

**2RF-197 - KEG SHELL
RF &
CONTAINMENTS
FACILITY ID
[fVV2323353410]
Variance Request Burial
in Place/January 29,
2024, Application ID
308822/OCD/Solaris**

**[371643] SOLARIS WATER
MIDSTREAM LLC 02/20/2024**

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Dylan M. Fuge
Deputy Secretary

Dylan Fuge, Division Director (Acting)
Oil Conservation Division



BY ELECTRONIC AND CERTIFIED MAIL (TRACKING NO. 7018 0040 0000 3405 7434)

February 20, 2024

Mr. Chad Gallagher
Solaris Water Midstream, LLC
9651 Katy Fwy, Suite 400
Houston, TX 77024

RE: [371643] Solaris Water Midstream, LLC - Facility 2RF-197, Keg Shell RF & Containments
[fVV2323353410]

Dear Mr. Gallagher,

The New Mexico Oil Conservation Division (OCD) received your variance request on January 29, 2024, for Solaris Water Midstream, LLC's [371643] (Solaris) Facility 2RF-197, Keg Shell RF & Containments [fVV2323353410]. Solaris specifically requested a variance to 19.15.34.14(B) NMAC which states, "The operator shall close a recycling containment by first removing all fluids, contents and synthetic liners and transferring these materials to a division approved facility." Instead of transferring the synthetic liner to a division approved facility, Solaris proposes to bury the liner in place at the time of closure. The OCD has considered this variance request and denies the request for the following reasons:

- Although, 19.15.17 NMAC allows for burial in place for a temporary pit, the OCD does not agree with Solaris that a recycling containment permitted/registered under 19.15.34 NMAC should be treated similarly as a temporary pit permitted/registered under 19.15.17 NMAC. A temporary pit permitted/registered under 19.15.17 NMAC is required to be closed out within six months from the date the operator releases the drilling or workover rig from the first well using the pit. Whereas 19.15.34 NMAC allows a recycling containment to be registered for a 5-year period and annually thereafter with OCD approval. Furthermore, 19.15.17 NMAC states that the volume of a temporary pit shall not exceed 10 acre feet; 19.15.34 NMAC does not have a size limitation for a recycling containment.
- Solaris failed to demonstrate that approval of the variance would provide equal or better protection of fresh water, public health, and the environment.
- Solaris failed to furnish financial assurance (FA) to the OCD in the amount of the recycling containment's estimated closure cost of \$465,370. Solaris must submit the required FA within 15-days of receipt of this notice.

If you have any questions concerning this notice, please contact me at 505-795-1722 or LeighP.Barr@emnrd.nm.gov.

Take Care,

Leigh Barr

Leigh Barr

Permitting Supervisor

Statement Explaining Why the Applicant Seeks a Variance

The prescriptive mandates of the Rule that are the subject of this variance request are presented below with emphasis added:

19.15.34.14 B. The operator shall close a recycling containment by first removing all fluids, contents and synthetic liners and transferring these materials to a division approved facility.

R.T. Hicks Consultants and Solaris Water Midstream strongly believe that the environmental and financial costs caused by compliance with the mandate to transfer materials to a division approved facility are not commensurate with any perceived benefit to fresh water, public health, or the environment. Moreover, other OCD allows on-site burial of synthetic liners under Rule 17 and OCD has approved burial of synthetic liners under Rule 29. While Solaris has a responsibility to shareholders to save cost where there is no benefit, their responsibility to shareholders includes identifying methods that provide higher protection of public health and the environment where the mandates of the rule and the alternative provide equal protection of groundwater and surface water.

Solaris requests approval of this variance to fulfill its commitments to shareholders relating to environmental and fiscal responsibility.

Discussion of OCD Rules Applicable to In-Place Liner Burial as Disposal

In addition to 19.15.34.14.B, Rule 34 prohibits disposal of oil field waste as stated below:

19.15.34.20 DISPOSITION OF PRODUCED WATER AND OTHER OIL FIELD WASTE: Except as authorized by 19.15.17 NMAC, 19.15.26.8 NMAC, 19.15.30 NMAC, 19.15.34 NMAC or

19.15.36 NMAC, persons, including transporters, shall not dispose of produced water or other oil field waste:

A. on or below the surface of the ground, in a pit or in a pond, lake, depression or watercourse;

B. in another place or in a manner that may constitute a hazard to fresh water, public health, or the environment; or

C. in a permitted pit or registered or permitted surface waste management facility without permission of the owner or operator of the pit or facility.

Oil field waste is defined in 19.15.2.7.O as:

(3) "Oil field waste" means non-domestic waste resulting from the exploration, development, production or storage of oil or gas pursuant to Paragraph (21) of Subsection B of Section 70-2-12 NMSA 1978 and the oil field service industry, the transportation of crude oil or natural gas, the treatment of natural gas or the refinement of crude oil pursuant to Paragraph (22) of Subsection B of Section 70-2-12 NMSA 1978, including waste generated from oil field remediation or abatement activity regardless of the date of release. Oil field waste does not include waste not generally associated with oil and gas industry operations such as tires, appliances or ordinary garbage or refuse unless generated at a division-regulated facility, and does not include sewage, regardless of the source.

The liner system associated with Rule 34 containments and the Keg Shell containments does not fit the definition of "oilfield waste". While Rule 34 liner systems hold oil field waste (e.g., treated, and untreated produced water), industries and governments routinely employ identical or similar liner systems for various uses, such as:

- mineral extraction (e.g., potash, tailings evaporation ponds, heap leach pads for metals extraction),

- municipal solid waste management landfills,
- municipal wastewater treatment, and
- acid mine drainage treatment ponds.

Rule 17 allows on-site burial of liners used for temporary (reserve) pits and *requires* liner burial over and in contact with oil field waste (buried stabilized cuttings and drilling mud). While Rule 17 excludes on-site burial for Multi-Well Fluid Management (MWFM) pit liners, liner burial is an integral part of the closure of reserve (temporary) pits.

Mr. Hicks was an author of the 2013 NMOGA version of Rule 17 and a consulting expert for the hearing. After recently examining the financial and environmental costs of liner disposal for Rule 34 containments (known as MWFM pits in Rule 17), Mr. Hicks concludes with a high degree of certainty that the exclusion of MWFM pits from on-site burial was an oversight by NMOGA based upon now obvious financial facts. If an expert at the hearing presented the following demonstration of equal or better protection of fresh water, public health, and the environment, Mr. Hicks believes that the Commission would have included on-site burial of liner systems for MWFM pits.

Proposed On-Site Deep Burial Protocol for Containment Liner Systems

While complying with all other requirements of 19.15.34.14, on-site burial at this facility proposes the following as an integral part of this variance request:

1. The liner foundation (i.e., “soil” in 19.15.34.14.B) beneath the bottom of the containment is exposed and inspected by a qualified person for stained or wet areas.
2. Any stained or wet areas are included in one or more 5-point composite samples to determine if concentrations in earth material are higher than the parameters listed in Table 1 of Rule 34.
3. If testing beneath the bottom liner demonstrate concentrations are less than the closure criteria for recycling containments (Table 1), the operator’s contractor removes the liner systems from the side slopes to the bottom of the containment.
4. A qualified person examines then samples and obtains laboratory test results of the soil beneath the side slope liner using the same protocols employed beneath the liner system at the bottom of the containment.
5. If testing beneath the side slopes demonstrate concentrations are less than the closure criteria for recycling containments (Table 1 of Rule 34), the contractor proceeds with reclamation.
6. The contractor obtains evidence (photographic or survey) that the top surface of the liners scheduled for burial are at least 5-feet beneath the final grade for the reclaimed containment.
7. Common sense permits a conclusion that the liner systems, due to their extremely low permeability, would not exceed the closure criteria concentrations of Table 1 if evaluated by a laboratory. Therefore, this protocol does not call for testing of the liner systems prior to burial.

The cross sections from the engineering plans for the Keg Shell containment, presented below, demonstrate that burial at or below the prescribed depth is practical. Limited excavation to ensure the depth of burial may be necessary.

Demonstration That the Variance Will Provide Equal or Better Protection of Fresh Water, Public Health, and the Environment

The approved cost estimate for closure with removal and transport of the liner to a landfill is \$432,870.10 and the revised cost estimate that is the subject of this variance request is \$209,250.00. The cost difference of \$223,620 reflects equipment to remove the liner, transport to a landfill and a tipping fee, which is a reflection of the mass of emissions that will enter the atmosphere and the volume of truck traffic that will cause a threat to public safety. The tipping fee at the landfill will reduce this cost that reflects emissions from equipment and trucking. However, with on-site burial, emissions to the atmosphere and the risk posed by truck traffic on public roads is materially reduced.

Fresh Water

With respect to impacts to surface water, the principal risk is surface exposure of the liner systems due to erosion and negative impacts to the watercourse (visual impairment, water flow pattern changes and possible deleterious impacts due to residual microplastics) caused by HDPE solids. The Keg Shell containment lies on a southeast-facing slope of a bedrock hill that is covered by a veneer of alluvial and eolian deposits. Exposure of the containment area by erosion will occur within the span of geologic time. When exposure occurs, 100,000 (or millions) of years from now, the synthetic liners will be chemically degraded by oxidation and other processes consistent with the Second Law of Thermodynamics (increasing entropy). A quick Google search resulted in a reviewed publication¹¹ that provides an estimate of a 5000-year degradation half-life for buried HDPE pipe. Given that 50,000 years is ten half-lives for an HDPE pipe and exposure due to erosion may occur in 500,000 years (more or less), we conclude that the buried HDPE liner system, including any microplastic particles, will not exist in a sufficient mass to present an environmental or regulatory concern when erosion may expose the former containment.

With respect to impacts to groundwater, we considered the difference between on-site burial of the HDPE liners versus transport to a landfill that uses a similar HDPE liner system to protect groundwater. Common sense permits a conclusion that on-site burial of the liner system provides equal protection of groundwater as burial in a landfill lined with an HDPE liner system similar that used in Rule 34 containments.

Hicks Consultants concludes with a high degree of scientific certainty that the on-site liner burial proposal provides equal protection of groundwater and fresh water as compliance with 19.15.34.14 B.

Public Health

The carbon footprint of tailpipe emission is only the last part of the long chain of events that includes petroleum production, refining and transport of fuel. Unnecessary emissions is a public health concern due to documented impacts of carbon emission to earth's climate. Unnecessary truck traffic on public and lease roads is also an obvious risk to public safety/health.

On-site burial of the liner systems eliminates emissions due to transport to a landfill as well as the attendant risk to public health and safety caused by heavy truck traffic on lease roads and public roads. Thus, we conclude that on-site burial provides better protection of the environment and public health.

¹ <https://pubs.acs.org/doi/pdf/10.1021/acssuschemeng.9b06635>

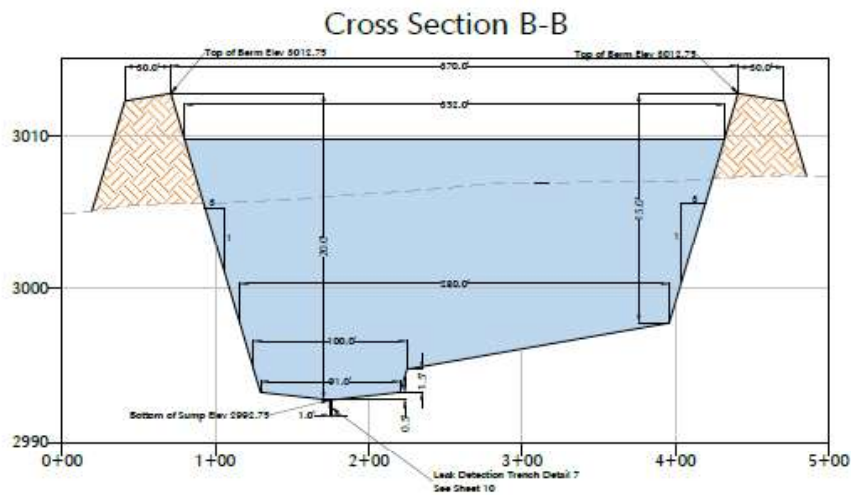
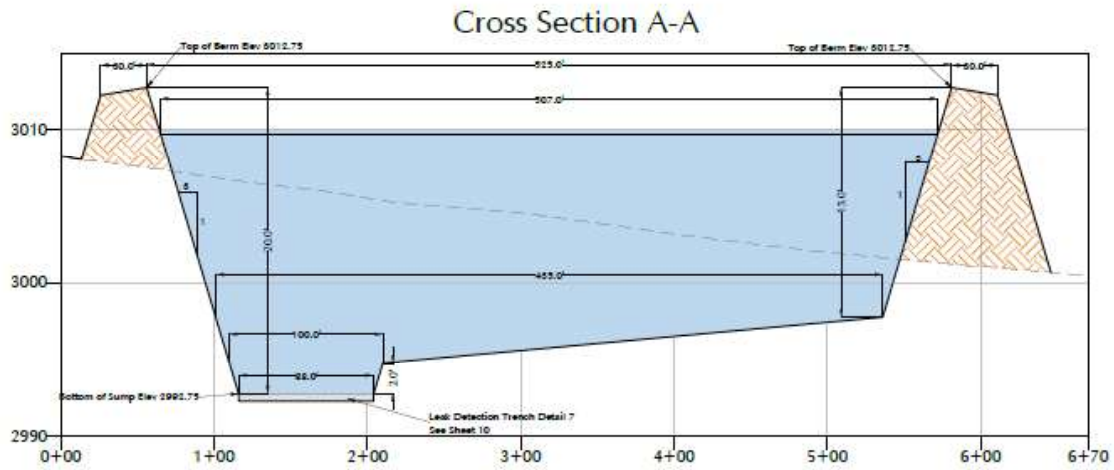
Environment

Our analysis of the proposed variance request provides the greatest amount of environmental protection. We considered the obvious risks to the following environmental concerns:

- Wildlife, migratory birds, special status species of concern, native plant communities, and livestock (vehicular accidents, noise, surface disturbance, soil compaction, invasive species)
- visibility and visual resources due to dust generation
- cave/karst resources
- air quality and greenhouse gas emissions

If the variance is not approved, disposing of the liner will require loading and transport that will not occur with the proposed alternative. These activities will cause the greatest risk to wildlife (noise, dust, vehicular accidents, human activity), native plant communities (compaction and importation of non-native and invasive species brought to the site on truck tires and in the imparted “clean earth”) and livestock (open gates, vehicular accidents). Transport of waste from the site and transport of clean soil for filling the excavation on unpaved lease roads will generate the most dust and create a visual impact as well as degrade air quality. The noise generated from the heavy truck traffic will impact wildlife and the action may have to be postponed to avoid negative effects during breeding season.

Cross Sections of Keg Shell Containment Demonstrating Feasibility of Burial



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

Recycling Facility and/or Recycling Containment

Type of Facility: ☒ Recycling Facility ☒ Recycling Containment*
Type of action: ☐ Permit ☐ Registration
☐ Modification ☐ Extension
☐ Closure ☒ Other (explain) Variance for an "in place" liner burial

* At the time C-147 is submitted to the division for a Recycling Containment, a copy shall be provided to the surface owner.

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: Solaris Water Midsteam, LLC (For multiple operators attach page with information) OGRID #: 371643
Address: 9651 Katy Fwy, Suite 400, Houston Texas 77024
Facility or well name (include API# if associated with a well): Keg Shell RF & Containments
OCD Permit Number: 2RF-197 (For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr B Section 35 Township 26S Range 28E County: Eddy
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.

☐ **Recycling Facility:**
Location of recycling facility (if applicable): Latitude 32.00374° Longitude -104.058209° 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.*
☒ Fluid Storage
☐ Above ground tanks ☒ Recycling containment ☐ Activity permitted under 19.15.17 NMAC explain type _____
☐ Activity permitted under 19.15.36 NMAC explain type: _____ ☐ Other explain _____
☐ For multiple or additional recycling containments, attach design and location information of each containment
☐ **Closure Report (required within 60 days of closure completion):** ☐ Recycling Facility Closure Completion Date: _____

3.

☒ **Recycling Containment:**
☐ Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)
Center of Recycling Containment (if applicable): Latitude 32.0040642° Longitude -104.0569973° NAD83
☐ For multiple or additional recycling containments, attach design and location information of each containment
☐ Lined ☒ Liner type: Thickness 60 Primary mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other 40 mil HDPE
☐ String-Reinforced
Liner Seams: ☐ Welded ☐ Factory ☐ Other _____ Volume: _____ bbl Dimensions: L _____ x W _____ x D _____
☐ Recycling Containment Closure Completion Date: _____

4.

Bonding:

- ☐ Covered under bonding pursuant to 19.15.8 NMAC per 19.15.34.15(A)(2) NMAC (These containments are limited to only the wells owned or operated by the owners of the containment.)
- ☒ Bonding in accordance with 19.15.34.15(A)(1). Amount of bond \$ _____ (work on these facilities cannot commence until bonding amounts are approved)
- ☐ Attach closure cost estimate and documentation on how the closure cost was calculated. To be submitted per letter

5.

Fencing:

- ☐ Four foot height, four strands of barbed wire evenly spaced between one and four feet
- ☒ Alternate. Please specify Game Fence

6.

Signs:

- ☒ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers
- ☐ Signed in compliance with 19.15.16.8 NMAC

7.

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.

8.

Siting Criteria for Recycling Containment

Instructions: The applicant must provide attachments that demonstrate compliance for each siting criteria below as part of the application. Potential examples of the siting attachment source material are provided below under each criteria.

General siting**Ground water is less than 50 feet below the bottom of the Recycling Containment.**

NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells

☐ Yes ☒ No
☐ NA

Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

☐ Yes ☒ No
☐ NA

- Written confirmation or verification from the municipality; written approval obtained from the municipality

Within the area overlying a subsurface mine.

☐ Yes ☒ No

- Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division

Within an unstable area.

☐ Yes ☒ No

- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map

Within a 100-year floodplain. FEMA map

☐ Yes ☒ No

Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

☐ Yes ☒ No

- Topographic map; visual inspection (certification) of the proposed site

Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

☐ Yes ☒ No

- Visual inspection (certification) of the proposed site; aerial photo; satellite image

Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

☐ Yes ☒ No

- NM Office of the State Engineer - iWATERS database search; visual inspection (certification) of the proposed site

Within 500 feet of a wetland.

☐ Yes ☒ No

- US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site

9.

Recycling Facility and/or Containment Checklist:

Instructions: Each of the following items must be attached to the application. Indicate, by a check mark in the box, that the documents are attached.

- ☒ Design Plan - based upon the appropriate requirements.
- ☒ Operating and Maintenance Plan - based upon the appropriate requirements.
- ☒ Closure Plan - based upon the appropriate requirements.
- ☒ Site Specific Groundwater Data -
- ☒ Siting Criteria Compliance Demonstrations –
- ☒ Certify that notice of the C-147 (only) has been sent to the surface owner(s)

10.

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): Chad Gallagher Title: Permitting Agent
Signature: Chad Gallagher Date: 1/29/24
e-mail address: chad.gallagher@ariswater.com Telephone: (575)444-9786

11.

OCD Representative Signature: _____ **Approval Date:** _____

Title: _____ **OCD Permit Number:** _____

- ☐ OCD Conditions _____
- ☐ Additional OCD Conditions on Attachment _____

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996

KED SHELL IN-GROUND CONTAINMENT

Financial Assurance Cost Estimate

Presented below is the itemized cost estimate for reclamation of the Keg Shell recycling in-ground containment. The cost of closure sampling is included in the itemized Charger Services estimate and will consist of six-point composite sample as described in addition to any stained or wet soils. Samples will be analyzed for the constituents listed in Table I of Rule 34.

The reclamation must meet terms set forth in the surface lease agreement with the landowner who received a copy of the registration.

Please contact Randall Hicks if you have any questions concerning this closure cost estimate.

Closure Sampling and Reclamation per Charger Services	\$209,250.00
Closure Reporting per R.T. Hicks Consultants	7,500.00
Total Closure/Reclamation Cost Estimate with Approved Variance	\$216,750.00

CHARGER SERVICES

23 W. INDUSTRIAL LOOP
MIDLAND, TEXAS 79701
(432) 218 - 7674

MATT.HOLM@CHARGERSERVICES.COM
(432)-425-0270

**ESTIMATE**

ARIS

Keg Shell reclaim (Deep Bury)

1/8/2024

DATE	ACTIVITY	QUANTITY	RATE	TOTAL
Reclaim Earthwork	<p>This is pricing to reclaim the Keg Shell pond Mobilize equipment to site.</p> <p>Existing Pond estimated dimensions 435' x 280' floor 636' x 510' outside to outside 30' top of wall Average 17' deep 3:1 slopes</p> <p>Dirt & liner reclaim of pond consist of- Deep bury all liner(s) 10' below ground level, backfill pond area with uncontaminated soil from pond walls. Pond area will be reclaimed to natural elevations and water flow patterns. All stockpiled strippings will be put down last to ensure ground has been completely returned to native design.</p>	1.00	\$185,200.00	\$185,200.00
Soil samples, including composite and discrete samples	Environmental soil sampling This will include digging 6 sample locations for each containment. One composite sample from 0-4 feet below surface and one discrete sample from each location at 4.25 feet	1.00	\$1,725.000	\$1,725.00
Soil and contamination testing	Environmental soil testing Before earthwork can begin the soil must be tested for contamination in case of liner leakage. Cost include trip, labor, materials, and laboratory testing of 6 tests.	1.00	\$2,700.000	\$2,700.00
Seeding	Broadcast seeding of pond area Seed will be a native mix for Lea County NM Includes purchase of seed mix and placement	1.00	\$1,500.00	\$1,500.00
Fence Removal	Fence removal and disposal Fence estimated at 2,430 ft This includes removal of all posts, braces, wire, fabric, gates, and hardware.	1.00	\$18,125.00	\$18,125.00

Total	\$209,250.00
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District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 316079

CONDITIONS

Operator: SOLARIS WATER MIDSTREAM, LLC 907 Tradewinds Blvd, Suite B Midland, TX 79706	OGRID: 371643
	Action Number: 316079
	Action Type: [C-147] Water Recycle Long (C-147L)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	Manual application to upload variance request letter OCD/Solaris correspondence to the facility file.	2/20/2024