



Oxy USA

**Lea County, NM
South Hobbs G/SA Unit
SHU 290**

Wellbore #1

Survey: Scout MWD

Standard Survey Report

27 September, 2018

**HOBBS OCD
DEC 12 2018
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Project: Lea County, NM
Site: South Hobbs G/SA Unit
Well: SHU 290
Depth Reference: GL 3618' + 13.5' KB @ 3631.50usft (Savanna 417)
SHL Northing: 616257.52
SHL Easting: 857718.46
Rig: Savanna 417
Plan: plan1



SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSecl	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Start DLS 2.00 TFO 353.15
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	Start 150.08 hold at 1462.92 MD
1462.92	17.26	353.15	1449.93	128.06	-15.38	2.00	353.15	128.98	Start Build 2.00
1613.00	17.26	353.15	1593.25	172.27	-20.69	0.00	0.00	173.51	Start 1158.23 hold at 2009.92 MD
2009.92	25.20	353.15	1962.95	314.85	-37.82	2.00	0.00	317.11	Start Drop -1.50
3168.15	25.20	353.15	3010.97	804.42	-96.64	0.00	0.00	810.20	Start 550.00 hold at 4181.28 MD
4181.28	10.00	353.15	3973.88	1107.86	-133.07	1.50	180.00	1115.62	TD @ 4731.28' MD
4731.28	10.00	353.15	4515.50	1202.48	-144.46	0.00	0.00	1211.13	

FORMATION TOP DETAILS

TVDPath	MDPath
1533.86	1550.81
1610.44	1631.02
2701.58	2826.23
2897.17	3042.38
3452.97	3643.93
3743.66	3946.11
4045.59	4254.12
4088.58	4297.77
4391.53	4605.40
4515.50	4731.28

Formation
RUSTLER
SALT
YATES
SEVEN RIVERS
QUEEN
GRAYBURG
SAN ANDRES 1
SA2 C UPPER
SA3 K
TD

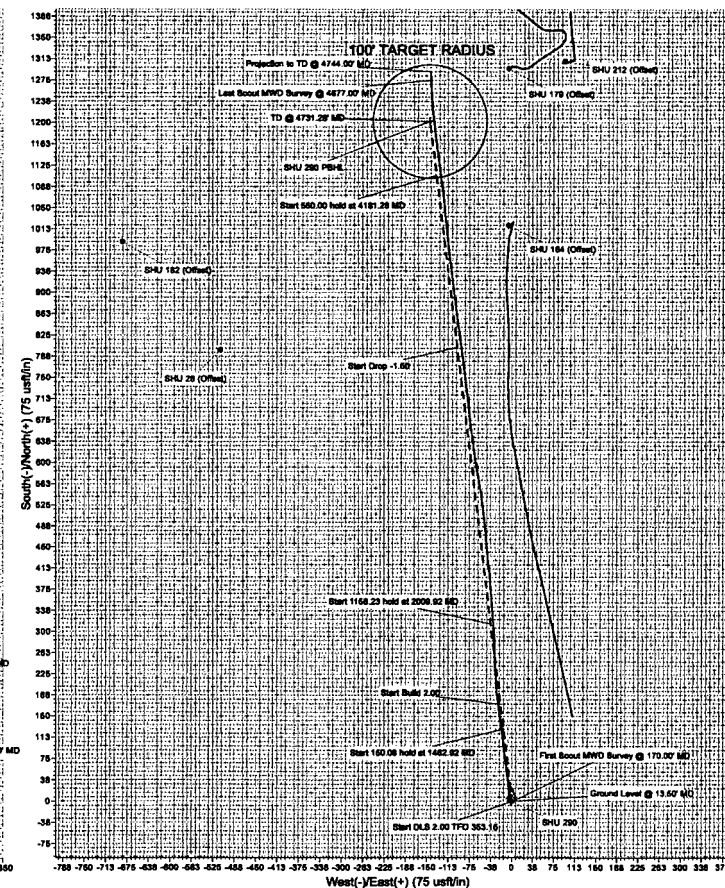
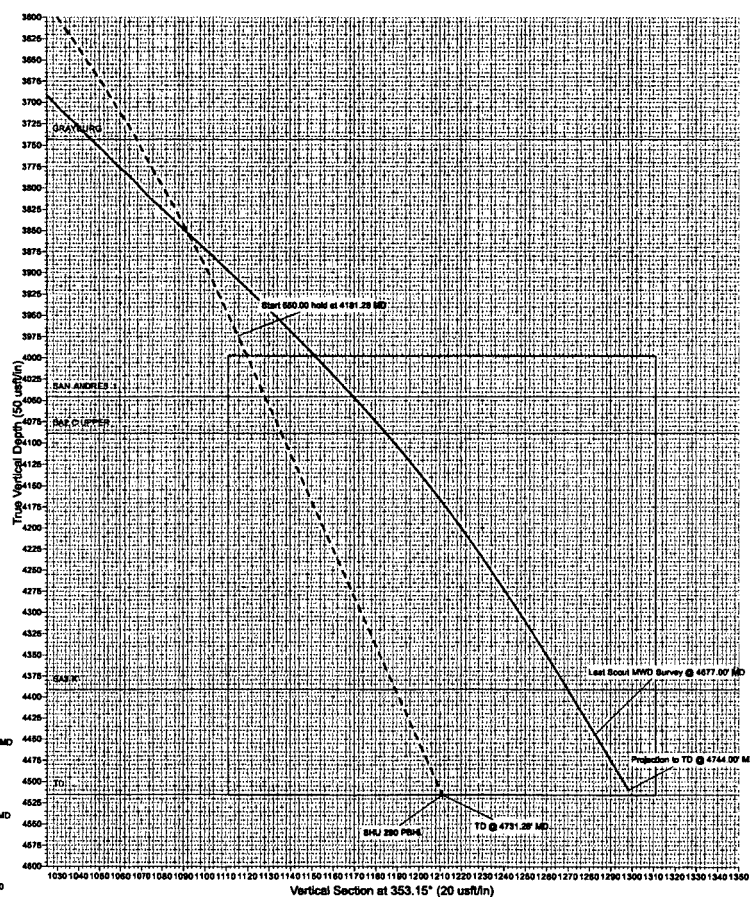
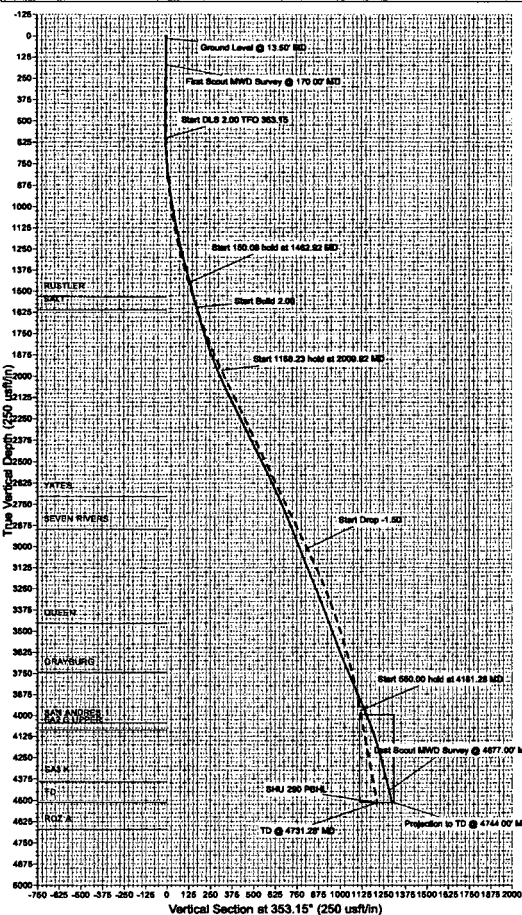
DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Shape
SHU 290 PBHL	4515.50	1202.48	-144.46	617460.00	857574.00	Circle (Radius: 100.00)



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

Magnetic Field
Strength: 48130.3nT
Dip Angle: 60.73°
Date: 09/11/2018
Model: HDGM





Survey Report



Company:	Oxy USA	Local Co-ordinate Reference:	Well SHU 290
Project:	Lea County, NM	TVD Reference:	GL 3618' + 13.5' KB @ 3631.50usft (Savanna 417)
Site:	South Hobbs G/SA Unit	MD Reference:	GL 3618' + 13.5' KB @ 3631.50usft (Savanna 417)
Well:	SHU 290	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	Latitude:	32° 41' 19.686 N
From:	Map	Easting:	857,718.46 usft	Longitude:	103° 10' 14.307 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.63 °

Well	SHU 290					
Well Position	+N/-S	0.00 usft	Northing:	616,257.52 usft	Latitude:	32° 41' 19.686 N
	+E/-W	0.00 usft	Easting:	857,718.46 usft	Longitude:	103° 10' 14.307 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	3,618.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	09/11/18	6.80	60.73	48,130.30000000

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)	Direction (°)	
	0.00	0.00	0.00	353.52	

Survey Program	Date 09/27/18				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
13.50	4,744.00	Scout MWD (Wellbore #1)	B001Mb_MWD+HRGM	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	1.23	194.43	169.99	-1.63	-0.42	-1.57	0.79	0.79	0.00	
First Scout MWD Survey @ 170.00' MD										
353.00	1.10	184.06	352.95	-5.28	-1.03	-5.13	0.14	-0.07	-5.67	
446.00	0.97	177.56	445.94	-6.96	-1.06	-6.79	0.19	-0.14	-6.99	
538.00	0.66	319.68	537.93	-7.33	-1.37	-7.13	1.68	-0.34	154.48	
629.00	2.59	348.24	628.89	-4.92	-2.13	-4.65	2.24	2.12	31.38	



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Site:	South Hobbs G/SA Unit	MD Reference:	GL 3618' + 13.5' KB @ 3631.50usft (Savanna 417)
Well:	SHU 290	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)
721.00	4.44	355.10	720.71	0.66	-2.86	0.98	2.06	2.01	7.46
813.00	5.98	353.07	812.33	8.97	-3.74	9.33	1.69	1.67	-2.21
906.00	7.78	355.71	904.66	20.06	-4.80	20.47	1.96	1.94	2.84
997.00	9.32	351.05	994.65	33.48	-6.40	33.99	1.85	1.69	-5.12
1,158.00	11.65	351.67	1,152.95	62.45	-10.79	63.26	1.45	1.45	0.39
1,330.00	14.68	354.39	1,320.41	101.33	-15.43	102.42	1.80	1.76	1.58
1,492.00	14.67	351.67	1,477.13	142.05	-20.41	143.45	0.43	-0.01	-1.68
1,597.00	14.51	352.20	1,578.74	168.24	-24.12	169.89	0.20	-0.15	0.50
1,769.00	16.79	355.97	1,744.36	214.38	-28.80	216.26	1.45	1.33	2.19
1,941.00	21.01	358.26	1,907.05	270.00	-31.48	271.83	2.49	2.45	1.33
2,113.00	25.27	356.41	2,065.18	337.50	-34.72	339.26	2.51	2.48	-1.08
2,286.00	26.29	354.13	2,220.96	412.46	-40.95	414.45	0.82	0.59	-1.32
2,458.00	25.58	355.45	2,375.64	487.37	-47.79	489.65	0.53	-0.41	0.77
2,631.00	26.46	350.00	2,531.12	562.57	-57.44	565.46	1.47	0.51	-3.15
2,803.00	23.52	352.02	2,687.01	634.31	-68.87	638.03	1.78	-1.71	1.17
2,975.00	21.76	354.39	2,845.75	700.04	-76.75	704.23	1.15	-1.02	1.38
3,148.00	20.62	352.46	3,007.05	762.15	-83.88	766.75	0.77	-0.66	-1.12
3,321.00	21.45	352.37	3,168.52	823.70	-92.08	828.83	0.48	0.48	-0.05
3,580.00	20.44	352.99	3,410.41	915.53	-103.89	921.41	0.40	-0.39	0.24
3,752.00	19.47	353.16	3,572.08	973.80	-110.96	980.10	0.56	-0.56	0.10
3,925.00	22.55	355.18	3,733.56	1,035.50	-117.19	1,042.11	1.83	1.78	1.17
4,097.00	23.08	352.02	3,892.11	1,101.75	-124.64	1,108.78	0.78	0.31	-1.84
4,270.00	20.04	352.81	4,052.98	1,164.76	-133.06	1,172.33	1.77	-1.76	0.46
4,442.00	15.56	354.57	4,216.71	1,216.99	-138.93	1,224.89	2.62	-2.60	1.02
4,615.00	13.49	357.73	4,384.17	1,260.25	-141.93	1,268.22	1.28	-1.20	1.83
4,677.00	13.63	358.44	4,444.45	1,274.78	-142.41	1,282.71	0.35	0.23	1.15
Last Scout MWD Survey @ 4677.00' MD									
4,744.00	13.63	358.44	4,509.56	1,290.57	-142.84	1,298.44	0.00	0.00	0.00
Projection to TD @ 4744.00' 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	169.99	-1.63	-0.42	First Scout MWD Survey @ 170.00' MD
4,677.00	4,444.45	1,274.78	-142.41	Last Scout MWD Survey @ 4677.00' MD
4,744.00	4,509.56	1,290.57	-142.84	Projection to TD @ 4744.00' MD

Checked By: _____ Approved By: _____ Date: _____