District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

HOBBS OCD

NOV 01 2018

RECEIVED

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

Form C-101
Revised July 18, 2013

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address	2. OGRID Number
Solaris Water Midstream, LLC 701 Tradewinds Blvd., Suite C, Midland, TX 79706	371643
	3. API Number 30-025- 45324

4. Property Code	5. Property Name	6. Well No.
320472 (TBD)	Athena ~~SWD~~ 28 SWD	1

7. Surface Location
(To be verified by field survey)

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
E	28	20S	34E		2198	FNL	350	FWL	LEA

8. Proposed Bottom Hole Location
(To be verified by field survey)

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
E	28	20S	34E		2198	FNL	350	FWL	LEA

9. Pool Information

Pool Name	Pool Code
SWD; Devonian-Silurian	97869

Additional Well Information

11. Work Type	12. Well Type	13. Cable/Rotary	14. Lease Type	15. Ground Level Elevation
N	SWD	R	P	3695'
16. Multiple	**17. Proposed Depth**	**18. Formation**	**19. Contractor**	**20. Spud Date**
No	16,250'	Fusselman	Latshaw	11/15/2018

Depth to Ground water	Distance from nearest fresh water well	Distance to nearest surface water
90'	3740'	n/a

☒ **We will be using a closed-loop system in lieu of lined pits**

SWD-1707

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	26.5"	20.0"	94.0 lb/ft	1550'	2100	SURFACE
Intermediate	17.5"	13.375"	68.0 lb/ft	~~5725'~~ 3950	1750	SURFACE
Production	12.25"	9.875"	62.8 lb/ft	12,000'	2300	SURFACE
Liner	8.5	7.625"	39.0 lb/ft	11,700'-14,950'	450	TOL
Openhole	6.5	--	--	14,950'-16,250'		

Casing/Cement Program: Additional Comments

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Hydraulic/Blinds, Pipe	10000 (10M)	10000	Shaffer or Equivalent

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. **I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☐, if applicable.** Signature: Ben Stone	OIL CONSERVATION DIVISION
Printed name: Ben Stone	Approved By:
Title: Agent for Solaris Water Midstream, LLC	Title: Petroleum Engineer
E-mail Address: ben@sosconsulting.us	Approved Date: 11/02/18 Expiration Date: 11/02/20
Date: 11/01/2018 Phone: 903-488-9850	Conditions of Approval Attached

See Attached Conditions of Approval

Solaris Water Midstream, LLC

Athena SWD Well No. 1
2198' FNL & 350' FWL
Section 28, Twp 20-S, Rng 34-E
Lea County, New Mexico

Well Program - New Drill

Objective: Drill new well for commercial salt water disposal into the Devonian, Silurian and Fusselman (mudlogging and e-logging to determine final depths) per SWD-(pending).

1. **Geologic Information** - Devonian Formation

The Devonian, Silurian and Fusselman all consist of carbonates including light colored dolomite and chert intervals interspersed with some tight limestone intervals. Several thick sections of porous dolomite capable of taking water are present within the subject formations in the area. Depth control data was inferred from deep wells to the north, south and east. If the base of Devonian and top of Silurian and/or Ordovician rocks come in as expected the well will only be drilled deep enough for adequate logging rathole.

Estimated Formation Tops:

B/Fresh Water	300
B/Salt	3065
Delaware Lamar	3255
Delaware Sand	5705
Bone Spring	7075
Wolfcamp	10265
Strawn	12635
Atoka	12835
Morrow	13310
Mississippian	14220
Woodford Shale	14770
Devonian	14955
TD Silurian*	16250
Fusselman	16500
Ellenburger	20000

*Please see narrative portion of drilling/pipe specs for TD options.

2. **Drilling Procedure**

a. MIRU drilling rig and associated equipment. Set up H_2S wind direction indicators; brief all personnel on Emergency Evacuation Routes.
b. All contractors conduct safety meeting prior to current task. All equipment inspected daily. Repair / replace as required.
c. Well spud operations commence.
d. Mud logger monitoring returns; cuttings & waste hauled to specified facility. (Sundance, Lea County)
e. After surface casing set/drilled; if H_2S levels >20ppm detected, implement H_2S Plan accordingly. (e.g., cease operations, shut in well, employ H_2S safety trailer & personnel safety devices, install flare line, etc. - refer to plan.)
f. Spills contained & cleaned up immediately. Repair or otherwise correct the situation within 48 hours before resuming operations. Notify OCD within 24 hours. Remediation started ASAP if

Well Program - New Drill (cont.)

required. Operator shall comply with 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.

g. Sundry forms filed as needed - casing, cement, etc. - operations continue to completion.

3. **Casing program** - Casing designed as follows:

STRING	HOLE SZ	DEPTH	CSG SZ	COND	WT/GRD	CLLPS/BRS	TNSN
						(Minimum Safety Factors)	
Surface	26.5"	0-1550'	20.0"	New	94.0 lb. J/K-55 ST&C	1.125/1.1	1.8
Intermediate	17.5"	0-5725'	13.375"	New	68.0 lb. HCL-80 BT&C	1.125/1.1	1.8
Production	12.25"	0-12,000'	9.675"	New	53.5 lb. Q-125 LT&C	1.125/1.1	1.8
Liner*	8.5"	11,700'-14,950'	7.625"	New	39.0 lb. P-110 FJ	1.125/1.1	1.8
Openhole*	6.5" hole	14,950'-16,250'	OH	n/a	n/a	n/a	n/a

Notes:

- ✓ On both Intermediate casing strings, the cement will be designed to circulate to surface. Both strings will have cement bond logs run (radial, CET or equivalent) to surface.
- ✓ While running all casing strings, the pipe will be kept a minimum of 1/3 full at all times to avoid approaching the collapse pressure of casing.
- ✓ * Based on mudlogging and e-logs, 7.0" casing shoe is expected to be set at 14,950'. TD is expected to be 16,250' as determined by logging and suitable porosity has been exposed. Sundry notice will document such events and a C-105 completion report filed within 60 days.

4. **Cementing Program:**

Surface – LEAD Slurry: 1500 sacks of Class C containing 4% gel + 2% CaCl2 + .4 pps defoamer + .125 pps cello flake + 3 pps Koal Seal. Weight 13.7 ppg, yield 1.68 ft3/sack; TAIL Slurry: 800 sacks of Class C Neet containing 2% CaCl2. Weight 14.8 ppg, yield 1.34 ft3/sack; 100% excess, circulate to surface.

Intermediate – LEAD Slurry: 1,400 sacks of Class C containing 4% gel + .4 pps defoamer + .125 pps cello flake + 5% NaCl. Weight 13.2 ppg, yield 1.83 ft3/sack; TAIL Slurry: 350 sacks of Class C Neet. Weight 14.8 ppg, yield 1.32 ft3/sack; 50% excess, circulate to surface.

Production – Stage 1 LEAD Slurry: 1,600 sacks of 50/50 POZ containing 10% gel + .4 pps defoamer + .125 pps cello flake + 1 pps Koal Seal + 5% NaCL. Weight 11.9 ppg, yield 2.473 ft3/sack; TAIL Slurry: 400 sacks of Class H containing 2% retarder + .2 pps defoamer. Weight 15.6 ppg, yield 1.18 ft3/sack; 25% excess. DV TOOL ~5800'; Stage 2 LEAD Slurry: 700 sacks of 50/50 POZ containing 10% gel + .4 pps defoamer + .125 pps cello flake + 1 pps Koal Seal + 5% NaCL. Weight 11.9 ppg, yield 2.473 ft3/sack; TAIL Slurry: 700 sacks of Class H containing 2% retarder + .2 pps defoamer. Weight 15.6 ppg, yield 1.18 ft3/sack; 35% excess. circulate to surface.

Liner – Slurry: 450 sacks of 50/50 POZ Class H containing .3% retarder + .7% fluid loss additive + .2% dispersant + .4 pps defoamer +.1% Anti-Settling agent. Weight 15.2 ppg, yield 1.32 ft3/sack. 35% excess; TOC calculated @ Top of liner 11,700'.

Well Program - New Drill (cont.)

5. **Pressure Control** - BOP diagram is attached to this application. All BOP and related equipment shall comply with well control requirements as described NMOCD Rules and Regulations and API RP 53, Section 17. Minimum working pressure of the BOP and related equipment required for the drilling shall be 5000 psi. The NMOCD Hobbs district office shall be notified a minimum of 4 hours in advance for a representative to witness BOP pressure tests. The test shall be performed by an independent service company utilizing a test plug (no cup or J-packer). The results of the test shall be recorded on a calibrated test chart submitted to the OCD district office. Test shall be conducted at:

a. Installation;
b. after equipment or configuration changes;
c. at 30 days from any previous test, and;
d. anytime operations warrant, such as well conditions

6. **Mud Program & Monitoring** - Mud will be balanced for all operations as follows:

DEPTH	MUD TYPE	WEIGHT	FV	PV	YP	FL	Ph
0-1550'	FW Spud Mud	8.5-9.2	70-40	20	12	NC	10.0
1150'-5725'	Brine Water	9.8-10.2	28-32	NC	NC	NC	10.0
5725'-12,000'	FW/Gel	8.7-9.0	28-32	NC	NC	NC	9.5-10.5
12,000'-14,950'	XCD Brine Mud	11.0-	45-48	20	10	<5	9.5-10.5
14,950'-16,250'	FW Mud	8.4-8.6	28-30	NC	NC	NC	9.5-10.5

Mud and all cuttings monitored w/ cuttings recovered for disposal. Returns shall be visually and electronically monitored. In the event of H2S, mud shall be adjusted appropriately by weight and H2S scavengers.

7. **Auxiliary Well Control and Monitoring** – Hydraulic remote BOP operation, mudlogging to monitor returns.

8. **H_2S Safety** - This well and related facilities are not expected to have H2S releases. However, there may be H2S in the area. There are no private residences or pubic facilities in the area but a contingency plan has been developed. Solaris Water Midstream, LLC will have a company representative available to personnel throughout all operations. If H2S levels greater than 10ppm are detected or suspected, the H2S Contingency Plan will be implemented at the appropriate level.

H2S Safety - There is a low risk of H2S in this area. The operator will comply with the provisions of NMAC 19.15.11 and BLM Onshore Oil and Gas Order #6.

a) Monitoring - all personnel will wear monitoring devices.
b) Warning Sign - a highly visible H2S warning sign will be placed for obvious viewing at the vehicular entrance point onto location.
c) Wind Detection - two (2) wind direction socks will be placed on location.
d) Communications - will be via cellular phones and/or radios located within reach of the driller, the rig floor and safety trailer when applicable.
e) Alarms - will be located at the rig floor, circulating pump / reverse unit area and the flareline and will be set for visual (red flashing light) at 15 ppm and visual and audible (115 decibel siren) at 20 ppm.

Well Program - New Drill (cont.)

f) Mud program - If H2S levels require, proper mud weight, safe drilling practices and H2S scavengers will minimize potential hazards.
g) Metallurgy - all tublars, pressure control equipment, flowlines, valves, manifolds and related equipment will be rated for H2S service if required.

The Solaris Water Midstream, LLC H2S Contingency Plan will be implemented if levels greater than 10ppm H2S are detected.

9. **Logging, Coring and Testing** – Solaris Water Midstream, LLC expects to run;

a. Mud logging through the interval will ensure the target interval remains Devonian and Silurian.
b. CBL (Radial, CET or equivalent) on both intermediate casing strings.
c. Standard porosity log suite from TD to approximately 14,000'.
d. No corings or drill tests will be conducted. (The well may potentially be step rate tested in the future if additional injection pressures are required.)

10. **Potential Hazards** - No abnormal pressures or temperatures are expected.

No loss of circulation is expected to occur with the exception of drilling into the target disposal zone. All personnel will be familiar with the safe operation of the equipment being used to drill this well.

The maximum anticipated bottom-hole pressure is 8900 psi and the maximum anticipated bottom-hole temperature is 200° F.

11. **Waste Management** - All drill cuttings and other wastes associated with and drilling operations will be transported to the Lea County Sundance facility (or alternate), permitted by the Environmental Bureau of the New Mexico Oil Conservation Division.

12. **Anticipated Start Date** - Upon approval of all permits for SWD, operations would begin within 30 days. Completion of the well operations will take six to seven weeks. Installation of the tank battery, berms, plumbing and other and associated equipment would be occurring during the same interval. In any event, it is not expected for the construction phase of the project to last more than 60 days, depending on availability of contractors and equipment. At the time of this submittal, and subject to the availability of the drilling contractor, the anticipated start date is:

November 15, 2018

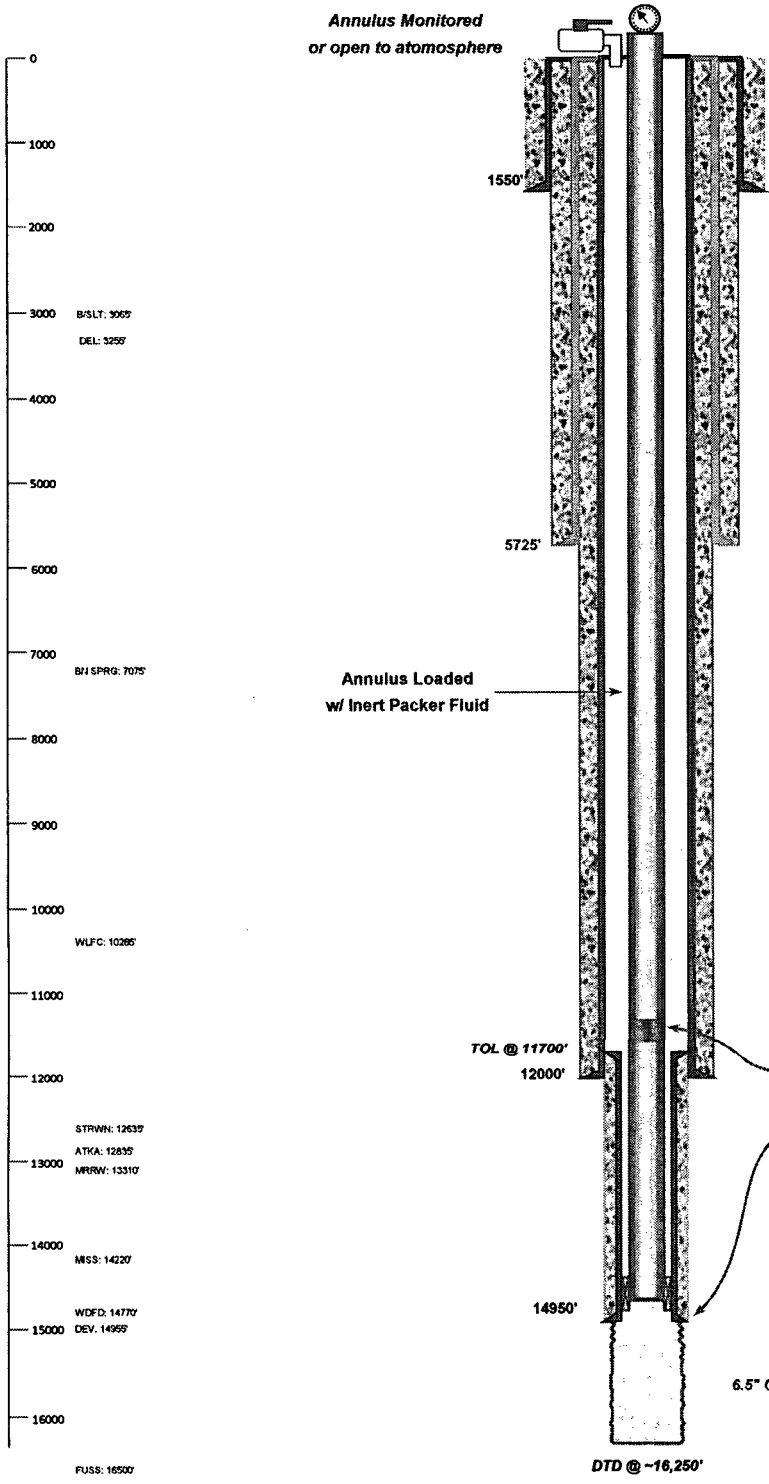
13. **Configure for Salt Water Disposal** – Subsequent to SWD permit approval from OCD and prior to commencing any work, an NOI sundry(ies) will be submitted to configure the well for SWD and will detail the completion workover including all work otherwise described above, any change to the procedure noted herein and to perform mechanical integrity pressure test per BLM and OCD test procedures. (Notify NMOCD 24 hours prior.) The casing/tubing annulus will be monitored for communication with injection fluid or loss of casing integrity. Anticipated daily maximum volume is 30,000 bpd and average of 20,000 bpd at a maximum surface injection pressure of 2990 psi (0.2 psi/ft to uppermost injection interval, i.e., casing shoe). If satisfactory disposals rates cannot be achieved at default pressure of .2 psi/ft, Solaris Water Midstream, LLC will conduct a step-rate test and apply for an injection pressure increase 50 psi below parting pressure.

SOLARIS
WATER MIDSTREAM, LLC

WELL SCHEMATIC - PROPOSED
Athena 28 SWD Well No.1

API 30-025-xxxxx
2198' FNL & 350' FWL, SEC. 28-T20S-R34E
LEA COUNTY, NEW MEXICO

SWD; Devonian-Silurian (97869)
Spud Date: 11/15/2018
SWD Config Dt: 1/03/2019



Surface Casing
20.0", 94.0# K-55 Csg. (26.0" Hole) @ 1550'
2100 sx - Circulated to Surface

Intermediate Casing
13.375", 68.0# Csg. (17.5" Hole) @ 5725'
1750 sx - Circulated to Surface

Solaris Water Midstream, LLC

Drill and set casing as designed w/ all strings cemented to surface.
Install 7.625" liner @ ~14,950 w/ 450 sx to TOL.
Drill 6.5" openhole to approx. 16,250' TD w/ mudlog for interval/ formation verification. Acidize formation;
run 5.5" (5.0" FJ inside liner) injection TBG on PKR set at 14,850'.+
Conduct OCD witnessed MIT.
Well ready for injection upon completion of surface facilities.

2nd Intermediate Casing
9.625", 53.5# P-110 Csg. (12.25" Hole) @ 12,000'
2300 sx - Staged; Circulate to Surface
(DV @ 3310'/ 7050')

Prod/LNR Casing
7.625", 39.0# P-110 Csg (8.5" Hole) 11,900' to 14,950'
450 sxs Cls H - TOC @ Top of LNR

Corrected Version
Drawn by: Ben Stone, Rvs'd 11/27/2017

CONDITIONS OF APPROVAL

API #	Operator	Well name & Number
30-025-45324	SOLARIS WATER MIDSTREAM	ATHENA 28 SWD # 001

Applicable conditions of approval marked with XXXXXX

Administrative Orders Required

XXXXXXXX	Reveiw administrative order when approved for additional conditions of approval

Other wells

Casing

XXXXXXX	SURFACE, INTERNEMIATE(1) & PRODUCTION CASING - Cement must circulate to surface -- Liner(1) Cement come to top of liner
XXXXXXX	**Surface casing must be set 25' below top of Rustler Anhydrite in order to seal off protectable water**
XXXXXXX	Intermediate case can be set no deeper than 500' below the base of the salt.

Lost Circulation

XXXXXXX	Must notify OCD Hobbs Office if lost circulation is encountered at 575-370-3186

Water flows

XXXXXXX	Must notify OCD Hobbs Office of any water flow in the Salado formation at 575-370-3186. Report depth and flow rate.

Stage Tool

XXXXXXX	Must notify OCD Hobbs Office prior to running Stage Tool at 575-370-3186
XXXXXXX	If using Stage Tool on Surface casing, Stage Tool must be greater than 350' and a minimum 200 feet above surface shoe.
XXXXXXX	When using a Stage Tool on Intermediate or Production Casing Stage must be a minimum of 50 feet below previous casing shoe.

Completion & Production

XXXXXXX	Will require a deviational survey with the C-105
XXXXXXX	Must notify Hobbs OCD office prior to conducting MIT (575) 393-6161 ext. 114
XXXXXXX	May not inject prior to SWD order approval
XXXXXXX	Must conduct & pass MIT prior to any injection