2.69	2.25	13358	12.37
2.5	7.80	19.4	22028	252.6	2.64	2.25	14376	13.37
3	7.81	19.4	22979	247.3	2.60	2.09	14968	13.95
3.5	7.83	19.6	21537	234.4	2.92	4.87	13678	13.51
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations.

Analytical Method(s): Chloride Filtered metals, etc.

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 6.3.2019
Project Manager: John Ayarbe
Sample Time: 1445

Well #: MW-5

Well Diameter: 2" (inches) Height of Water Column: 63.48 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 10.15 (gal)
Depth to Water: 65.30 (feet btoc) Purge Volume: 30.47 (gal)
Total Depth of Well: 128.78 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)	TDS	Sal
Initial	7.85	19.6	2218	246.7	3.47	2.49	1442	1.14
1	7.85	19.6	1494	237.7	3.82	2.73	1479	1.17
1.5	7.83	19.5	2428	235.2	3.82	2.46	1580	1.26
2	7.83	19.5	2447	234.5	3.83	2.51	1588	1.26
2.5	7.84	19.5	2421	234.1	3.85	2.64	1572	1.25
3	7.83	19.5	2409	235.4	3.88	2.76	1568	1.25
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations.

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 6.3.2019
Project Manager: John Ayarbe
Sample Time: 1405

Well #: DBS-6

Well Diameter: 2" (inches) Height of Water Column: 8.78 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.40 (gal)
Depth to Water: 67.24 (feet btoc) Purge Volume: 4.21 (gal)
Total Depth of Well: 76.02 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0' = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)	TDS	Sal
Initial	7.99	22.3	1213	262.4	6.45	1968.13	789	0.61
1	7.94	20.1	1229	247.5	6.92	1747.41	799	0.61
1.5								
2	7.89	19.6	1227	249.2	6.77	649.45	798	0.61
2.5								
3	6.73	19.6	1228	220.1	6.73	27.45	799	0.61
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations:

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: M. Zbrozek

Project #: ES08.0118.06 Sample Date: 6.3.2019

Project Manager: John Ayarbe Sample Time: 1330

Well #: DBS-10

Well Diameter: 2" (inches) Height of Water Column: 13.00 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 2.08 (gal)

Depth to Water: 65.11 (feet btoc) Purge Volume: 6.24 (gal)

Total Depth of Well: 78.11 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)	mg/L TDS	
Initial	8.02	20.2	2082	238.6	6.06	~~2082~~ 159.25	1350	1.07
1	7.87	19.8	2133	241.8	6.01	~~2133~~ 49.33	1353	1.21
1.5								
2	7.81	19.8	2154	245.3	5.86	~~2154~~ 42.46	1400	1.11
2.5								
3	7.82	19.6	2232	246.0	5.77	~~2232~~ 17.26	1451	1.15
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations.

Analytical Method(s) Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: M. Zbrozek

Project #: ES08.0118.06 Sample Date: 6.3.2019

Project Manager: John Ayarbe Sample Time: 1300

Well #: DBS-8

Well Diameter: 2" (inches) Height of Water Column: 4.39 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume 0.70 (gal)

Depth to Water: 65.52 (feet btoc) Purge Volume 2.11 (gal)

Total Depth of Well: 69.91 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)	TDS mg/L	Sal ppt
Initial	8.46	23.5	647	189.9	6.77	231.51	414	0.31
1	8.29	20.4	634	199.1	6.71	177.70	411	0.31
1.5								
2	8.24	20.0	630	200.2	6.63	140.54	409	0.31
2.5								
3	8.23	19.9	625	202.5	6.61	268.24	405	0.30
3.5								
4								
4.5								
5								

Sample Description: 1 poly

Physical Observations:

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 6.3.2019
Project Manager: John Ayarbe
Sample Time: 1232

Well #: DBS-9

Well Diameter: 2" (inches) Height of Water Column: 9.02 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.44 (gal)
Depth to Water: 58.53 (feet btoc) Purge Volume: 4.32 (gal)
Total Depth of Well: 67.55 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)	TDS mg/L / Sal ppt
Initial	7.73	19.9	1962	173.1	7.86	1801.21	1028 1032
1	7.91	19.1	1589	116.5	7.90	1731.76	
1.5							
2	7.22	19.3	1446	133.1	7.21	1131.97	933 0.73
2.5							
3	7.20	19.3	1430	134.7	7.20	1096.13	933 0.72
3.5							
4							
4.5							
5							

Sample Description: 1 poly

Physical Observations.

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: M. Zbrozek

Project #: ES08.0118.06 Sample Date: 6.3.2019

Project Manager: John Ayarbe Sample Time: 1720

Well #: PMW-1

Well Diameter: 2" (inches) Height of Water Column: 5.97 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 0.95 (gal)

Depth to Water: 71.76 (feet btoc) Purge Volume: 2.86 (gal)

Total Depth of Well: 77.73 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)		
Initial	~~7~~.74	21.9	23449	258.7	7.07	19.85	15175	14.16
1	7.15	19.7	23600	253.7	7.13	6.03	15611	14.66
1.5								
2	7.73	19.4	24612	251.9	6.99	4.60	16339	15.55
2.5								
3	~~6~~.74	19.3	26526	249.2	6.81	3.55	17374	16.57
3.5								
4	~~7~~.77	19.3	2~~7~~503	247.7	6.75	3.24	17968	17.07
4.5								
5	7.81	19.3	28101	246.1	6.72	3.58	18344	17.44

Sample Description: 1 poly

Physical Observations.

Analytical Method(s) Chloride

Appendix C

Historical Data

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 9

Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
DBS-1	56.0–76.0	3,817.09	4/08/2009	62.38	3,754.71
			5/11/2011	64.70	3,752.39
			10/04/2011	Well destroyed	
DBS-1R	58.0–78.0	3,817.00 [b]	4/30/2012	63.60	3,753.40
			9/10/2012	65.65	3,751.35
			6/23/2013	64.40	3,752.60
			1/09/2014	67.23	3,749.77
			4/07/2014	66.36	3,750.64
			3/20/2015	67.17	3,749.83
			7/01/2015	67.92	3,749.08
			9/29/2015	67.07	3,749.93
			12/16/2015	67.54	3,749.46
			3/22/2016	66.61	3,750.39
			6/08/2016	66.23	3,750.77
			9/13/2016	67.43	3,749.57
			12/01/2016	67.31	3,749.69
			6/20/2017	69.60	3,747.40
			12/19/2017	67.80	3,749.20
			6/18/2018	67.45	3,749.55
			11/07/2018	68.71	3,748.29
			6/03/2019	68.25	3,748.75
DBS-2	58.0–78.0	3,820.50	4/08/2009	65.45	3,755.05
			5/11/2011	66.80	3,753.70
			10/04/2011	65.87	3,754.63
			2/08/2012	65.96	3,754.54
			4/30/2012	66.26	3,754.24
			9/10/2012	67.45	3,753.05
			6/23/2013	67.03	3,753.47
			1/09/2014	69.08	3,751.42
			4/07/2014	68.67	3,751.83
			3/20/2015	69.32	3,751.18
			6/30/2015	69.29	3,751.21

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft btoc = Feet below top of casing
ft msl = Feet above mean sea level
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 9

Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
DBS-2 (cont.)	58.0–78.0	3,820.50	9/29/2015	69.41	3,751.09
			12/16/2015	69.71	3,750.79
			3/22/2016	69.13	3,751.37
			6/08/2016	68.91	3,751.59
			9/13/2016	69.76	3,750.74
			12/01/2016	69.73	3,750.77
			6/20/2017	71.33	3,749.17
			12/19/2017	70.42	3,750.08
			6/18/2018	70.25	3,750.25
			11/07/2018	71.07	3,749.43
			6/03/2019	70.94	3,749.56
DBS-3	56.0–76.72	3,816.66	4/08/2009	60.67	3,755.99
			5/11/2011	61.25	3,755.41
			10/04/2011	61.25	3,755.41
			2/08/2012	61.11	3,755.55
			4/30/2012	61.41	3,755.25
			9/10/2012	61.81	3,754.85
			6/23/2013	62.08	3,754.58
			1/09/2014	63.30	3,753.36
			4/07/2014	63.43	3,753.23
			3/20/2015	63.93	3,752.73
			6/30/2015	63.99	3,752.67
			9/29/2015	64.17	3,752.49
			12/16/2015	64.41	3,752.25
			3/22/2016	63.88	3,752.78
			6/08/2016	63.92	3,752.74
			9/13/2016	64.56	3,752.10
			12/01/2016	64.59	3,752.07
			6/20/2017	65.52	3,751.14
			12/19/2017	65.54	3,751.12
			6/18/2018	65.60	3,751.06

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft btoc = Feet below top of casing
ft msl = Feet above mean sea level
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
DBS-3 (cont.)	56.0–76.72	3,816.66	11/07/2018	66.11	3,750.55
			6/03/2019	66.10	3,750.56
DBS-4	56.0–76.0	3,820.37	4/08/2009	66.27	3,754.10
			5/11/2011	67.23	3,753.14
			10/04/2011	66.67	3,753.70
			2/08/2012	66.76	3,753.61
			4/30/2012	67.02	3,753.35
			9/10/2012	67.78	3,752.59
			6/23/2013	67.70	3,752.67
			1/09/2014	69.37	3,751.00
			4/07/2014	69.23	3,751.14
			3/20/2015	69.81	3,750.56
			6/30/2015	69.85	3,750.52
			9/29/2015	70.00	3,750.37
			12/16/2015	70.25	3,750.12
			3/22/2016	69.74	3,750.63
			6/08/2016	69.62	3,750.75
			9/13/2016	70.35	3,750.02
			12/01/2016	70.38	3,749.99
			6/20/2017	71.67	3,748.70
			12/19/2017	71.08	3,749.29
			6/18/2018	70.98	3,749.39
			11/07/2018	71.61	3,748.76
			6/03/2019	71.66	3,748.71
DBS-5	56.9–76.9	3,820.66	4/08/2009	62.99	3,757.67
			5/11/2011	63.45	3,757.21
			10/04/2011	63.41	3,757.25
			2/08/2012	63.46	3,757.20
			4/30/2012	63.70	3,756.96
			9/10/2012	63.92	3,756.74
			6/23/2013	64.30	3,756.36
			1/09/2014	65.28	3,755.38

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft msl = Feet above mean sea level
ft btoc = Feet below top of casing
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
DBS-5 (cont.)	56.9–76.9	3,820.66	4/07/2014	65.48	3,755.18
			3/20/2015	65.90	3,754.76
			7/01/2015	66.18	3,754.48
			9/29/2015	66.25	3,754.41
			12/16/2015	66.47	3,754.19
			3/22/2016	66.08	3,754.58
			6/08/2016	66.16	3,754.50
			9/13/2016	66.64	3,754.02
			12/01/2016	66.72	3,753.94
			6/20/2017	67.60	3,753.06
			12/19/2017	67.88	3,752.78
			6/18/2018	68.04	3,752.62
			11/07/2018	68.47	3,752.19
			6/03/2019	68.44	3,752.22
DBS-6	56.7–76.7	3,812.65	4/07/2009	62.75	3,749.90
			5/11/2011	63.11	3,749.54
			10/04/2011	63.16	3,749.49
			2/08/2012	63.20	3,749.45
			4/30/2012	63.43	3,749.22
			9/10/2012	63.60	3,749.05
			6/23/2013	63.74	3,748.91
			1/09/2014	64.00	3,748.65
			4/07/2014	64.22	3,748.43
			3/19/2015	64.78	3,747.87
			7/01/2015	64.81	3,747.84
			9/29/2015	65.48	3,747.17
			12/16/2015	65.26	3,747.39
			3/22/2016	65.38	3,747.27
			6/08/2016	65.37	3,747.28
			9/13/2016	65.51	3,747.14
			12/01/2016	65.51	3,747.14
			6/20/2017	65.81	3,746.84

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft btoc = Feet below top of casing
ft msl = Feet above mean sea level
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
DBS-6 (cont.)	56.7–76.7	3,812.65	12/19/2017	66.29	3,746.36
			6/18/2018	66.45	3,746.20
			11/07/2018	66.62	3,746.03
			6/03/2019	67.24	3,745.41
DBS-7	55.1–75.1	3,810.21	4/07/2009	61.74	3,748.47
DBS-8	55.2–75.2	3,810.70	4/07/2009	61.20	3,749.50
			5/11/2011	61.67	3,749.03
			10/04/2011	61.71	3,748.99
			2/08/2012	61.77	3,748.93
			4/30/2012	62.00	3,748.70
			9/10/2012	62.15	3,748.55
			6/23/2013	62.28	3,748.42
			1/09/2014	62.47	3,748.23
			4/07/2014	62.67	3,748.03
			3/19/2015	63.19	3,747.51
			6/30/2015	63.25	3,747.45
			9/29/2015	63.82	3,746.88
			12/16/2015	63.58	3,747.12
			3/22/2016	63.76	3,746.94
			6/08/2016	63.72	3,746.98
			9/13/2016	63.83	3,746.87
			12/01/2016	63.79	3,746.91
			6/20/2017	64.09	3,746.61
			12/19/2017	64.53	3,746.17
			6/18/2018	64.70	3,746.00
			11/07/2018	64.82	3,745.88
			6/03/2019	65.52	3,745.18
DBS-9	48.0–68.0	3,806.26	4/08/2009	53.93	3,752.33
			5/11/2011	54.39	3,751.87
			10/04/2011	54.59	3,751.67
			2/08/2012	54.53	3,751.73
			4/30/2012	54.68	3,751.58

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft btoc = Feet below top of casing
ft msl = Feet above mean sea level
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
DBS-9 (cont.)	48.0–68.0	3,806.26	9/10/2012	54.77	3,751.49
			6/23/2013	55.04	3,751.22
			1/09/2014	55.27	3,750.99
			4/07/2014	55.56	3,750.70
			3/19/2015	55.95	3,750.31
			7/01/2015	56.14	3,750.12
			9/29/2015	56.49	3,749.77
			12/16/2015	56.52	3,749.74
			3/22/2016	56.51	3,749.75
			6/08/2016	56.64	3,749.62
			9/13/2016	56.81	3,749.45
			12/01/2016	56.88	3,749.38
			6/20/2017	57.28	3,748.98
			12/19/2017	57.67	3,748.59
			6/18/2018	57.98	3,748.28
			11/07/2018	58.22	3,748.04
			6/03/2019	58.53	3,747.73
DBS-10	57.2–77.2	3,807.48	6/18/2018	64.46	3,743.02
			11/07/2018	64.66	3,742.82
			6/03/2019	65.11	3,742.37
NW-1s	52.95–72.95	3,817.33	4/08/2009	62.35	3,754.98
NW-1m	99.31–119.31	3,817.35	4/08/2009	62.25	3,755.10
NW-1d	149.45–169.45	3,817.35	4/08/2009	62.04	3,755.31
NW-2s	53.35–73.35	3,812.50	4/08/2009	63.08	3,749.42
NW-2m	93.72–113.72	3,812.45	4/08/2009	63.27	3,749.18
NW-2d	126.87–146.87	3,812.46	4/08/2009	66.41	3,746.05
PMW-1	63–78	3,821.17	6/23/2008	67.51	3,753.66
			4/08/2009	65.97	3,755.20
			5/11/2011	68.70	3,752.47
			10/04/2011	66.95	3,754.22
			2/08/2012	66.69	3,754.48
			4/30/2012	67.27	3,753.90

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft msl = Feet above mean sea level
ft btoc = Feet below top of casing
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
PMW-1 (cont.)	63–78	3,821.17	9/10/2012	69.77	3,751.40
			6/23/2013	68.40	3,752.77
			1/09/2014	71.24	3,749.93
			4/07/2014	69.97	3,751.20
			3/20/2015	70.78	3,750.39
			7/01/2015	71.41	3,749.76
			9/29/2015	70.76	3,750.41
			12/16/2015	71.03	3,750.14
			3/22/2016	70.30	3,750.87
			6/08/2016	69.65	3,751.52
			9/13/2016	71.08	3,750.09
			12/01/2016	70.97	3,750.20
			6/20/2017	73.06	3,748.11
			12/19/2017	71.19	3,749.98
			6/18/2018	70.97	3,750.20
			11/07/2018	72.52	3,748.65
			6/03/2019	71.76	3,749.41
MW-1	120–140	NA	6/23/2008	59.90	NA
MW-2	127–147	3,812.68	6/23/2008	61.42	3,751.26
			4/07/2009	61.65	3,751.03
MW-3	NA	3,812.05	6/23/2008	62.06	3,749.99
			4/07/2009	62.02	3,750.03
			5/11/2011	62.91	3,749.14
			10/04/2011	62.91	3,749.14
			2/08/2012	62.95	3,749.10
			4/30/2012	63.39	3,748.66
			9/10/2012	63.50	3,748.55
			6/23/2013	63.36	3,748.69
			1/09/2014	63.55	3,748.50
			4/07/2014	63.88	3,748.17
			3/19/2015	64.27	3,747.78
			7/01/2015	64.34	3,747.71

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft btoc = Feet below top of casing
ft msl = Feet above mean sea level
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
MW-3 (cont.)	NA	3,812.05	9/29/2015	67.94	3,744.11
			12/16/2015	64.75	3,747.30
			3/22/2016	64.84	3,747.21
			6/08/2016	64.89	3,747.16
			9/13/2016	66.33	3,745.72
			12/01/2016	66.66	3,745.39
			6/20/2017	65.56	3,746.49
			12/19/2017	65.70	3,746.35
			6/18/2018	66.52	3,745.53
			11/07/2018	66.09	3,745.96
			6/03/2019	68.18	3,743.87
MW-4	111–131	3,811.33	6/23/2008	62.12	3,749.21
			4/07/2009	62.51	3,748.82
MW-5	112–132	3,808.96	6/23/2008	60.60	3,748.36
			4/07/2009	60.79	3,748.17
			5/11/2011	61.17	3,747.79
			10/04/2011	61.72	3,747.24
			2/08/2012	61.23	3,747.73
			4/30/2012	61.50	3,747.46
			9/10/2012	61.65	3,747.31
			6/23/2013	61.75	3,747.21
			1/09/2014	61.90	3,747.06
			4/07/2014	62.18	3,746.78
			3/19/2015	62.96	3,746.00
			6/30/2015	62.71	3,746.25
			9/29/2015	63.92	3,745.04
			12/16/2015	63.02	3,745.94
			3/22/2016	63.14	3,745.82
			6/08/2016	63.47	3,745.49
			9/13/2016	63.66	3,745.30
			12/01/2016	63.70	3,745.26
			6/21/2017	63.62	3,745.34

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft btoc = Feet below top of casing
ft msl = Feet above mean sea level
NA = Not available

Table C-1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
MW-5 (cont.)	112–132	3,808.96	12/19/2017	65.02	3,743.94
			6/18/2018	64.32	3,744.64
			11/07/2018	64.34	3,744.62
			06/03/2019	65.30	3,743.66
MW-6	NA	3,810.17	6/23/2008	62.17	3,748.00
			4/07/2009	62.41	3,747.76

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
ft bgs = Feet below ground surface
ft btoc = Feet below top of casing
ft msl = Feet above mean sea level
NA = Not available

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-1	4/08/2009	**320**
	5/12/2011	**940**
	10/04/2011	Well destroyed
DBS-1R	5/01/2012	**3,000**
	9/11/2012	**3,200**
	6/25/2013	**3,300**
	1/10/2014	**1,000**
	4/08/2014	**1,700**
	3/20/2015	**1,200**
	7/01/2015	**860**
	9/30/2015	**670**
	12/17/2015	**760**
	3/23/2016	**560**
	6/09/2016	**570**
	09/14/2016	**360**
	12/01/2016	**360**
	6/20/2017	**320**
	12/20/2017	190
	6/19/2018	190
	11/08/2018	180
	6/03/2019	190
DBS-2	4/08/2009	14
	5/12/2011	25
	10/05/2011	18
	2/09/2012	22
	5/01/2012	24
	9/11/2012	44
	6/25/2013	36
	1/10/2014	45
	4/08/2014	22
	3/20/2015	29

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-2 (cont.)	6/30/2015	28
	9/30/2015	40
	12/17/2015	35
	3/23/2016	46
	6/09/2016	41
	9/14/2016	41
	12/02/2016	53
	6/20/2017	59
	12/20/2017	37
	6/18/2018	47
	11/08/2018	47
	6/03/2019	42
DBS-3	4/08/2009	36
	5/12/2011	35
	10/05/2011	34
	2/09/2012	34
	5/01/2012	33
	9/11/2012	34
	6/24/2013	32
	1/10/2014	34
	4/08/2014	32
	3/20/2015	35
	6/30/2015	35
	9/30/2015	34
	12/17/2015	34
	3/23/2016	36
	6/09/2016	35
	9/14/2016	37
	12/02/2016	37
	6/20/2017	39
	12/20/2017	42

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-3 (cont.)	6/18/2018	47
	11/08/2018	46
	6/03/2019	46
DBS-4	4/08/2009	38
	5/12/2011	33
	10/05/2011	32
	2/09/2012	32
	5/01/2012	31
	9/11/2012	32
	6/25/2013	31
	1/10/2014	32
	4/08/2014	30
	3/20/2015	33
	6/30/2015	31
	9/30/2015	33
	12/17/2015	35
	3/23/2016	38
	6/09/2016	35
	9/14/2016	37
	12/02/2016	41
	6/20/2017	35
	12/20/2017	32
	6/19/2018	39
	11/08/2018	35
	6/03/2019	30
DBS-5	4/08/2009	65
	5/12/2011	140
	10/05/2011	140
	2/09/2012	140
	4/30/2012	150
	9/11/2012	160

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-5 (cont.)	6/24/2013	160
	1/10/2014	180
	4/08/2014	160
	3/20/2015	140
	7/01/2015	140
	9/30/2015	150
	12/17/2015	160
	3/23/2016	150
	6/09/2016	150
	9/14/2016	170
	12/02/2016	170
	6/20/2017	170
	12/20/2017	170
	6/18/2018	180
	11/08/2018	170
	6/03/2019	**280**
DBS-6	4/07/2009	**380**
	5/12/2011	**410**
	10/05/2011	**400**
	2/09/2012	**380**
	4/30/2012	**400**
	9/11/2012	**390**
	6/24/2013	**340**
	1/10/2014	**390**
	4/07/2014	**400**
	3/19/2015	**370**
	7/01/2015	**360**
	9/30/2015	**370**
	12/17/2015	**380**
	3/23/2016	**310**
	6/09/2016	**300**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-6 (cont.)	9/14/2016	**290**
	12/02/2016	**300**
	6/21/2017	240
	12/19/2017	200
	6/19/2018	210
	11/08/2018	190
	6/03/2019	180
DBS-7	4/07/2008	**570**
DBS-8	4/07/2009	58
	5/12/2011	36
	10/05/2011	140
	2/09/2012	41
	4/30/2012	41
	9/10/2012	42
	6/24/2013	45
	1/09/2014	38
	4/07/2014	36
	3/19/2015	36
	7/01/2015	34
	9/30/2015	35
	12/17/2015	33
	3/23/2016	35
	6/09/2016	34
	9/14/2016	34
	12/02/2016	33
	6/21/2017	33
	12/19/2017	28
	6/19/2018	33
	11/08/2018	30
	6/03/2019	35

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
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Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-9	4/08/2009	210
	5/12/2011	**600**
	10/05/2011	**440**
	2/09/2012	**290**
	4/30/2012	**330**
	9/11/2012	**320**
	6/24/2013	200
	1/10/2014	170
	4/07/2014	220
	3/19/2015	**260**
	7/01/2015	210
	9/30/2015	**260**
	12/17/2015	230
	3/23/2016	200
	6/09/2016	190
	9/14/2016	190
	12/02/2016	180
	6/21/2017	200
	12/20/2017	230
	6/19/2018	**260**
	6/03/2019	160
DBS-10	6/19/2018	**690**
	11/08/2018	**590**
	6/03/2019	**510**
NW-1s	4/08/2009	**630**
NW-1m	4/08/2009	57
NW-1d	4/08/2009	38
NW-2s	4/08/2009	**410**
NW-2m	4/08/2009	**570**
NW-2d	4/08/2009	**4,700**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 7 of 10

Monitor Well	Date	Chloride Concentration (mg/L) [a]
	NMWQCC Standard	*250*
PMW-1	2/27/2008	**9,500** [b]
	5/30/2008	**8,600** [b]
	6/23/2008	**12,700**
	4/08/2009	**11,000**
	5/12/2011	**13,000**
	10/05/2011	**12,000**
	2/09/2012	**12,000**
	5/01/2012	**12,000**
	9/11/2012	**14,000**
	6/25/2013	**14,000**
	1/10/2014	**11,000**
	4/08/2014	**12,000**
	3/20/2015	**8,500**
	7/01/2015	**8,600**
	9/30/2015	**9,700**
	12/17/2015	**9,800**
	3/23/2016	**8,200**
	6/09/2016	**8,500**
	9/14/2016	**9,300**
	12/01/2016	**8,300**
	6/20/2017	**13,000**
	12/20/2017	**12,000**
	6/19/2018	**9,600**
	11/08/2018	**10,000**
	6/03/2019	**11,000**
MW-1	5/30/2008	75 [b]
	6/23/2008	243
MW-2	2/27/2008	120 [b]
	5/30/2008	80 [b]
	6/23/2008	**1,480**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 8 of 10

Monitor Well	Date	Chloride Concentration (mg/L) [a]
	NMWQCC Standard	*250*
MW-2 (cont.)	4/07/2009	**1,200**
	6/19/2018	**390**
MW-3	2/27/2008	**348** [b]
	5/30/2008	**360** [b]
	6/23/2008	**1,090**
	4/07/2009	**17,000**
	5/12/2011	**16,000**
	10/05/2011	**14,000**
	2/09/2012	**15,000**
	4/30/2012	**14,000**
	9/10/2012	**16,000**
	6/24/2013	**12,000**
	1/10/2014	**10,000**
	4/07/2014	**12,000**
	3/19/2015	**9,700**
	7/01/2015	**10,000**
	9/30/2015	**9,600**
	12/17/2015	**5,100**
	3/23/2016	**8,200**
	6/09/2016	**9,400**
	9/14/2016	**9,100**
	12/02/2016	**11,000**
	6/21/2017	**10,000**
	12/20/2017	**8,300**
	6/19/2018	**7,300**
	11/08/2018	**8,000**
	6/03/2019	**8,000**
MW-4	2/27/2008	**476** [b]
	5/30/2008	**512** [b]
	6/23/2008	**5,730**
	4/07/2009	**6,600**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 9 of 10

Monitor Well	Date	Chloride Concentration (mg/L) [a]
	NMWQCC Standard	*250*
MW-5	2/27/2008	**1,280** [b]
	5/30/2008	**1,220** [b]
	6/23/2008	**1,260**
	4/07/2009	**1,300**
	5/12/2011	**1,500**
	10/05/2011	**1,500**
	2/09/2012	**1,500**
	4/30/2012	**1,400**
	9/10/2012	**1,500**
	6/24/2013	**1,300**
	1/10/2014	**1,300**
	4/07/2014	**1,300**
	3/19/2015	**1,200**
	7/01/2015	**1,200**
	9/30/2015	**1,000**
	12/17/2015	**1,000**
	3/23/2016	**980**
	6/09/2016	**970**
	9/14/2016	**1,000**
	12/02/2016	**710**
	6/21/2017	**870**
	12/19/2017	**850**
	6/19/2018	**840**
	11/08/2018	**680**
	6/03/2019	**610**
MW-6	2/27/2008	32 [b]
	5/30/2008	36 [b]
	6/23/2008	31.4
	4/07/2009	25

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-2. Historical Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 10 of 10

Monitor Well	Date	Chloride Concentration (mg/L) [a]
	NMWQCC Standard	*250*
Ranch Headquarters Supply Well	6/23/2008	35.4
Brine Station Fresh Water Supply Well	2/27/2008	**630** [b]
	5/30/2008	**590** [b]
	6/23/2008	**650**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table C-3. Historical Average Groundwater Extraction Rates
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 2

Recovery Well	Date	Average Extraction Rate [a] (gpm)
RW-1	4/07/2012	Groundwater extraction started
	5/01/2012	2.1
	9/11/2012	2.9
	6/25/2013	4.1
	11/15/2013	3.6
	3/20/2015 [b]	2.4
	6/30/2015	—
FWS-1	12/17/2015	—
	3/22/2016	12.8
	6/08/2016	33.9
	9/13/2016	5.4
	12/02/2016	39.7
	6/20/2017	32.7
	12/19/2017	37.3
	6/18/2018	15.4
	11/08/2018	22.4
	6/03/2019 [c]	23.9
RW-2	4/06/2012	Groundwater extraction started
	5/01/2012	2.5
	9/11/2012	4.3
	12/14/2012	3.9
	6/25/2013 [d]	—
	9/21/2013 [e]	2.9
	9/30/2015	68
	12/17/2015	44
	3/22/2016	32

[a] Average extraction rates based on totalizer flow meter readings and/or fresh water production records.

[b] Pumping at RW-1 stopped because pumping of FWS-1 lowered groundwater levels at RW-1, precluding groundwater extraction at RW-1. Pumping at FWS-1 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area.

[c] New meter on December 3, 2019; well stopped pumping on May 11, 2019.

[d] New pump installed in RW-2 and started on June 25, 2013.

[e] Meter and pump were removed from RW-2 on approximately September 21, 2013 by facility manager to install a new, larger-capacity pump.

[f] Meter was inoperable because it was damaged. Meter was replaced in November 2017.

[g] Meter read on November 8, 2018, but well had not been pumped since October 10, 2018; average extraction rate between June 18 and October 10, 2018 is reported.

gpm = Gallons per minute

Table C-3. Historical Average Groundwater Extraction Rates
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 2

Recovery Well	Date	Average Extraction Rate [a] (gpm)
RW-2 (cont.)	6/08/2016	9.0
	9/13/2016	5.7
	12/01/2016 [f]	—
	6/20/2017 [f]	—
	12/19/2017	12.4
	6/19/2018	5.2
	10/10/2018 [g]	3.4
	6/3/2019	7.0

[a] Average extraction rates based on totalizer flow meter readings and/or fresh water production records.

[b] Pumping at RW-1 stopped because pumping of FWS-1 lowered groundwater levels at RW-1, precluding groundwater extraction at RW-1. Pumping at FWS-1 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area.

[c] New meter on December 3, 2019; well stopped pumping on May 11, 2019.

[d] New pump installed in RW-2 and started on June 25, 2013.

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[g] Meter read on November 8, 2018, but well had not been pumped since October 10, 2018; average extraction rate between June 18 and October 10, 2018 is reported.

gpm = Gallons per minute

Chavez, Carl J, EMNRD

From: McVey, Michael <mmcVey@dbstephens.com>
Sent: Thursday, March 16, 2017 1:35 PM
To: Chavez, Carl J, EMNRD
Cc: Ayarbe, John
Subject: 4th Qtr 2016 Groundwater Monitoring and O&M Report - Salty Dog
Attachments: Salty Dog_4th Qtr 2016 Mntrng Rpt_3-16-2017.pdf

Carl,

Attached is a pdf of the Fourth Quarter 2016 Groundwater Monitoring and O&M Report for the Salty Dog Brine Station in Hobbs, NM. Per our agreement, we will be conducting groundwater monitoring and O&M on a semiannual basis going forward. The next monitoring event is scheduled for June 2017. Please give me a call if you have any questions.

Thanks,

Michael D. McVey
Senior Hydrogeologist

Daniel B. Stephens & Associates, Inc.
Hydrology | Engineering | Geoscience

Providing solutions for water, natural resources, and the environment

6020 Academy Road NE, Suite 100 | Albuquerque, New Mexico 87109
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March 16, 2017

Carl Chavez
New Mexico Oil Conservation Division
Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505-4225

Re: Fourth Quarter 2016 Groundwater Monitoring and O&M Report, Salty Dog Brine Station

Dear Mr. Chavez:

On behalf of PAB Services, Inc., Daniel B. Stephens & Associates, Inc. (DBS&A) is pleased to submit the enclosed groundwater monitoring and operation and maintenance (O&M) report for the Salty Dog brine station located in Lea County, New Mexico. The report documents results of fourth quarter 2016 groundwater monitoring activities completed at the site on December 1 and 2, 2016, as well as groundwater extraction system O&M information.

Please do not hesitate to call us at (505) 822-9400 if you have any questions or require additional information.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

John Ayarbe, P.G.
Senior Hydrogeologist

Michael D. McVey, P.G.
Senior Hydrogeologist

JA/MDM/rpf
Enclosure
cc: Pieter Bergstein, PAB Services, Inc.
Jim Sayre, Salty Dog, Inc.

Fourth Quarter 2016

Groundwater Monitoring and

O&M Report

Salty Dog Brine Station

Lea County, New Mexico

Prepared for **New Mexico Energy, Minerals and Natural Resources Department**
Oil Conservation Division

March 16, 2017

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

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Appendix

Fourth Quarter 2016 Groundwater Monitoring and O&M Report
Salty Dog Brine Station, Lea County, New Mexico

1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this groundwater monitoring and operations and maintenance (O&M) report for submission to the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD) Environmental Bureau on behalf of PAB Services, Inc. (PAB) for the Salty Dog brine station (the site) located in Lea County, New Mexico (Figure 1). The report summarizes activities conducted at the site on December 1 and 2, 2016.

The site consists of a northern portion, where the brine pond was located prior to closure in October 2008, and a southern portion, where the brine well is located. The brine pond area and the brine well area are separated by approximately 2,500 feet, joined by a dirt road (Figure 1). Injection water for the brine well comes from two fresh water supply wells (FWS-1 and FWS-2) and remedial pumping at recovery wells in both the former brine pond area (RW-1) and brine well area (RW-2). Groundwater extraction at RW-1 is limited due to pumping from FWS-1. However, pumping at FWS-1 provides hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area.

Brine that is produced for sale is stored at a tank battery on the southern boundary of the former brine pond area. The tank battery consists of six 750-barrel aboveground storage tanks (ASTs) surrounded by a berm. A concrete truck loading pad with two brine filling stations is located north of the tank battery. An operations shed is located adjacent to the loading pad to the west.

Six monitor wells (PMW-1, DBS-1R, and DBS-2 through DBS-5), one nested well (NW-1), one fresh water supply well (FWS-1), and one recovery well (RW-1) are located in the former brine pond area. Nine monitor wells (MW-2 through MW-6, DBS-6 through DBS-9), one nested well (NW-2), one fresh water supply well (FWS-2), and one recovery well (RW-2) are located in the brine well area (Figure 1).

DBS&A installed groundwater extraction systems at the site in early April 2012 to provide hydraulic containment and removal of chloride-impacted groundwater in the former brine pond and brine well areas. The extraction systems consist of submersible pumps, conveyance lines, electrical power, and controls to extract impacted groundwater from the recovery wells. Extracted groundwater is conveyed to the on-site ASTs for reinjection at the brine well.

2. Scope of Work

The scope of work for groundwater monitoring consisted of (1) measuring fluid levels in and collecting groundwater samples from 11 monitor wells, and (2) performing maintenance on the groundwater extraction systems, as necessary. Groundwater samples were submitted to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico for chloride analysis using U.S. Environmental Protection Agency (EPA) method 300.0. The monitor wells included in the quarterly sampling were selected in consultation with Jim Griswold on October 4, 2010; Mr. Griswold was the OCD Project Manager for the site at that time. The selected monitor wells are shown in Figures 2 through 5.

3. Monitoring Activities

3.1 Fluid Level Measurement

On December 1, 2016, DBS&A measured water levels in monitor wells DBS-1R, DBS-2 through DBS-5, and PMW-1 in the former brine pond area (Figure 2) and DBS-6, DBS-8, DBS-9, MW-3, and MW-5 in the brine well area (Figure 3) using a properly decontaminated electronic water level meter. Table 1 reports water level measurements and groundwater elevations.

During this monitoring event, the average depths to water beneath the former brine pond area and brine well area were 68.3 feet below ground surface (bgs) and 63.3 feet bgs, respectively. On average, water levels in the former brine pond area increased by approximately 0.02 foot since the last monitoring event in September 2016, while water levels in the brine well area declined by 0.1 foot.

Figures 2 and 3 present potentiometric surface maps for the former brine pond area and the brine well area, respectively. The direction of groundwater flow beneath the former brine pond area remains to the southeast at a gradient of approximately 0.005 foot per foot (ft/ft) (Figure 2)—decreasing slightly since the previous monitoring event. A broad cone of depression was observed in the vicinity of the fresh water supply well (FWS-1) due to increased fresh water production when depth to water level measurements were recorded. The direction of groundwater flow beneath the brine well area remains to the southeast at a gradient of approximately 0.004 ft/ft (Figure 3)—consistent with the previous monitoring event.

3.2 Groundwater Sampling

On December 1 and 2, 2016, groundwater samples were collected from monitor wells DBS-1R, DBS-2 through DBS-6, DBS-8, DBS-9, MW-3, MW-5, and PMW-1 following standard sampling procedures developed from EPA guidance. Before sampling, each well was purged of a minimum of three casing volumes using a submersible pump so that a representative groundwater sample was collected. While purging, DBS&A measured water quality field parameters consisting of temperature, specific conductance, and pH. Samples were collected once three casing volumes were purged. Sample containers were then filled, labeled, and placed in an ice-filled cooler. Groundwater samples were submitted under chain of custody to HEAL for chloride analysis.

Samples of the brine well injection water and the produced brine were also collected to meet requirements under discharge permit BW-8. Analytical results of these samples will be reported in the 2016 Annual Class III Well Report.

4. Analytical Results

Table 2 summarizes chloride analytical results for the 11 groundwater samples. Figures 4 and 5 show the distribution of chloride in groundwater beneath the former brine pond area and the brine well area, respectively. The laboratory report and chain of custody documentation are provided in Appendix A. Field notes recorded during groundwater monitoring activities are provided in Appendix B.

4.1 Former Brine Pond Area Wells

Since the last monitoring event in September 2016, minor to no changes in chloride concentrations were observed at monitor wells DBS-2 through DBS-5 (Table 2). DBS-1R and PMW-1 continue to exhibit chloride concentrations above the New Mexico Water Quality Control Commission (NMWQCC) standard of 250 milligrams per liter (mg/L) (Figure 4). The chloride concentration at DBS-1R remained at 360 mg/L, while the concentration at PMW-1 decreased from 9,300 mg/L to 8,300 mg/L.

The chloride plume in the former brine pond area remains bounded by the existing monitor well network (Figure 4). Pumping from PAB's fresh water supply well FSW-1 provides hydraulic containment of the chloride plume. The chloride concentration at downgradient monitor well DBS-4 remains below the NMWQCC standard, as do chloride concentrations at the two cross-gradient monitor wells, DBS-2 and DBS-3.

4.2 Brine Well Area Wells

Since the last monitoring event in September 2016, minor changes in chloride concentrations were observed at most of the monitor wells in the brine well area (Table 2). Monitor wells MW-3 (the well closest to extraction well RW-2), MW-5 (the farthest downgradient well), and DBS-6 (the northernmost cross-gradient well) continue to exhibit chloride concentrations above the NMWQCC standard (Figure 5). The chloride concentration at MW-3 increased from 9,100 mg/L to 11,000 mg/L. The chloride concentration at MW-5 decreased from 1,000 mg/L to 710 mg/L. The chloride concentration at DBS-6 rebounded slightly from 290 mg/L to 300 mg/L.

During previous monitoring events, monitor well DBS-9 (an upgradient monitor well) has exhibited chloride concentrations above the NMWQCC standard; however, during this reporting period, the chloride concentration at DBS-9 was 180 mg/L, below the NMWQCC standard (Table 2). DBS-9 was installed in the playa located northeast of the brine well to help characterize groundwater impacts from documented releases in 2002 and 2005.

5. Groundwater Extraction System O&M

Remedial groundwater extraction in the former brine pond and brine well areas began in April 2012 by pumping from recovery wells RW-1 and RW-2. Extracted groundwater volumes at RW-1 and RW-2 are reported in Table 3.

Production from the fresh water supply well (FWS-1) also supports hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area.

5.1 Former Brine Pond Area

Other than some brief shutdowns to address a few maintenance issues, the groundwater extraction system at RW-1 operated continually until approximately March 2015 (Table 3). Pumping from the nearby fresh water supply well (FWS-1) is inhibiting the effectiveness of RW-1 as an extraction well by lowering groundwater levels at this well. PAB attempted to set the pump at RW-1 to a deeper depth in the well so that pumping from RW-1 could continue, but the pump is already set near the bottom of the well. Although pumping from RW-1 has ceased, pumping at FWS-1 provides containment of the chloride plume in the former brine pond area. The average pumping rate at FWS-1 during the fourth quarter 2016 was approximately 39.7 gallons per minute (gpm).

Monitor wells DBS-1R and PMW-1 are the only wells that exhibit chloride concentrations above the NMWQCC standard. Pumping of the fresh water supply well is preventing the downgradient migration of the chloride groundwater plume; although the chloride concentrations in wells DBS-1R and PMW-1 remain elevated, they have decreased from historical highs (Table 2) and are expected to continue to decrease through time with continued pumping at the fresh water supply well. The chloride concentration at downgradient monitor well DBS-4 is well below the NMWQCC standard.

5.2 Brine Well Area

The groundwater extraction system at RW-2 has been operated continually since April 6, 2012 with the exception of addressing a few maintenance issues. A total of 18,456,447 gallons of chloride-impacted groundwater have been pumped from RW-2 (Table 3); this value reflects the total recorded at the meter until it was damaged during the fourth quarter. Historically, pumping of recovery well RW-2 at flow rates of 2.5 to 4.3 gpm produced little drawdown in the brine well area. However, after increasing the average pumping rate to 68 gpm after the second quarter 2015 monitoring event (Table 3), a cone of depression became evident, thereby improving hydraulic containment and removal of the chloride plume.

Due to damage to the RW-2 totalizer, the average pumping rate at RW-2 during this reporting period was estimated to be approximately 5 gpm based on PAB fresh water injection volumes. A cone of depression was not observed during this monitoring event (Figure 3), although RW-2 was pumping at the time water level measurements were recorded.

The chloride plume remains undefined downgradient and cross-gradient to the north of the recovery well (RW-2). Since April 2009, chloride concentrations in the northernmost cross-gradient well (DBS-6) have fluctuated between 290 and 410 mg/L. Since February 2008, chloride concentrations in the downgradient well (MW-5) have fluctuated between 710 and 1,500 mg/L. The chloride concentration in monitor well MW-3, the well closest to the extraction well (RW-2), decreased by almost half between September and December 2015, but has been showing a slight rebound since that time (Table 2).

5.3 Facility and System Maintenance

On June 13, 2016 the pump at RW-2 was damaged during a lightning storm. Operations manager Jim Sayre promptly replaced the pump on June 15, 2016. The pump at FWS-2, upgradient from RW-2 (Figure 1), was also damaged and subsequently replaced.

During the fourth quarter monitoring event, DBS&A field staff discovered that the wire from the pump at RW-2 to the totalizer had been damaged and was not recording while the pump was

active. DBS&A staff are working with PAB site management to replace the totalizer as soon as possible.

5.4 Future Extraction System Operation

Pumping of the fresh water supply well (FWS-1) has lowered groundwater levels at RW-1, precluding groundwater extraction at this well. Pumping of FWS-1 provides hydraulic containment and removal of the chloride plume. Future monitoring data will be used to evaluate the effectiveness of FWS-1 in providing hydraulic containment and removal of chloride-impacted groundwater in the former brine pond area.

Pumping of extraction well RW-2 will continue. Increased pumping at RW-2 since the second quarter of 2015 has provided improved hydraulic containment and removal of the chloride plume in the brine well area; however, at the request of the OCD, greater hydraulic containment is required. DBS&A will work with PAB to develop a plan for enhanced groundwater extraction in the brine well area to optimize hydraulic containment and removal of the chloride plume. DBS&A will submit a work plan detailing the proposed enhancements to OCD for review and approval.

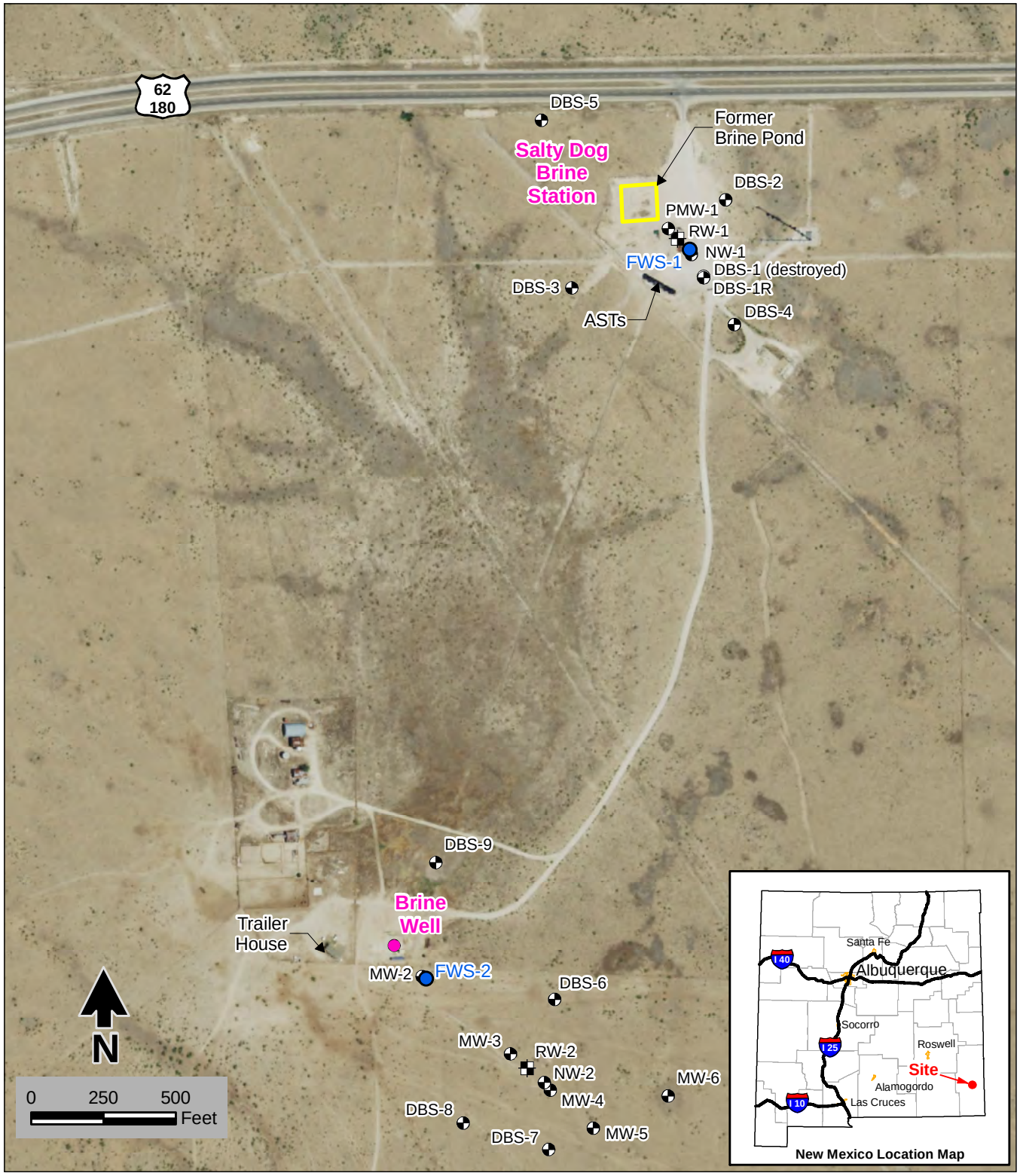
6. Recommendations

Based on the current groundwater monitoring results, site O&M activities, and discussions with OCD, DBS&A has the following recommendations:

- Continue groundwater extraction at FWS-1 to provide hydraulic containment and removal of the chloride plume in the former brine pond area.
- Work with PAB site management to optimize groundwater extraction at RW-2 to provide better hydraulic containment and removal of the chloride plume in the brine well area.
- Install one new downgradient monitor well approximately 300 feet southeast of MW-5 in the brine well area to determine the downgradient extent of chloride-impacted groundwater.

- Reduce the frequency of groundwater monitoring and reporting from quarterly to semiannual in 2017, with semiannual monitoring events to be conducted in June and December.

Figures



Note: AST = Aboveground storage tank

Source: National Agriculture Imagery Program (NAIP), May 10, 2014

Explanation

- Fresh water supply well
- Monitor well
- Recovery well
- Well destroyed

S:\PROJECTS\ES08.0118.01_SALTY_DOG_INC\GIS\MXDS\REPORT2016_4Q\FIG01_SITE_LOCATION_MAP.MXD

Daniel B. Stephens & Associates, Inc.

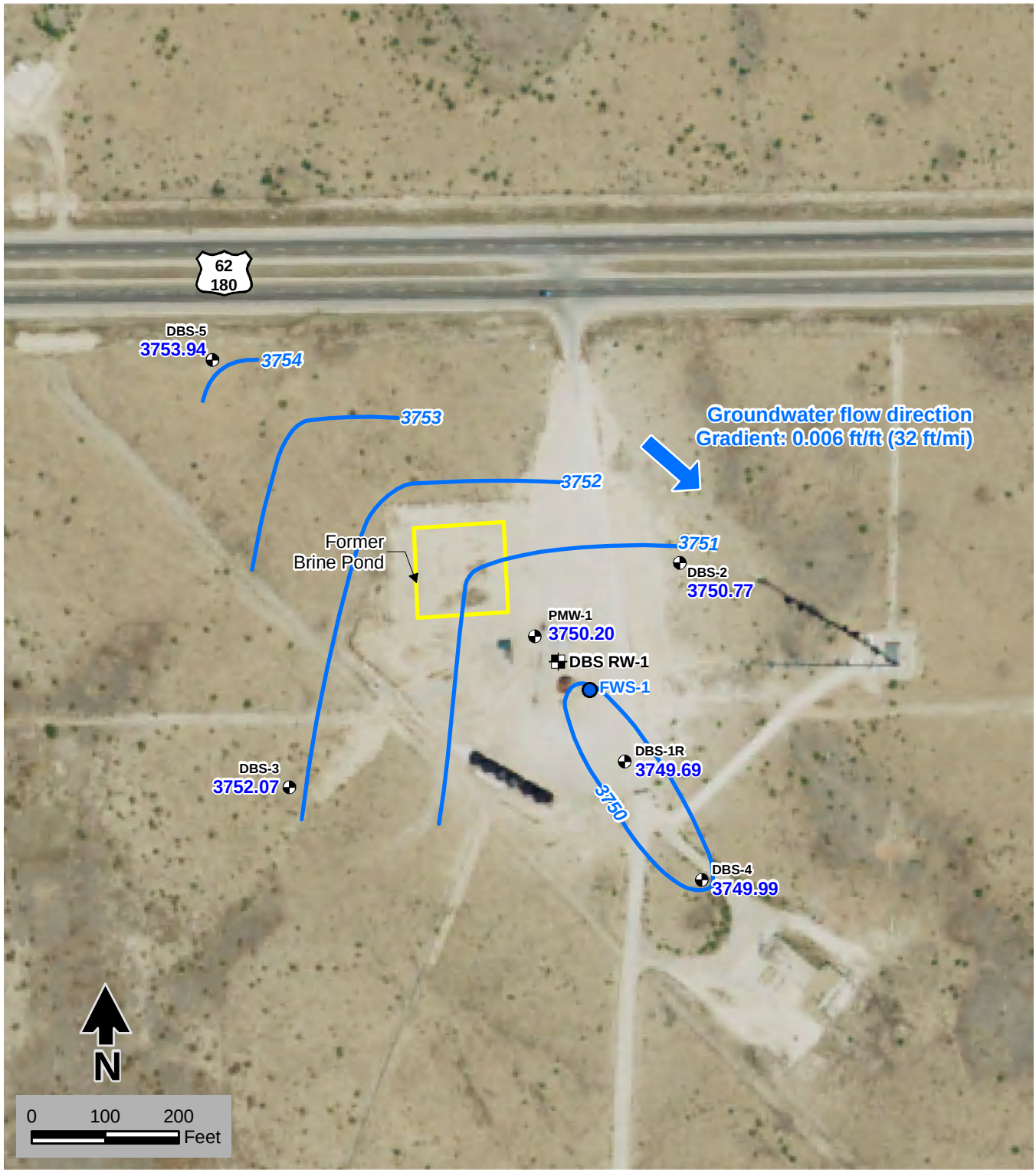
2/15/2017

JN ES08.0118.06

SALTY DOG BRINE STATION

Site Location Map

Figure 1



Source: National Agriculture Imagery Program (NAIP), May 10, 2014

Explanation

DBS-3 Well designation

3752.10 Groundwater elevation, ft msl

- Monitor well
- Recovery well
- Fresh water supply well
- Potentiometric surface elevation contour (ft msl), dashed where inferred
- Groundwater flow direction

SALTY DOG BRINE STATION

Former Brine Pond Area Potentiometric Surface Elevations December 2016

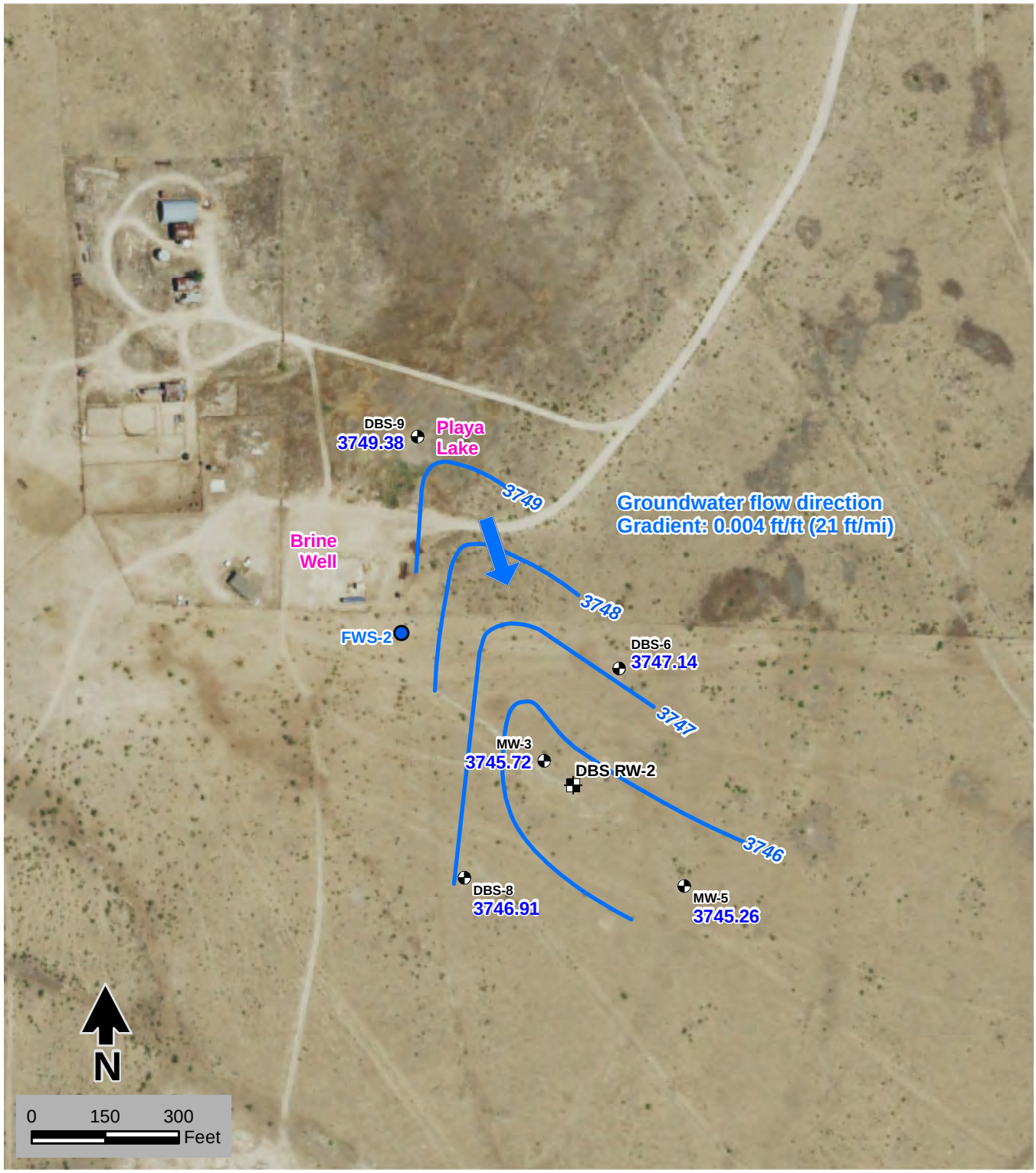
Daniel B. Stephens & Associates, Inc.

2/17/2017

JN ES08.0118.06

Figure 2

S:\PROJECTS\ES08.0118.01_SALTY_DOG_INC\GIS\MXDS\REPORT\2016_4Q\FIG02_GWE_201612_BRINE_STATION.MXD



Source: National Agriculture Imagery Program (NAIP), May 10, 2014

Explanation

MW-5 Well designation

3745.26 Groundwater elevation, ft msl

- Monitor well
- Recovery well
- Fresh water supply well
- Potentiometric surface elevation contour (ft msl), dashed where inferred
- Groundwater flow direction

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area Potentiometric Surface Elevations December 2016

Daniel B. Stephens & Associates, Inc.

2/17/2017

JN ES08.0118.06

Figure 3

S:\PROJECTS\ES08.0118.01_SALTY_DOG_INC\GIS\MXDS\REPORT\2016_4Q\FIG03_GWE_201612_BRINE_WELL.MXD

Source: National Agriculture Imagery Program (NAIP), May 10, 2014

Explanation

DBS-5 Well designation

170 Chloride concentration (mg/L)

Monitor well

Recovery well

Red indicates concentration equal to or greater than the NMWQCC standard.

SALTY DOG BRINE STATION

Former Brine Pond Area
Chloride Concentrations in Groundwater
December 2016

Daniel B. Stephens & Associates, Inc.

2/15/2017

JN ES08.0118.06

Figure 4

S:\PROJECTS\ES08.0118.01_SALTY_DOG_INC\GIS\MXDS\REPORT2016_4Q\FIG04_CL_GW_201612_BRINE_STATION.MXD

Source: National Agriculture Imagery Program (NAIP), May 10, 2014

Explanation

DBS-8 Well designation

33 Chloride concentration (mg/L)

Monitor well

Recovery well

Red indicates concentration equal to or greater than the NMWQCC standard.

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area
Chloride Concentrations in Groundwater
December 2016

Daniel B. Stephens & Associates, Inc.

2/15/2017

JN ES08.0118.06

Figure 5

S:\PROJECTS\ES08.0118.01_SALTY_DOG_INC\GIS\MXDS\REPORT\2016_4Q\FIG05_CL_GW_201612_BRINE_WELL.MXD

Tables

Table 1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 7

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-1	56.0–76.0	3,817.09	4/08/2009	62.38	3,754.71
			5/11/2011	64.70	3,752.39
			10/04/2011	Well destroyed	
DBS-1R	58.0–78.0	3,817.00 [b]	4/30/2012	63.60	3,753.40
			9/10/2012	65.65	3,751.35
			6/23/2013	64.40	3,752.60
			1/09/2014	67.23	3,749.77
			4/07/2014	66.36	3,750.64
			3/20/2015	67.17	3,749.83
			7/01/2015	67.92	3,749.08
			9/29/2015	67.07	3,749.93
			12/16/2015	67.54	3,749.46
			3/22/2016	66.61	3,750.39
			6/08/2016	66.23	3,750.77
			9/13/2016	67.43	3,749.57
			12/01/2016	67.31	3,749.69
DBS-2	58.0–78.0	3,820.50	4/08/2009	65.45	3,755.05
			5/11/2011	66.80	3,753.70
			10/04/2011	65.87	3,754.63
			2/08/2012	65.96	3,754.54
			4/30/2012	66.26	3,754.24
			9/10/2012	67.45	3,753.05
			6/23/2013	67.03	3,753.47
			1/09/2014	69.08	3,751.42
			4/07/2014	68.67	3,751.83
			3/20/2015	69.32	3,751.18
			6/30/2015	69.29	3,751.21
			9/29/2015	69.41	3,751.09
			12/16/2015	69.71	3,750.79
			3/22/2016	69.13	3,751.37
			6/08/2016	68.91	3,751.59

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table 1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 7

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-2 (cont.)	58.0–78.0	3,820.50	9/13/2016	69.76	3,750.74
			12/01/2016	69.73	3750.77
DBS-3	56.0–76.72	3,816.66	4/08/2009	60.67	3,755.99
			5/11/2011	61.25	3,755.41
			10/04/2011	61.25	3,755.41
			2/08/2012	61.11	3,755.55
			4/30/2012	61.41	3,755.25
			9/10/2012	61.81	3,754.85
			6/23/2013	62.08	3,754.58
			1/09/2014	63.30	3,753.36
			4/07/2014	63.43	3,753.23
			3/20/2015	63.93	3,752.73
			6/30/2015	63.99	3,752.67
			9/29/2015	64.17	3,752.49
			12/16/2015	64.41	3,752.25
			3/22/2016	63.88	3,752.78
			6/08/2016	63.92	3,752.74
			9/13/2016	64.56	3,752.10
			12/01/2016	64.59	3,752.07
DBS-4	56.0–76.0	3,820.37	4/08/2009	66.27	3,754.10
			5/11/2011	67.23	3,753.14
			10/04/2011	66.67	3,753.70
			2/08/2012	66.76	3,753.61
			4/30/2012	67.02	3,753.35
			9/10/2012	67.78	3,752.59
			6/23/2013	67.70	3,752.67
			1/09/2014	69.37	3,751.00
			4/07/2014	69.23	3,751.14
			3/20/2015	69.81	3,750.56
			6/30/2015	69.85	3,750.52
			9/29/2015	70.00	3,750.37

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table 1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 3 of 7

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-4 (cont.)	56.0–76.0	3,820.37	12/16/2015	70.25	3,750.12
			3/22/2016	69.74	3,750.63
			6/08/2016	69.62	3,750.75
			9/13/2016	70.35	3,750.02
			12/01/2016	70.38	3,749.99
DBS-5	56.9–76.9	3,820.66	4/08/2009	62.99	3,757.67
			5/11/2011	63.45	3,757.21
			10/04/2011	63.41	3,757.25
			2/08/2012	63.46	3,757.20
			4/30/2012	63.70	3,756.96
			9/10/2012	63.92	3,756.74
			6/23/2013	64.30	3,756.36
			1/09/2014	65.28	3,755.38
			4/07/2014	65.48	3,755.18
			3/20/2015	65.9	3,754.76
			7/01/2015	66.18	3,754.48
			9/29/2015	66.25	3,754.41
			12/16/2015	66.47	3,754.19
			3/22/2016	66.08	3,754.58
			6/08/2016	66.16	3,754.50
			9/13/2016	66.64	3,754.02
			12/01/2016	66.72	3,753.94
DBS-6	56.7–76.7	3,812.65	4/07/2009	62.75	3,749.90
			5/11/2011	63.11	3,749.54
			10/04/2011	63.16	3,749.49
			2/08/2012	63.20	3,749.45
			4/30/2012	63.43	3,749.22
			9/10/2012	63.60	3,749.05
			6/23/2013	63.74	3,748.91
			1/09/2014	64.00	3,748.65
			4/07/2014	64.22	3,748.43

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
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msl = Above mean sea level NA = Not available

Table 1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 4 of 7

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-6 (cont.)	56.7–76.7	3,812.65	3/19/2015	64.78	3,747.87
			7/01/2015	64.81	3,747.84
			9/29/2015	65.48	3,747.17
			12/16/2015	65.26	3,747.39
			3/22/2016	65.38	3,747.27
			6/08/2016	65.37	3,747.28
			9/13/2016	65.51	3,747.14
			12/01/2016	65.51	3,747.14
DBS-7	55.1–75.1	3,810.21	4/07/2009	61.74	3,748.47
DBS-8	55.2–75.2	3,810.70	4/07/2009	61.20	3,749.50
			5/11/2011	61.67	3,749.03
			10/04/2011	61.71	3,748.99
			2/08/2012	61.77	3,748.93
			4/30/2012	62.00	3,748.70
			9/10/2012	62.15	3,748.55
			6/23/2013	62.28	3,748.42
			1/09/2014	62.47	3,748.23
			4/07/2014	62.67	3,748.03
			3/19/2015	63.19	3,747.51
			6/30/2015	63.25	3,747.45
			9/29/2015	63.82	3,746.88
			12/16/2015	63.58	3,747.12
			3/22/2016	63.76	3,746.94
			6/08/2016	63.72	3,746.98
			9/13/2016	63.83	3,746.87
			12/01/2016	63.79	3,746.91
DBS-9	48.0–68.0	3,806.26	4/08/2009	53.93	3,752.33
			5/11/2011	54.39	3,751.87
			10/04/2011	54.59	3,751.67
			2/08/2012	54.53	3,751.73
			4/30/2012	54.68	3,751.58

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table 1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 5 of 7

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
DBS-9 (cont.)	48.0–68.0	3,806.26	9/10/2012	54.77	3,751.49
			6/23/2013	55.04	3,751.22
			1/09/2014	55.27	3,750.99
			4/07/2014	55.56	3,750.70
			3/19/2015	55.95	3,750.31
			7/01/2015	56.14	3,750.12
			9/29/2015	56.49	3,749.77
			12/16/2015	56.52	3,749.74
			3/22/2016	56.51	3,749.75
			6/08/2016	56.64	3,749.62
			9/13/2016	56.81	3,749.45
			12/01/2016	56.88	3,749.38
NW-1s	52.95–72.95	3,817.33	4/08/2009	62.35	3,754.98
NW-1m	99.31–119.31	3,817.35	4/08/2009	62.25	3,755.10
NW-1d	149.45–169.45	3,817.35	4/08/2009	62.04	3,755.31
NW-2s	53.35–73.35	3,812.50	4/08/2009	63.08	3,749.42
NW-2m	93.72–113.72	3,812.45	4/08/2009	63.27	3,749.18
NW-2d	126.87–146.87	3,812.46	4/08/2009	66.41	3,746.05
PMW-1	63–78	3,821.17	6/23/2008	67.51	3,753.66
			4/08/2009	65.97	3,755.20
			5/11/2011	68.70	3,752.47
			10/04/2011	66.95	3,754.22
			2/08/2012	66.69	3,754.48
			4/30/2012	67.27	3,753.90
			9/10/2012	69.77	3,751.40
			6/23/2013	68.40	3,752.77
			1/09/2014	71.24	3,749.93
			4/07/2014	69.97	3,751.20
			3/20/2015	70.78	3,750.39
			7/01/2015	71.41	3,749.76
			9/29/2015	70.76	3,750.41

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
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msl = Above mean sea level NA = Not available

Table 1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 6 of 7

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
PMW-1 (cont.)	63–78	3,821.17	12/16/2015	71.03	3,750.14
			3/22/2016	70.30	3,750.87
			6/08/2016	69.65	3,751.52
			9/13/2016	71.08	3,750.09
			12/01/2016	70.97	3,750.20
MW-1	120–140	NA	6/23/2008	59.90	NA
MW-2	127–147	3,812.68	6/23/2008	61.42	3,751.26
			4/07/2009	61.65	3,751.03
MW-3	NA	3,812.05	6/23/2008	62.06	3,749.99
			4/07/2009	62.02	3,750.03
			5/11/2011	62.91	3,749.14
			10/04/2011	62.91	3,749.14
			2/08/2012	62.95	3,749.10
			4/30/2012	63.39	3,748.66
			9/10/2012	63.50	3,748.55
			6/23/2013	63.36	3,748.69
			1/09/2014	63.55	3,748.50
			4/07/2014	63.88	3,748.17
			3/19/2015	64.27	3,747.78
			7/01/2015	64.34	3,747.71
			9/29/2015	67.94	3,744.11
			12/16/2015	64.75	3,747.30
			3/22/2016	64.84	3,747.21
			6/08/2016	64.89	3,747.16
			9/13/2016	66.33	3,745.72
			12/01/2016	66.66	3,745.39
MW-4	111–131	3,811.33	6/23/2008	62.12	3,749.21
			4/07/2009	62.51	3,748.82
MW-5	112–132	3,808.96	6/23/2008	60.60	3,748.36
			4/07/2009	60.79	3,748.17
			5/11/2011	61.17	3,747.79

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table 1. Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 7 of 7

Monitor Well	Screen Interval (feet bgs)	Top of Casing Elevation [a] (feet msl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
MW-5 (cont.)	112–132	3,808.96	10/04/2011	61.72	3,747.24
			2/08/2012	61.23	3,747.73
			4/30/2012	61.50	3,747.46
			9/10/2012	61.65	3,747.31
			6/23/2013	61.75	3,747.21
			1/09/2014	61.90	3,747.06
			4/07/2014	62.18	3,746.78
			3/19/2015	62.96	3,746.00
			6/30/2015	62.71	3,746.25
			9/29/2015	63.92	3,745.04
			12/16/2015	63.02	3,745.94
			3/22/2016	63.14	3,745.82
			6/08/2016	63.47	3,745.49
			9/13/2016	63.66	3,745.30
			12/01/2016	63.70	3,745.26
MW-6	NA	3,810.17	6/23/2008	62.17	3,748.00
			4/07/2009	62.41	3,747.76

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
[b] Top of casing elevation surveyed by Pettigrew & Assoc. on June 13, 2012.
bgs = Below ground surface btoc = Below top of casing
msl = Above mean sea level NA = Not available

Table 2. Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 8

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-1	4/08/2009	**320**
	5/12/2011	**940**
	10/04/2011	Well destroyed
DBS-1R	5/01/2012	**3,000**
	9/11/2012	**3,200**
	6/25/2013	**3,300**
	1/10/2014	**1,000**
	4/08/2014	**1,700**
	3/20/2015	**1,200**
	7/01/2015	**860**
	9/30/2015	**670**
	12/17/2015	**760**
	3/23/2016	**560**
	6/09/2016	**570**
	09/14/2016	**360**
	12/01/2016	**360**
DBS-2	4/08/2009	14
	5/12/2011	25
	10/05/2011	18
	2/09/2012	22
	5/01/2012	24
	9/11/2012	44
	6/25/2013	36
	1/10/2014	45
	4/08/2014	22
	3/20/2015	29
	6/30/2015	28
	9/30/2015	40
	12/17/2015	35
	3/23/2016	46
	6/09/2016	41

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table 2. Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 8

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-2 (cont.)	9/14/2016	41
	12/02/2016	53
DBS-3	4/08/2009	36
	5/12/2011	35
	10/05/2011	34
	2/09/2012	34
	5/01/2012	33
	9/11/2012	34
	6/24/2013	32
	1/10/2014	34
	4/08/2014	32
	3/20/2015	35
	6/30/2015	35
	9/30/2015	34
	12/17/2015	34
	3/23/2016	36
	6/09/2016	35
	9/14/2016	37
	12/02/2016	37
DBS-4	4/08/2009	38
	5/12/2011	33
	10/05/2011	32
	2/09/2012	32
	5/01/2012	31
	9/11/2012	32
	6/25/2013	31
	1/10/2014	32
	4/08/2014	30
	3/20/2015	33
	6/30/2015	31
	9/30/2015	33

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table 2. Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 3 of 8

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-4 (cont.)	12/17/2015	35
	3/23/2016	38
	6/09/2016	35
	9/14/2016	37
	12/02/2016	41
DBS-5	4/08/2009	65
	5/12/2011	140
	10/05/2011	140
	2/09/2012	140
	4/30/2012	150
	9/11/2012	160
	6/24/2013	160
	1/10/2014	180
	4/08/2014	160
	3/20/2015	140
	7/01/2015	140
	9/30/2015	150
	12/17/2015	160
	3/23/2016	150
	6/09/2016	150
	9/14/2016	170
	12/02/2016	170
DBS-6	4/07/2009	**380**
	5/12/2011	**410**
	10/05/2011	**400**
	2/09/2012	**380**
	4/30/2012	**400**
	9/11/2012	**390**
	6/24/2013	**340**
	1/10/2014	**390**
	4/07/2014	**400**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table 2. Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 4 of 8

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-6 (cont.)	3/19/2015	**370**
	7/01/2015	**360**
	9/30/2015	**370**
	12/17/2015	**380**
	3/23/2016	**310**
	6/09/2016	**300**
	9/14/2016	**290**
	12/02/2016	**300**
DBS-7	4/07/2008	**570**
DBS-8	4/07/2009	58
	5/12/2011	36
	10/05/2011	140
	2/09/2012	41
	4/30/2012	41
	9/10/2012	42
	6/24/2013	45
	1/09/2014	38
	4/07/2014	36
	3/19/2015	36
	7/01/2015	34
	9/30/2015	35
	12/17/2015	33
	3/23/2016	35
	6/09/2016	34
	9/14/2016	34
	12/02/2016	33
DBS-9	4/08/2009	210
	5/12/2011	**600**
	10/05/2011	**440**
	2/09/2012	**290**
	4/30/2012	**330**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table 2. Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 5 of 8

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-9 (cont.)	9/11/2012	**320**
	6/24/2013	200
	1/10/2014	170
	4/07/2014	220
	3/19/2015	**260**
	7/01/2015	210
	9/30/2015	**260**
	12/17/2015	230
	3/23/2016	200
	6/09/2016	190
	9/14/2016	190
	12/02/2016	180
NW-1s	4/08/2009	**630**
NW-1m	4/08/2009	57
NW-1d	4/08/2009	38
NW-2s	4/08/2009	**410**
NW-2m	4/08/2009	**570**
NW-2d	4/08/2009	**4,700**
PMW-1	2/27/2008	**9,500** [b]
	5/30/2008	**8,600** [b]
	6/23/2008	**12,700**
	4/08/2009	**11,000**
	5/12/2011	**13,000**
	10/05/2011	**12,000**
	2/09/2012	**12,000**
	5/01/2012	**12,000**
	9/11/2012	**14,000**
	6/25/2013	**14,000**
	1/10/2014	**11,000**
	4/08/2014	**12,000**
	3/20/2015	**8,500**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table 2. Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 6 of 8

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
PMW-1 (cont.)	7/01/2015	**8,600**
	9/30/2015	**9,700**
	12/17/2015	**9,800**
	3/23/2016	**8,200**
	6/09/2016	**8,500**
	9/14/2016	**9,300**
	12/01/2016	**8,300**
MW-1	5/30/2008	75 [b]
	6/23/2008	243
MW-2	2/27/2008	120 [b]
	5/30/2008	80 [b]
	6/23/2008	**1,480**
	4/07/2009	**1,200**
MW-3	2/27/2008	**348** [b]
	5/30/2008	**360** [b]
	6/23/2008	**1,090**
	4/07/2009	**17,000**
	5/12/2011	**16,000**
	10/05/2011	**14,000**
	2/09/2012	**15,000**
	4/30/2012	**14,000**
	9/10/2012	**16,000**
	6/24/2013	**12,000**
	1/10/2014	**10,000**
	4/07/2014	**12,000**
	3/19/2015	**9,700**
	7/01/2015	**10,000**
	9/30/2015	**9,600**
	12/17/2015	**5,100**
	3/23/2016	**8,200**
	6/09/2016	**9,400**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table 2. Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 7 of 8

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
MW-3 (cont.)	9/14/2016	**9,100**
	12/02/2016	**11,000**
MW-4	2/27/2008	**476** [b]
	5/30/2008	**512** [b]
	6/23/2008	**5,730**
	4/07/2009	**6,600**
MW-5	2/27/2008	**1,280** [b]
	5/30/2008	**1,220** [b]
	6/23/2008	**1,260**
	4/07/2009	**1,300**
	5/12/2011	**1,500**
	10/05/2011	**1,500**
	2/09/2012	**1,500**
	4/30/2012	**1,400**
	9/10/2012	**1,500**
	6/24/2013	**1,300**
	1/10/2014	**1,300**
	4/07/2014	**1,300**
	3/19/2015	**1,200**
	7/01/2015	**1,200**
	9/30/2015	**1,000**
	12/17/2015	**1,000**
	3/23/2016	**980**
	6/09/2016	**970**
	9/14/2016	**1,000**
	12/02/2016	**710**
MW-6	2/27/2008	32 [b]
	5/30/2008	36 [b]
	6/23/2008	31.4
	4/07/2009	25

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table 2. Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 8 of 8

Monitor Well	Date	Chloride Concentration (mg/L) [a]
	NMWQCC Standard	*250*
Ranch Headquarters Supply Well	6/23/2008	35.4
Brine Station Fresh Water Supply Well	2/27/2008	**630** [b]
	5/30/2008	**590** [b]
	6/23/2008	**650**

Bold indicates that value exceeds the applicable standard.
[a] All samples analyzed using EPA method 300.0, unless otherwise noted.
[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Table 3. Cumulative Extracted Groundwater Volumes
Salty Dog Brine Station, Lea County, New Mexico

Recovery Well	Date	Days of Operation	Average Flow Rate (gpm)	Extracted Volume (gallons)
RW-1	4/07/2012	Groundwater extraction started		
	5/01/2012	24	2.1	73,740
	9/11/2012	154	2.9	636,237
	6/25/2013	441	4.1	2,599,392
	11/15/2013 [a]	585	3.6	3,060,181
	3/20/2015	1,075	2.4	3,668,511
	6/30/2015 [b]	1,167	—	3,668,511
	9/30/2015	1,259	—	3,668,511
FWS-1	12/17/2015	—	—	1,232,787
	3/22/2016	359	12.8	3,011,469
	6/08/2016	437	33.9	6,818,179
	9/13/2016	534	5.4	7,578,404
	12/02/2016	614	39.7	12,149,596
RW-2	4/06/2012	Groundwater extraction started		
	5/01/2012	25	2.5	91,450
	9/11/2012	158	4.3	963,789
	12/14/2012 [c]	252	3.9	1,406,748
	6/25/2013 [d]	—	—	—
	9/21/2013 [e]	335	2.9	1,407,005
	9/30/2015 [f]	1,074	68 [f]	7,313,515
	12/17/2015	1,152	44	12,266,210
	3/22/2016	1,248	32	16,657,635
	6/08/2016	1,326	9.0	17,661,576
	9/13/2016	1,423	5.7	18,453,822
	12/01/2016 [b]	—	—	18,453,447

[a] Pump went down in RW-1 on approximately November 15, 2013.

[b] Meter appears to not be functioning correctly, but the pumping well is functioning.

[c] Pump in RW-2 went down on December 14, 2012 due to a blown inner shaft motor seal.

[d] New pump installed in RW-2 and started on June 25, 2013.

[e] Meter and pump were removed from RW-2 on approximately September 21, 2013 by facility manager to install a new, larger-capacity pump.

[f] Meter reinstalled and pumping increased after the June 30 and July 1, 2015 monitoring event; flowrate assumes 60 days of operation (August 1 through September 30, 2015) based on personal communication with Jim Sayre (PAB).

gpm = Gallons per minute

Appendix A

Laboratory Analytical Report

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

December 15, 2016

John Ayarbe

Daniel B. Stephens & Assoc.
6020 Academy NE Suite 100
Albuquerque, NM 87109
TEL: (505) 822-9400
FAX (505) 822-8877

RE: Salty Dog OrderNo.: 1612248

Dear John Ayarbe:

Hall Environmental Analysis Laboratory received 13 sample(s) on 12/5/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1612248**
Date Reported: **12/15/2016**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-1R
Project: Salty Dog
Collection Date: 12/1/2016 4:35:00 PM
Lab ID: 1612248-001
Matrix: AQUEOUS
Received Date: 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	360	50	*	mg/L	100	12/10/2016 2:54:51 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-2
Project: Salty Dog
Collection Date: 12/2/2016 9:00:00 AM
Lab ID: 1612248-002
Matrix: AQUEOUS
Received Date: 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	53	5.0		mg/L	10	12/10/2016 3:07:16 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** DBS-3
Project: Salty Dog **Collection Date:** 12/2/2016 8:25:00 AM
Lab ID: 1612248-003 **Matrix:** AQUEOUS **Received Date:** 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	37	5.0		mg/L	10	12/10/2016 3:32:06 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-4
Project: Salty Dog
Collection Date: 12/2/2016 9:45:00 AM
Lab ID: 1612248-004
Matrix: AQUEOUS
Received Date: 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	41	5.0		mg/L	10	12/10/2016 4:21:44 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-5
Project: Salty Dog
Collection Date: 12/2/2016 7:45:00 AM
Lab ID: 1612248-005
Matrix: AQUEOUS
Received Date: 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	170	5.0		mg/L	10	12/10/2016 4:46:33 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** DBS-6
Project: Salty Dog **Collection Date:** 12/2/2016 3:30:00 PM
Lab ID: 1612248-006 **Matrix:** AQUEOUS **Received Date:** 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	300	50	*	mg/L	100	12/10/2016 5:23:46 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-8
Project: Salty Dog
Collection Date: 12/2/2016 1:30:00 PM
Lab ID: 1612248-007
Matrix: AQUEOUS
Received Date: 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	33	5.0		mg/L	10	12/10/2016 5:36:10 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** DBS-9
Project: Salty Dog **Collection Date:** 12/2/2016 12:50:00 PM
Lab ID: 1612248-008 **Matrix:** AQUEOUS **Received Date:** 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	180	5.0		mg/L	10	12/10/2016 6:00:59 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** MW-3
Project: Salty Dog **Collection Date:** 12/2/2016 2:45:00 PM
Lab ID: 1612248-009 **Matrix:** AQUEOUS **Received Date:** 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	11000	500	*	mg/L	1E	12/12/2016 2:04:30 PM	R39342

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** MW-5
Project: Salty Dog **Collection Date:** 12/2/2016 2:10:00 PM
Lab ID: 1612248-010 **Matrix:** AQUEOUS **Received Date:** 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	710	50	*	mg/L	100	12/10/2016 7:27:52 PM	R39310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: PMW-1
Project: Salty Dog
Collection Date: 12/1/2016 4:00:00 PM
Lab ID: 1612248-011
Matrix: AQUEOUS
Received Date: 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	8300	500	*	mg/L	1E	12/12/2016 12:12:49 PM	R39342

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: Brine Well
Project: Salty Dog
Collection Date: 12/1/2016 4:10:00 PM
Lab ID: 1612248-012
Matrix: AQUEOUS
Received Date: 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **LGT**	
Specific Gravity	1.200	0			1	12/12/2016 11:32:00 AM	R39308
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	200000	10000	*	mg/L	2E	12/12/2016 12:37:38 PM	R39342
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **SRM**	
Total Dissolved Solids	310000	2000	*D	mg/L	1	12/12/2016 1:24:00 PM	29074
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.47	1.68	H	pH units	1	12/6/2016 9:30:09 PM	R39213
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**	
Sodium	74000	1000		mg/L	1E	12/10/2016 2:27:59 PM	29037

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: Injection Well
Project: Salty Dog
Collection Date: 12/1/2016 3:55:00 PM
Lab ID: 1612248-013
Matrix: AQUEOUS
Received Date: 12/5/2016

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **LGT**	
Specific Gravity	0.9961	0			1	12/12/2016 11:32:00 AM	R39308
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	330	50	*	mg/L	100	12/12/2016 1:27:16 PM	R39342
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **SRM**	
Total Dissolved Solids	882	20.0	*	mg/L	1	12/12/2016 1:24:00 PM	29074
SM4500-H+B: PH						Analyst: **JRR**	
pH	8.00	1.68	H	pH units	1	12/6/2016 9:34:45 PM	R39213

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1612248**

15-Dec-16

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R39310**	RunNo: **39310**
Prep Date:	Analysis Date: **12/10/2016**	SeqNo: **1230358** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R39310**	RunNo: **39310**
Prep Date:	Analysis Date: **12/10/2016**	SeqNo: **1230359** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	95.9	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R39342**	RunNo: **39342**
Prep Date:	Analysis Date: **12/12/2016**	SeqNo: **1231568** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R39342**	RunNo: **39342**
Prep Date:	Analysis Date: **12/12/2016**	SeqNo: **1231569** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	97.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1612248**

15-Dec-16

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**MB-29037**	SampType:	**MBLK**	TestCode:	**EPA 6010B: Total Recoverable Metals**					
Client ID:	**PBW**	Batch ID:	**29037**	RunNo:	**39293**					
Prep Date:	**12/7/2016**	Analysis Date:	**12/10/2016**	SeqNo:	**1229838**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID	**LCS-29037**	SampType:	**LCS**	TestCode:	**EPA 6010B: Total Recoverable Metals**					
Client ID:	**LCSW**	Batch ID:	**29037**	RunNo:	**39293**					
Prep Date:	**12/7/2016**	Analysis Date:	**12/10/2016**	SeqNo:	**1229839**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	50	1.0	50.00	0	99.9	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1612248**

15-Dec-16

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**1612248-013ADUP**	SampType:	**DUP**	TestCode:	**Specific Gravity**					
Client ID:	**Injection Well**	Batch ID:	**R39308**	RunNo:	**39308**					
Prep Date:		Analysis Date:	**12/12/2016**	SeqNo:	**1230352**	Units:				

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	0.9999	0						0.381	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1612248**

15-Dec-16

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**MB-29074**	SampType:	**MBLK**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**PBW**	Batch ID:	**29074**	RunNo:	**39320**					
Prep Date:	**12/8/2016**	Analysis Date:	**12/12/2016**	SeqNo:	**1230647**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	**LCS-29074**	SampType:	**LCS**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**LCSW**	Batch ID:	**29074**	RunNo:	**39320**					
Prep Date:	**12/8/2016**	Analysis Date:	**12/12/2016**	SeqNo:	**1230648**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1030	20.0	1000	0	103	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: DBS | Work Order Number: 1612248 | RcptNo: 1

Received by/date: AT 12/05/16

Logged By: Anne Thorne 12/5/2016 Anne Thorne

Completed By: Anne Thorne 12/6/2016 2:09:24 PM Anne Thorne

Reviewed By: 12/06/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Client		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 1 (<2 or >12 unless noted)

Adjusted? NO

Checked by: RL

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.0	Good	Not Present			

Chain-of-Custody Record

Client: DBSA

Mailing Address: 6020 Academy RD NE
Suite 100 Albuquerque NM 87109

Phone #: 505-822-9400

email or Fax#: JAYARBE@DBSTEPHENS.COM

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Salty Dog

Project #: ES08.0118.06

Project Manager: J. Ayarbe

Sampler: M. Ebcozek

On Ice: ☒ Yes ☐ No

Sample Temperature: 2.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1612248	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	pH, Spec grav, TDS	Cations Na			Air Bubbles (Y or N)
2.1.16	1635	GW	DBS-1R	1 poly	none	-001								X								
2.2.16	0900	|	DBS-2	|	|	-002								X								
|	0835	|	DBS-3	|	|	-003								X								
|	0945	|	DBS-4	|	|	-004								X								
|	0745	|	DBS-5	|	|	-005								X								
|	1530	|	DBS-6	|	|	-006								X								
|	1330	|	DBS-8	|	|	-007								X								
|	1250	|	DBS-9	|	|	-008								X								
|	1445	|	MW-3	|	|	-009								X								
|	1410	|	MW-5	|	|	-010								X								
2.1.16	1600	|	PMW-1	|	[illegible]	-011								X								
2.1.16	1610 1655	|	Brine well Injection well	3 poly 2 poly	1 HNO3 none	-012 -013								X X				X X	X			

Date:	Time:	Relinquished by:	Received by:	Date	Time
2/5/16	0737	[signature]	[signature]	12/05/16	0737
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

Appendix B

Field Notes

12.1.2016 M Zbrozek

1200 M. Zbrozek onsite
4th Qtr GWM
Weather Sunny ~55° calm
1205 Spoke w/ Jim Sayre
1240 Begin Gauging Wells.

Well ID	DTW	TD	Notes
DBS-1R	67.31	74.42	
DBS-2	69.73	75.35	
DBS-3	64.59	74.76	
DBS-4	70.38	78.82	
DBS-5	66.72	75.38	
DBS-6	65.51	76.02	
DBS-8	63.79	69.91	
DBS-9	66.88	67.55	
MW-3	66.66	147.13	
MW-5	63.70	128.78	
PMW-1	70.97	77.73	

1315 Totalizer reading at RW-2 Pump on 405939.1 BBL
Totalizer is not recording, wires have been chewed, spoke to Jim about chewed wires - Plans to repair.
1420 Calibrate YSI

M. Zbrozek 12.1.2016

YSI Calibration

pH	4	4.0	14.3°C
	10	10.01	13.9°
	7	7.0	12.4°
SPC	1413 µS/cm	1413 µS/cm	13.7°
ORP	220 mV	219.8	14.0°
DO%	8760 mmHg	7.26 mg/L	65.2°C

1441 Set up to sample PMW-1
1450 Off Site to get new Power Inverter
1530 Back on site Set up inverter
Sample @ PMW-1 1600
1610 Sample Brine
Sample @ DBS-1R
1655 Sample @ Injection 1655
1705 M. Zbrozek Off Site
Samples stored on ice

12.1.16

3/27

12.2.2016 M. Zbrozek

0700 M. Zbrozek onsite.
continue GWM
Weather overcast ~40° rain possible
0710 Set up at well DBS-5
Sample DBS-5 @ 0745
0800 set up at DBS-3
sample DBS-3 @ 0825
0830 Set up at DBS-2
Sample @ DBS-2 0900
0910 Set up at DBS-4
Sample @ 0945
0957 Set up at DBS-9
– Problem with GeoSub pump
pump did not function, removed to
trouble shoot, internal control wires
Badly corroded and Broken
Called geotech.
1135 M. Zbrozek offsite for tools
1240 pump replaced
1250 Sample @ DBS-9
1330 Sample @ DBS-8
1340 Set up at MW-5
Sample @ MW-5 1410
1425 Set up at MW-3
Sample @ 1445
1455 Set up at MW-5

M. Zbrozek 12.2.16

1530 Sample @ DBS-6
Totalizer @ WS-1
=89276.1 BBL
295.2 BPD
1550 M. Zbrozek offsite
all samples on ICE for transport
to Hall

12.2.16

Daniel B. Stephens & Associates, Inc.

GROUNDWATER ELEVATION DATA SHEET

Project Name. Salty Dog Sampler: M. Zbrozek

Project #: ES08.0118.06 Sample Date. 12/01/16

Project Manager: John Ayarbe Sheet # 1 of 1

Well ID	Depth to NAPL	Depth to Water	Total Depth	Comments: (well dia., sampled, condition)
DBS-1R		67.31	74.42	
DBS-2		69.73	75.35	
DBS-3		64.59	74.76	
DBS-4		70.38	78.82	
DBS-5		66.72	75.38	
DBS-6		65.51	76.02	
DBS-7		62.30	76.71	WL only
DBS-8		63.79	69.91	
DBS-9		56.88	67.55	
MW-3		66.66	147.13	
MW-4		66.42	147.50	WL only
MW-5		63.70	128.78	
MW-6		~~63.70~~ 65.16	~~128.78~~ 119.18	WL only
PMW-1		70.97	77.73	
NW-1				WL only

Comments:

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M Zbrozek 12/1/16
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 1610

Well #: Brine

Well Diameter 2" (inches) Height of Water Column: (feet)
Depth to NAPL. --- (feet btoc) Casing Volume (gal)
Depth to Water: (feet btoc) Purge Volume: (gal)
Total Depth of Well: (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0 16 gal/ft; 4.0" = 0 65 gal/ft; 6.0" = 1 47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)
Initial						
1						
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						

Sample Description: 3 poly

Physical Observations.

Analytical Method(s): Sodium, Chloride, TDS, Spec Gravity, pH

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M Zbrozek
Project #: ES08.0118.06
Sample Date. 12/02/2016
Project Manager: John Ayarbe
Sample Time: 1655

Well #: Injection

Well Diameter 2" (inches) Height of Water Column._____(feet)
Depth to NAPL --- (feet btoc) Casing Volume _____(gal)
Depth to Water:_____(feet btoc) Purge Volume _____(gal)
Total Depth of Well:_____(feet) Purge Method Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft, 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)
Initial						
1						
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						

Sample Description. 2 poly

Physical Observations. _____

Analytical Method(s) Chloride, TDS, Spec Gravity, pH

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 1635

Well #: DBS-1R

Well Diameter: 2" (inches) Height of Water Column: 7.11 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.14 (gal)
Depth to Water: 67.31 (feet btoc) Purge Volume: 3.41 (gal)
Total Depth of Well: 74.42 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0 16 gal/ft; 4 0" = 0 65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)
Initial	7.72	17.2	1793	90.7	9.02	Tan Hazy
1	7.46	19.0	1424	93.5	7.29	
1.5	7.43	19.2	1449	94.8	7.42	
2	7.37	19.4	1530	94.9	6.90	
2.5	7.37	19.4	1512	94.2	6.77	Hazy clear
3	7.36	19.3	1524	93.6	6.67	
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 0900

Well #: DBS-2

Well Diameter: 2" (inches) Height of Water Column: 5.62 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 0.89 (gal)
Depth to Water: 69.73 (feet btoc) Purge Volume: 2.70 (gal)
Total Depth of Well: 75.35 (feet) Purge Method: Grab

Note
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft, 4.0" = 0 65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)
Initial	7.33	14.0	562.3	126.2	6.41	clear
1	7.08	18.9	543.3	69.6	5.55	clear
1.5	7.11	20.0	538.8	54.2	5.43	
2	7.12	21.3	540.0	43.5	5.29	
2.5	7.13	21.1	538.7	42.9	5.09	clear
3	7.14	21.1	534.8	42.8	4.91	
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations.

Analytical Method(s) Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler M. Zbrozek

Project #: ES08.0118.06 Sample Date 12/02/2016

Project Manager: John Ayarbe Sample Time: 0825

Well #: DBS-3

Well Diameter: 2" (inches) Height of Water Column: 10.17 (feet)

Depth to NAPL ---(feet btoc) Casing Volume: 1.63 (gal)

Depth to Water: 64.59 (feet btoc) Purge Volume: 4.88 (gal)

Total Depth of Well: 74.76 (feet) Purge Method. Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	7.25	19.9	478.3	163.7	7.57	clear
1	7.22	20.1	479.4	142.5	6.85	
1.5	7.23	20.6	483.9	131.6	6.50	
2	7.22	20.2	485.3	108.8	6.08	Hazy clear
2.5	7.24	20.1	480.7	78.1	6.18	
3	7.24	20.1	477.2	87.1	6.29	
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations.

Analytical Method(s). Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 0945

Well #: DBS-4

Well Diameter: 2" (inches) Height of Water Column: 8.44 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.35 (gal)
Depth to Water: 70.38 (feet btoc) Purge Volume: 4.05 (gal)
Total Depth of Well: 78.82 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1 47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F) C	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)
Initial	7.44	14.1	515.5	100.1	6.23	Silty Brown
1	7.26	15.9	512.4	103.2	5.20	
1.5	7.30	19.3	496.6	102.5	6.47	
2	7.24	21.8	499.0	91.2	7.85	Clear
2.5	7.28	21.0	487.0	86.8	6.94	
3	7.28	20.9	485.6	86.4	7.00	
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations: Clear / Hazy

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 0745

Well #: DBS-5

Well Diameter: 2" (inches) Height of Water Column: 8.66 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.38 (gal)
Depth to Water: 66.72 (feet btoc) Purge Volume: 4.15 (gal)
Total Depth of Well: 75.38 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft, 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F) C	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)
Initial	6.37	18.6	1069	225.8	5.71	Tan/red Hazy
1	6.54	19.0	1057	211.5	5.71	
1.5	6.61	19.4	1054	202.5	5.59	Tan Hazy Clear
2	6.66	19.5	1047	194.6	5.68	
2.5	6.67	19.4	1046	192.4	5.72	
3	6.68	19.5	1040	189.4	5.73	Tan Hazy
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations: Tan/Red Hazy

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: ~~1545~~ 1530

Well #: DBS-6

Well Diameter: 2" (inches) Height of Water Column: 10.51 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.68 (gal)
Depth to Water: 65.51 (feet btoc) Purge Volume: 5.04 (gal)
Total Depth of Well: 76.02 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0 16 gal/ft; 4 0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)
Initial	7.25	18.7	1633	45.8	12.71	Hazy Brown Turbid
1	7.13	21.2	1363	47.0	6.70	Turbid Brown
1.5	7.01	20.8	1328	67.9	5.72	Tan Hazy Clear
2	7.00	20.9	1327	70.4	5.67	
2.5	6.99	20.8	1333	72.7	5.49	Tan Hazy Clear
3	6.99	20.8	1326	74.2	5.58	
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations.

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog Sampler: M. Zbrozek

Project #: ES08.0118.06 Sample Date: 12/02/2016

Project Manager: John Ayarbe Sample Time: 1330

Well #: DBS-8

Well Diameter: 2" (inches) Height of Water Column: 6.12 (feet)

Depth to NAPL: --- (feet btoc) Casing Volume: 0.98 (gal)

Depth to Water: ~~69.91~~ 63.79 (feet btoc) Purge Volume: 2.94 (gal)

Total Depth of Well: 69.91 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O (mg/L)	Turbidity (NTU)
Initial	7.33	15.1	558.6	144.3	5.94	Hazy clear
1	7.25	17.8	559.7	141.4	5.50	
1.5	7.18	24.7	607.0	132.5	4.96	Hazy, clear
2	7.22	23.6	586.0	124.1	5.55	
2.5	7.22	22.1	575.0	122.7	5.84	
3	7.21	21.4	570	121.6	5.89	Hazy clear
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations.

Analytical Method(s) Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 1250

Well #: DBS-9

Well Diameter: 2" (inches) Height of Water Column: 10.67 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.70 (gal)
Depth to Water: 56.88 (feet btoc) Purge Volume: 5.12 (gal)
Total Depth of Well: 67.55 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	6.91	16.4	1205	163.3	12.80	Hazy Turbid Brown
1	7.01	19.4	1140	138.6	7.43	
1.5	7.05	19.3	1075	134.0	7.12	Hazy Brown
2	7.11	19.2	999	129.9	6.91	
2.5	7.11	19.2	992	125.9	6.92	Hazy Clear
3	7.09	19.1	992	122.2	6.51	
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 1445

Well #: MW-3

Well Diameter: 2" (inches) Height of Water Column: 80.47 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 12.87 (gal)
Depth to Water: 66.66 (feet btoc) Purge Volume: 38.62 (gal)
Total Depth of Well: 147.13 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft, 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D.O (mg/L)	Turbidity (NTU)
Initial	7.04	19.3	2844	122.0	5.03	Clear
1	7.06	19.3	3130	105.1	3.67	Clear
1.5	6.90	19.3	7919	115.1	3.26	Clear
2	6.71	19.3	19137	125.1	3.26	
2.5	6.71	19.3	21420	125.3	3.25	Clear
3	6.71	19.3	23000	126.3	3.22	Clear
3.5	6.72	19.3	23207	126.3	3.21	
4	6.72	19.3	23373	126.5	3.21	Clear
4.5						
5						

Sample Description: 1 poly

Physical Observations:

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 1410

Well #: MW-5
Well Diameter: 2" (inches)
Height of Water Column: 65.08 (feet)
Depth to NAPL: --- (feet btoc)
Casing Volume: 10.41 (gal)
Depth to Water: 63.70 (feet btoc)
Purge Volume: 31.24 (gal)
Total Depth of Well: 128.78 (feet)
Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2 0" ID casing = 0.16 gal/ft; 4 0" = 0.65 gal/ft, 6.0" = 1 47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (°F)	Conductivity (µS/cm)	ORP (mv)	D O (mg/L)	Turbidity (NTU)
Initial	6.79	19.1	2283	187.5	9.32	Clear
1	6.79	19.2	3305	128.3	3.61	clear
1.5	6.89	19.3	3003	114.2	3.53	
2	6.91	19.3	2824	109.3	3.55	clear
2.5	6.92	19.3	2736	106.8	3.57	
3	6.92	19.3	2721	106.0	3.59	clear
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations: Clear

Analytical Method(s): Chloride

Daniel B. Stephens & Associates, Inc.

GROUNDWATER MONITORING DATA SHEET

Project Name: Salty Dog
Sampler: M. Zbrozek
Project #: ES08.0118.06
Sample Date: 12/02/2016
Project Manager: John Ayarbe
Sample Time: 1600

Well #: PMW-1
Well Diameter: 2" (inches) Height of Water Column: 6.76 (feet)
Depth to NAPL: --- (feet btoc) Casing Volume: 1.08 (gal)
Depth to Water: 70.97 (feet btoc) Purge Volume: 3.24 (gal)
Total Depth of Well: 77.73 (feet) Purge Method: Grab

Note:
One casing volume (SCH 40 PVC): 2.0" ID casing = 0.16 gal/ft; 4.0" = 0.65 gal/ft; 6.0" = 1.47 gal/ft

Groundwater Parameters:

Casing Volume	pH	Temp (~~°F~~) °C	Conductivity (µS/cm)	ORP (mv)	D.O. (mg/L)	Turbidity (NTU)
Initial	6.89	18.9	20038	185.2	7.37	Hazy clear
1	6.93	19.0	18822	170.6	6.99	
1.5	6.96	19.1	20491	169.5	6.71	
2	6.96	19.1	21061	167.5	6.54	
2.5	6.97	19.1	21373	166.4	6.57	Hazy clear
3	6.99	19.1	21579	165.2	6.46	
3.5						
4						
4.5						
5						

Sample Description: 1 poly

Physical Observations: Hazy clear

Analytical Method(s): Chloride

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SALTY DOG
ATTN: JIM SAYRE
P.O. BOX 513
HOBBS, NM 88241
FAX TO: (505) 393-8353

Receiving Date: 06/12/07
Reporting Date: 06/12/07
Project Owner: NOT GIVEN
Project Name: NOT GIVEN
Project Location: NOT GIVEN

Analysis Date: 06/12/07
Sampling Date: 06/10/07 - 06/12/07
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: AB
Analyzed By: AB

LAB NO.	SAMPLE ID	Cl⁻ (mg/L)
H12740-1	1 MW @ well	460
H12740-2	2 MW "	940
H12740-3	3 MW "	400
H12740-4	4 MW "	420
H12740-5	5 MW "	1340
H12740-6	B4 PIT @ pit	640
H12740-7	WATER WELL	11200
H12740-8	RANCH HOUSE	36
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		1.0

METHOD: Standard Methods	4500-Cl⁻B

Chemist

06-13-07
Date

H12740 SALTY DOG

BW 8 ? (BW-8)

CARDINAL LABORATORIES

PHONE (325) 673-7001 · 2111 BEECHWOOD · ABILENE, TX 79603
PHONE (505) 393-2326 · 101 E. MARLAND · HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SALTY DOG, INC.
ATTN: TERRY WALLACE
P.O. BOX 513
HOBBS, NM 88241
FAX TO: (505) 393-8353

Receiving Date: 04/05/07
Reporting Date: 04/06/07
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: NOT GIVEN

Analysis Date: 04/06/07
Sampling Date: 04/04/07
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: NF
Analyzed By: HM

RECEIVED
JUN 21 2007
Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

LAB NUMBER	SAMPLE ID	Cl⁻ (mg/L)
H12431-1	MONITOR WELL #1	6398
H12431-2	MONITOR WELL #2	340
H12431-3	MONITOR WELL #3	404
H12431-4	MONITOR WELL #4	1280
H12431-5	MONITOR WELL @ WELL	660
H12431-6	MONITOR WELL @ PIT	5398
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		1.0

METHOD: Standard Methods	4500-ClB

Hope S. Mann
Chemist

04-06-07
Date

H12431

September 18, 2009

Mr. Jim Griswold
New Mexico Oil Conservation Division
Environmental Bureau
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Monitor Well Installation and Groundwater Monitoring Report

Dear Mr. Griswold:

On behalf of PAB Services, Inc., Daniel B. Stephens & Associates, Inc. (DBS&A) is pleased to submit the enclosed Monitor Well Installation and Groundwater Monitoring Report for the Salty Dog brine station located in Lea County, New Mexico. The report documents field investigation activities conducted at the site in March and April 2009 in partial fulfillment of the requirements set forth in Section 15 of the New Mexico Oil Conservation Division (OCD) Settlement Agreement & Stipulated Revised Final Order (Order), dated August 6, 2008.

Please don't hesitate to call me at (505) 353-9130 if you have any questions or require additional information.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

Michael D. McVey
Senior Hydrogeologist

Enclosures

cc: James Millett, PAB Services Inc.

Daniel B. Stephens & Associates, Inc.
6020 Academy Rd., NE, Suite 100 505-822-9400
Albuquerque, NM 87109-3315 FAX 505-822-8877

Monitoring Well Installation and Groundwater Monitoring Report
Salty Dog Brine Station
Lea County, New Mexico

Prepared for New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division, Environmental Bureau

September 18, 2009

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

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1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this monitor well installation and groundwater monitoring report for submission to the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD) on behalf of PAB Services, Inc. (PAB) for the Salty Dog brine station (Site). The Site is located in Lea County in southeastern New Mexico, approximately 12 miles west of Hobbs on the south side of the Hobbs/Carlsbad Highway (Figure 1). Formally, the Site is located in the in the J Unit of Section 5, Township 19 South, Range 36 East. This report summarizes field investigation activities conducted at the Site in March and April 2009.

1.1 Background

On May 18, 2008, OCD issued Administrative Compliance Order (ACO), NM-OCD-2008-02, to Mr. Peter Bergstein (d/b/a "Salty Dog, Inc.") (OCD, 2008a). After issuance of the ACO, OCD and Mr. Bergstein engaged in settlement discussions to resolve the outstanding issues addressed by the ACO. The OCD and Mr. Bergstein agreed to a Settlement Agreement & Stipulated Revised Final Order (Order), NM-OCD 2008-2A (OCD, 2008b), for the purpose of resolving the violations outlined in the ACO.

The Order requires Mr. Bergstein to complete certain actions to address environmental compliance-related issues at the Site in accordance with milestone deliverable dates agreed upon by the OCD and PAB. Specifically, among other things, the Order requires PAB to address contamination resulting from documented releases in 1999, 2002, and 2005, as well as releases at the brine loading/unloading area.

The ACO provides a description of each of these releases, which are summarized here. The 1999 release was caused by a hole in the casing of the Salty Dog brine well and resulted in contamination of the fresh water well on "Snyder Ranches," adjacent to the Site. The 2002 release was caused by a leaking tank in the vicinity of the brine well, and the 2005 release was caused by a rupture in the brine supply pipeline. The 2002 and 2005 releases were noted to have entered a fresh water playa located just north of the brine well.

1.2 Previous Work Conducted by DBS&A at the Site

To date, DBS&A has performed the following activities under contract to PAB: (1) preparation of a Comprehensive Site Plan, (2) groundwater monitoring, and (3) removal of the brine pond. Each of these activities is summarized below.

1.2.1 Comprehensive Site Plan

In September 2008, DBS&A submitted a Comprehensive Site Plan (Plan) to OCD addressing the requirements set forth in Section 15 of the Order (DBS&A, 2008). The Plan presented a proposed project schedule and individual specifications/proposals for addressing the environmental compliance-related issues at the Site. The Plan formed the basis for future investigation, characterization, and remediation of the Site.

1.2.2 Groundwater Monitoring

In June 2008, DBS&A completed groundwater monitoring at the Site. Groundwater samples were collected from existing monitor wells PMW-1, MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6, and from the ranch headquarters water supply well and the brine station fresh water supply (Figure 2). A groundwater sample was not collected from the mobile home located west of the brine well because the mobile home and the ranch headquarters use the same water supply well.

Prior to sampling, the depth to water was measured in each of the seven monitor wells listed above. Water levels were not measured in the ranch headquarters water supply well and the brine station fresh water supply well because of the presence of permanent submersible downhole pumps that blocked access to the wells. DBS&A could not determine groundwater elevations in the existing site wells nor could a potentiometric surface map be developed because an official survey from a New Mexico licensed land surveyor had not been completed at the Site. However, based on regional groundwater data and information contained in previous reports provided by PAB, DBS&A assumed that the direction of groundwater flow beneath the Site is to the southeast.

Laboratory results showed that chloride concentrations increased in six of the seven existing groundwater monitor wells (PMW-1, MW-1, MW-2, MW-3, MW-4, and MW-5) and in the brine station fresh water well since the wells were last sampled by employees of Salty Dog in May

2008. In six of the nine samples collected (PMW-1, MW-2, MW-3, MW-4, MW-5, and the brine station fresh water supply well), chloride concentrations exceeded the New Mexico Water Quality Control Commission (NMWQCC) standard of 250 mg/L (Figure 2).

The groundwater monitoring results indicated that the extent of the chloride groundwater plume in the vicinity of the brine pond has not been delineated. To the south, in the area of the brine well, the chloride groundwater plume extends from the brine well downgradient to monitor wells MW-4 and MW-5. Assuming a southeasterly groundwater flow direction, the plume is bounded downgradient by monitor well MW-6. The cross-gradient extent of the plume, however, has not been delineated (Figure 2).

Based on the findings, DBS&A recommended that the extent of the chloride groundwater plume in the vicinity of the brine pond be delineated, and that the cross-gradient extent of the chloride groundwater plume downgradient of the brine well be delineated.

1.2.3 Brine Pond Removal

In October 2008, the brine pond was removed in accordance with the OCD Order. Employees of Salty Dog pumped all of the aqueous brine from the pond into aboveground frac tanks located on-site. A trackhoe was then used to excavate the accumulated salt from the interior of the pond. The excavated salt was loaded into sealed bins and dump trucks and transported to Sundance Services, Inc. (Sundance) in Eunice, New Mexico for disposal. After the salt was removed from the pond interior, the underlying liner was removed and an additional six inches of the clay beneath the liner was excavated. The liner and soil excavated from beneath the liner were transported to Sundance for disposal. A total of 2,128 cubic yards of salt and contaminated soil were hauled to Sundance for disposal.

DBS&A completed soil sampling beneath the former brine pond and in the former brine loading area located on east side of the pond in November 2008. A 30-foot by 30-foot grid was laid out over an area measuring 180 feet (north-south) by 240 feet (east-west). The gridded area encompassed: (1) the entire extent of the former brine pond (including the berms and a distance of approximately 10 feet outside of the berms) and (2) the former brine loading area. A total of 76 composite soil samples were submitted for laboratory analysis. At each sample location, a backhoe was used to excavate soil to the maximum attainable depth. Sixty-one soil samples

were collected from depths of 4 feet below ground surface (ft bgs) or less and 15 samples were collected from depths greater than 4 ft bgs. Excavation to depths greater than 3 to 4 ft bgs was limited in most cases by the presence of caliche in the shallow subsurface.

Soil samples collected from the bucket of the backhoe during excavation were composited in a stainless steel bowl and then placed in laboratory-provided four-ounce glass jars. The samples were submitted to the laboratory for chloride analysis using U.S. Environmental Protection Agency (EPA) method 300.0.

Laboratory results showed significant concentrations of chloride in the shallow interval (0 to 4 ft bgs) beneath the former brine pond and brine loading area. Although the number of samples collected at greater depths (i.e., greater than 4 ft bgs) were limited due to the presence of caliche in the shallow subsurface at the site, the results from the samples that were collected in this deeper interval indicated that there is not a noticeable difference in chloride concentration from 0 to 4 ft bgs and 4 to 8 ft bgs. It is anticipated, based on the concentrations of chloride observed in the soils beneath the former pond and loading area, that these concentrations do not decrease significantly in the vadose zone and that the concentrations exceed the OCD standard of 500 mg/kg (site with groundwater less than 100 ft bgs) throughout the vadose zone to the water table at approximately 60 ft bgs. This conclusion was supported by the June 2008 sampling of monitor well PMW-1, located at the southeast corner (downgradient) of the brine pond, where the chloride concentration in groundwater was 12,700 mg/L.

Based on the findings, DBS&A recommended that the chloride-contaminated soils be left in place, but the potential for leaching and migration of chloride to the water table be reduced by limiting the infiltration of surface water and precipitation in the source area. To accomplish this, DBS&A and PAB propose to level the entire extent of the former brine pond and brine loading area, backfill and compact the former brine pond to grade, and cover the entire area with concrete. A new brine tank battery, brine loading area, and truck turnaround will then be constructed in this area as detailed in Section 3.6 of the Comprehensive Site Plan.

DBS&A also recommended that the extent of the chloride groundwater plume in the vicinity of the former brine pond and brine loading area be delineated as detailed in Sections 3.1.1.1 and 3.1.1.2

of the Plan by installing five groundwater monitor wells, one nested well, and ongoing quarterly groundwater monitoring and reporting.

1.3 Purpose

The purpose of the field investigation was to determine the magnitude and extent of impacts to soil and groundwater from the 1999, 2002, 2005, and the brine loading/unloading releases. The investigation was performed in accordance with the requirements of the Order and Sections 3.1, 3.2, and 3.3 of the Plan, approved by the OCD on September 17, 2008.

This report constitutes the first of three milestone deliverables: (1) Monitor Well Installation and Ground Water Monitoring report, (2) Recovery Well Installation and Pump Test report, and (3) Conceptual Remedial Design.

1.4 Project Scope

The Order identified three areas of primary concern (AOPC) requiring investigation and/or further delineation of the extent of contamination: (1) the brine loading/unloading area and brine pond, (2) the brine well, and (3) the playa.

To address the AOPCs and groundwater quality at the site, DBS&A completed a field investigation program that included the installation of nine groundwater monitor wells and two nested wells. DBS&A also instituted an analytical program to assess the likely contaminants of concern (COCs) in soil and groundwater at the Site. Finally, DBS&A prepared this report documenting the investigation.

Sections 2 and 3 of this report detail the field investigation and analytical program, respectively. Section 4 presents the results of the investigation, and Section 5 provides DBS&A's summary and conclusions.

2. Field Investigation

Subsurface conditions and groundwater quality were evaluated by the installation of nine monitor wells and two nested wells, and the collection of soil and groundwater samples in each of the three AOPCs. Samples of soil and groundwater were submitted to the selected analytical laboratory for chemical analysis based on the identified COCs. Descriptions of the soil and groundwater field investigation programs are presented below.

2.1 Soil Boring

The soil investigation program included the installation of 11 soil borings, which were later completed as monitor wells to assess groundwater quality. Details of monitor well installation and construction are discussed in Section 2.2 below. The drilling was performed by Peterson Drilling and Testing, Inc. of Amarillo, Texas, a New Mexico licensed drilling company, using air rotary drilling technology. All of the borings were advanced to a total depth of 83 ft bgs. The locations of the borings were predetermined by DBS&A prior to the field investigation (DBS&A, 2008).

All field work was performed under the supervision of a licensed professional geologist. Soil samples were collected during drilling using a split spoon for laboratory analysis. Samples collected for laboratory analysis from the borings were placed in an ice-filled cooler immediately after collection and remained on ice until they were delivered to the analytical laboratory. Chain-of-custody documentation accompanied the samples at all times. Investigation derived waste was stockpiled on visqueen and properly disposed of at a licensed facility after completion of the field investigation.

A description of the field investigation in each of the three AOPCs is provided below.

2.1.1 Brine Pond

Six soil borings, designated DBS-1 through DBS-5 and NW-1, were installed in the vicinity of the brine pond (Figure 3). Soil cuttings and split spoon samples were used during drilling for lithologic description. Soil samples were collected for laboratory analysis at 10-foot intervals

during drilling to quantify the chloride concentration profile with depth. Soil boring logs showing the subsurface geology at each location are provided in Appendix A. Laboratory results from soil samples collected during drilling are summarized in Table 1. Complete laboratory reports for the soil samples are provided in Appendix B.

2.1.2 Brine Well

Four soil borings designated DBS-6 through DBS-8 and NW-2, were installed downgradient of the brine well (Figure 4). Soil samples were collected at 10-foot intervals during drilling for laboratory analysis as described above. Soil cuttings and split spoon samples were used during drilling for lithologic description. Soil boring logs showing the subsurface geology at each location are provided in Appendix A. Laboratory results from soil samples collected during drilling are summarized in Table 1. Complete laboratory reports for the soil samples are provided in Appendix B.

2.1.3 Playa Lake

One soil boring, designated DBS-9, was installed in the fresh water playa lake located just north of the brine well (Figure 4). Soil samples were collected at 10-foot intervals during drilling for laboratory analysis as described above. Soil cuttings and split spoon samples were used during drilling for lithologic description. The soil boring log showing the subsurface geology is provided in Appendix A. Laboratory results of soil samples collected during drilling are summarized in Table 1. Complete laboratory reports for the soil samples are provided in Appendix B.

2.2 Groundwater Investigation

The groundwater investigation included the installation of nine monitor wells and two nested wells, and the collection of groundwater samples for laboratory analysis. The wells were completed at predetermined locations, as specified in Sections 3.1 and 3.2 of the Plan (DBS&A, 2008). The locations specified in the Plan were selected to delineate the extent of the chloride groundwater plume in the vicinity of the brine pond, the cross-gradient extent of the chloride plume resulting from the 1999 release at the brine well, and to determine if groundwater beneath the playa was impacted as a result of the 2002 and 2005 releases. All of the wells

were constructed in accordance with the New Mexico Environment Department Ground Water Quality Bureau Monitoring Well Construction Guidelines, Revision 1.0, dated July 2008.

2.2.1 Monitor Well Installation

2.2.1.1 Brine Pond

Soil borings DBS-1 through DBS-5 were advanced to approximately 20 ft below the water table and completed as 2-inch-diameter groundwater monitor wells (Figure 5). The wells were installed in upgradient, downgradient, and cross-gradient locations to delineate the extent of the chloride plume as follows:

- DBS-1: approximately 200 feet downgradient (southeast) of the brine pond
- DBS-2: approximately 200 feet cross-gradient (east) of the brine pond
- DBS-3: approximately 200 feet cross-gradient (south-southwest) of the brine pond
- DBS-4: approximately 400 feet downgradient (southeast) of the brine pond
- DBS-5: approximately 300 feet upgradient (northwest) of the brine pond

The wells were constructed of 20 feet of 2-inch-diameter, 0.020-inch slot, flush-threaded, machine-cut, Schedule 40 (SCH 40) polyvinyl chloride (PVC) well screen with a 2-foot sump. Blank 2-inch-diameter, SCH 40 PVC casing extended to approximately 2.5 feet above the ground surface. The screens were placed so that approximately five feet would be above the water table and 15 feet below. The filter pack consisted of 8-16 silica sand, placed by a tremie pipe, extending from the bottom of the boring to approximately 3 feet above the well screen. A 3-foot-thick bentonite pellet seal (hydrated) was then placed above the sand pack, and the annular space above the bentonite seal was filled with a cement/bentonite grout to the surface. The wells were completed aboveground with a protective steel well vault and a 3-foot by 3-foot by 4-inch-thick concrete pad and bollards at each corner. The well construction diagrams for DBS-1 through DBS-5 are provided in Appendix A.

Nested well NW-1 was drilled to the red beds (base of the Ogallala Formation) approximately 150 feet downgradient (southeast) of the former brine pond (Figure 5). NW-1 was installed to determine if a chloride density gradient exists with depth in the saturated zone. The well will enable DBS&A to evaluate vertical hydraulic and concentration gradients at a single location to

ensure that future recovery wells are screened properly. The well consists of three 2-inch-diameter monitor wells installed in one 10-inch-diameter soil boring with separate shallow (s), intermediate (m), and deep (d) screens. The screens are separated from each other in the boring by a bentonite seal.

The deep well consists of 20 feet of 2-inch-diameter 0.020-inch slot, flush-threaded, machine-cut, SCH 40 PVC well screen with a 2-foot sump. Blank 2-inch SCH 40 PVC casing extends to approximately 2.5 feet above the ground surface. The screen was placed from approximately 149 ft bgs to 169 ft bgs. The filter pack (8-16 silica sand) was placed by a tremie pipe from the bottom of the boring to approximately 4 feet above the top of the screen. A bentonite pellet seal (hydrated) was then placed above the sand pack.

The middle well consists of 20 feet of 2-inch-diameter 0.020-inch slot, flush-threaded, machine-cut, SCH 40 PVC well screen with a 2-foot sump. Blank 2-inch SCH 40 PVC casing extends to approximately 2.5 feet above the ground surface. The screen was placed from approximately 99 ft bgs to 119 ft bgs. The filter pack (8-16 silica sand) was placed by a tremie pipe from the bottom of the boring to approximately 4 feet above the top of the screen. A bentonite pellet seal (hydrated) was then placed above the sand pack.

The shallow well consists of 20 feet of 2-inch-diameter 0.020-inch slot, flush-threaded, machine-cut, SCH 40 PVC well screen with a 2-foot sump. The well is screened across the water table from approximately 52 ft bgs to 72 ft bgs. Blank 2-inch SCH 40 PVC casing extends to approximately 2.5 feet above the ground surface. The filter pack (8-16 silica sand) was placed by a tremie pipe from the bottom of the boring to approximately 2 feet above the top of the screen. A bentonite pellet seal (hydrated) was then placed above the sand pack. The remaining open annular space above the bentonite seal was then filled with a cement/bentonite grout to the surface.

The well was completed aboveground with a protective steel well vault and a 3-foot by 3-foot by 4-inch-thick concrete pad and bollards at each corner. The well construction diagram for NW-1 is provided in Appendix A.

2.2.1.2 Brine Well

Soil borings DBS-6 through DBS-8 were advanced to approximately 20 ft below the water table and completed as 2-inch-diameter groundwater monitor wells (Figure 6). The wells were installed to delineate the cross-gradient extent of the chloride plume as follows:

- DBS-6: approximately 300 feet north of existing monitor well MW-4
- DBS-7: approximately 200 feet south of existing monitor well MW-4
- DBS-8: approximately 300 feet southwest of existing monitor well MW-4

The wells were constructed as described above in Section 2.2.1.1 for wells DBS-1 through DBS-5. The well construction diagrams for DBS-6 through DBS-8 are provided in Appendix A.

Nested well NW-2 was drilled to the red beds approximately 20 feet upgradient (northwest) of monitor well MW-4 (Figure 6). NW-2, like NW-1, was installed to determine if a chloride density gradient exists with depth in the saturated zone. The well was constructed in similar manner to NW-1 with three 2-inch-diameter monitor wells installed in one 10-inch-diameter soil boring with separate shallow (s), intermediate (m), and deep (d) screens. The well was completed aboveground with a protective steel well vault and a 3-foot by 3-foot by 4-inch-thick concrete pad and bollards at each corner. The well construction diagram for NW-2 is provided in Appendix A.

2.2.1.3 Playa Lake

Soil boring DBS-9 was advanced to approximately 20 ft below the water table and completed as 2-inch-diameter groundwater monitor well (Figure 6). The well was installed to determine if groundwater beneath the playa was impacted from releases which occurred in the past. The well was constructed as described above in Section 2.2.1.1. The well construction diagram for DBS-9 is provided in Appendix A.

After completion, each of the newly installed monitor wells was developed by pumping until temperature, pH, and conductivity stabilized and turbidity was reduced to the extent practicable (Appendix C).

2.2.2 Survey

After drilling and installation of the monitor wells was completed, a survey was completed. Each of the newly installed monitor wells, as well as the existing monitor wells, was surveyed by

Pettigrew & Associates of Hobbs, New Mexico, a licensed New Mexico land surveyor. The top of casing elevations of each of the wells was surveyed to a North American Vertical Datum, 1988 (NAVD88), and the x-y coordinates of each well was surveyed to a North American Datum, 1983 (NAD83) in a state plane coordinate system. Survey results are provided in Appendix D.

2.2.3 Groundwater Sampling

Groundwater samples were collected from each of the newly installed monitor wells and the existing monitor wells for laboratory analysis. Before sampling, fluid levels in each well were gauged using a decontaminated electronic water level meter. After gauging, each well was purged of a minimum of three casing volumes using a pump. Field parameters of pH, specific conductivity, and temperature were monitored during purging to ensure that stagnant water was removed from the well (Appendix C). Groundwater samples were then collected from each well and transferred into laboratory-prepared sample containers. Immediately after the samples were collected, they were placed in an ice-filled cooler and remained on ice until they were delivered to the laboratory for analysis. Chain-of-custody documentation accompanied the samples at all times.

3. Analytical Program

The analytical program included analysis of soil and groundwater media. Samples were submitted to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico for analysis. Copies of the soil and groundwater laboratory analytical reports are included in Appendix B.

3.1 Soil Analysis

Soil samples were analyzed for chloride using U.S. Environmental Protection Agency (EPA) method 300.0. A total of 89 soil samples were submitted for laboratory analysis from the eleven soil borings installed during the field investigation. In addition, the samples collected from boring DBS-9 were also analyzed for total petroleum hydrocarbons (TPH) in accordance with EPA method 418.1.

3.2 Groundwater Analysis

Groundwater samples were analyzed for chloride using EPA method 300.0. In addition, samples collected from boring DBS-9 only were analyzed for TPH (gasoline range organics [GRO], diesel range organics [DRO], and motor oil range organics [MRO]) in accordance with EPA method 8015B. A total of 21 groundwater samples were submitted for laboratory analysis. Nine samples from newly installed monitor wells DBS-1 through DBS-9, six from the two newly installed nested wells (NW-1 [s], NW-1 [m], NM-1 [d], NW-2 [s], NW-2 [m], NW-2 [d]), and six from the existing wells (PMW-1, MW-2, MW-3, MW-4, MW-5, and MW-6).

4. Results

4.1 Soil

A summary of chloride concentrations with depth in the soil borings installed during the field investigation is provided in Table 1. TPH results for boring DBS-9 are provided in Table 2. The soil analytical results are also shown graphically on Figures 3 and 4.

4.1.1 Brine Pond

Of the six borings installed at the brine pond, only three borings contained concentrations of chloride in excess of the OCD standard of 500 mg/kg.. In boring DBS-1, located approximately 200 ft southeast of the former brine pond, samples collected from the 10-12 ft bgs and 30-32 ft bgs intervals yielded chloride concentrations of 3,600 and 1,400 mg/kg, respectively. Below 32 ft bgs, chloride concentrations decreased from 380 to 18 mg/kg (Table 1, Figure 3).

In boring DBS-2, located approximately 200 feet east of the former brine loading/unloading area, samples collected from the 0-2 ft bgs and 10-12 ft bgs intervals yielded chloride concentrations of 2,000 and 940 mg/kg, respectively. Below 12 ft bgs, chloride concentrations decreased from 42 to 5.8 mg/kg (Table 1, Figure 3).

Soil boring NW-1, located approximately 70 ft southeast of the former brine pond, showed chloride concentrations exceeding the OCD standard of 500 mg/kg in all of the samples collected from the boring. Measured chloride concentrations ranged from 800 to 3,600 mg/kg (Table 1, Figure 3). No notable decrease in chloride concentration occurred with depth.

4.1.2 Brine Well

No chloride concentrations in the soil samples collected from borings DBS-6, DBS-7, DBS-8, and NW-2, installed downgradient of the brine well, exceeded the OCD standard of 500 mg/kg (Table 1, Figure 4). Measured chloride concentrations ranged from 1.8 to 240 mg/kg.

4.1.3 Playa Lake

Soil samples collected from boring DBS-9 showed elevated chloride concentrations in three samples. In samples collected from the 10-12 ft bgs, 20-22 ft bgs, and 40-42 ft bgs intervals, measured chloride concentrations were 4,100, 560, and 550 mg/kg, respectively (Table 1, Figure 4). Below 42 ft bgs, chloride concentrations decreased from 160 to 9.7 mg/kg.

Soil samples from boring DBS-9 were also analyzed for TPH. In samples collected from the 10-12 ft bgs, 20-22 ft bgs, 30-32 ft bgs, 40-42 ft bgs, and 50-52 ft bgs intervals, measured TPH concentrations were 36, 220, 64, 40, and 82 mg/kg, respectively (Table 2). Below 52 ft bgs, TPH concentrations were below the laboratory reporting limit.

4.2 Groundwater

Table 3 provides water level measurements and corresponding groundwater elevations for each of the newly installed and existing monitor wells. These data were used to generate the potentiometric surface maps for the brine pond and brine well/playa lake areas shown on Figures 7 and 8. The groundwater data were combined for the two areas above and a Site potentiometric surface map was generated (Figure 9). The direction of groundwater flow beneath the Site is to the southeast; the average hydraulic gradient beneath the Site is relatively flat at 0.004 foot per foot.

Groundwater analytical results for chloride are provided in Tables 4 and 5 and shown graphically on Figures 5 and 6. Of the 21 groundwater samples submitted for chloride analysis, 12 samples exceeded the NMWQCC Standard of 250 mg/L for chloride. The samples exceeding the standard were: DBS-1 (320 mg/L), DBS-6 (380 mg/L), DBS-7 (570 mg/L), NW-1(s) (630 mg/L), NW-2(s) (410 mg/L), NW-2(m) (570 mg/L), NW-2(d) (4,700 mg/L), PMW-1 (11,000 mg/L), MW-2 (1,200 mg/L), MW-3 (17,000 mg/L), MW-4 (6,600 mg/L), and MW-5 (1,300 mg/L).

Groundwater samples submitted from DBS-9 for TPH GRO, DRO, and MRO analysis were all below the laboratory reporting limits.

5. Summary and Conclusions

5.1 Site Conditions

5.1.1 Soil

Chloride concentrations in soil were generally below the OCD standard of 500 mg/kg. Three exceptions were noted at the brine pond in borings DBS-1, DBS-2, and NW-1. All three of these borings contained chloride concentrations in excess of 500 mg/kg in two or more samples. The chloride concentrations exceeding 500 mg/kg in borings DBS-1 and DBS-2 were limited to the upper 32 ft in DBS-1 and the upper 12 ft in DBS-2. The chloride concentrations in NW-1, however, exceeded 500 mg/kg in all of the soil samples submitted from the boring.

TPH results from soil samples submitted from boring DBS-9 showed concentrations ranging from 36 to 220 mg/kg from 10 ft bgs to 52 ft bgs. Below 52 ft bgs, TPH concentrations were below the laboratory reporting limit. The sample collected from the 20-22 ft bgs interval exceeded the New Mexico Environment Petroleum Storage Tank Bureau action level of 100 mg/kg.

5.1.2 Groundwater

The chloride groundwater plume was delineated during the field investigation at the brine pond and brine well areas. At the brine pond, the highest chloride concentration in groundwater was encountered in monitor well PMW-1 11,000 mg/L, just downgradient of the former brine pond and brine loading/unloading area. Downgradient of PMW-1, the chloride concentration decreases two orders of magnitude in NW-1(s) (630 mg/L) and decreases by half again in DBS-1 (320 mg/L). The downgradient extent of the plume is bounded by monitor well DBS-4 (38 mg/L) and the cross-gradient extent is bounded by monitor wells DBS-2 (14 mg/L) and DBS-3 (36 mg/L). The upgradient monitor well contained a chloride concentration of 65 mg/L.

At the brine well location, the highest chloride concentration (17,000 mg/L) in groundwater was encountered in monitor well MW-3 (17,000 mg/L), located approximately 550 ft downgradient of the brine well. Downgradient of MW-4, the chloride concentration decreases one order of

magnitude in MW-4 (6,600 mg/L) and continues to decrease further downgradient in MW-5 (1,300 mg/L) and DBS-7 (570 mg/L). The downgradient extent of the plume was not delineated, as the farthest downgradient monitor wells, MW-5 and MW-7, contain chloride concentrations exceeding the NMWQCC standard of 250 mg/L. The cross-gradient extent of the plume was bounded to the south by monitor well DBS-8 (58 mg/L), while the cross-gradient extent of the plume was not defined to the north by DBS-6 (380 mg/L).

The groundwater sample collected from DBS-9 located in the playa was below the NMWQCC standard for chloride (210 mg/L), and below the laboratory reporting limits for TPH. GRO, DRO, and MRO.

5.2 Conclusions

Overall, the extent of the chloride groundwater plumes have been delineated at the brine pond, brine well, and playa. Although the chloride plume at the brine well has not been definitively defined by the field investigation, the chloride concentrations in the farthest downgradient and northernmost cross-gradient wells are low enough to suggest that the wells were installed in the outer fringe of the plume.

DBS&A recommends that recovery wells be installed at the brine pond and the brine well areas and that pump tests be performed on the wells so that a remedial approach for the Site can be developed.

References

DBS&A. 2008. Comprehensive Site Plan, Salty Dog Brine Station, Lea County, New Mexico. Prepared for the New Mexico Energy, Minerals, and Natural Resources Department, Oil Conservation Division, Environmental Bureau, Santa Fe, New Mexico. September 5, 2008.

New Mexico Energy, Minerals and Natural Resources Department. 2008. Notification of Compliance/Enforcement Action-Administrative Compliance Order, ACO 2008-02. Directed to Pieter Bergstein d/b/a Salty Dog, Inc. (OGRID 184208). May 20, 2008.

State of New Mexico New Oil Conservation Division, Constituent Agency of the Water Quality Control Commission In the Matter of Pieter Bergstein d/b/a "Salty Dog, Inc., (OGRID 184208). 2008. Settlement Agreement and Stipulated Revised Final Order NM-OCD 2008-2A. August 6, 2008.

Figures

Explanation

- Water supply well

Source: RGIS aerial photograph dated July 2005

S:/PROJECTS/ES08.0118.01_SALTY_DOG_INC/GIS/MXDS/COMPREHENSIVE_SITE_PLAN/FIG01-SITE_LOCATION_MAP.MXD 908190

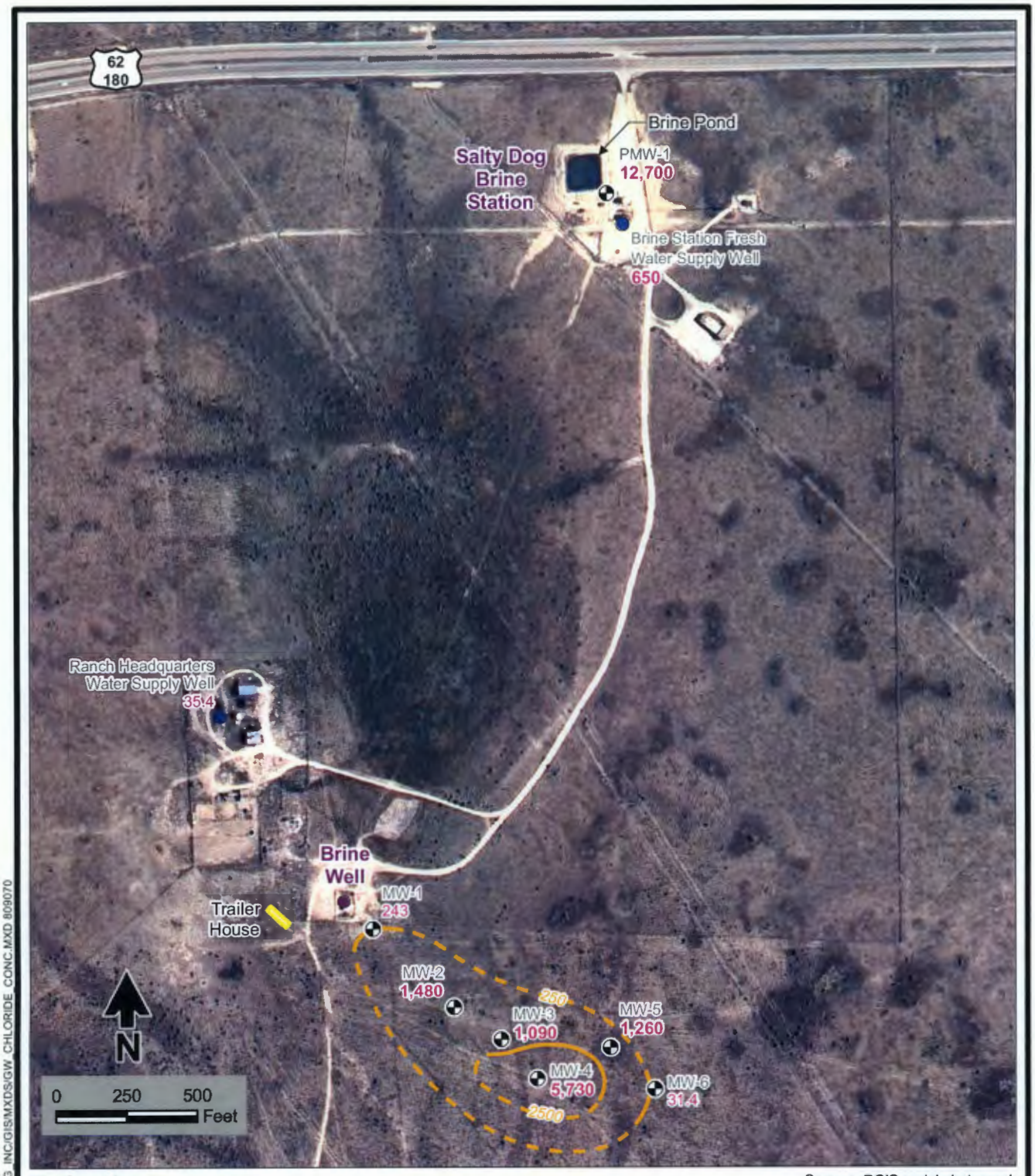
SALTY DOG BRINE STATION

Site Location Map

Daniel B. Stephens & Associates, Inc.

09/18/2009 JN ES08.0118.01

Figure 1



Explanation

MW-4 Well designation

5,730 Chloride concentration (mg/L)

Existing monitor well

Water supply well

Chloride concentration contour (dashed where inferred)

Note: Bold denotes concentration that exceeds the NMWQCC standard

Source: RGIS aerial photograph dated July 2005

SALTY DOG BRINE STATION

Chloride Concentrations in Groundwater

Daniel B. Stephens & Associates, Inc.

07/09/2008 JN ES08.0118.01

Figure 2

S:/PROJECTS/ES08.0118.01_SALTY_DOG_INC/GIS/MXDS/GW_CHLORIDE_CONC.MXD 809070

Explanation

DBS-2 Well designation

2,000 Chloride concentration (mg/kg)

(0-2) Sample depth (ft bgs)

Monitor well location

BOLD indicates concentration equal to or greater than the applicable OCD standard.

Source: Google Earth aerial photograph dated September 2002

SALTY DOG BRINE STATION

Brine Pond Area
Chloride Concentrations in Soil
March 23, 24, 25, and 31, 2009

Daniel B. Stephens & Associates, Inc.

09/18/2009 JN ES08.0118.01

Figure 3

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Explanation

DBS-9 Well designation

4,100 Chloride concentration (mg/kg)

(0-2) Sample depth (ft bgs)

Monitor well location

BOLD indicates concentration equal to or greater than the applicable OCD standard.

Source: Google Earth aerial photograph dated September 2002

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area Chloride Concentrations in Soil March 26, 27, 30, and April 1, 2009

Daniel B. Stephens & Associates, Inc.

09/18/2009

JN ES08.0118.01

Figure 4

S:/PROJECTS/ES08.0118.01_SALTY_DOG_INC/GIS/MXDS/ANALYTICAL_RESULTS/CL_SO_20090408_BRINE_WELL.MXD 908190

Explanation

DBS-1 Well designation

320 Chloride concentration (mg/L)

⊕ Monitor well location

BOLD indicates concentration equal to or greater than the NMWQCC standard.

Source: Google Earth aerial photograph dated September 2002

SALTY DOG BRINE STATION

Brine Pond Area
Chloride Concentrations in Groundwater
April 8, 2009

Daniel B. Stephens & Associates, Inc.

09/18/2009

JN ES08.0118.01

Figure 5

S:/PROJECTS/ES08.0118.01_SALTY_DOG_INC/GIS/MXDS/ANALYTICAL_RESULTS/CL_GW_20090408_BRINE_STATION.MXD 908190

Explanation

MW-2 Well designation

1,200 Chloride concentration (mg/L)

Monitor well location

BOLD indicates concentration equal to or greater than the NMWQCC standard.

Source: Google Earth aerial photograph dated September 2002

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area Chloride Concentrations in Groundwater April 7 and 8, 2009

Daniel B. Stephens & Associates, Inc.

09/18/2009 JN ES08.0118.01

Figure 6

S:/PROJECTS/ES08.0118.01_SALTY_DOG_INC/GIS/MXDS/ANALYTICAL_RESULTS/CL_GW_20090408_BRINE_WELL.MXD 908190

Explanation

DBS-1 Well designation

3754.71 Groundwater elevation, ft msl

● Groundwater elevation (ft msl)

Potentiometric surface elevation contour (ft msl)

Source: Google Earth aerial photograph dated September 2002

SALTY DOG BRINE STATION

Brine Pond Area

Potentiometric Surface Elevations

April 8, 2009

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09/18/2009 JN ES08.0118.01

Figure 7

Explanation

MW-2 Well designation

3751.03 Groundwater elevation, ft msl

● Groundwater elevation (ft msl)

Potentiometric surface elevation contour (ft msl)

Source: Google Earth aerial photograph dated September 2002

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area
Potentiometric Surface Elevations
April 7 and 8, 2009

Daniel B. Stephens & Associates, Inc.
05/20/2009 JN ES08.0118.01

Figure 8

S:/PROJECTS/ES08.0118.01_SALTY_DOG_INC/GIS/MXDS/FLUID_LEVELS/GWE_20090408_BRINE_WELL.MXD 900250

Explanation

DBS-6 Well designation

3749.90 Groundwater elevation, ft msl

● Groundwater elevation (ft msl)

Potentiometric surface elevation contour (ft msl)

Source: Google Earth aerial photograph dated September 2002

SALTY DOG BRINE STATION

Potentiometric Surface Elevations

April 7 and 8, 2009

Daniel B. Stephens & Associates, Inc.

05/28/2009 JN ES08.0118.01

Figure 9

S:/PROJECTS/ES08.0118.01 SALTY DOG INC/GIS/MXDS/FLUID LEVELS/GWE 20090408.MXD 908250

Tables

Table 1. Summary of Chloride Soil Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 3

Monitor Well	Sample Date	Depth Interval (ft bgs)	Chloride Concentration (mg/kg) [a]
Oil Conservation Division Soil Standard [b]			*500*
DBS-1	03/25/09	10-12	**3600**
		20-22	240
		30-32	**1400**
		50-52	380
		60-62	160
		70-72	230
		80-82	18
DBS-2	03/24/09	0-2	**2000**
		10-12	**940**
		20-22	39
		40-42	42
		50-52	10
		60-62	7.9
		70-72	7.7
		80-82	5.8
DBS-3	03/24/09	0-2	170
		10-12	58
		20-22	41
		30-32	44
		40-42	35
		50-52	3.4
		60-62	8.5
		80-82	6.6
DBS-4	03/25/09	0-2	18
		10-12	54
		20-22	39
		30-32	19
		40-42	55
		50-52	75
		60-62	44
		70-72	9.7
		80-82	6.9
DBS-5	03/23/09	0-2	19
		10-12	25

Bold indicates concentrations that exceed the applicable standard.

[a] All samples analyzed in accordance with EPA method 300.0, unless otherwise noted.

[b] OCD standard for a site with groundwater less than 100 feet below ground surface.

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

Table 1. Summary of Chloride Soil Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 3

Monitor Well	Sample Date	Depth Interval (ft bgs)	Chloride Concentration (mg/kg) [a]
Oil Conservation Division Soil Standard [b]			*500*
DBS-5 (cont.)	03/23/09	20-22	17
		40-42	8.5
		50-52	3.1
		60-62	18
		70-72	12
		80-82	7.5
DBS-6	03/26/09	0-2	4.7
		10-12	6.5
		20-22	6.3
		30-32	31
		40-42	4.4
		50-52	3.8
		60-62	30
		70-72	63
		80-82	17
DBS-7	03/26/09	0-2	16
		10-12	9.6
		20-22	9.8
		30-32	13
		40-42	16
		50-52	7.9
		60-62	33
		70-72	83
		80-82	130
DBS-8	03/26/09	0-2	9.5
		10-12	8.8
		20-22	7.3
		30-32	47
		40-42	20
		50-52	13
		60-62	9.3
		70-72	8.7
		80-82	11
DBS-9	03/30/09	0-2	99

Bold indicates concentrations that exceed the applicable standard.

[a] All samples analyzed in accordance with EPA method 300.0, unless otherwise noted.

[b] OCD standard for a site with groundwater less than 100 feet below ground surface.

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

Table 1. Summary of Chloride Soil Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 3 of 3

Monitor Well	Sample Date	Depth Interval (ft bgs)	Chloride Concentration (mg/kg) [a]
Oil Conservation Division Soil Standard [b]			*500*
DBS-9 (cont.)	03/30/09	10-12	**4100**
		20-22	**560**
		30-32	480
		40-42	**550**
		50-52	160
		60-62	93
		70-72	65
		80-82	9.7
DBS NW-1	03/31/09	10-12	**1300**
		20-22	**3600**
		30-32	**800**
		40-42	**2500**
		50-52	**2400**
		60-62	**1800**
DBS NW-2	04/01/09	0-2	12
		10-12	6.2
		20-22	12
		30-32	16
		40-42	1.8
		50-52	240
		60-62	47

Bold indicates concentrations that exceed the applicable standard.

[a] All samples analyzed in accordance with EPA method 300.0, unless otherwise noted.

[b] OCD standard for a site with groundwater less than 100 feet below ground surface.

ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram

Table 2. Summary of DBS-9 Total Petroleum Hydrocarbons Soil Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 1

Monitor Well	Sample Date	Depth Interval (ft bgs)	TPH Concentration (mg/kg) [a]
NMED PSTB Action Level			*100*
DBS-9	03/30/09	0-2	<6.0
		10-12	36
		20-22	**220**
		30-32	64
		40-42	40
		50-52	82
		60-62	<20
		70-72	<20
		80-82	<20

Bold indicates concentrations that exceed the NMED PSTB action level.

[a] All samples analyzed in accordance with EPA method 418.1

NMED PSTB = New Mexico Environment Department Petroleum Storage Tank Bureau
TPH = Total petroleum hydrocarbons
ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram

Table 3. Summary of Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 1

Monitor Well	Screen Interval (ft bgs)	Top of Casing Elevation [a] (ft msl)	Date Measured	Depth to Water (ft btoc)	Groundwater Elevation (ft msl)
DBS-1	56.0-76.0	3817.09	04/08/09	62.38	3754.71
DBS-2	58.0-78.0	3820.50	04/08/09	65.45	3755.05
DBS-3	56.0-76.72	3816.66	04/08/09	60.67	3755.99
DBS-4	56.0-76.0	3820.37	04/08/09	66.27	3754.10
DBS-5	56.9-76.9	3820.37	04/08/09	62.99	3757.67
DBS-6	56.7-76.7	3812.65	04/07/09	62.75	3749.90
DBS-7	55.1-75.1	3810.21	04/07/09	61.74	3748.47
DBS-8	55.2-75.2	3810.70	04/07/09	61.20	3749.50
DBS-9	48.0-68.0	3806.26	04/08/09	53.93	3752.33
NW-1(s)	52.95-72.95	3817.33	04/08/09	62.35	3754.98
NW-1 (m)	99.31-119.31	3817.35	04/08/09	62.25	3755.10
NW-1 (d)	149.45-169.45	3817.35	04/08/09	62.04	3755.31
NW-2 (s)	53.35-73.35	3812.50	04/08/09	63.08	3749.42
NW-2 (m)	93.72-113.72	3812.45	04/08/09	63.27	3749.18
NW-2 (d)	126.87-146.87	3812.46	04/08/09	66.41	3746.05
PMW-1	63-78	3821.17	06/23/08	67.51	3753.66
			04/08/09	65.97	3755.20
MW-1	120-140	NA	06/23/08	59.90	NA
MW-2	127-147	3812.68	06/23/08	61.42	3751.26
			04/07/09	61.65	3751.03
MW-3	NA	3812.50	06/23/08	62.06	3750.44
			04/07/09	62.02	3750.03
MW-4	111-131	3811.33	06/23/08	62.12	3749.21
			04/07/09	62.51	3748.82
MW-5	112-132	3808.96	06/23/08	60.60	3748.36
			04/07/09	60.79	3748.17
MW-6	NA	3810.17	06/23/08	62.17	3748.00
			04/07/09	62.41	3747.76

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.

ft bgs = Feet below ground surface
ft msl = Feet above mean sea level
ft btoc = Feet below top of casing
NA = Not available

Table 4. Summary of Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 2

Monitor Well	Date	Chloride Concentration (mg/L) [a]
New Mexico Water Quality Control Commission Standard		*250*
DBS-1	04/08/09	**320**
DBS-2	04/08/09	14
DBS-3	04/08/09	36
DBS-4	04/08/09	38
DBS-5	04/08/09	65
DBS-6	04/07/09	**380**
DBS-7	04/07/08	**570**
DBS-8	04/07/09	58
DBS-9	04/08/09	210
NW-1 (s)	04/08/09	**630**
NW-1 (m)	04/08/09	57
NW-1 (d)	04/08/09	38
NW-2 (s)	04/08/09	**410**
NW-2 (m)	04/08/09	**570**
NW-2 (d)	04/08/09	**4,700**
Brine Pit Well (PMW-1)	02/27/08	**9,500** [b]
	05/30/08	**8,600** [b]
	06/23/08	**12,700**
	04/08/09	**11,000**
MW-1	05/30/08	75 [b]
	06/23/08	243
MW-2	02/27/08	120 [b]
	05/30/08	80 [b]
	06/23/08	**1,480**
	04/07/09	**1,200**
MW-3	02/27/08	**348** [b]
	05/30/08	**360** [b]
	06/23/08	**1,090**
	04/07/09	**17,000**
MW-4	02/27/08	**476** [b]
	05/30/08	**512** [b]
	06/23/08	**5,730**

Bold indicates concentrations that exceed the applicable standard.

[a] All samples analyzed in accordance to EPA method 300.0, unless otherwise noted.

[b] Samples analyzed in accordance to Standard Method 4500-Cl B.

mg/L = Milligrams per liter

Table 4. Summary of Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 2

Monitor Well	Date	Chloride Concentration (mg/L) [a]
New Mexico Water Quality Control Commission Standard		*250*
MW-4 (cont.)	04/07/09	**6,600**
MW-5	02/27/08	**1,280** [b]
	05/30/08	**1,220** [b]
	06/23/08	**1,260**
	04/07/09	**1,300**
MW-6	02/27/08	32 [b]
	05/30/08	36 [b]
	06/23/08	31.4
	04/07/09	25
Ranch Headquarters Water Supply Well	06/23/08	35.4
Brine Station Fresh Water Supply Well	02/27/08	**630** [b]
	05/30/08	**590** [b]
	06/23/08	**650**

Bold indicates concentrations that exceed the applicable standard.

[a] All samples analyzed in accordance with EPA method 300.0, unless otherwise noted.

[b] Samples analyzed in accordance with Standard Method 4500-Cl B.

mg/L = Milligrams per liter

Table 5. Summary of DBS-9 Total Petroleum Hydrocarbons Groundwater Analytical Data Salty Dog Brine Station, Lea County, New Mexico Page 1 of 1

TPH	Sample Date	Concentration (mg/L) [a]
NMWQCC Standard		*None*
DRO	04/08/09	<1.0
MRO	04/08/09	<5.0
GRO	04/08/09	<0.05

[a] All samples analyzed in accordance with EPA method 8015B.

TPH = Total petroleum hydrocarbon
mg/L = Milligrams per liter
NMWQCC = New Mexico Water Quality Control Commission
DRO = Diesel Range Organics
MRO = Motor Oil Range Organics
GRO = Gasoline Range Organics

Appendices

Appendix A

Soil Boring Logs and Well Completion Diagrams

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-1**

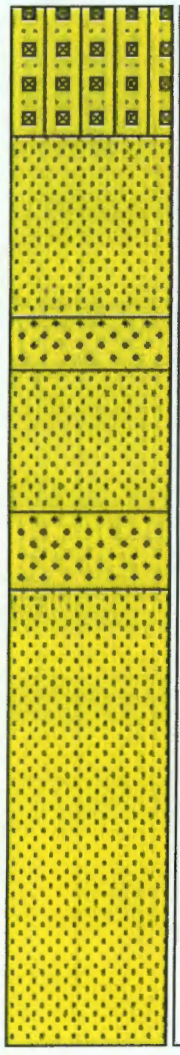
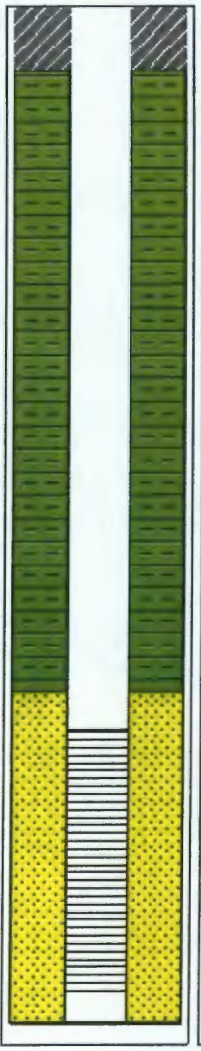
TOTAL DEPTH: **78.50'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/25/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling

▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5 to -80		GM	GM: Hard Packed Caliche Pad Area of SW Disposal Plant. No Sample.	0'-2'	N/A			Cement Bentonite 53.0' - 5' BG Surface
		SW	SW: Tan 5 YR 8/3 Fine Grained Sand, well sorted, minor caliche	10'-12'	0.3			
				20'-22'	0.5			
		SS	SANDSTONE: Hard					
		SW	SW: Tan brown, 7.5YR 8/3 medium to fine grained, well sorted, sugar sand. No Odor or staining.	30'-32'	0.3			Bentonite
		SS	SANDSTONE: Hard cemented tan brown SS.	40'-42'	N/A			
		SW	SW: Tan brown, 2.5YR 8/3 to 7 YR 5/4, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS. Measured Water at 62.38' from TOC	50'-52'	0.5			8 /16 Sand 78.50' - 53.0' Screen 0.02 Slot 76'-56'
				60'-62'	1.0			
				70'-72'	2.0			2' foot. Sump @ 76'-78'
		SW		80'-82'	2.0			T.D. 78.50', drilled to 83'

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-2**
TOTAL DEPTH: **79.80'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/24/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling
▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5		GM	GM: Brown Silt, Sand, Caliche mixture. Hard Caprock	0'-2'	0.3		Cement	
-10							Bentonite 52.8' - 5' BG	
-15		SW	SW: Tan 5 YR 8/3 Fine Grained Sand, well sorted, minor caliche	10'-12'	0.2		Surface	
-20				20'-22'	0.3			
-25		SS	SANDSTONE: Hard cemented tan brown SS. Fn. to med. gr., well sorted. 5YR 8/4					
-30		SS		30'-32'	N/A		Bentonite	
-35								
-40				40'-42'	Grab			
-45		SW	SW: Tan brown, 7.5YR 6/3					
		SS	SANDSTONE: Hard					
-50		SW	SW: Tan brown, 7.5 YR 6/3, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS. Measured Water at 65.45' from TOC	50'-52'	0.5			
-55								8 /16 Sand 79.80' - 52.8'
-60		SW		60'-62'	2.0			Screen 0.02 Slot 78'-58'
-65								
-70		SW		70'-72'	2.0			2' foot. Sump @ 78'-80'
-75								
-80		SW		80'-82'	2.0			T.D. 79.80', drilled to 83'

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-5**

TOTAL DEPTH: **78.90'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/23/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling

▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5		GM	GM: Tan White Caliche mixed with brown silt. Caprock material. @ 6' Sand 7.5YR 8/2	0'-2'	0.4		Cement	Cement
-10								
-15		SW	SW: Tan 5 YR 8/3 Fine Grained Sand, well sorted, minor caliche	10'-12'	0.5		Bentonite	Bentonite 53.0' - 5' BG Surface
-20								
-25		SS	SANDSTONE: Hard cemented tan brown SS. Fn. to med. gr., well sorted. 5YR 8/4	20'-22'	0.3			
-30								
-35		SS		30'-32'	N/A			Bentonite
-40		SW	SW: Tan brown, 2.5YR 8/3 to 7 YR 5/4, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS. Measured Water at 62.99' from TOC	40'-42'	0.4			
-45								
-50		SW		50'-52'	0.4			
-55								8 /16 Sand 78.90' - 53.0' Screen 0.02 Slot 76.9'-56.9'
-60		SW		60'-62'	0.5			
-65								
-70		SW		70'-72'	1.0			2' foot. Sump @ 76.9'-78'.9
-75								
-80		SW		80'-82'	2.0			T.D. 78.90', drilled to 83'

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-3**
TOTAL DEPTH: **78.72'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/24/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling
▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5		GM	GM: Brown Silt, 7.5YR 4/4,Sand,Caliche mixture. Hard Caprock	0'-2'	0.3			Cement
-10		SW	SW: Tan 5 YR 8/3 Fine Grained Sand, well sorted, minor caliche	10'-12'	0.3			Bentonite 53.0' - 5' BG Surface
-15		SS	SANDSTONE: Hard cemented tan brown SS. Fn. to med. gr., well sorted.	20'-22'	0.4			
-20		SW	SW: Tan Fine grained sand, well sorted, 7.5YR 8/2	30'-32'	0.6			Bentonite
-25		SS	SANDSTONE: Hard Sandstone Layer					
-30		SW	SW: Tan brown, 7.5 YR 6/3, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS.Measured Water at 60.67' from TOC	40'-42'	0.6			
-35		SW		50'-52'	1.0.			
-40		SW		60'-62'	2.0			8 /16 Sand 78.72' - 53.0' Screen 0.02 Slot 76.72'-56'
-45		SW		70'-72'	N/A			2' foot. Sump @ 76.72'-78.72' T.D. 78.72', drilled to 83'
-50		SW		80'-82'	2.0			
-55								
-60								
-65								
-70								
-75								
-80								

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-4**
TOTAL DEPTH: **80.15'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/25/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling
▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5		GM	GM: Brown Silt, 7.5YR 4/4,Sand,Caliche mixture. Hard Caprock	0'-2'	0.6			Cement
-10								Bentonite 52.4' - 5' BG
-15		SW	SW: Tan 5 YR 8/3 Fine Grained Sand, well sorted, minor caliche	10'-12'	N/A			Surface
-20		SS	SANDSTONE: Hard cemented tan brown SS. Fn. to med. gr., well sorted. 5YR 8/4	20'-22'	N/A			
-25		SS		30'-32'	N/A			Bentonite
-30		SW	SW: Tan brown, 7.5 YR 6/3, to 8/2 medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS.Measured Water at 66.27' from TOC	40'-42'	0.6			
-35		SW		50'-52'	1.0.			
-40		SW		60'-62'	1.0			8 /16 Sand 80.15' - 52.4' Screen 0.02 Slot 76'-56'
-45		SW		70'-72'	1.0			2' foot. Sump @ 78'-80'
-50		SW		80'-82'	2.0			T.D. 80.15', drilled to 83'
-55								
-60								
-65								
-70								
-75								
-80								

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-6**
TOTAL DEPTH: **78.70'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/26/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling
▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5		GM	GM: Tan White Caliche mixed with brown silt. Caprock material. @ 6' Sand 7.5YR 8/2	0'-2'	0.3		Cement	Cement
-10		SW	SW: Tan 7.5 YR 8/2 Fine Grained Sand, well sorted,	10'-12'	0.5		Bentonite	Bentonite 51.9' - 5' BG Surface
-15		SS	SANDSTONE: Hard cemented tan brown SS. Fn. to med. gr., well sorted. 7.5YR 8/2					
-20				20'-22'	Grab			
-25		SS						
-30				30'-32'	1.0			Bentonite
-35		SS						
-40		SW	SW: Tan brown, 7.5YR 8/4 to 7 YR 5/4, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 62'-64' BGS. Measured Water at 62.75' from TOC	40'-42'	1.0			
-45								
-50		SW		50'-52'	0.5			
-55								8 /16 Sand 78.70' - 51.9' Screen 0.02 Slot 76.70'-56.70'
-60		SW		60'-62'	0.5			
-65								
-70		SW		70'-72'	2.0			2' foot. Sump @ 76.7'-78'.7
-75								
-80		SW		80'-82'	2.0			T.D. 78.70', drilled to 83'

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-7**
TOTAL DEPTH: **77.10'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/26/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling
▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5		GM	GM: Brown Silt, 5YR 5/6, Sand, Caliche mixture. Hard Caprock	0'-2'	0.3		Cement	Cement
-10								Bentonite 52.0' - 5' BG Surface
-15		SW	SW: Tan 5 YR 8/3 Fine Grained Sand, well sorted, minor caliche	10'-12'	0.5			
-20				20'-22'	1.0			
-25								
-30		SS	SANDSTONE: Hard	30'-32'	Grab			Bentonite
-35		SW	SW: Tan brown, 5YR 6/6 to 7.5 YR 8/3, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS. Measured Water at 61.74' from TOC					
-40				40'-42'	1.0			
-45		SW						
-50				50'-52'	1.0.			
-55		SW						8 /16 Sand 77.10' - 52.0' Screen 0.02 Slot 75.10'-55.10'
-60				60'-62'	2.0			
-65		SW						
-70				70'-72'	2.0			2' foot. Sump @ 75.10'-77.10' T.D. 77.10', drilled to 83'
-75		SW						
-80				80'-82'	2.0			

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-8**
TOTAL DEPTH: **77.20'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/26/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling
▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5		GM	GM: Brown Silt, 5YR 5/3 to 8/2, Sand, Caliche mixture. Hard Caprock	0'-2'	0.3		Cement	Cement
-10		GM		10'-12'	0.5			Bentonite 52.5' - 5' BG Surface
-15								
-20		SS	SANDSTONE: Hard cemented tan brown SS. Fn. to med. gr., well sorted. 7.5YR 8/2	20'-22'	Grab			
-25		SW	SW: Tan brown, 5YR 6/6 to 7.5 YR 7/3 - 8/3, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS. Measured Water at 61.20' from TOC	30'-32'	1.0			Bentonite
-30		SW		40'-42'	1.0			
-35		SW						
-40		SW		50'-52'	2.0			8 /16 Sand 77.20' - 52.5' Screen 0.02 Slot 75.20'-55.20'
-45		SW		60'-62'	2.0			
-50		SW		70'-72'	2.0			2' foot. Sump @ 75.20'-77.20' T.D. 77.20', drilled to 83'
-55		SW		80'-82'	2.0			
-60								
-65								
-70								
-75								
-80								

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FIELD BOREHOLE LOG

BOREHOLE NO.: **DBS-9**

TOTAL DEPTH: **70.85'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/30/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling

▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
-5		SM	SM: Gray Black - Brown Silty Sand, clay , silt	0'-2'	0.3		Cement	Cement
-10		SW	SW: Tan brown,7.5YR 6/4 medium to fine grained, well sorted, sugarsand.No Odor or staining.	10'-12'	0.5		Bentonite 42.5' - 5' BG	Bentonite 42.5' - 5' BG
-15		SS	SANDSTONE: Hard				Surface	Surface
-20		SW	SW: Tan brown,10YR 8/3, medium to fine grained, well sorted, sugarsand.No Odor or staining. @52' BGS softer diffling. Capillary fringe @ 50' BGS? @ 53' BGS saturated to total drilled depth of 83'	20'-22'	0.5			
-30				30'-32'	1.0			Bentonite
-35		SW						
-40				40'-42'	1.0			
-45		SS	SANDSTONE: Hard					
-50		SW	SW: Tan brown,7.5YR 6/4 medium to fine grained, well sorted, sugarsand.No Odor or staining. Water at 53.93' from TOC	50'-52'	2.0			
-55		SW						8 /16 Sand 70.85'-42.5'
-60				60'-62'	1.0			Screen 0.02 Slot 68'-48'
-65		SW						
-70				70'-72'	2.0			2' foot. Sump @ 68'-70'
-75		SW		80'-82'	2.0			T.D. 70.85', drilled to 83'
-80								

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FIELD BOREHOLE LOG

BOREHOLE NO.: NW-1
TOTAL DEPTH: 74.95',121.31',171.45'

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	03/31/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling
▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
5 -10 15 20 -25 -30 35 40 -45 50 55 -60 65 70 -75 -80 85 90 -95 100 105 -110 115 120 125 -130 135 140 -145 150 155 -160 -165 170 175 -180		GM	GM: Brown Silt, 5YR 5/3 to 8/2, Sand, Caliche mixture.	0'-2'	N/A			NW-1 Shallow: DTW = 62.35' TOC, T.D. = 74.95' Cement: 0'-5' Bentonite Seal 5'-50', 8/16 Sand Pack: 50'-74.95' 0.020 Slot Screen: 52.95'-72.95' Sump and Screen Cap: 72.95'-74.95'
		SW	SW: Tan brown, 5YR 6/6 to 7.5 YR 7/3 - 8/3,	10'-12'	1.0			
		SS	SANDSTONE: Hard cemented tan brown SS. Fn. to med. gr., well sorted.	20'-22'	1.0			
		SS		30'-32'	Grab			
		SW	SW: Tan brown, 5YR 6/6 - 7/4 to 7.5 YR 7/3 - 8/3, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS. Measured Water at 62.35' from TOC NW-1 Shallow; 62.25' NW-1 Middle; 62.04' NW-1 Deep. Three Nested wells placed in one large 9" inch Soil boring. All wells are cased to surface, but separated and isolated by different bentonite seals, 8/16 sand filter packs, and 20 foot screened intervals at different depths. Soil Boring was split spoon sampled from ground surface at 10 foot intervals to 60'-62' BGS. After 60', all sample descriptions were from cuttings from mud rotary drilling.	40'-42'	1.0			NW-1 Middle DTW = 62.25' TOC T.D. = 121.31' Bentonite Seal: 80'-95' 8/16 Sand pack 95' - 121.31' 0.020 Slot Screen: 99.31' - 119.31' Sump and Screen Cap 119.31' - 121.31'
		SW		50'-52'	1.0			
		SW		60'-62'	2.0			
		SW						
		SW						
		SW						
		Red Bed /	CL: Red Bed formation: Maroon siltstone /					NW-1 Deep DTW = 62.04' TOC T.D. = 171.45' Bentonite Seal: 122' - 145' 8/16 Sand pack 145' - 171.45' 0.020 Slot Screen: 149.45' - 169.45' Sump and Screen

CMB Environmental & Geological Services, Inc.

PO Box 2304 Roswell, NM 88202-2304

cmbenviro@dfn.com

(505) 622-2012 Fax (505) 625-0538

FIELD BOREHOLE LOG

BOREHOLE NO.: NW-2

TOTAL DEPTH: 75.35',115.72',148.87'

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	ES08.0118.01.00004	DRILLING CO.:	Peterson Drilling Co.
SITE LOCATION:	Lea Co., NM	DRILLER:	Charles Johnson
JOB NO.:	Salty Dog	RIG TYPE:	Ingersoll-Rand TH-60
LOGGED BY:	CM Barnhill, PG	METHOD OF DRILLING:	Air Rotary 6 1/4"
PROJECT MANAGER:	Mike McVey, PG	SAMPLING METHODS:	Split Spoon
DATES DRILLED:	04/01/09	HAMMER WT./DROP	N/A

NOTES: Split Spoon Pushed by TH-60 Drilling Rig.

▽ Water level during drilling

▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Rec. / feet.	PPM TPH	BORING COMPLETION	WELL DESCRIPTION
5 -10 15 20 -25 -30 35 40 -45 50 55 -60 ▼65 70 -75 -80 85 90 -95 100 105 -110 115 120 125 -130 135 140 -145 150 155 -160 -165 170 175 -180		GM SW SS SW SW SW SW SC SC CL CL	GM: Brown Silt, 5YR 5/3 to 8/2, Sand, Caliche mixture. SW: Tan brown, 5YR 6/6 to 7.5 YR 7/3 - 8/3, SANDSTONE: Hard cemented tan brown SS. SW: Tan brown, 5YR 6/6 - 7/4 to 7.5 YR 7/3 - 8/3, medium to fine grained, well sorted, sugar sand. No Odor or staining. Capillary Fringe 60'-62' BGS. Measured Water at 63.08' from TOC NW-2 Shallow; 63.27' NW-2 Middle; 66.41' NW-2 Deep. Three Nested wells placed in one large 9" inch Soil boring. All wells are cased to surface, but separated and isolated by different bentonite seals, 8/16 sand filter packs, and 20 foot screened intervals at different depths. Soil SC: @ 115' BGS Clayey Sand, fine grained sand / clay mixture 2.5 YR 5/8 CL: Red Bed formation: @ 150' BGS Maroon siltstone / mudstone 2.5 YR 3/2	0'-2' 10'-12' 20'-22' 30'-32' 40'-42' 50'-52' 60'-62'	0.3 1.0 Grab 0.5 1.0 2.0 0.5			NW-2 Shallow: DTW = 63.08' TOC, T.D. = 75.35' Cement: 0'-5' Bentonite Seal 5'-50', 8/16 Sand Pack: 50'-75.35' 0.020 Slot Screen: 53.35'-73.35' Sump and Screen Cap: 73.35'-75.35' NM-2 Middle DTW = 63.27' TOC T.D. = 115.72' Bentonite Seal: 80'-90' 8/16 Sand pack 90' - 115.72' 0.020 Slot Screen: 93.72' - 113.72' Sump and Screen Cap 113.72' - 115.72' NM-2 Deep DTW = 66.41' TOC T.D. = 148.87' Bentonite Seal: 115' - 125' 8/16 Sand pack 125' - 148.87' 0.020 Slot Screen: 126.87' - 146.87' Sump and Screen

Appendix B

Laboratory Reports

Soil

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Friday, April 17, 2009

Mike McVey
Daniel B. Stephens & Assoc.
6020 Academy NE Suite 100
Albuquerque, NM 87109

TEL: (505) 822-9400
FAX (505) 822-8877

RE: Salty Dog

Order No.: 0903463

Dear Mike McVey:

Hall Environmental Analysis Laboratory, Inc. received 67 sample(s) on 3/30/2009 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-01 **Collection Date:** 3/25/2009 8:45:00 AM
Client Sample ID: DBS-1 10'-12' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	3600	15		mg/Kg	50	4/13/2009 7:09:37 PM

Lab ID: 0903463-02 **Collection Date:** 3/25/2009 9:00:00 AM
Client Sample ID: DBS-1 20'-22' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	240	3.0		mg/Kg	10	4/13/2009 7:27:02 PM

Lab ID: 0903463-03 **Collection Date:** 3/25/2009 9:15:00 AM
Client Sample ID: DBS-1 30'-32' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	1400	6.0		mg/Kg	20	4/13/2009 7:44:27 PM

Lab ID: 0903463-04 **Collection Date:** 3/25/2009 9:50:00 AM
Client Sample ID: DBS-1 50'-52' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	380	3.0		mg/Kg	10	4/13/2009 8:01:52 PM

Lab ID: 0903463-05 **Collection Date:** 3/25/2009 10:10:00 AM
Client Sample ID: DBS-1 60'-62' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	160	3.0		mg/Kg	10	4/13/2009 8:19:16 PM

Lab ID: 0903463-06 **Collection Date:** 3/25/2009 10:30:00 AM
Client Sample ID: DBS-1 70'-72' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	230	3.0		mg/Kg	10	4/13/2009 8:36:41 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-07 **Collection Date:** 3/25/2009 12:05:00 PM
Client Sample ID: DBS-1 80'-82' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	18	0.30		mg/Kg	1	4/13/2009 10:03:42 PM

Lab ID: 0903463-08 **Collection Date:** 3/24/2009 4:05:00 PM
Client Sample ID: DBS-2 0'-2' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	2000	6.0		mg/Kg	20	4/13/2009 10:21:07 PM

Lab ID: 0903463-09 **Collection Date:** 3/24/2009 4:15:00 PM
Client Sample ID: DBS-2 10'-12' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	940	3.0		mg/Kg	10	4/13/2009 10:38:32 PM

Lab ID: 0903463-10 **Collection Date:** 3/24/2009 4:25:00 PM
Client Sample ID: DBS-2 20'-22' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	39	0.30		mg/Kg	1	4/13/2009 10:55:56 PM

Lab ID: 0903463-11 **Collection Date:** 3/24/2009 4:45:00 PM
Client Sample ID: DBS-2 40'-42' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	42	0.30		mg/Kg	1	4/13/2009 11:13:21 PM

Lab ID: 0903463-12 **Collection Date:** 3/24/2009 5:10:00 PM
Client Sample ID: DBS-2 50'-52' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	10	0.30		mg/Kg	1	4/13/2009 11:30:45 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-13 **Collection Date:** 3/24/2009 5:20:00 PM
Client Sample ID: DBS-2 60'-62' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	7.9	0.30		mg/Kg	1	4/13/2009 11:48:10 PM

Lab ID: 0903463-14 **Collection Date:** 3/24/2009 5:45:00 PM
Client Sample ID: DBS-2 70'-72' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	7.7	3.0		mg/Kg	10	4/10/2009 2:56:20 AM

Lab ID: 0903463-15 **Collection Date:** 3/24/2009 6:10:00 PM
Client Sample ID: DBS-2 80'-82' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	5.8	3.0		mg/Kg	10	4/10/2009 3:13:45 AM

Lab ID: 0903463-16 **Collection Date:** 3/24/2009 12:45:00 PM
Client Sample ID: DBS-3 0'-2' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	170	3.0		mg/Kg	10	4/10/2009 3:31:10 AM

Lab ID: 0903463-17 **Collection Date:** 3/24/2009 1:00:00 PM
Client Sample ID: DBS-3 10'-12' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	58	3.0		mg/Kg	10	4/10/2009 3:48:34 AM

Lab ID: 0903463-18 **Collection Date:** 3/24/2009 1:10:00 PM
Client Sample ID: DBS-3 20'-22' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	41	3.0		mg/Kg	10	4/10/2009 4:05:59 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-19 **Collection Date:** 3/24/2009 1:25:00 PM
Client Sample ID: DBS-3 30'-32' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	44	0.30		mg/Kg	1	4/10/2009 4:23:24 AM

Lab ID: 0903463-20 **Collection Date:** 3/24/2009 1:45:00 PM
Client Sample ID: DBS-3 40'-42' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	35	0.30		mg/Kg	1	4/14/2009 10:26:44 AM

Lab ID: 0903463-21 **Collection Date:** 3/24/2009 2:00:00 PM
Client Sample ID: DBS-3 50'-52' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	3.4	0.30		mg/Kg	1	4/14/2009 11:18:58 AM

Lab ID: 0903463-22 **Collection Date:** 3/24/2009 2:15:00 PM
Client Sample ID: DBS-3 60'-62' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	8.5	0.30		mg/Kg	1	4/14/2009 11:36:23 AM

Lab ID: 0903463-23 **Collection Date:** 3/24/2009 3:00:00 PM
Client Sample ID: DBS-3 80'-82' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	6.6	0.30		mg/Kg	1	4/14/2009 11:53:47 AM

Lab ID: 0903463-24 **Collection Date:** 3/25/2009 1:45:00 PM
Client Sample ID: DBS-4 0'-2' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	18	0.30		mg/Kg	1	4/14/2009 1:03:25 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-25 **Collection Date:** 3/25/2009 1:50:00 PM
Client Sample ID: DBS-4 10'-12' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	54	0.30		mg/Kg	1	4/14/2009 1:20:49 PM

Lab ID: 0903463-26 **Collection Date:** 3/25/2009 2:00:00 PM
Client Sample ID: DBS-4 20'-22' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	39	0.30		mg/Kg	1	4/14/2009 1:38:14 PM

Lab ID: 0903463-27 **Collection Date:** 3/25/2009 2:10:00 PM
Client Sample ID: DBS-4 30'-32' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	19	0.30		mg/Kg	1	4/14/2009 1:55:38 PM

Lab ID: 0903463-28 **Collection Date:** 3/25/2009 2:20:00 PM
Client Sample ID: DBS-4 40'-42' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	55	0.30		mg/Kg	1	4/14/2009 2:13:03 PM

Lab ID: 0903463-29 **Collection Date:** 3/25/2009 2:40:00 PM
Client Sample ID: DBS-4 50'-52' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	75	0.30		mg/Kg	1	4/14/2009 2:30:27 PM

Lab ID: 0903463-30 **Collection Date:** 3/25/2009 3:00:00 PM
Client Sample ID: DBS-4 60'-62' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	44	0.30		mg/Kg	1	4/14/2009 2:47:52 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Estimated value	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-31 **Collection Date:** 3/25/2009 3:20:00 PM
Client Sample ID: DBS-4 70'-72' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	9.7	0.30		mg/Kg	1	4/14/2009 3:05:16 PM

Lab ID: 0903463-32 **Collection Date:** 3/25/2009 3:55:00 PM
Client Sample ID: DBS-4 80'-82' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	6.9	0.30		mg/Kg	1	4/14/2009 3:22:41 PM

Lab ID: 0903463-33 **Collection Date:** 3/23/2009 3:40:00 PM
Client Sample ID: DBS-5 0'-2' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	19	0.30		mg/Kg	1	4/14/2009 4:32:19 PM

Lab ID: 0903463-34 **Collection Date:** 3/23/2009 4:00:00 PM
Client Sample ID: DBS-5 10'-12' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	25	0.30		mg/Kg	1	4/14/2009 4:49:44 PM

Lab ID: 0903463-35 **Collection Date:** 3/23/2009 4:20:00 PM
Client Sample ID: DBS-5 20'-22' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	17	0.30		mg/Kg	1	4/14/2009 5:07:09 PM

Lab ID: 0903463-36 **Collection Date:** 3/23/2009 5:20:00 PM
Client Sample ID: DBS-5 40'-42' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	8.5	0.30		mg/Kg	1	4/14/2009 5:24:34 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-37 **Collection Date:** 3/24/2009 7:50:00 AM
Client Sample ID: DBS-5 50'-52' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	3.1	0.30		mg/Kg	1	4/14/2009 5:41:58 PM

Lab ID: 0903463-38 **Collection Date:** 3/24/2009 8:10:00 AM
Client Sample ID: DBS-5 60'-62' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	18	0.30		mg/Kg	1	4/14/2009 5:59:23 PM

Lab ID: 0903463-39 **Collection Date:** 3/24/2009 8:45:00 AM
Client Sample ID: DBS-5 70'-72' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	12	0.30		mg/Kg	1	4/14/2009 6:51:36 PM

Lab ID: 0903463-40 **Collection Date:** 3/24/2009 9:20:00 AM
Client Sample ID: DBS-5 80'-82' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	7.5	1.5		mg/Kg	5	4/11/2009 5:04:35 PM

Lab ID: 0903463-41 **Collection Date:** 3/26/2009 8:20:00 AM
Client Sample ID: DBS-6 0'-2' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	4.7	1.5		mg/Kg	5	4/11/2009 6:14:13 PM

Lab ID: 0903463-42 **Collection Date:** 3/26/2009 8:35:00 AM
Client Sample ID: DBS-6 10'-12' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	6.5	1.5		mg/Kg	5	4/12/2009 2:21:39 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-43 **Collection Date:** 3/26/2009 8:45:00 AM
Client Sample ID: DBS-6 20'-22' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	6.3	1.5		mg/Kg	5	4/12/2009 2:56:27 AM

Lab ID: 0903463-44 **Collection Date:** 3/26/2009 9:00:00 AM
Client Sample ID: DBS-6 30'-32' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	31	1.5		mg/Kg	5	4/12/2009 3:31:16 AM

Lab ID: 0903463-45 **Collection Date:** 3/26/2009 9:15:00 AM
Client Sample ID: DBS-6 40'-42' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	4.4	1.5		mg/Kg	5	4/12/2009 4:06:04 AM

Lab ID: 0903463-46 **Collection Date:** 3/26/2009 9:40:00 AM
Client Sample ID: DBS-6 50'-52' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	3.8	1.5		mg/Kg	5	4/12/2009 4:40:53 AM

Lab ID: 0903463-47 **Collection Date:** 3/26/2009 10:00:00 AM
Client Sample ID: DBS-6 60'-62' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	30	1.5		mg/Kg	5	4/12/2009 5:50:31 AM

Lab ID: 0903463-48 **Collection Date:** 3/26/2009 10:15:00 AM
Client Sample ID: DBS-6 70'-72' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	63	1.5		mg/Kg	5	4/12/2009 6:25:20 AM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Estimated value	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-49 **Collection Date:** 3/26/2009 10:45:00 AM
Client Sample ID: DBS-6 80'-82' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	17	1.5		mg/Kg	5	4/12/2009 7:34:57 AM

Lab ID: 0903463-50 **Collection Date:** 3/26/2009 1:00:00 PM
Client Sample ID: DBS-7 0'-2' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	16	1.5		mg/Kg	5	4/14/2009 8:36:03 PM

Lab ID: 0903463-51 **Collection Date:** 3/26/2009 1:10:00 PM
Client Sample ID: DBS-7 10'-12' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	9.6	0.30		mg/Kg	1	4/14/2009 8:53:28 PM

Lab ID: 0903463-52 **Collection Date:** 3/26/2009 1:20:00 PM
Client Sample ID: DBS-7 20'-22' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	9.8	0.30		mg/Kg	1	4/14/2009 9:45:42 PM

Lab ID: 0903463-53 **Collection Date:** 3/26/2009 1:30:00 PM
Client Sample ID: DBS-7 30'-32' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	13	0.30		mg/Kg	1	4/14/2009 10:03:07 PM

Lab ID: 0903463-54 **Collection Date:** 3/26/2009 1:45:00 PM
Client Sample ID: DBS-7 40'-42' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	16	1.5		mg/Kg	5	4/14/2009 10:20:32 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
E	Estimated value
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
S	Spike recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
MCL	Maximum Contaminant Level
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-55 **Collection Date:** 3/26/2009 2:00:00 PM
Client Sample ID: DBS-7 50'-52' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	7.9	1.5		mg/Kg	5	4/14/2009 11:30:09 PM

Lab ID: 0903463-56 **Collection Date:** 3/26/2009 2:15:00 PM
Client Sample ID: DBS-7 60'-62' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	33	1.5		mg/Kg	5	4/14/2009 11:47:35 PM

Lab ID: 0903463-57 **Collection Date:** 3/26/2009 2:30:00 PM
Client Sample ID: DBS-7 70'-72' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	83	0.30		mg/Kg	1	4/15/2009 12:04:59 AM

Lab ID: 0903463-58 **Collection Date:** 3/26/2009 3:00:00 PM
Client Sample ID: DBS-7 80'-82' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	130	1.5		mg/Kg	5	4/16/2009 1:02:12 AM

Lab ID: 0903463-59 **Collection Date:** 3/26/2009 4:40:00 PM
Client Sample ID: DBS-8 0'2' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	9.5	1.5		mg/Kg	5	4/15/2009 12:39:49 AM

Lab ID: 0903463-60 **Collection Date:** 3/26/2009 4:55:00 PM
Client Sample ID: DBS-8 10'-12' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	8.8	0.30		mg/Kg	1	4/15/2009 12:57:13 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-61 **Collection Date:** 3/26/2009 5:13:00 PM
Client Sample ID: DBS-8 20'-22' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	7.3	0.30		mg/Kg	1	4/15/2009 1:14:37 AM

Lab ID: 0903463-62 **Collection Date:** 3/26/2009 5:25:00 PM
Client Sample ID: DBS-8 30'-32' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	47	0.30		mg/Kg	1	4/15/2009 2:59:05 AM

Lab ID: 0903463-63 **Collection Date:** 3/26/2009 5:40:00 PM
Client Sample ID: DBS-8 40'-42' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	20	1.5		mg/Kg	5	4/15/2009 3:16:30 AM

Lab ID: 0903463-64 **Collection Date:** 3/26/2009 5:55:00 PM
Client Sample ID: DBS-8 50'-52' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	13	1.5		mg/Kg	5	4/15/2009 3:33:54 AM

Lab ID: 0903463-65 **Collection Date:** 3/27/2009 8:30:00 AM
Client Sample ID: DBS-8 60'-62' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	9.3	0.30		mg/Kg	1	4/15/2009 3:51:18 AM

Lab ID: 0903463-66 **Collection Date:** 3/27/2009 8:45:00 AM
Client Sample ID: DBS-8 70'-72' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	8.7	1.5		mg/Kg	5	4/15/2009 4:08:43 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0903463
Project: Salty Dog

Lab ID: 0903463-67 **Collection Date:** 3/27/2009 9:25:00 AM
Client Sample ID: DBS-8 80'-82' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	11	1.5		mg/Kg	5	4/15/2009 4:26:08 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

QA/QC SUMMARY REPORT

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog **Work Order:** 0903463

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 300.0: Anions									
Sample ID: 0903463-19AMSD		*MSD*			Batch ID: **18770**		Analysis Date:	4/10/2009 5:15:36 AM	
Chloride	60.43	mg/Kg	0.30	112	75	125	2.13	20	
Sample ID: 0903463-38AMSD		*MSD*			Batch ID: **18798**		Analysis Date:	4/11/2009 4:28:19 AM	
Chloride	31.40	mg/Kg	0.30	94.2	75	125	2.17	20	
Sample ID: 0903463-40AMSD		*MSD*			Batch ID: **18807**		Analysis Date:	4/11/2009 5:39:23 PM	
Chloride	22.33	mg/Kg	1.5	99.2	75	125	0.411	20	
Sample ID: 0903463-48AMSD		*MSD*			Batch ID: **18807**		Analysis Date:	4/12/2009 7:17:33 AM	
Chloride	82.67	mg/Kg	1.5	128	75	125	9.33	20	S
Sample ID: 0903463-20AMSD		*MSD*			Batch ID: **18798**		Analysis Date:	4/14/2009 11:01:34 AM	
Chloride	50.63	mg/Kg	0.30	103	75	125	3.79	20	
Sample ID: 0903463-51AMSD		*MSD*			Batch ID: **18810**		Analysis Date:	4/14/2009 9:28:17 PM	
Chloride	25.35	mg/Kg	0.30	105	75	125	1.57	20	
Sample ID: 0903463-61AMSD		*MSD*			Batch ID: **18810**		Analysis Date:	4/15/2009 1:49:27 AM	
Chloride	22.21	mg/Kg	0.30	99.4	75	125	0.417	20	
Sample ID: MB-18770		*MBLK*			Batch ID: **18770**		Analysis Date:	4/9/2009 8:33:21 PM	
Chloride	ND	mg/Kg	0.30						
Sample ID: MB-18798		*MBLK*			Batch ID: **18798**		Analysis Date:	4/10/2009 7:46:02 PM	
Chloride	ND	mg/Kg	0.30						
Sample ID: MB-18807		*MBLK*			Batch ID: **18807**		Analysis Date:	4/11/2009 4:29:46 PM	
Chloride	ND	mg/Kg	0.30						
Sample ID: MB-18810		*MBLK*			Batch ID: **18810**		Analysis Date:	4/14/2009 8:01:14 PM	
Chloride	ND	mg/Kg	0.30						
Sample ID: LCS-18770		*LCS*			Batch ID: **18770**		Analysis Date:	4/9/2009 8:50:46 PM	
Chloride	13.87	mg/Kg	0.30	92.5	90	110			
Sample ID: LCS-18770		*LCS*			Batch ID: **18770**		Analysis Date:	4/10/2009 2:50:06 PM	
Chloride	14.13	mg/Kg	0.30	94.2	90	110			
Sample ID: LCS-18798		*LCS*			Batch ID: **18798**		Analysis Date:	4/10/2009 8:03:27 PM	
Chloride	15.05	mg/Kg	0.30	100	90	110			
Sample ID: LCS-18807		*LCS*			Batch ID: **18807**		Analysis Date:	4/11/2009 4:47:10 PM	
Chloride	15.49	mg/Kg	0.30	103	90	110			
Sample ID: LCS-18798		*LCS*			Batch ID: **18798**		Analysis Date:	4/14/2009 10:09:19 AM	
Chloride	15.30	mg/Kg	0.30	102	90	110			
Sample ID: LCS-18810		*LCS*			Batch ID: **18810**		Analysis Date:	4/14/2009 8:18:39 PM	
Chloride	15.75	mg/Kg	0.30	105	90	110			
Sample ID: 0903463-19AMS		*MS*			Batch ID: **18770**		Analysis Date:	4/10/2009 4:58:12 AM	
Chloride	61.73	mg/Kg	0.30	121	75	125			
Sample ID: 0903463-38AMS		*MS*			Batch ID: **18798**		Analysis Date:	4/11/2009 4:10:54 AM	
Chloride	30.73	mg/Kg	0.30	89.7	75	125			
Sample ID: 0903463-40AMS		*MS*			Batch ID: **18807**		Analysis Date:	4/11/2009 5:21:59 PM	
Chloride	22.24	mg/Kg	1.5	98.6	75	125			

Qualifiers:

	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Work Order: 0903463

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 300.0: Anions									
Sample ID: 0903463-48AMS		*MS*			Batch ID:	**18807**	Analysis Date:	4/12/2009 7:00:09 AM	
Chloride	75.30	mg/Kg	1.5	79.2	75	125			
Sample ID: 0903463-20AMS		*MS*			Batch ID:	**18798**	Analysis Date:	4/14/2009 10:44:09 AM	
Chloride	48.74	mg/Kg	0.30	90.8	75	125			
Sample ID: 0903463-51AMS		*MS*			Batch ID:	**18810**	Analysis Date:	4/14/2009 9:10:53 PM	
Chloride	24.95	mg/Kg	0.30	102	75	125			
Sample ID: 0903463-61AMS		*MS*			Batch ID:	**18810**	Analysis Date:	4/15/2009 1:32:02 AM	
Chloride	22.30	mg/Kg	0.30	100	75	125			

Qualifiers:

J	Estimated value	H	Holding times for preparation or analysis exceeded
R	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name DBS | Date Received: 3/30/2009

Work Order Number 0903463 | Received by: ARS

Checklist completed by: _____ 3/30/09 | Sample ID labels checked by: TS

Signature | Date | Initials

Matrix: | Carrier name: Greyhound

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☑	No ☐	N/A ☐	
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 ☐		
Water - VOA vials have zero headspace? No VOA vials submitted	☑	Yes ☐	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	
Container/Temp Blank temperature?	3°	<6° C *Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

_____

_____

_____

_____

Corrective Action _____

_____

_____

Chain-of-Custody Record

Turn-Around Time:

☒ Standard ☐ Rush

Client: DBS & A

ATTN: Mike McVey

Mailing Address: 6020 Academy Road NE Ste. 100, Albuquerque, NM 87109

Phone #: 505-822-9400

email or Fax#: 505-822-8877

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Project Name: Salty Dog

Project #: 6508.0118.01.00004

Project Manager: Mike McVey, PE

Sampler: Cam Barnhill, PE

On Ice: ☒ Yes ☐ No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0903463	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride Epa 300.0			Air Bubbles (Y or N)
No Sample		Soil	DBS-1 0'-2' - No Sample	1402/G/Jar	None													X			N/A
3/25/09	0845	Soil	DBS-1 10'-12'			1															
3/25/09	0900	Soil	DBS-1 20'-22'			2															
3/25/09	0915	Soil	DBS-1 30'-32'			3															
No Sample			DBS-1 40'-42'			~~4~~ 3/30															
3/25/09	0950	Soil	DBS-1 50'-52'			~~5~~ 4															
3/25/09	10:10	Soil	DBS-1 60'-62'			~~6~~ 5															
3/25/09	10:30	Soil	DBS-1 70'-72'			~~7~~ 6															
3/25/09	12:05	Soil	DBS-1 80'-82'			~~8~~ 7															

Date	Time	Relinquished by:	Received by:	Date	Time
3/29/09	1200				
			9:45	3/30/09	

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: DBS & A

ATTN: Mike McVey

Mailing Address: 6020 Academy Road NE Ste 100, Albuquerque, NM 87109

Phone #: 505 - 822-9400

email or Fax#: 505-822-8877

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Salty Dog

Project #: ES08.0118.01.00004

Project Manager: Mike McVey, PE.

Sampler: Cm Barnhill, PE

On Ice: ☒ Yes ☐ No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
~~3/24/09~~	~~1605~~	~~Soil~~				0903463
3/24/09	1605	Soil	DBS-2 0'-2'	1x40z/G Jar	None	8
3/24/09	1615	Soil	DBS-2 10'-12'			9
3/24/09	1625	Soil	DBS-2 20'-22'			10
NO Sample			DBS-2 30'-32'			12
3/24/09	1645	Soil	DBS-2 40'-42'			11
3/24/09	1710	Soil	DBS-2 50'-52'			12
3/24/09	1720	Soil	DBS-2 60'-62'			13
3/24/09	1745	Soil	DBS-2 70'-72'			14
3/24/09	1810	Soil	DBS-2 80'-82'			15

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride EPA 300.0				Air Bubbles (Y or N)
											X				N/A

Date	Time	Relinquished by:	Received by:	Date	Time
3/29/09	1200			3/30/09	9:45
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Any Question's Please Call Mike McVey @ 505-822-9400

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: DBS & A

ATTN: Mike McVey

Mailing Address: 6020 Academy Rd. NE STE 100, Albuquerque, NM 87109

Phone #: 505-822-9400

email or Fax#: 505-822-8877

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Soity Pad

Project #: ES08.0118.01.00004

Project Manager: Mike McVey, PE

Sampler: Cm Barnhill PE

On Ice: ☒ Yes ☐ No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0903463
3/24/09	1245	Soil	DBS-3 0'-2'	14oz Jar	None	18 16
3/24/09	1300	Soil	DBS-3 10'-12'			19 17
3/24/09	1310	Soil	DBS-3 20'-22'			20 18
3/24/09	1325	Soil	DBS-3 30'-32'			21 19
3/24/09	1345	Soil	DBS-3 40'-42'			22 20
3/24/09	1400	Soil	DBS-3 50'-52'			23 21
3/24/09	1415	Soil	DBS-3 60'-62'			24 22
NO Sample			DBS-3 70'-72'			25
3/24/09	1500	Soil	DBS-3 80'-82'			26 23

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	X Chloride EPA 300.0				Air Bubbles (Y or N)
											X				N/A

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/29/09	1200			3/30/09	9:45
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: DBS & A	Turn-Around Time: ☑ Standard ☐ Rush
ATTN: Mike McVey	Project Name: Salty Dog
Mailing Address: 6020 Academy Rd. NE STE 100, Albuquerque NM 87109	Project #: ES08.0118.01.00004
Phone #: 505-822-9400	Project Manager: Mike McVey, PE
email or Fax#: 505-822-8877	Sampler: CM Barnhill, PE
QA/QC Package: ☑ Standard ☐ Level 4 (Full Validation)	On Ice: ☑ Yes ☐ No
Accreditation: ☐ NELAP ☐ Other	Sample Temperature: 3
☐ EDD (Type)	

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0903463
3/25/09	1345	Soil	DBS-4 0'-2'	1x 4oz/6 Jar	None	27 24
3/25/09	1350	Soil	DBS-4 10'-12'			28 25
3/25/09	1400	Soil	DBS-4 20'-22'			29 26
3/25/09	1410	Soil	DBS-4 30'-32'			30 27
3/25/09	1420	Soil	DBS-4 40'-42'			31 28
3/25/09	1440	Soil	DBS-4 50'-52'			32 29
3/25/09	1500	Soil	DBS-4 60'-62'			33 30
3/25/09	1520	Soil	DBS-4 70'-72'			34 31
3/25/09	1555	Soil	DBS-4 80'-82'			35 32

Analysis Request															
BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride EPA 300.0				Air Bubbles (Y or N)
											X				N/A

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/29/09	1200			3/30/09	9:45
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: DBS & A	☒ Standard ☐ Rush
ATTN: Mike McVey	Project Name: Salty Dog
Mailing Address: 6020 Academy RD NE STE 100, ALBUQUERQUE NM	Project #: ES08.0118.01.00004
Phone #: 505-822-9400 87109	Project Manager: MIKE McVEY, PE.
email or Fax#: 505 822-8877	Sampler: CM Barnhill, PG
QA/QC Package: ☒ Standard ☐ Level 4 (Full Validation)	On Ice: ☒ Yes ☐ No
Accreditation ☐ NELAP ☐ Other	Sample Temperature: 3
☐ EDD (Type)	

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0903463	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	CHLORIDE @ EPA 300.0			Air Bubbles (Y or N)
3/23/09	15:40	Soil	DBS-5-0'-2'	1 x 4oz G/Jar	None	~~36~~ 33												X			N/A
3/23/09	16:00	Soil	DBS-5-10'-12'			~~37~~ 34															
3/23/09	16:20	Soil	DBS-5-20'-22'			~~38~~ 35															
3/23/09	17:20	Soil	DBS-5-40'-42'			~~39~~ 36															
3/24/09	0750	Soil	DBS-5-56'-52'			~~40~~ 37															
3/24/09	0810	Soil	DBS-5-60'-62'			~~41~~ 38															
3/24/09	0845	Soil	DBS-5-70'-72'			~~42~~ 39															
3/24/09	0920	Soil	DBS-5-80'-82'			~~43~~ 40															

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/29/09	1200			3/30/09	9:45
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: ANY QUESTIONS? Please Call Mike McVey @ 505-822-9400

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Chain-of-Custody Record

Client: DBS & A

ATTN: Mike McVey

Mailing Address: 6020 Academy RD, N.E. STE 100 Albuquerque, NM 87109

Phone #: 505-822-9400

email or Fax#: 505-822-8877

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: Salty Dog

Project #: ES08.0118.01.00004

Project Manager: Mike McVey, PE.

Sampler: CM Barnhill, PE

On Ice: ☒ Yes ☐ No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0903463
3/26/09	0820	Soil	DBS-6 0'-2'	1 x 4oz Jar	None	41
3/26/09	0835	Soil	DBS-6 10'-12'			42
3/26/09	0845	Soil	DBS-6 20'-22'			43
3/26/09	0900	Soil	DBS-6 30'-32'			44
3/26/09	0915	Soil	DBS-6 40'-42'			45
3/26/09	0940	Soil	DBS-6 50'-52'			46
3/26/09	1000	Soil	DBS-6 60'-62'			47
3/26/09	1015	Soil	DBS-6 70'-72'			48
3/26/09	1045	Soil	DBS-6 80'-82'			49

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA) EDA Volume 30ml	Air Bubbles (Y or N)
										X	N

Date	Time	Relinquished by:	Received by:	Date	Time
3/29/09	1200			3/30/09	9:45
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

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Chain-of-Custody Record

Client: DBS & A

ATTN: Mike McVey

Mailing Address: 6020 Academy RD, NE. STE. 100 Albuquerque, NM 87109

Phone #: 505-822-9400

email or Fax#: 505-822-8877

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☑ Standard ☐ Rush _____

Project Name: Salty Dog

Project #: E508.0118.01.00004

Project Manager: Mike McVey, PE.

Sampler: CM Barnhill, PE

On Ice: ☑ Yes ☐ No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0903463	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride 300.0				Air Bubbles (Y or N)
3/26/09	1300	SOIL	DBS-7 0'-2'	1x4oz/6 Jar	None	53 50												X				N/A
3/26/09	1310	SOIL	DBS-7 10'-12'			54 51																
3/26/09	1320	SOIL	DBS-7 20'-22'			55 52																
3/26/09	1330	SOIL	DBS-7 30'-32'			NR 56 53																
3/26/09	1345	SOIL	DBS-7 40'-42'			3/30 57 54																
3/26/09	1400	SOIL	DBS-7 50'-52'			58 55																
3/26/09	1415	SOIL	DBS-7 60'-62'			59 56																
3/26/09	1430	SOIL	DBS-7 70'-72'			60 57																
3/26/09	1500	SOIL	DBS-7 80'-82'			61 58																

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/29/09	1200			3/30/09	9:45
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

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Chain-of-Custody Record

Client: DBS & A

ATTN: Mike McVey

Mailing Address: 6020 Academy RD, NE. STE 100, Albuquerque, NM 87109

Phone #: 505-822-9400

email or Fax#: 505-822-8877

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Salty Dog

Project #: E508.0118.01.00004

Project Manager: Mike McVey, PE

Sampler: CM Barnhill, PE

On Ice: ☒ Yes ☐ No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0903463	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chlorides EPA 300.0			Air Bubbles (Y or N)
3/26/09	1640	Soil	DBS-8 6'-2'	1x4oz/c JAR	None	62 59												X			H/B
3/26/09	1655	Soil	DBS-8 10'-12'			63 60															
3/26/09	1713	Soil	DBS-8 20'-22'			64 61															
3/26/09	1725	Soil	DBS-8 30'-32'			3/30 65 62															
3/26/09	1740	Soil	DBS-8 40'-42'			66 63															
3/26/09	1755	Soil	DBS-8 50'-52'			67 64															
3/27/09	0830	Soil	DBS-8 60'-62'			68 65															
3/27/09	0845	Soil	DBS-8 70'-72'			69 66															
3/27/09	0925	Soil	DBS-8 80'-82'			70 67															

Date	Time	Relinquished by:	Received by:	Date	Time
3/29/09	1200			9:45 3/30/09	
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: ANY Questions Please Call Mike McVey @ 505-822-9400

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Friday, April 17, 2009

Mike McVey
Daniel B. Stephens & Assoc.
6020 Academy NE Suite 100
Albuquerque, NM 87109

TEL: (505) 822-9400
FAX (505) 822-8877

RE: Salty Dog

Order No.: 0904064

Dear Mike McVey:

Hall Environmental Analysis Laboratory, Inc. received 22 sample(s) on 4/3/2009 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-1 10'-12'
Lab Order:	0904064	**Collection Date:**	3/31/2009 10:20:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-01	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: RAGS
Chloride	1300	6.0		mg/Kg	20	4/16/2009 1:19:37 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
E	Estimated value
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
S	Spike recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
MCL	Maximum Contaminant Level
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-1 20'-22'
Lab Order:	0904064	**Collection Date:**	3/31/2009 10:30:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-02	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	3600	15		mg/Kg	50	4/16/2009 1:37:02 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
E	Estimated value
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
S	Spike recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
MCL	Maximum Contaminant Level
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-1 30'-32'
Lab Order:	0904064	**Collection Date:**	3/31/2009 10:45:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-03	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	800	6.0		mg/Kg	20	4/16/2009 1:54:27 AM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Estimated value	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-1 40'-42'
Lab Order:	0904064	**Collection Date:**	3/31/2009 11:00:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-04	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	2500	15		mg/Kg	50	4/16/2009 2:11:51 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-1 50'-52'
Lab Order:	0904064	**Collection Date:**	3/31/2009 11:15:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-05	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	2400	15		mg/Kg	50	4/16/2009 3:21:29 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-1 60'-62'
Lab Order:	0904064	**Collection Date:**	3/31/2009 11:30:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-06	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	1800	6.0		mg/Kg	20	4/16/2009 3:38:53 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-2 0'-2'
Lab Order:	0904064	**Collection Date:**	4/1/2009 10:10:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-07	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	12	0.30		mg/Kg	1	4/15/2009 11:52:35 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
E	Estimated value
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
S	Spike recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
MCL	Maximum Contaminant Level
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-2 10'-12'
Lab Order:	0904064	**Collection Date:**	4/1/2009 10:25:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-08	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	6.2	0.30		mg/Kg	1	4/16/2009 12:10:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
E	Estimated value
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
S	Spike recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
MCL	Maximum Contaminant Level
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-2 20'-22'
Lab Order:	0904064	**Collection Date:**	4/1/2009 10:30:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-09	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	12	0.30		mg/Kg	1	4/16/2009 12:27:24 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
E	Estimated value
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
S	Spike recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
MCL	Maximum Contaminant Level
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-2 30'-32'
Lab Order:	0904064	**Collection Date:**	4/1/2009 10:45:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-10	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	16	0.30		mg/Kg	1	4/16/2009 12:44:48 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
E	Estimated value
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
S	Spike recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
MCL	Maximum Contaminant Level
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-2 40'-42'
Lab Order:	0904064	**Collection Date:**	4/1/2009 11:00:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-11	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	1.8	0.30		mg/Kg	1	4/16/2009 6:32:58 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-2 50'-52'
Lab Order:	0904064	**Collection Date:**	4/1/2009 11:15:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-12	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	240	6.0		mg/Kg	20	4/15/2009 3:10:18 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Estimated value	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	DBS NW-2 60'-62'
Lab Order:	0904064	**Collection Date:**	4/1/2009 11:30:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-13	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	47	6.0		mg/Kg	20	4/15/2009 8:58:28 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank	
	E	Estimated value	H	Holding times for preparation or analysis exceeded	
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level	
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit	
	S	Spike recovery outside accepted recovery limits			

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 0'-2'
Lab Order:	0904064	**Collection Date:**	3/30/2009 10:50:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-14	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	99	6.0		mg/Kg	20	4/15/2009 9:15:53 PM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 10'-12'
Lab Order:	0904064	**Collection Date:**	3/30/2009 11:05:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-15	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	4100	15		mg/Kg	50	4/16/2009 6:24:02 PM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	36	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 20'-22'
Lab Order:	0904064	**Collection Date:**	3/30/2009 11:15:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-16	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	560	6.0		mg/Kg	20	4/15/2009 9:50:42 PM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	220	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 30'-32'
Lab Order:	0904064	**Collection Date:**	3/30/2009 11:30:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-17	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	480	6.0		mg/Kg	20	4/15/2009 10:08:07 PM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	64	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 40'-42'
Lab Order:	0904064	**Collection Date:**	3/30/2009 11:45:00 AM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-18	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	550	6.0		mg/Kg	20	4/15/2009 10:25:31 PM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	40	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 50'-52'
Lab Order:	0904064	**Collection Date:**	3/30/2009 1:00:00 PM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-19	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	160	6.0		mg/Kg	20	4/15/2009 10:42:56 PM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	82	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 60'-62'
Lab Order:	0904064	**Collection Date:**	3/30/2009 1:20:00 PM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-20	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	93	0.30		mg/Kg	1	4/16/2009 4:13:42 AM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 70'-72'
Lab Order:	0904064	**Collection Date:**	3/30/2009 1:40:00 PM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-21	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	65	3.0		mg/Kg	10	4/16/2009 5:05:55 AM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *17-Apr-09*

CLIENT:	Daniel B. Stephens & Assoc.	**Client Sample ID:**	SB-1/DBS-9 80'-82'
Lab Order:	0904064	**Collection Date:**	3/30/2009 2:00:00 PM
Project:	Salty Dog	**Date Received:**	4/3/2009
Lab ID:	0904064-22	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Chloride	9.7	3.0		mg/Kg	10	4/16/2009 5:23:19 AM
EPA METHOD 418.1: TPH						Analyst: **LRW**
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	4/8/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

QA/QC SUMMARY REPORT

Client: Daniel B. Stephens & Assoc.
Project: Salty Dog **Work Order:** 0904064

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 300.0: Anions									
Sample ID: MB-18826		*MBLK*			Batch ID: **18826**		Analysis Date:	4/15/2009 5:53:11 AM	
Chloride	ND	mg/Kg	0.30						
Sample ID: MB-18837		*MBLK*			Batch ID: **18837**		Analysis Date:	4/15/2009 8:23:40 PM	
Chloride	ND	mg/Kg	0.30						
Sample ID: LCS-18826		*LCS*			Batch ID: **18826**		Analysis Date:	4/15/2009 6:10:36 AM	
Chloride	15.39	mg/Kg	0.30	103	90	110			
Sample ID: LCS-18837		*LCS*			Batch ID: **18837**		Analysis Date:	4/15/2009 8:41:04 PM	
Chloride	15.66	mg/Kg	0.30	104	90	110			
Method: EPA Method 418.1: TPH									
Sample ID: MB-18766		*MBLK*			Batch ID: **18766**		Analysis Date:	4/8/2009	
Petroleum Hydrocarbons, TR	ND	mg/Kg	20						
Sample ID: LCS-18766		*LCS*			Batch ID: **18766**		Analysis Date:	4/8/2009	
Petroleum Hydrocarbons, TR	103.7	mg/Kg	20	104	82	114			
Sample ID: LCSD-18766		*LCSD*			Batch ID: **18766**		Analysis Date:	4/8/2009	
Petroleum Hydrocarbons, TR	105.1	mg/Kg	20	105	82	114	1.32	20	

Qualifiers:

*	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name DBS | Date Received: 4/3/2009

Work Order Number 0904064 | Received by: AT

Checklist completed by: _____ 4/3/09 | Sample ID labels checked by: _____ Initials

Signature | Date

Matrix: | Carrier name: Client drop-off

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☐	Not Shipped ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
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 ☐		
Water - VOA vials have zero headspace? No VOA vials submitted	☑	Yes ☐	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	
Container/Temp Blank temperature?	6°	<6° C *Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

_____

_____

_____

_____

Corrective Action _____

_____

_____

Chain-of-Custody Record

Client: DBS & A ATTN: Mike McVey	☑ Standard ☐ Rush Project Name: Salty Dog
Mailing Address: 6020 Academy Road NE STE 100, Albuquerque NM 87109	Project #: ES08.0118.01.00004
Phone #: 505-822-9400	Project Manager: Mike McVey, PE.
email or Fax#: 505-822-8877	Sampler: CM Barnhill, PE
QA/QC Package: ☑ Standard ☐ Level 4 (Full Validation)	On Ice: ☑ Yes ☐ No
Accreditation ☐ NELAP ☐ Other	Sample Temperature: 6°
☐ EDD (Type)	

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904064	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	24 hour 300.0				Air Bubbles (Y or N)
No Sample			DBS NW-1 0'-2'	1x40z/G/Jar	None	1												X				N/A
03/31/09	10:20	Soil	DBS NW-1 10'-12'			2 1																
3/31/09	10:30	Soil	DBS NW-1 20'-22'			3 2																
3/31/09	10:45	Soil	DBS NW-1 30'-32'			4 3																
3/31/09	11:00	Soil	DBS NW-1 40'-42'			5 4																
3/31/09	11:15	Soil	DBS NW-1 50'-52'			6 5																
3/31/09	11:30	Soil	DBS NW-1 60'-62'			7 6																

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/1/09	1600			4/3/09	1310
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain of Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: DBS & A	☒ Standard ☐ Rush
ATTN: Mike McVey	Project Name: Salty Dog
Mailing Address: 6020 Academy Road NE STE 100, Albuquerque NM 87109	Project #: ES08.0118.01.00004
Phone #: 575-822-9400	Project Manager: Mike McVey, PE
email or Fax#: 505-822-8877	Sampler: CM Barnhill PE
QA/QC Package: ☒ Standard ☐ Level 4 (Full Validation)	On Ice: ☒ Yes ☐ No
☐ Other ☐ EDD (Type)	Sample Temperature: 6

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904064	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride 300.0				Air Bubbles (Y or N)
4/01/09	10:10	SOIL	DBS NW-2 0'-2'	1/4oz/G Jar	None	8 7												X				N/A
4/01/09	10:25	SOIL	DBS NW-2 10'-12'			9 8																
4/01/09	10:30	SOIL	DBS NW-2 20'-22'			10 9																
4/01/09	10:45	SOIL	DBS NW-2 30'-32'			11 10																
4/01/09	11:00	SOIL	DBS NW-2 40'-42'			12 11																
4/01/09	11:15	SOIL	DBS NW-2 50'-52'			13 12																
4/01/09	1130	SOIL	DBS NW-2 60'-62'			14 13																

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/02/09	1600			4/3/09	1310
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

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Chain-of-Custody Record

Client: DBS & A	☑ Standard ☐ Rush
ATTN: Mike McVey	Project Name: Salty Dog
Mailing Address: 6020 Academy NE Road NE STE 100 Albuquerque, NM 87109	Project #: ES08.0113.01.00004
Phone #: 505-822-9400	Project Manager: Mike McVey, PE
email or Fax#: 505-822-8877	Sampler: CM Barnhill, PE
QA/QC Package: ☑ Standard ☐ Level 4 (Full Validation)	On Ice: ☑ Yes ☐ No
Accreditation ☐ NELAP ☐ Other _____	Sample Temperature: 6°
☐ EDD (Type) _____	

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chlorine 300.0				Air Bubbles (Y or N)
						0904064																
3/30/09	1050	Soil	SB-1/DBS-9 0'-2'	2-4oz/6/Jar	None	15 14				X								X				N/A
3/30/09	1105	Soil	SB-1/DBS-9 10'-12'			16 15																
3/30/09	1115	Soil	SB-1/DBS-9 20'-22'			17 16																
3/30/09	1130	Soil	SB-1/DBS-9 30'-32'			18 17																
3/30/09	1145	Soil	SB-1/DBS-9 40'-42'			19 18																
3/30/09	1300	Soil	SB-1/DBS-9 50'-52'			20 19																
3/30/09	1320	Soil	SB-1/DBS-9 60'-62'			21 20																
3/30/09	1340	Soil	SB-1/DBS-9 70'-72'			22 21																
3/30/09	1400	Soil	SB-1/DBS-9 80'-82'			23 22																

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/1/09	1600			4/1/09	
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Groundwater

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Wednesday, April 22, 2009

Mike McVey
Daniel B. Stephens & Assoc.
6020 Academy NE Suite 100
Albuquerque, NM 87109

TEL: (505) 822-9400
FAX (505) 822-8877

RE: Salty Dog Brine Station

Order No.: 0904165

Dear Mike McVey:

Hall Environmental Analysis Laboratory, Inc. received 21 sample(s) on 4/10/2009 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX

Hall Environmental Analysis Laboratory, Inc.

Date: *22-Apr-09*

CLIENT: Daniel B. Stephens & Assoc.
Project: Salty Dog Brine Station
Lab Order: 0904165

Lab ID: 0904165-01 **Collection Date:** 4/8/2009 2:57:00 PM
Client Sample ID: PMW-1 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	11000	50		mg/L	500	4/21/2009 1:27:50 PM

Lab ID: 0904165-02 **Collection Date:** 4/7/2009 1:18:00 PM
Client Sample ID: MW-2 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	1200	5.0		mg/L	50	4/22/2009 2:31:16 AM

Lab ID: 0904165-03 **Collection Date:** 4/7/2009 2:13:00 PM
Client Sample ID: MW-3 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	17000	50		mg/L	500	4/21/2009 2:02:39 PM

Lab ID: 0904165-04 **Collection Date:** 4/7/2009 3:00:00 PM
Client Sample ID: MW-4 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	6600	50		mg/L	500	4/22/2009 2:13:52 AM

Lab ID: 0904165-05 **Collection Date:** 4/7/2009 3:45:00 PM
Client Sample ID: MW-5 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	1300	5.0		mg/L	50	4/22/2009 3:23:30 AM

Lab ID: 0904165-06 **Collection Date:** 4/7/2009 4:23:00 PM
Client Sample ID: MW-6 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	25	0.10		mg/L	1	4/21/2009 2:54:52 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Estimated value	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *22-Apr-09*

CLIENT: Daniel B. Stephens & Assoc.
Project: Salty Dog Brine Station
Lab Order: 0904165

Lab ID: 0904165-07 **Collection Date:** 4/8/2009 10:55:00 AM
Client Sample ID: DBS-1 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	320	1.0		mg/L	10	4/21/2009 3:12:17 PM

Lab ID: 0904165-08 **Collection Date:** 4/8/2009 10:13:00 AM
Client Sample ID: DBS-2 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	14	0.10		mg/L	1	4/21/2009 3:29:41 PM

Lab ID: 0904165-09 **Collection Date:** 4/8/2009 8:44:00 AM
Client Sample ID: DBS-3 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	36	0.10		mg/L	1	4/21/2009 3:47:05 PM

Lab ID: 0904165-10 **Collection Date:** 4/8/2009 9:28:00 AM
Client Sample ID: DBS-4 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	38	0.10		mg/L	1	4/21/2009 4:04:30 PM

Lab ID: 0904165-11 **Collection Date:** 4/8/2009 7:58:00 AM
Client Sample ID: DBS-5 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	65	1.0		mg/L	10	4/21/2009 6:06:22 PM

Lab ID: 0904165-12 **Collection Date:** 4/7/2009 6:32:00 PM
Client Sample ID: DBS-6 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	380	2.0		mg/L	20	4/21/2009 6:23:46 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *22-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0904165
Project: Salty Dog Brine Station

Lab ID: 0904165-13 **Collection Date:** 4/7/2009 5:07:00 PM
Client Sample ID: DBS-7 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	570	5.0		mg/L	50	4/21/2009 6:41:10 PM

Lab ID: 0904165-14 **Collection Date:** 4/7/2009 5:52:00 PM
Client Sample ID: DBS-8 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	58	1.0		mg/L	10	4/21/2009 6:58:34 PM

Lab ID: 0904165-15 **Collection Date:** 4/8/2009 6:01:00 PM
Client Sample ID: DBS-9 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **SCC**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/13/2009
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	4/13/2009
Surr: DNOP	115	58-140		%REC	1	4/13/2009
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **DAM**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	4/15/2009 2:17:54 AM
Surr: BFB	89.1	59.9-122		%REC	1	4/15/2009 2:17:54 AM
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	210	10		mg/L	100	4/21/2009 7:15:59 PM

Lab ID: 0904165-16 **Collection Date:** 4/8/2009 12:56:00 PM
Client Sample ID: NW-1 Shallow **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	630	5.0		mg/L	50	4/21/2009 7:33:24 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *22-Apr-09*

CLIENT: Daniel B. Stephens & Assoc. **Lab Order:** 0904165
Project: Salty Dog Brine Station

Lab ID: 0904165-17 **Collection Date:** 4/8/2009 12:31:00 PM
Client Sample ID: NW-1 Middle **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	57	1.0		mg/L	10	4/21/2009 8:25:37 PM

Lab ID: 0904165-18 **Collection Date:** 4/8/2009 12:00:00 PM
Client Sample ID: NW-1 Deep **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	38	0.10		mg/L	1	4/21/2009 8:43:02 PM

Lab ID: 0904165-19 **Collection Date:** 4/8/2009 5:07:00 PM
Client Sample ID: NW-2 Shallow **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	410	5.0		mg/L	50	4/21/2009 9:00:26 PM

Lab ID: 0904165-20 **Collection Date:** 4/8/2009 4:51:00 PM
Client Sample ID: NW-2 Middle **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	570	2.0		mg/L	20	4/22/2009 11:06:09 AM

Lab ID: 0904165-21 **Collection Date:** 4/8/2009 4:19:00 PM
Client Sample ID: NW-2 Deep **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **TAF**
Chloride	4700	20		mg/L	200	4/21/2009 9:35:16 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Estimated value	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

QA/QC SUMMARY REPORT

ient: Daniel B. Stephens & Assoc.
Project: Salty Dog Brine Station **Work Order:** 0904165

nalyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 300.0: Anions									
mple ID: 0904165-08AMSD		*MSD*			Batch ID: **R33344**		Analysis Date:	4/21/2009 5:14:09 PM	
hloride	18.72	mg/L	0.10	87.9	75	125	1.09	20	
Sample ID: MB		*MBLK*			Batch ID: **R33344**		Analysis Date:	4/21/2009 12:53:01 PM	
loride	ND	mg/L	0.10						
mple ID: MB		*MBLK*			Batch ID: **R33358**		Analysis Date:	4/22/2009 10:31:19 AM	
Chloride	ND	mg/L	0.10						
mple ID: LCS		*LCS*			Batch ID: **R33344**		Analysis Date:	4/21/2009 1:10:25 PM	
hloride	5.075	mg/L	0.10	101	90	110			
Sample ID: LCS		*LCS*			Batch ID: **R33358**		Analysis Date:	4/22/2009 10:48:44 AM	
loride	4.969	mg/L	0.10	99.4	90	110			
mple ID: 0904165-08AMS		*MS*			Batch ID: **R33344**		Analysis Date:	4/21/2009 4:56:44 PM	
Chloride	18.92	mg/L	0.10	92.0	75	125			
thod: EPA Method 8015B: Diesel Range									
Sample ID: MB-18809		*MBLK*			Batch ID: **18809**		Analysis Date:	4/13/2009	
esel Range Organics (DRO)	ND	mg/L	1.0						
tor Oil Range Organics (MRO)	ND	mg/L	5.0						
Sample ID: LCS-18809		*LCS*			Batch ID: **18809**		Analysis Date:	4/13/2009	
Diesel Range Organics (DRO)	5.228	mg/L	1.0	105	74	157			
mple ID: LCSD-18809		*LCSD*			Batch ID: **18809**		Analysis Date:	4/13/2009	
Diesel Range Organics (DRO)	5.455	mg/L	1.0	109	74	157	4.25	23	
thod: EPA Method 8015B: Gasoline Range									
mple ID: 5ML RB		*MBLK*			Batch ID: **R33239**		Analysis Date:	4/14/2009 9:30:26 AM	
Gasoline Range Organics (GRO)	ND	mg/L	0.050						
mple ID: 2.5UG GRO LCS		*LCS*			Batch ID: **R33239**		Analysis Date:	4/14/2009 6:38:55 PM	
soline Range Organics (GRO)	0.5620	mg/L	0.050	112	80	115			

Qualifiers:

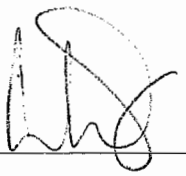
J	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name DBS | Date Received: 4/10/2009

Work Order Number 0904165 | Received by: TLS

Checklist completed by:  4/10/09 | Sample ID labels checked by: 

Signature | Date | Initials

Matrix: | Carrier name: UPS

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
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 ☐		
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	
Container/Temp Blank temperature?	2°	*<6° C Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Chain-of-Custody Record

Client: DBS & A

ATTN: Mike McVey

Mailing Address: 6020 Academy ROAD NE STE 100 Albuquerque NM 87109

Phone #: 505-822-9400

email or Fax#: 505-822-8877

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Salty Dog Brine Station

Project #: ES08.0118.01.00004

Project Manager: Mike McVey, PE.

Sampler: Jim Barnhill, PG.

On Ice: ☒ Yes ☐ No

Sample Temperature: 2°

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904165	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride EPA 300.0				Air Bubbles (Y or N)
4/06/09	1457	H_2O	PMW-1	1x 125mL plastic	None	1																N/G
4/07/09	1318	H_2O	MW-2			2																1
4/07/09	1413	H_2O	MW-3			3																
4/07/09	1500	H_2O	MW-4			4																
4/07/09	1545	H_2O	MW-5			5																
4/07/09	1623	H_2O	MW-6			6																
4/08/09	1055	H_2O	DBS-1			7																
4/08/09	1013	H_2O	DBS-2			8																
4/08/09	0844	H_2O	DBS-3			9																
4/08/09	0928	H_2O	DBS-4			10																
4/08/09	0758	H_2O	DBS-5			11																
4/07/09	1832	H_2O	DBS-6			12																

Date: 4/09/09 Time: 1430 Relinquished by: [signature]

Date: Time: Relinquished by:

Received by: [signature] Date: 4/10/09 Time: 1000

Received by: Date: Time:

Remarks: Any Questions Please Call Mike McVey @ 505-822-9400

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Turn-Around Time:
☑ Standard ☐ Rush

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: DBS & A
ATTN: Mike McVey
Mailing Address: 6020 Academy Road NE
STE 100, Albuquerque, NM 87109
Phone #: 505-822-9400
email or Fax#: 505-822-8877
QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Project Name: Salty Dog Brine Station
Project #: E508.0118.01.00004
Project Manager: Mike McVey, PE.
Sampler: CM Barnhill, Jr.
On Ice: ☑ Yes ☐ No
Sample Temperature: 2°

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904165	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride EPA 300.0				Air Bubbles (Y or N)
4/07/09	1707	H2O	DBS-7	1x 125 mL plastic	None	13												X				N/A
4/07/09	1752	H2O	DBS-8	" "	" "	14												X				N/A
4/08/09	1801	H2O	DBS-9	1x 250 mL plastic	None	15			X									X				N/A
				3x VOAs	HCl/HNO3	15																
				1x 250 mL	H2SO4																	
				1x 250 mL		15																
4/08/09	1256	H2O	NW-1 Shallow	1x 125 mL plastic	None	16												X				N/A
4/08/09	1231	H2O	NW-1 Middle			17																
4/08/09	1200	H2O	NW-1 Deep			18																
4/08/09	1707	H2O	NW-2 Shallow			19																
4/08/09	1651	H2O	NW-2 Middle			20																
4/08/09	1619	H2O	NW-2 Deep			21																

Date	Time	Relinquished by:	Received by:	Date	Time
4/09/09	1430			4/10/09	1000
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Please call Mike McVey @ 505-822-9400 To Discuss Any additional Analyses Needed on Sample DBS-9

Appendix C

Well Data Forms

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-1 Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dog Brine Station	2. Project Location Salty Dog Brine Pond Area Lea Co. NM	3. Date 04/08/09
4. Technician CMBarnhill, PG		
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) DBS-1

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 10:30	Date: 04/08/09 Time: 11:00	Date: Time:
10. Total Depth of Well (from TOC) 78.50'	15. Total Depth of Well (from TOC) 78.50'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.38'	16. Water Level (from TOC) 62.63'	21. Water Level (from TOC)

12. Water Column Height 16.12'	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes 7.73 Gallons
13. Well Diameter 2" SCH 40 PVC MW	(2")	(0.16)	0.1534	18. 5 Well Volumes 12.89 Gallons
14. Well Volume (gal) (s) w.e. height) 2.576	4"	0.65	0.5972	19. Purge Volume 10 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of (Pump) or Bailer: Red Flo 2, 1.8" Submersible Set @ T.D.

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled?
10 Gallons	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: Sampling Personnel? DBS-1, 04/08/09 CMBarnhill @ 10:55

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
10:54	19.99	1.383	8.35	clear	62.63	10 Gallons	1.0 GPM	clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid Initially - clear @ Sample.

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
10:42	21.53	1.343	8.11	Turbid	62.38'	Initial	4.39	1.0	Turbid
10:45	20.99	1.366	8.27	Turbid	—	2.5	2.37	1.0	Turbid
10:48	20.30	1.394	8.33	Turbid	—	5.0	2.36	1.0	Turbid
10:51	19.72	1.386	8.35	clear	—	7.5	2.67	1.0	clear
10:54	19.99	1.383	8.35	clear	62.63'	10.0	2.71	1.0	clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CMBarnhill PG — Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well	Type of Data	Well No. / Sheet
☑ MW ☐ Production ☐ Other _____	☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-2 Sheet 1 of 1 Sheets

1. Project	2. Project Location	3. Date
DBS&A Salty Dog Brine Station	Salty Dog Brine Pond Area Lea Co, N.M.	04/08/09
4. Technician: CM Barnhill, PG		
7. Method: (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig: DSR-2001	9. Location of Well (Site, Description): DBS-2

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 0950	Date: 04/08/09 Time: 10:15	Date: Time:
10. Total Depth of Well (from TOC): 79.80'	15. Total Depth of Well (from TOC): 79.60'	20. Total Depth of Well (from TOC):
11. Water Level (from TOC): 65.45'	16. Water Level (from TOC): 66.33	21. Water Level (from TOC):

12. Water Column Height	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes	22. Size and Type of Pump or Bailer
14.35'				6.88 Gallons	
13. Well Diameter: 2" SCH 40 PVC MW	(2")	0.16	0.1534	18. 5 Well Volumes: 11.48 Gallons	Redi-flo 2, 1.8" Submersible set @ T.D.
	4"	0.65	0.5972		
	6"	1.47	1.3540		
14. Well Volume (gal) (s) w.e. height): 2.296'	8"	2.61	2.3720	19. Purge Volume: 10 Gallons	

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled?
10 Gallons	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: Sampling Personnel? DBS-2, 04/08/09 CMBarnhill @ 10:13

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
10:12	20.08	0.451	8.24	Almost clear	66.33	10 Gallons	1.0 GPM	Almost clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid initially - almost clear @ Sample.

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
10:00	21.34	0.699	8.24	Turbid	65.45'	Initial	5.87	1.0	Turbid
10:03	20.79	0.494	8.28	Turbid	—	2.5	4.98	1.0	Turbid
10:06	20.29	0.461	8.24	Turbid	—	5.0	3.89	1.0	Turbid
10:09	20.17	0.452	8.24	Turbid	—	7.5	3.36	1.0	Turbid
10:12	20.08	0.451	8.23	Almost clear	66.33'	10.0	3.61	1.0	Almost clear.

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CM Barnhill PG — Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-3 Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dog Brine Station	2. Project Location Salty Dog Brine Pond Area Lea Co; N.M.	3. Date 04/08/09
4. Technician CM Barnhill, PG		
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) DBS-3

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 0820	Date: 04/08/09 Time: 0948	Date: Time:
10. Total Depth of Well (from TOC) 78.72'	15. Total Depth of Well (from TOC) 78.60'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 60.67'	16. Water Level (from TOC) 61.44	21. Water Level (from TOC)

12. Water Column Height 18.05'	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes 8.66 Gallons
13. Well Diameter 2" Sch 40 PVC MW	(2")	(0.16)	0.1534	18. 5 Well Volumes 14.44 Gallons.
14. Well Volume (gal) (s) w.e. height) 2.88 Gal.	4"	0.65	0.5972	19. Purge Volume 10 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of (Pump) or Bailer: Redi-flo2, 1.8" Submersible Set @ T.D.

Final Field Analysis

23. Total Amount of Water Removed 10 Gallons.	24. Was Well Pumped Dry? Yes (No)	25. Was water added to well? (No) Yes If yes, source:	26. Was the Groundwater Sampled (Yes) No If yes, what was the sample number & Date: Sampling Personnel? DBS-3, 04/08/09 CM Barnhill @ 0844

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
0843	19.53	0.552	7.44	Clear	61.44'	10 Gallons	1.0 GPM	Clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid Initially - Clear Sample

29. Purgewater disposal method: On Ground Surface.

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
0831	18.06	0.735	7.89	Turbid	60.67'	10 (10.1)	6.44	1.0	Turbid
0834	18.85	0.620	7.68	Turbid	—	2.5	4.56	1.0	Turbid
0837	19.34	0.583	7.52	Turbid	—	5.0	2.66	1.0	Turbid
0840	19.58	0.558	7.48	Turbid	—	7.5	2.55	1.0	Turbid
0843	19.53	0.552	7.44	Clear	61.44'	10.0	2.93	1.0	Clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CM Barnhill PG — Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-4 Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dog Brine Station	2. Project Location Salty Dog Brine Pond Area Lea Co, NM	3. Date 04/08/09
4. Technician CM Barnhill, PG		
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) DBS-4

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 0905	Date: 04/08/09 Time: 0935	Date: Time:
10. Total Depth of Well (from TOC) 80.15'	15. Total Depth of Well (from TOC) 80.10'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 66.27'	16. Water Level (from TOC) 66.38'	21. Water Level (from TOC)

12. Water Column Height 13.88'	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes 6.66 Gallons
13. Well Diameter 2" SCH 40 PVC MW	(2")	(0.16)	0.1534	18. 5 Well Volumes 11.10 Gallons
14. Well Volume (gal) (s) w.e. height) 2.2261	4"	0.65	0.5972	19. Purge Volume 10 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of (Pump) or Bailer: Redi-flo2, 1.81" Submersible Set @ T.D.

Final Field Analysis

23. Total Amount of Water Removed 10 Gallons	24. Was Well Pumped Dry? Yes (No)	25. Was water added to well? (No) Yes If yes, source:	26. Was the Groundwater Sampled (Yes) No If yes, what was the sample number & Date: DBS-4, 04/08/09 Sampling Personnel? CM Barnhill @ 0928

27. Final Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
0927	20.38	0.520	7.59	Clear	66.38'	10 Gallons	1.0 GPM	Clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid Initially - Clear @ Sample.

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
0915	19.91	0.819	7.52	Turbid	66.27'	Initial	7.94	1.0	Turbid
0918	20.38	0.595	8.08	Turbid	—	2.5	6.65	1.0	Turbid
0921	20.34	0.540	8.05	Turbid	—	5.0	5.42	1.0	Turbid
0924	20.31	0.523	7.96	Clear	—	7.5	4.97	1.0	Clear
0927	20.38	0.520	7.59	Clear	66.38'	10.0	4.92	1.0	Clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: Christopher M. Barnhill PG — Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-5 Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dot Brine Station	2. Project Location Brine Pond Area Salty Dog Playa Lake Shed & Brine Well Lea County, NM.	3. Date 04/08/2009
4. Technician CM Barnhill, PG		
7. Method Pumping Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) DBS-5

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 0730	Date: 04/08/09 Time: 0800	Date: Time:
10. Total Depth of Well (from TOC) 78.90'	15. Total Depth of Well (from TOC) 78.90'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.99'	16. Water Level (from TOC) 63.55	21. Water Level (from TOC)

12. Water Column Height 15.91'	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes 7.63 Gallons
13. Well Diameter 2" SCH 40 PVC MW	(2")	0.16	0.1534	18. 5 Well Volumes 12.72 Gallons
14. Well Volume (gal) (s) w.e. height) 2.546al	4"	0.65	0.5972	19. Purge Volume 10 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of Pump or Bailer: Redi flo2, 1.8" Submersible set @ T.D.

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled
10 Gallons	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: Sampling Personnel? DBS-5, 04/08/09 CM Barnhill @ 0758

27. Final Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
0757	19.60	0.777	7.15	Almost clear	63.55'	10 Gallons	1.0 GPM	Almost clear @ Sample

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid Initially – Almost clear @ Sample

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
0745	16.04	0.858	7.39	Turbid	62.99	Initial	5.11	1.0	Turbid
0748	17.89	0.811	7.16	Turbid	—	2.5	4.07	1.0	Turbid
0751	19.09	0.758	7.19	Turbid	—	5.0	4.18	1.0	Turbid
0754	19.57	0.778	7.16	Turbid	—	7.5	4.57	1.0	Turbid
0757	19.60	0.777	7.15	Almost clear	63.55'	10.0	4.96	1.0	Almost clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CM Barnhill PG. Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-6 Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dog Brine Station	2. Project Location Salty Dog, Playa Lake Shed & Brine well Area Lea Co, N.M.	3. Date 04/07/09
4. Technician CM Barnhill, PG		
7. Method Pumping Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) DBS-6

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/07/09 Time: 18:15	Date: 04/07/09 Time: 18:36	Date: Time:
10. Total Depth of Well (from TOC) 78.70'	15. Total Depth of Well (from TOC) 78.40'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.75'	16. Water Level (from TOC) 63.70'	21. Water Level (from TOC)

12. Water Column Height 15.95'	Nom Dia	x = gal/ft Sch 40	Sch 80
13. Well Diameter 2" Sch 40 PVC MW	2"	0.16	0.1534
	4"	0.65	0.5972
	6"	1.47	1.3540
	8"	2.61	2.3720
14. Well Volume (gal) (s) w.e. height) 2.556 l.			
17. 3 Well Volumes 7.65 Gallons			
18. 5 Well Volumes 12.76 Gallons			
19. Purge Volume 10 Gallons			
22. Size and Type of Pump or Bailer Redi flo 2, 1.8" submersible @ T.O.			

Final Field Analysis

23. Total Amount of Water Removed 10 Gallons	24. Was Well Pumped Dry? Yes (No)	25. Was water added to well? (No) Yes If yes, source:	26. Was the Groundwater Sampled (Yes) No If yes, what was the sample number & Date: Sampling Personnel? DBS-6, 04/07/06 CMBarnhill 1833

27. Final Parameters

Time	Temp C	Conductivity ms/cm	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
18:32	20.12	1.566	6.95	almost clear	63.70	10 Gallons	1.0 gpm	almost clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid initially - almost clear Sample

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity ms/cm	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
18:20	21.49	1.262	7.96	Turbid	62.75'	initial	7.06	1.0	Turbid
18:23	21.06	1.308	7.37	Turbid	—	2.5	6.85	1.0	Turbid
18:26	20.45	1.434	7.06	Turbid	—	5.0	6.57	1.0	Turbid
1829	20.16	1.545	6.99	Turbid	—	7.5	6.42	1.0	Turbid
1832	20.12	1.566	6.95	almost clear	63.70	10.0	6.21	1.0	almost clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: Christopher M Barnhill PG — Date: 04/07/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-7 Sheet 1 of 1 Sheets
1. Project DBS: A Salty Dog Brine Station	2. Project Location Salty Dog Playa Lake Shed & Brine well area Lea Co, N.M.	3. Date 04/07/09
4. Technician CM Barnhill, PG		
7. Method Pumping Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2000	9. Location of Well (Site, Description) DBS-7

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/07/09 Time: 16:45	Date: 04/07/09 Time: 17:10	Date: Time:
10. Total Depth of Well (from TOC) 77.10'	15. Total Depth of Well (from TOC) 76.20'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 61.74'	16. Water Level (from TOC) 61.89	21. Water Level (from TOC)

12. Water Column Height 15.36'	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes 7.37 Gallons
13. Well Diameter 2" SCH 40 PVC MW	(2")	0.16	0.1534	18. 5 Well Volumes 12.28 Gallons
14. Well Volume (gal) (s) w.e. height) 2.456 gl.	4"	0.65	0.5972	19. Purge Volume 10 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of Pump or Bailer: Redi-flo2, 1.8" Submersible Set @ T.D.

Final Field Analysis

23. Total Amount of Water Removed 10 Gallons.	24. Was Well Pumped Dry? Yes (No)	25. Was water added to well? (No) Yes If yes, source:	26. Was the Groundwater Sampled (Yes) No If yes, what was the sample number & Date: Sampling Personnel? DBS-7, 04/07/09 CM Barnhill PG 1767

27. Final Parameters

Time	Temp C	Conductivity ms/cm	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
1706	20.51	1.999	7.03	almost clear	61.89	10 Gallons	1.0 GPM	Almost clear @ Sample

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid initially — almost clear @ Sample.

29. Purgewater disposal method: on Ground Surface.

Sampling / Development Parameters

Time	Temp C	Conductivity ms/cm	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
16:54	21.79	3.051	7.37	Turbid	61.74'	initial	4.71	1.0 ~~2.5~~	Turbid
16.57	21.16	1.776	7.36	Turbid	—	2.5	4.35	1.0 ~~2.5~~	Turbid
1700	20.83	1.869	7.25	Turbid	—	5.0	5.23	1.0 ~~2.5~~	Turbid
1703	20.69	1.959	7.15	Turbid	—	7.5	4.65	1.0 ~~2.5~~	Turbid
1706	20.51	1.999	7.03	Almost clear	61.89	10.0	4.30	1.0 ~~2.5~~	Almost @ clear.

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: [signature] PG — Date: 04/07/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-8 Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dog Brine Station	2. Project Location Salty Dog Playa Lake Shed & Brine Well Area Lea Co, NM	3. Date 04/07/09
4. Technician CM Barnhill, PG		
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) DBS-8

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/07/09 Time: 17:30	Date: 04/07/09 Time: 17:56	Date: Time:
10. Total Depth of Well (from TOC) 77.20'	15. Total Depth of Well (from TOC) 77.05'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 61.20'	16. Water Level (from TOC) 61.57'	21. Water Level (from TOC)

12. Water Column Height 16.0'	Nom Dia	x = gal/ft (Sch 40)	Sch 80	17. 3 Well Volumes 7.68 Gallons
13. Well Diameter 2" SCH 40 PVC MW	(2")	(0.16)	0.1534	18. 5 Well Volumes 12.8 Gallons
14. Well Volume (gal) (s) w.e. height) 2.56 Gallons	4"	0.65	0.5972	19. Purge Volume 10 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of (Pump) or Bailer: Bedflo2, 1.8" submersible set @ T.D.

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled?
10 Gallons	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: Sampling Personnel? DBS-8 04/07/09 CM Barnhill @ 17:52

27. Final Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
17:51	20.52	0.684	7.52	Turbid	61.57'	10 Gallons	1.0 GPM	Turbid

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid H_2O

29. Purgewater disposal method: on Ground Surface.

Sampling / Development Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
17:39	21.42	2.374	8.62	Turbid	61.20'	initial	3.91	1.0	Turbid
17:42	20.58	0.974	8.77	Turbid	—	2.5	4.65	1.0	Turbid
17:45	20.41	0.924	8.70	Turbid	—	5.0	4.34	1.0	Turbid
17:48	20.54	0.898	7.94	Turbid	—	7.5	4.37	1.0	Turbid
17:51	20.52	0.884	7.52	Turbid	61.57'	10.0	4.88	1.0	Turbid

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CM Barnhill PG. Date: 04/07/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well	Type of Data	Well No. / Sheet
☒ MW ☐ Production ☐ Other _____	☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. DBS-9 Sheet 1 of 1 Sheets

1. Project	2. Project Location	3. Date
DBS&A Salty Dog Brine Station	Salty Dog Playa Lake Shed & Brine Well Area Lea Co. NM	04/08/09
4. Technician: CM Barnhill, PG		
7. Method: (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig: DSR-2001	9. Location of Well (Site, Description): DBS-9

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 17:35	Date: 04/08/09 Time: 18:05	Date: Time:
10. Total Depth of Well (from TOC): 70.75'	15. Total Depth of Well (from TOC): 70.85'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC): 53.93'	16. Water Level (from TOC): 54.12'	21. Water Level (from TOC)

12. Water Column Height	Nom Dia	x = gal/ft Sch 40	x = gal/ft Sch 80	17. 3 Well Volumes	22. Size and Type of (Pump) or Bailer
16.82'				8.07 Gallons	
13. Well Diameter: 2" SCH 40 PVC MW	(2")	(0.16)	0.1534	18. 5 Well Volumes: 13.45 Gallons	FS-120, 1.8" Submersible set @ T.D
14. Well Volume (gal) (s) w.e. height: 2.696 gal.	4"	0.65	0.5972	19. Purge Volume: 10 Gallons	
	6"	1.47	1.3540		
	8"	2.61	2.3720		

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled?
10 Gallons	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: DBS-9, 04/08/09 Sampling Personnel? CM Barnhill @ 18:01

27. Final Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
18:00	18.48	1.176	7.12	TURBID	54.12	10 Gallons	1.0 GPM	TURBID

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: TURBID H2O

29. Purgewater disposal method: ON GROUND SURFACE.

Sampling / Development Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
16:48	18.49	1.358	7.63	TURBID	53.93'	initial	7.05	1.0	TURBID
16:51	18.45	1.217	7.20	TURBID	—	2.5	4.86	1.0	TURBID
16:54	18.35	1.203	7.14	TURBID	—	5.0	4.43	1.0	TURBID
16:57	18.48	1.201	7.13	TURBID	—	7.5	5.08	1.0	TURBID
18:00	18.48	1.176	7.12	TURBID	54.12	10.0	5.59	1.0	TURBID

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: [signature] PG — Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. NW-1 Shallow Sheet 1 of 1 Sheets
1. Project DBS & A Salty Dog Brine Station	2. Project Location Salty Dog Brine Pond Area Lea Co. NM	3. Date 04/08/09
4. Technician CM Barnhill, PG		
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) NW-1 Shallow

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 12:40	Date: 04/08/09 Time: 1300	Date: Time:
10. Total Depth of Well (from TOC) 74.95'	15. Total Depth of Well (from TOC) 74.95	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.35	16. Water Level (from TOC) 62.35	21. Water Level (from TOC)

12. Water Column Height 12.60'	Nom Dia	x = gal/ft (Sch 40)	Sch 80	17. 3 Well Volumes 6.048 Gallons
13. Well Diameter 2" SCH 40 PVC MW	(2")	0.16	0.1534	18. 5 Well Volumes 10.08 Gallons
14. Well Volume (gal) (s) w.e. height) 2.016 l.	4"	0.65	0.5972	19. Purge Volume 10 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of (Pump) or Bailer
Redi-flo 2, 1.8" Submersible Set a T.D.

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled
10 Gallons	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: NW-1 Shallow, 04/08/09 Sampling Personnel? CM Barnhill 12:56

27. Final Parameters

Time	Temp C	Conductivity	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
12:55	20.36	1.404	7.39	TURBD	62.35	10.0	1.0	TURBID

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: TURBID H2O — Well NOT Well Developed

29. Purgewater disposal method: ON GROUND Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
12:43	21.29	1.253	7.48	TURBID	62.35	initial	3.69	1.0	TURBID
12:45	20.92	1.444	7.47	TURBID	—	2.5	2.08	2.0	TURBID
12:47	20.20	1.393	7.46	TURB		5.0	2.11	1.0	TURBD
12:52	21.0	1.442	7.40	TURBD		7.5	2.09	1.0	TURBD
12:55	20.36	1.404	7.39	TURBD	62.35	10.0	2.08	1.0	TURBD

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CM Barnhill PG — Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well	Type of Data	Well No. NW-1 middle
☒ MW ☐ Production ☐ Other ______	☐ Development ☒ Sampling ☐ Pump Test ☐ Other ______	Sheet 1 of 1 Sheets

1. Project DBS&A Salty Dog Brine Station	2. Project Location Salty Dog Brine Pond Area	3. Date 04/08/09
4. Technician CM Barnhill, PG	Lea Co., N.M.	
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) NW-1 Middle

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 12:10	Date: 04/08/09 Time: 12:35	Date: Time:
10. Total Depth of Well (from TOC) 121.31'	15. Total Depth of Well (from TOC) 121.31'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.25'	16. Water Level (from TOC) 62.51	21. Water Level (from TOC)

12. Water Column Height 59.06'	Nom Dia / x = gal/ft Sch 40 (circled) / Sch 80	17. 3 Well Volumes 28.34 Gallons	22. Size and Type of Pump or Bailer
13. Well Diameter 2" SCH 40 PVC MW	(2") 0.16 (circled) 0.1534 4" 0.65 0.5972 6" 1.47 1.3540 8" 2.61 2.3720	18. 5 Well Volumes 47.24 Gallons	Redi-Flo 2, 1.8" submersible set @ T.D.
14. Well Volume (gal) (s) w.e. height) 9.44 Gal.		19. Purge Volume 30 Gallons	

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled (Yes) No
30 Gallons	Yes (No)	(No) Yes If yes, source:	If yes, what was the sample number & Date: Sampling Personnel? NW-1, middle, 04/08/09 CM Barnhill @ 12:31

27. Final Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
12:30	20.00	0.638	7.47	Turbid	62.51	30 Gal.	2.5 GPM	Turbid

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid H_2O

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
12:18	20.07	0.755	7.61	Turbid	62.25'	initial	6.17	3.0	Turbid
12:22	19.90	0.735	7.54	Turbid	—	10	2.89	2.5	Turbid
12:26	20.02	0.665	7.48	Turbid	—	20	2.86	2.5	Turbid
12:30	20.00	0.638	7.47	Turbid	62.51	30	3.37	2.5	Turbid

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: Clayton M. Barnhill PG

Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. NW-1 Deep Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dog Brine Station	2. Project Location Salty Dog Brine Pond Area Lea Co, N.M.	3. Date 04/08/09
4. Technician CM Barnhill, PG		
7. Method Pumping Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) NW-1 Deep

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 11:30	Date: 04/08/09 Time: 12:02	Date: Time:
10. Total Depth of Well (from TOC) 165.50'	15. Total Depth of Well (from TOC) 171.45'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.04'	16. Water Level (from TOC) 62.60	21. Water Level (from TOC)

12. Water Column Height 103.46'	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes 49.66 Gal.
13. Well Diameter 2" SCH 40 PVC MW	(2")	(0.16)	0.1534	18. 5 Well Volumes 82.76 Gal.
14. Well Volume (gal) (s) w.e. height) 16.55 gal	4"	0.65	0.5972	19. Purge Volume 50 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of (Pump) or Bailer
Redi-flo 2, 1.5" Submersible See T.D.

Final Field Analysis

23. Total Amount of Water Removed 50 Gallons.	24. Was Well Pumped Dry? Yes (No)	25. Was water added to well? (No) Yes If yes, source:	26. Was the Groundwater Sampled (Yes) No If yes, what was the sample number & Date: Sampling Personnel? NW-1 Deep, 04/08/09 CM Barnhill 12:00

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
11:55	19.85	0.497	7.44	Clear	62.60	50 Gallon	3.5 GPM	Clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Initially Turbid - Clear @ Sample.

29. Purgewater disposal method: ON Ground Surface.

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons).	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
11:40	20.27	0.603	7.55	Turbid	62.04	Initial	4.92	3.5	Turbid
11:43	20.01	0.532	7.50	Turbid	—	10	3.59	3.5	Turbid
11:46	20.04	0.510	7.48	Turbid	—	20	3.53	3.5	Turbid
11:49	19.80	0.505	7.47	Almost Clear	—	30	3.62	3.5	Almost clear
11:52	19.94	0.497	7.46	Clear	—	40	3.59	3.5	Clear
11:55	19.85	0.497	7.44	Clear	62.60	50	3.49	3.5	Clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: Christopher M Barnhill PG. Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well	Type of Data	Well No.
☒ MW ☐ Production ☐ Other _____	☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Sheet 1 of 1 Sheets NW-2 Shallow

1. Project	2. Project Location	3. Date
DBS&A Salty Dog Brine station	Salty Dog Playa Lake Shed & Brine well area Lea Co, NM	04/08/09
4. Technician CMBarnhill, PG		

7. Method	8. Manufacturer's Designation of Rig	9. Location of Well (Site, Description)
(Pumping) Surging Air Lift Bailing Other	DSR-2001	NW-2 - Shallow

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 16:45	Date: 04/08/09 Time: 17:15	Date: Time:
10. Total Depth of Well (from TOC) 74.15	15. Total Depth of Well (from TOC) 75.35	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 63.08	16. Water Level (from TOC) 63.68	21. Water Level (from TOC)

12. Water Column Height	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes	22. Size and Type of Pump or Bailer
11.07				5.31 Gallons	
13. Well Diameter	(2")	(0.16)	0.1534	18. 5 Well Volumes	ES 120, 1.8" Submersible Set to T.D.
2" SCH 40 PVC MW	4"	0.65	0.5972	8.8 Gallons	
14. Well Volume (gal) (s) w.e. height) 1.77	6"	1.47	1.3540	19. Purge Volume 10 Gallons	
	8"	2.61	2.3720		

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled
10 Gallons	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: Sampling Personnel? NW-2 shallow 04/08/09 CMBarnhille 17:07

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
17.06	19.32	1.883	7.33	TURBID	63.68'	10 Gallons	1.0 GPM	TURBID

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: TURBID - Poorly Developed Well

29. Purgewater disposal method: ON Ground Surface.

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
16:55	19.62	1.928	7.37	TURBID	63.08	Initial	5.46	1.0	TURBID
16:57	19.54	1.902	7.42	TURBID	—	2.5	4.22	1.0	TURBID
17:00	19.46	1.866	7.40	TURBID	—	5.0	4.03	1.0	TURBID
17:03	19.40	1.877	7.35	TURBID	—	7.5	4.37	1.0	TURBID
17:06	19.32	1.883	7.33	TURBID	63.68	10.0	4.43	1.0	TURBID

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CMBarnhill PG. Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well	Type of Data	Well No.
☒ MW ☐ Production ☐ Other _____	☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Sheet 1 of / Sheets: NW-2 middle

1. Project	2. Project Location	3. Date
DBS&A Salty Dog Brine Station	Salty Dog Playa Lake Shell Brine well Area Lea Co, NM.	04/08/09
4. Technician: CM Barnhill, PG		
7. Method: Pumping Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig: DSR-2001	9. Location of Well (Site, Description): NW-2 - middle

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 16:25	Date: 04/08/09 Time: 16:55	Date: Time:
10. Total Depth of Well (from TOC): 104.49	15. Total Depth of Well (from TOC): 115.72	20. Total Depth of Well (from TOC)
11. Water Level (from TOC): 63.27	16. Water Level (from TOC): 64.41	21. Water Level (from TOC)

12. Water Column Height	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes	22. Size and Type of Pump or Bailer
41.22'				19.78 Gallons	
13. Well Diameter	(2")	(0.16)	0.1534	18. 5 Well Volumes: 32.95	ES 120' 1.8" Submersible Set @ T.P.
	4"	0.65	0.5972		
	6"	1.47	1.3540		
14. Well Volume (gal) (s) w.e. height): 6.5962'	8"	2.61	2.3720	19. Purge Volume: 20 Gallons	

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled?
206 Gallons.	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: Sampling Personnel? NW-2, middle 04/08/09 CM Barnhill PG

27. Final Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
16:50	19.04	2.172	7.17	Turbid	64.41	20 Gallons	1.0 GPM	Turbid

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid H2O

29. Purgewater disposal method: On Ground Surface.

Sampling / Development Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
16:30	18.69	2.933	7.37	Turbid	63.27	1 (1st)	5.38	1.0	Turbid
16:40	18.91	2.155	7.36	Turbid	—	10	5.52	1.0	Turbid
16:45	18.76	2.153	7.25	Turbid	—	15	6.52	1.0	Turbid
16:50	19.04	2.172	7.17	Turbid	64.41	20	6.63	1.0	Turbid

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: [signature] PG — Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☑ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☑ Sampling ☐ Pump Test ☐ Other _____	Well No. NW-2 Deep Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dob Brine Station	2. Project Location Salty Dob Playa Lake Shell Brine Well Area Lea Co, NM	3. Date 04/08/09
4. Technician CM Barnhill, PE		
7. Method Pumping Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) NW-2 - Deep

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 15:30	Date: 04/08/09 Time: 16:22	Date: Time:
10. Total Depth of Well (from TOC) 132.20'	15. Total Depth of Well (from TOC) 148.87	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 66.41'	16. Water Level (from TOC) 66.10'	21. Water Level (from TOC)

12. Water Column Height 65.79'	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes 31.57 Gallons
13. Well Diameter 2" Sch 40 PVC MW	(2")	0.16	0.1534	18. 5 Well Volumes 52.63 Gallons
14. Well Volume (gal) (s) w.e. height) 10.52 Gal	4"	0.65	0.5972	19. Purge Volume 40 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of Pump or Bailer: ES 120 Set 1.8" Submersible @120' From TOC.

Final Field Analysis

23. Total Amount of Water Removed 40 Gallons	24. Was Well Pumped Dry? Yes (No)	25. Was water added to well? (No) Yes If yes, source:	26. Was the Groundwater Sampled (Yes) No If yes, what was the sample number & Date: Sampling Personnel? NW-2 Deep 04/08/09 CM Barnhill 16:19

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
16:18	18.82	10.72	6.81	Turbid	66.10	30 Gallons	1.0 GPM	Turbid

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid H_2O

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
15:38	19.15	1.548	7.69	Turbid	66.41	Initial	1.21	1.0	Turbid
15:48	19.86	3.646	7.53	Turbid	—	10	6.55	1.0	Turbid
15:58	18.79	5.694	7.01	Turbid	—	20	6.99	1.0	Turbid
16:08	18.65	8.751	6.88	Turbid	—	30	7.39	1.0	Turbid
16:18	18.82	10.72	6.81	Turbid	66.10	40	6.35	1.0	Turbid

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: [signature] PE — Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well	Type of Data	Well No.
☒ MW ☐ Production ☐ Other _____	☐ Development ~~☒~~ Sampling ☐ Pump Test ☐ Other _____	PMW-1 Sheet 1 of 1 Sheets

1. Project	2. Project Location	3. Date
DBS&A Salty Dog Brine Station	Salty Dog Brine Pond Area	04/08/09
4. Technician		
CM Barnhill, PE	Lea Co, NM	
7. Method	**8. Manufacturer's Designation of Rig**	**9. Location of Well (Site, Description)**
(Pumping) Surging Air Lift Bailing Other	DSR-2001	PMW-1

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/08/09 Time: 14:35	Date: 04/08/09 Time: 15:00	Date: Time:
10. Total Depth of Well (from TOC) 78.87'	15. Total Depth of Well (from TOC) 79.41'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 65.97'	16. Water Level (from TOC) 66.25	21. Water Level (from TOC)

12. Water Column Height	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes	22. Size and Type of (Pump) or Bailer
12.9				6.19 Gallons	
13. Well Diameter	2"	0.16	0.1534	18. 5 Well Volumes	Redi-flo 2, 1.8"
2" SCH 40 PVC MW	4"	0.65	0.5972	10.32 Gallons	Submersible
14. Well Volume (gal) (s) w.e. height) 2.06 Gal	6"	1.47	1.3540	19. Purge Volume 10 Gallons	See T.D.
	8"	2.61	2.3720		

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled (Yes) No
10 Gallons	Yes (No)	(No) Yes If yes, source:	If yes, what was the sample number & Date: Sampling Personnel? PMW-1, 04/08/09 CM Barnhill @ 14:57

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
1456	20.49	25.41	6.83	clear	66.25	10 Gallons	1.0 GPM	clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid initially - clear @ Sample.

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
14:44	22.42	17.24	7.13	Turbid	65.97'	Initial	~~8.30~~ 7.88	1.0	Turbid
14:47	21.87	23.02	7.11	Turbid	—	2.5	6.62	1.0	Turbid
14:50	21.22	24.56	7.05	Turbid	—	5.0	6.61	1.0	Turbid
1453	20.62	25.25	6.84	Slight Turbid	—	7.5	6.42	1.0	Slight Turbid
1456	20.49	25.41	6.83	Clear	66.25	10.0	6.32	1.0	Clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CM Barnhill PE - Date: 04/08/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well: ☒ MW ☐ Production ☐ Other _____	Type of Data: ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. MW-2, Sheet 1 of 1 Sheets
1. Project: DB St A Salty Dog Brine Station	2. Project Location: Salty Dog, Playa Lake shed & Brine area Lea Co, NM.	3. Date: 04/07/09
4. Technician: CM Barnhill, PG		
7. Method: (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig: DSR-2001	9. Location of Well (Site, Description): MW-2

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/07/09 Time: 12:00	Date: 04/07/09 Time: 13:22	Date: Time:
10. Total Depth of Well (from TOC): 137.35'	15. Total Depth of Well (from TOC): 137.35'	20. Total Depth of Well (from TOC):
11. Water Level (from TOC): 61.65'	16. Water Level (from TOC): 61.61'	21. Water Level (from TOC):

12. Water Column Height: 75.70'	Nom Dia / x = gal/ft: Sch 40 / Sch 80	17. 3 Well Volumes: 36.33 ~~36~~ Gallons	22. Size and Type of (Pump) or Bailer
13. Well Diameter: 2" SCH 40 PVC MW	2" 0.16 0.1534; 4" 0.65 0.5972; 6" 1.47 1.3540; 8" 2.61 2.3720	18. 5 Well Volumes: 60.56 Gallons	Redi flo2, 1.8" Submersible Set @ T.D.
14. Well Volume (gal) (s) w.e. height): 12.1162'		19. Purge Volume: 40 Gallons	

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry? Yes (No)	25. Was water added to well? (No) Yes If yes, source:	26. Was the Groundwater Sampled (Yes) No If yes, what was the sample number & Date: Sampling Personnel? MW-2, 04/07/09 CM Barnhill @ 13:18
40 Gallons			

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
13:17	19.73	4.492	8.68	Clear	61.61'	40 Gal	2.5 Gpm	Clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid initially - Clear @ Sample

29. Purgewater disposal method: ON Ground Surface.

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
13:02	18.83	2.720	8.19	Turbid	61.65'	initial	4.74	3.33	Turbid
13:05	19.32	4.204	8.47	Clear	—	10	4.16	3.33	Clear
13:09	19.76	4.472	8.66	Clear	—	20	4.04	2.5	Clear
13:13	19.80	4.443	8.68	Clear	—	30	3.80	2.5	Clear
13:17	19.73	4.492	8.68	Clear	61.61'	40	3.73	2.5	Clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: Clayton M Barnhill, PG Date: 04/07/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well	Type of Data	Well No.
☒ MW ☐ Production ☐ Other _____	☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	MW-3 Sheet 1 of 1 Sheets

1. Project	2. Project Location	3. Date
DBS&A Salty Dot Brine station	Salty Dot, Playa Lake Shell Brine well Area Lea Co. NM	04/07/09
4. Technician		
CM Barnhill, PG		
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig	9. Location of Well (Site, Description)
	DSR-2001	MONITOR WELL 3

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/07/09 Time: 13:46	Date: 04/07/09 Time: 14:17	Date: Time:
10. Total Depth of Well (from TOC) 147.02'	15. Total Depth of Well (from TOC) 147.05'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.02'	16. Water Level (from TOC) 62.68'	21. Water Level (from TOC)

12. Water Column Height	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes	22. Size and Type of Pump or Bailer
85.01'				40.80 Gallons	
13. Well Diameter	(2")	(0.16)	0.1534	18. 5 Well Volumes	Redi-flo2, 1.8" submersible set @ T.D.
2" SCH 40 PVC	4"	0.65	0.5972	68 Gallons	
14. Well Volume (gal) (s) w.e. height) 13.6 Gallons	6"	1.47	1.3540	19. Purge Volume 41 Gallons	
	8"	2.61	2.3720		

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled?
41 Gallons	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: Sampling Personnel? MW-3, 04/07/09 CM Barnhill 14:13

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
14:12	19.90	36.61	6.39	clear	62.68'	41 Gallons	2.5 GPM	Clear H2O

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Clear H_2O

29. Purgewater disposal method: ON GROUND Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
13:55	19.46	24.87	6.67	clear	62.02	initial	4.67	2.5	clear
13:59	20.05	31.40	6.37	clear	—	10	4.35	2.5	clear
14:03	20.06	35.92	6.37	clear	—	20	4.16	2.5	clear
14:07	19.91	36.48	6.37	clear	—	30	3.93	2.5	clear
14:12	19.90	36.61	6.39	clear	62.68	41	3.18	2.5	clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: [signature] PG — Date: 04/07/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. MW-4 Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dog Brine station	2. Project Location Salty Dog Playa Lake Shed & Brine well Area Lea Co. NM	3. Date 04/07/2009
4. Technician CM Barnhill, PG		
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) Monitor Well #4

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/07/09 Time: 14:35	Date: 04/07/09 Time: 15:05	Date: Time:
10. Total Depth of Well (from TOC) ~~62.5+'~~ 147.3	15. Total Depth of Well (from TOC) 147.31	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.51'	16. Water Level (from TOC) 62.50	21. Water Level (from TOC)

12. Water Column Height 84.79'	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes 40.69 Gallons
13. Well Diameter 2" SCH 40 PVC MW	(2")	(0.16)	0.1534	18. 5 Well Volumes 67.83 Gallons.
14. Well Volume (gal) (s) w.e. height) 13.56 Gal	4"	0.65	0.5972	19. Purge Volume 41 Gallons
	6"	1.47	1.3540	
	8"	2.61	2.3720	

22. Size and Type of (Pump) or Bailer: Redi-flo 2 ; 1.8" Submersible 50' of T.D.

Final Field Analysis

23. Total Amount of Water Removed 41 Gallons	24. Was Well Pumped Dry? Yes (No)	25. Was water added to well? (No) Yes If yes, source:	26. Was the Groundwater Sampled (Yes) No If yes, what was the sample number & Date; Sampling Personnel? MW-4, 04/07/09 CM Barnhill 15:00

27. Final Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
14:59	19.67	15.58	6.65	Clear	62.50	41 Gallons	2.5 GPM	Clear.

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Clear H_2O

29. Purgewater disposal method: ON Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (mS/cm)	pH	NTUs	WL (from TOC), ~~62.51'~~	Volume (gallons),	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
14:42	19.64	12.68	6.80	clear	~~initial~~	initial	2.42	2.5 GPM	Clear.
14:46	19.76	15.52	6.72	clear	—	10	3.45	2.5	Clear.
14:50	19.91	15.80	6.74	Clear	—	20	3.67	2.5	Clear.
14:54	19.83	15.72	6.64	clear	—	30	3.89	2.5	Clear.
14:59	19.67	15.58	6.65	clear	62.50	41	3.93	2.5	Clear.

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: Clayton McBarnhill PG. Date: 04/07/2009

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well	Type of Data	Well No.
☒ MW ☐ Production ☐ Other _____	☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	MW-5 Sheet 1 of 1 Sheets

1. Project	2. Project Location	3. Date
DBS: A Salty Dog Brine Station	Salty Dog, Playa Lake Shed & Brine Well Area Lea Co. NM	04/07/09
4. Technician: CM Barnhill, PG		
7. Method: (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig: DSR-2001	9. Location of Well (Site, Description): MONITOR WELL #5

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/07/09 Time: 15:23	Date: 04/07/09 Time: 15:48	Date: Time:
10. Total Depth of Well (from TOC): 129.78'	15. Total Depth of Well (from TOC): 129.78'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC): 60.79'	16. Water Level (from TOC): 60.85	21. Water Level (from TOC)

12. Water Column Height	Nom Dia	x = gal/ft Sch 40	Sch 80	17. 3 Well Volumes	22. Size and Type of Pump or Bailer
68.99'				33 Gallons	
13. Well Diameter: 2" SCH 40 PVC MW	(2")	(0.16)	0.1534	18. 5 Well Volumes: 55.19 Gallons.	Redi-Flo2, 1.8" Submersible Set @ T.D.
	4"	0.65	0.5972		
14. Well Volume (gal) (s) w.e. height): 11 Gallons.	6"	1.47	1.3540	19. Purge Volume: 35 Gallons	
	8"	2.61	2.3720		

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled?
35 Gallons.	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: MW-5, 04/07/09 Sampling Personnel? CM Barnhill @ 15:45

27. Final Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
15:43	20.07	3.679	6.97	Clear	60.85'	35 Gallons	2.5 GPM	Clear

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: Turbid initially - clear @ Sample.

29. Purgewater disposal method: On Ground Surface

Sampling / Development Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
15:30	20.27	5.210	7.15	Turbid	60.79'	Initial	3.40	2.5	Turbid
15:34	20.42	4.117	7.10	Turbid	—	10	3.27	2.5	Turbid
15:38	20.19	3.791	7.03	Slight Turbid	—	20	3.83	2.5	Slight Turbid
15:43	20.07	3.679	6.97	Clear	60.85'	35	3.95	2.5	Clear

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CM Barnhill PG. Date: 04/07/09

CMB ENVIRONMENTAL & GEOLOGICAL SERVICES, INC. - WELL DATA FORM

Type Well ☒ MW ☐ Production ☐ Other _____	Type of Data ☐ Development ☒ Sampling ☐ Pump Test ☐ Other _____	Well No. ~~MW-6~~ MW-6 Sheet 1 of 1 Sheets
1. Project DBS&A Salty Dog Brine Station	2. Project Location Salty Dog Playa Lake Shed & Brine Well Area Lea Co, NM	3. Date 04/07/09
4. Technician CM Barnhill, PG		
7. Method (Pumping) Surging Air Lift Bailing Other	8. Manufacturer's Designation of Rig DSR-2001	9. Location of Well (Site, Description) MONITOR Well #6

Water Levels

Initial	Final	Final + 24 Hours
Date: 04/07/09 Time: 16:00	Date: 04/07/09 Time: 16:30	Date: Time:
10. Total Depth of Well (from TOC) 119.11'	15. Total Depth of Well (from TOC) 119.40'	20. Total Depth of Well (from TOC)
11. Water Level (from TOC) 62.41'	16. Water Level (from TOC) 62.38	21. Water Level (from TOC)

12. Water Column Height 56.70'	Nom Dia / x = gal/ft: Sch 40 / Sch 80 2" 0.16 0.1534 4" 0.65 0.5972 6" 1.47 1.3540 8" 2.61 2.3720	17. 3 Well Volumes 27.21 Gallons	22. Size and Type of (Pump) or Bailer
13. Well Diameter 2" SCH 40 PVC MW		18. 5 Well Volumes 45.36 Gallons	Redi-flo2, 1.8" Submersible Set @ T.D.
14. Well Volume (gal) (s) w.e. height) 9.0726 Gal.		19. Purge Volume 30 Gallons	

Final Field Analysis

23. Total Amount of Water Removed	24. Was Well Pumped Dry?	25. Was water added to well?	26. Was the Groundwater Sampled
30 Gallons.	Yes (No)	(No) Yes If yes, source:	(Yes) No If yes, what was the sample number & Date: MW-6, 04/07/09 Sampling Personnel? CM Barnhill 16:23

27. Final Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL	Removed	Flow Rate	Photo Roll #, Observations
	19.92	0.451	7.65	TURBID	62.38	30 Gal.	2.5 GPM	TURBID

IF PETROLEUM IS IN THE WELL, DO NOT TAKE pH AND CONDUCTIVITY PARAMETERS

28. Physical Appearance and Remarks: TURBID H2O

29. Purgewater disposal method: ON GROUND SURFACE

Sampling / Development Parameters

Time	Temp C	Conductivity (ms/cm)	pH	NTUs	WL (from TOC)	Volume (gallons)	Dissolved Oxygen	Flow Rate (gpm)	Photo #, Observ. (1)
16:10	20.48	1.445	7.73	TURBID	62.41'	Initial	5.96	2.5	TURBID
16:14	20.13	0.486	7.95	TURBID	—	10	5.78	2.5	TURBID
16:18	19.89	0.458	7.77	SLIGHT TURBID	—	20	5.61	2.5	SLIGHT TURBID
16:22	19.92	0.451	7.65	TURBID	62.38	30	5.63	2.5	TURBID

(1) Note volume and physical character of sediments removed.
NTU = Nephelometric turbidity units
WL = Water Level from Top of PVC Casing

Checked By: CM Barnhill PG — Date: 04/07/09

Appendix D

Survey Report

WELL	EASTING	NORTHING	CASING_ELEV	CONCRETE_ELEV	NOTE	STICK_UP	Latitude	Longitude
DBS-1	837410.946	617873.964	3817.091	3817.360		-0.269	32.694886	-103.370911
DBS-2	837487.158	618138.347	3820.504	3817.524		2.980	32.69561	-103.370655
DBS-3	836956.004	617833.410	3816.662	3813.953		2.709	32.694786	-103.37239
DBS-4	837516.816	617707.515	3820.374	3817.441		2.933	32.694426	-103.370571
DBS-5	836851.361	618414.069	3820.659	3818.001		2.658	32.696384	-103.372714
DBS-6	836896.578	615374.784	3812.650	3810.213		2.437	32.68803	-103.372656
DBS-7	836875.641	614857.267	3810.210	3807.210		3.000	32.686608	-103.372739
DBS-8	836580.482	614947.540	3810.699	3808.051		2.648	32.686864	-103.373696
DBS-9	836485.585	615847.216	3806.264	3803.460		2.804	32.689339	-103.373978
PMW-1	837289.690	618038.544	3821.167	3818.646		2.521	32.695341	-103.3713
MW-2	836438.049	615454.721	3812.677	3810.259		2.418	32.688261	-103.374144
MW-3	836743.571	615186.298	3812.049	3809.616		2.433	32.687516	-103.373159
MW-4	836882.305	615061.483	3811.325	3808.643		2.682	32.687169	-103.372712
MW-5	837029.110	614930.722	3808.961	3808.058		0.903	32.686806	-103.372238
MW-6	837288.689	615041.326	3810.168	3808.590		1.578	32.687104	-103.371391
NW-1(s)	837369.632	617950.772	3817.325	3817.627	SHALLOW	-0.302	32.695098	-103.371043
NW-1(m)	837369.657	617950.542	3817.351	3817.627	MIDDLE	-0.276	32.695097	-103.371043
NW-1(d)	837369.402	617950.848	3817.352	3817.627	DEEP	-0.275	32.695098	-103.371043
NW-2(s)	836860.966	615088.572	3812.497	3809.156	SHALLOW	3.341	32.687244	-103.37278
NW-2(m)	836861.043	615088.794	3812.452	3809.156	MIDDLE	3.296	32.687245	-103.37278
NW-2(d)	836861.137	615088.531	3812.460	3809.156	DEEP	3.304	32.687244	-103.37278