

Additional Information

Proposed Well Relocation

McClure, Dean, EMNRD

From: Tyler Moehlman <tyler.moehlman@lonquist.com>
Sent: Friday, October 18, 2019 9:27 AM
To: McClure, Dean, EMNRD
Subject: [EXT] Amended Relocation Package - Hayhurst SWD No. 1
Attachments: Amended Relocation Package_Hayhurst SWD No. 1.pdf

Dean,

Attached for you is the Amended Package for the Hayhurst SWD No. 1 for Solaris Water Midstream. The proposed relocation of this well has moved approximately 2,395 feet from the previous location. The well picked up no newly affected parties and we have proof of delivery for the original notices.

Please contact me if you have any questions.

Tyler F. Moehlman,
Petroleum Engineer

LONQUIST & CO. LLC



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tyler.moehlman@lonquist.com · www.lonquist.com

AUSTIN · HOUSTON · CALGARY · WICHITA · BATON ROUGE · DENVER · COLLEGE STATION

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4/17/19

LONQUIST & CO. LLC

PETROLEUM
ENGINEERS

ENERGY
ADVISORS

AUSTIN • HOUSTON • WICHITA • DENVER • CALGARY

October 17, 2019

New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division District IV
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
(505) 476-3440

✓ Km 11-6
4-17-19
pro

**RE: HAYHURST SWD NO. 1 AUTHORIZATION TO INJECT
UPDATED WELL LOCATION and NOTICE PARTY DETERMINATION
SOLARIS WATER MIDSTREAM, LLC**

To Whom It May Concern:

To accommodate the request of the New Mexico State Land Office, Solaris Water Midstream is requesting to modify the proposed location to the following coordinates:

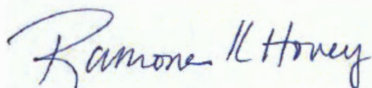
2,650' FNL, 2,395' FEL
UNIT G, SEC 20, T25S, R27E
LAT 32.11545678, LONG -104.21139940 (NAD83)

The proposed surface hole location now lies greater than one-half mile from New Mexico State Lands. The proposed location of the Hayhurst SWD No. 1 well has been relocated approximately two thousand and three hundred and ninety-five feet (2,395) feet from the previous location submitted to the New Mexico Oil Conservation Division on April 15, 2019. The new location is shown in the attached C-102.

The 1-Mile AOR was evaluated for offset wellbores penetrating the injection formation and to determine notice parties, the revised maps and list are attached. Relocation of the proposed wellbore resulted no additional notice parties. The 1-Mile AOR remains void of wellbores penetrating the injection formation.

Any questions should be directed towards Solaris Water Midstream, LLC's agent Lonquist & Co., LLC.

Regards,



Ramona K. Hovey
Sr. Petroleum Engineer
Lonquist & Co., LLC

(512) 600-1777
ramona@lonquist.com

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

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

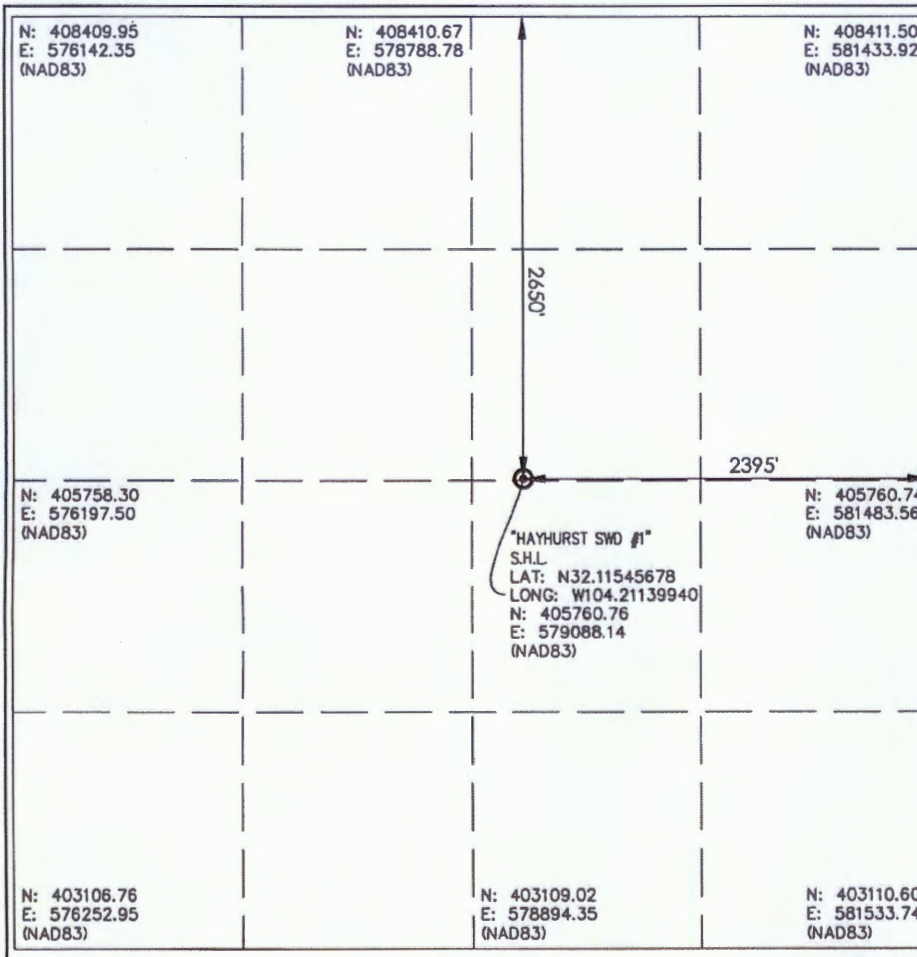
WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number	² Pool Code	³ Pool Name
⁴ Property Code	⁵ Property Name HAYHURST-ROOK FAMILY EDUCATION TRUST	
		⁶ Well Number 1
⁷ OGRID No.	⁸ Operator Name SOLARIS WATER MIDSTREAM, LLC	
		⁹ Elevation 3126'

¹⁰ Surface Location									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	20	25 S	27 E		2650'	NORTH	2395'	EAST	EDDY

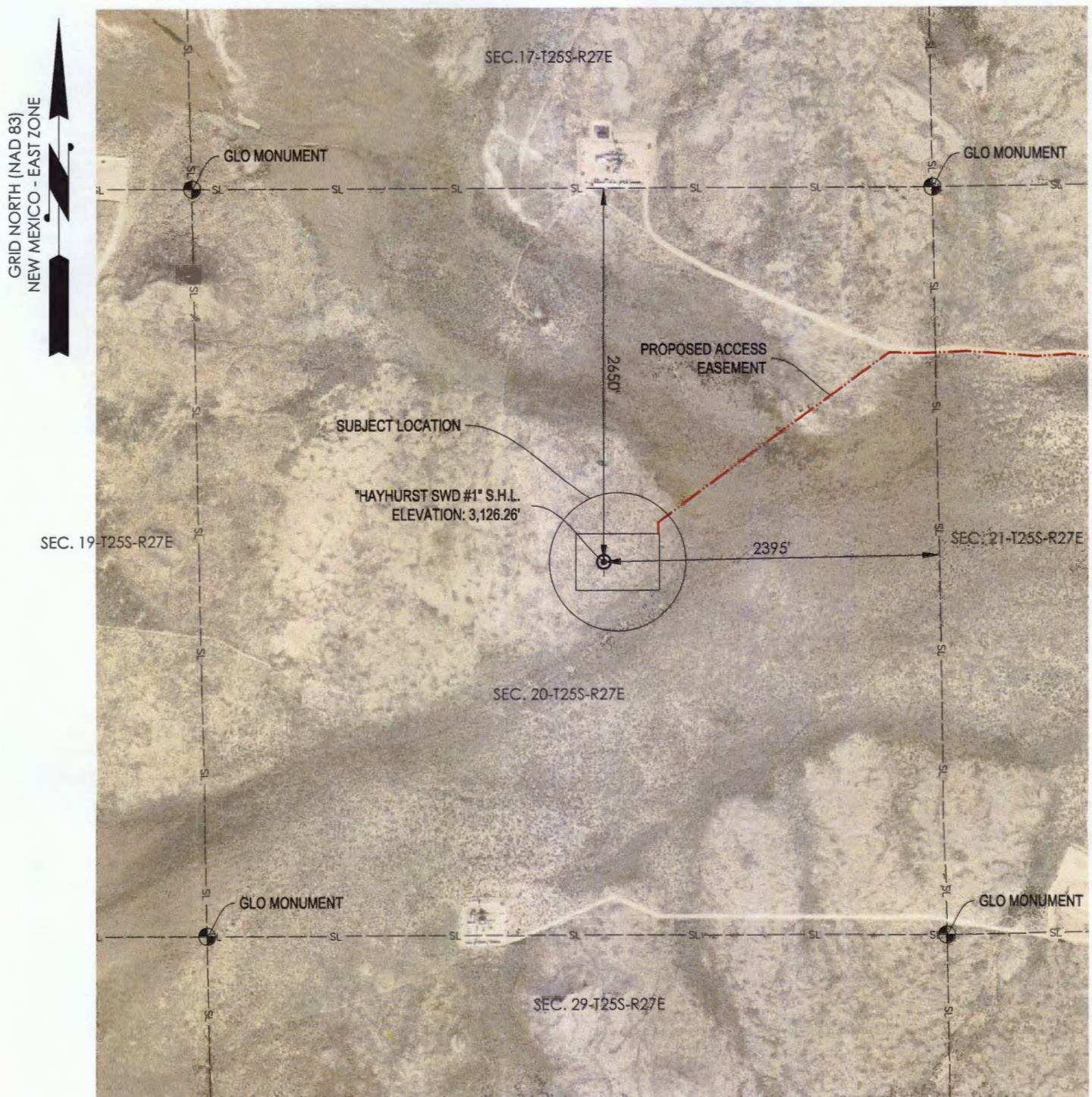
¹¹ Bottom Hole Location If Different From Surface									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
¹² Dedicated Acres		¹³ Joint or Infill		¹⁴ Consolidation Code		¹⁵ Order No.			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



¹⁷ OPERATOR CERTIFICATION	
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.	
<i>Ramona K. Hovey</i> Signature	10/17/19 Date
RAMONA K. HOVEY Printed Name	
ramona@longquist.com E-mail Address	
¹⁸ SURVEYOR CERTIFICATION	
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me under my supervision, and that the same is true and correct to the best of my belief.	
10-15-19 Date of Survey	23783 Surveyor's Number
<i>[Signature]</i> Signature of Surveyor	
10/15/2019 Date of Survey	
PROFESSIONAL SURVEYOR	
Certificate Number	

WELL PAD LOCATION OVERVIEW



REFERENCE	ELEVATION	NAD83 (1986)		NAD27	
		STATE PLANE NEW MEXICO EAST	GEOGRAPHIC	STATE PLANE NEW MEXICO EAST	GEOGRAPHIC
S. H. L.	3,126.26'	N: 405760.76 E: 579088.14	LAT: 32.11545678° LONG: -104.21139940°	N: 405703.42 E: 537904.85	LAT: 32.11533585° LONG: -104.21090409°

CALLS FROM SECTION LINE

S.H.L.	2,650' FNL, 2,395' FEL (SEC. 20)
--------	----------------------------------



Crafton Tull
surveying

501.328.3316 f 501.328.3325 f
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1000 Ledgeawn Dr
Conway, Arkansas 72034

GRID NORTH (NAD 83)
NEW MEXICO - EAST ZONE



PROPOSED PAD (5.51 ACRES)

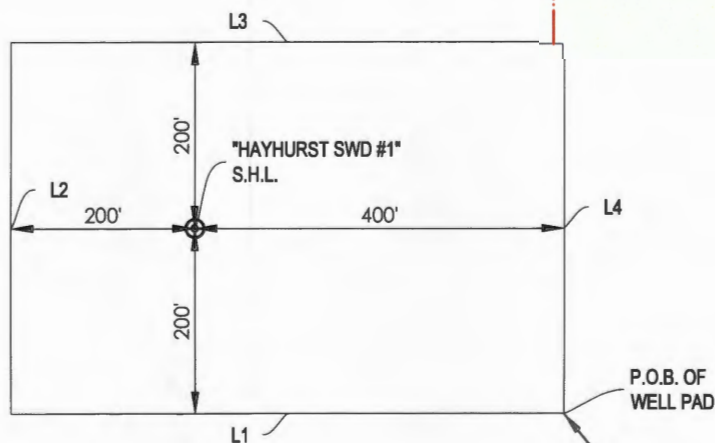
LEGEND

	SECTION LINE
	PROPERTY LINE
	EXISTING PIPELINE ROUTE
	OVERHEAD ELECTRIC FENCE
	EDGE OF EXISTING ROAD
	CL OF PROPOSED ACCESS EASEMENT
	EDGE OF PROPOSED ACCESS EASEMENT
	EDGE OF PROPOSED PAD
	POINT OF COMMENCEMENT
	POINT OF BEGINNING
	POINT OF TERMINATION
	LINEAR FEET
	POWER POLE
	PROPOSED WELL LOCATION
	EXISTING WELL LOCATION
	FOUND MONUMENT (AS NOTED)

P.O.C.
P.O.B.
P.O.T.
LF

SEC. 20-T25S-R27E
HAYHURST-ROOK FAMILY
EDUCATIONAL TRUST
VOL. 669, PG. 716

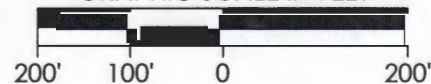
PROPOSED ACCESS
EASEMENT (SEE PAGE 3)



P.O.C.
A GLO MONUMENT, AT THE SE CORNER
OF S.20-T25S-R27E, BEING
S 39°51'29\"/>

LINE #	BEARING	DISTANCE
L1	WEST	600'
L2	NORTH	400'
L3	EAST	600'
L4	SOUTH	400'

GRAPHIC SCALE IN FEET





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Conway, Arkansas 72034
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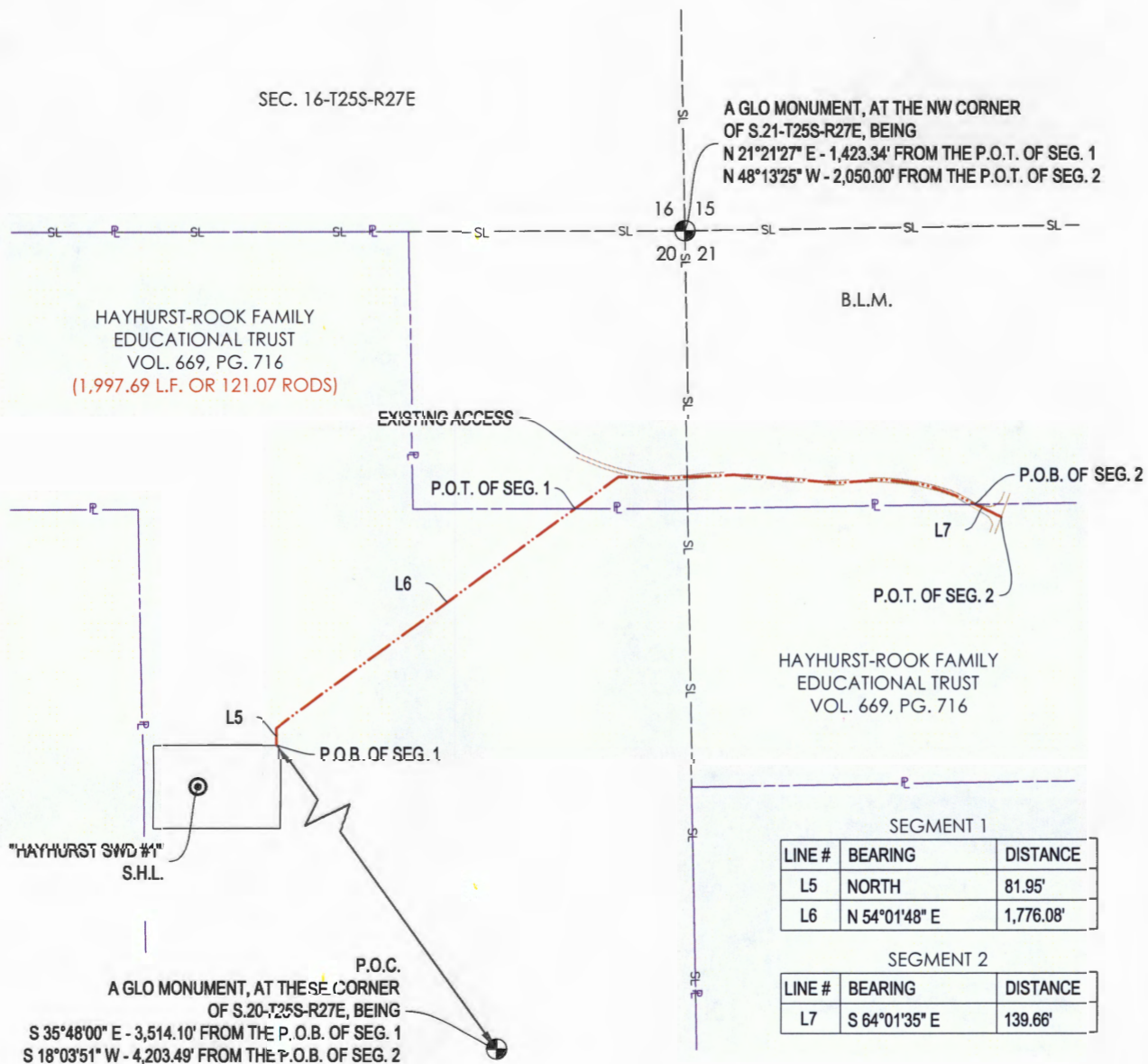
LEGEND

	SECTION LINE
	PROPERTY LINE
	EXISTING PIPELINE ROUTE
	OVERHEAD ELECTRIC
	FENCE
	EDGE OF EXISTING ROAD
	CL OF PROPOSED ACCESS EASEMENT
	EDGE OF PROPOSED ACCESS EASEMENT
	EDGE OF PROPOSED PAD
	POINT OF COMMENCEMENT
	POINT OF BEGINNING
	POINT OF TERMINATION
	LINEAR FEET
	POWER POLE
	PROPOSED WELL LOCATION
	EXISTING WELL LOCATION
	FOUND MONUMENT (AS NOTED)

P.O.C.
P.O.B.
P.O.T.
LF
●
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PROPOSED ACCESS EASEMENT (1,997.69 L.F. OR 121.07 RODS)

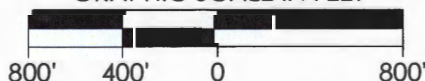
GRID NORTH (NAD 83)
NEW MEXICO - EAST ZONE



SITE COORDINATES

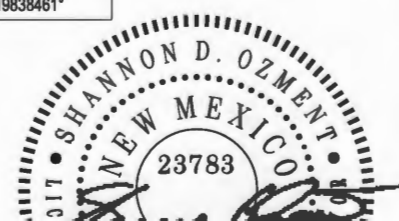
REFERENCE	ELEVATION	NAD83 (1986)		NAD27	
		STATE PLANE NEW MEXICO EAST	GEOGRAPHIC	STATE PLANE NEW MEXICO EAST	GEOGRAPHIC
P.O.B. SEG. 1	3,121.77'	N: 405960.76 E: 579478.14	LAT: 32.11600535° LONG: -104.21013897°	N: 405903.42 E: 538294.84	LAT: 32.11588441° LONG: -104.20964370°
P.O.T. SEG. 2	3,100.62'	N: 407045.73 E: 582962.71	LAT: 32.11897643° LONG: -104.19887944°	N: 406988.32 E: 541779.35	LAT: 32.11885537° LONG: -104.19838461°

GRAPHIC SCALE IN FEET



GENERAL NOTES

1. THE LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN HEREON ARE BASED ON REASONABLE VISUAL OBSERVATION.





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Conway, Arkansas 72034

LEGAL DESCRIPTIONS

"HAYHURST SWD #1 PROPOSED WELL PAD":

A METES AND BOUNDS DESCRIPTION OF A PROPOSED WELL PAD BEING OUT OF SECTION 20, TOWNSHIP 25 SOUTH, RANGE 27 EAST, EDDY COUNTY, NEW MEXICO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A GLO MONUMENT, AT THE SOUTHEAST CORNER OF SAID SECTION 20; THENCE N 39°51'29" W A DISTANCE OF 3,191.83 FEET TO THE POINT OF BEGINNING;

THENCE WEST A DISTANCE OF 600 FEET TO A POINT;
THENCE NORTH A DISTANCE OF 400 FEET TO A POINT;
THENCE EAST A DISTANCE OF 600 FEET TO A POINT;
THENCE SOUTH A DISTANCE OF 400 FEET TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED WELL PAD HAS A TOTAL OF 240,000 SQUARE FEET OR 5.51 ACRES, MORE OR LESS.

"HAYHURST SWD 1H PROPOSED ACCESS EASEMENT": - SEGMENT 1

A CENTERLINE DESCRIPTION OF A PROPOSED ACCESS EASEMENT IN, OVER, ACROSS, AND THROUGH SECTION 20, TOWNSHIP 25 SOUTH, RANGE 27 EAST, EDDY COUNTY, NEW MEXICO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A GLO MONUMENT, AT THE SOUTHEAST CORNER OF SAID SECTION 20; THENCE N 35°48'00" W A DISTANCE OF 3,514.10 FEET TO THE POINT OF BEGINNING OF THE FOLLOWING DESCRIBED CENTERLINE;

THENCE NORTH A DISTANCE OF 81.95 FEET TO A POINT;
THENCE N 54°01'48" E A DISTANCE OF 1,776.08 FEET TO THE POINT OF TERMINATION, SAID POINT BEING S 21°21'27" W A DISTANCE OF 1,423.34 FEET FROM A GLO MONUMENT, AT THE NORTHWEST CORNER OF SAID SECTION 21.

THE ABOVE DESCRIBED CENTERLINE HAS A TOTAL LENGTH OF 1,858.03 FEET OR 112.61 RODS, MORE OR LESS.

"HAYHURST SWD 1H PROPOSED ACCESS EASEMENT": - SEGMENT 2

A CENTERLINE DESCRIPTION OF A PROPOSED ACCESS EASEMENT IN, OVER, ACROSS, AND THROUGH SECTION 21, TOWNSHIP 25 SOUTH, RANGE 27 EAST, EDDY COUNTY, NEW MEXICO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A GLO MONUMENT, AT THE SOUTHEAST CORNER OF SAID SECTION 20; THENCE N 18°03'51" E A DISTANCE OF 4,203.49 FEET TO THE POINT OF BEGINNING OF THE FOLLOWING DESCRIBED CENTERLINE;

THENCE S 64°01'35" E A DISTANCE OF 139.66 FEET TO THE POINT OF TERMINATION, SAID POINT BEING S 48°13'25" E A DISTANCE OF 2,050.00 FEET FROM A GLO MONUMENT, AT THE NORTHWEST CORNER OF SAID SECTION 21.

THE ABOVE DESCRIBED CENTERLINE HAS A TOTAL LENGTH OF 139.66 FEET OR 8.46 RODS, MORE OR LESS.

THE ABOVE TWO DESCRIBED CENTERLINES HAVE A TOTAL COMBINED LENGTH OF 1,997.69 FEET OR 121.07 RODS, MORE OR LESS.

BASIS OF BEARINGS: NEW MEXICO STATE PLANE GRID, EAST ZONE, NAD83 AS DETERMINED BY GPS OBSERVATION.

ALL DISTANCES ARE GRID DISTANCES BASED ON U.S. SURVEY FEET
THIS LEGAL DESCRIPTION ACCOMPANIES A SKETCH PREPARED FOR THIS TRACT OF LAND.





Solaris Water Midstream, LLC

Hayhurst SWD No. 1

FORM C-108 Supplemental Information

III. Well Data

A. Wellbore Information

1.

Well information	
Lease Name	Hayhurst SWD
Well No.	1
Location	S-20 T-25S R-27E
Footage Location	2,650' FNL & 2,395' FEL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate	Production	Liner
OD	16"	13.375"	9.625"	7.625"
WT	0.495"	0.480"	0.545"	0.500"
ID	15.010"	12.415"	8.535"	6.625"
Drift ID	14.822"	12.259"	8.379"	6.500"
COD	17.000"	13.375"	10.625"	7.625"
Weight	84 lb/ft	68 lb/ft	53.5 lb/ft	39 lb/ft
Grade	J-55 BTC	L-80, EZ-GO FJ3	HCP-110 BTC	Q-125 EZ-GO FJ3
Hole Size	18.125"	14.75"	12.25"	8.5"
Depth Set	440'	2,090'	8,825'	8,625'-13,500'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate	Production	Liner
Lead Cement	HALCEM™	HALCEM™	Stage 1: NeoCem™	-
Lead Cement Volume (sacks)	177	572	Stage 1: 865 Stage 2: 229	-
Lead Cement Yield (ft3/sack)	1.682	2.767	Stage 1: 2.731 Stage 2: 2.731	-
Tail Cement	HALCEM™	HALCEM™	Stage 1: NeoCem™	VERSACEM™
Tail Cement Volume (sacks)	953	468	Stage 1: 557 Stage 2: 50	381
Tail Cement Yield (ft3/sack)	1.347	1.441	Stage 1: 1.222 Stage 2: 1.336	1.223
Cement Excess	150%	75%	50%	25%
Total Sacks	1,131	1,041	1,755	381
TOC	Surface	Surface	Surface	8,625'
Method	Circulate to Surface	Circulate to Surface	Circulate to Surface	Logged

3. Tubing Description

Tubing Information	
OD	5.5" 5.0"
WT	0.361" 0.362"
ID	4.778" 4.276"
Drift ID	4.653" 4.151"
COD	6.050" 5.563"
Weight	20 lb/ft 18 lb/ft
Grade	HCL-80 BTC HCL-80 LTC
Depth Set	0 - 8,425' 8,425' - 13,450'

Tubing will be lined with Duoline.

4. Packer Description

Nickel Plated Double Grip Retrievable Packer or Equivalent

B. Completion Information

1. Injection Formation: Devonian, Fusselman

2. Gross Injection Interval: 13,500' - 15,300'

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
Bone Spring	5,635'
Wolfcamp	8,725'
Strawn	11,025'
Atoka	11,225'
Morrow	11,850'

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 Injected:

Average Volume: 30,000 BPD

Maximum Volume: 40,000 BPD

2. Closed System

3. Anticipated Injection Pressure:

Average Injection Pressure: 2,025 PSI (surface pressure)

Maximum Injection Pressure: 2,700 PSI (surface pressure)

4. The injection fluid is to be locally produced water. It is expected that the source water will predominantly be from the Bone Spring, Morrow, and Wolfcamp formations. Attached are produced water sample analyses taken from the closest wells that feature samples from the Atoka, Upper Avalon, Bone Spring, Delaware, Devonian, Morrow, Pennsylvanian, San Andreas, and Wolfcamp formations.
5. The disposal interval is non-productive. No water samples are available within a 1-mile radius. Approximately 8 miles Northeast, Chevron tested the Devonian formation before plugging back and producing gas from the Pennsylvanian in 1960. The results from this well are displayed in the attached Hayhurst SWD No. 1 - Offset Produced Water Analysis table from the White City Penn Gas Com Unit 1 #001 well.

VIII. Geological Data

Devonian Formation Lithology:

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.

Fusselman Formation Lithology:

The Silurian/Ordovician Fusselman Formation is stratigraphically below the Wristen Group and is above and separated from the Montoya Formation by the Sylvan Shale. The Sylvan Shale is the lower confining layer for the proposed Hayhurst SWD No. 1 well. Fusselman facies include a laminated skeletal wackestone in the upper part and a buildup complex in the lower part composed of ooid and bryozoan grainstones. These grainstones can also be potentially prolific zones for disposal.

A. Injection Zone: Devonian-Silurian Formation

Formation	Depth
Rustler	190'
Salado (Top of Salt)	465'
Salado (Bottom of Salt)	1,875'
Bell Canyon	2,110'
Cherry Canyon	2,925'
Brushy Canyon	3,975'
Bone Spring	5,635'
Bone Spring 1 st Sand	6,550'
Bone Spring 2 nd Sand	7,325'
Bone Spring 3 rd Sand	8,375'
Wolfcamp	8,725'
Strawn	11,025'
Atoka	11,225'
Morrow	11,850'
Lower Morrow	12,475'
Barnett	12,725'
Devonian	13,500

B. Underground Sources of Drinking Water

One (1) water well exists within a one-mile radius of the proposed well. Water wells outside a one-mile radius in the surrounding area have an average depth of 112 feet and an average water depth of 36 feet generally producing from the Carlsbad Basin. The upper Rustler may also be another USDW and will be protected.

IX. Proposed Stimulation Program

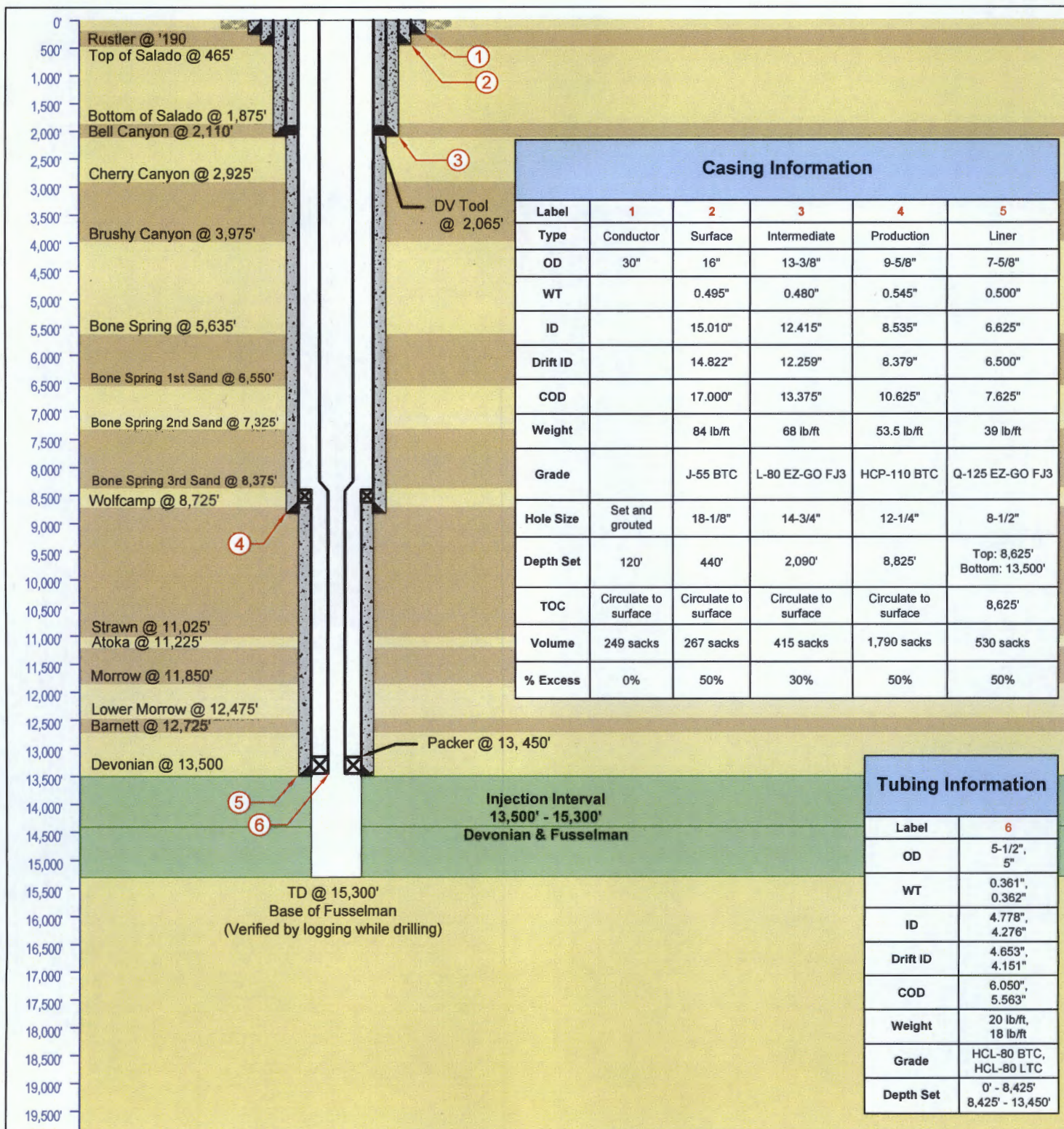
50,000 gallon acid job

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

Attached is a map of the one (1) water well that exists within one-mile of the well location. A Water Right Summary from the New Mexico Office of the State Engineer is attached for the C-03261-POD1 water well was included in the original C-108 Application. Cardinal Laboratories went to retrieve water samples from the C-03261-POD1 water well, however, the well was capped or abandoned.



<div>LONQUIST & CO. LLC</div> <div>PETROLEUM ENGINEERSENERGY ADVISORS</div> <div>HOUSTON CALGARY AUSTIN WICHITA DENVER</div> <div>Texas License F-9147</div> <div>12912 Hill Country Blvd. Ste F-200 Austin, Texas 78738 Tel: 512.732.9812 Fax: 512.732.9816</div>	Solaris Water Midstream, LLC		Hayhurst SWD No. 1	
	Country: USA		State/Province: New Mexico	County/Parish: Eddy
	Location:		Site: 1,473' FNL & 288' FEL	Survey: S20-T25S-R27E
	API No: NA		Field: Devonian-Silurian (Code: 97869)	Well Type/Status: SWD
	NMOC District No: 2		Project No: 1964	Date: 4/11/2019
	Drawn: TFM		Reviewed:	Approved:
	Rev No: 1		Notes:	