State of New Mexico
Energy Minerals and Natural Resources
Department Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505
https://www.emnrd.nm.gov/ocd/ocd-e-permitting/

Form C-147
Revised October 11, 2022

Action ID 444320

Recycling Facility Only

Type of action: [X] Permit [ ] Registration [ ] Modification [ ] Closure [ ] Other (explain) _____

Be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.

Operator: Hilcorp Energy Company (For multiple operators attach page with information) OGRID #: 372171

Address: 382 Road 3100 Aztec, NM 87410

Facility or well name (include API# if associated with a well): Salty Dog SWD 6 (API# 30-045-32943)

OCD Permit Number: 3RF-89/[fVV2519941374] (For new facilities the permit number will be assigned by the district office)

U/L or Qtr/Qtr C Section 19 Township 29N Range 13W County: San Juan

Surface Owner: [X] Federal [ ] State [ ] Private [ ] Tribal Trust or Indian Allotment

2.

[X] **Recycling Facility:**

Location of recycling facility (if applicable): Latitude 36.7177696 Longitude -108.2480545 NAD83

Proposed Use: [ ] Drilling* [ ] Completion* [ ] Production* [ ] Plugging *

The re-use of produced water may NOT be used until fresh water zones are cased and cemented

[ ] Other, ***requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.***

[X] Fluid Storage

[X] Above ground tanks [ ] Activity permitted under 19.15.17 NMAC explain type_____

[ ] Activity permitted under 19.15.36 NMAC explain type:_____ [ ] Other explain _____

[ ] **Closure Report (required within 60 days of closure completion):** [ ] **Recycling Facility Closure Completion Date:**_____

3.

Variances:

Justifications and/or demonstrations that the proposed variance will afford reasonable protection against contamination of fresh water, human health, and the environment.

Check the below box only if a variance is requested:

Variance(s): Requests must be submitted to the appropriate division district for consideration of approval. If a Variance is requested, include the variance information on a separate page and attach it to the C-147 as part of the application.

If a Variance is requested, it must be approved prior to implementation.

4.

Operator Application Certification:

I hereby certify that the information and attachments submitted with this application are true, accurate and complete to the best of my knowledge and belief.

Name (Print): Cherylene Weston Title: Operations/Regulatory Tech-Sr.

Signature: Cherylene Weston Date: 3/20/2025

e-mail address: cweston@hilcorp.com Telephone: 713-289-2615

5.

OCD Representative Signature: Victoria Venegas **Approval/Registration Date:** 07/18/2025

Title: Environmental Specialist **OCD Permit Number:** 3RF-89/[fVV2519941374]

[X] OCD Conditions

[X] Additional OCD Conditions on Attachment

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Sundry Print Report

06/23/2025

Well Name: SALTY DOG SWD

Well Location: T29N / R13W / SEC 19 / NENW / 36.7177744 / -108.2474283

County or Parish/State: SAN JUAN / NM

Well Number: 6

Type of Well: INJECTION - ENHANCED RECOVERY

Allottee or Tribe Name:

Lease Number: NMSF079065

Unit or CA Name:

Unit or CA Number:

US Well Number: 300453294300S1

Operator: HILCORP ENERGY COMPANY

Notice of Intent

Sundry ID: 2856391

Type of Submission: Notice of Intent

Type of Action: Other

Date Sundry Submitted: 06/05/2025

Time Sundry Submitted: 09:39

Date proposed operation will begin: 07/01/2025

Procedure Description: Hilcorp Energy requests permission to install a pilot Water Recycle Facility at the Salty Dog SWD 6. All existing construction activities and operation activities for the Water Pilot Project will take place on the existing Salty Dog 6 SWD well pad. There will be no new surface disturbances. Upon BLM approval, a C-147 Recycling Facility Only permit application will be submitted to NMOCD. See attached project summary.

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

Salty_Dog_SWD_6_Recycle_Facility_Plan_20250605093725.pdf

Well Name: SALTY DOG SWD

Well Location: T29N / R13W / SEC 19 / NENW / 36.7177744 / -108.2474283

County or Parish/State: SAN JUAN / NM

Well Number: 6

Type of Well: INJECTION - ENHANCED RECOVERY

Allottee or Tribe Name:

Lease Number: NMSF079065

Unit or CA Name:

Unit or CA Number:

US Well Number: 300453294300S1

Operator: HILCORP ENERGY COMPANY

Operator

I certify that the foregoing is true and correct. Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: CHERYLENE WESTON

Signed on: JUN 05, 2025 09:37 AM

Name: HILCORP ENERGY COMPANY

Title: Operations/Regulatory Tech - Sr

Street Address: 1111 TRAVIS STREET

City: HOUSTON **State:** TX

Phone: (713) 289-2615

Email address: CWESTON@HILCORP.COM

Field

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

BLM Point of Contact

BLM POC Name: DAVE J MANKIEWICZ

BLM POC Title: AFM-Minerals

BLM POC Phone: 5055647761

BLM POC Email Address: DMANKIEW@BLM.GOV

Disposition: Approved

Disposition Date: 06/23/2025

Signature: Dave J Mankiewicz

Form 3160-5
(June 2019)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE *- Other instructions on page 2*

5. Lease Serial No. NMSF079065

6. If Indian, Allottee or Tribe Name

7. If Unit of CA/Agreement, Name and/or No.

1. Type of Well
☐ Oil Well ☐ Gas Well ☑ Other

8. Well Name and No.
SALTY DOG SWD/6

2. Name of Operator HILCORP ENERGY COMPANY

9. API Well No. 3004532943

3a. Address 1111 TRAVIS STREET, HOUSTON, TX 77002

3b. Phone No. *(include area code)* (713) 209-2400

10. Field and Pool or Exploratory Area
SWD ENTRADA/SWD ENTRADA

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*
SEC 19/T29N/R13W/NMP

11. Country or Parish, State
SAN JUAN/NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☑ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Subsequent Report	☐ Casing Repair	☐ New Construction	☐ Recomplete	☑ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
☐ Final Abandonment Notice	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be perfonned or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has detennined that the site is ready for final inspection.)

Hilcorp Energy requests permission to install a pilot Water Recycle Facility at the Salty Dog SWD 6. All existing construction activities and operation activities for the Water Pilot Project will take place on the existing Salty Dog 6 SWD well pad. There will be no new surface disturbances. Upon BLM approval, a C-147 Recycling Facility Only permit application will be submitted to NMOCD. See attached project summary.

14. I hereby certify that the foregoing is true and correct. Name *(Printed/Typed)*
CHERYLENE WESTON / Ph: (713) 289-2615

Title Operations/Regulatory Tech - Sr

Signature (Electronic Submission)

Date 06/05/2025

THE SPACE FOR FEDERAL OR STATE OFICE USE

Approved by
DAVE J MANKIEWICZ / Ph: (505) 564-7761 / Approved

Title AFM-Minerals

Date 06/23/2025

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office FARMINGTON

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations and reports of such operations when completed as indicated on Federal and Indian lands pursuant to applicable Federal law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area or regional procedures and practices, are either shown below, will be issued by or may be obtained from the local Federal office.

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13: Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to the top of any tubing left in the hole; method of closing top of well and date well site conditioned for final inspection looking for approval of the abandonment. If the proposal will involve **hydraulic fracturing operations**, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.
PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c)and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.
ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.
EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM collects this information to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.
Response to this request is mandatory.
The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect ofthis form to U.S. Department ofthe Interior, Bureau ofLand Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C St., N.W., Mail Stop 401 LS, Washington, D.C. 20240

Additional Information

Location of Well

0. SHL: NENW / 515 FNL / 1300 FWL / TWSP: 29N / RANGE: 13W / SECTION: 19 / LAT: 36.7177744 / LONG: -108.2474283 (TVD: 0 feet, MD: 0 feet)

BHL: NENW / 515 FNL / 1300 FWL / TWSP: 29N / SECTION: / LAT: 0.0 / LONG: 0.0 (TVD: 0 feet, MD: 0 feet)

Problem and Objectives

New Mexico is one of the top oil and gas producing states in the country, which means that it is also one of the top produced water (PW) generators in the country. In 2019, New Mexico generated 1.246 billion barrels of (PW). With current technologies, the majority of this PW is hauled to the nearest disposal well facility (SWD) and disposed of downhole. This is a tremendous volume of water to be disposed of as a waste product. This occurs in an arid state that receives less than 15 inches of rainfall each year, with rainfall projected to be increasingly scarce in coming years. The average water hauling and disposal costs in the San Juan Basin are between $3 and $4 per barrel, resulting in significant cost, particularly on the marginal gas wells found in the San Juan Basin. These costs result in a higher threshold of oil and gas production where the well becomes uneconomic leading to the premature plugging of the well and a wasting of the remaining reserves that will be forever lost to the benefit of the well owners and to the state. Given this problem, this project seeks to find an alternate way to manage PW that would create water resources and begin aquifer recharge, as well as significantly reduce water hauling and underground disposal.

In the San Juan Basin, large quantities of PW are produced from individual well sites that are often very remote and not interconnected with a PW pipeline system. Because there are no major centralized PW treatment sites in the San Juan Basin, treatment is only cost-effective if the treatment unit can be moved from well site to well site or SWD depending on need, and a modular approach allows for fitting the system to the needs of particular sites.

Specifically, this project seeks to demonstrate a cost-effective mobile treatment technology applicable to low, medium, and high salinity PW and associated constituents. The objective performance goals of the project tests will be, first, to demonstrate the ability to cost-effectively achieve NMOCD and NMED water quality standards for surface and groundwater discharge of the treated PW. Second, the project seeks to minimize the ratio of post-treatment concentrated brine water to treated PW, thereby minimizing costs of transportation of the concentrated brine to off-site disposal. Third, this project will test the mobility and flexibility of the skid-mounted treatment unit by moving the equipment from PESCO out to the SWD, setting up and performing water treatment operations, and then moving the equipment back to PESCO to determine costs and time required as a gauge for the mobility of the unit.

While this project is focused on an SWD in the San Juan Basin that has medium TDS levels, generally representative of the higher end of TDS levels found in PW from the San Juan Basin, the project will simulate the higher TDS levels found in the Permian Basin by further treating the concentrated brine streams produced in this project. This additional treatment step will demonstrate how this project could be expanded in a future “Phase Two” project to test high-TDS water in the Permian Basin.

Methods, Facilities, and Procedure

Methods:

Membrane distillation offers the capability to treat high salinity PW with theoretically 100% salt rejection. In a typical direct contact membrane distillation (DCMD) process, the hot feed and cold permeate solution are separated through a hydrophobic microporous membrane, which prevents the salt permeation but allows water vapor transport through the membrane pores, as shown in Fig. 1

Fig 1. Schematic of basic principle of DCMD processes.

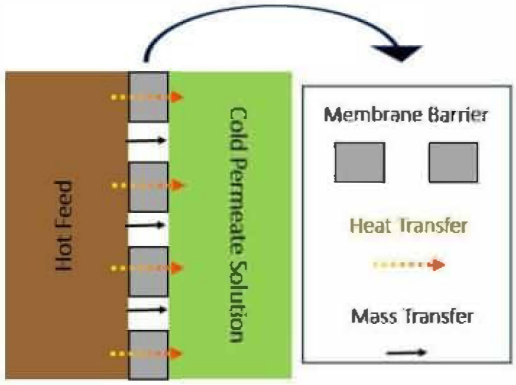


Fig. 1 Schematic of basic principle of DCMD processes.

The vapor transport is driven by the temperature-induced vapor pressure difference across the two sides of the hydrophobic membrane. As the DCMD process is not purely thermally driven, membrane distillation can be operated at a much lower temperature than conventional thermal distillation processes, leading to lower specific energy consumption. Aside from the energy advantage, DCMD shows a considerably lower fouling potential than the pressure-driven based membrane process, such as reverse osmosis and nanofiltration. Because there is no trans-membrane pressure applied on the membrane surface, the accumulation of foulants on the membrane surface are significantly eliminated.

Fig. 1 shows that DCMD is a simultaneous process that involves both heat transfer and mass transfer. High mass transfer and low heat transfer rates are preferred to enhance the water permeation flux and maintain constant driving force arising from the temperature difference. In recent years, New Mexico Tech has successfully developed a novel Janus hollow fiber membrane that exhibits a relatively minor effect on the conductive heat loss. It has been proven from bench-scale experiments that the Janus hollow fiber membrane exhibits favorable energy efficiency compared to other conventional membranes. In this project, a pilot scale Janus hollow fiber membrane-based DCMD system will be constructed for testing with actual oilfield produced water in the San Juan Basin. The initial test units will be designed to treat 5,000 gallons per day of water that contains up to 200,000 mg/L of total dissolved solids. The membrane distillation (MD) Units designed by PESCO are skid-mounted and easily transported from well site to well site.

Facilities:

The currently operating Salty Dog SWD 6 (API# 30-045-32943) owned and operated by Hilcorp has been selected as a site for this test. The facility is located in the western portion of the San Juan Basin in northwestern New Mexico. The site includes a disposal well, pumps and a tank battery, that receive PW from a gathering system connected to wells in the area. An analysis of water sampled from this site showed a TDS of just under 63,000 mg/L.

The subject MD Unit was manufactured at PESCO's facilities in Farmington, NM. PESCO's manufacturing facilities cover over twenty acres and include 160,000 square feet of manufacturing and office space and can accommodate over 500 personnel. The manufacturing equipment includes a full array of industrial raw material, cutting and bending tools, manual and automated welding equipment, 15-ton capacity overhead cranes, fully enclosed industrial sandblast and paint facilities, and assembly lines for equipment fabrication. PESCO can design and manufacture equipment ranging from a single, small ASME Code compliant vessel to a full process production unit weighing up to 50 tons and 80 feet long.

Procedure:

a. Site Prep and Equipment Mobilization

Prior to the installation of the project test equipment, each wellsite will be prepared by ensuring that all required secondary-containment berms and/or liners are in place as a contingency against accidental leaks from the test equipment or interconnecting piping. Next, an external feed pump, followed by the MD Unit will be placed on the site, followed by two additional 100-bbl storage tanks: One for the concentrate (brine) water; and one for the treated (permeate) water. The existing SWD PW tanks will be piped to the MD Unit, which will then the piped to the concentrate and treated water tanks. A 5000-Watt propane powered generator will be set adjacent to the MD Unit to provide electrical power. For further leak detection and prevention, the MD Unit will be configured with an on-skid leak catch tray and detection system, that will trigger a unit shutdown if a leak is detected.

During cold weather testing, heat tracing will be run on all water lines, and tank heaters will be installed on the inlet surge tank, the concentrate tank, and the treated water tank to prevent freezing. A 1000-gallon propane tank will be set and piped in for fuel gas for the MD Unit and the electrical generator.

b. Test Procedure

Once the test equipment is in place, a Process and Hazard Review will be conducted to identify all personal and public safety and environmental hazards. Each hazard will be evaluated to determine the associated risk, evaluated as the consequence of the event weighted by the probability of the event occurring. The disposal plan for the concentrated brine will include on-site storage, with secondary containment and leak detection. At the conclusion of the tests, the concentrated brine will be returned to the PW tank along with the treated water and disposed of per Hilcorp's standard operating procedure.

To begin the test, the electrical generator will be started and voltage supplies verified to the MD Unit. The Unit will then be charged with approximately 100 gallons of potable water to fill all internal piping, tankage, and filter modules. Flow circulation tests will be carried out to verify proper control system operation, pump operation, flow control, and shutdown trips, and to verify that the heater is on and operational. Upon a successful startup, the PW can start to be fed into the system.

Once the startup of the MD Unit is complete, the external feed pump will be activated to pump PW from the SWD PW tanks to the MD Unit. After approximately ten bbls of PW has been pumped into the unit, the unit will be placed into normal operating mode and the following parameters will be recorded:

1. Flow rate of PW into the Unit
2. Flow rate of concentrate out of the Unit
3. Flow rate of treated water out of the Unit
4. Conductivity measurements of the inlet PW, discharged concentrate, and treated water

5. Measurements to monitor for inlet filter plugging
6. Measurements to monitor for membrane module fouling
7. Fuel use for heating
8. Fuel use for electrical generation

After the initial operation of the MD Unit and all system are observed to be operating nominally, representative samples of the PW from the SWD PW tank, the concentrate from the concentrate tank, and treated water from the treated water tank shall be taken at regular intervals (approximately every 100 bbls of PW flowing into the system) and sent to the designated testing laboratory where it will be tested for the target constituents. During the tests, flowrates may be varied through the filter modules to test treated water flux through the membrane as a function of flowrate and PW salinity.

During operation, the water from the concentrate and treated water tanks will be returned and recombined to the on-site PW tank to be disposed of as part of the normal operation of the SWD. It is the goal of the project to complete 30 days of MD Unit operation with increasing periods of continuous operation depending on the performance of the MD Unit.

At the conclusion of the multiple cycles, the MD Unit will be shut down, purged of PW and concentrate, and prepared for transport. The flow lines will be drained of water in preparation for disassembly and transport back to the PESCO facility. At this point, the mobility of the MD Unit will be tested as it is moved back to PESCO, recording time, personnel and equipment needed, and total costs to move.

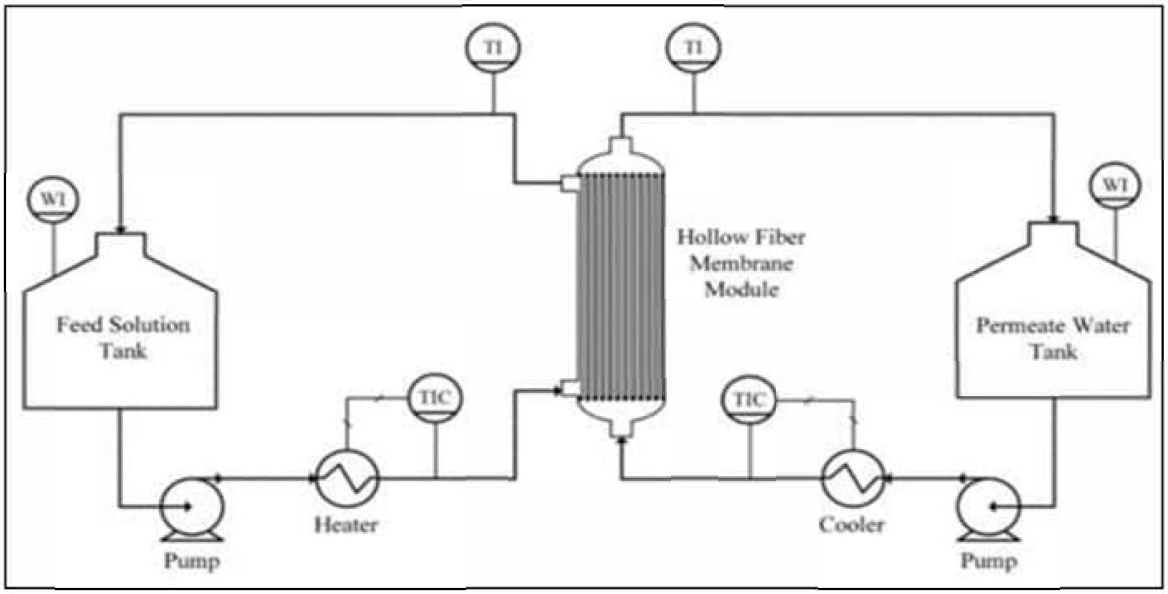
In addition to daily in-person visits to the project site by Hilcorp and/or PESCO personnel during operation, the MD Unit will be monitored by real-time telemetry to verify proper operation, and to detect upset conditions or MD Unit shutdown. The MD Unit will have on-board leak detection and auto- shutdown sensors and trips as follows:

- Conductivity meter detects high TDS downstream of filters
- Loss of flow into the MD Unit
- High pressure
- Leak detected on skid
- High temperature shutdown
- Loss of fuel gas
- Monitoring for fouling
- On-skid tank high liquid level

c. Process Flow

The process flow of the MD Unit begins with the inflow of the contaminated water source (feed solution) through pre-treatment filters into an internal surge tank. (Note: Since samples from the SWD indicated there are minimal issues with suspended solids or entrained hydrocarbons that would affect the primary membrane filter media, only a basic level of filtration of the inlet water will be required. If, however, it is determined to be a problem upon testing, additional pre-treatment equipment can be added at that time). After the PW enters the internal surge tank, it is circulated by pump through a feed solution cycle loop, where it flows through the filter modules, coming in direct contact with the hollow fiber membranes. Vapor from the hot feed solution side migrates, via the DCMD process, across the

highly-porous and hydrophobic membrane barriers, over to a permeate water circulation loop. As permeate water builds in the treated water surge tank, it is routed to a treated water storage tank. During the DCMD process, the concentration of TDS in the feed solution loop will build. When it reaches a pre-determined set point of max concentration for the system, the concentrate will be moved to a concentrate holding tank. At this point, the cycle starts again. The TDS concentration of the contaminated water source directly affects the ratio of treated water to concentrate produced by the MD Unit. Below is a process flow diagram of this process:



Anticipated Benefits and Impact

The PW treating process will generate two resulting product streams. One will be a stream of treated water. It is expected that the resulting data from the project will demonstrate that the contaminants from the source PW that remain in the treated water stream will be reduced to below NMOCD and NMED water quality standards. Thus, in theory, the treated PW could qualify for a discharge permit for discharge to the surface, or discharged to groundwater for aquifer recharge, or other beneficial use. The waste stream will be a smaller volume of concentrated brine to be disposed of downhole at SWDs used by the operator.

The expected ratio of treated water to concentrated brine will depend on the salinity of the source PW, but it is expected that this ratio will be in the range of 3:1 (treated permeate water to concentrated brine) for this test, thereby greatly reducing the volume of water to be disposed of. This reduction of the overall PW waste stream that requires SWD disposal is a key component for calculating the money saved versus current practice. If the results show a significant cost savings, then it will pave the way for Hilcorp to work with the Consortium and the State of New Mexico regulatory agencies to pursue a discharge permit, eliminating most of the current PW hauling and disposal. Once proven to be a cost-effective treatment, this treatment technology could be applied across the San Juan Basin and beyond, reducing operating costs, extending the economic lives of wells, significantly reducing the volume of water truck traffic on lease roads and highways, and resulting in a substantial influx of clean water available for beneficial use across the State of New Mexico.

If the project is successful, New Mexico Tech and PESCO are prepared to finance the fabrication of a total of six MD Units, and Hilcorp would seek permits from NMED and NMOCD to utilize this

technology. Subsequent development of the MD Unit manufacturing will be done through a cooperative effort between New Mexico Tech and PESCO.

Provide an equipment/material list along the size and include the potential pre-treatment equipment that may be needed if the if the basic level of filtration proves to be insufficient.

- 1- propane electrical generator
- 1 - 1,000-gallon propane tank
- 1 - Water Filtration Unit
- 1 - External Feed Pump
- 1 – 100-gallon Permeate Tank
- 1 – 100-barrel Brine Tank

Describe any land disturbance, if applicable

- All existing construction activities and operation activities for the Water Pilot Project will take place on the existing Salty Dog 6 SWD well pad. There will be no new surface disturbances.

A list of chemicals used as part of the pilot project, if applicable, and a representative laboratory analysis of the concentrated brine.

We have no plans to use any chemicals as part of the test. Analysis of the raw water from the disposal well inlet and tank battery is attached. The TDS level of this water is approximately 63,000 mg/L. It is expected that the system will be able to concentrate the waste stream to approximately three times the concentration of inlet stream or approximately 250,000 mg/L TDS. A table with an additional column showing the respective calculated concentrations of constituents is also attached.

Describe the secondary containment (i.e., type and size/volume including freeboard) and list all equipment that will be housed within secondary containment. What measures will be taken during a rain event (e.g. will a vacuum truck be utilized to remove rainwater to ensure proper storage capacity in the event of a release).

Secondary containment will consist of a lined berm with the dimensions of 45' X 25'. In addition the Water Filtration Unit is self-contained and in the event of a release will hold all fluids within the Unit.

Equipment housed within the secondary containment consists of:

- Water Filtration Unit
- External Feed Pump
- Permeate Tank
- Concentrate Tank

In the event that rain has caused excess rain to be stored within the secondary containment a vacuum truck will be utilized to remove the excess water.

Explain the capacity of the MD Unit on-skid catch tray and how to leak detection system works.

- The MD Unit internal catch tray has a capacity of 13 bbls which exceeds the volume of any process tank inside of the unit.
- The Water Filtration Unit is equipped with an electronic leak detection system that will detect the presence of water in the catch tray. If the system detects a release, the Unit will shut down automatically.

Explain the leak detection associated with the concentrated brine.
A water sensor is located on the catch tray of the unit. If water is detected, the unit is shut down.

Include the standard operating procedure for the disposal of the treated produced water and concentrated brine.

- The treated permeate water and concentrated brine will be pumped from their respective tanks back into the Salty Dog 6 SWD tank battery for standard disposal at the site.

How does Hilcorp plan to dispose of the potable water used to conduct the initial test of the MD Unit?

- The potable water will be pumped into a 100-gallon storage tank on site where samples can be pulled and then pumped into the Salty Dog 6 SWD tank battery for standard disposal at the site.

What target constituents will be tested throughout the pilot project?

- The constituents to be tested will be those listed on the attached WATER SAMPLE ANALYSIS REPORT

What is the expected duration of the pilot project?

- The Water Pilot Project will be tested for 30 days. Depending on results the testing may exceed that period.

Include the in-person inspection frequency along with the parameters that will be inspection.

- Inspections will be conducted daily during unit operation. Crews will inspect the Unit and all connections to ensure that there are no leaks or damaged equipment.

How does Hilcorp plan to dispose of the purged water from the MD Unit and equipment after shutdown?

- The purged water will be pumped into the concentrate and permeate storage tanks and then pumped into the Salty Dog 6 SWD tank battery for standard disposal at the site.

Include a closure plan and associated cost estimate to return the well site back to the original condition. Note, Financial assurance is required for approved pilot projects.

- All test tanks and the water treatment unit will be emptied of water by pumping it into the Salty Dog 6 SWD tank battery for standard disposal at that site. Then all associated lines, tanks, the propane tank, electrical generator and the water unit will be transported back to their associated rental vendors or back to PESCO's facility. The cost for this work is estimated to be $10,000.00.

CALCULATED CONCENTRATE LEVELS BASED ON WATER SAMPLE ANALYSIS REPORT OF MAY 2024

Constituent	Inlet Sample	Tank Sample	Calculated Concentrate Waste
Alkalinity as CO_3^{-2} (mg/L)			
Alkalinity as HCO_3^- (mg/L)	92.7	87.8	361.0
Chloride (mg/L)	34,355.6	34,624.1	137,959.4
Fluoride (F^-) (mg/L)	ND	ND	ND
Bromide (Br^-) (mg/L)	ND	1.5	6.0
Nitrate (NO_3^-) (mg/L)	7,081.5	6,823.9	27,810.8
Phosphate (mg/L)	ND	ND	ND
Sulfate (SO_4^{-2}) (mg/L)	ND	ND	ND
Lithium(Li) (mg/L)	2.1	1.8	7.9
Sodium (Na) (mg/L)	18,999.6	19,021.8	76,042.8
Potassium (K) (mg/L)	91.5	90.9	364.7
Magnesium (Mg) (mg/L)	439.8	439.8	1,759.0
Calcium (Ca) (mg/L)	1,802.8	1,801.0	7,207.7
TDS Calculation (mg/L)	62,818.5	62,846.4	251,329.9
Total cations (meq/L)	954.9	955.7	3,821.1
Total anions (meq/L)	-1,083.5	-1,086.8	-4,340.6
Percent difference (%)	-6.3	-6.4	-6.4
NPOC (ppm)	17.4	18.7	18.7

ND, non-detectable.
NPOC, non-purgeable organic carbon

HILCORP ENERGY COMPANY

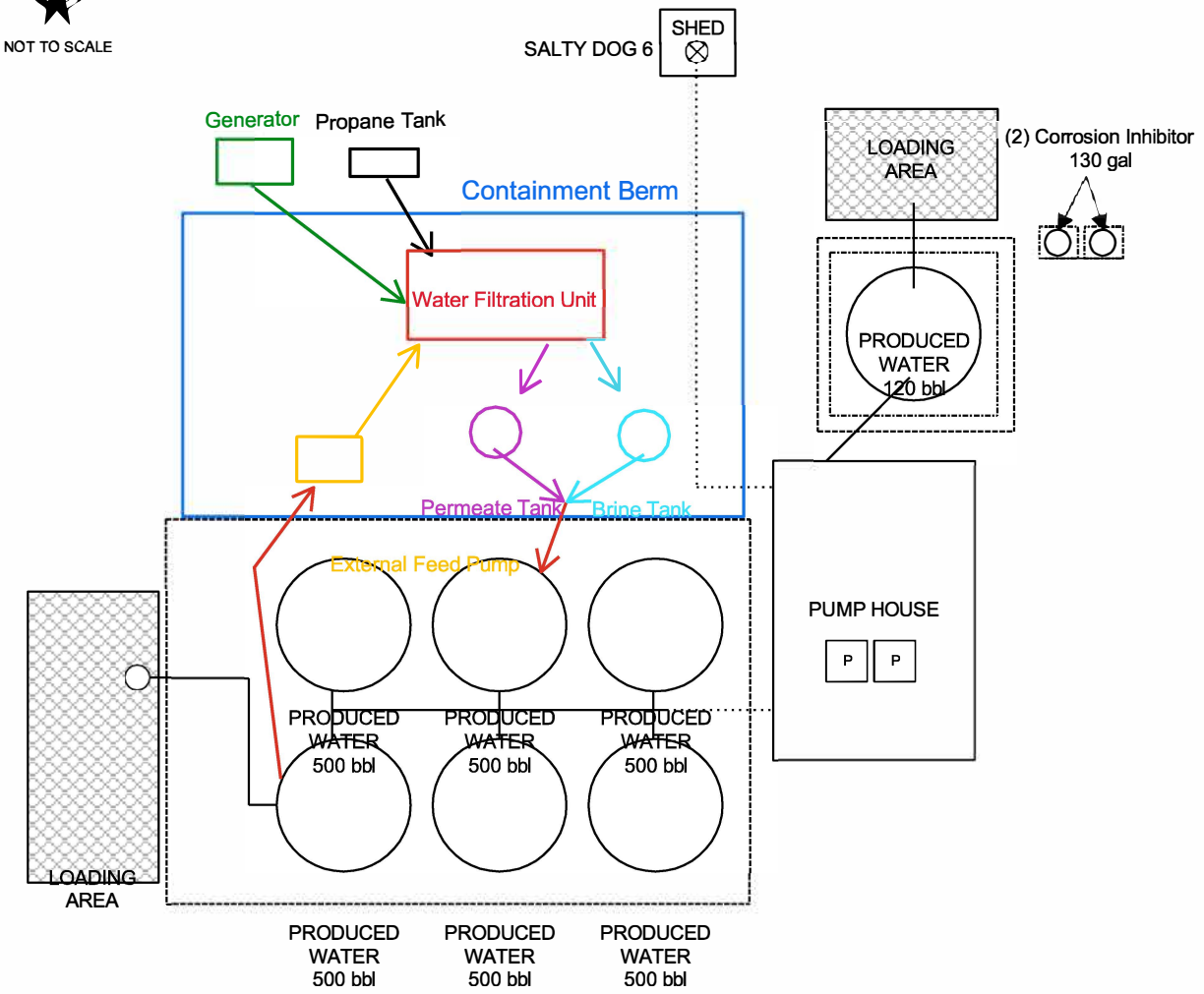
FIGURE 2

SALTY DOG 6 SWD
36.717774, -108.247428
SAN JUAN COUNTY, NEW MEXICO

NOT TO SCALE

LEGEND

- BERM
- ABOVEGROUND PIPING
- UNDERGROUND PIPING
- SECONDARY CONTAINMENT
- DRIP PAN
- DIRECTION OF FLOW
- bbl BARREL(S)
- gal GALLON(S)
- WELL HEAD
- MH METER HOUSE
- P PUMP



ENSOLUM

Unnamed Wash
0.08 mile

Belowground piping location is estimated and for process flow demonstration only.

State of New Mexico
Energy, Minerals and Natural Resources Department

BY ELECTRONIC MAIL ONLY

July 18, 2025

Cherylene Weston
San Juan North Operations
Regulatory Tech-Sr.
1111 Travis Street | Houston, TX 77002
713.289.2615 | cweston@hilcorp.com

HILCORP ENERGY COMPANY – Produced Water Mobile Treatment Research Pilot Project. 30-045-32943 SALTY DOG SWD #006.

Dear Ms. Weston:

The New Mexico Oil Conservation Division (OCD) has reviewed the C-147 Form and related documentation submitted by [372171] HILCORP ENERGY COMPANY (Permittee) on 06/24/2025, for the proposed **SALTY DOG SWD 6 API# 30-045-32943 RESEARCH PILOT PROJECT** (Salty Dog SW6 Pilot Project) in C-19-29N-13W, San Juan County, NM.

This project seeks to find an alternative way to manage produced water (PW), create water resources and begin aquifer recharge, while significantly reducing water transport and underground disposal.

Given 19.15.34.8(A)(3) NMAC allows for pilot projects related to produced water research, OCD hereby approves the Salty Dog SW6 Pilot Project, subject to the following conditions of approval:

- The Permittee agrees to the specific provisions set out in this document, all applicable requirements of 19.15.34 NMAC, and the commitments made in the attachments to the C-147 Form.

- The financial assurance (FA) associated with the Salty Dog SW6 Pilot Project is $10,000. The FA must be on OCD prescribed forms, or forms otherwise acceptable to the OCD, payable to the OCD. Bond forms can be found at the bottom of OCD's Forms Page located at:

https://www.emnrd.nm.gov/ocd/ocd-forms/. Prior to construction of the Salty Dog SW6 Pilot Project, the FA must be submitted to:

EMNRD - Oil Conservation Division,
Administration & Compliance Bureau
Attn: Bond Administrator
1220 S. St. Francis Drive | Santa Fe, NM 87505.

- The Permittee shall notify the OCD when the Salty Dog SW6 Pilot Project commences and ceases operations.

- The Permittee shall:
  - All existing construction and operational activities for the Salty Dog SW6 Pilot Project will take place on the existing Salty Dog 6 SWD well pad. There will be no new surface disturbances.
  - The Permittee shall conduct daily inspections throughout the duration of the Salty Dog SW6 Pilot Project to ensure the facility is functioning properly. Any malfunctions shall be reported to the OCD, along with a description of corrective actions taken
  - Prior to the installation of the project test equipment, the site will be prepared by ensuring that all required secondary-containment berms and/or liners are in place as a contingency against accidental leaks from the test equipment or interconnecting piping.
  - A Process and Hazard Review will be conducted to identify all personal and public safety and environmental hazards. This review must be documented and must be available to OCD upon request.
  - Representative samples of the PW from the SWD PW tank, the concentrate and the treated water will be taken and sent to the designated testing laboratory where they will be tested for the target constituents. The analytical test results will be made available to the Division upon request.
  - The treated permeate water and concentrated brine will be pumped from their respective tanks back into the Salty Dog 6 SWD tank battery for standard disposal at the site. The purged water will be pumped into the concentrate and permeate storage tanks and then pumped into the Salty Dog 6 SWD tank battery for standard disposal at the site.

- If the Permittee requires to modify any aspect of this pilot project, a modification request must be submitted to OCD on form C-147 along with the additional documentation for the requested modification. The modification must be approved by OCD before implementation.

- At the end of this project the Permittee shall submit a closure notification to OCD.

- The Permittee shall submit a Closure Report to OCD and Form C-147, including the following:
  - Attachments, photos, etc., to document all closure activities,
  - Project duration,
  - The Permittee shall test the soil for contamination with a five-point composite sample, which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I of NMAC 19.15.34.14,
  - All analytical test results from tests performed throughout this project,
  - A summary of all waste disposal activities,
  - The Permittee shall comply with 19.15.29 NMAC in the event of the release of produced water whether treated or untreated. The Permittee must include the incident number and form C-141 in the Closure Report,
  - An overall discussion of Salty Dog SW6 Research Pilot Project success and/or lessons learned.

- The final Closure Report is due to the OCD within 45-days of Salty Dog SW6 Research Pilot Project completion.

The permit number for this project is 3RF-89 - SALTY DOG SWD #006 RESEARCH PILOT PROJECT [fVV2519941374]. The Permittee shall include this permit number in all future communications with the OCD.

Please let me know if you have any additional questions.
Best regards,

Victoria Venegas

Victoria Venegas ● Environmental Specialist Advanced
EMNRD - Oil Conservation Division
506 W. Texas Ave. Artesia, NM 88210
575.909.0269 | **Victoria.Venegas@emnrd.nm.gov**

Venegas, Victoria, EMNRD

From: Venegas, Victoria, EMNRD
Sent: Friday, July 18, 2025 1:29 PM
To: cweston@hilcorp.com
Subject: HILCORP ENERGY COMPANY – Produced Water Mobile Treatment Research Pilot Project. 30-045-32943 SALTY DOG SWD #006
Attachments: 3RF-89 - SALTY DOG SWD #006 RESEARCH PILOT PROJECT [fVV2519941374] Conditions of Approval.pdf; C-147 3RF-89 - SALTY DOG SWD #006 RESEARCH PILOT PROJECT [fVV2519941374] 07.18.2025.pdf

HILCORP ENERGY COMPANY – Produced Water Mobile Treatment Research Pilot Project. 30-045-32943 SALTY DOG SWD #006

Good afternoon Ms. Weston

Please see attached approval letter, for the Salty Dog SWD 6 API# 30-045-32943 Research Pilot Project, in C-19-29N-13W, San Juan County, NM. Given 19.15.34.8(A)(3) NMAC allows for pilot projects related to produced water research, OCD hereby approves the Salty Dog SW6 Pilot Project, subject to the conditions of approval detailed in the attached approval letter.

Please me know if you have any questions.
Best regards,

Victoria Venegas ● Environmental Specialist Advanced
EMNRD - Oil Conservation Division
506 W. Texas Ave. Artesia, NM 88210
575.909.0269 | **Victoria.Venegas@emnrd.nm.gov**

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
https://www.emnrd.nm.gov/ocd/contact-us

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 478302
	Action Type: [C-147] Water Recycle Short (C-147S)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	Please see the approval letter, for the Salty Dog SWD 6 API# 30-045-32943 Research Pilot Project, in C-19-29N-13W, San Juan County, NM. Given 19.15.34.8(A)(3) NMAC allows for pilot projects related to produced water research, OCD hereby approves the Salty Dog SW6 Pilot Project, subject to the conditions of approval detailed in the approval letter sent by email.	7/18/2025