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Received by OCD: 2/5/2024 2:14 C2 T447 Permit Package for Cotton Draw Recycling Facility & AST Containment Section 9, T25S, R32E, Lea County

Volume 2

C-147 Form Design/Construction, Operations, & Closure Plans Engineering Drawings & Liner Specifications Mustang/Extreme AST Setup SOP Variances for AST Storage Containments Applicability of Engineering Variances to Permian Basin Conditions



View west of the Cotton Draw RF and AST Containment pad, which is due north of two fresh water frac ponds shown in the left of this image.

Prepared for: Solaris Midstream LLC 9811 Katy Freeway Suite 900 Houston, TX 77024

Prepared by: R.T. Hicks Consultants, Ltd. 901 Rio Grande NW F-142 Albuquerque, New Mexico C-147

Received by OCD: 2/5/2024 2:14:02 PM Page 3 of 114 State of New Mexico Form C-147 District I Revised April 3, 2017 1625 N. French Dr., Hobbs, NM 88240 **Energy Minerals and Natural Resources** District II Department 811 S. First St., Artesia, NM 88210 District III **Oil Conservation Division** 1000 Rio Brazos Road, Aztec, NM 87410 1220 South St. Francis Dr. District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505 Santa Fe, NM 87505 Recycling Facility and/or Recycling Containment Recycling Containment* **Type of Facility:** Recycling Facility **Type of action:** Permit Registration Modification Extension Closure Other (explain) * 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. Operator: <u>Solaris Water Midstream LLC</u> (For multiple operators attach page with information) OGRID #: 371643 Address: 9811 Katy Freeway, Ste 900, Houston, Texas, 77024 Facility or well name (include API# if associated with a well): COTTON DRAW RF AND CONTAINMENT OCD Permit Number: **1RF-511** (For new facilities the permit number will be assigned by the district office) Section 9Range 32E Township 25S County: LEA U/L or Otr/Otr В Surface Owner: 🔽 Federal 🗌 State 🗌 Private 🗍 Tribal Trust or Indian Allotment Recycling Facility: Location of recycling facility (if applicable): Latitude 32.1521967 Longitude -103.674065 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:____ **Recycling Containment:** Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year) Longitude -103.674065 Center of Recycling Containment (if applicable): Latitude 32.1521967 NAD83 For multiple or additional recycling containments, attach design and location information of each containment 40_mil □ LLDPE ☑ HDPE □ PVC ☑ Other 30 ml HDPE Liner type: Thickness Lined Primary String-Reinforced Liner Seams: V Welded Factory Other _____ V 40,000.00 bbl Dimensions: L x W x D Recycling Containment Closure Completion Date: vv. 02.16.2024

Bonding:

4.

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 § See Estimate (work on these facilities cannot commence until bonding amounts are approved)

amounts are approved)

X Attach closure cost estimate and documentation on how the closure cost was calculated.

Fencing:

5.

Four foot height, four strands of barbed wire evenly spaced between one and four feet

Alternate. Please specify GAME FENCE

6. Signs:

7.

☑ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers

Signed in compliance with 19.15.16.8 NMAC

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.

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			
 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. Written confirmation or verification from the municipality; written approval obtained from the municipality 	☐ Yes ☑ No ☐ NA		
 Within the area overlying a subsurface mine. Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division 	🗌 Yes 🗹 No		
 Within an unstable area. Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map 	🗌 Yes 🔽 No		
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). Topographic map; visual inspection (certification) of the proposed site 	🗌 Yes 📈 No		
 Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. Visual inspection (certification) of the proposed site; aerial photo; satellite image 	🗌 Yes 🔽 No		
 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. NM Office of the State Engineer - iWATERS database search; visual inspection (certification) of the proposed site 	🗌 Yes 🗹 No		
 Within 500 feet of a wetland. US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site 	🗌 Yes 📈 No		

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)

Operator Application Certification:

10.

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): Drew Dixon	Title: SVP- Land and Regulatory
Signature: Drew Difon	Date: 2/5/2023 e-
mail address drew.dixon@ariswater.com	Telephone: 832-304-9028
11. OCD Representative Signature: <u>Victoria Venegas</u>	Approval Date: 02/16/2024
Title: Environmental Specialist	OCD Permit Number: 1RF-511
 OCD Conditions Additional OCD Conditions on Attachment 	



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Determine slope of pad and low point of AST



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APPENDIX 1

- STAMPED DESIGN DRAWINGS
- SELECT AST SET-UP SOP

Three Amigos Tank Design



40K Assembly Prints











40K Components

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Geotextile Product Description Sheet GT-110 Nonwoven Geotextile

GT-110 is a needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, which are formed into a random network for dimensional stability. SKAPS GT-110 resists ultraviolet deterioration, rotting, biological degradation, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. SKAPS GT-110 conforms to the physical property values listed below:

PROPERTY TEST METHOD UNIT M.A.R.V. (Minimum Average Roll Value)

Weight (Typical) ASTM D 5261 oz/yd₂ (g/m₂) 10.0 (339) Grab Tensile ASTM D 4632 lbs (kN) 250 (1.11) Grab Elongation ASTM D 4632 % 50 Trapezoid Tear Strength ASTM D 4533 lbs (kN) 100 (0.444) CBR Puncture Resistance ASTM D 6241 lbs (kN) 700 (3.11) Permittivity* ASTM D 4491 sec.₁ 1.2 Water Flow* ASTM D 4491 gpm/ft₂ (l/min/m₂) 80 (3251) AOS* ASTM D 4751 US Sieve (mm) 100 (0.150) UV Resistance ASTM D 4355 %/hrs 70/500

PACKAGING

Roll Dimensions (W x L) – ft. 12.5 x 360 / 15 x 300 Square Yards Per Roll 500 Estimated Roll Weight – lbs. 320

* At the time of manufacturing. Handling may change these properties. This information is provided for reference purposes only and is not intended as a warranty or guarantee. SKAPS assumes no liability in connection with the use of this information.

Made in U.S.A.

U.S. Fabrication & Distribution Centers

Moses Lake, Washington • 4172 North Frontage Road E, Moses Lake, WA 98837 • 800.346.7744 • Fax 509.766.0414



4172 North Frontage Rd E Moses Lake, WA 98837 (800) 346-7744 (509) 766-7024 Fax (509) 766-0414 www.inlandtarp.com

TECHNICAL DATA SHEET Geomembrane 40mil LLDPE

Property	Test Method	Frequency (A)	Unit Metric	Solmax 140-7000
Thickness (Nominal +/- 10%) (E)	ASTM D 5199	Every roll	mm	1.00
Resin Density	ASTM D 1505	1/Batch	g/cc	<0.926
Melt Index-190/2.16(max)	ASTM D 1238	1/Batch	g/10min	1.0
Sheet Density (C)	ASTM D 1505	Every 2 rolls	g/cc	<0.939
Carbon Black Content (D)	ASTM D 4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	Every 6 rolls	Category	Cat. 1 / Cat. 2
Oxidative Induction Time (min. avg)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg)(B)	ASTM D 6693	Every 2 rolls		
Strength as Break			kN/m	23
Elongation at Break			%	800
2% Modulus (max.)	ASTM D 5323	PerFormulation	kN/m	420
Tear Resistance (min. avg.)	ASTM D 1004	Every 6 rolls	Ν	85
Puncture Resistance (min. avg.)	ASTM D 4833	Every 6 rolls	N	215
Dimensional Stability	ASTM D 1204	Every 6 rolls	%	+/- 2
Multi-Axial Tensile (min.)	ASTM D 5617	PerFormulation	%	90
Oven Aging-% retained after 90 days	ASTM D 5721	PerFormulation		
STD OIT (min. avg.)	ASTM D 3895		%	35
HP OIT (min. avg.)	ASTM D 5885		%	60
UV Resistance-% retained after 1600				
hr	GRI-GM-11	PerFormulation		
HP-OIT (min. avg.)	ASTM D 5885		%	35

Note;

(A) Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).

(B) Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.

(C) Correlation table is available for ASTM D792 vs. ASTM D1505. Both methods give the same results.

(D) Correlation table is available for ASTM D1603 vs. ASTM D4218. Both methods give the same results.

(E) The minimum average thickness is +/- 10% of the nominal value.

*All values are nominal test results, except when specified as minimum of maximum.

* The information contained herein is provided for reference purposes only and is not intended as warranty of guarantee. Final determination of suitability

for use contemplated is the sole responsibility of the user. Solmax along with Inland Tarp & Liner assumes no liability in connection with the use of this information.

Manufacture & Distribution of Hay Tarps, Truck Tarps, Industrial Liners, Building & Athletic Field Covers. 1-800-346-7744



SKAPS TRANSNET[™] geonet consists of SKAPS Geonet made from HDPE resin.

PROPERTY	TEST METHOD	UNIT	VALUE	QUALIFIER
Thickness	ASTM D 5199	mm	5.08	MAV ⁽³⁾
Carbon Black	ASTM D 4218	%	2.0	MAV
Tensile Strength	ASTM D 7179	N/mm	7.87	MAV
Melt Flow	ASTM D 1238 ⁽²⁾	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cm ³	0.94	MAV
Transmissivity ⁽¹⁾	ASTM D 4716	m²/sec	2.0 x 10 ⁻³	MAV

Notes:

(1) Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 479 kPa between steel plates after 15 minutes. Values may vary with individual labs.

(2) Condition 190/2.16

(3) Minimum average value



This information is provided for reference purposes only and is not intended as a warranty or guarantee. SKAPS assumes no liability in connection with the use of this information.



4172 North Frontage Rd E Moses Lake, WA 98837 (800) 346-7744 (509) 766-7024 Fax (509) 766-0414 www.inlandtarp.com

TECHNICAL DATA SHEET Geomembrane 30mil LLDPE

Property	Test Method	Frequency (A)	Unit Metric	Solmax 130-2000
Thickness (min. avg.)	ASTM D 5199	Every roll	mm	0.75
Thickness (min.)	ASTM D 5199	Every roll	mm	0.68
Resin Density	ASTM D 1505	1/Batch	g/cc	<0.926
Melt Index-190/2.16(max)	ASTM D1238	1/Batch	g/10min	1.0
Sheet Density (C)	ASTM D1505	Every 2 rolls	g/cc	<0.939
Carbon Black Content (D)	ASTM D 4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	Every 6 rolls	Category	Cat. 1 / Cat. 2
Oxidative Induction Time (min. avg)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg)(B)	ASTM D 6693	Every 2 rolls		
Strength as Break			kN/m	20
Elongation at Break			%	750
2% Modulus (max.)	ASTM D 5323	PerFormulation	kN/m	315
Tear Resistance (min. avg.)	ASTM D 1004	Every 6 rolls	N	70
Puncture Resistance (min. avg.)	ASTM D 4833	Every 6 rolls	N	200
Dimensional Stability	ASTM D 1204	Every 6 rolls	%	+/- 2
Multi-Axial Tensile (min.)	ASTM D 5617	PerFormulation	%	90
Oven Aging-% retained after 90 days	ASTM D 5721	PerFormulation		
STD OIT (min. avg.)	ASTM D 3895		%	35
HP OIT (min. avg.)	ASTM D 5885		%	60
UV Resistance-% retained after 1600				
hr	GRI-GM-11	PerFormulation		
HP-OIT (min. avg.)	ASTM D 5885		%	35

Note;

(A) Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).

(B) Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.

(C) Correlation table is available for ASTM D792 vs. ASTM D1505. Both methods give the same results.

(D) Correlation table is available for ASTM D1603 vs. ASTM D4218. Both methods give the same results.

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APPENDIX 2

- STAMPED DESIGN DRAWINGS
- WELL WATER SOLUTIONS AST SET-UP SOP

DESIGN/CONSTRUCTION PLAN

General

Examination of the engineering drawings, the SOP for set-up, plus the history of solid performance of these AST Containments demonstrates that the AST Containment is designed and will be assembled to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall. As the AST Containments are generally less than 190 feet in diameter, wave action is not a meaningful consideration.

These AST Containments are constructed of 12-foot high steel panels and are netted or employ the Mega Blaster Pro avian deterrent system to prevent ingress of migratory birds. Unless OCD denies the requested variance for fencing, AST Containments will be enclosed by a 4-strand barbed wire fence to comply with the Rule to fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair.

The operator shall post an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in conspicuous places surrounding the containment. The operator shall post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following information: the operator's name, the location of the site by quarter-quarter or unit letter, section, township and range, and emergency telephone numbers.

Site Preparation

Foundation for AST Containment

Preparation of the soils on site is required to form a dependable base for the AST Containment in accordance with the SOP. If the location of the AST Containment is on an existing pad, the operator has stripped and stockpiled the topsoil for use as the final cover or fill at the time of closure. If the pad is new construction, the operator will strip and stockpile the soil for reclamation upon cessation of site activities.

19.15.34.12 A

(1) The operator shall design and construct a recycling containment to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall.

19.15.34.12 D

(1) The operator shall fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

19.15.34.12 C

Signs. The operator shall post an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the containment. The operator shall post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following information: the operator's name, the location of the site by quarter-quarter or unit letter, section, township and range, and emergency telephone numbers.

19.15.34.12 B Stockpiling of topsoil. Prior to constructing containment, the operator shall strip and stockpile the topsoil for use as the final cover or fill at the time of closure.

The foundation soils may be roller compacted smooth and free of loose aggregate over ½ inch. If required byby the AST Set Up protocol, compaction characteristics must meet or exceed 95% of Standard Proctor Density in accordance with ASTM D 698.

Examination of the SOP shows that the AST Containment contractor will conform to the following mandates of the Rule:

- the AST Containment will have a properly constructed compacted earth foundation and interior slopes (vertical steel) consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.
- Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity.
- If the AST Containment is within a levee, the inside grade is no steeper than two horizontal feet to one vertical foot (2H: 1V) and the outside grade no steeper than three horizontal feet to one vertical foot (3H: IV). The vertical steel walls of the AST Containment are the *subject of a requested variance*.

The Operator will ensure that at a point of discharge into or suction from the recycling containment, the liner is protected from excessive hydrostatic force or mechanical damage and external discharge or suction lines shall not penetrate the liner.

Liner and Leak Detection Materials

The liner and geotextile specifications show that all primary (upper) liners in a recycling containment shall be geomembrane liners composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. All primary liners shall be *an equivalent liner [to that stated in Rule 34] approved by OCD pursuant to a variance.* The liner system is presented in an earlier section of this submission.

All secondary liners shall be an equivalent liner [to that stated in Rule 34] or approved by OCD pursuant to a

19.15.34.12 A

(2) A recycling containment shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity. The operator shall construct the containment in a levee with an inside grade no steeper than two horizontal feet to one vertical foot (2H:1V). The levee shall have an outside grade no steeper than three horizontal feet to one vertical foot (3H:1V). The top of the levee shall be wide enough to install an anchor trench and provide adequate room for inspection and maintenance.

19.15.34.12 A

(6) At a point of discharge into or suction from the recycling containment, the operator shall insure that the liner is protected from excessive hydrostatic force or mechanical damage. External discharge or suction lines shall not penetrate the liner.

19.15.34.12 A

(4) All primary (upper) liners in a recycling containment shall be geomembrane liners
composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline
solutions. All primary liners shall be 30-mil flexible
PVC, 45-mil LLDPE string reinforced or 60-mil
HDPE liners. Secondary liners shall be 30-mil
LLDPE string reinforced or equivalent with a hydraulic conductivity no greater than 1 x 10-9 cm/sec. Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

variance. The liner system is presented in an earlier section of this submission.

Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

The AST Containment will have a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet to facilitate drainage.

Install Secondary Liner, Leak Detection System and Secondary Containment

All AST containments holding produced water will have a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions. The rule states that the edges of all secondary liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep. *The lack of an anchor trench with an AST Containment is also the subject of requested variance.*

The AST Containment Contractor will cause the recycling containment will have a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet to facilitate drainage. The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection (see attached design sketch).

The 12-foot high steel walls of the AST effectively prevent run-on of surface water into the AST. The steel walls provide an excellent diversion of run-on into the AST, thereby complying with the Rule.

AST Containment Setup

As with the secondary liner, AST Containment contractor will minimize liner seams and orient them up and down, as much as possible, not across, a slope. Factory welded seams shall be used where possible. AST Containment contractor will employ field seams in geosynthetic material that are thermally seamed. Prior to field seaming, AST Containment contractor shall

19.15.34.12 A

(3) Each recycling containment shall incorporate, at a minimum, a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions. The edges of all liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

19.15.34.12 A

(7) The operator of a recycling containment shall place a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet or two feet of compacted soil with a saturated hydraulic conductivity of 1 x 10-5 cm/sec or greater to facilitate drainage. The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection.

19.15.34.12 A

(8) The operator of a recycling containment shall design the containment to prevent run-on of surface water. The containment shall be surrounded by a berm, ditch or other diversion to prevent run-on of surface water.

19.15.34.12 A

(5) The operator of a recycling containment shall minimize liner seams and orient them up and down, not across, a slope of the levee. Factory welded seams shall be used where possible. The operator shall ensure field seams in geosynthetic material are thermally seamed. Prior to field seaming, the operator shall overlap liners four to six inches. The operator shall minimize the number of field seams and corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the slope's toe. Qualified personnel shall perform field welding and testing.

overlap liners four to six inches and minimize the number of field seams and corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the AST Containment bottom. Qualified personnel shall perform field welding and testing.

Fluid Injection/Withdrawal Flow Diverter The injection or withdrawal of fluids from the containment shall be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.

19.15.34.13 B

(3) The injection or withdrawal of fluids from the containment shall be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.

OPERATIONS AND MAINTENANCE PLAN

CLOSURE PLAN

Released to Imaging: 2/16/2024 9:12:57 AM
General Specifications

This plan provides additional protocols to cause the proposed recycling containments (AST Containments) to conform to NMOCD Rules.

The operator will maintain and operate the recycling containments and facility in accordance with the following plan to contain liquids and maintain the integrity of the liner to prevent contamination of fresh water and protect public health and the environment.

- The operator will use the treated produced water in the containments for drilling, completion (stimulation), producing or processing oil or gas or both. If other uses are planned, the operator will notify the OCD though the submission of a modified C-147.
- For all exploration and production operations that use produced water, the operator will conduct these activities in a manner consistent with hydrogen sulfide gas provisions in 19.15.11 NMAC or NORM provisions in 19.15.35 NMAC, as applicable.
- The operator will address all releases from the recycling and re-use of produced water in accordance with 19.15.29 NMAC.

19.15.34.10 B Recycling cont

Recycling containments may hold produced water for use in connection with drilling, completion, producing or processing oil or gas or both. 19.15.34.8 A (6) All releases from the recycling and re-use of produced water shall be handled in accordance with 19.15.29 NMAC.

19.15.34.10 B

Recycling containments may hold produced water for use in connection with drilling, completion, producing or processing oil or gas or both. Such fluids may include fresh water, brackish water, recycled and treated water, fluids added to water to facilitate well drilling or completion, water produced with oil and gas, flowback from operations, water generated by an oil or gas processing facility or other waters that are gathered for well drilling or completion but may not include any hazardous waste.

19.15.34.8 A

(5) All operations in which produced water is used shall be conducted in a manner consistent with hydrogen sulfide gas provisions in 19.15.11 NMAC or NORM provisions in 19.15.35 NMAC, as applicable.

19.15.29.6

To prohibit releases and require persons who operate or control the release or the location of the release to report the unauthorized release of oil, gases, produced water, condensate or oil field waste including regulated NORM or other oil field related chemicals, contaminants or mixtures of those chemicals or contaminants that occur during drilling, producing, storing, disposing, injecting, transporting, servicing or processing and to establish procedures for reporting, site assessment, remediation, closure, variance and enforcement.

- The operator will not discharge into or store any hazardous waste in the recycling containments, but they may hold fluids such was freshwater, brackish water, recycled and treated water, water generated by oil or gas processing facilities, or other waters that are gathered for well drilling or completion. The recycling facility will not be used for the disposal of produced water. The operator will maintain the containments free of miscellaneous solid waste or debris.
- The operator will verify that no oil is on the surface of the contained fluid. If oil is observed, the oil shall be removed using an absorbent boom or other device and properly disposed at an approved facility. An absorbent boom or other device will be maintained on site.
- The operator will install and use a header and diverter described in the design/construction plan in order to prevent damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes during injection or withdrawal of liquids.
- The operator shall maintain at least three feet of freeboard at each containment.
- If the liner develops a leak or if any penetration of the liner occurs above the liquid's surface, then the operator will repair the damage or initiate replacement of the liner within 48 hours of discovery or will seek a variance from the division district office within this time period.
- If visible inspection suggests that the liner developed a leak or if any penetration of the liner occurs below the liquid's surface, then the operator will remove all liquid above the damage or leak line within 48 hours of discovery. The operator will also notify the district division office within this same 48 hours of the discovery and repair the damage or replace the liner.

19.15.34.9 G Recycling facilities may not be used for the disposal of produced water.

19.15.34.13 B

(1) The operator shall remove any visible layer of oil from the surface of the recycling containment

(7) The operator shall install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release.

19.15.34.13 B

(3) The injection or withdrawal of fluids from the containment shall be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.

19.15.34.13 B

(2) The operator shall maintain at least three feet of freeboard at each containment.

19.5.34.13 B

(4) If the containment's primary liner is compromised above the fluid's surface, the operator shall repair the damage or initiate replacement of the primary liner within 48 hours of discovery or seek an extension of time from the division district office.

(5) If the primary liner is compromised below the fluid's surface, the operator shall remove all fluid above the damage or leak within 48 hours of discovery, notify the division district office and repair the damage or replace the primary liner.

- In the event of a leak due to a hole in the liner, the following steps will be followed:
 - 1. If the source of the fluid is uncertain, comparative field tests may need to be performed on both the water in the containment and that which may have been released (e.g. pH, conductance, and chloride).
 - 2. If the fluid is found to be coming from the containment, determine the location from which the leak is originating.
 - 3. Mark the point where the water is coming out of the tank.
 - 4. Locate the puncture or hole in the liner.
 - 5. Empty the containment to the point of damage in liner.
 - 6. Clean area of liner that needs to be repaired.
 - 7. Cut out piece of material (patch or tape) to overlay liner.
 - Either weld the patch to the injured area in the liner or apply tape over the rupture.
 - 9. Make sure rupture is completely covered.
 - 10. Monitor as needed.

The operator will inspect and remove, as necessary, surface water run-on accumulated in the secondary containment

Monitoring, Inspections, and Reporting An inspection log will be maintained by the operator and

will be made available to the division upon request. Inspection will include: freeboard monitoring, leak detection, identifying potential hazards that may have developed, change in site conditions or if the contents of the containment change from the initial use.

Weekly inspections consist of:

- Reading and recording the fluid height of staff gauges and freeboard
- Recording any evidence of visible oil on surface

19.15.29.8 B.

Requirements. For all releases regardless of volume, the responsible party shall comply with 19.15.29.8 NMAC and shall remediate the release. For major and minor releases, the responsible party shall also comply with 19.15.29.9, 19.15.29.10, 19.15.29.11, 19.15.29.12 and 19.15.29.13 NMAC.

19.15.34.13

(6) The containment shall be operated to prevent the collection of surface water runon.

19.15.34.13 A.

The operator shall inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the log available for review by the division upon request.

- Visually inspecting the containments exposed liners
- Checking the leak detection system for any evidence of a loss of integrity of the primary liner
- Inspect any diversion ditches and berms around the containment to check for erosion and collection of surface water run-on.
- Inspect the leak detection system for evidence of damage or malfunction and monitor for leakage.
- Inspect netting (may not be used if Mega Blaster Pro avian deterrent is used) for damage or dead wildlife, including migratory birds. Operator shall report the discovery of a dead animal to the appropriate wildlife agency and to the district within 30 days of discovery. Further prevention measures may be required.

Additional monitoring to identify hazards that may have developed, changes in site conditions, tank use, and to enable early detection of structural issues such as uneven tank panel settlement, soil settlement, liner damage, insufficient liner slack or leaks. If changes are noted the AST contractor should be notified

• If observed conditions indicate a potential tank failure is imminent, the vicinity will be immediately cleared and the AST will be drained.

Monthly, the operator will:

- Report to the division, the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.
- Record sources and disposition of all recycled water.

Cessation of Operations

If less than 20% of the total fluid capacity is utilized every six months, beginning from the first withdraw, operation of the facility has ceased and the division district office will be

19.15.34.12 E

Netting. The operator shall ensure that a recycling containment is screened, netted or otherwise protective of wildlife, including migratory birds. The operator shall on a monthly basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

19.15.34.9 E

The operator of a recycling facility shall keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.

19.15.34.13 C

A recycling containment shall be deemed to have ceased operations if less than 20% of the total fluid capacity is used every six

notified. The division district may grant an extension not to exceed six months to determine the cessation of operations.

The operator will remove all fluids from the recycling facility within 60 days of cessation of operations. An extension, not to exceed 2 months, may be granted by the district division for the removal of fluids from the facility.

The breakdown of the containments follows the reverse order of the setup steps presented in the set-up manual.

months following the first withdrawal of produced water for use. The operator must report cessation of operations to the appropriate division district office. The appropriate division district office may grant an extension to this determination of cessation of operations not to exceed six months.

19.15.34.14 A

Once the operator has ceased operations, the operator shall remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use. The division district office may grant an extension for the removal of all fluids not to exceed two months.

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Closure Plan Above Ground Tank Containment (AST)

Closure Plan

The containments are expected to contain a small volume of solids, the majority of which will be windblown sand and dust with some mineral precipitates from the water.

The operator will notify the division district (phone or email) before initiating closure of the containments and/or facility.

Excavation and Removal Closure Plan – Protocols and Proceedures

Procedures

- 1. Residual fluids in the containments will be sent to disposal at a division-approved facility.
- The operator will remove all solid contents and transfer those materials to the following division-approved facility: Disposal Facility Name: R360 Permit Number NM 01-0006
- 3. If possible, geomembrane textiles and liners that exhibit good integrity may be recycled for use as an under liner of tank batteries or other use as approved by OCD.
- 4. Disassemble the recycling containment infrastructure according to manufacturer's recommendations
- 5. After the disassemble of the containments and removal of the contents and liners, soils beneath the tanks will be tested as follows
 - a. Collect a five-point (minimum) composite from beneath the liner to include any obviously stained or wet soils, or any other evidence of impact from the containments for laboratory analyses for the constituents listed in Table I of 19.15.34.14 NMAC.
 - b. If any concentration is higher than the parameters listed in Table I, additional delineation may be required, and closure activities will not proceed without Division approval.
 - c. If all constituents' concentrations are less than or equal to the parameters listed in Table I, then the operator will backfill the facility as necessary using non-waste containing, uncontaminated, earthen material and proceed to reclaim the surface to pre-existing conditions.

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.

19.15.34.14 C

The operator shall test the soils beneath the containment 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 below. (1) If any contaminant concentration is higher than the parameters listed in Table I, the division may require additional delineation upon review of the results and the operator must receive approval before proceeding with closure.

(2) If all contaminant concentrations are less than or equal to the parameters listed in Table I, then the operator can proceed to backfill with non-waste containing, uncontaminated, earthen material.

Closure Plan Above Ground Tank Containment (AST)

Closure Documentation

Within 60 days of closure completion, the operator will submit a closure report (Form C-147) to the District Division, with necessary attachments to document all closure activities are complete, including sampling results and details regarding backfilling and capping as necessary.

In the closure report, the operator will certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in the closure plan.

Reclamation and Revegetation

The operator will reclaim the surface to safe and stable pre-existing conditions that blends with the surrounding undisturbed area. "Pre-existing conditions" may include a caliche well pad that existed prior to the construction of the recycling containment and that supports active oil and gas operations.

Areas not reclaimed as described herein due to their use in production or drilling operations will be stabilized and maintained to minimize dust and erosion.

For all areas disturbed by the closure process that will not be used for production operations or future drilling, the operator will

- 1. Replace topsoils and subsoils to their original relative positions
- 2. Grade so as to achieve erosion control, long-term stability and preservation of surface water flow patterns
- 3. Reseed in the first favorable growing season following closure

Federal, state trust land, or tribal lands may impose alternate reclamation and revegetation obligations that provide equal or better protection of fresh water, human health, and the environment. Revegetation and reclamation plans imposed by the surface owner will be outlined in communications with the OCD.

The operator will notify the division when the site meets the surface owner's requirements or exhibits a uniform vegetative cover that reflects a life-form ratio of plus or minus fifty percent (50%) of predisturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds. The operator will notify the Division when reclamation and revegetation is complete.

19.15.34.14 D

Within 60 days of closure completion, the operator shall submit a closure report on form C-147, including required attachments, to document all closure activities including sampling results and the details on any backfilling, capping or covering, where applicable. The closure report shall certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in division rules or directives.

19.15.34.14 E

Once the operator has closed the recycling containment, the operator shall reclaim the containment's location to a safe and stable condition that blends with the surrounding undisturbed area. Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed area shall then be reseeded in the first favorable growing season following closure of a recycling containment. The operator shall substantially restore the impacted surface area to the condition that existed prior to the construction of the recycling containment.

19.15.34.14 G

The re-vegetation and reclamation obligations imposed by federal, state trust land or tribal agencies on lands managed by those agencies shall supersede these provisions and govern the obligations of any operator subject to those provisions, provided that the other requirements provide equal or better protection of fresh water, human health and the environment.

19.15.34.14 F

Reclamation of all disturbed areas no longer in use shall be considered complete when all ground surface disturbing activities at the site have been completed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus fifty percent (50%) of predisturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

AST SET UP SOP

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Policy Template

APPROVALS

All approvals are maintained and controlled By OPERATIONS MANAGEMENT
Please refer to the <u>SOP MANUAL</u> for the current controlled revision and approval records.

REVISION HISTORY			
AUTHOR	REVISED SECTION/PARAGRAPH	REV	RELEASED
Jeff Anderson	INITIAL RELEASE	05	2018-07-03

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1. PURPOSE

This procedure is being implemented to standardize the process for installing Epic 360 Tanks and to ensure the quality from a standardized plan.

2. SCOPE

This procedure applies to the installations of Tank in a Tank Epic Tanks

3. **DEFINITIONS**

• <u>Epic 360 Tank</u> – Above ground tank used for water containment. Permanent or temporary structure used in industrial processes where large volumes of water are needed.

4. **RESPONSIBILITIES**

- <u>SOP process owner</u> –On-Site Epic Supervisor designated by management
- <u>Supervising Crew Leader</u> Ensure that SOP is strictly followed as the source for correct assembly and installation of Epic Tanks and managing their crew in a safe and productive manner. Also responsible for making sure all rigging is done in the correct manor within the capabilities of the equipment.
- <u>Crew</u> Labor portion of the assembly/installation process
 - Crew Size to be a Minimum of five (5) persons consisting of at least one (1) certified Telehandler Operator, one (1) certified Skid Loader Operator, one (1) certified Welder (liner), and Spotter with a Crew Leader.

5. REQUIREMENTS

- Overall site must be level to ± 0.50 "
- Soil compaction must meet ASTM D-698A, 90% or greater.
- Final grade must be a smooth compacted surface, utilizing 1" of smaller crushed aggregate.

6. POLICY

Procedure for installing Epic 360 Tanks.

6.1 Prepare Surface Area

- Assure that all site / ground requirements are met and signed off on by EPP personnel prior to operations.
- Once level, find the center of tank location and mark ground with paint. Determine radius of secondary tank and mark ground for footprint of the tank.
- Obtain textile and appropriate liner, as determined by customer or internal specifications.

6.2 Ground Cover Installation

• Determine whether any special conditions exist for tank installation.

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- Apply textile to the entire footprint of the tank, including secondary tank if applicable. Re-mark the painted footprint on top of the textile to serve as a guide for the wall panel placement.
- Apply liner material over the textile extending it 15 feet past the edge of the tank footprint utilizing a Skid Loader with Spreader Bar and Z-Arm attachments (Caution full rolls of liner can weight up to 4,000 lb. NO butt seams permitted on tank liners.
- Trial welds to be performed and peel and sheer tested prior to seaming step panel liner together.
- All welded seams to be Air Channel tested.
- QAQC documentation to be provided at project completion upon request.
- Fold the primary tank liners liner back toward the center of the tank footprint allowing sufficient space to place the wall panels.
- Secondary tank liner will be maneuvered during primary tank install to reduce/ eliminate any traffic on it.

6.3 Primary Tank Wall Assembly

- Panels weight up to 8,600 lbs. each. A 10,000 lb Telehandler or greater should be used when handling and installing these panels. Use **Extreme Caution** when performing this process. Panels create large amounts of risk if not properly handled and/or secured. All lifting needs performed with Certified Leg Slings and will adhere to the minimum angles referenced in Chain Length Angle Chart.
- Hold a safety meeting to determine who the signal person will be. The designated signal person will be the **ONLY** person to give direction to the Telehandler operator. However, anyone can give the **STOP** signal.
- Transporting tank panels from designated onsite storage location to be done using rated and certified lift chains, attach two (2) hooks to the top of the wall panel and attach two (2) hooks to the bottom of the wall panel at D-Rings. Verify that certified lift chains are adjusted to the proper length to achieve an angle greater than 30° between the plain between the D-Rings and the lift chains.
- Using rated and certified lift chains, attach two (2) hooks to the top of the wall panel. Verify that certified lift chains are adjusted to the proper length to achieve an angle greater than 30° between the plain between the D-Rings and the lift chains.
- Attach tag lines to the bottom of the wall panel to assist in guiding the panel during installation.
- Equipment operator will place the wall panel in its designated location. While still supported by chains and the telehandler, a Skid loader with J-Hook attachment will be hooked to panel for support.
- Once the second wall panel is in place, bolt the panels together utilizing 1-1/4"-7x5" Grade A490 Structural Bolts tightened to a minimum of 800 ft-lbs of torque utilizing air or electric impact wrenches as needed.
- Install the first three (3) wall panels following the same process.
- Be sure to leave the J-Hook in place until all but the last 3 panel are installed.

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- Repeat this setting and bolting processes until the entire circumference is complete for the remaining panels.
- 1

6.4 Primary Tank Liner Installation

- Utilize Ladders for Ingress and Egress of tank, making sure to follow 3 points of contact safety protocol.
- Transition foam is placed around bottom inside perimeter of tank.
- Attach pull line to the edge of the liner and pull line over top of the wall panels utilizing a telehandler.
- Secure liner to the top of the wall panels using the (3) clamps per panel. While clamping, inspect the liner to ensure it is not in a "stressed" condition and be sure to leave enough slack so that the liner can conform to the walls once the tank is filled with water.
- Trim any excess liner material from the outer edge of the tank wall.

6.5 Secondary Tank Wall Assembly

- Panels weight up to 8,600 lbs. each. A 10,000 lb Telehandler or greater should be used when handling and installing these panels. Use **Extreme Caution** when performing this process. Panels create large amounts of risk if not properly handled and/or secured. All lifting needs performed with Certified Leg Slings and will adhear to the minimum angles referenced in Chain Length Angle Chart.
- Hold a safety meeting to determine who the signal person will be. The designated signal person will be the **ONLY** person to give direction to the Telehandler operator. However, anyone can give the **STOP** signal.
- Transporting tank panels from designated onsite storage location to be done using rated and certified lift chains, attach two (2) hooks to the top of the wall panel and attach two (2) hooks to the bottom of the wall panel at D-Rings. Verify that certified lift chains are adjusted to the proper length to achieve an angle greater than 30° between the plain between the D-Rings and the lift chains.
- Using rated and certified lift chains, attach two (2) hooks to the top of the wall panel. Verify that certified lift chains are adjusted to the proper length to achieve an angle greater than 30° between the plain between the D-Rings and the lift chains.
- Attach tag lines to the bottom of the wall panel to assist in guiding the panel during installation.
- Equipment operator will place the wall panel in its designated location. While still supported by chains and the telehandler, a Skid loader with J-Hook attachment will be hooked to panel for support.
- Once the second wall panel is in place, bolt the panels together utilizing 1-1/4"-7x5" Grade A490 Structural Bolts tightened to a minimum of 800 ft-lbs of torque utilizing air or electric impact wrenches as needed.
- Install the first three (3) wall panels following the same process.

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- Be sure to leave the J-Hook in place until all but the last 3 panel are installed.
- Repeat this setting and bolting processes until the entire circumference is complete for the remaining panels.

6.6 Secondary Tank Liner Installation

- Utilize Ladders for Ingress and Egress of tank, making sure to follow 3 points of contact safety protocol.
- Transition foam is placed around bottom inside perimeter of tank.
- Attach pull line to the edge of the liner and pull line over top of the wall panels utilizing a telehandler.
- Secure liner to the top of the wall panels using the (3) clamps per panel. While clamping, inspect the liner to ensure it is not in a "stressed" condition and be sure to leave enough slack so that the liner can conform to the walls once the tank is filled with water.
- Trim any excess liner material from the outer edge of the tank wall. All work at height to be performed from a man-lift.

6.7 Installation of Tank Accessories

- Utilizing a Telehandler all required tubing need hung and anchored to mounting tabs on tank panels.
- Utilizing a Telehandler all required steps and observation decks need anchored to mounting tabs on tank panels.

6.8 Final Inspection

• A final walk around needs completed with Supervising Crew Leader and customer representative to ensure that it was built to the customer specifications.

7. APPLICABLE REFERENCES

• Chain Length Angle Chart

Variances and/or Equivalency Demonstrations for Above Ground Steel Tank Modular Recycling Storage Containments (AST) Primary and Secondary Liners

Additional VARIANCE FOR RECYCLING STORAGE CONTAINMENTS (Inground and AST)

- Alternative Testing Methods
- Fencing AST Containments

Request for OCD Approval of Alternative Test Methods to Analyze Concentrations of TPH and Chloride

The prescriptive mandates of the Rule that are the subject of this request are the following subsections of NMAC 19.15.17.13 [emphasis added], 19.15.34.14 and 19.15.29. 12 D

19.15.17.13 CLOSURE AND SITE RECLAMATION REQUIREMENTS:

D.(5) The operator shall collect, at a minimum, a five point composite of the contents of the temporary pit or drying pad/tank associated with a closed-loop system to demonstrate that, after the waste is solidified or stabilized with soil or other non-waste material at a ratio of no more than 3:1 soil or other non-waste material to waste, the concentration of any contaminant in the stabilized waste is not higher than the parameters listed in Table II of 19.15.17.13 NMAC.

The referenced Table II, which is reproduced in part below, notes the Method with asterisk signifying: "*Or other test methods approved by the division".

Table II Closure Criteria for Burial Trenches and Waste Left in Place in Temporary Pits				
Depth below bottom of pit to groundwater less than 10,000 mg/l TDS	f pit Constituent Method* Limit**			
	Chloride	EPA Method 300.0	20,000 mg/kg	
25-50 feet	TPH	EPA SW-846 Method 418.1	100 mg/kg	

19.15.34.14 CLOSURE AND SITE RECLAMATION REQUIREMENTS FOR RECYCLING CONTAINMENTS:

C. The operator shall test the soils beneath the containment 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 below.

(1) If any contaminant concentration is higher than the parameters listed in Table I, the division may require additional delineation upon review of the results and the operator must receive approval before proceeding with closure.

The referenced Table I, which is reproduced in part below, notes the Method with asterisk signifying: "*Or other test methods approved by the division".

Table I				
Closure Criteria for Recycli	ing Containments			
Depth below bottom of containment to groundwater less than 10,000 mg/l TDS	Constituent	Method*	Limit**	
51 feet - 100 feet	Chloride	EPA 300.0	10,000 mg/kg	
	TPH (GRO+DRO+MRO)	EPA SW-846 Method 8015M	2,500 mg/kg	

After sampling solids of more than 50 drilling pits in the Permian Basin, we have observed and reported to OCD on numerous occasions significant problems with non-petroleum drilling additives (e.g. starch) interfering with the laboratory method 418.1. It is not surprising that in many instances we found no correlation between the laboratory results using 418.1 and the results using Method 8015.

We request approval of Method 8015 (GRO + DRO + MRO) for Method 418.1.

19.15.29.12 D. CLOSURE REQUIREMENTS. The responsible party must take the following action for any major or minor release containing liquids.

(1) The responsible party must test the remediated areas for contamination with representative five-point composite samples from the walls and base, and individual grab samples from any wet or discolored areas. The samples must be analyzed for the constituents listed in Table I of 19.15.29.12 NMAC or constituents from other applicable remediation standards.

	Closure Criteria for S	Fable I foils Impacted by a Release	
Minimum depth below any point within the horizontal boundary of the release to ground water less than 10,000 mg/l TDS	Constituent	Method*	Limit**
≤ 50 feet	Chloride***	EPA 300.0 or SM4500 C1 B	600 mg/kg
	TPH (GRO+DRO+MRO)	EPA SW-846 Method 8015M	100 mg/kg
	BTEX	EPA SW-846 Method 8021B or 8260B	50 mg/kg
	Benzene	EPA SW-846 Method 8021B or 8260B	10 mg/kg

The referenced Table I, is reproduced in part below.

We request approval of EPA 300.0 or SM4500 for the analysis of chloride.

Demonstration that OCD Approval Will Provide Equal or Better Protection of Fresh Water, Public Health and the Environment

The purpose of TPH analyses in the Pit Rule is to measure total petroleum hydrocarbons not all non-polar compounds, such as starch or cellulose that can interfere with Method 418.1. While Method 418.1 may provide some useful data for transportation of crude oil or condensate spills to disposal, the addition of non-polar organic materials in drilling fluids, especially for horizontal wells, renders Method 418.1 highly problematic to determine compliance with the Rule. Using Method 8015 for TPH (GRO+DRO+MRO) provides a better measurement of what we believe the Commission intended operators to measure.

In hearings before the Oil Conservation Commission technical arguments were presented regarding the use of SM4500 in lieu of EPA 300.00 for chloride analysis for Rule 29. The Division and the Commission agreed that these two methods provide equal or better protection of fresh water, public health and the environment.

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 <u>emphasis **added**</u>:

D. Fencing.

(1) The operator shall <u>fence or enclose</u> a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.
(2) Recycling containments shall be fenced with a four foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level.
E. Netting. The operator shall ensure that a recycling containment is screened, netted or otherwise protective of wildlife, including migratory birds. The operator shall on a monthly basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

The subject AST employs netting or sonic bird hazing (Mega Bird X with bird calls specific to the Permian Basin). These methods effectively protect avian species such as waterfowl and bats. OCD and BLM have approved both methods per Rule 34 and by BLM Rules respectively.

The steel structure of the AST is 11-feet high, which obviously encloses the containment "in a manner that deters...[terrestrial] wildlife." Thus, the steel structure meets the mandate of the Rule for enclosure. Thus, netting and the steel structure meet the mandate of Rule 34 for deterring/protecting avian and terrestrial wildlife.

Because AST Containments have a steel stairway between ground surface and the open top, the operator proposes the following deterrent to unauthorized human access:

- 1. Install gate (e.g. <u>https://www.saferack.com/saferack-yellowgate-adjustable-safety-swing-gates/</u>) or chain across the stairway
- 2. Place an appropriate sign on the gate or chain to help deter unauthorized human access to the open top of the containment
- 3. Provide for a mechanism to lock the gate when responsible personnel are not onsite.

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

We believe the proposed protocol provides equal protection of Public Health as a 4-strand barbed wire fence.

40-mil Non-reinforced LLDPE Liner as Alternate Primary and 30-mil Non-reinforced LLDPE as Secondary Liner for Above Ground Steel Tank Modular Recycling Storage Containments

STATEMENT EXPLAINING WHY THE APPLICANT SEEKS A VARIANCE FOR 40 MIL NON-REINFORCED LLDPE GEOMEMBRANE AS AN ALTERNATIVE PRIMARY AND 30 MIL NON-REINFORCED AS ALTERNATIVE SECONDARY LINER FOR MODULAR STEEL AST CONTAINMENT

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections of 19.15.34.12

NMAC 19.15.34.12 A DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT
 (4) All primary (upper) liners in a recycling containment shall be geomembrane liners composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. All primary liners shall be 30-mil flexible PVC, 45-mil LLDPE string reinforced or 60-mil HDPE liners. Secondary liners shall be 30-mil LLDPE string reinforced or equivalent with a hydraulic conductivity no greater than 1 x 10-9 cm/sec. Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

The applicant proposes one layer of 40-mil LLDPE non-reinforced as a primary liner and a secondary liner comprised of one layer of 30-mil LLDPE non-reinforced material

Rule 34 did not consider Above Ground Steel Storage Tanks that employ liners as a primary and secondary containment method.

This material is more readily available than the prescribed liners in the Rule and provides superior flexibility and conformity characteristics. Due to the vertical steel walls, 60-mil HDPE, 45 or 30-mil LLDPE string reinforced liners and 30-mil PCV liners are not sufficiently flexible for use in these modular containments.

All liners will have a hydraulic conductivity no greater than 1 x 10 -9 cm/sec and meet or exceed EPA SW-846 method 9090A.

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

The following technical documents provide supportive data to demonstrate that this liner system *(with integrated leak detection system)* provides equal or better protection of fresh water, public health and the environment by providing the requisite containment and protection. Attached is a technical comparison of the proposed material is compared to what is advised through Rule 34. A second memorandum provides clarification that the engineering requirements for site preparation, which ensures functionality of the liner system, is crosscutting to varied locations/sites within the Permian Basin. Liner specifications are also included in submission.

Technical Memorandum: 40-mil LLDPE as Alternative Primary with 30mil LLDPE as Alternative Secondary Liner System for Modular Steel AST Recycling Containment NMAC 19.15.34.12 A (4)

In consideration of the liner application for modular AST impoundments, size and depth of the AST, design details for modular tanks as well as estimated length of at least five years of service time, it is my professional opinion that a 40 mil LLDPE (non-reinforced) and a 30 mil LLDPE (non-reinforced) geomembrane system will provide the requisite barrier against produced water loss as an alternative primary and secondary liner system. *The two proposed liners, 40 mil LLDPE as Primary liner and 30 mil LLDPE Secondary liner, will function equal to or better than 45 mil String Reinforced LLDPE, 30 mil PVC, or 60 mil HDPE liners as a primary liner and 30 mil LLDPE string reinforced as a secondary liner system. Additionally, this two-layer system with integrated leak detection system, will provide requisite protection for the environment that is equal to or better than the above primary and secondary liner systems referenced in OCD rule 34. The following are discussion points that will exhibit the attributes of a 40 mil/30 mil LLDPE lining system:*

<u>The nature and formulation of LLDPE resin is very similar to HDPE</u>. The major difference is that LLDPE is lower density, lower crystallinity (more flexible and less chemical resistant). However, LLDPE will resist aging and degradation and remain intact for many years in exposed conditions. The LLDPE resin is virtually the same for non-reinforced 30 or 40 mil LLDPE and string reinforced 30 or 45 mil LLDPE geomembranes and both will provide requisite containment and be equally protective for this application, enduring UV and chemical degradation in the produced water environment.

<u>Flexibility Requirements.</u> Non-reinforced LLDPE geomembranes are less stiff and far more flexible than string reinforced geomembranes as well as 60 mil HDPE and in this regard are preferred for installations in vertical wall tanks such as this proposed installation. LLDPE provides a very flexible sheet that enables it to be fabricated into large panels, folded for shipping and installed on vertical walls transitioned to flat bottom. Non-reinforced LLDPE sheet will conform better than a string reinforced LLDPE to the tank dimensions under hydrostatic loading and will exhibit less wrinkling and creasing during and after installation.

<u>Thermal Fusion Seaming Requirements</u>. Thermal seaming and QC seam test requirements for geomembranes are product specific and usually prescribed by the sheet manufacturer. Both dual wedge and single wedge thermal fusion welding is commonly used on LLDPE and QC testing by air channel (ASTM D 5820) or High Pressure Air Lance (ASTM D 4437) is fully acceptable and recognized as industry standards. In this regard, either non-reinforced LLDPE or string-reinforced LLDPE will be acceptable as far as QC and thermal fusion seaming methods are concerned.

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<u>Potential for Leakage through the Primary and Secondary Liners.</u> Leakage through geomembrane liners is directly a function of the height of liquid head above any hole or imperfection. The geonet drainage media between the primary and secondary LLDPE geomembranes at the base of the AST in this application provides immediate drainage to a low point or outside the Modular AST Impoundment and thus no hydrostatic head or driving gradient is available to push leakage water through a hole in the Secondary LLDPE liner.

Leakage through any Primary geomembrane is driven by size of hole and depth and will be detected by the increase of water in the drainage system and the volume being pumped out of the secondary containment. In this regard and for this variance, the Primary consists of 40 mil LLDPE geomembrane which will perform equal to or better than a single layer of string reinforced LLDPE for potential leakage. Thus, if a leak occurs through the top layer, it will be effectively contained by the second layer of 30 mil LLDPE geomembrane. If required, location of holes in the Primary can be found by Electrical Leak Location Survey (ELLS) using a towed electrode (ASTM D 7007). Holes found can then be repaired and thus water seepage into the leakage collection and drainage system will be kept to a minimum. Dependent on OCR requirements for Action Leakage Rate (ALR), the leakage volumes may only be monitored. For example, a typical ALR is < 20 gpad whereas a rapid and large leak (RLL) may be > 100 gpad. Most states specify maximum ALR values for waste and process water impoundments usually in the range of 100 to 500 gpad. However, New Mexico does not specify an ALR for waste or process water impoundments (GRI Paper No. 15).

LLDPE (and string reinforced LLDPE) can be prefabricated into large panels and thus both types offer the following for Containment:

- Prefabrication in factory-controlled conditions into very large panels (up to 30,000 sf) results in ease of installation, less thermal fusion field seams and less on site QC and CQA. (It should be noted that HDPE cannot be prefabricated into panels and requires considerably more on-site welding and QC).
- Large prefabricated panels will provide better control of thermal fusion welding in a factory environment that will improve the liner system integrity for the long term. Ease of installation of large prefabricated custom size panels results in a greater reduction of installation time and associated installation and QC costs
- <u>The Non-reinforced LLDPE geomembrane provides superior lay flat</u> <u>characteristics and conformability</u> which allows for more intimate contact with the underlying soil, geonet, or geotextile and tank walls as well as overlying materials thus providing better flow characteristics for drainage of water. String reinforced LLDPE exhibits more wrinkling and when overlaid or in contact with a geonet drain, wrinkles tend to form pockets and dams affecting drainage of any leakage water to the exterior of the Modular AST Impoundment.

 Both types of LLDPE geomembrane are easily repaired using the same thermal fusion bonding method without the need for special surface grinding preparation for extrusion welding as is typically used in repair of HDPE geomembranes. <u>However, string reinforced LLDPE requires that all cut edges with exposed scrim</u> <u>must be encapsulated with extrusion bead</u>. No encapsulation is required on nonreinforced LLDPE.

In summary, it is my professional opinion that the liner system of 40 mil non-reinforced LLDPE geomembrane as Primary liner and 30 mil non-reinforced LLDPE Secondary liner, with integrated leak detection system, will provide protection that is equal to or better than 45 mil string reinforced LLDPE. 30 mil PVC, 60 mil HDPE (primary liner) mil 35 mil LLDPEr (secondary liner) and meets requirements as defined by the rule as an alternative liner system (resistance to UV and chemical exposure and required hydraulic conductivity). Additionally, this liner system will provide a superior initiallation in the AST environment and function better than liners referenced in the OCD rule and will provide the requisite protection of fresh water, public health and the environment for at least 5 years in the produced water recycling environment.

If you have any questions on the above technical memorandum or require further information, give me a call at 720-289-0300 or email geosynthetics@jusn.com

Sincerely Yours.

RRFHAN

Ronald K. Frobel, MSCE, PE

References:



NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

Geosynthetic Research Institute (GRI) Published Standards and Papers 2018

ASTM Standards 2018

Attachments:

R. K. Frobel C.V.

STATEMENT EXPLAINING WHY THE APPLICANT SEEKS A VARIANCE FOR 40 MIL NON-REINFORCED LLDPE GEOMEMBRANE AS AN ALTERNATIVE PRIMARY AND SECONDARY LINER FOR MODULAR STEEL AST CONTAINMENT

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections of 19.15.34.12

NMAC 19.15.34.12 A DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT
 (4) All primary (upper) liners in a recycling containment shall be geomembrane liners composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. All primary liners shall be 30-mil flexible PVC, 45-mil LLDPE string reinforced or 60-mil HDPE liners. Secondary liners shall be 30-mil LLDPE string reinforced or equivalent with a hydraulic conductivity no greater than 1 x 10-9 cm/sec. Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

The applicant proposes one layer of 40-mil LLDPE as a primary liner and a secondary liner comprised of one layer of 40-mil LLDPE material.

Rule 34 did not consider Above Ground Steel Storage Tanks that employ liners as a primary and secondary containment method.

This material is more readily available than the prescribed liners in the Rule and provides superior flexibility and conformity characteristics. Due to the vertical steel walls, 60-mil HDPE, 45 or 30-mil LLDPE string reinforced liners and 30-mil PCV liners are not sufficiently flexible for use in these modular containments.

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

The following technical documents provide supportive data to demonstrate equal or better protection of fresh water, public health and the environment by providing the requisite containment and protection. Technical comparison of the proposed material is compared to what is advised through Rule 34 is discussed. A second memorandum provides clarification that the engineering requirements for site preparation, which ensures functionality of the liner system, is crosscutting to varied locations within the Permian Basin. Stamped plans from design engineer confirm applicability of this liner system to this specific site.

Technical Memorandum: 40-mil LLDPE as Alternative Primary/Secondary Liner System for Modular Steel AST Recycling Containment NMAC 19.15.34.12 A (4)

In consideration of the Primary lining application (modular AST impoundment), size of the AST and depth, design details for modular tanks as well as estimated length of up to five years of service time, it is my professional opinion that a 40 mil LLDPE geomembrane will provide the requisite barrier against processed water loss. It should be noted that the 40 mil LLDPE exceeds the OCD mandate for a Secondary lining system. *The two proposed 40 mil LLDPE liners will function equal to or better than 45 mil String Reinforced LLDPE, 30 mil PVC, or 60 mil HDPE liners as a primary liner and 30 mil LLDPE string reinforced as a secondary liner system. Additionally, the 40 mil LLDPE in a two-layer system will provide requisite protection for the environment that is equal to or better than the above primary and secondary liner systems referenced in OCD rule 34. The following are discussion points that will exhibit the attributes of a 40 mil LLDPE lining system:*

<u>The nature and formulation of LLDPE resin is very similar to HDPE</u>. The major difference is that LLDPE is lower density, lower crystallinity (more flexible and less chemical resistant). However, LLDPE will resist aging and degradation and remain intact for many years in exposed conditions. The LLDPE resin is virtually the same for non-reinforced 40 mil LLDPE and string reinforced 45 mil LLDPE geomembranes and both will provide requisite containment and be equally protective for this application.

<u>Flexibility Requirements.</u> Non-reinforced LLDPE geomembranes are less stiff and far more flexible than string reinforced geomembranes as well as 60 mil HDPE and in this regard are preferred for installations in vertical wall tanks such as this proposed installation. LLDPE provides a very flexible sheet that enables it to be fabricated into large panels, folded for shipping and installed on vertical walls transitioned to flat bottom. Non-reinforced LLDPE sheet will conform better than a string reinforced LLDPE to the tank dimensions under hydrostatic loading and will exhibit less wrinkling and creasing during and after installation.

<u>Thermal Fusion Seaming Requirements</u>. Thermal seaming and QC seam test requirements for geomembranes are product specific and usually prescribed by the sheet manufacturer. Both dual wedge and single wedge thermal fusion welding is commonly used on LLDPE and QC testing by air channel (ASTM D 5820) or High Pressure Air Lance (ASTM D 4437) is fully acceptable and recognized as industry standards. In this regard, either non-reinforced LLDPE or string-reinforced LLDPE will be acceptable as far as QC and thermal fusion seaming methods are concerned.

<u>Potential for Leakage through the Primary and Secondary Liners.</u> Leakage through geomembrane liners is directly a function of the height of liquid head above any hole or imperfection. The geonet drainage media between the primary and secondary LLDPE

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geomembranes at the base of the AST in this application provides immediate drainage to a low point or outside the Modular AST Impoundment and thus no hydrostatic head or driving gradient is available to push leakage water through a hole in the Secondary LLDPE liner.

Leakage through any Primary geomembrane is driven by size of hole and depth and will be detected by the increase of water in the drainage system and the volume being pumped out of the secondary containment. In this regard and for this variance, the Primary consists of 40 mil LLDPE geomembrane which will perform equal to or better than a single layer of string reinforced LLDPE for potential leakage. Thus, if a leak occurs through the top layer, it will be effectively contained by the second layer of 40 mil LLDPE geomembrane. If required, location of holes in the Primary can be found by Electrical Leak Location Survey (ELLS) using a towed electrode (ASTM D 7007). Holes found can then be repaired and thus water seepage into the leakage collection and drainage system will be kept to a minimum. Dependent on OCR requirements for Action Leakage Rate (ALR), the leakage volumes may only be monitored. For example, a typical ALR is < 20 gpad whereas a rapid and large leak (RLL) may be > 100 gpad. Most states specify maximum ALR values for waste and process water impoundments usually in the range of 100 to 500 gpad. However, New Mexico does not specify an ALR for waste or process water impoundments (GRI Paper No. 15).

Both non-reinforced LLDPE and string reinforced LLDPE can be prefabricated into large panels and thus both types offer the following for Containment:

- Prefabrication in factory-controlled conditions into very large panels (up to 30,000 sf) results in ease of installation, less thermal fusion field seams and less on site QC and CQA. (It should be noted that HDPE cannot be prefabricated into panels and requires considerably more on-site welding and QC).
- Large prefabricated panels will provide better control of thermal fusion welding in a factory environment that will improve the liner system integrity for the long term. Ease of installation of large prefabricated custom size panels results in a greater reduction of installation time and associated installation and QC costs
- <u>The Non-reinforced LLDPE geomembrane provides superior lay flat</u> <u>characteristics and conformability</u> which allows for more intimate contact with the underlying soil, geonet, or geotextile and tank walls as well as overlying materials thus providing better flow characteristics for drainage of water. String reinforced LLDPE exhibits more wrinkling and when overlaid or in contact with a geonet drain, wrinkles tend to form pockets and dams affecting drainage of any leakage water to the exterior of the Modular AST Impoundment.
- Both types of LLDPE geomembrane are easily repaired using the same thermal fusion bonding method without the need for special surface grinding/preparation for extrusion welding as is typically used in repair of HDPE geomembranes.

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However, string reinforced LLDPE requires that all cut edges with exposed scrim must be encapsulated with extrusion bead. No encapsulation is required on nonreinforced LLDPE.

In summary, it is my professional opinion that the two layers of 40 mil non-reinforced LLDPE geomembranes will provide a Primary/Secondary liner system that is equal to or better than 45 mil string reinforced LLDPE, 30 mil PVC, 60 mil HDPE (primary liner) and 35 mil LLDPEr (secondary liner). Additionally, the two layers of 40 mil LLDPE will provide a superior installation and function better than liners referenced in the OCD rule. The two layers of 40 mil non- reinforced LLDPE will provide the requisite protection of fresh water, public health and the environment for at least 5 years in the frack water environment.

If you have any questions on the above technical memorandum or require further information, give me a call at 720-289-0300 or email geosynthetics@msn.com

Sincerely Yours.

RK Frobel

Ronald K. Frobel, MSCE, PE

References:



Geosynthetic Research Institute (GRI) Published Standards and Papers 2018

ASTM Standards 2018

Attachments

R. K. Frobel C.V.

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Slope and Anchor Variance Request for Above Ground Steel Tank Modular Recycling Storage Containments

STATEMENT EXPLAINING WHY THE APPLICANT SEEKS A VARIANCE FOR SLOPE AND ANCHOR FOR MODULAR STEEL AST CONTAINMENT

Statement Explaining Why the Applicant Seeks a Variance

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections of NMAC 19.15.34.12.

NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT:

A. An operator shall design and construct a recycling containment in accordance with the following specifications.

(2) A recycling containment shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity. *The operator shall construct the containment in a levee with an inside grade no steeper than two horizontal feet to one vertical foot (2H:1V). The levee shall have an outside grade no steeper than three horizontal feet to one vertical foot rench and provide adequate room for inspection and maintenance.*(3) Each recycling containment shall incorporate, at a minimum, a primary (upper) liner

and a secondary (lower) liner with a leak detection system appropriate to the site's conditions. The edges of all liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

The applicant requests a variance to prescribed slope and anchor in the setting of above ground modular steel containments.

With respect to storage of produced water for use in lieu of fresh water, Rule 34 is written for earthen, lined pits, not free-standing modular impoundments that employ liners as their primary fluid containment system. A modular impoundment consists of a professionally designed steel tank ring with vertical walls. There is no slope to consider as the segmental steel sections are set vertical.

There is no anchor trench as envisioned by the Rule, liners are anchored to the top of the steel walls with clips, no anchor trench is required.

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

The following technical memorandum provides supportive data to demonstrate equal or better protection of fresh water, public health and the environment by providing the requisite containment and protection.

Technical Memorandum: Slope and Anchor Trench Variance for Above Ground Steel Modular Containments NMAC 19.15.34.12 A (2), (3)

Side Slope

The design of soil side slope (inclination) is a geotechnical engineering design consideration. Liquid impoundments such as fresh water or process water containments are usually built within an excavation or with raised earthen embankments. For a liquid impoundment with an exposed liner system, the slope soils and construction dictate slope inclination and very detailed slope stability analysis may be required to determine if slope failure within the embankment will occur once loaded with impounded water. Slope failure may also occur during construction or when the impoundment is empty. A maximum slope is usually specified and is dependent on soil type and cohesive strength, saturated or unsaturated conditions, etc. Detailed analysis for slope stability can be found in "Designing with Geosynthetics" by R.M Koerner as well as many geotechnical books.

A modular impoundment, on the other hand, consists of a professionally designed steel tank ring with vertical walls. *There is no slope to consider as the segmental steel sections are set vertical.* Design of steel tanks, in regard to hydrostatic loading, wind loading, seismic loads, etc. are thoroughly referenced with detailed procedures in the design code - American Petroleum Institute (API) 650-98 "Welded Steel Tanks for Oil Storage". *There are no requirements for maximum slope inclination other than perhaps 90 degrees or vertical wall.*

Anchor Trench

All earthen impoundments with a geomembrane lining system require some form of top of slope anchor, the most common of which is an excavated and backfilled anchor trench usually set back at least 3 ft from the top of slope. Again, there are detailed procedures for anchor trench design in "Designing with Geosynthetics" by R.M Koerner.

A Modular Impoundment requires mechanical anchoring of the geomembrane at the top of the vertical steel wall using standard liner clips that prevent the geomembrane or geomembrane layers from slipping down the side wall. These are detailed in the Tank Installation Manual. There are no requirements for an "anchor trench" as this is not an in-ground impoundment.

In summary, based on the design and specifications of a modular steel impoundment, there is no requirement for a maximum interior slope angle of 2H:1V due to the fact that this impoundment is a steel tank with vertical walls. Additionally, there is no requirement for an anchor trench as the geomembrane is attached to the top of the Modular Impoundment vertical walls with large steel clips. This provides the requisite protection of fresh water, public health and the environment for many years.

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If you have any questions on the above technical memorandum or require further information, give me a call at 303-679-0285 or email geosynthetics@msn.com

Sincerely Yours.

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Ronald K. Frobel, MSCE, PE





American Petroleum Institute (API) 650-98 "Welded Steel Tanks for Oil Storage"

Koemer, R.M., 2005 "Designing With Geosynthetics" Prentice Hall Publishers

Attachments:

R. K. Frobel C.V.

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January 2020

Applicability of Variances for Modular AST Containments in the Permian Basin of New Mexico

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Technical Memorandum: Applicability of Variances for Modular AST Containments in the Permian Basin of New Mexico NMAC 19.15.34.12 A (2)

I have reviewed the most recent historical variances for AST Containments in the document titled "Variances for C-147 Registration Packages Permian Basin of New Mexico" (January 2020) and examined the applicable design drawings and permits for the following modular AST containments located in the Permian Basin of New Mexico.

- C-147 Registration Package for Myox Above Ground Storage Tank Section 32, T25S, R28E, Eddy County (January 20, 2020)
- C-147 Registration Package for Fez Recycling Containment and Recycling Facility Area (100+ acres) Section 8, T25-S, R35-E, Lea County, Volume 2 – Above-Ground Storage Tank Containments
- Hackberry 16 Recycling Containments and Recycling Facility Section 16, T19S, R31E, Eddy County

Locations of the modular containments range from west of the Pecos River to slightly west of Jal, NM. All locations exhibit different surface and subsurface geology, different topography and are of various sizes and volumes. *However, in regard to structural integrity of the base soils that support the AST and in particular the geomembrane containment system, the specification requirements are the same*. The foundation soils must be roller compacted smooth and free of loose aggregate over ½ inch. Compaction characteristics must meet or exceed 95% of Standard Proctor Density in accordance with ASTM D 698. This specification requirement is specific and causes the general or earthworks contractor to meet this standard regardless of the site- specific geology or topography. Provided that the design drawings and associated specifications call out the minimum requirements for subsoils compaction (i.e., 95% Standard Proctor Density – ASTM D 698), the design engineer or owners representative will carry out soils testing on the foundation materials to provide certainty to the AST containment owner that the earthworks contractor has met these obligations.

Thus, provided that the contractor meets the minimum specified requirements for foundation soils preparation and density, the location, geology or depth to groundwater will make no difference in regard to geomembrane liner equivalency as demonstrated by the AST variances presented in this volume and are considered valid for meeting NMOCD Rule 34 requirements for all locations within the Permian Basin of New Mexico.

If you have any questions on the above technical memorandum or require further information, give me a call at 720-289-0300 or email <u>geosynthetics@msn.com</u>

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R.K. FROBEL & ASSOCIATES Consulting Engineers

Sincerely Yours,

RR France

Ronald K. Frobel, MSCE, PE

References:

NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

ASTM Standards 2019



RONALD K. FROBEL, MSCE, P.E.

CIVIL ENGINEERING GEOSYNTHETICS EXPERT WITNESS FORENSICS

FIRM: R. K. FROBEL & ASSOCIATES Consulting Civil / Geosynthetics Engineers

TITLE: Principal and Owner

PROFESSIONAL AFFILIATIONS:

American Society for Testing and Materials (ASTM) -Founding member of Committee D 35 on Geosynthetics Chairman ASTM D35 Subcommittee on Geomembranes 1985-2000 ASTM Award of Merit Recipient/ASTM Fellow - 1992 ASTM D18 Soil and Rock - Special Service Award - 2000 Transportation Research Board (TRB) of The National Academies Appointed Member A2K07 Geosynthetics 2000 - 2003 National Society of Professional Engineers (NSPE) - Member American Society of Civil Engineers (ASCE) - Member Colorado Section - ASCE - Member International Society of Soil Mechanics and Foundation Engineers (ISSMFE) - Member International Geosynthetics Society (IGS) - Member North American Geosynthetics Society (NAGS) - Member International Standards Organization (ISO) - Member TC 221 Team Leader - USA Delegation Geosynthetics 1985 - 2001 European Committee for Standardization (CEN) - USA Observer EPA Advisory Committee on Geosynthetics (Past Member) Association of State Dam Safety Officials (ASDSO) - Member U. S. Committee on Irrigation and Drainage (USCID) - Member Technical Advisory Committee - Geosynthetics Magazine Editorial Board - Geotextiles and Geomembranes Journal Fabricated Geomembrane Institute (FGI) – Board of Directors Co-Chairman International Conference on Geomembranes Co-Chairman ASTM Symposium on Impermeable Barriers U.S. Naval Reserve Officer (Inactive) Registered Professional Engineer – Civil (Colorado) Mine Safety Health Administration (MSHA) Certified

ACADEMIC

BACKGROUND:

University of Arizona: M.S. - Civil Engineering - 1975 University of Arizona: B. S. - Civil Engineering – 1969 Wentworth Institute of Technology: A.S. Architecture – 1966
RONALD K. FROBEL, MSCE, P.E.

PROFESSIONAL EXPERIENCE:	R. K. Frobel & Associates - Consulting Engineers Evergreen, Colorado, Principal and Owner, 1988 - Present
	Chemie Linz AG and Polyfelt Ges.m.b.H., Linz, Austria U. S. Technical Manager Geosynthetics, 1985 - 1988
	U.S. Bureau of Reclamation, Engineering and Research Center Denver, Colorado, Technical Specialist in Construction Materials Research and Application, 1978 - 1985
	Water Resources Research Center (WRRC), University of Arizona Tucson, AZ, Associate Research Engineer, 1975 - 1978
	Engineering Experiment Station, University of Arizona Tucson, AZ, Research Assistant, 1974 - 1975
	United States Navy, Commissioned Naval Officer, 1970 - 1973

REPRESENTATIVE EXPERIENCE:

<u>R.K. Frobel & Associates</u>: Civil engineering firm specializing in the fields of geotechnical, geo-environmental and geosynthetics. Expertise is provided to full service civil/geotechnical engineering firms, federal agencies, municipalities or owners on a direct contract, joint venture or sub-consultant basis. Responsibilities are primarily devoted to specialized technical assistance in design and application for foreign and domestic projects such as the following:

Forensics investigations into geotechnical and geosynthetics failures; providing expert report and testimony on failure analysis; providing design and peer review on landfill lining and cover system design, mine waste reclamation, water treatment facilities, hydro-technical canal, dam, reservoir and mining projects, floating reservoir covers; oil and gas waste containment; design of manufacturers technical literature and manuals; development and presentation of technical seminars; new product development and testing; MQA/CQA program design and implementation.

<u>Polyfelt Ges.m.b.H., Linz, Austria and Denver Colorado</u>: As U.S. technical manager, primary responsibilities included technical development for the Polyfelt line of geosynthetics for the U.S. civil engineering market as well as worldwide applications.

Page 2

RONALD K. FROBEL, MSCE, P.E.

<u>U.S. Bureau of Reclamation, Denver, Colorado</u>: As technical specialist, responsibilities included directing laboratory research, design and development investigations into geosynthetics and construction materials for use on large western water projects such as dams, canals, power plants and other civil structures. Included were material research, selection and testing, specification writing, large scale pilot test programs, MQA/CQA program design and supervision of site installations. Prime author or contributor to several USBR technical publications incorporating geosynthetics.

<u>University of Arizona, Tucson, Arizona</u>: As research engineer at the Water Resources Research Center, responsibilities included research, design and development of engineering materials and methods for use in construction of major water projects including potable water reservoirs, canals and distribution systems. Prime author or contributor to several WRRC technical publications.

<u>Northeast Utilities, Hartford, Connecticut</u>: As field engineer for construction at Northeast Utilities, responsibilities included liason for many construction projects including additions to power plants, construction of substations, erection of fuel oil pipelines and fuel oil storage tanks. Responsibilities also included detailed review, inspection and reporting on numerous construction projects.

U.S. Navy: Commissioned Naval Officer - Nuclear Program

PUBLICATIONS: Over 85 published articles, papers and books.

CONTACT DETAILS:

Ronald K. Frobel, MSCE, P.E. R. K. Frobel & Associates Consulting Civil/Geosynthetics Engineers PO Box 2633 Evergreen, Colorado 80439 USA Phone 720-289-0300 Email: geosynthetics@msn.com Page 74 of 114

C-147 Registration Package for Cotton Draw Recycling Facility & AST Containment Section 9, T25S, R32E, Lea County

Volume 1 Transmittal Letter & AST Closure Cost Estimate Siting Criteria Demonstration with Plates & Appendices



View west of the Cotton Draw RF and AST Containment pad, which is due north of two fresh water frac ponds shown in the left of this image. .

Prepared for: Solaris Midstream LLC 9811 Katy Freeway Suite 900 Houston, TX 77024

Prepared by: R.T. Hicks Consultants, Ltd. 901 Rio Grande NW F-142 Albuquerque, New Mexico

R. T. HICKS CONSULTANTS, LTD.

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

November 3, 2023

Ms. Leigh Barr EMNRD - Oil Conservation Division 1220 S. St. Francis Drive Santa Fe, NM 87505 Via E-Mail Ms. Victoria Venegas NMOCD - District 2 811 S. First St. Artesia, NM 88210 Via E-Mail

RE: Solaris Water Midstream – Cotton Draw Recycling Facility and AST Containments Section 9, T25S, R32E, Lea County

Dear Ms. Barr and Ms. Venegas:

On behalf Solaris Water Midstream LLC, R.T. Hicks Consultants prepared a C-147 *permit application* for the above-referenced project. As suggested on the cover page, construction of the pad for the ASTs is complete. Set up of the AST is currently underway and in order to meet the new frac schedule, produced water will <u>flow into the containments very soon after 11/15/23</u>. We apologize for the short notice. Drilling schedules changed, so we have tried to make your review simple and fast.

Volume 1 of the package contains:

- this letter
- siting criteria demonstration for both containments

Depth to groundwater data are solid and other setback data are clearly displayed in the Plates of the submission.

Except for the C-147 Form, Volume 2 is verbatim from the Keg Shell AST submission. Mustang/Extreme is providing the same size/type AST for this project. Volume 2 contains:

- C-147 Form to register the AST containment,
- Stamped Design Drawings and Set-Up Protocols
- Recently Approved Plans for Design/Construction, O&M, Closure (Keg Shell 2RF-197)
- Variances for AST Storage Containments
- Variances Applicable to the Permian Basin in General

The closure cost estimate is attached. The Cotton Draw AST lies on a newly-built pad that Chevron plans to use for the adjacent fresh water frac ponds.

November 3, 2023 Page 2

Solaris will upload this document via the OCD.Online portal and transmit notice to the BLM, the surface owner's representative, to comply with Rule 34 mandates. If you have any questions or concerns regarding this permit or the attached C-147, please contact me. As always, we appreciate your work ethic and diligence.

Sincerely, R.T. Hicks Consultants

Randall T. Hicks PG Principal

Copy: Chad Gallagher, Solaris Water Midstream, LLC BLM, Robert Gomez

R. T. HICKS CONSULTANTS, LTD.

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

COTTON DRAW ABOVE-GROUND STORAGE TANK

Financial Assurance Cost Estimate

Total estimated cost for closure, reclamation, and restoration of the facility (AST, fencing, etc.) pursuant to Rule 34 is **\$50,500** based upon the work elements in the spreadsheet (below). We used the same estimate as the 2022 approved cost estimate for Ranger AST Containment. As described in the transmittal letter, the AST Containment will lie on a newly constructed Chevron working pad for use with the adjacent fresh water frac ponds. However, for the purpose of this cost estimate, we are assuming Solaris will maintain responsibility for reclamation of the pad.

Items shown with "0" units are costs recommended for certain agencies (e.g. BLM) but are not required in a closure cost estimate for compliance with Rule 34. Hicks Consultants generated this estimate with input from Solaris and is equivalent to contractor bids for other AST containments.

ITEM NO.	ITEM DESCRIPTION	UNITS	QTY	UNIT PRICE	Rule 34 TOTAL PRICE
	Cotton Draw AST				
	Containment				
1	Site Containment Removal of AST and Liner	0	1	\$1,000.00	\$0.00
2	Disposal	1	1	\$30,000.00	\$30,000.00
3	Removal of Weir Tanks	0	5	\$500.00	\$0.00
4	Removal of Chemical Trailer	0	1	\$50.00	\$0.00
5	Removal of Filter Pods	0	1	\$200.00	\$0.00
	Removal of pumps, generators, light				
6	towers	0	4	\$200.00	\$0.00
8	Clean Pumps, piping and equipment Remove Pumps, piping, and	0	1	\$1,500.00	\$0.00
9	equipment	0	3	\$1,500.00	\$0.00
11	Assess soil for impacts	1	1	\$2,500.00	\$2,500.00
12	Re-grade and Reclaim Site	1	1	\$16,000.00	\$16,000.00
,13	Misc. disposal and removal of fencing and cattle guards	0	1	\$1,000.00	\$1000.00
	<u>Facility Decommission Site</u> <u>Subtotal:</u>				\$50,500.00

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AST Closure Cost Estimate

Received by OCD: 2/5/2024 2:14:02 PM

SITE ASSESSMENT & CHARACTERIZATION

TEXT AND FIGURES

PLATES

SITING CRITERIA (19.15.34.11 NMAC) Solaris Water Midstream – Cotton Draw AST Containments

Distance to Groundwater

Plate 1, Plate 2, and the discussion below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the locations is greater than 100 feet beneath the area of interest that will include the location of the COG Production Cotton Draw AST.

Plate 1 is a topographic map that shows:

- 1. The containment area identified by the blue stippled polygon.
- 2. Water wells from the OSE database as a blue triangle inside colored. OSE wells are often mislocated in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range. Additionally, the OSE database can include locations of proposed wells (i.e. permit applications). The permit data generally show "no date" and "DTW=0" as data. Plate 1 has screened the OSE data and eliminated permit information from Plate 1. We provide no depth to water data for the OSE wells as these data do not represent static water levels and are often misleading. Borings that did not intercept groundwater show "0 ft" and the date of drilling. The boring logs for the 55± foot wells are presented in Appendix USGS Data and Well Logs.

OSE data suggests that depth to groundwater is greater than 200 feet in the nearest water well, north of the proposed recycling project. Plate 1 also shows this is the only water supply well within the mapped area of Plate 1. Well C-4536. Drilled to a depth of 500 feet, this well produces only 4 GPM. The lack of water supply wells on Plate is a reflection of the lack of groundwater in the area.

Plate 2 is an area topographic and geologic map that shows:

- 1. The recycling containment area identified by the blue stippled polygon with the surface elevation noted.
- 2. Water wells measured by the USGS, the year of the measurement and the calculated elevation of the groundwater surface.
- 3. Water wells measured by professionals and documented in published reports or by staff of Hicks Consultants (Misc.).
- 4. The groundwater elevation contours drawn by Hicks Consultants.

Hydrogeology

As shown in Plate 2, most of the map area is covered by Quaternary alluvial deposits. The Triassic Chinle Formation and Tertiary Ogallala Formation crop out in the southeast quadrant of the map. The USGS database identifies the water-bearing unit in the following five wells.

- 1. USGS-14343: Chinle Formation, which overlies the Rustler, makes sense as the waterbearing horizon. North and west of this well, DOE/WIPP borings and wells suggest the Chinle is relatively thin (due to erosion) and dry. As indicated in the Appendix USGS Data and Well Logs, the total depth of this well is 367 feet according to the USGS database. Depth to groundwater is about 314 feet in 1960 and lies between 290 and 285 from about 1991 to 2013.
- 2. USGS-14380: Santa Rosa Sandstone, which is the basal sandstone of the Chinle and the most common aquifer in southwestern Lea County.

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SITING CRITERIA (19.15.34.11 NMAC) SOLARIS WATER MIDSTREAM - COTTON DRAW AST CONTAINMENTS

- 3. USGS-14482: Chinle Formation, which in this area is typically the aquifer employed by stock wells.
- 4. USGS-8935 is reported in the USGS database as a 400-foot well completed in the Pecos River Valley Alluvial Aquifer with a depth to water of 318 feet in 1959. This aquifer does not extend into Lea County.
- 5. USGS-9063: Rustler Formation, the most common aquifer in eastern Eddy County

The OSE database provides a driller's log for C-4536, which is the only well shown on Plate 1 that is close enough to the Cotton Draw to be useful. Because this boring used air rotary drilling, identification of groundwater is generally good and if the cuttings can be identified relatively well. The driller's log is reproduced below:

	DEPTH (1	feet bgl)		COLOR AND TYPE OF MATERIAL ENCOUNTERED -	WA	TFR	ESTIMATED
	FROM	то	THICKNESS (feet)	INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	BEA (YES	RING? / NO)	WATER- BEARING ZONES (gpm)
	0	3	3	RED SAND	Y	√ N	
	3	12	9	CALICHE	Y	√ N	
	12	180	168	RED CLAY	Y	√ N	
	180	235	415	TAN SANDSTONE	Y	√ N	
	235	480	245	TAN SANDSTONE & CLAY STRINGERS	√ Y	N	4.00
. म्	480	500	20	RED CLAY WITH SAND STRINGERS	Y	🗸 N	
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This log reports groundwater between 235-480 feet. The well report indicates a static water level of 314 feet. Based upon the lithologic description, we contend:

0-12 feet	is Quaternary Alluvium and caliche
12-180 feet	is dry Chinle Formation
180-235 feet	is obviously 55 feet thick (not 415 feet), is dry, and might be the top of the Santa
	Rosa Sandstone
235-480 feet	probably includes a saturated section of the Santa Rosa Sandstone from about 314
	to 480
480-500	is probably the Quartermaster Formation

is probably the Quartermaster Formation 480-300

The lithology agrees with the descriptions on pages 35-36 of *Geology and Groundwater* Conditions in Southern Lea County, New Mexico (Nicholson & Clebsch 1961). We conclude the Chinle/Santa Rosa is the uppermost aquifer beneath the Cotton Draw AST Containment.

Groundwater Data

The USGS data in Appendix USGS Data and Well Logs shows that groundwater elevations are relatively stable over the decades of record. The groundwater elevation data for the wells shown in Plate 2 can be used for establishing 100-foot elevation contours, despite the different years of measurement.

Plate2 honors all data that we know are accurate to the best of our knowledge. We employed the most recent data available, and we conclude:

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Siting Criteria (19.15.34.11 NMAC) Solaris Water Midstream – Cotton Draw AST Containments

- The uppermost groundwater zone beneath the containment resides in the basal unit, the Santa Rosa Sandstone.
- The data from USGS wells are accurate to provide an estimate of the groundwater elevation beneath the Cotton Draw AST containment
- The static water level reported for C-4536 makes sense, but if the measurement occurred soon after well development, it may be off by 20 feet (\pm).
- The groundwater elevation contours suggest the groundwater elevation beneath the Cotton Draw AST containment location is about 3520 feet above sea level.
- The driller's measurement of depth to water at C-4536 is reasonable, but we believe the estimate based upon regional water levels is more accurate.
- <u>Based upon regional data, the calculated depth to groundwater beneath the Cotton Draw</u> <u>AST containments is (3520-3250=) 270 feet.</u>

Distance to Municipal Boundaries and Fresh Water Fields

Plate 3 demonstrates that the Cotton Draw AST site is not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipality is Malaga, NM approximately 26 miles west of the site.
- The closest public well fields belong to the City of Jal. These municipal supply wells are about 27 miles to the southeast.

Distance to Subsurface Mines

Plate 4 and our general reconnaissance of the Cotton Draw AST area demonstrate that the nearest mines are caliche pits. This location is not within an area overlying a subsurface mine.

- A reclaimed caliche pit is 0.75 miles north of the recycling project area.
- There are no subsurface mines in the area shown in Plate 4.

Distance to High or Critical Karst Area

Plate 5 shows the Cotton Draw AST recycling project area is not within mapped zone of high or critical with respect to BLM Karst area.

- The proposed containments are located within a "low" potential karst area.
- The nearest "high" or "critical" potential karst area is located approximately 17.5 miles northwest of the proposed recycling facility.
- We observed no evidence of solution voids or unstable ground near the site during the field inspection.

Distance to 100-Year Floodplain

Plate 6 demonstrates that the Cotton Draw AST recycling project area is within Zone D as designated by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.

- FEMA describes the location as an area with possible but undetermined flood hazards. No flood hazard analysis has been conducted.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for flooding.

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Siting Criteria (19.15.34.11 NMAC) Solaris Water Midstream – Cotton Draw AST Containments

• The nearest mapped flood hazards are 6 to 7 miles southwest and are in closed depressions.

Distance to Surface Water

Plate 7 shows that the closest water body is mapped as Lake/Pond and are about 3.3 miles southeast of the proposed Cotton Draw recycling area. The site visit and photographs demonstrate that the recycling project area is not within 300 feet of a continuously flowing watercourse or 200-feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark) or spring.

The mapped Lake/Pond water bodies are shifted about 500 feet southeast of the closed depressions and mapped water bodies on the USGS topographic maps. The error could be simply an ESRI database issue.

Distance to Permanent Residence or Structures

Plate 8 and the site visit demonstrates that the location is not within 1000 feet from an occupied permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application and is more than 500 feet from a stock/wildlife well (see Appendix Site Photos).

- The nearest structures are fresh water frac ponds due south of the recycling project area and Orla Road due east.
- No residences or other structures are in the area.

Distance to Non-Public Water Supply

Plates 1, and 7, demonstrate that the Cotton Draw recycling project is not within 500 horizontal feet of a spring or fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

- Plate 1 shows the locations of all area water wells, active or plugged.
- There are no domestic water wells located within 1,000 feet of the area of interest.
- No springs were identified within the mapping area (see Plate 7).

Distance to Wetlands

Plate 9 demonstrates the Cotton Draw location is not within 500 feet of mapped wetlands using the New Mexico database.

• The nearest designated wetland is a Freshwater Pond about 1 mile northwest of the AST project area. This wetland lies within a closed depression.

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PLATES





















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Well Logs and USGS Data

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WELL RECORD & LOG

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PAGE 1 OF 2

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LICENSE NO. NAME OF LICENSED DRILLER				WNSHJIP, RANGE) WHE	RE AVAILABLE	
1249	Jackie D. Atkins			NAME OF WELL DRIL Atkins Engir	LING COMPANY neering Associates, I	nc.
DRILLING STARTED DRILLING ENDED DEPTH OF CC 6/1/2022 6/1/2022 Te	OMPLETED WELL (FT) Emporary Well	BORE HO	LE DEPTH (FT) ±55	DEPTH WATER FIRST	TENCOUNTERED (FT) N/A	
COMPLETED WELL IS: ARTESIAN I DRY HO	LE 🗌 SHALLOW (UNCON	FINED)	STATIC IN COM (FT)	WATER LEVEL PLETED WELL N/A	A DATE STATIC	MEASU 022
DRILLING FLUID: AIR MUD	ADDITIVES - SPEC	FY:		1		
DRILLING METHOD: ROTARY HAMMER CAP	BLE TOOL 🔽 OTHER - SPEC	FY: H	Hollow Stem	Auger CHECK H	IERE IF PITLESS ADAI ED	PTER IS
DEPTH (feet bgl) BORE HOLE CASING	MATERIAL AND/OR	~	SING	CASING	CASING WALL	SI
FROM TO DIAM (include (inches) note	GRADE CON (include each casing string, and note sections of screen) (add con			INSIDE DIAM. (inches)	THICKNESS (inches)	SLZ (incl
0 55 ±6.5	Boring-HSA		æ.			
				DOE DI JU	10 2022 ++013	4
DEPTH (feet bgl) DODE HOLE	IST ANNUI AD SEAL MAT	FRIAL	AND	AMOUNT	METHO	
FROM TO DIAM. (inches) GRA	VEL PACK SIZE-RANGE	BY INTE	ERVAL	(cubic feet)	PLACEN	MENT
		_		6	1	
						-
				WELL RECORD A	LOG (Version 01/2	8/2022
ENO. (- UNDO	POD NO. POR	21	TRN 1	NO. 7259	ss log (version 01/2	0/2022

	DEPTH (feet	t bgl)		CO	LOR ANI	D TYPE OF	MATERIAL	ENCOUN	TERED -		WA	TER	ESTIMATE
	FROM	то	THICKNESS (feet)	INCLUD (at	E WATE	R-BEARIN plemental s	G CAVITIES heets to fully	OR FRAC	CTURE ZONE all units)	s	BEAR (YES	ING? /NO)	WATER- BEARING ZONES (gpm
	0	6	6	Sa	nd, Fine-g	grained, poo	ly graded, 2.	5 YR 3/6, 1	Dark Red	- 1	Y	√N	
	6	19	13	Sand, Fine-gra	ained, poo	orly graded,u	nconsolidate	d, 7.5 YR	7/6, Reddish	Yellow	Y	√N	
	29	55	36	Sand, Fin	ne-grained	l, poorly gra	ded, with Ca	liche, 7.5 Y	R 75/6, Brow	n	Y	√ N	-
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			c	otton Draw U	nit 252H	C.				OSE DI	ALLE TI	1020	22 amg:24
	PRINT NAME	(S) OF D	RILL RIG SUPE	RVISOR(S) TH	AT PRO	VIDED ON	SITE SUPER	VISION O	OF WELL CON	NSTRUC	TION O	THER TI	HAN LICENSE
	THE UNDERS CORRECT RE AND THE PER Jack Att	SIGNED I CORD O RMIT HO	HEREBY CERTI OF THE ABOVE	FIES THAT, TO DESCRIBED H 30 DAYS AFTI	O THE B IOLE AN ER COMI Jac	EST OF HIS D THAT H PLETION O Skie D. Atk	S OR HER K E OR SHE W F WELL DR ins	NOWLED TLL FILE ILLING:	GE AND BE THIS WELL	LIEF, TH RECORI	E FORI D WITH 6/9	GOING THE ST	IS A TRUE AN ATE ENGINER
		SIGNAT	URE OF DRILL	ER / PRINT S	SIGNEE	NAME			-			DATE	
	H- C	SIGNAI	C 22 C 75 C 80 2 K 3	17. A. A. A. A. A.	ALC: NO POLY &								
08	OSE INTERNA	AT LISE					1010		WP-20 W/	ELL REC	ORD	1.06 (V	ersion 01/28/202



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CATIO	WELL OWNER N Devon Energy	AME(S) Resou	rces					PHONE (OPTIC	ONAL)	10 2	-
VELL LO	WELL OWNER M 64888 Seven H	AILING Rivers I	ADDRESS Highway					CITY Artesia		STATE NM 88210	ZIP
A UND A	WELL LOCATION	LAT	DE	egrees 32	minutes 09'	SECOND 55.8'	n N	• ACCURACY	REQUIRED: ONE TEN	TH OF A SECOND	
GENER	(FROM GPS)	LON	GITUDE G WELL LOCATION TO	103 STREET ADDRES	43' S AND COMMO	07.5' ON LANDMAI	W RKS – PLS	• DATUM REC	QUIRED: WGS 84 WNSHJIP, RANGE) WH	ERE AVAILABLE	-
_	LICENSE NO. 1833		NAME OF LICENSED	DRILLER	ason Maley	-			NAME OF WELL DR	ILLING COMPANY	-
	DRILLING STAR 6-1-23	TED	DRILLING ENDED 6-1-23	DEPTH OF COMP	LETED WELL	(FT)	BORE HO	LE DEPTH (FT) 55'	DEPTH WATER FIR:	ST ENCOUNTERED (FT Dry)
NC	COMPLETED WI	ELL IS:	ARTESIAN *add Centralizer info be	DRY HOLE	SHALI	.OW (UNCON	FINED)	STATIC IN COMI (FT)	WATER LEVEL PLETED WELL D	TY DATE STATIC	MEASUREI
RMATIC	DRILLING FLUID); IOD: 🔽	AIR ROTARY HAMM	MUD MER CABLE		IVES – SPECI HER – SPECI	FY: FY:	-	CHECK	HERE IF PITLESS ADA LED	PTER IS
SING INFO	DEPTH (feet bgl) FROM TO		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)		ND/OR g, and	C/ CONI	ASING NECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches
CA	0	45	6	note sec 2" P	note sections of screen) (add coupling diameter 2" PVC SCH 40 Thread		ling diameter) 'hread	2"	SCH 40	-	
2. DRILLING &	45	55	6	2" P	VC SCH 40		T	Thread	2"	SCH 40	.02
	DEPTH (fee	t bgl)	BOBE HOLE	LIST ANNULA	R SEAL MAT	ERIAL AND	GRAVE	L PACK SIZE-	AMOUNT	METHO	DOF
ERIAL	FROM	то	DIAM. (inches)	*(if using Centra	RANGE alizers for Arte None pul	BY INTERV. sian wells- in led and plug	AL dicate the ged	e spacing below)	(cubic feet)	PLACE	MENT
3. ANNULAR MATI									OCC DIT JUN	132023 pm2:10	1

325

255

LOCATION

20

332

WELL TAG ID NO.

NA

PAGE 1 OF 2

	DEPTH (feet bgl)		COLOR AND TYPE OF MATERIAL ENCOUNTE	RED -	WATER	ESTIMATED
	FROM TO	THICKNESS (feet)	INCLUDE WATER-BEARING CAVITIES OR FRACTU (attach supplemental sheets to fully describe all u	JRE ZONES units)	BEARING? (YES / NO)	WATER- BEARING ZONES (gpm
	0 30	30	White Caliche		Y ↓N	
	30 55	25	Brown fine sand		Y √N	
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					Y N	
		1			Y N	
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WEI				1	Y N	
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KO	6 To 3 To 4	1.		1	Y N	
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1		10000		1	Y N	
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		1.000			Y N	
					Y N	
	METHOD USED TO	ESTIMATE YIELD	OF WATER-BEARING STRATA:	TOTA	L ESTIMATED	•
		AIR LIFT	BAILER OTHER – SPECIFY:	WEL	L YIELD (gpm):	0
	WELL TEST TE	ST RESULTS - ATT	ACH A COPY OF DATA COLLECTED DURING WELL TES ME, AND A TABLE SHOWING DISCHARGE AND DRAWD	TING, INCLUDIN	G DISCHARGE	METHOD
Z	51.	ART THEL, LIND TH		OWN OVER THE	E TESTING PERIC	D.
NOISI	MISCELLANEOUS	INFORMATION:		OOWN OVER THE	E TESTING PERIC	DD.
I; RIG SUPERVISION	MISCELLANEOUS	INFORMATION:		USE ()	TESTING PERIC	23 PM2107
5. IEST; KIG SUPERVISION	MISCELLANEOUS PRINT NAME(S) OF Jason Maley	INFORMATION:	VISOR(S) THAT PROVIDED ONSITE SUPERVISION OF W	USE ()	TESTING PERIC	23 PM2:07
GNATURE 5. TEST; RIG SUPERVISION	PRINT NAME(S) OF Jason Maley THE UNDERSIGNE CORRECT RECORI AND THE PERMIT	TORILL RIG SUPER	VISOR(S) THAT PROVIDED ONSITE SUPERVISION OF W IES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE ESCRIBED HOLE AND THAT HE OR SHE WILL FILE TH 0 DAYS AFTER COMPLETION OF WELL DRILLING: Jason Maley	USE () VELL CONSTRUC	TESTING PERIC	23 PM2:07 HAN LICENSEE
B. SIGNALUKE 3. LEST; KIG SUPERVISION	PRINT NAME(S) OF Jason Maley THE UNDERSIGNE CORRECT RECORD AND THE PERMIT	TORILL RIG SUPER	VISOR(S) THAT PROVIDED ONSITE SUPERVISION OF W IES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE ESCRIBED HOLE AND THAT HE OR SHE WILL FILE TH 0 DAYS AFTER COMPLETION OF WELL DRILLING: Jason Maley R/ PRINT SIGNEE NAME	VELL CONSTRUCT AND BELIEF, THE IS WELL RECOR	TESTING PERIC IT JUN 13 202 TION OTHER TH HE FOREGOING I D WITH THE ST/ 6-7-23 DATE	23 Pa(2;07 IAN LICENSEI
W SIGNATURE STEST; KIG SUFERVISION	PRINT NAME(S) OI Jason Maley THE UNDERSIGNE CORRECT RECORI AND THE PERMIT	TORILL RIG SUPER	VISOR(S) THAT PROVIDED ONSITE SUPERVISION OF W IES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE ESCRIBED HOLE AND THAT HE OR SHE WILL FILE TH 0 DAYS AFTER COMPLETION OF WELL DRILLING: Jason Maley PRINT SIGNEE NAME	VELL CONSTRUC	TESTING PERIC IT JUN 13 202 TION OTHER TH HE FOREGOING I D WITH THE STA 6-7-23 DATE	23 PM2:07 HAN LICENSEI



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	POD 1 (TW-1)				N/A	N/A C-4634								
WELL OWNER NAME(S) Devon Energy					PHONE (OPTIONAL) 575-748-1838									
WELL OWNER MAILING ADDRESS 6488 7 Rivers Hwy						CITY STATE ZIP Artesia NM 88210								
	WELL LOCATION LATIT		D	egrees 32	MINUTES SI 8	SECONDS 17.23	N	ACCURACY REQUIRED: ONE TENTH OF A SECOND						
	(FROM GPS)	LON	NGITUDE	103	40	4.33	w	DATUM REQUIRED: WGS 84						
Ī	DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE SE SW SW Sec.10 T25S R32S NMPM													
LICENSE NO. NAME OF LICENSED 1249			DRILLER Jackie D. Atkins				NAME OF WELL DRILLING COMPANY Atkins Engineering Associates, Inc.							
DRILLING STARTED DRILLING ENDED 6/7/2022 6/7/2022		DEPTH OF COMPLETED WELL (FT) BORE HOU Temporary Well			LE DEPTH (FT) ±55	E DEPTH (FT) DEPTH WATER FIRST ENCOUNTERED (FT) 55 N/A								
COMPLETED WELL IS: TARTESIAN			DRY HOLE SHALLOW (UNCONFINED)			STATIC IN COM (FT)	WATER LEVEL DATE STATIC N (PLETED WELL N/A 6/13/2)			MEASU 2022				
DRILLING FLUID: AIR MUD ADDITIVES - SPECIFY:														
DRILLING METHOD: ROTARY HAMMER CABLE TOOL OTHER-SPECIFY: Hollow Stem Auger										PTER IS				
DEPTH (feet bgl) BORE HOLE		CASING MATERIAL AND/OR		ASING	CASING		CASD	ASINGWALL						
ſ	FROM TO DIAM (inches)		GRADE (include each casing string, and note sections of screen) (add cour		NECTION TYPE ling diameter)	INSIDE DIAM. T (inches)		THI (i	HICKNESS (inches) (in					
	0	55	±6.5		Boring-HSA				-		-			
	DEPTH	at he?)									T			
	DEPTH (reet bgi) BORE HOLE FROM TO		LIST ANNULAR SEAL MATERIAL AN GRAVEL PACK SIZE-RANGE BY INTERV			ND AMOUNT RVAL (cubic feet)		METHOD OF PLACEMENT						
									OSE DIT JUN 16			1022 or 3:13		
	OSEINTERNI	AL USE				-		WR-2	WELL	RECORD &	1060	Version 01/2	8/2022)	

	7037	TODIO. POD	I IRN NO. TLOU	$\left(+ \right)$
LOCATION 750	5 322, 10	4:33	WELL TAGID NO. N. MA	PAGE 1 OF 2

	DEPTH (feet	bgl)	COLOR AND TYPE OF MATERIAL ENCOUNTERED -			WATER		ESTIMATED YIELD FOR				
	FROM	то	(feet)	INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)			ING? / NO)	WATER- BEARING ZONES (gpm				
	0	4	4	Sand, Fine-grained, poorly graded, 2.5 YR 3/6, Dark Red		Y	√N	1-2-2				
	4	14	10	Caliche, with Fine-grained sand, 7.5 YR 7/4, Pink		Y	√N					
	14	55	41	Sand, Fine-grained, poorly graded, with Caliche, 7.5 YR 7/6, Reddish Y	ellow	Y	√N					
1						Y	N					
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IJ						Y	N					
						Y	N	-				
	METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:						ATED					
	PUMP AIR LIFT BAILER OTHER - SPECIFY: WEI							0.00				
RIG SUPERVISION	WELL TEST TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.											
	MISCELLANEOUS INFORMATION: Temporary well material removed and soil boring backfilled using drill cuttings from total depth to ten fee below ground surface(bgs), then hydrated bentonite chips ten feet bgs to surface. 32 CDU 237 OSE 501 JUN 16 2022 PM3:13											
	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE											
	PRINT NAME	C	Shane Eldridge, Cameron Pruitt									
	PRINT NAME(, Camer	EREBY CERTIN	HES THAT TO THE REST OF HIS OP HEP KNOWLEDGE AND BE	IFF THE	FORE	GOING	S A TRUE AN				
	PRINT NAME(Shane Eldridge, THE UNDERSI CORRECT REC AND THE PERM	GNED H CORD OI MIT HOI	IEREBY CERTII F THE ABOVE I LDER WITHIN 3	FIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BEI DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL 30 DAYS AFTER COMPLETION OF WELL DRILLING:	LIEF, THE RECORD	FORE	GOING I THE ST	S A TRUE AN ATE ENGINEE				
	PRINT NAME(Shane Eldridge, THE UNDERSI CORRECT REC AND THE PERN Jack Atk	, Camer GNED H CORD OI MIT HOI	EREBY CERTIN	FIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BEI DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL 30 DAYS AFTER COMPLETION OF WELL DRILLING: Jackie D. Atkins	LIEF, THE RECORD	FORE WITH 6/16	GOING I THE ST/ /2022	S A TRUE AN ATE ENGINEE				
	PRINT NAME(Shane Eldridge, THE UNDERSIA CORRECT REC AND THE PERM Jack Atte	, Camer GNED H CORD OI MIT HOI Kins	EREBY CERTII F THE ABOVE I LDER WITHIN :	FIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BEI DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL 30 DAYS AFTER COMPLETION OF WELL DRILLING: Jackie D. Atkins ER / PRINT SIGNEE NAME	LIEF, THE RECORD	FORE WITH 6/16	GOING I THE ST/ /2022 DATE	S A TRUE AN ATE ENGINEE				
OH	PRINT NAME(Shane Eldridge, THE UNDERSI CORRECT REC AND THE PERI Jack Atk S	, Camer GNED H CORD OI MIT HOI Eins SIGNATI	EREBY CERTIN THE ABOVE I LDER WITHIN : URE OF DRILLE	FIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BEI DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL 30 DAYS AFTER COMPLETION OF WELL DRILLING: Jackie D. Atkins BR / PRINT SIGNEE NAME WR-20 WF	LIEF, THE RECORD	6/16,	GOING I THE ST/ /2022 DATE LOG (Ve	S A TRUE AN ATE ENGINEE				

USGS 321005103402301 24S.32E.33.42241 AKA USGS-14343

Lea County, New Mexico Hydrologic Unit Code 13070001 Latitude 32°10'21.6", Longitude 103°40'18.9" NAD83 Land-surface elevation 3,499.00 feet above NGVD29 The depth of the well is 367 feet below land surface. This well is completed in the Other aquifers (N99990THER) national aquifer. This well is completed in the Chinle Formation (231CHNL) local aquifer.



USGS 320956103353801 25S.33E.05.12122 AKA USGS-14380

Lea County, New Mexico Hydrologic Unit Code 13070007 Latitude 32°09'59.4", Longitude 103°35'47.2" NAD83 Land-surface elevation 3,473.00 feet above NGVD29 This well is completed in the Other aquifers (N9999OTHER) national aquifer. This well is completed in the Santa Rosa Sandstone (231SNRS) local aquifer.



USGS 320643103465002 25S.31E.21.413314A AKA USGS-8935

Received by OCD: 2/5/2024 2:14:02 PM

The depth of the well is 400 feet below land surface.

This well is completed in the Pecos River Basin alluvial aquifer (N100PCSRVR) national aquifer.

This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.


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SITE PHOTOGRAHS

Released to Imaging: 2/16/2024 9:12:57 AM



SP1 – View south from the northwest corner of the working pad for the Cotton Draw Recycling Facility and AST. Fresh water frac ponds are on the horizon and the nature of the vegetation and landscape are on the right side of the image.



SP2 – View west from same location as above show the outline of the Guadalupe Mountains on the horizon. The area is characterized by low sand dunes that are stabilized by vegetation.



SP3 – The Cover Shot with the Guadalupe Mountains obscured by the fence! Next time we will use more art with our images.

Venegas, Victoria, EMNRD

From:	Venegas, Victoria, EMNRD
Sent:	Friday, February 16, 2024 9:11 AM
То:	'Chad Gallagher'
Subject:	1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139]
Attachments:	C-147 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139].pdf

1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139]

Good morning Mr. Gallagher,

NMOCD has reviewed the recycling containment permit application and related documents, submitted by [371643] SOLARIS WATER MIDSTREAM, LLC on 02/05/2024 Application ID: 311387, for 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] in Unit Letter A, Section 09, Township 25S, Range 32E, Lea County, New Mexico.

[371643] SOLARIS WATER MIDSTREAM, LLC requested variances from 19.15.34 NMAC for 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139].

The following general variances have been approved:

- The variance to 19.15.34.14 NMAC Table I for the use of alternate analytical method 8015/8015M for total petroleum hydrocarbons (TPH) is approved.
- The variance to 19.15.34.14 NMAC Table I for the use of alternate analytical method EPA 300.0 or SM4500 for the analysis of chloride is approved.
- The variance to 19.15.34.12.A.(2) NMAC for the no side-slope requirement for the AST containment with vertical walls is approved.
- The variance to 19.15.34.12.A.(3) NMAC for the liners to be anchored to the top of the AST steel walls with clips and no anchor trenches is approved.
- The variance to 19.15.34.12.A.(4) NMAC for the installation on the AST containment of a 30-mil non-reinforced LLDPE secondary liner is approved.
- The variance to 19.15.34.12.A.(4) NMAC for the installation on the AST containment of a 40-mil non-reinforced LLDPE primary liner is approved.

The proposed liner system cross-section for the earthen containment is as follows: prepare subgrade, Underlayment 8oz Geotextile, Secondary Liner 40-mil HDPE Smooth Liner-Black, Leak Detection 200-mil Geonet, Primary Liner 60-mil HDPE Smooth Liner-Black.

The form C-147 and related documents for 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] is approved with the following conditions of approval:

- The purpose of this permit is for oil and gas activities regulated under the NMAC 19.15.34.3 STATUTORY AUTHORITY: 19.15.34 NMAC is adopted pursuant to the Oil and Gas Act, Paragraph (15) of Section 70-2-12(B) NMSA 1978, which authorizes the division to regulate the disposition of water produced or used in connection with the drilling for or producing of oil and gas or both and Paragraph (21) of Section 70-2-12(B) NMSA 1978 which authorizes the disposition of nondomestic wastes from the exploration, development, production or storage of crude oil or natural gas.
- 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] is approved for five years of
 operation from the date of permit application of February 05, 2024.

- 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] permit expires on February 05, 2029. If [371643] SOLARIS WATER MIDSTREAM, LLC wishes to extend operations past five years, an annual permit extension request must be submitted using an OCD form C-147 through <u>OCD Permitting</u> by January 05, 2029.
- 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] consists of one (1) above ground tanks containment (AST) of 40,000.00 BBL. The total fluid capacity of 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] is 40,000.00 BBL.
- The total closure cost estimated of 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] in the amount of \$50,500.00, meets the requirements of NMAC 19.15.34.15.A. The financial assurance should be mailed to Oil Conservation Division; Administration and Compliance Bureau; 1220 South St Frances Drive; Santa Fe, NM 87505.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall construct, operate, maintain, close, and reclaim 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] in compliance with NMAC 19.15.34 NMAC.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall notify OCD, through <u>OCD Permitting</u>, when construction of 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] commences.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall notify NMOCD through <u>OCD Permitting</u> when recycling operations commence and cease at 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139].
- A minimum of 3-feet freeboard must be maintained at 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] at all times during operations.
- If less than 20% of the total fluid capacity is utilized every six months, beginning from the first withdrawal, operations of the 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] is considered ceased and a notification of cessation of operations should be sent electronically to <u>OCD Permitting</u>. A request to extend the cessation of operation, not to exceed six months, may be submitted using a C-147 form through <u>OCD Permitting</u>. If after that 6-month extension period, the 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] is not utilized at a minimum of 20% fluid capacity, no additional extensions would be granted, and the operator would be directed to remove all fluids and proceed with the closure requirements.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall submit monthly reports of recycling and reuse of produced water drilling fluids, and liquid oil field waste on OCD form C-148 via <u>OCD Permitting</u> even <u>if there is zero activity</u>.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the log available for review by the division upon request according to 19.15.34.13.A.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall comply with 19.15.29 NMAC Releases in the event of any release
 of produced water or other oil field waste at 1RF-511 COTTON DRAW RF AND CONTAINMENT FACILITY ID
 [fVV2333239139].

Please reference number 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] in all future communications. Regards,

Victoria Venegas • Environmental Specialist Environmental Bureau EMNRD - Oil Conservation Division 506 W. Texas Ave. Artesia, NM 88210 (575) 909-0269 | <u>Victoria.Venegas@emnrd.nm.gov</u> https://www.emnrd.nm.gov/ocd/



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

CONDITIONS

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

Operator:	OGRID:
SOLARIS WATER MIDSTREAM, LLC	371643
907 Tradewinds Blvd, Suite B	Action Number:
Midland, TX 79706	311387
	Action Type:
	[C-147] Water Recycle Long (C-147L)

Created By	Condition	Condition Date	
vvenegas	• 1RF-511 - COTTON DRAW RF AND CONTAINMENT FACILITY ID [fVV2333239139] permit expires on February 05, 2029. If [371643] SOLARIS WATER MIDSTREAM, LLC wishes to extend operations past five years, an annual permit extension request must be submitted using an OCD form C-147 through OCD Permitting by January 05, 2029.	2/16/2024	

Action 311387

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