BW - __8__

PERMITS, RENEWALS & MODS

2018

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, June 6, 2019 8:23 AM
To: 'Ayarbe, John'
Cc: 'Pieter Bergstein (pieter@bergsteinenterprises.com)'; 'susan@thestandardenergy.com'; Zbrozek, Michael
Subject: RE: PAB Services - Renewed BW-8

John,

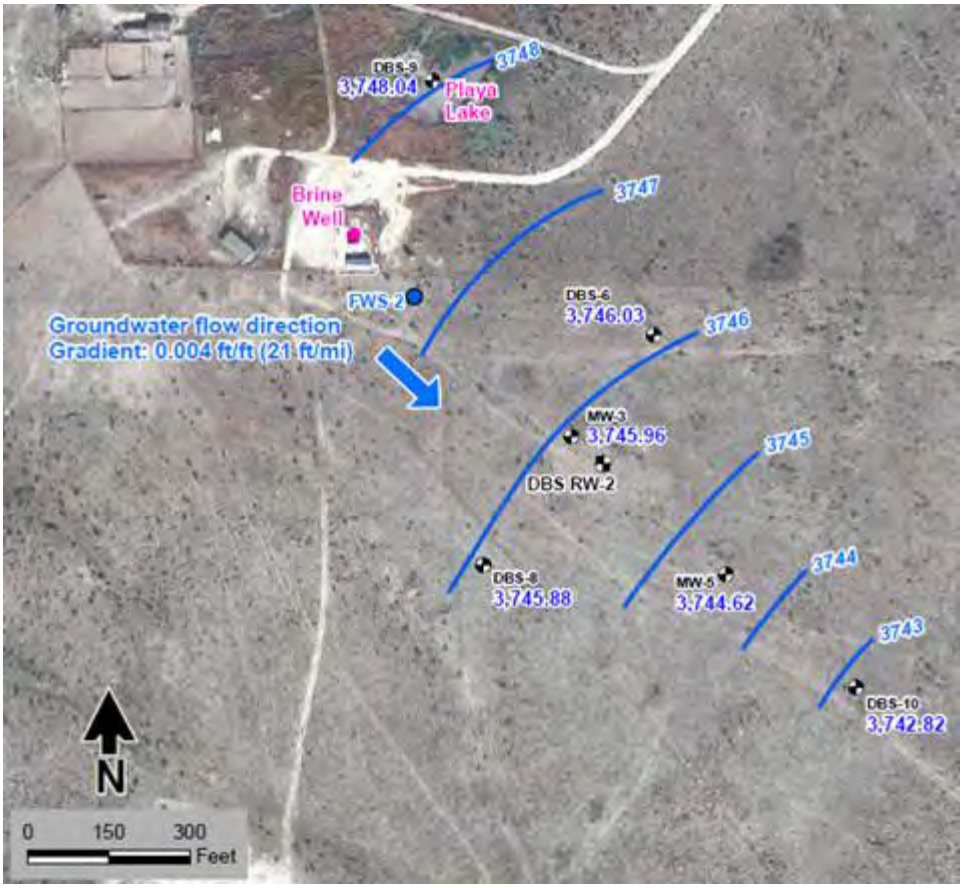
Received. Thank you.

From: Ayarbe, John <jayarbe@geo-logic.com>
Sent: Thursday, May 30, 2019 2:34 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: 'Pieter Bergstein (pieter@bergsteinenterprises.com)' <pieter@bergsteinenterprises.com>; 'susan@thestandardenergy.com' <susan@thestandardenergy.com>; Zbrozek, Michael <mzbrozek@geo-logic.com>
Subject: [EXT] PAB Services - Renewed BW-8

Hi Carl,

Thanks for taking the time to talk with me about the Salty Dog Brine Station renewed permit. Per our discussion, below is a summary of our conversation and the direction that will be taken for three of the permit conditions:

1. Condition 2.A.(1) – The current monitoring program includes 12 wells that are analyzed for field parameters (i.e., pH, specific conductance, and temperature), chloride concentrations, and water levels. Of these 12 wells, MW-3 is the closest downgradient monitor well to the brine well. We propose to collect samples from this well for the constituents specified in Condition 2.A.(1). The below image shows the location of MW-3.



2. Condition 3.F. – This condition states: *"The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production."* Currently, PAB Services compares the ratio of the volume of injected fluids to the volume of produced brine. This is completed monthly with a targeted ratio that is greater than 90% and less than 110%. PAB Services will continue with this current practice, which yields monthly injection volumes that are within ±10% of associated brine production.

3. Condition 5.C – The requested surface subsidence monitoring plan was submitted in 2014 and has already been implemented. So, the condition has been satisfied.

Please confirm your agreement with the above three items or let me know if you have questions.

Thanks!

John P. Ayarbe
Senior Hydrogeologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company
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Albuquerque, New Mexico 87109
Office: (505) 822-9400 | Direct: (505) 353-9137
Mobile: (505) 280-4339
jayarbe@dbstephens.com or jayarbe@geo-logic.com

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State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd E. Leahy, JD, PhD
Deputy Secretary

Adrienne Sandoval, Director
Oil Conservation Division

MAY 17, 2019

Mr. Pieter Bergstein
PAB Services, Inc.
P.O. Box 2724
Lubbock, Texas 79408

Re: Discharge Permit (BW-8) PAB Services, Inc., 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, 1980 FSL, 1980 FEL, Lat. N 32.68847°, Long. W 103.37445°, NMPM, Lea County, New Mexico

Dear Mr. Bergstein,

The discharge permit (BW-8) for the Class III Brine Well "Brine Supply Well No. 1" is hereby approved under the terms and conditions specified in the enclosed discharge permit.

The New Mexico Oil Conservation Division (OCD) approves this new discharge permit pursuant to 20.6.2.3109A NMAC. Please note 20.6.2.3109 NMAC, which provides for possible future amendment of the permit. Please be advised that approval of this discharge permit does not relieve PAB Services, Inc. (PAB) of liability if operations result in pollution of surface water, groundwater, or the environment.

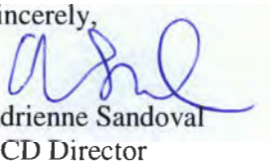
Please note that 20.6.2.3104 NMAC specifies "When a permit has been issued, discharges must be consistent with the terms and conditions of the permit." Pursuant to 20.6.2.3107C NMAC, PAB is required to notify the Director of any increase in the injection volume or injection pressure, or process modification that would result in any change in the water quality or volume of the discharge.

This discharge permit will expire on **February 24, 2024**, and PAB should submit a discharge permit renewal application in ample time before this date. Note that under 20.6.2.3106F NMAC, if a discharger submits a discharge permit renewal application at least 120 days before the discharge permit expires and is in compliance with the approved discharge permit, then the existing discharge permit will not expire until the application for renewal has been approved or disapproved.

The discharge permit application for the Class III Brine Well is subject to 20.6.2.3114 NMAC. Every billable facility submitting a discharge permit application is assessed a non-refundable filing fee of $100.00. OCD has already received the required $100.00 filing fee but the $1,700.00 permit fee for a Class III Brine Well is now required by check made payable to the "Water Quality Management Fund."

If you have any questions, please contact Carl Chavez of my staff at 505-476-3490 or email: Car1J.Chavez@state.nm.us. On behalf of the staff of the OCD, I wish to thank you and your staff for your cooperation during this discharge permit review.

Sincerely,



Adrienne Sandoval
OCD Director

AS/cc

Enclosure: Discharge Permit BW-8

cc: Hobbs District Office

DISCHARGE PERMIT APPROVAL CONDITIONS

All discharge permits are subject to Water Quality Control Commission regulations.

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY : The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department issues a Discharge Permit Renewal for BW-8 to PAB Services, Inc. (Permittee) to operate a Underground Injection Control (UIC) Class III Well for the solution mining of salt (Brine Supply Well No. 1 API # 30-025-26307) is located 1,980 FSL, and 1,980 FEL, Unit Letter J (NW/4 of SE/4) of Section 5, Township 19 South Range 36 East, Latitude N 32.68847°, Longitude W 103.37445°, NMPM, Lea County, New Mexico. This brine well is located approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 intersection. The brine station or sales terminal is located approximately 1/2 mile north-northeast of the brine well. Produced brine is metered at surface and transported greater than 0.5 miles via a surface 3-inch polyethylene pipeline to the brine station for sale. Chloride impacted groundwater at the brine station and hydrogeologically downgradient from the brine well are being recovered and used as freshwater for injection into BW-8.

The Permittee is permitted to inject water into the subsurface salt layers and produce brine for use in the oil and gas industry. Ground water that may be affected by a spill, leak, or accidental discharge of brine occurs at a depth of approximately 75 feet below ground surface and has a total dissolved solids (TDS) concentration of approximately 400 mg/L.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class III wells associated with the oil and gas industry (See Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (See 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5399 NMAC).

This Discharge Permit for a Class III Brine Well is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or on-site disposal of, any materials, product, by-product, or oil-field waste.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.
2. The injection of fluids into a large capacity cesspool is prohibited.
3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.
4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.
5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a

hazard to public health, (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified of 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5399 NMAC) for Class III wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5399 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified at 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject non-hazardous fluids into ground water having 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (See Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT: This Discharge Permit is a permit renewal that replaces the permit being renewed. Replacement of a prior permit does not relieve the Permittee of its responsibility to comply with the terms of that prior permit while that permit was in effect.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required $100.00 filing fee. The Permittee is now required to submit the $1,700.00 permit fee for a Class III well. Please remit payment made payable to the "Water Quality Management Fund" in care of OCD at 1220 South St. Francis Drive in Santa Fe, New Mexico 87505.

1.F. EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT: This Discharge Permit becomes effective immediately from the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit will expire on **February 24, 2024**. The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. If a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (See Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

1.G. MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD Director and OCD's Environmental Bureau of any Facility expansion or process modification (See 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class III well that was approved pursuant to the requirements of 20.6.2.5000 through 20.6.2.5399 NMAC for the following causes:

    a. Noncompliance by Permittee with any condition of this Discharge Permit; or,

    b. The Permittee's failure in the discharge permit application or during the discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

c. A determination that the permitted activity may cause a hazard to public health or undue risk to property and can only be regulated to acceptable levels by discharge permit modification or termination (See Section 75-6-6 NMSA 1978; 20.6.2.5101I NMAC; and, 20.6.2.3109E NMAC).

2. This Discharge Permit may also be modified or terminated for any of the following causes:

a. Violation of any provisions of the Water Quality Act or any applicable regulations, standard of performance or water quality standards;

b. Violation of any applicable state or federal effluent regulations or limitations; or

c. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (See Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS III WELL DISCHARGE PERMIT:

1. The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class III well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class III well discharge permit if:

a. The OCD Director receives written notice 30 days prior to the transfer date; and

b. The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2.a shall:

a. Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgement that the succeeding Permittee shall be responsible for compliance with the Class III well discharge permit upon taking possession of the facility; and

b. Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

c. Include information relating to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance immediately or within a specified time period, or assess a civil penalty, or both (See Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (See Section 74-6-10(A)(2) NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a state or federal law or regulation (See Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS:

2.A. SEMI-ANNUAL MONITORING REQUIREMENTS FOR CLASS III WELLS: The Permittee may use either or both fresh water or water from otherwise non-potable sources. The Permittee shall provide analysis of the injected fluids and brine at least semi-annually to yield data representative of their characteristics. The Permittee shall

analyze both the injected fluids and brine for the following characteristics: pH; density, concentration of total dissolved solids (TDS); chloride concentration; and sodium concentration (for brine only).

1. **Groundwater Monitoring Well:** Collect groundwater samples for general chemistry and WQCC 20.6.2.3103 NMAC groundwater constituents. Groundwater quality data shall comply with EPA Quality Assurance/Quality Control (QA/QC) and Data Quality Objectives (DQOs). The monitor well is required to be sampled and monitored **semi-annually** for the following characteristics:

   - pH (Method 9040);
   - Eh;
   - Specific conductance;
   - Specific gravity;
   - Temperature; and
   - General ground water quality parameters (pH, total dissolved solids, and major cations and anions, including fluoride, calcium, potassium, magnesium, sodium bicarbonate, carbonate, chloride, sulfate, and bromide using the methods specified in 40 CFR 136.3).

   The environmental data results shall be reported in the Annual Report (Section 2.J).

2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. **Surface Subsidence Monitoring Plan:** The Permittee shall survey each survey monument and top of well casing at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS geodetic benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program with proper instrument accuracy assessment at the conclusion of each survey. The Permittee shall submit the results of all subsidence surveys with summary of results and any recommendations to OCD within 15 days of survey completion. If the monitored surface subsidence survey at any measuring point deviates 0.10 ft. or more compared to its baseline elevation, then the Permittee shall notify OCD within 30 days of survey completion for further instructions. If survey results continue to demonstrate subsidence over time, and the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.

   The Permittee shall include the above information in the Annual Report (Section 2.J).

2. **Solution Cavern Characterization Program:** The Permittee shall characterize the size and shape of the solution cavern using a geophysical method approved by OCD at least once before the expiration date of the permit. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.

   a. The Permittee shall provide an estimate of the size and shape of the solution cavern at least annually in the Annual Report (Section 2.J), based on fluid injection and brine production data.

   b. The Permit shall compare the ratio of the volume of injected fluids to the volume of produced brine monthly. If the average ratio of injected fluid to produced brine varies is less than 90% or greater than 110%, the Permittee shall report this to OCD and cease injection and production operations of its Class III well within 24 hours. The Permittee shall begin an investigation to determine the cause of this abnormal ratio within 72 hours. The Permittee shall submit to OCD a report of its investigation within 15 days of cessation of injection and production operations of its Class III well for further instructions.

3. **Annual Certification:** The Permittee shall certify annually in the Annual Report (Section 2.J) that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.

If the solution cavern is determined by either OCD or the Permittee to be potentially unstable by either direct or indirect means, then the Permittee shall cease all fluid injection and brine production within 24 hours. If the Permittee ceases operations because it or OCD has determined that the solution cavern is unstable, then it shall submit a plan to stabilize the solution cavern within 30 days. OCD may require the Permittee to implement additional subsidence monitoring and to conduct additional corrective action.

2.C. CONTINGENCY PLANS: The Permittee shall implement its proposed contingency plan(s) included in its Permit Application to cope with failure of a system(s) in the Discharge Permit.

2.D. CLOSURE: The Permittee shall submit as a condition of C-103 Sundry approval, and for OCD approval, a facility closure plan with third-party cost estimate for its well pursuant to 20.6.2.5209 NMAC and as specified in Permit Conditions 2.I and 5.B to address: well plug and abandonment, land surface restoration; environmental groundwater monitoring and remediation; pipeline abandonment; and two years of surface subsidence monitoring.

1. **Pre-Closure Notification:** Pursuant to 20.6.2.5005A NMAC, the Permittee shall submit a pre-closure notification to OCD's Environmental Bureau at least 30 days prior to the date that it proposes to close or to discontinue operation of its Class III well. Pursuant to 20.6.2.5005B NMAC, OCD's Environmental Bureau must approve all proposed well closure activities before Permittee may implement its proposed closure plan.

2. **Required Information:** The Permittee shall provide OCD's Environmental Bureau with the following information:

- Name of facility;
- Address of facility;
- Name of Permittee (and owner or operator, if appropriate);
- Address of Permittee (and owner or operator, if appropriate);
- Contact person;
- Phone number;
- Number and type of well(s);
- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (e.g., sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation and/or continued environmental monitoring and remediation, other);
- Proposed date of well closure;
- Proposed method and date of surface restoration;
- Proposed method and date of pipeline abandonment;
- Name of preparer; and
- Date.

2.E. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon its Class III well, it shall submit to OCD a plugging and abandonment plan that meets the requirements of 20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.F RECORD KEEPING: The Permittee shall maintain records of all inspections, surveys, investigations, etc., required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection at the request of an OCD Representative.

2.G. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified at 20.6.2.3103 NMAC, then it shall report a release to OCD's Environmental Bureau.

1. **Oral Notification:** As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

   - The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
   - The name and location of the facility;
   - The date, time, location, and duration of the discharge;
   - The source and cause of discharge;
   - A description of the discharge, including its chemical composition;
   - The estimated volume of the discharge; and,
   - Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. **Written Notification:** Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use form C-141 with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

   The Permittee shall provide subsequent corrective actions and written reports as required by OCD's Environmental Bureau.

2.H. OTHER REQUIREMENTS:

1. **Inspection and Entry:** Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director, to:

   - Upon the presentation of proper credentials, enter the premises at reasonable times;
   - Inspect and copy records required by this Discharge Permit;
   - Inspect any treatment works, monitoring, and analytical equipment;
   - Sample any injection fluid or produced brine;
   - Conduct various types environmental media sampling, and
   - Use the Permittee's monitoring systems and wells in order to collect groundwater samples.

2. **Advance Notice:** The Permittee shall provide OCD's Environmental Bureau and Hobbs District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well plugging, abandonment or decommissioning of any equipment associated with its Class III well.

3. **Environmental Monitoring:** The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC or EPA QA/QC Standards. The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit environmental sampling data summary tables, all raw analytical data, and laboratory QA/QC.

2.I. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a WQCC single well plugging bond in the amount that it shall determine, in accordance with Permit Conditions 2.D and 5.B, to cover potential costs associated with plugging and abandonment of the Class III

well, surface restoration, environmental ground water remediation and monitoring, pipeline abandonment, along with five years of surface subsidence monitoring thereafter. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required environmental related corrective actions.

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding requirements of Sections 20.6.2.5000 through 20.6.2.5399 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required hereinabove.

2.J. ANNUAL REPORT: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by June 1st of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class III Well Report, Name of Permittee, Discharge Permit Number, API number of well(s), date of report, and person submitting report;
- Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103;
- Monthly fluid injection and brine production volume, including the cumulative total carried over each year;
- Semi-annual monitor and recovery well analytical data results;
- Injection pressure data;
- Pipeline hydrostatic test results;
- Pipeline visual leak inspection monitoring results at joints;
- A copy of the chemical analyses shall be included with data summary and all QA/QC information;
- Copy of any mechanical integrity test chart(s), including the type of test, i.e., duration, gauge pressure, etc.;
- Brief explanation describing deviations from the normal operations;
- Results of any leaks and spill corrective action reports;
- An Area of Review (AOR) update summary;
- A summary with interpretation of MITs, surface subsidence surveys, estimated cavern size and shape, cavern volume and geometry measurements with conclusion(s) and recommendation(s);
- A summary of the ratio of the monthly volume of injected fluids to the volume of produced brine;
- A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;
- Annual Surface Subsidence Monitoring Plan data results in accordance with Permit Condition 2.B.1;
- Annual Solution Cavern Characterization data results in accordance with Permit Condition 2.B.2; and
- The Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

3. CLASS III WELL OPERATIONS:

1. **Owner/Operator Commitments.** Once a permit is issued, the owner/operator must ensure all operations are consistent with the terms and conditions of the permit and in conformance with all pertinent rules and regulations under both the Water Quality Act. The owner/operator shall abide by all commitments submitted in its discharge permit application including any attachments and/or amendments along with these approval conditions. Applications which reference previously approved plans on file with the OCD shall be incorporated into this permit and the owner/operator shall abide by all commitments of such plans.

3.A. OPERATING REQUIREMENTS: The Permittee shall comply with the operating requirements specified in 20.6.2.5206A NMAC and 20.6.2.5206C NMAC to ensure that:

1. **Brine Production Method:** During the cavern development process and daily brine production, a reverse flow configuration consisting of fresh water injection through the internally cemented 4-1/2 in. liner cemented within the 8-5/8 in. casing to a depth of 1,877 ft. bgl, which is at least 123 ft. above the salt-rock interface at approximately 2,000 ft. bgl. Brine production is through the 2-7/8 in. tubing at an approximate depth of 2,610 ft. bgl. Injection and production flow may temporarily be reversed as required periodically to clean the tubing and annulus.

2. **Injection Out of Zone:** Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone. If the Permittee determines that its Class III well is discharging or suspects that it is discharging fluids into a zone or zones other than the permitted injection zone specified in Permit Condition 3.B.1., then the Permittee shall within 24 hours notify OCD's Environmental Bureau and Hobbs District Office of the circumstances and action(s) taken. The Permittee shall cease operations until proper repairs are made and it has received approval from OCD to re-start injection operations.

3. **Pipeline:** Hydrostatic testing (HST) of pipeline is required for any pressure loss, leakage, etc. at joints (if present). The HST report with "as-built" pipeline transect, and associated construction information shall be submitted to OCD for approval within 30-days of test completion. Mandatory HST of the pipeline is required after leakage discovery and repair. The pipeline shall be constructed with an Emergency Shut-Down Device with block off locations for pipeline isolation, access, cleaning, testing, etc. Daily pipeline inspection and monitoring is required at a minimum for the first week and each time the pipeline is brought back into service after shut-down, service work, etc. The pipeline shall be inspected within 8-hours of pipeline pressure loss, upset, etc. Weekly inspection and monitoring at a minimum is required thereafter. Inspection record keeping is required and shall include the date and time of each inspection, inspectors name and contact information, weather conditions with inspection summary, any conclusion on pipeline condition with any recommendations. Spills or release locations shall include GPS Coordinates (NAD83) and be handled in accordance with Condition 2.G Release Reporting herein.

3.B. INJECTION OPERATIONS:

1. **Well Injection Pressure Limit:** The Permittee shall ensure that the maximum wellhead or surface injection pressure of 350 psig on its Class III well shall not exceed the fracture pressure of the injection salt formation and will not cause new fractures or propagate any existing fractures of cause damage to the system and underground source of drinking water.

2. **Pressure Limiting Device:** The Permittee shall equip and operate its Class III well or system with a pressure limiting device which shall, at all times, limit surface injection pressure to the maximum allowable pressure for its Class III well. The Permittee shall monitor the pressure-limiting device daily and shall report all pressure exceedances within 24 hours of detecting an exceedance to OCD's Environmental Bureau.

   The Permittee shall take all steps necessary to ensure that the injected fluids enter only the proposed injection interval and is not permitted to escape to other formations, fresh water zones, or onto the ground surface. The Permittee shall report to OCD's Environmental Bureau within 24 hours of discovery any indication that new fractures or existing fractures have been propagated, or that damage to the well, the injection zone, or formation has occurred.

3.C. CONTINUOUS MONITORING DEVICES: The Permittee shall use continuous monitoring devices to provide a record of surface injection pressure, flow rate, and flow volume.

3.D. MECHANICAL INTEGRITY FOR CLASS III WELLS:

1. Pursuant to 20.6.2.5204 NMAC, the Permittee shall demonstrate mechanical integrity for its Class III well at least once every five years or more frequently as the OCD Director may require for good cause during the life of the well. The Permittee shall demonstrate mechanical integrity for its Class III well every time it performs a well workover, including when it pulls the tubing. A Class III well has mechanical integrity if there is no detectable leak in the casing or tubing which OCD considers to be significant at maximum operating temperature and pressure; and no detectable conduit for fluid movement out of the injection zone

through the well bore or vertical channels adjacent to the well bore which the OCD Director considers to be significant. The Permittee shall conduct a casing Mechanical Integrity Test (MIT) from the surface to the approved injection depth to assess casing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 500 psig measured at the surface when tubing is removed and a plug is installed within 20 ft. of the casing shoe depth. Alternatively, the MIT may consist of a casing/cavern 4-hr. test at a minimum pressure of 300 psig measured at the surface when the cavern and casing are full and tubing remains in the well. More work is required in the "casing/cavern" test in the event of failure to determine the actual cause.

The Permittee shall notify OCD's Environmental Bureau and Hobbs District Office at least 5 days prior to conducting any MIT to allow OCD Hobbs the opportunity to witness the MIT.

2. The following criteria will determine if the Class III well has passed the MIT:

   a. Passes MIT if zero bleed-off during the test;

   b. Passes casing MIT if final test pressure is within +/- 10% of starting pressure, if approved by OCD (Note: Passes +/- 1% of starting pressure for cavern test due to the massive volume of fluid required in the cavern and casing during this test);

   c. When the MIT is not witnessed by OCD and fails, the Permittee shall notify OCD within 24 hours of the failure of the MIT.

   d. All chart recorder information, charts containing appropriate information, calibration sheets, etc. shall be provided to OCD within 5 working days of completing an MIT.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use by the Permittee of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

3.E. WELL WORKOVER OPERATIONS: Pursuant to 20.6.2.5205A(5) NMAC, the Permittee shall provide notice to and shall obtain approval from OCD's District Office in Hobbs and the Environmental Bureau in Santa Fe prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Hobbs District Office. Properly completed Forms C-103 and/or C-105 must be filed with OCD upon completion of workover activities and copies included in that year's Annual Report.

3.F. FLUIDS INJECTION AND BRINE PRODUCTION VOLUMES AND PRESSURES: The Permittee shall continuously monitor the volumes of water injected and brine production. The Permittee shall submit monthly reports of its injection and production volumes on or before the 10th day of the following month. The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours.

3.G. AREA OF REVIEW (AOR): The Permittee shall report within 72 hours of discovery any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class III well. OCD shall be notified within 24 hours of having knowledge of any wells lacking cement within the cavern interval within a ½-mile radius from the Class III well.

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells.

This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (e.g., septic systems, leach fields, dry wells, etc.) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. ANNUAL REPORT: The Permittee shall submit its annual report to OCD by June 1st of each year.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its UIC Class III well, conduct ground water restoration if applicable, and any post-operational monitoring and remediation as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC), and/or the Closure Plan addresses this requirement and is approved by OCD. The Permittee's cost estimate shall be based on third person estimates and included in the Closure Plan with the application. OCD will require the Permittee to submit a single well plugging bond based on the OCD approved third person cost estimate for OCD approval before OCD may issue approval to drill and construct a new well (also see Permit Conditions 2.D and 2.I).

5.C. SURFACE SUBSIDENCE MONITORING PLAN: The Permittee shall submit the Surface Subsidence Monitoring Plan required in accordance with Permit Condition 2.B.1 within 180 days of permit issuance for OCD approval unless it has already been approved by the OCD.

5.D. SOLUTION CAVERN CHARACTERIZATION PLAN: The Permittee shall submit the Solution Cavern Characterization Plan required in accordance with Permit Condition 2.B.2 within 180 days of permit issuance for OCD approval unless it has already been approved by the OCD.

Description (11/6/2018)

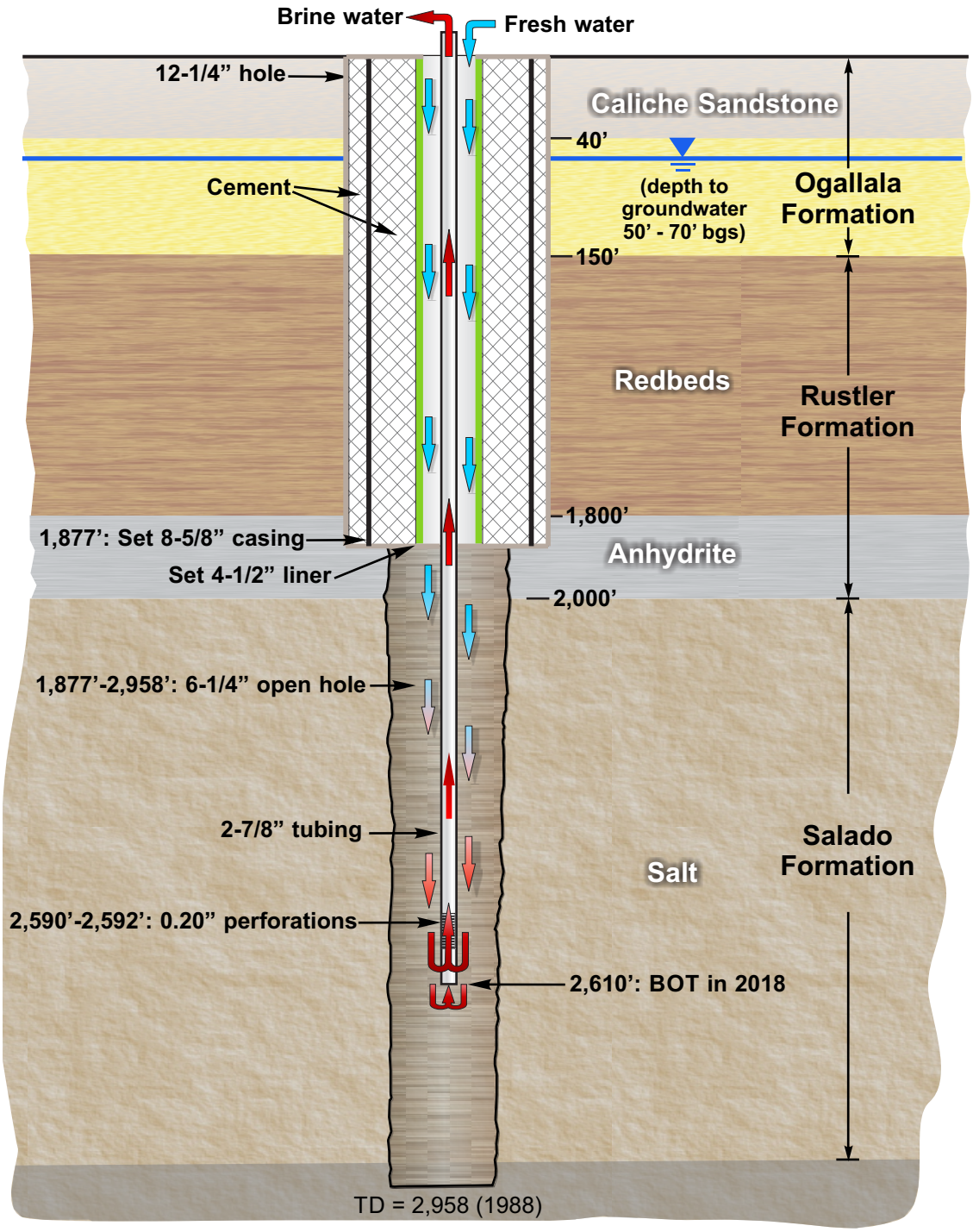
Discharge Permit Renewal (BW-08) PAB Services, Inc., UIC Class III Brine Well "Brine Supply Well No. 1" (API No. 30-025-26307) UL: J Section 5 Township 19 South, Range 36 East, 1,980 FSL, 1,980 FEL, Lat. 32.68782°, Long. -103.37449°, NMPM, Lea County, New Mexico:

The Underground Injection Control (UIC) Class III Brine Well is located approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 intersection. The Salty Dog Brine Station is located approximately 2,500 N-NE of the brine well. Brine is conveyed via a 3 in. diameter high-density Polyethylene (HDPE) pipeline 3/8 in. thick from the brine well to the tank battery on the ground surface.

The brine well total depth (TD) is 2,958 ft. below ground level (bgl) into the Salado "Salt" Formation. The casing shoe (8-5/8 in.) is set at 1,877 ft. bgl into the Anhydrite beds above the Salado "Salt" Formation. The Anhydrite-Salado contact is at 2,000 ft. bgl. Open hole (6-1/4 in.) runs to TD. Production tubing (2-7/8 in.) is set at a depth of 2,610 ft. within the Salado "Salt" Formation to produce high density "Brine Fluids" used in the drilling of oil and gas wells in New Mexico. Technical discussions are ongoing to increase the depth of freshwater injection directly into the salt formation. The water table ranges from about 60 - 70 ft. bgl.

Fresh groundwater will be injected into the tubing-casing annulus through the open-hole and at an average injection rate of 1,600 bbl/day (~ 47 gpm) and maximum injection rate of 2,674 bbl/day (~ 78 gpm) below a permitted maximum surface injection pressure (MSIP) of 375 psig. The construction and design of this brine well is an open system and utilizes a reverse-flow scheme where freshwater is injected through the well annulus into the anhydrite beds above the Salado "Salt" Formation with production of brine through tubing to surface.

Salty Dog Brine Well



Notes:

1. BOT = Bottom of tubing
2. Figure not to scale

Sources:

1. Completion data based on OCD well reports
2. Lithology from Salty Dog (1988)

SALTY DOG BRINE STATION

Generalized Brine Well Schematic

Daniel B. Stephens & Associates, Inc.

12-6-18 JN ES08.0118.06

S:\Projects\ES08.0118.06_Salty_Dog_2016\GIS\VR_drawings\Fig03_Generalized_brine_well_schematic.cdr

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Heather Riley, Division Director
Oil Conservation Division

OCTOBER 11, 2018

CERTIFIED MAIL
RETURN RECEIPT NO: 5995 4063

Mr. Pieter Bergstein
PAB Services, Inc.
P.O. Box 2724
Lubbock, Texas 79408

Re: Discharge Permit (BW-8) PAB Services, Inc., 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, 1980 FSL, 1980 FEL, Lat. N 32.68847°, Long. W 103.37445°, NMPM, Lea County, New Mexico

Mr. Bergstein,

The New Mexico Oil Conservation Division (OCD) has received PAB Services, Inc.'s (PAB) discharge permit renewal application dated July 2, 2018, was officially received on July 5, 2018, for the discharge permit renewal of the Brine Supply Well No. 1.

The initial submittal with additional information requested by OCD provided the required information to deem the application ***"administratively complete"*** per New Mexico Water Quality Control Commission regulations (20.6.2.3108 NMAC).

As such, the Water Quality Control Commission (WQCC) regulations notice requirements of 20.6.2.3108 NMAC must be satisfied and demonstrated to the OCD. OCD will also provide public notice pursuant to WQCC requirements and determine if there is sufficient public interest.

Please contact me at (505) 476-3490 or carlj.chavez@state.nm.us if you have questions. Thank you for your cooperation throughout the discharge permit review process.

Sincerely,

Carl J. Chávez
Environmental Engineer

xc: OCD Hobbs District Office

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations (20.6.2.3108 NMAC), the following discharge permit renewal application has been submitted to the Director of the New Mexico Oil Conservation Division ("OCD"), 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3460:

(BW-8) PAB Services, Inc., Pieter Bergstein, Owner, P.O. Box 2724, Lubbock, TX 79408, has submitted an application for an Underground Injection Control (UIC) Class III Brine Well Discharge Permit Renewal for the "Brine Supply Well No. 1" (API# 30-025-26307), located 1,980 FSL and 1,980 FEL, UL: J in Section 5, Township 19 South, Range 36 East (Lat. N 32.68847°, Long.: W 103.37445°), NMPM, Lea County, New Mexico. approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 intersection.

The current fluid flow process is termed "reverse flow" which consists of fresh water injection through the 8-5/8 in. casing annulus with a fully cemented 4-1/2 in. liner at an approximate depth of 1,877 ft. bgl into anhydrite beds above the Salado "Salt" Formation. Brine production is through the 2-7/8 in. tubing set at 2,610 ft. bgl within the Salado "Salt" Formation. The anhydrite-salt contact is at 2,000 ft. bgl. The 6-1/4 in. open hole extends to a TD of 2,958 ft. bgl. Injection and production flow may temporarily be reversed as required periodically to clean the tubing and annulus.

Fresh water injection down the 4-1/2 in. liner is at an average injection rate of 1,600 bbl./day (~ 47 gpm) and maximum injection rate of approximately 2,674 bbl./day (~ 78 gpm). Injection shall be below a permitted maximum surface injection pressure (MSIP) of 350 psig. Fresh water is supplied by a water supply well located approximately ½ mi. N-NE of the brine well with tank storage.

The fresh water and brine sales station is located approximately 2,500 ft. N-NE of the brine well. Groundwater recovery wells are present near the station and hydrogeologically downgradient from the brine well. Groundwater with elevated Chlorides from both locations are recovered and injected into the brine well. Produced brine ready for sale is stored in a bermed tank battery consisting of six 750-bbl ASTs that are constructed of fiberglass. The total capacity of the tank battery is 4,500 bbl. Produced brine is conveyed via a 3-inch-diameter high-density polyethylene (HDPE) pipeline at surface from the brine well to the tank battery. The conveyance pipeline is ⅜ inch thick and runs along the ground surface to readily detect leaks. The areas of the conveyance pipeline and storage tanks are inspected regularly for signs of leaks and deterioration.

Produced Salado brine fluid is expected to be at a concentration of about 324,000 ppm Total Dissolved Solids- TDS. Groundwater most likely to be affected by a spill, leak or accidental discharge is at a depth of approximately 75 ft. bgl with a TDS concentration of approximately 400 ppm. The discharge permit addresses well construction, operation, monitoring, ground subsidence, associated surface facilities, financial assurance, and provides a contingency plan in the event of accidental discharges.

The OCD has determined the renewal application is administratively complete and has prepared a draft permit. The OCD will accept comments and statements of interest regarding this application and will create a facility-specific mailing list for persons who wish to receive future notices. Persons interested in obtaining further information, submitting comments or requesting to be on a facility-specific mailing list may contact the Environmental Bureau Chief of the OCD at the address given above. The permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, or at the OCD web site http://www.emnrd.state.nm.us/ocd/. Persons interested in obtaining a copy of the application and draft permit may contact the OCD at the address given above. Prior to ruling on any proposed permit, the Director shall allow a period of at least thirty (30) days after the date of publication of this notice, during which interested persons may submit comments or request that OCD hold a public hearing. Requests for a hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no hearing is held, the Director will approve the proposed permit based on information available, including all comments received. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit application and information submitted at the hearing.

Para obtener más información sobre esta solicitud en español, sirvase comunicarse por favor: New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservación Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Laura Tulk, 575-748-1283).

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 24th day of March 2019.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

S E A L

Gabriel Wade, Acting Director

Chavez, Carl J, EMNRD

From: Estes, Bob, DCA
Sent: Wednesday, April 3, 2019 1:06 PM
To: Chavez, Carl J, EMNRD
Subject: FW: bw 8
Attachments: log 110164.pdf

'Afternoon Carl,

Here is the SHPO response to the BW 8 permit renewal,

Sincerely,
Bob Estes Ph.D.
NM HPD Staff archaeologist
407 Galisteo St., Suite 236
Santa Fe, NM 87501
505-827-4225

-----Original Message-----
From: HPDXerox@state.nm.us [mailto:HPDXerox@state.nm.us]
Sent: Wednesday, April 3, 2019 12:29 PM
To: Estes, Bob, DCA
Subject: bw 8

Please open the attached document. It was scanned and sent to you using a Xerox Multifunction Device.

Attachment File Type: pdf, Multi-Page

Multifunction Device Location: machine location not set
Device Name: HPD_Xerox_WorkCentre_5945

For more information on Xerox products and solutions, please visit http://www.xerox.com

Susana Martinez
Governor

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 FAX (505) 827-6338

April 3, 2019

Carl Chavez
Environmental Engineer
Oil Conservation Bureau-Environmental Bureau Mining and Minerals Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Salty Dog Brine Well Discharge Permit renewal BW-8 (HPD Log 110164)

Dear Mr. Chavez:

This letter is in response to the above referenced permit renewal application received at the Historic Preservation Division (HPD) on March 25, 2019. According to the application, the proposed project is within Township 19 South, Range 36 East, Section 5. My review shows that the well is on private property.

I reviewed our records to determine if cemeteries, burial grounds or cultural resources listed on the State Register of Cultural Properties or the National Register of Historic Places exist within or near the permit area. Our records show that there are no cultural resources listed on the National Register or State Register within or near the proposed permit area and no known cemeteries or burial grounds.

Our records also show that there have been three surveys along US 62/180 to identify cultural resource near the permit area. No cultural resources were identified during those surveys.

The SHPO has no concerns that the permit renewal will inadvertently affect cultural resources.

Please do not hesitate to contact me if you have any questions regarding these comments. I can be reached by telephone at (505) 827-4225 or by email at bob.estes@state.nm.us .

Sincerely,

Bob Estes

Bob Estes Ph.D.
Archaeologist

MAR 28 2019 PM02:12

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
March 24, 2019
and ending with the issue dated
March 24, 2019.

Publisher

Sworn and subscribed to before me this 24th day of March 2019.

Business Manager

My commission expires:
January 29, 2023
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-23

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said

LEGAL NOTICE
MARCH 24,2019

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations (20.6.2.3108 NMAC), the following discharge permit renewal application has been submitted to the Director of the New Mexico Oil Conservation Division ("OCD"), 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3460:

(BW-8) PAB Services, Inc., Pieter Bergstein, Owner, P.O. Box 2724, Lubbock, TX 79408, has submitted an application for an Underground Injection Control (UIC) Class III Brine Well Discharge Permit Renewal for the "Brine Supply Well No. 1" (API# 30-025-26307), located 1,980 FSL and 1,980 FEL, UL: J in Section 5, Township 19 South, Range 36 East (Lat. N 32.68847°, Long.: W 103.37445°), NMPM, Lea County, New Mexico, approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 Intersection.

The current fluid flow process is termed "reverse flow" which consists of fresh water injection through the 8-5/8 in. casing annulus with a fully cemented 4-1/2 in. liner at an approximate depth of 1,877 ft. bgl into anhydrite beds above the Salado "Salt" Formation. Brine production is through the 2-7/8 in. tubing set at 2,610 ft. bgl within the Salado "Salt" Formation. The anhydrite-salt contact is at 2,000 ft. bgl. The 6-1/4 in. open hole extends to a TD of 2,958 ft. bgl. Injection and production flow may temporarily be reversed as required periodically to clean the tubing and annulus.

Fresh water injection down the 4-1/2 in. liner is at an average injection rate of 1,600 bbl./day (47 gpm) and maximum injection rate of approximately 2,674 bbl./day (76 gpm). Injection shall be below a permitted maximum surface injection pressure (MSIP) of 350 psig. Fresh water is supplied by a water supply well located approximately ½ mi. N-NE of the brine well with tank storage.

The fresh water and brine sales station is located approximately 2,500 ft. N-NE of the brine well. Groundwater recovery wells are present near the station and hydrogeologically downgradient from the brine well. Groundwater with elevated Chlorides from both locations are recovered and injected into the brine well. Produced brine ready for sale is stored in a bermed tank battery consisting of six 750-bbl ASTs that are constructed of fiberglass. The total capacity of the tank battery is 4,500 bbl. Produced brine is conveyed via a 3-inch-diameter high-density polyethylene (HDPE) pipeline at surface from the brine well to the tank battery. The conveyance pipeline is 3/8 inch thick and runs along the ground surface to readily detect leaks. The areas of the conveyance pipeline and storage tanks are inspected regularly for signs of leaks and deterioration.

Produced Salado brine fluid is expected to be at a concentration of about 324,000 ppm Total Dissolved Solids- TDS. Groundwater most likely to be affected by a spill, leak or accidental discharge is at a depth of approximately 75 ft. bgl with a TDS concentration of approximately 400 ppm. The discharge permit addresses well construction, operation, monitoring, ground subsidence, associated surface facilities, financial assurance, and provides a contingency plan in the event of accidental discharges.

The OCD has determined the renewal application is administratively complete and has prepared a draft permit. The OCD will accept comments and statements of interest regarding this application and will create a facility-specific mailing list for persons who wish to receive future notices. Persons interested in obtaining further information, submitting comments or requesting to be on a facility-specific mailing list may contact the Environmental Bureau Chief of the OCD at the address given above. The permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, or at the OCD web site http://www.emnrd.state.nm.us/ocd/. Persons interested in obtaining a copy of the application and draft permit may contact the OCD at the address given above. Prior to ruling on any proposed permit, the Director shall allow a period of at least thirty (30) days after the date of publication of this notice, during which interested persons may submit comments or request that OCD hold a public hearing. Requests for a hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no hearing is held, the Director will approve the proposed permit based on information available, including all comments received. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit application and information submitted at the hearing.

Para obtener más información sobre esta solicitud en español, sírvase comunicarse por favor: New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energía, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservación Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Laura Tulk, 575-748-1283).

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 24th day of March 2019.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

SEAL
#33930

Gabriel Wade, Acting Director

1220 S. SAINT FRANCIS DR.
SANTA FE, NM 87505

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, March 27, 2019 11:34 AM
To: 'Ayarbe, John'
Cc: 'Pieter Bergstein (pieter@bergsteinenterprises.com)'; 'susan@thestandardenergy.com'; Zbrozek, Michael
Subject: RE: PAB Services, Inc. Brine Supply Well No. 1 (BW-8) (API# 30-025-26307 in Lea County Brine Well Renewal Application Administratively Complete

John, et al.:

The New Mexico Oil Conservation Division (OCD) is in receipt of PAB Services, Inc. public comments of March 26, 2019 on the OCD Draft Discharge Permit public noticed in the Hobbs Sun and Albuquerque Journal on Sunday, March 24, 2019.

OCD will enter the comments in its administrative record for consideration in the permit technical review process.

Thank you.

From: Ayarbe, John <jayarbe@geo-logic.com>
Sent: Tuesday, March 26, 2019 2:23 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: 'Pieter Bergstein (pieter@bergsteinenterprises.com)' <pieter@bergsteinenterprises.com>; 'susan@thestandardenergy.com' <susan@thestandardenergy.com>; Zbrozek, Michael <mzbrozek@geo-logic.com>
Subject: [EXT] RE: PAB Services, Inc. Brine Supply Well No. 1 (BW-8) (API# 30-025-26307 in Lea County Brine Well Renewal Application Administratively Complete

Hi Carl,

I reviewed the draft DP and have the following comments:

- Section 2.A. Quarterly Monitoring Requirements for Class III Wells – We've been conducting semiannual sampling since 2017. PAB initiated semiannual monitoring in consultation with OCD. Fresh water and produce brine samples are collected at the same time groundwater quality samples are collected.

- Section 2.B. Solution Cavern Monitoring Program – The requirements for a Surface Subsidence Monitoring Plan and a Solution Cavern Characterization Plan seem to be from the existing discharge permit and have already been meet. We submitted these plans to OCD in September 2014.

  Five surface subsidence monitoring points were installed around the brine well in 2018. A letter report documenting the installation was submitted to OCD in June 2018. The five surface subsidence monitoring points are resurveyed semiannually (at about the same time groundwater quality samples are collected).

  In consultation with OCD, characterization of the brine solution cavern using geophysical techniques was postponed. We understand that OCD may require geophysical characterization (or other means of characterization) if results of subsidence monitoring show subsidence attributable to brine production. DBS&A

reports the estimated size of the brine solution cavern in the Annual Class III well reports that are submitted to OCD. We also submitted a calculation with the estimated height and estimated floor diameter of the brine cavern in December 2018.

- Subsection 1 under Section 2.A – We've been analyzing groundwater samples for the following constituents since the monitoring program was initiated:

    - Field pH
    - Field specific conductance
    - Chloride by EPA 300.0

    Groundwater quality has significantly improved since remedial groundwater extraction began in 2012. Monitoring for chloride is sufficient to assess the extent of groundwater quality impacts and efficacy of remedial pumping. Analysis of the groundwater samples for specific gravity, TDS, major cations, and major anions other than chloride is not necessary.

- Section 2.D. Closure – The current version of the closure plan specifies two years rather five years for surface subsidence monitoring. In earlier emails you sent me, two years was specified.

- Subsection 3.a under Section 2.H. – Monitor wells already exist downgradient of the brine well. These wells are sampled semiannually. An additional well is not needed to monitor for releases from the brine well.

Attached is the draft permit with my edits in tracked changes. I used the Adobe comment tools.

Please let me know if you have questions and call me if you want to discuss.

Thanks!.

John P. Ayarbe
Senior Hydrogeologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company
Direct: (505) 353-9137
Mobile: (505) 280-4339

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, March 22, 2019 9:19 AM
To: 'Sandoval, Alexandra J., DGF'; Wunder, Matthew, DGF; 'Shije, Suzette, IAD'; ddapr@nmda.nmsu.edu; adunn@slo.state.nm.us; James_Amos@blm.gov; psisneros@nmag.gov; r@rthicksconsult.com; sric.chris@earthlink.net; Parks, NM, EMNRD; Blaine, Tom, OSE; marieg@nmoga.org; Fetner, William, NMENV; lazarus@glorietageo.com; perry@glorietageo.com; 'Majure, Allison, NMENV'; cjoyner@fs.fed.us; Kieling, John, NMENV; bsg@garbhall.com; Hunter, Michelle, NMENV; claudette.horn@pnm.com; ekendrick@montand.com; pam@ipanm.org; 'Brown, Maxey G, EMNRD'; 'Bayliss, Randolph, EMNRD'; Bratcher, Mike, EMNRD; 'Perrin, Charlie, EMNRD'; Jones, William V, EMNRD; Kelly, Jonathan, EMNRD; Powell, Brandon, EMNRD; Jones, William V, EMNRD; Wojahn, Beth, EMNRD; Sanchez, Daniel J., EMNRD; Goetze, Phillip, EMNRD; Griswold, Jim, EMNRD
Cc: Tulk, Laura, EMNRD; DeVargas, Lorraine, EMNRD; Ayarbe, John; 'Pieter Bergstein (pieter@bergsteinenterprises.com)'
Subject: PAB Services, Inc. Brine Supply Well No. 1 (BW-8) (API# 30-025-26307 in Lea County Brine Well Renewal Application Administratively Complete

Ladies and Gentlemen:

Please find below the New Mexico Oil Conservation Division (OCD) first Public Notice for the above subject Water Quality Control Commission Underground Injection Control (UIC) Class III Brine Well Discharge Permit application and associated documents. The public notice will be posted in the Sunday, March 24, 2019 editions of the Hobbs Sun News and Albuquerque Journal.

Discharge Permit (BW-8) PAB Services, Inc. (11/6/2018)**:**
The Underground Injection Control (UIC) Class III Brine Well "Brine Supply Well No. 1" is located at UL: J, Section 5, Township 19 South, Range 36 East, Latitude: N 32.68782 Longitude: W -103.37449, NMPM, Lea County. The brine well is located approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 intersection.

Administrative Completeness (10/11/2018)
Description (11/6/2018)
Application (7/10/2018)
Application Update (1/3/2019)
Discharge Permit (3/24/2019)
Public Notice (3/24/2019)

The OCD Website for public notices is at http://www.emnrd.state.nm.us/OCD/env-draftpublicetc.html (see "Draft Permits and Public Notices" section).

Please contact me if you have questions. Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

DISCHARGE PERMIT APPROVAL CONDITIONS

All discharge permits are subject to Water Quality Control Commission regulations.

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY : The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department issues a Discharge Permit Renewal for BW-8 to PAB Services, Inc. (Permittee) to operate a Underground Injection Control (UIC) Class III Well for the solution mining of salt (Brine Supply Well No. 1 API # 30-025-26307) ~~is~~ located 1,980 FSL, and 1,980 FEL, Unit Letter J (NW/4 of SE/4) of Section 5, Township 19 South Range 36 East, Latitude N 32.68847º, Longitude W 103.37445º, NMPM, Lea County, New Mexico. This brine well is located approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 intersection. The brine station or sales terminal is located approximately 1/2 mile north-northeast of the brine well. Produced brine is metered at surface and transported greater than 0.5 miles via a surface 3-inch polyethylene pipeline to the brine station for sale. Chloride impacted groundwater at the brine station and hydrogeologically downgradient from the brine well are being recovered and used as freshwater for injection into BW-8.

The Permittee is permitted to inject water into the subsurface salt layers and produce brine for use in the oil and gas industry. Ground water that may be affected by a spill, leak, or accidental discharge of brine occurs at a depth of approximately 75 feet below ground surface and has a total dissolved solids (TDS) concentration of approximately 400 mg/L.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class III wells associated with the oil and gas industry (See Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (See 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5399 NMAC).

This Discharge Permit for a Class III Brine Well is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or on-site disposal of, any materials, product, by-product, or oil-field waste.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.
2. The injection of fluids into a large capacity cesspool is prohibited.
3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.
4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.
5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a

hazard to public health, (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified of 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5399 NMAC) for Class III wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5399 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified at 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject non-hazardous fluids into ground water having 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (See Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT: This Discharge Permit is a permit renewal that replaces the permit being renewed. Replacement of a prior permit does not relieve the Permittee of its responsibility to comply with the terms of that prior permit while that permit was in effect.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required $100.00 filing fee. The Permittee is now required to submit the $1,700.00 permit fee for a Class III well. Please remit payment made payable to the "Water Quality Management Fund" in care of OCD at 1220 South St. Francis Drive in Santa Fe, New Mexico 87505.

1.F. EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT: This Discharge Permit becomes effective immediately from the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit will expire on **March 24, 2024**. The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. If a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (See Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

1.G. MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD Director and OCD's Environmental Bureau of any Facility expansion or process modification (See 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class III well that was approved pursuant to the requirements of 20.6.2.5000 through 20.6.2.5399 NMAC for the following causes:

    a. Noncompliance by Permittee with any condition of this Discharge Permit; or,

    b. The Permittee's failure in the discharge permit application or during the discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

c. A determination that the permitted activity may cause a hazard to public health or undue risk to property and can only be regulated to acceptable levels by discharge permit modification or termination (See Section 75-6-6 NMSA 1978; 20.6.2.5101I NMAC; and, 20.6.2.3109E NMAC).

2. This Discharge Permit may also be modified or terminated for any of the following causes:

a. Violation of any provisions of the Water Quality Act or any applicable regulations, standard of performance or water quality standards;

b. Violation of any applicable state or federal effluent regulations or limitations; or

c. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (See Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS III WELL DISCHARGE PERMIT:

1. The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class III well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class III well discharge permit if:

a. The OCD Director receives written notice 30 days prior to the transfer date; and

b. The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2.a shall:

a. Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgement that the succeeding Permittee shall be responsible for compliance with the Class III well discharge permit upon taking possession of the facility; and

b. Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

c. Include information relating to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance immediately or within a specified time period, or assess a civil penalty, or both (See Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (See Section 74-6-10(A)(2) NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a state or federal law or regulation (See Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS:

2.A. ~~QUARTERLY~~ MONITORING REQUIREMENTS FOR CLASS III WELLS: The Permittee may use either or both fresh water or water from otherwise non-potable sources. Pursuant to 20.6.2.5207C, the Permittee shall provide analysis of the injected fluids and brine at least ~~quarterly~~ to yield data representative of their characteristics. The

Permittee shall analyze both the injected fluids and brine for the following characteristics: pH; density, concentration of total dissolved solids (TDS); chloride concentration; and sodium concentration (for brine only).

1. **Groundwater Monitoring Well:** Collect groundwater samples for general chemistry and WQCC 20.6.2.3103 NMAC groundwater constituents. Groundwater quality data shall comply with EPA Quality Assurance/Quality Control (QA/QC) and Data Quality Objectives (DQOs). The monitor well is required to be sampled and monitored **semi-annually** for the following characteristics:

   - pH (Method 9040);
   - Eh;
   - Specific conductance;
   - ~~Specific gravity;~~
   - Temperature; and
   - General ground water quality parameters ~~(pH, total dissolved solids, and major cations and anions, including fluoride, calcium, potassium, magnesium, sodium bicarbonate, carbonate,~~ chloride~~, sulfate, and bromide~~ using the methods specified in 40 CFR 136.3).

   The environmental data results shall be reported in the Annual Report (Section 2.J).

2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. **Surface Subsidence Monitoring Plan** ~~The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective date of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments and top of well casing at least semi-annually.~~

   The Permittee shall survey each survey monument and top of well casing at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS geodetic benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program with proper instrument accuracy assessment at the conclusion of each survey. The Permittee shall submit the results of all subsidence surveys with summary of results and any recommendations to OCD within 15 days of survey completion. If the monitored surface subsidence survey at any measuring point deviates 0.10 ft. or more compared to its baseline elevation, then the Permittee shall notify OCD within 30 days of survey completion for further instructions. If survey results continue to demonstrate subsidence over time, and the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.

   The Permittee shall include the above information in the Annual Report (Section 2.J).

2. **Solution Cavern Characterization Program** ~~The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical methods approved by OCD at least once before the expiration date of the permit. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.~~

   a. The Permittee shall provide an estimate of the size and shape of the solution cavern at least annually in the Annual Report (Section 2.J), based on fluid injection and brine production data.

   b. The Permit shall compare the ratio of the volume of injected fluids to the volume of produced brine monthly. If the average ratio of injected fluid to produced brine varies is less than 90% or greater than 110%, the Permittee shall report this to OCD and cease injection and production operations of its Class III well within 24 hours. The Permittee shall begin an investigation to determine the cause of this

abnormal ratio within 72 hours. The Permittee shall submit to OCD a report of its investigation within 15 days of cessation of injection and production operations of its Class III well for further instructions.

3. **Annual Certification:** The Permittee shall certify annually in the Annual Report (Section 2.J) that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.

   If the solution cavern is determined by either OCD or the Permittee to be potentially unstable by either direct or indirect means, then the Permittee shall cease all fluid injection and brine production within 24 hours. If the Permittee ceases operations because it or OCD has determined that the solution cavern is unstable, then it shall submit a plan to stabilize the solution cavern within 30 days. OCD may require the Permittee to implement additional subsidence monitoring and to conduct additional corrective action.

2.C. CONTINGENCY PLANS: The Permittee shall implement its proposed contingency plan(s) included in its Permit Application to cope with failure of a system(s) in the Discharge Permit.

2.D. CLOSURE: The Permittee shall submit as a condition of C-103 Sundry approval, and for OCD approval, a facility closure plan with third-party cost estimate for its well pursuant to 20.6.2.5209 NMAC and as specified in Permit Conditions 2.I and 5.B to address: well plug and abandonment and surface restoration; environmental groundwater monitoring and remediation; pipeline abandonment; and ~~five~~ years of surface subsidence monitoring.

1. **Pre-Closure Notification:** Pursuant to 20.6.2.5005A NMAC, the Permittee shall submit a pre-closure notification to OCD's Environmental Bureau at least 30 days prior to the date that it proposes to close or to discontinue operation of its Class III well. Pursuant to 20.6.2.5005B NMAC, OCD's Environmental Bureau must approve all proposed well closure activities before Permittee may implement its proposed closure plan.

2. **Required Information:** The Permittee shall provide OCD's Environmental Bureau with the following information:

- Name of facility;
- Address of facility;
- Name of Permittee (and owner or operator, if appropriate);
- Address of Permittee (and owner or operator, if appropriate);
- Contact person;
- Phone number;
- Number and type of well(s);
- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (e.g., sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation and/or continued environmental monitoring and remediation, other);
- Proposed date of well closure;
- Proposed method and date of surface restoration;
- Proposed method and date of pipeline abandonment;
- Name of preparer; and
- Date.

2.E. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon its Class III well, it shall submit to OCD a plugging and abandonment plan that meets the requirements of 20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of

the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.F RECORD KEEPING: The Permittee shall maintain records of all inspections, surveys, investigations, etc., required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection at the request of an OCD Representative.

2.G. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified at 20.6.2.3103 NMAC, then it shall report a release to OCD's Environmental Bureau.

1. **Oral Notification:** As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

   - The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
   - The name and location of the facility;
   - The date, time, location, and duration of the discharge;
   - The source and cause of discharge;
   - A description of the discharge, including its chemical composition;
   - The estimated volume of the discharge; and,
   - Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. **Written Notification:** Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use form C-141 with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

   The Permittee shall provide subsequent corrective actions and written reports as required by OCD's Environmental Bureau.

2.H. OTHER REQUIREMENTS:

1. **Inspection and Entry:** Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director, to:

   - Upon the presentation of proper credentials, enter the premises at reasonable times;
   - Inspect and copy records required by this Discharge Permit;
   - Inspect any treatment works, monitoring, and analytical equipment;
   - Sample any injection fluid or produced brine;
   - Conduct various types environmental media sampling, and
   - Use the Permittee's monitoring systems and wells in order to collect groundwater samples.

2. **Advance Notice:** The Permittee shall provide OCD's Environmental Bureau and Hobbs District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well plugging, abandonment or decommissioning of any equipment associated with its Class III well.

3. **Environmental Monitoring:** The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC or EPA QA/QC Standards.

The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit environmental sampling data summary tables, all raw analytical data, and laboratory QA/QC.

~~a. groundwater monitor well shall be installed hydrogeologically downgradient from the Brine Well and sampled in accordance with Section 2.A.1.~~

2.I. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a WQCC single well plugging bond in the amount that it shall determine, in accordance with Permit Conditions 2.D and 5.B, to cover potential costs associated with plugging and abandonment of the Class III well, surface restoration, environmental ground water remediation and monitoring, pipeline abandonment, along with ~~five~~ years of surface subsidence monitoring thereafter. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required environmental related corrective actions.

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding requirements of Sections 20.6.2.5000 through 20.6.2.5399 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required hereinabove.

2.J. ANNUAL REPORT: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by June 1st of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class III Well Report, Name of Permittee, Discharge Permit Number, API number of well(s), date of report, and person submitting report;
- Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103;
- Monthly fluid injection and brine production volume, including the cumulative total carried over each year;
- Semi-annual monitor and recovery well analytical data results;
- Injection pressure data;
- Pipeline hydrostatic test results;
- Pipeline visual leak inspection monitoring results at joints;
- A copy of the chemical analyses shall be included with data summary and all QA/QC information;
- Copy of any mechanical integrity test chart(s), including the type of test, i.e., duration, gauge pressure, etc.;
- Brief explanation describing deviations from the normal operations;
- Results of any leaks and spill corrective action reports;
- An Area of Review (AOR) update summary;
- A summary with interpretation of MITs, surface subsidence surveys, estimated cavern size and shape, cavern volume and geometry measurements with conclusion(s) and recommendation(s);
- A summary of the ratio of the monthly volume of injected fluids to the volume of produced brine;
- A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;
- Annual Surface Subsidence Monitoring Plan data results in accordance with Permit Condition 2.B.1;
- Annual Solution Cavern Characterization data results in accordance with Permit Condition 2.B.2; and
- The Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

3. CLASS III WELL OPERATIONS:

1. **Owner/Operator Commitments.** Once a permit is issued, the owner/operator must ensure all operations are consistent with the terms and conditions of the permit and in conformance with all pertinent rules and regulations under both the Water Quality Act. The owner/operator shall abide by all commitments submitted in its discharge permit application including any attachments and/or amendments along with these approval conditions. Applications which reference previously approved plans on file with the OCD shall be incorporated into this permit and the owner/operator shall abide by all commitments of such plans.

3.A. OPERATING REQUIREMENTS: The Permittee shall comply with the operating requirements specified in 20.6.2.5206A NMAC and 20.6.2.5206C NMAC to ensure that:

1. **Brine Production Method:** During the cavern development process and daily brine production, a reverse flow configuration consisting of fresh water injection through the internally cemented 4-1/2 in. liner cemented within the 8-5/8 in. casing to a depth of 1,877 ft. bgl, which is at least 123 ft. above the salt-rock interface at approximately 2,000 ft. bgl. Brine production is through the 2-7/8 in. tubing at an approximate depth of 2,610 ft. bgl. Injection and production flow may temporarily be reversed as required periodically to clean the tubing and annulus.

2. **Injection Out of Zone:** Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone. If the Permittee determines that its Class III well is discharging or suspects that it is discharging fluids into a zone or zones other than the permitted injection zone specified in Permit Condition 3.B.1, then the Permittee shall within 24 hours notify OCD's Environmental Bureau and Hobbs District Office of the circumstances and action(s) taken. The Permittee shall cease operations until proper repairs are made and it has received approval from OCD to re-start injection operations.

3. **Pipeline:** Hydrostatic testing (HST) of pipeline is required for any pressure loss, leakage, etc. at joints (if present). The HST report with "as-built" pipeline transect, and associated construction information shall be submitted to OCD for approval within 30-days of test completion. Mandatory HST of the pipeline is required after leakage discovery and repair. The pipeline shall be constructed with an Emergency Shut-Down Device with block off locations for pipeline isolation, access, cleaning, testing, etc. Daily pipeline inspection and monitoring is required at a minimum for the first week and each time the pipeline is brought back into service after shut-down, service work, etc. The pipeline shall be inspected within 8-hours of pipeline pressure loss, upset, etc. Weekly inspection and monitoring at a minimum is required thereafter. Inspection record keeping is required and shall include the date and time of each inspection, inspectors name and contact information, weather conditions with inspection summary, any conclusion on pipeline condition with any recommendations. Spills or release locations shall include GPS Coordinates (NAD83) and be handled in accordance with Condition 2.G Release Reporting herein.

3.B. INJECTION OPERATIONS:

1. **Well Injection Pressure Limit:** The Permittee shall ensure that the maximum wellhead or surface injection pressure of 350 psig on its Class III well shall not exceed the fracture pressure of the injection salt formation and will not cause new fractures or propagate any existing fractures of cause damage to the system and underground source of drinking water.

2. **Pressure Limiting Device:** The Permittee shall equip and operate its Class III well or system with a pressure limiting device which shall, at all times, limit surface injection pressure to the maximum allowable pressure for its Class III well. The Permittee shall monitor the pressure-limiting device daily and shall report all pressure exceedances within 24 hours of detecting an exceedance to OCD's Environmental Bureau.

   The Permittee shall take all steps necessary to ensure that the injected fluids enter only the proposed injection interval and is not permitted to escape to other formations, fresh water zones, or onto the ground surface. The Permittee shall report to OCD's Environmental Bureau within 24 hours of discovery any indication that new fractures or existing fractures have been propagated, or that damage to the well, the injection zone, or formation has occurred.

3.C. CONTINUOUS MONITORING DEVICES: The Permittee shall use continuous monitoring devices to provide a record of surface injection pressure, flow rate, and flow volume.

3.D. MECHANICAL INTEGRITY FOR CLASS III WELLS:

1. Pursuant to 20.6.2.5204 NMAC, the Permittee shall demonstrate mechanical integrity for its Class III well at least once every five years or more frequently as the OCD Director may require for good cause during the life of the well. The Permittee shall demonstrate mechanical integrity for its Class III well every time it performs a well workover, including when it pulls the tubing. A Class III well has mechanical integrity if there is no detectable leak in the casing or tubing which OCD considers to be significant at maximum operating temperature and pressure; and no detectable conduit for fluid movement out of the injection zone through the well bore or vertical channels adjacent to the well bore which the OCD Director considers to be significant. The Permittee shall conduct a casing Mechanical Integrity Test (MIT) from the surface to the approved injection depth to assess casing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 500 psig measured at the surface when tubing is removed and a plug is installed within 20 ft. of the casing shoe depth. Alternatively, the MIT may consist of a casing/cavern 4-hr. test at a minimum pressure of 300 psig measured at the surface when the cavern and casing are full and tubing remains in the well. More work is required in the "casing/cavern" test in the event of failure to determine the actual cause.

   The Permittee shall notify OCD's Environmental Bureau and Hobbs District Office at least 5 days prior to conducting any MIT to allow OCD Hobbs the opportunity to witness the MIT.

2. The following criteria will determine if the Class III well has passed the MIT:

   a. Passes MIT if zero bleed-off during the test;

   b. Passes casing MIT if final test pressure is within +/- 10% of starting pressure, if approved by OCD (Note: Passes +/- 1% of starting pressure for cavern test due to the massive volume of fluid required in the cavern and casing during this test);

   c. When the MIT is not witnessed by OCD and fails, the Permittee shall notify OCD within 24 hours of the failure of the MIT.

   d. All chart recorder information, charts containing appropriate information, calibration sheets, etc. shall be provided to OCD within 5 working days of completing an MIT.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use by the Permittee of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

3.E. WELL WORKOVER OPERATIONS: Pursuant to 20.6.2.5205A(5) NMAC, the Permittee shall provide notice to and shall obtain approval from OCD's District Office in Hobbs and the Environmental Bureau in Santa Fe prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Hobbs District Office. Properly completed Forms C-103 and/or C-105 must be filed with OCD upon completion of workover activities and copies included in that year's Annual Report.

3.F. FLUIDS INJECTION AND BRINE PRODUCTION VOLUMES AND PRESSURES: The Permittee shall continuously monitor the volumes of water injected and brine production. The Permittee shall submit monthly reports

of its injection and production volumes on or before the 10th day of the following month. The Permittee shall suspend injection if the monthly injection volume is less than ~~110~~% or greater than ~~120~~% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours.

3.G. AREA OF REVIEW (AOR): The Permittee shall report within 72 hours of discovery any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class III well. OCD shall be notified within 24 hours of having knowledge of any wells lacking cement within the cavern interval within a ½-mile radius from the Class III well.

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells. This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (e.g., septic systems, leach fields, dry wells, etc.) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. ANNUAL REPORT: The Permittee shall submit its annual report to OCD by June 1st of each year.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its UIC Class III well, conduct ground water restoration if applicable, and any post-operational monitoring and remediation as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC), and/or the Closure Plan addresses this requirement and is approved by OCD. The Permittee's cost estimate shall be based on third person estimates and included in the Closure Plan with the application. OCD will require the Permittee to submit a single well plugging bond based on the OCD approved third person cost estimate for OCD approval before OCD may issue approval to drill and construct a new well (also see Permit Conditions 2.D and 2.I).

~~**5.C. SURFACE SUBSIDENCE MONITORING PLAN:** The Permittee shall submit the Surface Subsidence Monitoring Plan required in accordance with Permit Condition 2.B.1 within 180 days of permit issuance for OCD approval unless it has already been approved by the OCD.~~

~~**5.D. SOLUTION CAVERN CHARACTERIZATION PLAN:** The Permittee shall submit the Solution Cavern Characterization Plan required in accordance with Permit Condition 2.B.2 within 180 days of permit issuance for OCD approval unless it has already been approved by the OCD.~~

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, November 6, 2018 2:02 PM
To: Wunder, Matthew, DGF; Shije, Suzette, IAD; 'ddapr@nmda.nmsu.edu'; 'adunn@slo.state.nm.us'; 'James_Amos@blm.gov'; 'psisneros@nmag.gov'; 'r@rthicksconsult.com'; 'sric.chris@earthlink.net'; 'nmparks@state.nm.us'; Blaine, Tom, OSE; 'marieg@nmoga.org'; Fetner, William, NMENV; 'lazarus@glorietageo.com'; 'perry@glorietageo.com'; 'cjoyner@fs.fed.us'; Kieling, John, NMENV; 'bsg@garbhall.com'; Hunter, Michelle, NMENV; 'claudette.horn@pnm.com'; 'ekendrick@montand.com'; 'pam@ipanm.org'; Brown, Maxey G, EMNRD; Bayliss, Randolph, EMNRD; Bratcher, Mike, EMNRD; Perrin, Charlie, EMNRD; Jones, William V, EMNRD; Kelly, Jonathan, EMNRD; Powell, Brandon, EMNRD; Jones, William V, EMNRD; Wojahn, Beth, EMNRD; Sanchez, Daniel J., EMNRD; Goetze, Phillip, EMNRD; Griswold, Jim, EMNRD; Trujillo, Harold, EMNRD
Cc: Tulk, Laura, EMNRD; DeVargas, Lorraine, EMNRD; Pieter Bergstein (pieter@bergsteinenterprises.com); 'Ayarbe, John'
Subject: PAB Services, Inc. Brine Supply Well No. 1 (BW-8) (API# 30-025-26307) in Lea County Application Administratively Complete

Ladies and Gentlemen:

Please find below the New Mexico Oil Conservation Division (OCD) Administrative Completeness information for the above subject Water Quality Control Commission Underground Injection Control (UIC) Class III Brine Well Discharge Permit application and associated linked documents.

The OCD is currently working on the technical review pending receipt of requested information, plans, financial assurance, etc. OCD may be posting public newspaper notices in the Hobbs Sun News and Albuquerque Journal upon completion of its review and resolution of relevant issues based on the application submittal, addendums, and completion of a draft discharge permit.

Discharge Permit (BW-8) PAB Services, Inc. (11/6/2018)**:**
The Underground Injection Control (UIC) Class III Brine Well "Brine Supply Well No. 1" is located at UL: J, Section 5, Township 19 South, Range 36 East, Latitude: N 32.68782 Longitude: W -103.37449, NMPM, Lea County. The brine well is located approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 intersection.

Administrative Completeness (10/11/2018)
Description (11/6/2018)
Application (7/10/2018)

The OCD Website for public notices is at http://www.emnrd.state.nm.us/OCD/env-draftpublicetc.html (see "Applications, Draft Permits, Public Notices, and Notifications" section).

Please contact me if you have questions. Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department

1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

Description (11/6/2018)

Discharge Permit Renewal (BW-08) PAB Services, Inc., 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, 1,980 FSL, 1,980 FEL, Lat. 32.68782°, Long. -103.37449°, NMPM, Lea County, New Mexico:

The Underground Injection Control (UIC) Class III Brine Well is located approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 intersection. The Salty Dog Brine Station is located approximately 2,500 N-NE of the brine well. Brine is conveyed via a 3 in. diameter high-density Polyethylene (HDPE) pipeline 3/8 in. thick from the brine well to the tank battery on the ground surface.

The brine well total depth (TD) is 2,958 ft. below ground level (bgl) into the Salado "Salt" Formation. The casing shoe (8-5/8 in.) is set at 1,877 ft. bgl into the Anhydrite beds above the Salado "Salt" Formation. The Anhydrite-Salado contact is at 2,000 ft. bgl. Open hole (6-1/4 in.) runs to TD. Production tubing (2-7/8 in.) is set at a depth of 2,610 ft. within the Salado "Salt" Formation to produce high density "Brine Fluids" used in the drilling of oil and gas wells in New Mexico. Technical discussions are ongoing to increase the depth of freshwater injection directly into the salt formation. The water table ranges from about 60 - 70 ft. bgl.

Fresh groundwater will be injected into the tubing-casing annulus through the open-hole and at an average injection rate of 1,600 bbl/day (~ 47 gpm) and maximum injection rate of 2,674 bbl/day (~ 78 gpm) below a permitted maximum surface injection pressure (MSIP) of 375 psig. The construction and design of this brine well is an open system and utilizes a reverse-flow scheme where freshwater is injected through the well annulus into the anhydrite beds above the Salado "Salt" Formation with production of brine through tubing to surface.

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Heather Riley, Division Director
Oil Conservation Division

OCTOBER 11, 2018

CERTIFIED MAIL
RETURN RECEIPT NO: 5995 4063

Mr. Pieter Bergstein
PAB Services, Inc.
P.O. Box 2724
Lubbock, Texas 79408

Re: Discharge Permit (BW-8) PAB Services, Inc., 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, 1980 FSL, 1980 FEL, Lat. N 32.68847°, Long. W 103.37445°, NMPM, Lea County, New Mexico

Mr. Bergstein,

The New Mexico Oil Conservation Division (OCD) has received PAB Services, Inc.'s (PAB) discharge permit renewal application dated July 2, 2018, was officially received on July 5, 2018, for the discharge permit renewal of the Brine Supply Well No. 1.

The initial submittal with additional information requested by OCD provided the required information to deem the application ***"administratively complete"*** per New Mexico Water Quality Control Commission regulations (20.6.2.3108 NMAC).

As such, the Water Quality Control Commission (WQCC) regulations notice requirements of 20.6.2.3108 NMAC must be satisfied and demonstrated to the OCD. OCD will also provide public notice pursuant to WQCC requirements and determine if there is sufficient public interest.

Please contact me at (505) 476-3490 or carlj.chavez@state.nm.us if you have questions. Thank you for your cooperation throughout the discharge permit review process.

Sincerely,

Carl J. Chávez
Environmental Engineer

xc: OCD Hobbs District Office

Cash Remittance Report (CRR)

Appendix 8-14 revised 11/27/01

Energy, Minerals & Natural Resources Department
CASH REMITTANCE REPORT (CRR)

Location Name ① OCD - Environment

Location Code ② 0740

Today's Date: _____ (MONTH) _____ (DAY) ③ 20____ (YEAR)

Collection Period: ____ / ____ / ____ (MM / DD / YYYY) through ____ / ____ / ____ (MM / DD / YYYY) ④

Cost Center ⑤	Revenue Code ⑤	Receipt Amount ⑦	Collected Amount ⑧
0740		100.00	

Total ========→	$ 100.00 ⑨	$ ⑩

Over/Short Amount	$ ⑪

CRR Deposit Amount	$ ⑫

Print Name: Lorraine DeVargas ⑬ Signature: Lorraine DeVargas ⑬

Print Name: _____ ⑬ Signature: _____ ⑬

Distribution: White and Yellow copy to Accounts Receivable-ASD.
Pink copy retained at CRR submitting location.

Official Use Only

Completed by the Accounts Receivable

Date Received: _____ ❶

Notes: _____ ❷

Amount Received: _____ ❸

State Treasurer Deposit Number: _____ ❹

Verified by: _____ ❻

Deposit Date: _____ ❺

EMNRDCRR Revised 4/01

July 9, 2018

Mr. Carl Chavez
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Discharge Permit BW-8 Renewal, Salty Dog Brine Station, Lea County, New Mexico

Dear Mr. Chavez:

On behalf of PAB Services, Inc., Daniel B. Stephens & Associates, Inc. is submitting the enclosed discharge permit application for the renewal of discharge permit BW-8 (DP BW-8) at the Salty Dog Brine Station located in Lea County, New Mexico. Enclosed are the permit application and fee.

Please call me at (505) 353-9137 if you have questions or need additional information.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

John Ayarbe, P.G.
Senior Hydrogeologist

JA/rpf
Enclosure
cc: Jim Griswold (Jim.Griswold@state.nm.us)
Pieter Bergstein (pieter@bergsteinenterprises.com)
Susan North (susan@thestandardenergy.com)

Daniel B. Stephens & Associates, Inc.
6020 Academy Rd., NE, Suite 100 505-822-9400
Albuquerque, NM 87109-3315 FAX 505-822-8877

DANIEL B. STEPHENS & ASSOCIATES, INC.

Check Date: 6/22/2018

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
CkRqst 062218	6/22/2018	0177226	100.00			100.00
Water Quality Management Fund		TOTAL	100.00			100.00
Operating Acct - Bank of Alb 1		230026				

ACKNOWLEDGEMENT OF RECEIPT OF CHECK/CASH

I hereby acknowledge receipt of Check No. 106192 dated 06/22/2018

or cash received on 09/10/2018 in the amount of $ 100.00

from Daniel B. Stephens & Assoc.

for BW-8 Renewal

Submitted by: Carl Chavez Date: 09/10/18

Submitted to ASD by: Lorraine DeVargas Date: 09/10/18

Received in ASD by: _____ Date: _____

Filing Fee _____ New Facility: _____ Renewal: _____

Modification _____ Other * Discharge permit

Organization Code 521.07 Applicable FY _____

To be deposited in the Water Quality Management Fund.

Full Payment _____ or Annual Increment _____

NEW MEXICO ENVIRONMENT DEPARTMENT - ALBUQUERQUE FIELD OFFICE DAILY CHECK RECEIPT LOG

DATE RECEIVED	WALK-IN	MAIL	NAME ON CHECK	DATE OF CHECK	CHECK/MONEY ORDER#	PROGRAM ACCOUNT CODE	AMOUNT OF CHECK	DATE DEPOSITED	DEPOSITED BY:
7/10/18		*	Daniel Stephens & Assoc.	6/22/18	106192		100.00		
TOTAL							100.00		

REVENUE TRANSMITTAL SHEET

Description	Fund	Dept.	Share Acct	Sub Acct	Amount
Liquid Waste	34000	Z3200	496402		
Water Recreation Facilities	40000	Z8501	496402		
Food Permit Fees	99100	Z2600	496402		
OTHER	34100	232900		2329029000	

Chavez, Carl J, EMNRD

From: Ayarbe, John <jayarbe@geo-logic.com>
Sent: Monday, July 9, 2018 10:46 AM
To: Chavez, Carl J, EMNRD
Cc: Brown, Maxey G, EMNRD; Griswold, Jim, EMNRD; Pieter Bergstein (pieter@bergsteinenterprises.com); susan@thestandardenergy.com; McVey, Mike
Subject: Salt Dog Brine Station - DP BW-8 renewal application
Attachments: Salty Dog Permit Renewal_7-02-2018.pdf

Hi Carl,

Attached is an electronic copy of Salty Dog's permit renewal application. We have also sent the following hardcopies:

- Two hardcopies w/ the application fee to Mr. Carl J. Chavez, CHMM, 1220 South St Francis Drive, Santa Fe, New Mexico 87505
- One hardcopy to Maxey G. Brown, 1625 N. French Drive, Hobbs, New Mexico 88240

Please let me know if you have questions.

Thanks,

John P. Ayarbe
Senior Hydrogeologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company
6020 Academy Road NE, Suite 100
Albuquerque, New Mexico 87109
Office: (505) 822-9400 | Direct: (505) 353-9137
Mobile: (505) 280-4339
jayarbe@dbstephens.com or jayarbe@geo-logic.com

www.dbstephens.com | www.geo-logic.com

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Revised August 1, 2011

Submit Original
Plus 1 Copy
to Santa Fe
1 Copy to Appropriate
District Office

DISCHARGE PLAN APPLICATION FOR BRINE EXTRACTION FACILITIES

(Refer to the OCD Guidelines for assistance in completing the application)

☐ New ☒ Renewal

I. Facility Name: Salty Dog Brine Station

II. Operator: PAB Services, Inc. (PAB)

Address: PO Box 2724 Lubbock, TX 79408

Contact Person: Pieter Bergstein Phone: (806) 741-1080

III. Location: NW /4 SE /4 Section 5 Township 19S Range 36E
Submit large scale topographic map showing exact location.

IV. Attach the name and address of the landowner of the facility site.

See attached supporting information document.

V. Attach a description of the types and quantities of fluids at the facility.

See attached supporting information document.

VI. Attach a description of all fluid transfer and storage and fluid and solid disposal facilities.

See attached supporting information document.

VII. Attach a description of underground facilities (i.e. brine extraction well).

See attached supporting information document.

VIII. Attach a contingency plan for reporting and clean-up of spills or releases.

See attached supporting information document.

IX. Attach geological/hydrological evidence demonstrating that brine extraction operations will not adversely impact fresh water.

See attached supporting information document.

X. Attach such other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

See attached supporting information document.

XI. CERTIFICATION:

I hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Name: Pieter Bergstein Title: President/Owner

Signature: Date: 7/2/18

E-mail Address: pieter@bergsteinenterprises.com

Chavez, Carl J, EMNRD

From: Ayarbe, John <jayarbe@geo-logic.com>
Sent: Wednesday, March 27, 2019 8:50 AM
To: Chavez, Carl J, EMNRD
Cc: 'Pieter Bergstein (pieter@bergsteinenterprises.com)'; 'susan@thestandardenergy.com'; 'vincent@thestandardenergy.com'; Griswold, Jim, EMNRD; Gallegos, Denise, EMNRD
Subject: [EXT] RE: Submittal of Closure Plan and Brine Well P&A Plan, Salty Dog Brine Station

Thanks, Carl! We appreciate the quick review and response.

John P. Ayarbe
Senior Hydrogeologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company
Direct: (505) 353-9137
Mobile: (505) 280-4339

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, March 27, 2019 8:49 AM
To: Ayarbe, John
Cc: 'Pieter Bergstein (pieter@bergsteinenterprises.com)'; 'susan@thestandardenergy.com'; 'vincent@thestandardenergy.com'; Griswold, Jim, EMNRD; Gallegos, Denise, EMNRD
Subject: RE: Submittal of Closure Plan and Brine Well P&A Plan, Salty Dog Brine Station

John,

- Re: BW-8 PAB Services, Inc. (formerly Standard Energy) Brine Supply Well #1 API# 30-025-26307

The New Mexico Oil Conservation Division (OCD) has completed its review of the "Closure Plan and Brine Well Plugging and Abandonment Plan Salty Dog Brine Station Lea County, New Mexico" dated March 22, 2019.

The Closure Plan Amount of $573,430.00 is hereby **approved**.

Please contact Denise Gallegos at (505) 476-3453 for any questions regarding the new WQCC Bond Amount and/or submittal.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505

Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

From: Ayarbe, John <jayarbe@geo-logic.com>
Sent: Monday, March 25, 2019 3:03 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: 'Pieter Bergstein (pieter@bergsteinenterprises.com)' <pieter@bergsteinenterprises.com>; 'susan@thestandardenergy.com' <susan@thestandardenergy.com>; 'vincent@thestandardenergy.com' <vincent@thestandardenergy.com>
Subject: [EXT] Submittal of Closure Plan and Brine Well P&A Plan, Salty Dog Brine Station

Hi Carl,

Attached is the Closure Plan and Brine Well Plugging and Abandonment Plan for the Salty Dog Brine Station. I'm submitting the document to you on behalf of PAB Services, Inc. and to support the renewal of the brine well discharge permit. Section 7 of the document presents a FA cost estimate. Once approved, we'll work with PAB on the WQCC bond and release of the existing bond.

Please let me know if you have questions.

Sincerely,

John P. Ayarbe
Senior Hydrogeologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company
6020 Academy Road NE, Suite 100
Albuquerque, New Mexico 87109
Office: (505) 822-9400 | Direct: (505) 353-9137
Mobile: (505) 280-4339
jayarbe@dbstephens.com or jayarbe@geo-logic.com

www.dbstephens.com | www.geo-logic.com

Closure Plan and Brine Well Plugging and Abandonment Plan Salty Dog Brine Station Lea County, New Mexico

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

March 22, 2019

Daniel B. Stephens & Associates, Inc.

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

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Appendix

A Financial Assurance Cost Estimate

B Salty Dog 2018 Fresh Water Sales

Closure Plan and Brine Well Plugging and Abandonment Plan
Salty Dog Brine Station, Lea County, New Mexico

1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this closure plan and brine well plugging and abandonment plan 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). This closure plan is being submitted in support of renewal of discharge permit BW-8 (DP BW-8) and development of a cost estimate for closure. A permit renewal application was submitted to OCD on July 2, 2018.

Submittal of this closure and brine well plugging and abandonment plan is intended to meet the requirements of Subsection A of 20.6.2.5209 NMAC and to provide protection of groundwater quality pursuant to 20.6.2.3109 NMAC, 20.6.2.5101 NMAC, and 20.6.2.5005 NMAC. If necessary or requested by OCD, a revised or updated plan will be submitted for approval before implementation of closure activities. PAB understands that the obligation to implement and the requirements of this plan survive the termination or expiration of DP BW-8.

2. Pre-Closure Notification

Pursuant to 20.6.2.5005A NMAC, PAB will submit a pre-closure notification to OCD at least 30 days before they close or discontinue operation of the site's brine well, a UIC Class III well (API No. 30-025-26307). Pursuant to 20.6.2.5005B NMAC, OCD must approve all proposed well closure activities before they may be implemented.

The pre-closure notification will include the following:

- *Name of facility:* Salty Dog Brine Station

- *Address of facility:* The Salty Dog Brine Station is located approximately 11 miles west of Hobbs, New Mexico along U.S. Highway 62/180 (US 62/80), about 0.5 mile east of the US 62/180 and 529 intersection.
- *Name of Permittee (and owner or operator, if appropriate):* PAB Services, Inc.
- *Address of Permittee (and owner or operator, if appropriate):* PO Box 2724 Lubbock, TX 79408
- *Contact person:* Pieter Bergstein
- *Phone number:* (806) 741-1080
- *Number and type of well(s):* UIC Class III well (Brine Supply Well #1 [API No. 30-025-26307])
- *Year of well construction:* 1979
- *Well construction details:* 8⅝-inch-diameter casing to 1,877 feet below ground surface (feet bgs); 4½-inch-diameter liner to 1,877 feet bgs; 6¼-inch open hole to 2,958 feet bgs; 0.20-inch perforations from 2,590 to 2,592 feet bgs; 2⅞-inch tubing to 2,610 feet bgs
- *Type of discharge:* Brine supply well
- *Average flow (gallons per day):* Approximately 71,000 gallons per day (gpd), based on 2017 brine production
- *Proposed well closure activities:* Plug well with cement, remove facilities, regrade and reseed disturbed areas to match natural surroundings, extract and monitor chloride-impacted groundwater, and conduct subsidence monitoring
- *Proposed date of well closure:* To be determined (TBD)
- *Proposed method and date of surface restoration:* Remove facilities and regrade and reseed disturbed areas to match natural surroundings; date TBD

- *Proposed method and date of pipeline abandonment:* Pipelines will be removed; date TBD
- *Name of pre-closure notification preparer:* TBD
- *Date pre-closure notification:* TBD

3. Brine Well Plugging and Abandonment

The brine well will be abandoned by placing a plug at the bottom of the 4.5-inch-diameter liner and then filling the liner with neat cement to the ground surface. Tremie pipe will be used to place the neat cement. A New Mexico licensed driller will perform all plugging and abandonment activities and will plug the brine well in accordance with 20.6.2.5209 NMAC. After the brine well is plugged, all surface casing will be cut flush with the ground surface. If requested by OCD, PAB will submit a revised or updated well plugging and abandonment plan for approval prior to closure.

Figure 2 shows a schematic of the brine well that includes an illustration of the underlying geology. The annular spaces between the 8⅝-inch-diameter casing and 4½-inch-diameter liner are sealed with cement. Therefore, only the plugging of the 4½-inch-diameter liner is necessary.

4. Land Surface Restoration and Facilities Removal

All brine production and sales facilities will be removed after closure of the site, unless a facility is needed for storage and/or conveyance of chloride-impacted groundwater. Brine production and sales facilities include the following:

- Six 750-barrel (bbl) aboveground storage tanks (ASTs)
- Concrete truck loading pad
- Two brine filling stations
- Operations shed

- Pipelines, including the brine well conveyance pipeline

Figure 1 shows the locations of the site facilities. Produced brine ready for sale is stored in a bermed tank battery consisting of six 750-bbl ASTs that are constructed of fiberglass. Produced brine is conveyed via a 3-inch-diameter high-density polyethylene (HDPE) pipeline from the brine well to the tank battery. The conveyance pipeline runs along the ground surface. Brine is sold at the operations shed, which is located adjacent to the brine filling stations.

The brine production, storage, and sales facilities will be moved off-site, and the brine well will be plugged and abandoned as described in Section 3. It is expected that the six 750-bbl ASTs can either be used by PAB at another facility or can be sold to another oil-field operator. Other facilities will likely be demolished, and the materials transported to a licensed disposal facility. As practical, some materials may be salvaged for reuse or recycling, or may be sold.

After the brine production and sales facilities are removed, disturbed areas will be regraded and reseeded to match surrounding conditions. The goal of reseeding is to establish a plant community that is consistent with the local natural vegetation.

Roads are expected to remain in place, as they are used by locals (e.g., ranchers) and residents.

5. Groundwater Extraction and Monitoring

Salty Dog is addressing groundwater impacts resulting from releases at the brine well and a former brine pond (Figure 1). A hole in the casing of the brine well at 250 feet bgs was discovered in 1999 (Salty Dog, 1999). The hole released brine, impacting groundwater; it was repaired in August 1999 by installing the 4½-inch-diameter casing liner (Salty Dog, 1999). In October 2008, the brine pond was removed and impacted soil was excavated and disposed of (DBS&A, 2008).

Two chloride plumes currently exist at the site: one in the area of the brine station (i.e., the former brine pond area) and a second near the brine well (brine well area). In May 2008, OCD issued an Administrative Compliance Order (ACO) (ACO-2008-02) to Salty Dog to address

chloride-impacted groundwater at the site. In 2009, PAB initiated groundwater extraction to remove and provide hydraulic containment of chloride-impacted groundwater (DBS&A, 2009a and 2009b).

Groundwater monitoring and extraction data are reported and evaluated in reports submitted to OCD. The data include water levels and water quality (i.e., chloride concentrations) at site monitor wells. Site monitor wells are shown in Figure 3. Groundwater monitoring is currently conducted at 13 wells, as follows:

- Former Brine Pond Area: DBS-1R, DBS-2 through DBS-5, and PMW-1
- Brine Well Area: DBS-6, DBS-8 through DBS-10, MW-3, MW-5, and MW-6

Monitoring data show that groundwater extraction is effective at providing hydraulic containment of the chloride plumes (DBS&A, 2018b). The current groundwater extraction systems include pumping from wells FWS-1 (former brine pond area) and RW-2 (brine well area). Extracted groundwater is currently used as injection water at the brine well.

Groundwater extraction and monitoring will continue for five years post closure. The groundwater extraction rate is assumed to be approximately 15.5 gallons per minute (gpm). Monitoring data show that groundwater quality has improved since the initial discovery of the water quality impacts (DBS&A, 2018b). The initial rate (15.5 gpm) is based on capture zone analyses conducted to determine the pumping rates required for containment of the chloride plumes in both the former pond area and brine well area (DBS&A, 2009b). Post-closure operation of the groundwater extraction systems will continue by pumping from wells FSW-1 and RW-2 and then conveying the extracted groundwater to the existing six 750-bbl aboveground storage tanks at the brine tank battery (Figure 1), where it can be transferred to tanker trucks.

It is expected that the extracted groundwater can be provided to local oil field operators, as there is a demand for fresh water in the Hobbs area. Although the chloride and total dissolved solids (TDS) concentrations are elevated above New Mexico Water Quality Control Commission standards, the water is of adequate quality to be reused in oil field operations in accordance

with 19.15.34.8 NMAC. Typical applications include use in drilling and fracking fluids. Salty Dog currently sells fresh water obtained from FWS-1 to oil field operators, contractors, and trucking companies (Appendix B). In 2018, the average chloride and TDS concentrations of this fresh water were 415 and 1,011 milligrams per liter (mg/L), respectively. Prices for the fresh water provided by Salty Dog are expected to be reduced or eliminated in order to encourage disposition of the water for appropriate reuse in the oil field.

6. Surface Subsidence Monitoring

In March 2018, Salty Dog installed five permanent subsidence monitoring points in the vicinity of the brine well, as shown in Figure 4 (DBS&A, 2018a). The elevations of the subsidence monitoring points are surveyed on a semiannual basis by a licensed surveyor. Surface subsidence monitoring will continue for two years post closure.

7. Financial Assurance Cost Estimate

This plan was prepared to support the development of a financial assurance cost estimate pursuant to 20.6.2.5210B(17) NMAC. The estimated cost for closure of the Salty Dog brine well and ancillary facilities is $573,430 (including NMGRT), as summarized in Table 1. Detailed costs are provided in Appendix A, including costs for monitoring, extraction, and handling of chloride-impacted groundwater. The cost estimate is based on unit rates obtained from RS Means (2017), contractors, and vendors, and, as necessary, approximated based on professional experience.

Table 1. Estimated Closure Costs

Item	Cost
Brine well plugging and abandonment	$53,244
Land surface restoration and facilities removal	$77,406
Groundwater monitoring, extraction, and handling (5 years post closure)	$436,884
Surface subsidence monitoring (2 years post closure)	$5,896
Total	$573,430

References

Daniel B. Stephens & Associates, Inc. (DBS&A). 2008. *Closure report, brine pond and loading area, 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. December 3, 2008.

DBS&A. 2009a. *Recovery well installation and pump test report, 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. November 20, 2009.

DBS&A. 2009b. *Preliminary conceptual remedial design report, 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. December 31, 2009.

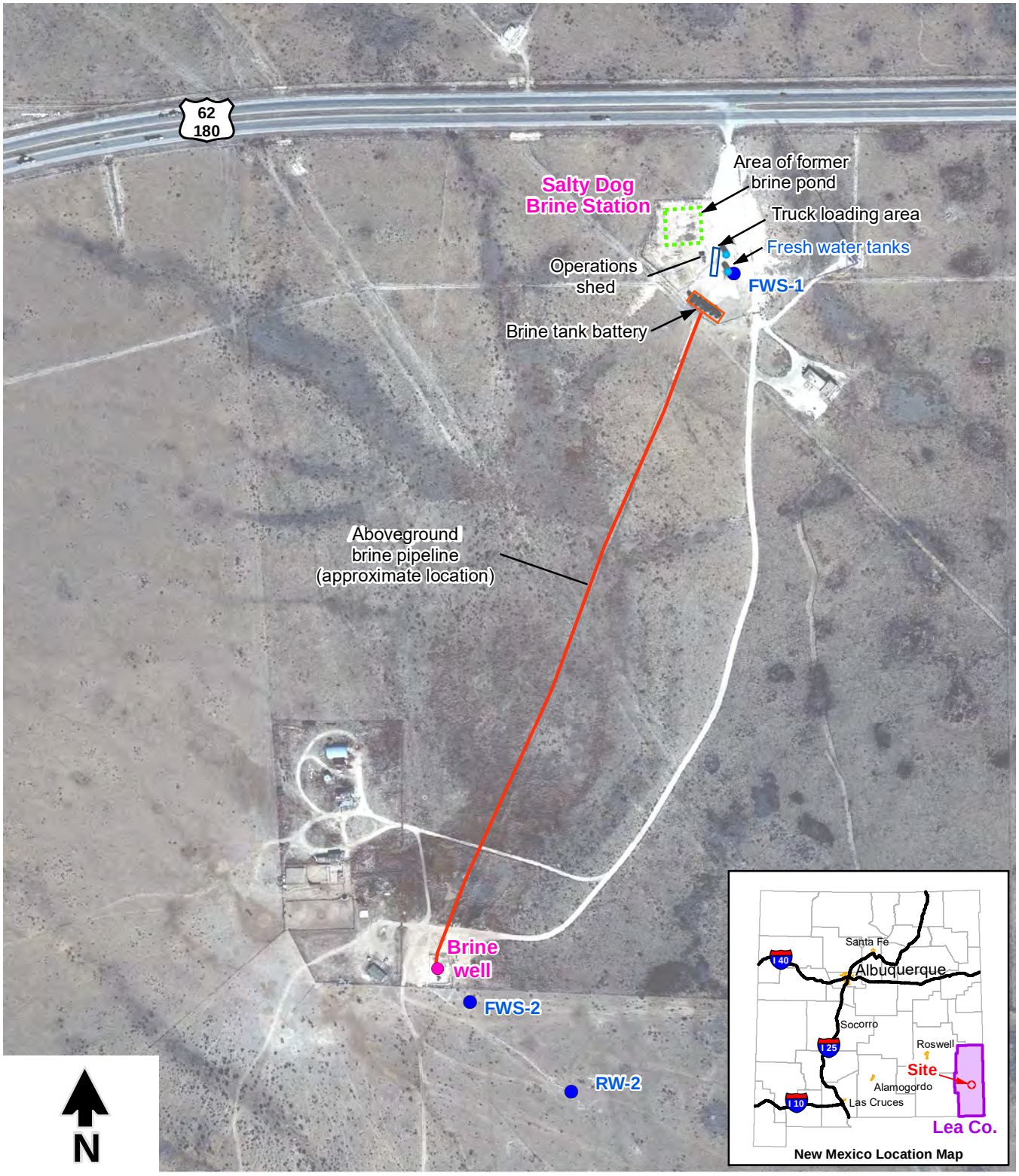
DBS&A. 2018a. Letter from John Ayarbe and Michael D. McVey to Carl Chavez, New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, regarding Installation of monitor well and subsidence survey monitoring points, Salty Dog Brine Station (API No. 30-025-26307). June 25, 2018.

DBS&A. 2018b. *Semiannual groundwater monitoring and O&M report, January 1 through June 30, 2018, 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 18, 2018.

Salty Dog, Inc. (Salty Dog). 1988. Letter report outlining facility data for quarter ending September 1987. February 25, 1988.

Salty Dog. 1999. Form C-103 report on Brine supply well #1. Submitted September 8, 1999. Approved by OCD December 1, 1999.

Figures



Source: USDA Farm Service Agency
DigitalGlobe, NMRGIS
February 14, 2014

Explanation

- Injection water supply well
- Brine well
- Fresh water tank

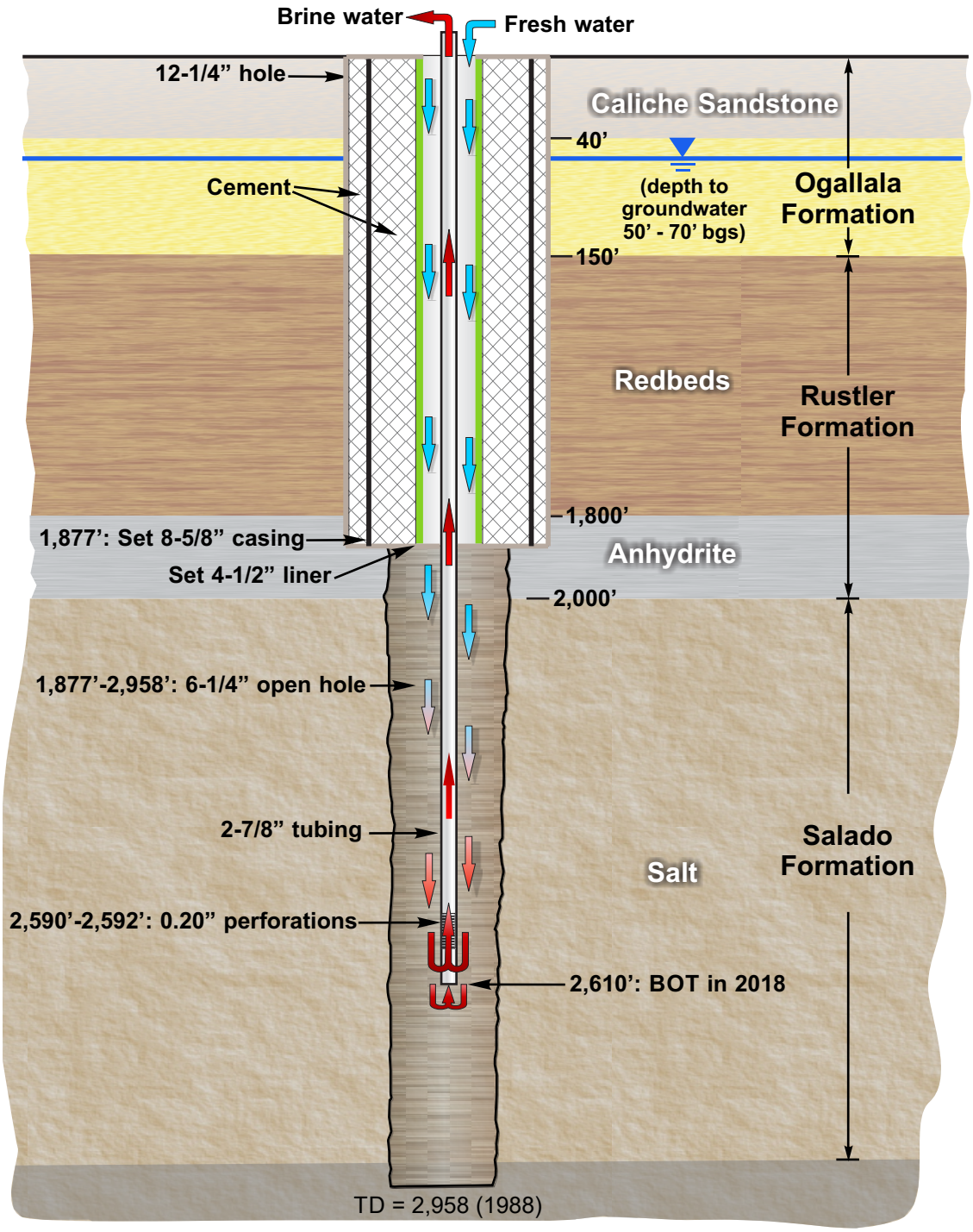
S:\PROJECTS\ES08.0118_SALTY_DOG_2018\GIS\MXD\CLOSURE_PLAN\FIG01_SITE_LOCATION_AND_FACILITIES_REV.MXD

Daniel B. Stephens & Associates, Inc.
12/14/2018
JN ES08.0118.06

SALTY DOG BRINE STATION
Site Location and Facilities

Figure 1

Salty Dog Brine Well



Notes:

1. BOT = Bottom of tubing
2. Figure not to scale

Sources:

1. Completion data based on OCD well reports
2. Lithology from Salty Dog (1988)

SALTY DOG BRINE STATION

Generalized Brine Well Schematic

Daniel B. Stephens & Associates, Inc.

12-6-18 JN ES08.0118.06

Figure 2

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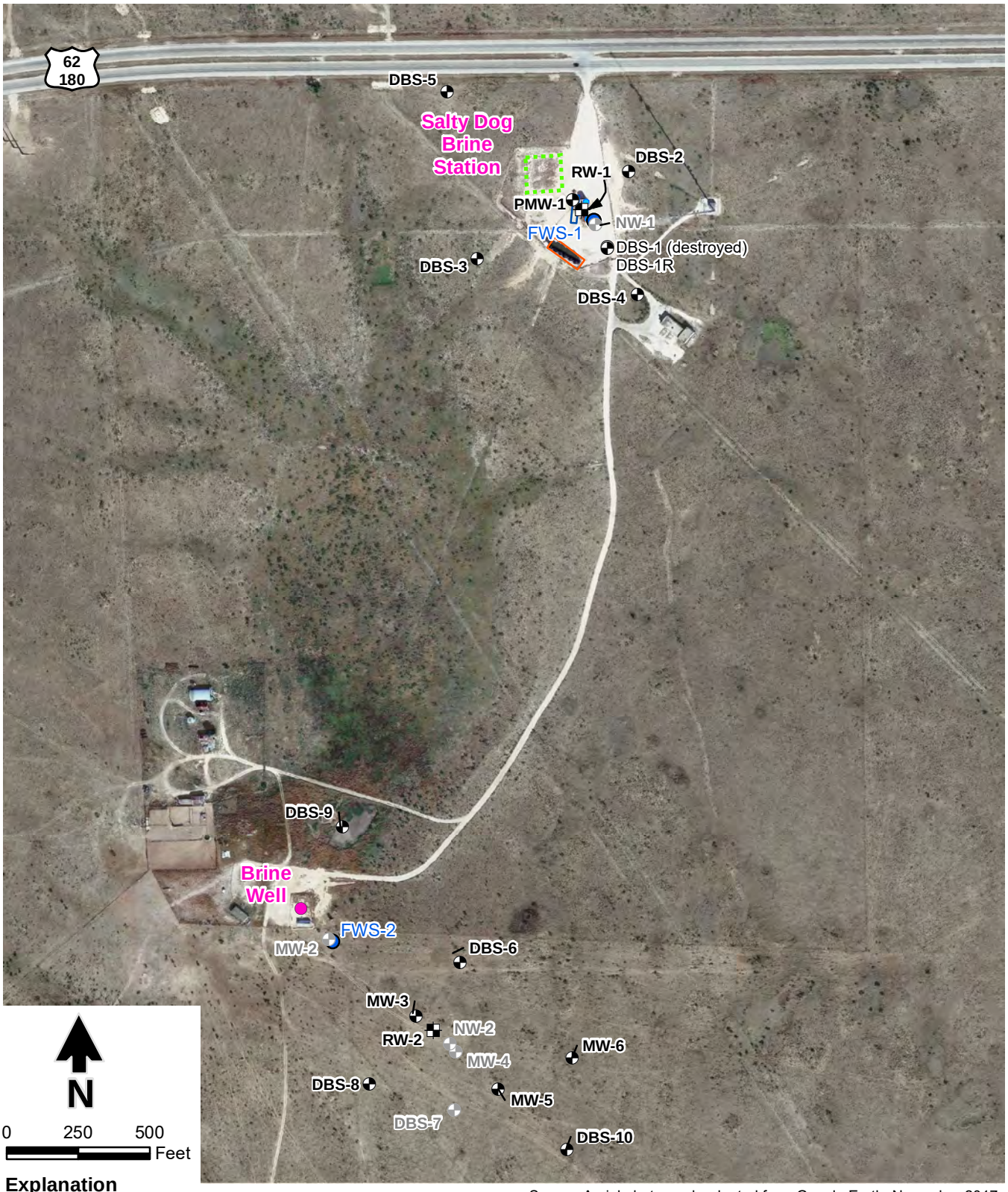


Explanation

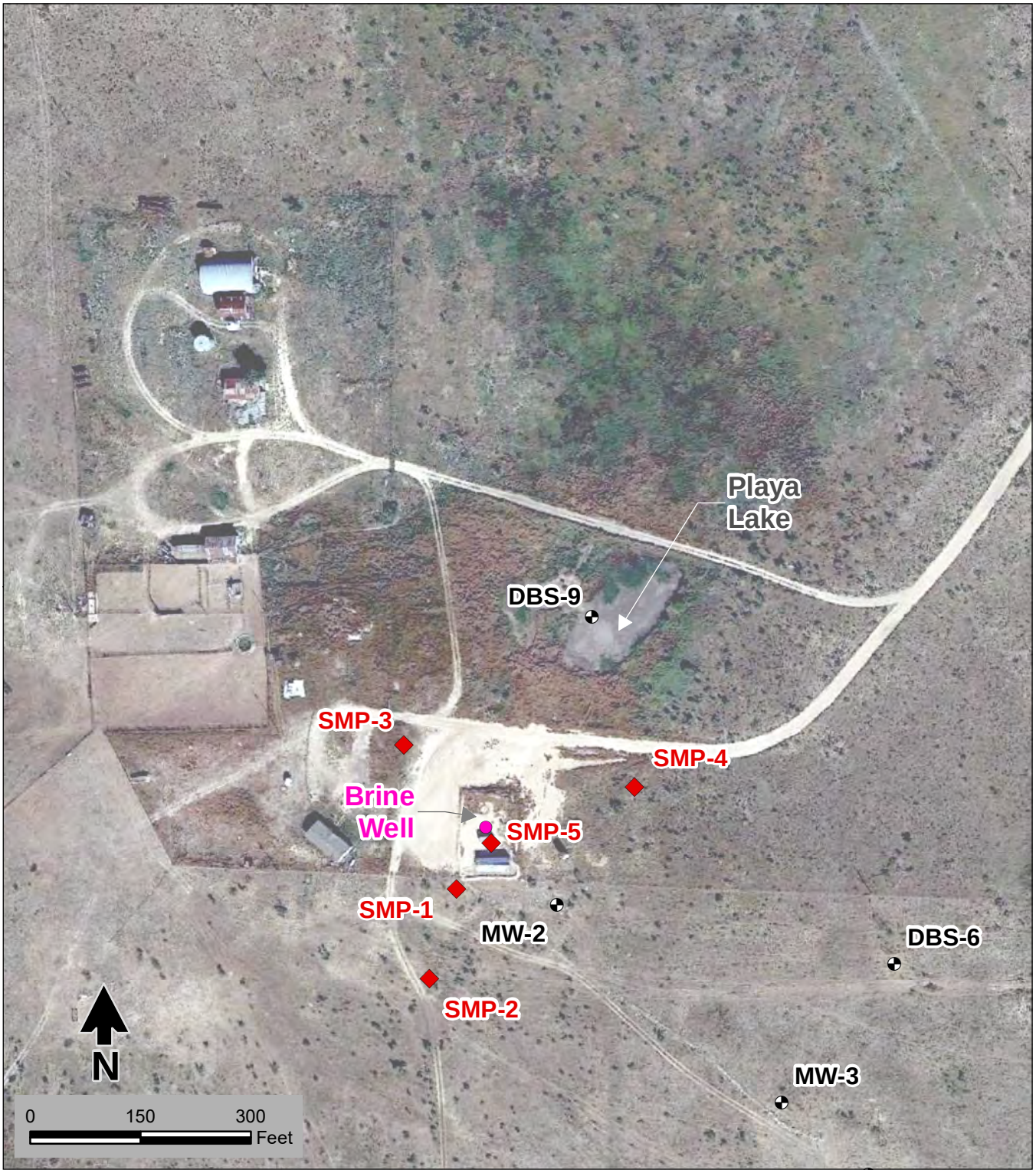
- Fresh water supply well
- Monitor well
- Recovery well
- Well destroyed
- Well not monitored
- Brine well
- Brine tank battery
- Truck loading area
- Former brine pond

Source: Aerial photograph adapted from Google Earth, November 2017.

S:\PROJECTS\ES08.0118_SALTY_DOG_2018\GIS\MXD\CLOSURE_PLAN\FIG03_SITE_MONITOR_AND_EXTRACTION_WELL_LOCS.MXD

Daniel B. Stephens & Associates, Inc.
12/14/2018
JN ES08.0118.06

SALTY DOG BRINE STATION
Monitor and Extraction Well Locations
Figure 3



Source: Google Earth aerial photograph dated November 2017

Explanation

- Survey monument
- Monitor well
- Brine well

SALTY DOG BRINE STATION

Surface Subsidence Monitoring Locations

Daniel B. Stephens & Associates, Inc.

12/17/2018 JN ES08.0118.01

Figure 4

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Appendix A

Financial Assurance Cost Estimate

Salty Dog Brine Station

Estimated Closure Costs

Item	Cost
Brine Well Plugging and Abandonment	$ 53,244
Land Surface Restoration and Facilities Removal	$ 77,406
Groundwater Extraction and Monitoring	$ 436,884
Surface Subsidence Monitoring	$ 5,896
Subtotal	**$ 573,430**

Estimated Closure Costs

Salty Dog Brine Station

Brine Well Plugging and Abandonment

Engineer's Opinion of Probable Cost

Item No	Description	Quantity	Unit	Unit Price	Extended Price
1	Contractor Mobilization/Demobilization	1	%	6%	$ 2,000
2	Brine Well Plugging and Abandonement, inside 4.5-inch diameter liner	1877	LF	$ 20	$ 37,540
3	Cut surface casing and restore land surface conditions	1	LS	$ 2,000	$ 2,000
	Subtotal				**$ 41,540**
4	*Contingency*	*$ 41,540*	*%*	*20%*	*$ 8,308*
	Subtotal				**$ 49,848**
5	*NMGRT*	*$ 49,848*	*%*	*6.8125%*	*$ 3,395.90*
	Grand Total Costs				**$ 53,244**

Estimated Closure Costs

Salty Dog Brine Station

Land Surface Restoration and Facilities Removal

Engineer's Opinion of Probable Cost

Item No	Description	Quantity	Unit	Unit Price	Extended Price
1	Contractor Mobilization/Demobilization	1	%	6%	$ 3,000
2	Remove and dispose of 3-inch diameter HDPE conveyance pipeline	2500	LF	$ 4	$ 9,325
3	Remove six 750-barrel aboveground storage tanks (ASTs)	6	EA	$ 2,500	$ 15,000
4	Remove and dispose of concrete pad, filling station, operation shed	1	LS	$ 10,000	$ 10,000
5	Remove and dispose other miscellaneous	1	LS	$ 2,500	$ 2,500
6	Regrading and reseeding	2	AC	$ 10,283	$ 20,566
	Subtotal				**$ 60,391**
7	*Contingency*	*$ 60,391*	*%*	*20%*	*$ 12,078.11*
	Subtotal				**$ 72,469**
8	*NMGRT*	*$ 72,469*	*%*	*6.8125%*	*$ 4,936.93*
	Grand Total Costs				**$ 77,406**

Estimated Closure Costs

Salty Dog Brine Station

Groundwater Extraction and Monitoring

Engineer's Opinion of Probable Cost

Item No	Description	Quantity	Unit	Unit Price	Extended Price
1	Laboratory cost for chloride analysis, 13 monitor wells sampled semiannually for 5 years	10	EA	$ 350	$ 3,500
2	Technician, monitor 13 wells semiannually for 5 years	10	EA	$ 2,400	$ 24,000
3	Groundwater pumping	5	YR	$ 270	$ 1,350
4	O&M labor	60	Month	$ 5,200	$ 312,000
	Subtotal				**$ 340,850**
5	*Contingency*	*$ 340,850*	*%*	*20%*	*$ 68,170*
	Subtotal				**$ 409,020**
6	*NMGRT*	*$ 409,020*		*6.8125%*	*$ 27,864*
	Grand Total Costs				**$ 436,884**

Estimated Closure Costs

Salty Dog Brine Station

Surface Subsidence Monitoring

Engineer's Opinion of Probable Cost

Item No	Description	Quantity	Unit	Unit Price	Extended Price
1	Contractor Mobilization/Demobilization	1	%	6%	$ 1,000
2	Survey surface subsidence monitoring points	4	EA	$ 900	$ 3,600
	Subtotal				**$ 4,600**
3	*Contingency*	*$ 4,600*	*%*	*20%*	*$ 920*
	Subtotal Capital Costs				**$ 5,520**
6	*NMGRT*	*$ 5,520*		*6.8125%*	*$ 376*
	Grand Total Costs				**$ 5,896**

Appendix B

Salty Dog
2018 Fresh Water Sales

Salty Dog Fresh Water Sales

Customer	# BBLs
ACD OILFIELD SERVICES LLC - Item: FW-01 - Fresh Water Total	120.00
ALLIANCE TRUCKING - Item: FW-01 - Fresh Water Total	100.00
AMERICAN SAFETY SERVICES INC Total	1,022.08
APSI - Item: FW-01 - Fresh Water Total	330.00
BAKER HUGHES PETROLITE - Item: FW-01 - Fresh Water Total	14,282.00
BASIC ENERGY #1208 - EUNICE - Item: FW-01 - Fresh Water Total	785.00
BCM AND ASSOCIATES - Item: FW-01 - Fresh Water Total	1,140.00
BLACK RIVER TRUCKING - Item: FW-01 - Fresh Water Total	100.00
BLADE SERVICES - Item: FW-01 - Fresh Water Total	130.00
C & C TRANSPORT LLC - Item: FW-01 - Fresh Water Total	920.00
C & J ENERGY SERVICES - Item: FW-01 - Fresh Water Total	2,670.00
CHARLIE'S TRUCKING - Item: FW-01 - Fresh Water Total	100.00
CHEMICAL SERVICES - Item: FW-01 - Fresh Water Total	4,340.00
CHEMICAL WEED CONTROL - Item: FW-01 - Fresh Water Total	6.00
CHOICE OILFIELD SERVICES - Item: FW-01 - Fresh Water Total	610.00
CREDO ENERGY SERVICES - CES - Item: FW-01 - Fresh Water Total	370.00
CUATRO TRANSPORTATION INC - Item: FW-01 - Fresh Water Total	340.00
DAWSON GEOPHYSICAL - Item: FW-01 - Fresh Water Total	85.70
DE LA SIERRA TRUCKING - Item: FW-01 - Fresh Water Total	130.00
DMC OILFIELD SERVICES - Item: FW-01 - Fresh Water Total	645.00
ENERGY SERVICE CO- ESCO - Item: FW-01 - Fresh Water Total	90.00
EXTREME SERVICES - Item: FW-01 - Fresh Water Total	1,150.00
FRAC TANK RENTALS LLC-TWO STAT - Item: FW-01 - Fresh Water Total	2,695.00
GEOMECHANICS SOUTHWEST INC. - Item: FW-01 - Fresh Water Total	348.00
GLOBE ENERGY - ARTESIA - Item: FW-01 - Fresh Water Total	2,545.00
HYDROSTEAM - Item: FW-01 - Fresh Water Total	180.00
IMPACT CHEMICAL TECHNOLOGIES - Item: FW-01 - Fresh Water Total	940.00
JES - Item: FW-01 - Fresh Water Total	130.00
KEY ENERGY - #407 - EUNICE - Item: FW-01 - Fresh Water Total	200.00
KILL IT SERVICES - Item: FW-01 - Fresh Water Total	130.00
KODIAK OILFIELD SERVICES - Item: FW-01 - Fresh Water Total	1,300.00
LEGENDARY LLC - Item: FW-01 - Fresh Water Total	80.00
LIONS TRANSPORT CORP - Item: FW-01 - Fresh Water Total	125.00
M & S SERVICE INC - Item: FW-01 - Fresh Water Total	1,424.00
MACLASKEY OILFIELD SERVICES - Item: FW-01 - Fresh Water Total	72.00
MAVERICK SERVICES - Item: FW-01 - Fresh Water Total	1,800.00
MULLHOLLAND ENERGY SERVICES - Item: FW-01 - Fresh Water Total	50.00
MVA TRUCKING & RENTALS LLC - Item: FW-01 - Fresh Water Total	120.00
NALCO CHAMPION - HOBBS - Item: FW-01 - Fresh Water Total	5,386.00
NOVA MUD, INC. - Item: FW-01 - Fresh Water Total	260.00
OMEGA TREATING CHEMICALS - Item: FW-01 - Fresh Water Total	410.00
ONE CALL LOGISTICS LLC - Item: FW-01 - Fresh Water Total	100.00
ONO'S SANDBLASTING - Item: FW-01 - Fresh Water Total	148.00
PATE TRUCKING COMPANY LLC - Item: FW-01 - Fresh Water Total	2,280.00
PENASCO SERVICES LLC - Item: FW-01 - Fresh Water Total	150.00
PRESTIGE OILFIELD SERVICE - Item: FW-01 - Fresh Water Total	380.00
PRODUCTION & ENVIRONMENTAL SER - Item: FW-01 - Fresh Water Tota	17.00
R & M TRUCKING - Item: FW-01 - Fresh Water Total	250.00
RAMIREZ ROUSTABOUT LLC - Item: FW-01 - Fresh Water Total	610.00
RANGER SERVICES - Item: FW-01 - Fresh Water Total	340.00
REDLINE HOTSHOT - Item: FW-01 - Fresh Water Total	120.00
ROCKIN 8 SERVICES - Item: FW-01 - Fresh Water Total	120.00
STANDARD ENERGY SERVICES - Item: FW-01 - Fresh Water Total	21,387.00
STONE OILFIELD SERVICE - Item: FW-01 - Fresh Water Total	1,555.00
STRAUB CORP - Item: FW-01 - Fresh Water Total	285.00
TANMAR COMPANIES, LLC - Item: FW-01 - Fresh Water Total	130.00

Customer	# BBLs
TEX MEX RENTALS - Item: FW-01 - Fresh Water Total	220.00
TEXAS LOBO TRUCKING LLC - Item: FW-01 - Fresh Water Total	806.00
TFH LTD COMPANY - Item: FW-01 - Fresh Water Total	860.00
TIGER OF THE NORTH TRANSPORTAT - Item: FW-01 - Fresh Water Total	130.00
TORRES TRUCKING - Item: FW-01 - Fresh Water Total	60.00
TRACKER ENERGY - Item: FW-01 - Fresh Water Total	214.25
TRIDENT OILFIELD SERVICES - Item: FW-01 - Fresh Water Total	240.00
TRM LLC - Item: FW-01 - Fresh Water Total	185.00
UNITED WELL SERVICES - Item: FW-01 - Fresh Water Total	850.00
VAZQUEZ TRUCKING - VTI - Item: FW-01 - Fresh Water Total	360.00
VMJ OILFILED SERVICES - Item: FW-01 - Fresh Water Total	490.00
WEST TEXAS BORING - Item: FW-01 - Fresh Water Total	120.00
WINDMILL TRUCKING - Item: FW-01 - Fresh Water Total	1,455.00
ZH SERVICES INC - Item: FW-01 - Fresh Water Total	340.00
Grand Total	**81,863.03**

Supporting Information for Renewal Application of Discharge Permit BW-8

Prepared for

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

July 2, 2018

Daniel B. Stephens & Associates, Inc.

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

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E Historical Groundwater Level and Groundwater Quality Data

Supporting Information for Renewal Application of Discharge Permit BW-8

This document provides supporting information associated with the Salt Dog Brine Station (Salty Dog) discharge permit renewal application. Salty Dog is seeking renewal of discharge permit BW-8 (DP BW-8) for Brine Supply Well No. 1. This discharge permit was last renewed on November 8, 2013 (NMEMNRD, 2013). Brine Supply Well No. 1 is permitted as a UIC Class III well (API No. 30-025-26307). Salty Dog is located in Lea County, New Mexico (Figure 1). Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared the renewal application for submission to the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD) on behalf of PAB Services, Inc. (PAB).

I. Facility Name

Salty Dog Brine Station

II. Operator

The Salty Dog Brine Station is operated by:

PAB Services, Inc.
P.O. Box 2724
Lubbock, TX 79408
(806) 741-1080

III. Location of Facility

The Salty Dog brine well, Brine Supply Well No.1, is located 1,980 feet from south line (FSL) and 1,980 feet from east line (FEL) (NW/4 SE/4, Unit Letter J) in Section 5, Township 19 South, Range 36 East, New Mexico Principal Meridian (NMPM). Figure 1 shows the topography in the area of the Salty Dog facility, which is located approximately 11 miles west of Hobbs, New Mexico.

IV. Landowner

Salty Dog facilities are located on private property owned by (Appendix A):

- Snyder Ranches, Ltd.
  P.O. Box 2158
  Hobbs, NM 88241
  (575) 393-7544

- Squires, Inc.
  P.O. Box 2158
  Hobbs, NM 88241

- PAB Services, Inc.
  P.O. Box 2724
  Lubbock, TX 79408
  (806) 741-1080

V. Types and Quantities of Fluids

Salty Dog produces and sells both fresh water and brine. Fresh water is obtained from the Ogallala Aquifer. Brine is produced from in situ extraction of salt at the brine well. Fresh water is circulated down the casing annulus of the brine well into the Salado Formation—a Permian Age sedimentary rock unit composed of halite (salt) and other evaporative beds. Fresh water dissolves the salt, and the brine is extracted through the center tubing of the well (Figure 2).

In 2017, monthly fresh water injection volumes ranged from 15,753 to 81,711 barrels (bbl), while monthly brine production ranged from 16,321 and 80,409 bbl (DBS&A, 2018b). Fresh water is metered as it is injected into the brine well, and produced brine is metered as it is pumped from the brine well to brine storage tanks. Fresh water and brine production values are recorded daily on monthly fresh and brine water report forms that are submitted to OCD at the end of each month and in annual Class III well reports. In 2017, the calculated average rate for both fresh water injection and brine production was 1,700 bbl. Appendix B provides monthly fresh

and brine water report forms for 2017. The latest annual Class III well report was submitted to OCD on May 1, 2018 (DBS&A, 2018b).

Total dissolved solids (TDS) concentrations of the fresh water and produced brine are approximately 800 and 300,000 milligrams per liter (mg/L), respectively. Water quality samples of the injected fresh water and produced brine are collected semiannually and submitted to a certified laboratory for analysis. Average chemical and physical characteristics of the injection water and produced brine based 2017 semiannual sampling are shown in Table 1. Appendix C provides laboratory reports associated with the 2017 semiannual sampling; because the brine well was down during the December 2017 monitoring event, the second semiannual brine sample was collected in February 2018. Results of the water quality analyses are reported in the annual Class III well reports (DBS&A, 2018a).

Table 1. Injection Water and Produced Brine Chemical and Physical Characteristics

Constituent	Average Concentration (mg/L [a])	
	Injection Water	Produced Brine
pH (s.u.)	7.76	7.37
Specific gravity (unitless)	0.997	1.19
Chloride	270	180,000 [b]
Sodium	NM	79,500
TDS	775	316,500

Note: Average constituent concentrations calculated from 2017 semiannual monitoring data.
[a] Unless otherwise noted
[b] During the second 2017 semiannual monitoring event, the chloride concentration of the brine water was not analyzed.
mg/L = Milligram per liter
nm = Not measured
s.u. = Standard units
TDS = Total dissolved solids

VI. Description of Fluid Transfer and Storage

Salty Dog is a brine water production and loading station. It consists of fresh water supply wells, a brine production well, and a concrete truck loading pad with two brine filling stations (Figure 1).

Water for brine production comes from two fresh water supply wells (FWS-1 and FWS-2) and one groundwater remediation well (RW-2). Well FWS-1 is the main fresh water supply well. Fresh water from well FWS-1 is pumped to a stainless-steel, 750-bbl aboveground storage tank (AST) located near the north end of the facility and well FWS-1. Water from wells RW-2 and FWS-2 is pumped to two 500-bbl tanks located near the brine well.

Produced brine ready for sale is stored in a bermed tank battery consisting of six 750-bbl ASTs that are constructed of fiberglass. The total capacity of the tank battery is 4,500 bbl. Produced brine is conveyed via a 3-inch-diameter high-density polyethylene (HDPE) pipeline from the brine well to the tank battery. The conveyance pipeline is ⅜ inch thick and runs along the ground surface (Figure 1), where leaks can be easily identified. The areas of the conveyance pipeline and storage tanks are inspected regularly for signs of leaks and deterioration.

Several monitor wells are located downgradient of the brine well and brine storage and handling facilities, providing a mechanism to detect any potential future release to groundwater. The locations of the monitor wells are shown in Figure 3.

VII. Description of Brine Extraction Well

Figure 2 is a generalized schematic of the current configuration of the brine well. The brine well has been in operation since the early 1980s. The Salty Dog brine well is configured for reverse circulation brine recovery, where fresh water is circulated down the casing annulus into the Salado Formation. Fresh water dissolves salt from the Salado Formation, and brine is extracted through the center tubing of the well.

In 2017 and 2018, the brine well was repaired because the well tubing had collapsed. The existing well, which was originally drilled to 2,958 feet below ground surface (bgs), was redrilled and cleaned out to 2,791 feet bgs. New tubing was then installed to a depth of 2,610 feet bgs. The tubing was perforated with 0.20-inch-diameter holes from 2,590 to 2,592 feet bgs (Figure 2). The well was operational again in February 2018 (DBS&A, 2018). Before placing the well back in operation, PAB conducted a mechanical integrity test (MIT) on the well; it passed the test. A record of the MIT is provided in Appendix D, along with documentation of the repairs that were made in 2017 and 2018. Pursuant to 20.6.2.5204 New Mexico Administrative

Code (NMAC), PAB is required to demonstrate mechanical integrity of the brine well at least once every five years.

Each year fresh water injection and brine production data are used to calculate the size of the brine solution cavern caused by salt dissolution from the Salado Formation. These calculations are reported in the annual Class III well reports. In 2017, brine production activities dissolved an estimated 89,500 bbl of Salado Formation (DBS&A, 2018b). The total estimated size of the brine solution cavern is approximately 883,300 bbl based on historical and present brine production data. In 2012, OCD estimated a volume of 1,022,196 bbl for the Salty Dog solution cavern (NMEMNRD, 2012).

In March 2018, Salty Dog installed five survey monuments near the brine well to monitor for potential subsidence associated with brine production (Figure 4) (DBS&A, 2018d). Construction of the subsidence survey monitoring points followed the design presented in the *Work Plan for Surface Subsidence Monitoring and Solution Cavern Characterization* (DBS&A, 2014), with the exception of minor design changes to accommodate field conditions. Salty Dog will have each monitoring point surveyed semiannually to at least the nearest 0.1 foot (NMEMNRD, 2013). Survey results will be submitted to OCD within 15 days of the survey and will be included in the annual Class III well reports.

VIII. Contingency Plan for Addressing Spills and Releases

The Salty Dog facility is manned by an operator during operational hours. Regular duties of the operator include inspection of conveyance pipelines, valves, hoses, and tanks. In addition, the operator monitors tank fluid levels, brine well operating pressures, and flow meters. These inspection and monitoring activities are conducted to prevent spills by identifying any leaks and deterioration of the conveyance and storage equipment.

The truck load pad where brine is sold is constructed of concrete with a sump. Any spillage during truck loading drains to and is captured at the sump. In addition, the tank battery where brine is stored for sale is bermed. If one of the ASTs were to leak, the release would be contained within the bermed area, and the spilled brine would be removed for disposal by a vacuum truck or possibly other appropriate means.

If an accidental spill or release occurs, the following procedure will be followed:

- The facility manager, Jim Sayre, will be contacted immediately by cell at (575) 361-5072.
- If necessary (i.e., the release is at the brine well or from the brine conveyance line), operation of brine well will be stopped.
- Depending on the size of the spill, a vacuum truck contractor, such as Zia Transports, Inc. ([575] 393-8352) in Hobbs, New Mexico, will be called to collect and remove the released fluid for proper disposal.
- OCD will be notified in accordance with 19.15.29.9 NMAC.
- The facility manager, in consultation with OCD, will determine if further actions are required (e.g., soil removal).

Salty Dog will report major releases by giving both immediate verbal notices and timely written notices to OCD in accordance with Subsections A and B of 19.15.29.10 NMAC, and will report minor releases by giving timely written notices pursuant to Subsection B of 19.15.29.10 NMAC.

When reporting a release to OCD, the following information will be provided:

- Name, address, and telephone number of the person in charge of the facility as well as the owner or operator of the facility
- The name and address of the facility
- The date, time, location and duration of the discharge
- The source or cause of the discharge
- A description of the discharge, including chemical composition
- The estimated volume of the discharge
- A description of any actions taken to mitigate immediate damage from the discharge

Within one week of the release, Salty Dog will send written notification to OCD in Santa Fe, New Mexico and the OCD District I office in Hobbs, New Mexico verifying the oral notification and providing any appropriate additions or corrections to the information provided in the oral notification. Salty Dog will also submit a completed C-141 Release Notification and Corrective Action Form within 15 days of the release.

For releases that endanger public health and/or the environment, Salty Dog will complete a division-approved corrective action.

IX. Hydrogeologic Site Characteristics

Salty Dog is addressing groundwater impacts resulting from releases at the brine well and a former brine pond. In 1999, a hole was discovered in the casing of the brine well at 250 feet bgs (Salty Dog, 1999). The hole released brine, impacting groundwater, and was repaired in August 1999 by installing a casing liner (Salty Dog, 1999). In October 2008, the brine pond was removed and impacted soil was excavated and disposed of (DBS&A, 2008).

Two chloride plumes currently exist at the site: one in the area of the brine station (i.e., the former brine pond area) and a second near the brine well. In 2009, PAB initiated groundwater extraction to remove and provide hydraulic containment of brine-impacted groundwater at the brine station and near the brine well (DBS&A, 2009). OCD issued an Administrative Compliance Order (ACO) (ACO-2008-02) to Salty Dog to address chloride-impacted groundwater at the site in May 2008.

Groundwater monitoring and extraction data are reported and evaluated in reports submitted to OCD. The data include water levels and water quality (i.e., chloride concentrations) at site monitor wells. Site monitor wells are shown in Figure 3; historical water level and chloride data for the wells are provided in Appendix E. Monitoring data show that the systems are effective at providing hydraulic containment of the chloride plumes (DBS&A, 2018a).

To help prevent a future release, Salty Dog continually monitors pressures on the well tubing and on the annulus between the inner tubing and outer casing. These measurements are recorded daily on the monthly fresh and brine water report forms. Appendix B provides monthly

fresh and brine water report forms for 2017. In additional, mechanical integrity tests are performed after major brine well repairs and at least once every five years pursuant to 20.6.2.5204 NMAC.

Salty Dog no longer stores brine in a pond. Instead, brine is stored in a bermed tank battery with six ASTs. This method of storage allows for easier detection of leaks and containment of a release if a leak were to occur.

The Ogallala Aquifer is protected from potential water quality impact caused by brine production from the Salado Formation. Figure 2 is a generalized schematic of the brine well showing that brine is produced from the Salado Formation located approximately 1,850 below the base of the Ogallala Aquifer. The Ogallala Aquifer and the Salado Formation are separated by the Rustler Formation, which consists of an approximately 1,650-foot sequence of redbeds and 200 feet of anhydrite. The redbeds are composed primarily of low permeability mudstones. The low permeability and large thickness of the redbeds helps to prevent fluid from moving upward from the Salado Formation to the Ogallala Aquifer. The geology, along with continually monitoring of well tubing and annulus pressures and routine mechanical integrity testing, helps to prevent additional water quality impacts to the Ogallala Aquifer.

X. Additional Compliance Information

Salty Dog has maintained compliance with its existing discharge permit (DP BW-8) and is meeting ACO requirements. On May 2, 2018, DBS&A submitted a letter to OCD on behalf of Salty Dog (DBS&A, 2018c). The letter was submitted in response to a February 16, 2018 letter from OCD requesting a review of the DP BW-8 administrative record. As part of this review, several existing documents were uploaded to the OCD website via the Varonis system. All documents required under DP BW-8 are now available online as part of the DP BW-8 administrative record.

Salty Dog is operating groundwater extraction systems at the site to provide hydraulic containment and removal of chloride-impacted groundwater in both the former brine pond area and brine well area. Groundwater levels and groundwater quality are currently monitored semiannually at several monitor wells to assess the effectiveness of the extraction systems.

Monitoring data show that the systems are effective at providing hydraulic containment of the chloride plumes (DBS&A, 2018a). In March 2018, an additional monitor well was installed in the brine well area at the request of OCD (DBS&A, 2018d). The well will be used to better define the downgradient extent of the chloride plume in the brine well area.

Salty Dog submits annual Class III well reports to OCD by June 1 of each year. The annual Class III well reports are based on brine well operational activities from the previous year, and include fresh water injection and brine production volumes, tubing and casing pressure readings, chemical and physical properties of the fresh water and produced brine, descriptions of any deviation from normal operations and any leaks or spills, and results of an area of review survey and any mechanical integrity test. Also reported in the annual Class III well reports are the amount of halite (salt) dissolved from the Salado Formation for the year and the estimated total size of the brine solution cavern. The total estimated size of the brine solution cavern is approximately 883,300 bbl (DBS&A, 2018b).

On February 9, 2018, PAB performed a mechanical integrity test at the brine well. Pressure was applied to the annulus between the inner tubing and outer casing. Gary Robinson from the OCD District 1 office was present during the test. The annulus held pressure, and the brine well passed the test (Appendix D). Pursuant to 20.6.2.5204 NMAC, mechanical integrity tests are performed after major brine well repairs and at least once every five years.

In March 2018, Salty Dog installed five permanent subsidence monitoring points in the vicinity of the brine well (DBS&A, 2018d). The elevations of the subsidence monitoring points will be surveyed on a semiannual basis as required by DP BW-8. If subsidence is measured at or greater than 0.1 foot at any of the subsidence monitoring points, Salty Dog will suspend operations at the brine well and conduct an analysis to determine the cause of the movement and integrity of the brine solution cavern.

References

Daniel B. Stephens & Associates, Inc. (DBS&A). 2008. *Closure report, brine pond and loading area, Salty Dog Brine Station, Lea County, New Mexico*. Prepared for the New Mexico

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DBS&A. 2014. *Work plan for surface subsidence monitoring and solution cavern characterization, Salty Dog Brine Station*. Prepared for New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, Environmental Bureau. September 17, 2014.

DBS&A. 2018a. *Semiannual Groundwater Monitoring and O&M Report, July 1 through December 31, 2017, 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. March 30, 2018.

DBS&A. 2018b. *2017 Annual Class III Well Report, Salty Dog Brine Station, DP BW-8, API No. 30-025-26307, Lea County, New Mexico*. Prepared for the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division, Environmental Bureau, Santa Fe, New Mexico. May 1, 2018.

DBS&A. 2018c. Letter from DBS&A to Carl Chavez, New Mexico OCD, regarding Response to OCD letter requesting review of administrative record (BW-8) and submittal of required and/or missing information, discharge permit (BW-8) Standard Energy, UIC Class III Brine Well, API No. 30-025-26307. May 2, 2018.

DBS&A. 2018d. Letter report from DBS&A to Carl Chavez, New Mexico OCD, regarding Installation of monitor well and subsidence survey monitoring points, Salty Dog Brine Station (API No. 30-025-26307). June 25, 2018.

New Mexico Energy, Minerals and Natural Resources Department (NMEMNRD). 2012. Presentation from pre-proposal conference, Request for professional & technical services, I&W Brine Cavern project, Carlsbad, New Mexico. May 9, 2012.

NMEMNRD. 2013. Letter from Jami Bailey to Pieter Bergstein, Salty Dog, Inc., regarding Renewal of discharge permit BW-8 for brine supply well #1 in Unit J of Section 5, Township 19 South, Range 36 East NMPM, Lea County, New Mexico. November 8, 2013.

Salty Dog. 1999. Form C-103 report on Brine supply well #1. Submitted September 8, 1999. Approved by OCD December 1, 1999.

Figures

S:\PROJECTS\ES08.0118_SALTY_DOG_2018\GIS\MXD\DP_RENEWAL_BW-08\FIG01_SITE_LOCATION_AND_FACILITIES.MXD

PAB Services
Salty Dog Brine Station
Truck loading area
Fresh water tank
Former brine pond
Brine tank battery
Brine station fresh water supply well
Squires Inc.
Brine well
Snyder Ranches
T18S R36E
T19S R36E

Source: USGS topographic maps of the Monument North and Ironhouse Draw 7.5 Minute Quadrangles

New Mexico Location Map
Santa Fe
Albuquerque
Socorro
Roswell
Site
Alamogordo
Las Cruces
Lea Co.

N
0 600 1,200 Feet

Explanation

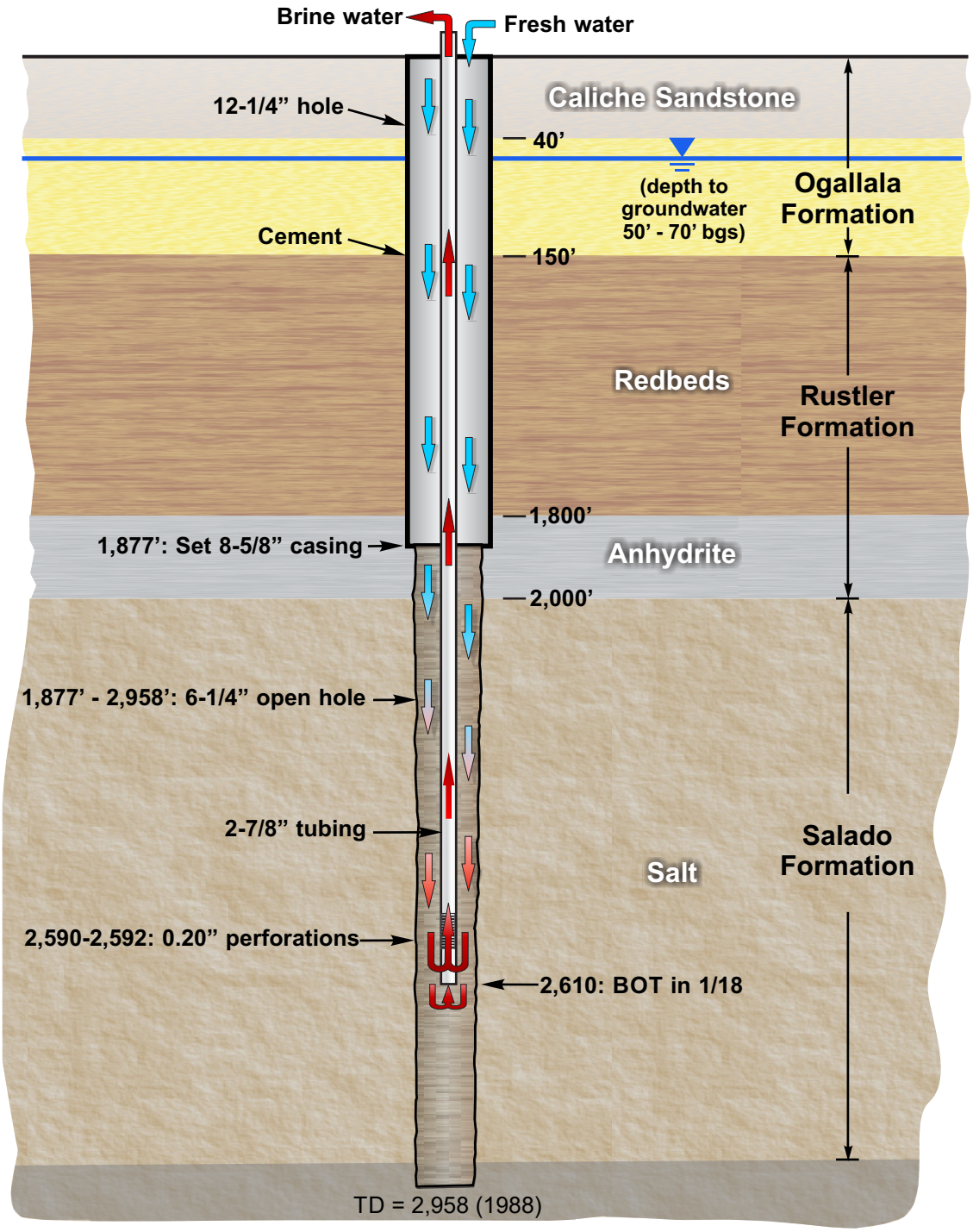
- Water supply well
- Brine well
- Fresh water tank
- Above ground brine pipeline - approximate location
- Property boundary
- Section
- Township and range

Figure 1

SALTY DOG BRINE STATION
Topographic Map of Facility Area

Daniel B. Stephens & Associates, Inc.
6/27/2018 JN ES08.0118.06

Salty Dog Brine Well



Notes:

1. BOT = Bottom of tubing
2. Figure not to scale

Sources:

1. Completion data based on OCD well reports
2. Lithology from Salty Dog (1988)

SALTY DOG BRINE STATION

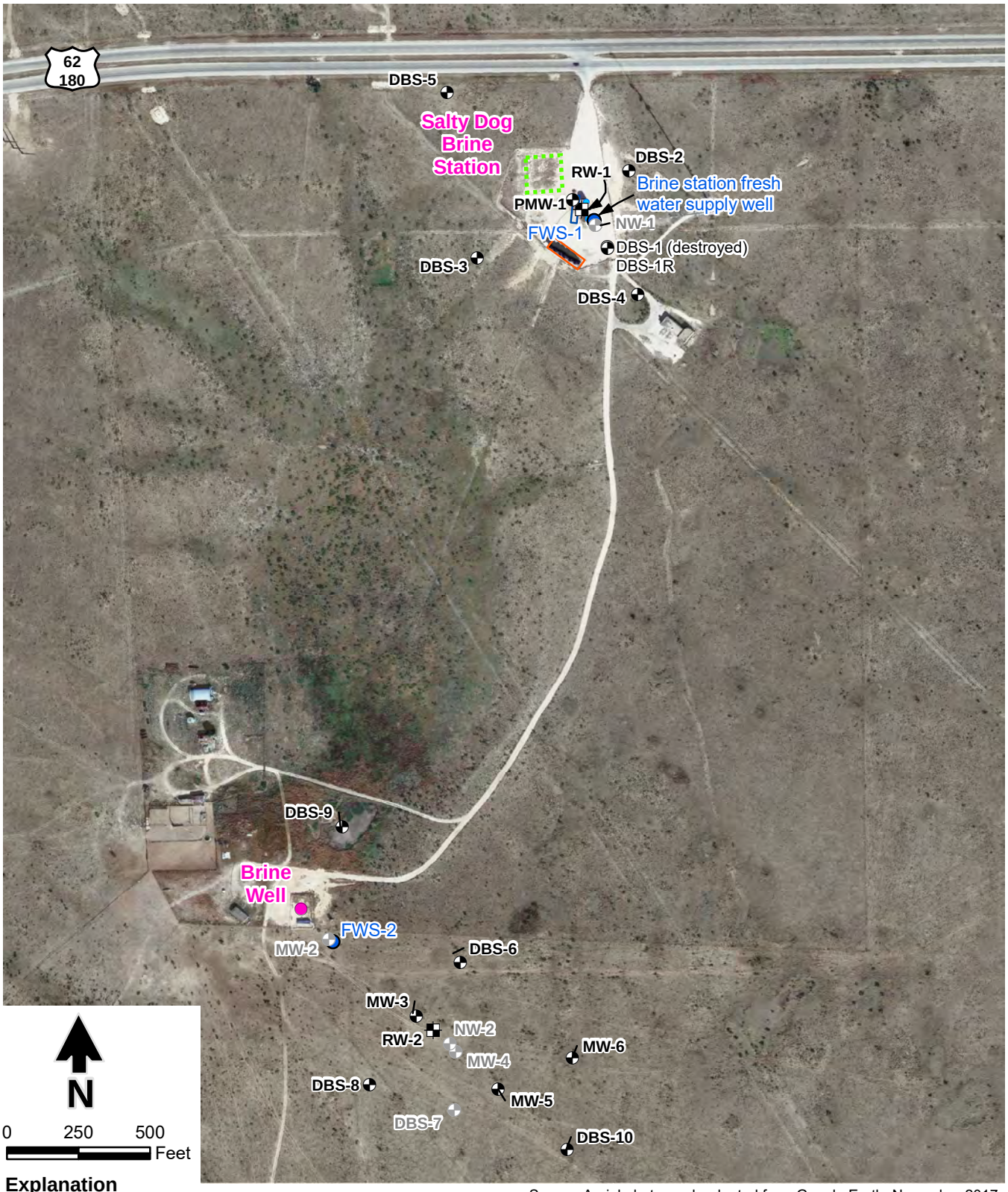
Generalized Brine Well Schematic

Daniel B. Stephens & Associates, Inc.

6-10-18 JN ES08.0118.06

Figure 2

S:\Projects\ES08.0118.06_Salty_Dog_2016\GIS\VR_drawings\Fig03_Generalized_brine_well_schematic.cdr



Explanation

- Fresh water supply well
- Monitor well
- Recovery well
- Well destroyed
- Well not monitored
- Brine well
- Brine tank battery
- Truck loading area
- Former brine pond

Source: Aerial photograph adapted from Google Earth, November 2017.

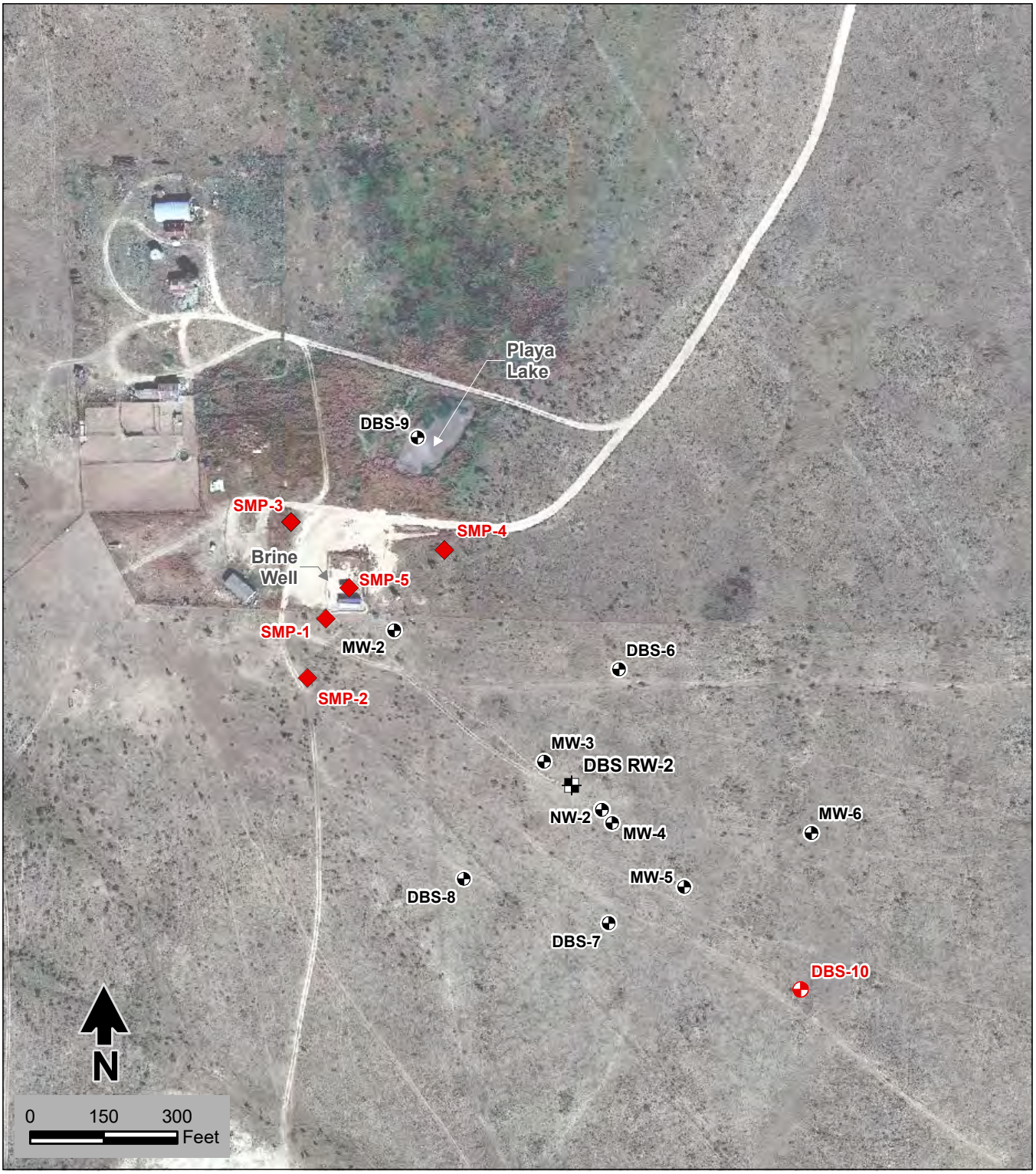
S:\PROJECTS\ES08.0118_SALTY_DOG_2018\GIS\MXD\DP_RENEWAL_BW-08\FIG03_SITE_MONITOR_AND_EXTRACTION_WELL_LOCS.MXD

Daniel B. Stephens & Associates, Inc.
6/24/2018
JN ES08.0118.06

SALTY DOG BRINE STATION

Monitor and Extraction Well Locations

Figure 3



Explanation

- Recovery well
- Monitor well

New facility

- Monitor well
- Survey monument

Source: Google Earth aerial photograph dated November 2017

SALTY DOG BRINE STATION

Playa Lake and Brine Well Area New Facilities

Daniel B. Stephens & Associates, Inc.

6/21/2018 JN ES08.0118.01

Figure 4

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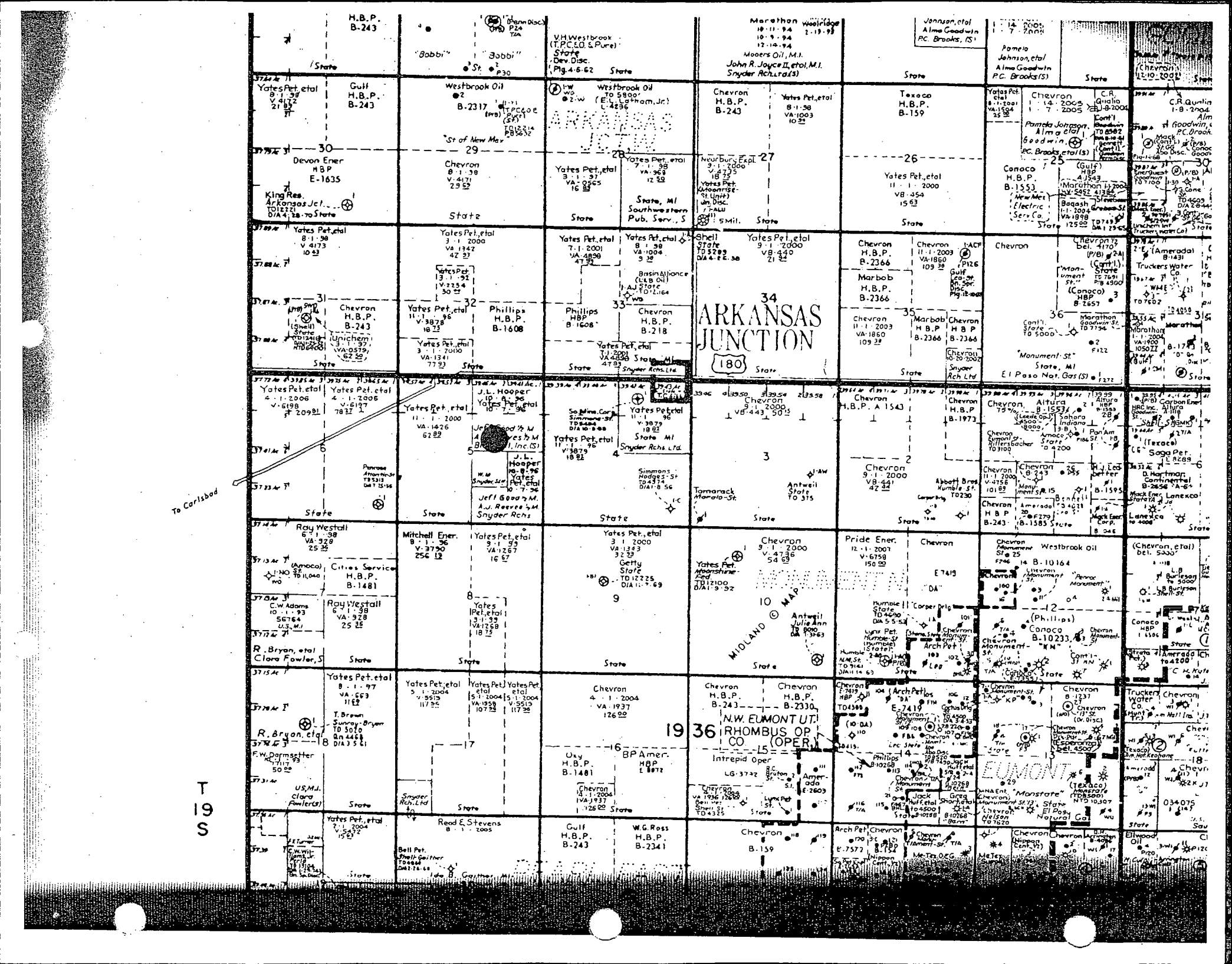
Appendix A

Property Ownership Map


ARKANSAS JUNCTION
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Appendix B

2017 Monthly Fresh and Brine Water Report Forms

53769

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION SALTY Dog

MONTH/YEAR JAN 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	980	900	100	325	90
2	400	330			190
3	2750	2695			505
4	2375	2335			
5	2350	2346			80
6	1100	1065			
7	900	875			
8	600	560			
9	1000	952			560
10	2900	2885			740
11	2300	2235			335
12	900	924			42
13	1450	1410			285
14	1150	1130			390
15	1500	1485			65
16	1200	1175			435
17	2595	2580			390
18	1625	1605			455
19	1010	1000			280
20	3575	3522			50
21	1325	1350			130
22	1250	1210			
23	2630	2600			120
24	1760	1760			130
25	2250	2210			30 30
26	1490	1470			60
27	2630	2600			
28	2110	2095			
29	3675	3655			
30	1905	1790			80
31	2360	2310			
TOTALS					

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION SALAY D09

MONTH/YEAR Feb 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	840	800	100	375	160
2	3720	3610			30
3	1970	1945			
4	2590	2570			
5	2000	1990			
6	700	575			125
7	2075	1910			195
8	3250	3175 ~~1890~~			90
9	720	670			30
10	1010	950			130
11	1120	1000			
12	500	300			
13	~~0~~	130			70
14	2310	2225			55
15	1870	1735			60
16	2120	2040			70
17	1710	1660			230
18	830	795			
19	2999	2890			
20	3795	3680			125
21	1720	1620			275
22	2080	1905 ~~1850~~			
23	1000	850			30
24	2020	1096			50
25	~~800~~	660			
26	210	175			
27	1270	1230			
28	450	370			130
29					
30					
31					
TOTALS					

15,270

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION: SALTY DOG

MONTH/YEAR: MARCH

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BRLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	850	810	100	325	30
2	480	468			100
3	400	360			90
4	1200	1120			150 ~~105~~
5	2570	2,500			
6	3000	2900			95
7	1070	1030			195
8	3590	3545			210
9 (10710)	2050	2001 ~~2005~~			50 ~~30~~
10	3200	3150			
11	1400	1335			
12	600	530			
13	1290	1245			105
14	600	500			345
15	1050	1010			40
16	1200	1170			170
17	900	815			90
18	1395	1355			520
19	2900	2880			
20	5250	5160			30
21	3120	3085 ~~3100~~			30
22	2390	2345			
23	1695	1630			
24	1400	1350			30
25	230	220			
26	4100	4091			
27	~~0~~	~~0~~			35
28	2401	2360			60
29	4000	3927			50
30	1310	1297			10
31	1530	1490			80
TOTALS					

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION Salty Dog

MONTH/YEAR APRIL 17

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	680	660	100	375	
2	200	200			
3	2060	2030			30
4	1010	910			
5	2400	2380			340
6	1990	1960			290
7	820	770			170
8	1100	1050			
9	800	720			
10	3170	3103			30
11	1620	1585			280
12	2070	2007			60
13	800	780			250
14	1250	1240			242
15	1160	1120			0
16	1500	1480			0
17	2900	2806			245
18	3300	3260			125
19	2256	2200			165
20	2800	2743			180
21	3220	2691			
22	1930	1900			70
23	1500	1470			
24	2280	2260			830
25	1760	1730			160
26	700	640			
27	1995	1946			230
28	3000	2829			290
29	3000	3020			
30	1160	1040			
31					
TOTALS					

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION Salty Dog

MONTH/YEAR MAY 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	2300	2150			330
2	1985	1955			350
3	2110	2098			195
4	3000	2975 ~~770~~			250
5	2380	2340			30
6	1250	1210			260
7	600	580			430
8	2040	2000			155
9	700 FROC	15308 680			210
10	960	925			36
11	780	745			65
12	2470	2422			30
13	~~0~~	230			80
14	700	670			
15	1470	1440 ~~420~~ ~~210~~			260
16	26594 4230	4171			405
17	910	860			215 ~~200~~
18	1375	1340			20
19	1680	1620			25
20	1380	1370			
21	910	890			
22	2470	2410			126
23	2365	2347			240
24	1875	1830			540
25	4610	4585			170
26	1595	1556			225
27	~~0~~	435			80
28	1765	1780			
29	700	630 ~~500~~			
30	700	680			285
31	2210	2180			40
TOTALS					

AVE 413

21600 AVG 1,661

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION Salty Dog

MONTH/YEAR June 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	780	756	100	375	500
2	600	556			70
3	470	450			30
4	~~0~~	135			~~0~~
5	1280	1250			50
6	900	875			200
7	1600	1580 ~~470~~			310 ~~25~~
8	710	689			30
9	1580	1510			90
10	600	590			155
11	350	250			110
12	1900	1860			30
13	2150	2134			140
14	820	770			150
15	3640	3595			65
16	1770	1705			75
17	820	710			25
18	1980	1920			
19	3690	3665			350
20	3020	2990 ~~350~~			30
21	3070	2924 ~~350~~			145
22	2810	2750 ~~1900~~			240
23	~~0~~	339			275
24	~~0~~	300			~~0~~
25	1800	1770			~~0~~
26	1280	1265			270
27	1920	1905			235
28	2182	2169			505
29	3150	3125			155
30	1500	1470			230
31					
TOTALS					

29302

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION SALTY Dog

MONTH/YEAR July 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	2550	2520	100	375	
2	1900	1880	100	375	
3	2395	2380	100	375	125
4	2105	2084	100	375	130
5	4190	4145	100	375	60
6	2670	2640	100	375	130
7	1950	1930	100	350	30
8	800	778	100	375	
9	1170	1150	100	375	
10	2710	2690	100	375	255
11	2455	2437	100	375	60
12	1860	1820	100	375	60
13	1660	1640	100	350	
14	2690	2669	100	350	105
15	5045	5005	100	360	55
16	2400	2380	100	375	
17	2045	2006	100	375	60
18	1975	1915	100	375	60
19	1280	1259	100	375	80
20	1390	1350	100	375	100
21	1620	1594	100	375	80
22	1380	1350	100	375	
23	1515	1490	100	350	
24	~~4095~~ 4095	4060	100	350	230
25	1165	1135	100	375	120
26	1685	1655	100	375	
27	2800	2775	100	375	140
28	1050	1010	100	375	35
29	1210	1180	100	375	310
30	1050	1010	100	375	50
31	2100	2070	100	375	100
TOTALS		62,145			

H0154

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION: SALTY Dog

MONTH/YEAR: August 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	1245	1320	100	375	155
2	4360	4340	100	375	130
3	1320	1310	100	375	
4	1500	1490	100	375	
5	1860	1850	100	375	
6	775	760	100	375	120
7	1840	1825	100	375	280
8	5895	5485	100	375	
9	1720	1705	100	375	190
10	1240	1220	100	375	106
11	1810	1800	100	375	27
12	1950	1940	100	375	120
13	1425	1410	100	375	130
14	1500	1495	100	375	160
15	1100	1090	100	375	520
16	2215	2200	100	375	155
17	2315	2305	100	375	180
18	1775	1760	100	375	
19	~~0~~	100	100	375	190
20	~~0~~	260	100	375	
21	~~0~~	340	100	375	
22	2595	2580	100	375	410
23	1475	1460	100	375	175
24	860	840	100	375	60
25	1180	1160	100	375	
26	1075	1045	100	325	250
27	2150	2120	100	375	
28	2746	2706	100	375	323
29	50916 2910	3000	100	375	491
30	54586 3670	3610	100	375	210
31	3380	3337			
TOTALS		57966			

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION: SALTY Dog

MONTH/YEAR: Sept 17

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	4520	4505	100	375	
2	3100	3050	100	375	
3	1645	1600	100	375	
4	2000	1970	100	375	100
5	2965	2920	100	375	30
6 (16585)	2590	2540	100	375	190
7	4275	4254	100	375	280
8	1460	1425	100	375	100
9	2880	2810	100	375	360
10 (27534)	2495	2460	100	375	130
11	2366	2344	100	375	37
12	3150	3115	100	375	810
13	3340	3312	100	375	280
14 (37660)	1390	1365	100	375	840
15	3080	3050	100	375	355
16	800	770	100	375	
17 (44090)	2650	2600	100	375	
18	1790	1745	100	375	700
19	4700	4682	100	375	90
20	2095	2045	100	375	
21	1680	1620	100	375	70
22	3595	3355	100	375	25
23	2870	2800	100	375	130
24 (63867)	3580	3538	100	375	130
25	2175	2135	100	375	40
26	3350	3303	100	375	162
27	3195	3165	100	375	28
28	2475	2439	100	375	186
29	3720	3790	100	375	30
30	1760	1710	100	375	
31					
TOTALS		80,409			

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION Salty Dog

MONTH/YEAR Oct 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	620	600	100	375	25
2	2100	2055	100	375	121
3	1375	1335	100	375	200
4	1250	1220	100	375	208
5	2570	2540	100	375	30
6	3200	3170	100	375	285
7	2900	2880	100	375	
8	510	440	100	375	
9	3370	3310	100	375	165
10	1895	1860	100	375	225
11	1360	1320	100	375	190
12	1000	910	100	375	30
13	700	550	100	375	30
14	610	560	100	375	130
15	615	520	100	375	
16	2420	2405	100	375	140
17	1950	1915	100	375	60
18	420	395	100	375	30
19	1760	1730	100	375	30
20	1340	1315	100	375	168
21	2080	2040	100	375	50
22	1530	1500	100	375	
23	2065	2035	100	375	28
24	1700	1656	100	375	650
25	1950	1923	100	375	368
26	2340	2311	100	375	30
27	600	500	100	375	290
28	210	690	100	375	
29	2150	2130	100	375	
30	895	840	100	375	30
31	800	717	100	375	160
TOTALS	46949	47366			

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION SALTY Dog

MONTH/YEAR NOV 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	2500	2450	100	375	290
2	1050	1007	100	375	330
3	830	703	100	375	200
4	560	500	100	375	400
5	690	660	100	375	0
6	1480	1408	100	375	160
7	1210	1152	100	375	570
8	1260	1700	100	375	790
9	1380	1351	100	375	60
10	2200	1930	100	375	90
11	1290	1230	100	375	130
12	500	440	100	375	
13	1970	1930	100	375	250
14	3030	3000	100	375	430
15	1310	1286	100	375	225
16	4000	3720	100	375	120
17	1785	1760	100	375	240
18	1850	1820	100	375	165
19	1295	1780	100	375	40
20	3220	3210	100	375	415
21	2600	2580	100	375	320
22	1245	1230	100	375	
23	2525	2500	100	375	
24	800	780	100	375	
25	1920	1900	100	375	240
26	1040	1010	100	375	
27	1500	1470	100	375	90
28	1170	1155	100	375	320
29	1150	1110	100	375	120
30	2000	1975	100	375	30
31					
TOTALS		48827			

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

MONTHLY FRESH & BRINE WATER REPORT

FACILITY/LOCATION Salty Dog

MONTH/YEAR December 2017

Date	AMOUNT OF FRESH WATER PUMPED DOWN HOLE BBLS	AMOUNT OF BRINE WATER OUT OF HOLE BBLS SOLD	DAILY TUBING PRESSURES PSI	DAILY CASING PRESSURES PSI	FRESH WATER SOLD
1	2056	2010	100	325	60
2	2040	2010	100		
3	1360	1340			
4	1000	955			55
5	920	855			285
6	1870	1855			
7	1610	1570			90
8	2620	2590			
9	680	640			
10	200	120			
11	700	611 ~~200~~			230
12	300	210			
13	~~0~~	100			630
14	333	325			
15	~~0~~	110			130
16	~~0~~	~~0~~			
17	~~0~~	~~0~~			80
18	70	60			240
19	~~0~~	~~0~~			290
20	~~0~~	130			30
21	~~0~~	~~0~~			
22	~~0~~	~~0~~			60
23	~~0~~	~~0~~			
24	~~0~~	~~0~~			
25	~~0~~	350			
26	~~0~~	220			
27	~~0~~	260			
28	~~0~~	~~0~~			
29	~~0~~	~~0~~			
30	~~0~~	~~0~~			
31	~~0~~	~~0~~			
TOTALS					

13825

REPAIRS AND/OR EXPENSES

Date	Company Performing Work/Repairs	Descritpion of Work/Repairs	Estimated Cost	Work Authorized by

Appendix C

Laboratory Analytical Reports for 2017 Semiannual Sampling

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

July 17, 2017

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.: 1706B95

Dear John Ayarbe:

Hall Environmental Analysis Laboratory received 13 sample(s) on 6/21/2017 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 #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1706B95**
Date Reported: **7/17/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: PMW-1
Project: Salty Dog
Collection Date: 6/20/2017 2:30:00 PM
Lab ID: 1706B95-001 **Matrix:** AQUEOUS **Received Date:** 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	13000	500	*	mg/L	1E	7/3/2017 7:36:52 PM	R43998

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 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-1R
Project: Salty Dog
Collection Date: 6/20/2017 3:17:00 PM
Lab ID: 1706B95-002
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	320	50	*	mg/L	100	6/29/2017 1:02:14 PM	R43888

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 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:** 6/20/2017 3:50:00 PM
Lab ID: 1706B95-003 **Matrix:** AQUEOUS **Received Date:** 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	59	5.0		mg/L	10	6/29/2017 1:14:38 PM	R43888

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 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: 6/20/2017 4:15:00 PM
Lab ID: 1706B95-004
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	35	5.0		mg/L	10	6/29/2017 1:39:27 PM	R43888

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 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: 6/20/2017 4:50:00 PM
Lab ID: 1706B95-005
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	170	5.0		mg/L	10	6/29/2017 2:04:17 PM	R43888

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 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:** 6/20/2017 5:15:00 PM
Lab ID: 1706B95-006 **Matrix:** AQUEOUS **Received Date:** 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	39	5.0		mg/L	10	6/29/2017 2:53:56 PM	R43888

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 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: 6/21/2017 7:40:00 AM
Lab ID: 1706B95-007
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	200	50		mg/L	100	6/29/2017 3:31:10 PM	R43888

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 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: 6/21/2017 8:10:00 AM
Lab ID: 1706B95-008
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	240	50		mg/L	100	6/29/2017 3:55:59 PM	R43888

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 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: 6/21/2017 9:05:00 AM
Lab ID: 1706B95-009
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	33	5.0		mg/L	10	6/29/2017 4:08:23 PM	R43888

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 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: 6/21/2017 10:55:00 AM
Lab ID: 1706B95-010
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	10000	500	*	mg/L	1E	7/3/2017 7:49:16 PM	R43998

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 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: 6/21/2017 10:15:00 AM
Lab ID: 1706B95-011
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	870	50	*	mg/L	100	6/29/2017 6:00:04 PM	R43888

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 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
Project: Salty Dog
Collection Date: 6/21/2017 11:20:00 AM
Lab ID: 1706B95-012
Matrix: AQUEOUS
Received Date: 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	0.9944	0			1	6/28/2017 1:27:00 PM	R43862
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	270	50	*	mg/L	100	6/29/2017 6:24:54 PM	R43888
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	773	20.0	*	mg/L	1	6/25/2017 1:47:00 PM	32462
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.93		H	pH units	1	6/27/2017 1:13:43 PM	R43848

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 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
Project: Salty Dog **Collection Date:** 6/21/2017 11:15:00 AM
Lab ID: 1706B95-013 **Matrix:** AQUEOUS **Received Date:** 6/21/2017 4:29:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	1.200	0			1	6/28/2017 1:27:00 PM	R43862
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	180000	10000	*	mg/L	2E	6/29/2017 6:49:43 PM	R43888
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	324000	2000	*D	mg/L	1	6/25/2017 1:47:00 PM	32462
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.57		H	pH units	1	6/27/2017 1:18:06 PM	R43848
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Sodium	100000	2000		mg/L	2E	7/5/2017 5:41:32 PM	A44011

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 Detection Limit
W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706B95**

17-Jul-17

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**MB-A**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**PBW**	Batch ID:	**A44011**	RunNo:	**44011**					
Prep Date:		Analysis Date:	**7/5/2017**	SeqNo:	**1387942**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID	**LCSLL-A**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**BatchQC**	Batch ID:	**A44011**	RunNo:	**44011**					
Prep Date:		Analysis Date:	**7/5/2017**	SeqNo:	**1387943**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0	0.5000	0	98.2	50	150			

Sample ID	**LCS-A**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**LCSW**	Batch ID:	**A44011**	RunNo:	**44011**					
Prep Date:		Analysis Date:	**7/5/2017**	SeqNo:	**1387944**	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	85	115			

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 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#: **1706B95**

17-Jul-17

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**MB**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBW**	Batch ID:	**R43888**	RunNo:	**43888**					
Prep Date:		Analysis Date:	**6/29/2017**	SeqNo:	**1383528**	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:	**R43888**	RunNo:	**43888**					
Prep Date:		Analysis Date:	**6/29/2017**	SeqNo:	**1383529**	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	94.9	90	110			

Sample ID	**MB**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBW**	Batch ID:	**R43998**	RunNo:	**43998**					
Prep Date:		Analysis Date:	**7/3/2017**	SeqNo:	**1387038**	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:	**R43998**	RunNo:	**43998**					
Prep Date:		Analysis Date:	**7/3/2017**	SeqNo:	**1387039**	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	95.8	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
PQL	Practical Quanitative Limit	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#: **1706B95**

17-Jul-17

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**1706B95-012ADUP**	SampType:	**DUP**		TestCode:	**Specific Gravity**				
Client ID:	**Injection**	Batch ID:	**R43862**		RunNo:	**43862**				
Prep Date:		Analysis Date:	**6/28/2017**		SeqNo:	**1382491**	Units:			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	0.9947	0						0.0302	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 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#: **1706B95**
17-Jul-17

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

Sample ID	**MB-32462**	SampType:	**MBLK**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**PBW**	Batch ID:	**32462**	RunNo:	**43772**					
Prep Date:	**6/23/2017**	Analysis Date:	**6/25/2017**	SeqNo:	**1378753**	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-32462**	SampType:	**LCS**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**LCSW**	Batch ID:	**32462**	RunNo:	**43772**					
Prep Date:	**6/23/2017**	Analysis Date:	**6/25/2017**	SeqNo:	**1378754**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	987	20.0	1000	0	98.7	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 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: 1706B95 | RcptNo: 1

Received By: **Erin Melendrez** 6/21/2017 4:29:00 PM

Completed By: **Erin Melendrez** 6/22/2017 8:33:59 AM

Reviewed By: AJS 6/22/17

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 ☐	# of preserved bottles checked for pH: 1 (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? 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 ☐	Checked by: Re

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	2.8	Good	Not Present			

Chain-of-Custody Record

Client: DBS&A

Mailing Address: 6020 Academy RD NE Suite 100

Phone #:

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:

On Ice: ☒ Yes ☐ No

Sample Temperature: 2.8

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. 1706B95	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)	Chloride	TDS, specgravity, pH	Na Sodium		Air Bubbles (Y or N)
6.20.17	1430	GW	PMW-1	1 Poly	none	-001								✓								
6.20.17	1517		~~PMW~~ DBS-1R			-002								✓								
6.20.17	1550		DBS-2			-003								✓								
6.20.17	1615		DBS-4			-004								✓								
6.20.17	1650		DBS-5			-005								✓								
6.20.17	1735		DBS-3			-006								✓								
6.21.17	0740		DBS-9			-007								✓								
6.21.17	0810		DBS-6			-008								✓								
6.21.17	0905		DBS-8			-009								✓								
6.21.17	1055		MW-3			-010								✓								
6.21.17	1015		MW-5			-011								✓								
6.21.17	1120		INJECTION			-012								✓					✓			
6.21.17	1115		BRINE	2 Poly	None/HNO3	-013								✓					✓	✓		

Date:	Time:	Relinquished by:	Received by:	Date	Time
6.21.17	1639			6/21/17	1629
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

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

March 01, 2018

John Ayarbe

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

RE: Salty Dog OrderNo.: 1802942

Dear John Ayarbe:

Hall Environmental Analysis Laboratory received 1 sample(s) on 2/16/2018 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 #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1802942**
Date Reported: **3/1/2018**

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: Brine
Project: Salty Dog
Collection Date: 2/15/2018 1:00:00 PM
Lab ID: 1802942-001 **Matrix:** AQUEOUS **Received Date:** 2/16/2018 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	1.185	0			1	2/20/2018 12:44:00 PM	R49250
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	309000	2000	*D	mg/L	1	2/21/2018 7:01:00 PM	36630
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.16		H	pH units	1	2/19/2018 11:44:03 AM	R49228
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**	
Sodium	59000	1000		mg/L	1E	2/23/2018 10:50:04 AM	36576

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 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#: **1802942**

02-Mar-18

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**MB-36576**	SampType:	**MBLK**	TestCode:	**EPA 6010B: Total Recoverable Metals**				
Client ID:	**PBW**	Batch ID:	**36576**	RunNo:	**49241**				
Prep Date:	**2/16/2018**	Analysis Date:	**2/20/2018**	SeqNo:	**1588828**	Units:	**mg/L**		

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

Sample ID	**LCS-36576**	SampType:	**LCS**	TestCode:	**EPA 6010B: Total Recoverable Metals**				
Client ID:	**LCSW**	Batch ID:	**36576**	RunNo:	**49241**				
Prep Date:	**2/16/2018**	Analysis Date:	**2/20/2018**	SeqNo:	**1588829**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	46	1.0	50.00	0	92.6	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 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#: **1802942**

02-Mar-18

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**1802942-001ADUP**	SampType:	**DUP**	TestCode:	**Specific Gravity**					
Client ID:	**Brine**	Batch ID:	**R49250**	RunNo:	**49250**					
Prep Date:		Analysis Date:	**2/20/2018**	SeqNo:	**1588971**	Units:				

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	1.183	0						0.118	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 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#: **1802942**

02-Mar-18

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**MB-36630**	SampType:	**MBLK**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**PBW**	Batch ID:	**36630**	RunNo:	**49297**					
Prep Date:	**2/20/2018**	Analysis Date:	**2/21/2018**	SeqNo:	**1590748**	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-36630**	SampType:	**LCS**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**LCSW**	Batch ID:	**36630**	RunNo:	**49297**					
Prep Date:	**2/20/2018**	Analysis Date:	**2/21/2018**	SeqNo:	**1590749**	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 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: 1802942 | RcptNo: 1

Received By: **Sophia Campuzano** 2/16/2018 9:30:00 AM

Completed By: **Erin Melendrez** 2/16/2018 11:23:26 AM

Reviewed By: SKC 02/16/18

Labeled: MW 2/16/18

Chain of Custody

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

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 ☐	# of preserved bottles checked for pH: 3 (<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? 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 ☐	Checked by: AC

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: DBSA

Mailing Address: Albuquerque N.M. 87109
6020 Academy Road NE Suite 100

Phone #: 505-822-9400

email or Fax#:

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

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☐ Rush _____

Project Name:
SALTY Dog

Project #:
ES0804118.16

Project Manager:
JPARK@dbstephens.com

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.6

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.
15 per John		SOIL	02/16/18			1802942
2-16-18	1 PM	W	BH/MP	2 PLASTIC	NITRIC ACID	-001

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)						Air Bubbles (Y or N)
TDS				SP	ECIFIC	GRAV	ITY									
PH & METALS																
SODIUM						NA										

Date:	Time:	Relinquished by:	Received by:	Date	Time
2-16-18	1600	JIM SAYRE		2/15/18	1600
Date:	Time:	Relinquished by:	Received by:	Date	Time
2/15/18	1900		Courier	02/16/18	0930

Remarks:

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

January 11, 2018

John Ayarbe

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

RE: Salty Dog OrderNo.: 1712D25

Dear John Ayarbe:

Hall Environmental Analysis Laboratory received 12 sample(s) on 12/21/2017 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 #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1712D25**
Date Reported: **1/11/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-6
Project: Salty Dog
Collection Date: 12/19/2017 2:15:00 PM
Lab ID: 1712D25-001 **Matrix:** AQUEOUS **Received Date:** 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	200	50		mg/L	100	12/29/2017 11:06:16 PM	R48148

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 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:** 12/19/2017 3:10:00 PM
Lab ID: 1712D25-002 **Matrix:** AQUEOUS **Received Date:** 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	28	5.0		mg/L	10	12/29/2017 11:18:40 PM	R48148

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 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:** 12/19/2017 3:45:00 PM
Lab ID: 1712D25-003 **Matrix:** AQUEOUS **Received Date:** 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	850	50	*	mg/L	100	12/29/2017 11:55:54 PM	R48148

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 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
Project: Salty Dog **Collection Date:** 12/19/2017 4:35:00 PM
Lab ID: 1712D25-004 **Matrix:** AQUEOUS **Received Date:** 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	1.000	0			1	12/27/2017 2:04:00 PM	R48036
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	270	50	*	mg/L	100	12/30/2017 12:20:44 AM	R48148
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	776	40.0	*D	mg/L	1	12/27/2017 6:16:00 PM	35709
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.59		H	pH units	1	12/27/2017 12:16:12 PM	R48063

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 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:** 12/20/2017 9:00:00 AM
Lab ID: 1712D25-005 **Matrix:** AQUEOUS **Received Date:** 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	8300	500	*	mg/L	1E	1/6/2018 11:36:49 PM	R48275

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 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:** 12/20/2017 9:35:00 AM
Lab ID: 1712D25-006 **Matrix:** AQUEOUS **Received Date:** 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	230	50		mg/L	100	12/30/2017 2:24:50 AM	A48148

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 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: 12/20/2017 10:00:00 AM
Lab ID: 1712D25-007
Matrix: AQUEOUS
Received Date: 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	32	5.0		mg/L	10	12/30/2017 2:37:15 AM	A48148

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 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: 12/20/2017 10:35:00 AM
Lab ID: 1712D25-008
Matrix: AQUEOUS
Received Date: 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	37	5.0		mg/L	10	12/30/2017 3:26:54 AM	A48148

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 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: 12/20/2017 10:50:00 AM
Lab ID: 1712D25-009
Matrix: AQUEOUS
Received Date: 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	170	5.0		mg/L	10	12/30/2017 3:51:44 AM	A48148

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 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: 12/20/2017 11:05:00 AM
Lab ID: 1712D25-010
Matrix: AQUEOUS
Received Date: 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	42	5.0		mg/L	10	12/30/2017 4:16:33 AM	A48148

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 Detection Limit
W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Client Sample ID: DBS-1R
Project: Salty Dog
Collection Date: 12/20/2017 11:40:00 AM
Lab ID: 1712D25-011
Matrix: AQUEOUS
Received Date: 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	190	50		mg/L	100	12/30/2017 4:53:47 AM	A48148

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 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:** 12/20/2017 12:10:00 PM
Lab ID: 1712D25-012 **Matrix:** AQUEOUS **Received Date:** 12/21/2017 10:18:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	12000	500	*	mg/L	1E	12/30/2017 5:18:36 AM	A48148

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 Detection Limit
W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1712D25**

11-Jan-18

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**MB**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBW**	Batch ID:	**R48148**	RunNo:	**48148**					
Prep Date:		Analysis Date:	**12/29/2017**	SeqNo:	**1544631**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID	**LCS-b**	SampType:	**lcs**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSW**	Batch ID:	**R48148**	RunNo:	**48148**					
Prep Date:		Analysis Date:	**12/29/2017**	SeqNo:	**1544634**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	92.4	90	110			

Sample ID	**MB**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBW**	Batch ID:	**A48148**	RunNo:	**48148**					
Prep Date:		Analysis Date:	**12/30/2017**	SeqNo:	**1544693**	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:	**A48148**	RunNo:	**48148**					
Prep Date:		Analysis Date:	**12/30/2017**	SeqNo:	**1544694**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	91.7	90	110			

Sample ID	**MB**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBW**	Batch ID:	**R48275**	RunNo:	**48275**					
Prep Date:		Analysis Date:	**1/6/2018**	SeqNo:	**1550433**	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:	**R48275**	RunNo:	**48275**					
Prep Date:		Analysis Date:	**1/6/2018**	SeqNo:	**1550434**	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	97.9	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
PQL	Practical Quanitative Limit	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#: **1712D25**

11-Jan-18

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**1712D25-004ADUP**	SampType:	**DUP**	TestCode:	**Specific Gravity**					
Client ID:	**Injection**	Batch ID:	**R48036**	RunNo:	**48036**					
Prep Date:		Analysis Date:	**12/27/2017**	SeqNo:	**1539533**	Units:				

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	0.9988	0						0.170	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 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#: **1712D25**

11-Jan-18

Client: Daniel B. Stephens & Assoc.

Project: Salty Dog

Sample ID	**MB-35709**	SampType:	**MBLK**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**PBW**	Batch ID:	**35709**	RunNo:	**48046**					
Prep Date:	**12/26/2017**	Analysis Date:	**12/27/2017**	SeqNo:	**1539713**	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-35709**	SampType:	**LCS**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**LCSW**	Batch ID:	**35709**	RunNo:	**48046**					
Prep Date:	**12/26/2017**	Analysis Date:	**12/27/2017**	SeqNo:	**1539714**	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 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: 1712D25 | RcptNo: 1

Received By: Sophia Campuzano 12/21/2017 10:16:00 AM

Completed By: Dennis Suazo 12/21/2017 2:27:14 PM

Reviewed By: SRC 12/21/17

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 ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
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 ☐	Checked by:

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	5.7	Good	Not Present			

Chain-of-Custody Record

Client: DBSA

Mailing Address: 6020 Academy RD NE Suite 100

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 #: ES08-0118.16

Project Manager: J. Ayarbe

Sampler: M. Zbrozek

On Ice: ☒ Yes ☐ No

Sample Temperature: 5.7

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. 1712D25	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)	TDS, Specgrav, pH				Air Bubbles (Y or N)
12.19.17	1415	GW	DBS-6	1 poly		001								X								
	1510		DBS-8			002								X								
	1545		MW-5			003								X								
	1635		Injection			004								X				X				
12.20.17	0900		MW-3			005								X								
	0935		DBS-9			006								X								
	1000		DBS-4			007								X								
	1035		DBS-2			008								X								
	1050		DBS-5			009								X								
	1105		DBS-3			010								X								
	1140		DBS-1R			011								X								
	1210		PMW-1			012								X								

Date:	Time:	Relinquished by:	Received by:	Date	Time
12/21/17	1019		Sigrid C	12/21/17	1048
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks

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 D

Mechanical Integrity Test Record


NOON
1
2
3
4
5
6 PM
7
8
9
10
11
6 AM
Graphic Controls LLC
CHART NO. MC MP-1000
METER
CHART PUT ON
TAKEN OFF
LOCATION
REMARKS
2-9-18
Start 7:30 am
End 10:01 pm
Brine Well Test
Smoky Dog Inc.
Brine Supply Well #1
30-025- 26307-00-00
J 5-19s-36E
Cal date 1-31-18
Ser.# 15698
1000#
12 Hour
Gary Robinson -OCD
Inv. My Standard
PRINTED IN U.S.A.

American Valve & Meter, Inc.

1113 W. BROADWAY

P.O. BOX 166 HOBBS,
NM 88240

To:Rental DATE:01/31/18

This is to certify that:

I, RLLarmon ,Technician for American Valve & Meter Inc. has checked the calibration of the following instrument. These points

12 "_Pressure recorder Ser#15698

Pressure #			* Pressure #		
Test	Found	Left	Test	Found	Left
- 0	-	- 0	-	-	-
- 500	- S	- 500	-	-	-
- 700	- A	- 700	-	-	-
- 1000	- M	- 1000	-	-	-
- 200	- E	- 200	-	-	-
- 0	-	- 0	-	-	-

Remarks:_____

_____

_____

Signature: _____

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

HOBBS OCD
DEC 18 2017
RECEIVED

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised August 1, 2011

WELL API NO. 30-025-26307
5. Indicate Type of Lease STATE ☐ FEE ☑
6. State Oil & Gas Lease No. 25087

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: BRINE SUPPLY WELL
1. Type of Well: Oil Well ☐ Gas Well ☑ Other BRINE WELL
8. Well Number 001
2. Name of Operator: SALTY DOG INC
9. OGRID Number 184208
3. Address of Operator: PO BOX 190 LUBBOCK TX 79408
10. Pool name or Wildcat: BSW & SALADO
4. Well Location
Unit Letter J : 1980 feet from the SOUTH line and 1980 feet from the EAST line
Section 5 Township 19S Range 36E NMPM County LEA
11. Elevation (Show whether DR, RKB, RT, GR, etc.)

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☑	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
OTHER:	☐			OTHER:	☐		

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Rig up pulling unit swab well to find salt plug

Spud Date: 12-18-17 Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE JW Sayre TITLE MANAGER DATE 12-18-17

Type or print name JIM SAYRE E-mail address: jim@thestandardenergy.com PHONE: 575-393-8352

For State Use Only

APPROVED BY: Maley Brown TITLE AO/II DATE 12-18-2017

Conditions of Approval (if any):

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

HOBBS OCD
JAN 08 2018
RECEIVED

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised August 1, 2011

WELL API NO. 30-025-26307
5. Indicate Type of Lease STATE ☐ FEE ☑
6. State Oil & Gas Lease No. 25087

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: Brine Supply Well
1. Type of Well: Oil Well ☐ Gas Well ☑ Other Brine Well
8. Well Number 01
2. Name of Operator PAB Services DBA Salty Dog Inc
9. OGRID Number 184208
3. Address of Operator PO Box 190 Lubbock Texas 79408
10. Pool name or Wildcat BSW + Salado
4. Well Location
Unit Letter J : 1980 feet from the South line and 1980 feet from the East line
Section 5 Township 19S Range 36E NMPM Lea County
11. Elevation (Show whether DR, RKB, RT, GR, etc.)

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☑	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
OTHER:	☐			OTHER:	☐		

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Rig up pulling Unit
Pull tubing
Replace Damaged Tubing
go back into Hole

C.O.A. – CHART TEST –
RUN PKR 1800'+/-. TEST CASING TO 300#+ FOR 30mins.
OR DO CAVERN TEST OF 300#+ FOR 4 Hours.

Condition of Approval: notify OCD Hobbs office 24 hours prior of running MIT Test & Chart

Spud Date: 1-9-18
Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE JD Sayre TITLE MANAGER DATE 1-8-18
Type or print name Jim Sayre E-mail address: jim@hestandardenergy.com PHONE: 575-393-8352

For State Use Only

APPROVED BY: **Accepted for Record Only** DATE
Conditions of Approval (if any):
MBrown 1/8/2018

816 West County Road
Hobbs, NM 88240
Office – 575-393-8352
Fax – 575-393-8353

Feb. 27, 2018

To Mike Zbrocek

SALTY DOG BRINE

Jim Sayre

Patsy Hunt
Billing clerk
patsy@thestandardenergy.com

Standard Energy Services

Salty Dog Brine Station

Lea County, NM

Prod. Csg.: 5-1/2" liner (1999) to 1829'. 8-5/8" csg. surf-1877'.

Prod. Tbg.: 3000' (chem-cut bottom 3 DC's---EOT approx. 2910')

Bottom Salt: 2900' +/-

12/26/17 07:45 Arrive on location. SICP=400#. Open well to brine tanks to bleed pressure.

09:45 Met w/ Jim Sayers-Standard Supt. Discussed workover plan. Drove to Standard yard-Hobbs. Found 12 jts. additional 2-7/8" PH-6 production tbg.

Daily Cost:

Supervision:	(1 x $1000)	$1000
Daily Cost		$1,000
Cum Cost		$1,000

12/27-1/8 Continue to flow well down to bleed pressure.

Daily Cost:	$0
Total Cost	$1,000

1/9/18

10:30-11:30 MIRU Standard Energy Services well service rig.

11:30-13:30 MIRU Rotary Wireline for chemical cut on 2-7/8" prod. tbg. Open up well, casing flowing.

BHA: 2-1/8" jet cutter, 1' shock sub, 18" CCL, 7' wt. bar (1-7/16"), 1' rope socket

Zero at GL. RIH. Tagged up at 1036' (little sticky). Latch elevators and pull 20K into tbg., tagged at 1036'. Pulled 70K into tbg, tagged at 1036'. POOH LD 2-1/8" jet cutter. PU 1-7/8" jet cutter, RIH. No tag or weight loss at 1036'. Tagged up at 1870' (collars at 1863', 1832').

Note: Previous Rotary wireline report from before Christmas showed tag at 1900' with 1-9/16" perf gun.

Pulled 70K into tbg., tagged at 1891'. Slacked off to 35K (15K over string wt.). Made jet cut at 1888'. Tbg. started flowing. POOH RD Rotary Wireline. Pulled 70K into tbg., no part. Slack off. Pulled 35K into tbg., parted.

13:30-15:15	WO slip-type elevators. LD 8' tbg. sub & 2-7/8" EUE x PH-6 XO. Confirmed PH-6 box looking up. POOH standing back: 16 stds. 2-7/8" PH-6 XO (PH-6 box s 2-7/8" AOH pin) 12 stds. 2-7/8" PH-6 1 jt. 2-7/8" cutoff (28.00')
16:15-18:00	RBIH 1 std. tbg. & valve. SI well. Tally 15 stands PH-6. Spot drill collar trailer outside firewall to winch line in. Fuel rig.
18:00-19:45	PU 4-3/4" bit, bit sub & 3 x 3-1/2" DC's (Total BHA=93.26'). RIH w/ 6 stds PH-6. SI well due to firewall being full.
19:45-21:30	Continue to vacuum water inside firewall. Unload separate reverse pit from Hobbs.
21:30-22:00	Continue RIH w/ remaining 11 stds. PH-6. SI BOP. SI top tbg. valve.
22:00-22:30	RU reverse pit to pump. Release rig crew.

Daily Costs:

Supervision	$1800
Pulling Unit: 8:00 am-12:00 am; 16 hrs.	$4800
Reverse Pit delivery	$1000
Reverse Pit rental	$1000
Reverse Unit Swivel	$N/C
Reverse Unit Pump	$N/C
Reverse Unit Operator: (2 x $900)	$1800
Reverse Unit Operator Mileage: (2 x $200)	$400
Downhole tools- Purchase:	
Bit	$500
Bit sub	$1200
XO	$1200
3 x 3-1/2" Drill Collars ($900/ea)	$2700
Rental Tools: Drill Collar Lift Subs	$50

Workstring, 65 jts. 2-7/8" PH-6: $6.00/ft * 2022.15'	$12,133
Tbg. delivery	$1000
Light Plant delivery	$250
Light plant rental	$200
Total Cost:	$30,033
Cum Cost:	$31,033

1/10/17

06:00-09:45	Firewall water levels pumped down. Rig crew and Yellowjacket fisherman arrived on location. WO forklift and pipe racks.
09:45-11:00	Break out firewall. Set piperacks. Move 65 jts. 2-7/8" 8.70 PH-6 yellow-band inspected pipe from Saguaro Petroleum inventory onto racks. Tally 65 jts. Push back up firewall. Spot vacuum truck.
11:00-12:50	PU 24 jts. 2-7/8" PH-6. RIH. Tagged up on jt. #25 20' in at 1896'. PU 1 jt. NU BIW stripper on top of BOP. PU swivel. RU floor.
12:50-16:40	Drill last 11' of jt. #25 tag joint to 1907'. 2K WOB. Jumping and torqueing on bottom, sticky on pick-ups.
16:40-05:45	Make connection. Drill f/ 1907'-1937'. Top 20' of Kelly drilled fairly quickly, bottom 10' much slower. While drilling at 1827' (slowest drilling), worked pipe to try to make hole. Lost 6' hole. Had to rotate ¼ turns to regain made hole.
05:45-6:00	Make connection. Drill f/ 1937'-1938'.

Daily Costs:

Supervision	$1800
Pulling Unit: 06:00 1/10- 06:00 1/11, (24 hrs.)	$7200
Reverse Pit rental	$500
Reverse Unit Swivel	$3000
Reverse Unit Pump	$2600
Reverse Unit Operator: (2 x $900)	$1800
Reverse Unit Mileage: (2 x $200)	$400
Rental Tools: BIW stripper, BOP	$300

Light plant rental	$200
Pipe rack delivery	$500
Pipe rack rental	$100
Backhoe	$320
Total Cost:	$18,630
Cum Cost:	$49,663

1/11/17

06:00-10:50 Cont. Drlg. 1938'-1964.

10:50-17:20 Make connection. Drill f/ 1964'-2000'.

Str. Wt.=15k, PU Wt.=16K-17K, Slackoff Wt.=11K-12K.

17:20-06:00 Make connection, (Jt. #29). Drill f/ 2000'-2417' (Jt. # 42 half-way down), made 417' in 24 hrs. Drilling improved on Jts. #30-#36. Jts. #37-#38 slid in hole with rotation. Jt. #39 drilled much slower than previous jts., bottom of Jt. #39 drilled with a lot of torque until last 3'—free fall. Flow from well has decreased significantly and went to zero for a short time before regaining.

Daily Costs:

Supervision	$1800
Pulling Unit: 06:00 1/11- 06:00 1/12, (24 hrs.)	$7200
Reverse Pit rental	$0
Reverse Unit Swivel	$3000
Reverse Unit Pump	$2600
Reverse Unit Operator: (2 x $900)	$1800
Reverse Unit Mileage: (2 x $200)	$400
Rental Tools: BIW stripper, BOP	$300
Light plant rental	$170
Trash Trailer/Porta-Potty	$195
Trash Trailer Delivery	$200

Pipe rack rental	$100
Total Cost:	$17,765
Cum Cost:	$67,428

1/12/17

06:00-06:35 Drill f/ 2417'-2464' (Jt. #43). Last 10' of Jt. #43 stalled out swivel w/ only 2 points on bit. Able to slide ahead with full returns. Attempt to work pipe 10' up and down to work out torque, no success.

06:35-07:00 PUH 50' to 2414' and regained rotation with some torque.

07:00-09:50 Attempt to rotate/drill back to bottom w/ 2 points on bit, gained all torque back in 10'. Stopped rotation. Slid back to original TD with full returns.

09:50-11:00 Continue sliding in hole w/ full circulation to 2810' (Jt. #54).

Hanging wt= 15K Slackoff wt= 11K-13K

11:00-13:00 Circulate well 15 mins. RU Sandline for no-go run. PU 1-3/4" mandrel 1-1/4" sinker bar, 1-9/16" spang jars, and lift sub (22' BHA). RIH & tag top of DC's at 2717'. POOH. No lost weight GIH and no gained wt. POOH.

13:00-14:45 WO Phoenix Technology Services for inclination/azimuth survey.

14:45-17:45 RU PTS. RIH w/ 1'3/4" OD x 18' centralized survey tool. Tagged up at 2120' (Jt. #32 from workstring tally)

Depth	Inclination	Azimuth	DLS
1800'	1.61°	267°	0
1900'	1.75°	62°	3.2
2000'	2.69°	251°	4.4
2100	5.7°	323°	5.7

POOH w/ survey tool. Break out both 2' centralizer subs on top and bottom of tool assembly. RIH. Tool tagged at same 2120'. POOH. RD wireline.

17:45-18:15 Make up new swabbing assembly.

18:15-21:00 RU floor and LD 12 stds. of original 2-7/8" AOH prod. tbg.

21:00-23:00 RU for swab for brine quality test at current 2810' SLM TD.

2-7/8" swab cups would not fit in 8.70# pipe. PU 2-3/8" cups. 1st Run dry. 2nd run fluid sample from end of swab run weighed 9.9# but had lots of iron from swab line and contaminated the sample and didn't appear to have sufficient chlorides. Parted sandline on 3rd run at approx. 1500'. Secure tbg. end of sandline to blocks. Left tbg. open. Shut in csg. SDON.

Daily Costs:

Supervision	$1800
Pulling Unit: 06:00 1/12- 24:00 1/12, (18 hrs.)	$5400
Reverse Pit rental	$0
Reverse Unit Swivel	$3000
Reverse Unit Pump	$2600
Reverse Unit Operator: (2 x $900)	$1800
Reverse Unit Mileage: (2 x $200)	$400
Rental Tools: BIW stripper, BOP	$300
Light plant rental	$170
Trash Trailer/Porta-Potty	$65
Pipe rack rental	$100
Total Cost:	$15,635
Cum Cost:	$83,063

1/13/17

06:00-11:00	Daylight crew arrived on location. WO daylight. Pull sandline out of 2-7/8" tbg. Pull 3500'+ sandline off of drum—no good. Can't get cable spooler until Monday. Decided to move ahead with replacing Larkin tbg. head.
11:00-11:30	Break for lunch.
11:30-13:30	Prepare floor and RU to run 5-1/2" pkr. into top joint of 5-1/2" csg. to isolate flow to be able to cut off old 5-1/2" Larkin 2K tbg. head and weld on new bell nipple and tbg. head. Strip BOP & tbg. slips over top jt. tbg.
13:30-17:15	PU 32-A tension pkr. on new jt. 2-7/8" PH-6. Screw into top jt. of PH-6 workstring. RIH 15' & set pkr. Stopped flow from csg. Terry Abernathy-Welder arrived on location. Clean/grind areas around bottom of tubing head. Discovered that female wellhead was not made up on to top of 5-1/2" bell

nipple pin but straight onto 5-1/2" csg. pin looking up and not welded up. Backed off existing Larkin 2K female tbg. head. Cleaned threads. Found that top 1-2 threads were corroded on 5-1/2" csg. pin. Screw on new WSI 2K female Larkin head onto Teflon and thread sealant 5-1/2" csg. pin. Screw on adapter flange onto bowl of tbg. head. NU BOP. Release 32-A pkr. POOH LD pkr. & XO's. SI pipe rams. Stab tbg. valve and close. Clean up tools.

Shut down until Monday afternoon to spool new sandline onto drum.

Daily Costs:

Supervision	$1200
Pulling Unit: 06:00 - 17:15 (11-1/4 hrs)	$3375
Reverse Pit rental	$0
Reverse Unit Swivel	$0
Reverse Unit Pump	$
Reverse Unit Operator: (1 x $900)	$900
Reverse Unit Mileage: (2 x $200)	$0
Rental Tools: BIW stripper, BOP	$300
Light plant rental	$170
Trash Trailer/Porta-Potty	$65
Pipe rack rental	$100
Welder	$500
Tbg. Head: 5-1/2" x 2-7/8"	$900
Rental Pkr. & XO's	$800
Packer Man & Mileage	$1000
Wireline: Tbg. Cut (Service Charge)	$1000
Total Cost:	$10,310
Cum Cost:	$93,373

1/14/17 Day off.

1/15/17

12:00-14:00	Horizon re-spooled 8000' sandline onto drum.
14:00-16:00	Made 8 swab runs approximately of approx. 9.9# brine, black water. SDON.

Daily Costs:

Supervision	$0
Pulling Unit: 12:00 – 19:00, (7 hrs)	$2100
Reverse Pit rental	$0
Reverse Unit Swivel (released on 1/14)	$0
Reverse Unit Pump (released on 1/14)	$0
Reverse Unit Operator: (released on 1/14)	$0
Reverse Unit Mileage:	$0
Rental Tools: BIW stripper, BOP	$100
Light plant rental	$170
Trash Trailer/Porta-Potty	$65
Pipe rack rental	$100
Total Cost:	$2,535
Cum Cost:	$95,908

1/16/17

07:30	Arrived on location.
07:30-13:15	Made 18 swab runs. Water still black until 10th run and started clearing up. ChemTech chemical man said that black coloration was not iron or biologicals. Water clarifier clear up sample and dropped out very fine tan-colored sand. Last 4 run samples weighed 10.15#.
13:15-13:30	Call into and decision from Peter to proceed ahead with shooting off pipe to complete well.
13:45-15:15	MIRU Rotary Wireline. PU 2-1/16" tbg. cutter. RIH to cut off collars at approx.. 2720'. Tagged up at 2145'. Worked to 2180' with no further progress. POOH. LD 2-1/16" cutter and PU 1-7/8" cutter. RIH. Tagged up at 2175'.
15:15-16:15	WO hot oiler to help pump cutter further down.

16:15-16:30 RU hot oiler. Pressure up to 500# on tbg. No further additional hole made on 1-7/8" tbg. cutter. POOH w/ cutter. RD hot oiler and release. Decided to skip cutting tubing and attempt to perforate tbg.

16:30-17:00 PU 1-9/16" OD x 3', (4spf, 8 holes) tbg. perforating gun. RIH. Tagged up at 2135'. POOH.

17:00-17:30 Remove wireline sheave from rig blocks and hand from derrick. PU 1-7/16" rope socket and CCL (2' 2" overall BHA). RIH. Tagged up at 2138'. Latched elevators on tbg. & PU 10'. Worked wireline tools to 2136' (made 8' hole). PU additional 10'. Worked wireline tools to 2141' (made 15' hole). Pulled full joint into derrick. Worked wireline tools to 2140'. POOH.

17:30-19:30 POOH standing back 2 stands 2-7/8" tbg. RU wireline. RIH w/ same wireline BHA. Tagged up at 2140' (WLM).

*proves that joint of tbg. 2 stds. Up was not crimped

*proves that there is no obstruction (junk) inside tbg.

POOH RD Rotary Wireline. Released rig crew. SDON.

Daily Costs:

Supervision	$1200
Pulling Unit: 07:30 – 19:30, (12 hrs)	$3600
Reverse Pit rental	$0
Reverse Unit Swivel (released on 1/14)	$0
Reverse Unit Pump (released on 1/14)	$0
Reverse Unit Operator: (released on 1/14)	$0
Reverse Unit Mileage:	$0
Rental Tools: BIW stripper, BOP	$100
Light plant rental	$170
Trash Trailer/Porta-Potty	$65
Pipe rack rental	$100
Wireline: Tbg. cut / perforate attempt	$6,200
Total Cost:	$11,520
Cum Cost:	$107,428

1/17/18

07:30-09:30	Crew arrived on location. POOH standing back 15 stds. (16 stds out total) PH-6 YB . Shut down to catch up on water flow.
09:30-10:15	Haul off water in reserve pit.
10:15-10:45	POOH standing back 27 stds (54 jts. that were PU) PH-6 YB, 1 std. old PH-6 (28 stds. total).
10:45-16:00	POOH LD old PH-6 in singles.
	Note: 18 jts. of 32 jts. total of old PH-6 prod. tbg. found bent or corkscrewed.
	Stand back 1 std DC's. Pull to 4-3/4" bit. Bit in good shape.
16:00-19:30	RBIH w/ DC's. Tally & PU 26 jts. original 2-7/8" AOH. PU AOH x PH-6 XO. RIH w/ 16 stds. of PH-6 YB tbg.
19:30-22:00	POOH LD 12 stds PH-6 YB tbg. in singles. RIH w/ 12 stds. remaining new PH-6 YB tbg. in derrick. Tagged up w/ 15' out on last stand (12 stds. RIH were longer than 12 stds. of singles LD). LD 1 jt.
	Rig crew soaked and no change of dry clothes. 20°F overnight.
	Stab tbg. valve on tbg. SI pipe rams. SDON. Release rig crew.

Daily Costs:

Supervision	$1800
Pulling Unit: 06:00, 17th – 22:00 (17 hrs)	$4800
Reverse Pit rental	$0
Reverse Unit Swivel (released on 1/14, start 1/17)	$3000
Reverse Unit Pump (released on 1/14, start 1/17)	$2500
Reverse Unit Pump Delivery	$1,000
Reverse Unit Operator: (released on 1/14, start 1/17)	$1800
Reverse Unit Mileage: (2 x $200)	$400
Rental Tools: BIW stripper, BOP	$100
Light plant rental	$170
Trash Trailer/Porta-Potty	$65
Pipe rack rental	$100
Total Cost:	$15,735

Cum Cost: $123,163

1/18/18

06:00 -09:30	Crew arrived on location. PU power swivel. RU floor to start drilling. Tagged 15' in on jt. #58 (1894'). Previous tag was 1926'.
09:30-11:45	Jt. #58 down (1910'). PU jt. #59. Rotate slowly down w/ 500# torque, 2 pts.
11:45-11:55	Jt. #59 down (1941'). PU jt. #60. Rotate slowly down w/ 500# torque, 2 pts.
11:55-12:20	Jt. #60 down (1972'). PU back to top of jt. due to torqueing at bottom. Slid/rotated back down.
12:20-12:40	Jt. #61 down (2003'). PU jt. #62. Rotate slowly down w/ 500# torque, 2 pts.
12:40-12:50	Jt. #62 down (2034). PU jt. #63. Rotate slowly down w/500# torque, 2 pts.
12:50-17:05	Jt. #63 down (2066'). PU jt. #64. Rotate slowly down w/ 500# torque, 2 pts.
17:05-18:35	Jt. #64 down (2097)'. PU jt. #65. Rotate slowly down w/ 500# torque, 2 pts.
	Note: No night crew available, daylight crew staying over.
18:35-19:05	Jt. #65 down (2128'). PU jt. #66. Rotate slowly down w/ 500# torque, 2 pts.
19:05-19:30	Jt. #66 down (2159'). PU jt. #67. Rotate slowly down w/ 500# torque, 2 pts.
19:30-19:45	Jt. #67 down (2190'). PU jt. #68. Rotate slowly down w/ 500# torque, 2 pts.
19:45-21:10	Jt. #68 down (2221') PU jt. #69. Rotate slowly down w/ 500# torque, 2 pts.
21:10-22:00	Made a few feet w/ jt. #69. Pull jt. out of hole, break out. SI pipe rams. Stab tbg. valve. SDON.

Daily Costs:

Supervision	$1800
Pulling Unit: 06:00, 17th – 22:00 (16 hrs)	$4800
Reverse Pit rental	$0
Reverse Unit Swivel	$3000
Reverse Unit Pump: (2 x $700)	$1400
Reverse Unit Operator: (2 x $900)	$1800
Reverse Unit Mileage: (2 x $200)	$400
Rental Tools: BW stripper, BOP	$100
Light plant rental	$170

Slip-type elevators	$740
Trash Trailer/Porta-Potty	$65
Pipe rack rental	$100
Roustabouts: (pick up bent pipe)	$400
Total Cost:	$14,775
Cum Cost:	$137,938

1/19/18

07:00 -09:10	Make up jt. #69. Reconnect pump hoses. Tag 2' in on jt. Drlg. w/ 2-3 pts., 700# torque.
09:10-10:10	Jt. #69 down (2252'). PU jt. #70. Top 15' drilled slow to 2237', then took off.
10:10-10:25	Jt. #70 down (2283'). PU jt. #71.
10:25-16:00	Jt. #71 down (2314'). PU jt. #72. Drlg. w/ 2-3 pts., 400#-600# torque.
16:00-16:05	Jt. #72 down (2346'). PU jt. #73. Slide/rotate jt. #73 down.
16:05-16:15	Jt. #73 down (2377'). PU jt. #74. Slide/rotate jt. #74 down.
16:15-16:25	Jt. #74 down (2408'). PU jt. #75. Slide/rotate jt. #75 down.
16:25-16:30	Jt. #75 down (2439'). PU jt. #76. Slide/rotate jt. #76 down.
16:30-18:45	Jt. #76 down (2470'). PU jt. #77. Slid jt. 20' in, then drlg. w/ 600# torque.
18:45-20:15	Jt. #77 down (2501'). PU jt. #78. Slid top 15' of jt. in. Drlg. ahead.
20:15-20:50	Jt. #78 down (2532'). PU jt. #79. Drill/rotate down w/ 500# torque, 2 pts.
20:50-04:00	Jt. # 79 down (2563'). PU Jt. #80. Drill Jts. #80-#86 (2781') down w/ 450#-600# torque. Str. wt.=22K. Intermittent ledges, slackoffs up to 5-6'.
04:00-04:30	PU Jt. #87. Drill 1st 10' in at 450#-600# torque, torque increased to 600#-1100#.
04:30-05:10	PU off bottom, did not lose torque. Break out and LD Jt. #87. PU 10' on jt. #86 dragging 6K over. Start rotation. Torque=500#-800#. Stop rotation. Slid 10' back to floor taking 4 pts. coming back down. Decision to not risk bending pipe at satisfactory depth.
	Crew change at 05:00.
05:10-05:45	RU for swab for brine test.
05:45-06:00	RIH for 1st swab run.

Daily Costs:

Supervision	$1800
Pulling Unit: 06:00, 17th – 06:00, 18th (24 hrs)	$7200
Reverse Pit rental	$0
Reverse Unit Swivel	$3000
Reverse Unit Pump: (2 x $700)	$1400
Reverse Unit Operator: (2 x $900)	$1800
Reverse Unit Mileage: (2 x $200)	$400
Rental Tools: BIW stripper, BOP	$100
Light plant rental	$170
Slip-type elevators	$90
Trash Trailer/Porta-Potty	$65
Pipe rack rental	$100
Total Cost:	$16,125
Cum Cost:	$154, 063

1/20/17

06:00-09:00	Make 7 total swab runs. Runs #4, #5,#6=10.1 ppg brine, rusty. Run #7 dry run. Run #8 made dry run to bottom with only 1-3/4" swab mandrel hanger on weight bar. RIH measuring raps. Calculated TD=2670' to top of DC's.
09:00-10:30	Rotary Wireline arrived on location. RD swab. RU wireline. PU 1-7/8" tbg. cutter. RIH. Tagged up at 2615'. Cut tbg. @ 2610'. POOH. PU 2' x 1-9/16" tbg. gun (8 holes w/ 0.2" hole diameter). RIH. Tagged up at 2615'. Collar @ 2595'. PU to 2590' & shoot 8 holes at 2590'-2592'. POOH RD wireline.
10:30-12:00	RD floor. Land tbg. in 2-7/8" x 5-1/2" Larkin tbg. head. Release rental equipment. Clean up location.

END OF REPORT

Appendix E

Historical Groundwater Level and Groundwater Quality Data

Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 1 of 8

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
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

[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
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ft msl = Feet above mean sea level
NA = Not available

Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 2 of 8

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	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
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
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

[a] Top of casing elevations surveyed by Pettigrew & Assoc. on May 28, 2009.
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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-4 (cont.)	56.0–76.0	3,820.37	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
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
			6/20/2017	67.60	3,753.06
			12/19/2017	67.88	3,752.78

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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	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
			12/19/2017	66.29	3,746.36
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

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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-8 (cont.)	55.2–75.2	3,810.70	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
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
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

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NA = Not available

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)
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
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

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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	9/10/2012	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
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

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NA = Not available

Historical Fluid Level Measurements
Salty Dog Brine Station, Lea County, New Mexico
Page 8 of 8

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	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
MW-6	NA	3,810.17	6/23/2008	62.17	3,748.00
			4/07/2009	62.41	3,747.76

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ft bgs = Feet below ground surface
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ft msl = Feet above mean sea level
NA = Not available

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**
	6/20/2017	**320**
	12/20/2017	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
	6/30/2015	28
	9/30/2015	40
	12/17/2015	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

Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-2 (cont.)	3/23/2016	46
	6/09/2016	41
	9/14/2016	41
	12/02/2016	53
	6/20/2017	59
	12/20/2017	37
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
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

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

Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-4 (cont.)	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
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
	6/20/2017	170

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

Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico

Monitor Well	Date	Chloride Concentration (mg/L) [a]
	NMWQCC Standard	*250*
DBS-5 (cont.)	12/20/2017	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**
	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**
	6/21/2017	240
	12/19/2017	200
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

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[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

Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
DBS-8 (cont.)	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
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
NW-1s	4/08/2009	**630**
NW-1m	4/08/2009	57
NW-1d	4/08/2009	38

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[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico

Monitor Well	Date	Chloride Concentration (mg/L) [a]
	NMWQCC Standard	*250*
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**
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**

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[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

Chloride Groundwater Analytical Data
Salty Dog Brine Station, Lea County, New Mexico

Monitor Well	Date	Chloride Concentration (mg/L) [a]
NMWQCC Standard		*250*
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**
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**

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[b] Samples analyzed using Standard Method 4500-Cl B.
mg/L = Milligrams per liter

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.)	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**
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**

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