



HOBBS OCD

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Oxy USA Inc.

Lea County, NM

North Hobbs G/SA Unit Section 33

NHU 33-694

Wellbore #1

Design: Surveys

Standard Survey Report

29 December, 2018





Survey Report



Company:	Oxy USA Inc.	Local Co-ordinate Reference:	Well NHU 33-694
Project:	Lea County, NM	TVD Reference:	GL 3644.3' + 17.5' KB @ 3661.80usft (Trinidad 417)
Site:	North Hobbs G/SA Unit Section 33	MD Reference:	GL 3644.3' + 17.5' KB @ 3661.80usft (Trinidad 417)
Well:	NHU 33-694	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

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

Site	North Hobbs G/SA Unit Section 33		
Site Position:		Northing:	623,400.01 usft
From:	Map	Easting:	862,622.48 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 42' 29.815 N
		Longitude:	103° 9' 16.006 W
		Grid Convergence:	0.64 °

Well	NHU 33-694		
Well Position	+N/-S	0.00 usft	Northing: 623,400.01 usft
	+E/-W	0.00 usft	Easting: 862,622.48 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 42' 29.815 N
		Longitude:	103° 9' 16.006 W
		Ground Level:	3,644.30 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	12/17/2018	6.78
		Dip Angle (°)	60.73
		Field Strength (nT)	48,104.70000000

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
Vertical Section:		Tie On Depth:	0.00
	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
		Direction (°)	117.04

Survey Program	Date	12/29/2018
From (usft)	To (usft)	Survey (Wellbore)
17.50	5,222.00	Scout MWD Survey (Wellbore #1)
	Tool Name	Description
	B001Mb_MWD+HRGM	OWSG MWD + HRGM

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
17.50	0.00	0.00	17.50	0.00	0.00	0.00	0.00	0.00	0.00
Ground Level at 17.5' MD									
171.00	1.23	115.92	170.99	-0.72	1.48	1.65	0.80	0.80	0.00
First Scout MWD Survey at 171.0' MD									
352.00	1.19	124.44	351.95	-2.63	4.78	5.45	0.10	-0.02	4.71
503.00	2.07	115.30	502.89	-4.68	8.54	9.73	0.61	0.58	-6.05
624.00	6.33	107.83	623.53	-7.66	16.87	18.51	3.54	3.52	-6.17
745.00	8.66	108.18	743.49	-12.55	31.87	34.09	1.93	1.93	0.29



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Well:	NHU 33-694	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
867.00	8.22	108.88	864.17	-18.24	48.85	51.80	0.37	-0.36	0.57
989.00	9.54	110.55	984.71	-24.61	66.57	70.48	1.10	1.08	1.37
1,112.00	12.35	116.97	1,105.46	-34.15	87.85	93.77	2.49	2.28	5.22
1,237.00	14.37	113.98	1,227.07	-46.52	113.93	122.63	1.71	1.62	-2.39
1,363.00	16.53	118.20	1,348.52	-61.35	144.02	156.17	1.93	1.71	3.35
1,489.00	19.21	120.22	1,468.43	-80.25	177.74	194.79	2.18	2.13	1.60
1,568.00	19.12	118.99	1,543.05	-93.07	200.28	220.70	0.52	-0.11	-1.56
1,649.00	18.55	120.31	1,619.71	-106.00	223.01	246.82	0.88	-0.70	1.63
1,775.00	21.27	119.96	1,738.17	-127.53	260.12	289.67	2.16	2.16	-0.28
1,901.00	22.90	118.73	1,854.92	-150.73	301.42	337.00	1.34	1.29	-0.98
2,027.00	26.15	119.43	1,969.54	-176.16	347.11	389.26	2.59	2.58	0.56
2,153.00	30.33	118.29	2,080.52	-204.90	399.33	448.83	3.34	3.32	-0.90
2,279.00	31.82	116.97	2,188.43	-235.04	456.96	513.86	1.30	1.18	-1.05
2,404.00	37.14	119.43	2,291.44	-268.55	519.24	584.57	4.40	4.26	1.97
2,530.00	38.55	120.13	2,390.94	-306.95	586.33	661.78	1.17	1.12	0.56
2,656.00	38.55	120.93	2,489.48	-346.84	653.96	740.16	0.40	0.00	0.63
2,782.00	39.38	121.19	2,587.45	-387.72	721.84	819.20	0.67	0.66	0.21
2,908.00	39.60	118.99	2,684.69	-427.89	791.16	899.20	1.12	0.17	-1.75
3,034.00	42.55	118.73	2,779.67	-467.84	863.66	981.94	2.35	2.34	-0.21
3,097.00	44.13	115.92	2,825.49	-487.67	902.07	1,025.17	3.96	2.51	-4.46
3,160.00	46.24	113.89	2,869.89	-506.47	942.61	1,069.82	4.05	3.35	-3.22
3,286.00	45.10	114.25	2,957.94	-543.23	1,024.90	1,159.83	0.93	-0.90	0.29
3,412.00	44.09	115.83	3,047.66	-580.66	1,105.05	1,248.23	1.19	-0.80	1.25
3,538.00	44.44	120.13	3,137.91	-621.91	1,182.67	1,336.12	2.40	0.28	3.41
3,664.00	42.37	117.76	3,229.46	-663.83	1,258.41	1,422.63	2.09	-1.64	-1.88
3,853.00	38.95	115.83	3,372.81	-719.40	1,368.27	1,545.75	1.93	-1.81	-1.02
3,979.00	37.10	114.16	3,472.07	-752.21	1,438.60	1,623.31	1.68	-1.47	-1.33
4,105.00	34.24	114.07	3,574.42	-782.23	1,505.65	1,696.68	2.27	-2.27	-0.07
4,231.00	33.05	113.10	3,679.31	-810.17	1,569.62	1,766.36	1.04	-0.94	-0.77
4,357.00	31.25	114.07	3,785.99	-836.98	1,631.07	1,833.28	1.49	-1.43	0.77
4,483.00	30.51	114.68	3,894.12	-863.66	1,689.98	1,897.88	0.64	-0.59	0.48
4,610.00	29.23	114.07	4,004.25	-889.77	1,747.58	1,961.06	1.04	-1.01	-0.48
4,736.00	29.14	113.89	4,114.26	-914.74	1,803.72	2,022.41	0.10	-0.07	-0.14
4,862.00	28.75	114.42	4,224.52	-939.69	1,859.36	2,083.31	0.37	-0.31	0.42
4,988.00	28.75	114.86	4,334.98	-964.96	1,914.45	2,143.86	0.17	0.00	0.35
5,114.00	28.57	114.86	4,445.55	-990.37	1,969.28	2,204.25	0.14	-0.14	0.00
5,160.00	28.31	115.39	4,485.99	-999.67	1,989.12	2,226.15	0.79	-0.57	1.15
Last Scout MWD Survey at 5160.0' MD									
5,222.00	28.31	115.39	4,540.58	-1,012.28	2,015.68	2,255.54	0.00	0.00	0.00
Projection to TD at 5222.0' MD									



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Well:	NHU 33-694	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
17.50	17.50	0.00	0.00	Ground Level at 17.5' MD
171.00	170.99	-0.72	1.48	First Scout MWD Survey at 171.0' MD
5,160.00	4,485.99	-999.67	1,989.12	Last Scout MWD Survey at 5160.0' MD
5,222.00	4,540.58	-1,012.28	2,015.68	Projection to TD at 5222.0' MD

Checked By: _____ Approved By: _____ Date: _____



Project: Lea County, NM
Site: North Hobbs G/SA Unit Section 33
Well: NHU 33-694
Depth Reference: GL 3644.3' + 17.5' KB @ 3661.80usft (Trinidad 417)
SHL Northing: 623400.01
SHL Easting: 862622.48
Rig: Trinidad 417
Plan: plan2



SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
2899.57	45.99	117.04	2680.48	-397.56	778.83	2.00	117.04	874.43	Start 434.88 hold at 2899.57 MD
3334.43	45.99	117.04	2982.58	-539.75	1057.40	0.00	0.00	1187.20	Start Drop -1.50
4400.52	30.00	117.04	3800.00	-837.17	1640.05	1.50	180.00	1841.36	Start 452.41 hold at 4400.52 MD
4852.93	30.00	117.04	4191.80	-940.01	1841.52	0.00	0.00	2067.56	Start 348.41 hold at 4852.93 MD
5199.34	30.00	117.04	4491.80	-1018.78	1995.79	0.00	0.00	2240.77	TD @ 5199.34' MD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1589.71	1610.54	Rustler
1676.80	1703.92	Salt
2689.95	2942.02	Yates
2875.45	3209.02	Seven Rivers
3408.42	3930.50	Queen
3705.63	4290.62	Grayburg
3984.81	4613.92	San Andres 1
4331.45	5014.19	SA3 K

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Shape
NHU 33-694 PBHL2	4191.80	-940.01	1841.52	622460.00	864464.00	Circle (Radius: 100.00)
NHU 33-694 PBHL	4491.80	-1020.01	1969.52	622380.00	864592.00	Point



Azimuths to Grid North
True North: -0.84°
Magnetic North: 6.15°

Magnetic Field
Strength: 48104.7nT
Dip Angle: 60.73°
Date: 12/17/2018
Model: HDGM

