



Oxy USA

**Lea County, NM
South Hobbs G/SA Unit
SHU 289**

Wellbore #1

Survey: Scout MWD

Standard Survey Report

11 October, 2018

**HOBBS OCD
DEC 12 2018
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Project: Lea County, NM
Site: South Hobbs G/SA Unit
Well: SHU 289
Depth Reference: GL 3619.5' + 13.5' KB @ 3633.00usft (Savanna 417)
SHL Northing: 616039.74
SHL Easting: 856368.07
Rig: Savanna 417
Plan: plan1



SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSeet	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
1463.00	17.26	348.80	1450.01	126.55	-25.06	2.00	348.80	129.01	Start Build 2.00
1594.94	17.26	348.81	1578.01	164.95	-32.66	0.00	0.00	168.15	Start Build 2.00
2109.46	27.55	348.81	2051.05	357.08	-70.68	2.00	0.00	364.00	Start Build 2.00
3062.22	27.55	348.81	2895.77	789.37	-156.23	0.00	0.00	804.68	Start Drop -1.50
4232.26	10.00	348.81	3999.22	1157.35	-229.06	1.50	180.00	1179.80	Start 475.00 hold at 4232.26 MD
4707.26	10.00	348.81	4467.00	1238.26	-245.07	0.00	0.00	1262.28	TD @ 4707.26' MD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1564.14	1582.52	RUSTLER
1623.23	1644.53	SALT
2721.43	2865.59	YATES
2920.77	3090.37	SEVEN RIVERS
3472.02	3688.27	QUEEN
3768.46	3996.51	GRAYBURG
4059.81	4293.78	SAN ANDRES 1
4106.88	4341.58	SA2 C UPPER
4412.73	4652.15	SA3 K
4467.00	4707.26	TD

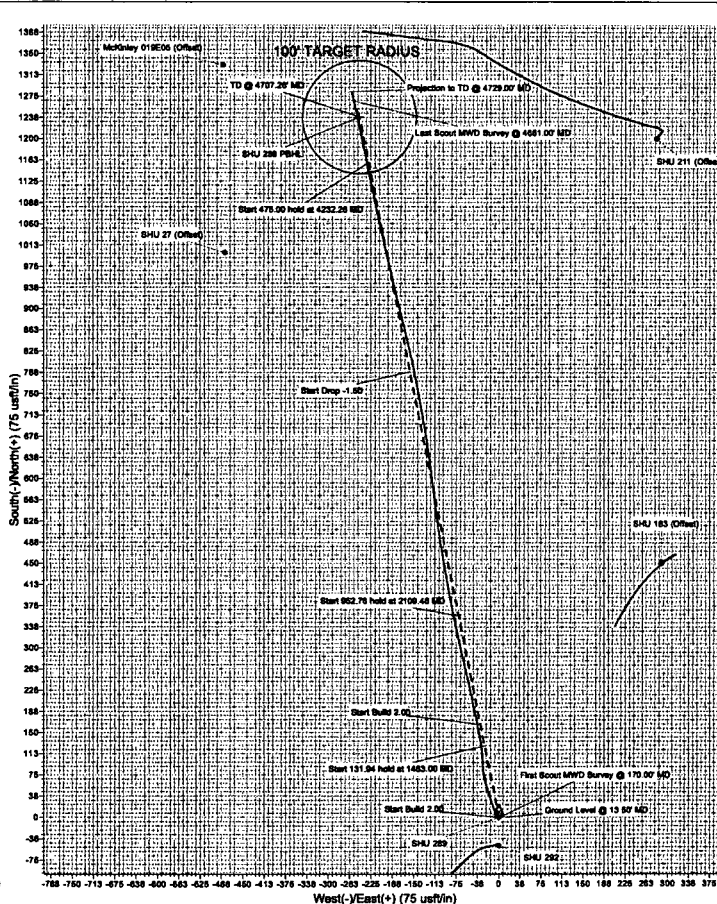
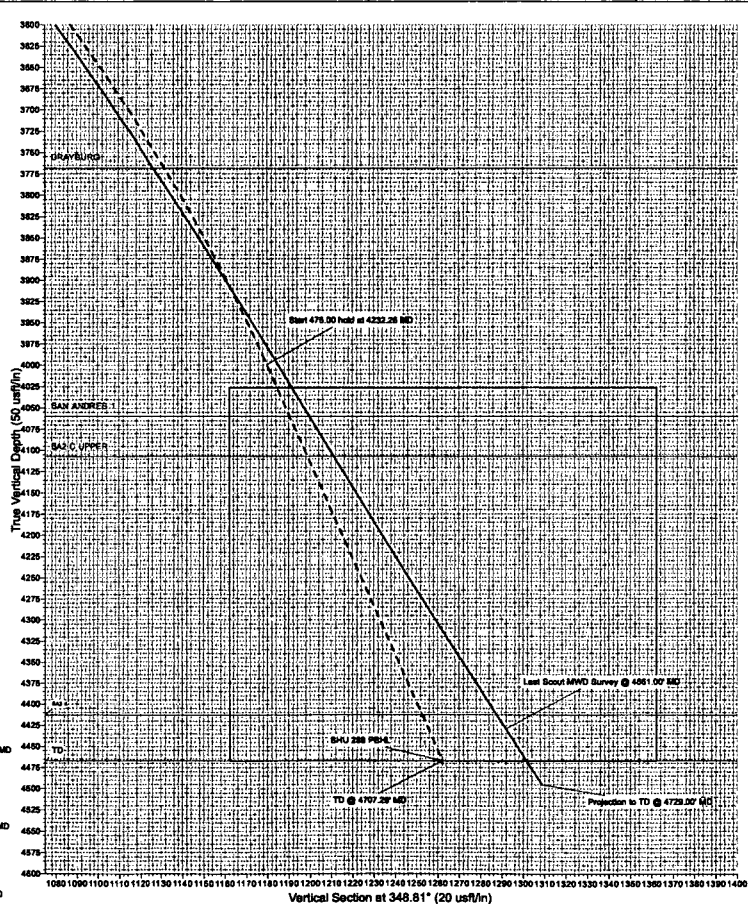
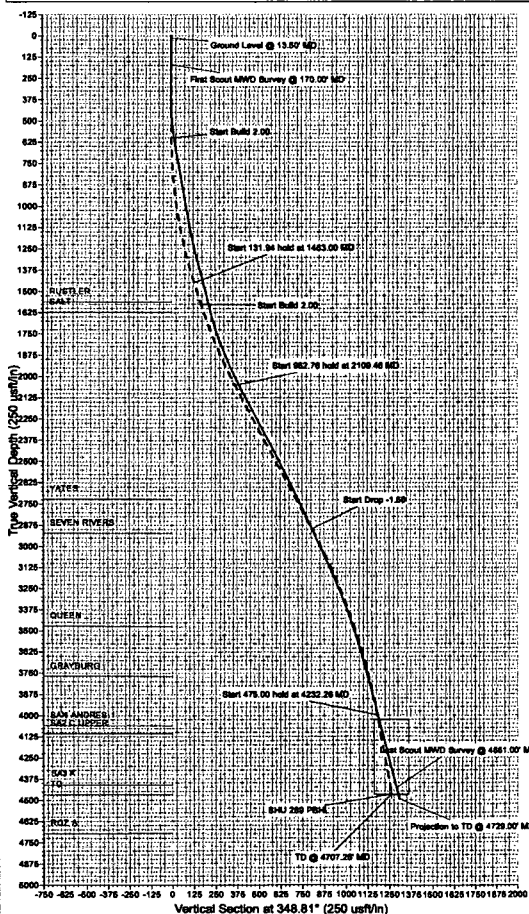
DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Shape
SHU 289 PBHL	4467.00	1238.26	-245.07	617278.00	856123.00	Circle (Radius: 100.00)



Azimuths to Grid North
True North: -0.63°
Magnetic North: 6.17°

Magnetic Field
Strength: 48122.6nT
Dip Angle: 60.73°
Date: 09/27/2018
Model: HDGM





Survey Report



Company:	Oxy USA	Local Co-ordinate Reference:	Well SHU 289
Project:	Lea County, NM	TVD Reference:	GL 3619.5' + 13.5' KB @ 3633.00usft (Savanna 417)
Site:	South Hobbs G/SA Unit	MD Reference:	GL 3619.5' + 13.5' KB @ 3633.00usft (Savanna 417)
Well:	SHU 289	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	South Hobbs G/SA Unit		
Site Position:		Northing:	616,257.52 usft
From:	Map	Easting:	857,718.46 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 41' 19.686 N
		Longitude:	103° 10' 14.307 W
		Grid Convergence:	0.63 °

Well	SHU 289		
Well Position	+N/-S	0.00 usft	Northing: 616,039.74 usft
	+E/-W	0.00 usft	Easting: 856,368.07 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 41' 17.678 N
		Longitude:	103° 10' 30.133 W
		Ground Level:	3,619.50 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	09/27/18	6.80
			Dip Angle (°) 60.73
			Field Strength (nT) 48,122.60000000

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 348.81

Survey Program	Date 09/18/18		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
13.50	4,729.00	Scout MWD (Wellbore #1)	B001Mb_MWD+HRGM
			Description OWSG MWD + HRGM

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13.50	0.00	0.00	13.50	0.00	0.00	0.00	0.00	0.00	0.00
Ground Level @ 13.50' MD									
170.00	0.79	191.62	170.00	-1.06	-0.22	-0.99	0.50	0.50	0.00
First Scout MWD Survey @ 170.00' MD									
353.00	0.53	193.99	352.98	-3.11	-0.68	-2.92	0.14	-0.14	1.30
536.00	6.68	335.67	535.59	5.77	-5.27	6.69	3.88	3.36	77.42
720.00	10.55	342.09	717.49	31.56	-14.86	33.85	2.16	2.10	3.49
904.00	9.41	345.69	898.70	62.17	-23.76	65.60	0.71	-0.62	1.96



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Site:	South Hobbs G/SA Unit	MD Reference:	GL 3619.5' + 13.5' KB @ 3633.00usft (Savanna 417)
Well:	SHU 289	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,071.00	9.71	358.44	1,063.40	89.48	-27.52	93.12	1.28	0.18	7.63
1,243.00	13.01	353.16	1,232.01	123.21	-30.22	126.73	2.01	1.92	-3.07
1,416.00	14.99	348.24	1,399.87	164.46	-37.10	168.53	1.33	1.14	-2.84
1,553.00	13.58	347.45	1,532.63	197.50	-44.21	202.33	1.04	-1.03	-0.58
1,637.00	12.62	348.50	1,614.44	216.12	-48.18	221.36	1.18	-1.14	1.25
1,809.00	20.04	346.39	1,779.39	263.24	-58.88	269.66	4.33	4.31	-1.23
1,981.00	23.65	348.15	1,939.02	325.67	-72.90	333.63	2.13	2.10	1.02
2,153.00	27.74	349.91	2,093.98	398.88	-87.00	408.18	2.42	2.38	1.02
2,326.00	28.26	350.26	2,246.73	478.88	-100.99	489.38	0.32	0.30	0.20
2,498.00	26.68	353.25	2,399.34	557.37	-112.42	568.59	1.22	-0.92	1.74
2,671.00	26.42	352.37	2,554.09	634.09	-122.09	645.73	0.27	-0.15	-0.51
2,843.00	25.32	349.91	2,708.86	708.23	-133.62	720.69	0.89	-0.64	-1.43
3,016.00	23.69	349.38	2,866.27	778.81	-146.50	792.44	0.95	-0.94	-0.31
3,189.00	24.92	345.69	3,023.94	848.30	-161.92	863.59	1.13	0.71	-2.13
3,361.00	22.90	346.48	3,181.17	915.95	-178.70	933.22	1.19	-1.17	0.46
3,534.00	20.13	347.01	3,342.10	977.70	-193.26	996.62	1.61	-1.60	0.31
3,707.00	17.23	347.54	3,505.97	1,031.74	-205.49	1,052.00	1.68	-1.68	0.31
3,880.00	15.38	348.24	3,672.01	1,079.22	-215.69	1,100.56	1.08	-1.07	0.40
4,052.00	14.42	348.15	3,838.22	1,122.51	-224.74	1,144.78	0.56	-0.56	-0.05
4,225.00	13.63	349.30	4,006.07	1,163.62	-232.95	1,186.71	0.48	-0.46	0.66
4,397.00	13.80	348.15	4,173.16	1,203.61	-240.92	1,227.48	0.19	0.10	-0.67
4,570.00	14.24	347.45	4,341.01	1,244.58	-249.78	1,269.39	0.27	0.25	-0.40
4,661.00	14.42	347.19	4,429.18	1,266.55	-254.73	1,291.90	0.21	0.20	-0.29
Last Scout MWD Survey @ 4661.00' MD									
4,729.00	14.42	347.19	4,495.03	1,283.06	-258.48	1,308.83	0.00	0.00	0.00
Projection to TD @ 4729.00' MD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
13.50	13.50	0.00	0.00	Ground Level @ 13.50' MD
170.00	170.00	-1.06	-0.22	First Scout MWD Survey @ 170.00' MD
4,661.00	4,429.18	1,266.55	-254.73	Last Scout MWD Survey @ 4661.00' MD
4,729.00	4,495.03	1,283.06	-258.48	Projection to TD @ 4729.00' MD

Checked By: _____ Approved By: _____ Date: _____