



**NGL Sidewinder SWD #1
Lea County NM**

Vertical Injection - Devonian, Silurian, Fusselman,
Montoya

AFE Number - tbd

Estimated Drilling Cost - \$9.23MM

TD - 19,067'

Directions to Site - Lat/Long 32.132843784/-103.453331886.
23.2 miles west of Jal NM on Hwy 128

Est. Drilling Days - 70

GL/KB - 3593'/3617'

Geologic Tops (MD ft)	Section	Problems	Bit/BHA	Mud	Casing	Logging	Cement (HOLD)	Injection String
Triassic - 193 Rustler Anhydrite - 848 Surface TD - 920	Surface Drill 24" 0' - 920' Set and Cement 20" Casing	Loss Circulation Hole Cleaning Wellbore stability in the Red Beds Anhydrite in the Rustler	24" Tricone 9-5/8" x 8" MM 9 jts: 8" DC 21 jts: 5" HWDP 5" DP to surface	Spud Mud MW< 9.0	920' of 20" 106.5# J55 BTC Centralizers - bottom 2 joints and every 3rd jt thereafter, Cement basket 5th jt from surface	No Logs	Thixotropic Cement 13.2 ppg Class C 3hr TT 25% Excess 1000psi CSD after 10hrs	
Top Salt - 973 Base of Silicates 1,313' Castile - 2816 Base Salt - 5023 ECP DV Tool - 5150 1st Int TD - 5200	1st Intermediate Drill 4300' of 17-1/2" Hole 900' - 5200' Set and Cement 13-3/8" Casing	Seepage Losses Possible H2S Anhydrite Salt Sections	17-1/2" PDC 9-5/8" x 8" MM 9 jts: 8" DC 21 jts: 5" HWDP 5" DP to surface		5M A Section Casing Bowl 5200' of 13-3/8" 68# HCL80 BTC Centralizers - bottom jt, every 3rd joint in open hole and 2 jt inside the surface casing	Mudlogger on site by 1250'	13.2 ppg Class C 4hr TT 10% Excess 1000psi CSD after 10 hrs Cement to Surface	11800' of 7" P110 26# TCPC
Delaware Mtn Group - 5295 Lamar Limestone - 5298 Bell Canyon - 5334 Cherry Canyon - 6367 Brushy Canyon - 8102 DV Tool - 9000 Bone Spring - 9242 3rd Int Liner Top - 11,900 Wolfcamp - 12288 2nd Int TD - 12,400	2nd Intermediate Drill 7200' of 12-1/4" Hole 5200' - 12400' Set 9-5/8" Intermediate Casing and Cement in 3 Stages	Hard Drilling in the Brushy Canyon Seepage to Complete Loss Water Flows Some Anhydrite H2S possible Production in the Bone Spring and Wolfcamp Ballooning is possible in Cherry Canyon and Brushy if Broken Down	12-1/4" PDC 8" MM 9jts: 8" DC 8" Drilling Jars 21 jts: 5" HWDP 5" DP to Surface	8.5 ppg OBM High Vis Sweeps UBD/MPD usig ADA	10M B Section 124000' of 9-5/8" 53.5# P110 BTC Special Drift to 8.535" Externally Coat 4000' Between DV Tools DV tool at at 9000' ECP DV Tool 15' inside Previous Casing Centralizers - bottom jt, 100' aside of DV tool, every 3rd joint in open hole and 5 within the surface casing	MWD GR Triple combo + CBL of 13-3/8" Casing	Stage 3: 13.2 ppg Class C 5hr TT 10% XS 1000psi CSD after 10 hrs Cement to Surface Stage 2: 13.2 ppg Class H 5hr TT 10% XS 1000psi CSD after 10 hrs Cement to Surface Stage 1: 13.2 ppg Class H 6hr TT 10% XS 1000psi CSD after 10 hrs Cement to Surface	5307' of 5-1/2" P110 17# TCPC Duoline Internally Coated Injection Tubing
Penn - 13292 Strawn - 13820 Atoka - 14017 Morrow - 14974 Miss 1st - 15022 Woodford - 16980 Perm Packer - 17107 3rd Int TD - 17,157	3rd Intermediate Drill 4757' of 8-1/2" Hole 12400' - 17157' Set 7-5/8" Liner and Cement in Single Stage	High Pressure (up to 15ppg) and wellbore instability (fracturing) expected in the Atoka Production in the Wolfcamp Atoka and Morrow Hard Drilling in the Morrow Clastic	8-1/2" PDC 6-3/4" MM 9 jts: 6" DC 21 jts: 5" HWDP 5" DP to Surface	12.5 ppg OBM UBD/MPD using ADA	5257' of 7-5/8" 39# Q125 - DTL (FJ4) FJ (Gas Tight) VersaFlex Packer Manger Centralizers on and 1 jt above shoe jt and then every 2nd jt.	MWD GR Triple combo, CBL of 9- 5/8" Casing	15.6 ppg Class H 8hr TT 10% Excess 1000psi CSD after 10hrs	7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and full Inconel 925 trim
Devonian - 17,157 Silurian - 18116 Fusselman - 18217 Montoya - 18,967' TD - 19,067'	Injection Interval Drill 191' of 6-1/2" hole 16,157 to 19,067'	Chert is possible Loss of Circulation is expected H2S encountered on the Striker 3 well BHT estimated at 280F	6-1/2" PDC 4-3/4" MM 9 jts: 4-3/4" DC 4-3/4" Drilling Jars 18 jts: 4" FH HWDP 4" FH DP to Surface	Fresh Water - possible flows	Openhole completion	MWD GR Triple Combo with FMI, CBL of 7-5/8"	Displace with 3% KCl (or heavier brine if necessary)	

NGL Water Solutions Permian, LLC

Sidewinder SWD No. 1

FORM C-108 Supplemental Information

III. Well Data

A. Wellbore Information

1.

Well information	
Lease Name	Sidewinder SWD
Well No.	1
Location	S-15 T-25S R-34E
Footage Location	1,755' FNL & 18' FEL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate	Production	Liner
OD	20"	13.375"	9.625"	7.625"
WT	0.500"	0.480"	0.545"	0.500"
ID	19.000"	12.415"	8.535"	6.625"
Drift ID	18.812"	12.259"	8.535"	6.500"
COD	21.00"	14.375"	10.625"	7.625"
Weight	106.5 lb/ft	68 lb/ft	53.5 lb/ft	39 lb/ft
Grade	J-55	HCL-80	P-110	Q-125
Hole Size	24"	17.5"	12.25"	8.5"
Depth Set	920'	5,200'	12,400'	17,157'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate	Production	Liner
Lead Cement	C	C	H,H,C	H
Lead Cement Volume	416	1,274	Stage 1: 443 sks Stage 2: 521 sks Stage 3: 709 sks	188
Tail Cement	C	C	H,H,C	H
Tail Cement Volume	803	1,327	Stage 1: 414 sks Stage 2: 443 sks Stage 3: 272 sks	176
Cement Excess	25%	10%	10%	10%
TOC	Surface	Surface	Surface	11,900'
Method	Circulate to Surface	Circulate to Surface	Circulate to Surface	Logged

3. Tubing Description

Tubing Information		
OD	7"	5.5"
WT	0.362"	0.304"
ID	6.276"	4.892"
Drift ID	6.151"	4.767"
COD	7.875"	6.050"
Weight	26 lb/ft	17 lb/ft
Grade	P-110 TCPC	P-110 TCPC
Depth Set	0'-11,800'	11,800'-17,107'

Tubing will be lined with Duoline.

4. Packer Description

7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and Full Inconel

B. Completion Information

1. Injection Formation: Devonian, Silurian, Fusselman, Montoya (Top 100')

2. Gross Injection Interval: 17,157' – 19,067'

Completion Type: Open Hole

3. Drilled for injection.

4. See the attached wellbore schematic.

5. Oil and Gas Bearing Zones within area of well:

Formation	Depth
Delaware	5,295'
Bone Spring	9,242'
Wolfcamp	12,288'
Atoka	14,017'
Morrow	14,974'

VI. Area of Review

No wells within the area of review penetrate the proposed injection zone.

VII. Proposed Operation Data

1. Proposed Daily Rate of Fluids to be Injection:

Average Volume: 40,000 BPD
Maximum Volume: 50,000 BPD

2. Closed System

3. Anticipated Injection Pressure:

Average Injection Pressure: 2,574 PSI (surface pressure)
Maximum Injection Pressure: 3,431 PSI (surface pressure)

4. The injection fluid is to be locally produced water. Attached are produced water sample analyses taken from the closest wells that feature samples from the Avalon, Delaware, Bone Spring, and Wolfcamp formations.
5. The disposal interval is non-productive. No water samples are available from the surrounding area.

VIII. Geological Data

The Devonian formation is a dolomitic ramp carbonate that occurs below the Woodford shale and above the Fusselman formation. Strata found in the Devonian formation include two major groups, the Wristen Buildups and the Thirtyone Deepwater Chert, with the Wristen being more abundant. The Wristen Groups is composed of mixed limestone and dolomites with mudstone to grainstone and boundstone textures. Porosity in the Wristen group is a result of both primary and secondary development. Present are moldic, vugular, karstic (including collapse breccia) features that allow for higher porosities and permeabilities. The Thirtyone Formation contains two end-member reservoir facies, skeletal packstones/grainstones and spiculitic chert, with most of the porosity and permeability found in the coarsely crystalline cherty dolomite. These particular characteristics allow for this formation to be a tremendous Salt Water Disposal horizon.

A. Injection Zone: Siluro-Devonian Formation

Formation	Depth
Rustler	848'
Salado	1,313'
Delaware	5,295'
Bone Spring	9,242'
Wolfcamp	12,288'
Penn	13,292'
Atoka	14,017'
Morrow	14,974'
Mississippian Lime	16,657'
Woodford	16,980'
Devonian	17,157'

B. Underground Sources of Drinking Water

Within 1-mile of the proposed Sidewinder SWD #1 location, there are two water wells with depths of 175 ft and a water depth of 135 ft. Water wells in the surrounding area have an average depth of 332 ft and an average water depth of 224 ft generally producing from the Santa Rosa. The upper Rustler may also be another USDW and will be protected.

IX. Proposed Stimulation Program

Stimulate with up to 50,000 gallons of acid.

X. Logging and Test Data on the Well

There are no logs or test data on the well. During the process of drilling and completion resistivity, gamma ray, and density logs will be run.

XI. Chemical Analysis of Fresh Water Wells

There are two water wells that exists within one mile of the well location. A map and Water Right Summary from the New Mexico Office of the State Engineer for water wells C-02314 and C-02315 are attached. Analysis of the water samples is in process and will be provided as soon as it is available.