



HOBBS OCD
APR 24 2019
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Oxy USA Inc.

Lea County, NM
North Hobbs G/SA Unit
NHU 26-672

Wellbore #1

Design: Surveys

Standard Survey Report

20 February, 2019





Survey Report



Company: Oxy USA Inc.
Project: Lea County, NM

Site: North Hobbs G/SA Unit

Well: NHU 26-672

Wellbore: Wellbore #1

Design: Surveys

Local Co-ordinate Reference: Well NHU 26-672
TVD Reference: GL 3675.5' + 12.5' KB @ 3688.00usft (Precision 194)
MD Reference: GL 3675.5' + 12.5' KB @ 3688.00usft (Precision 194)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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	North Hobbs G/SA Unit				
Site Position:		Northing:	634,663.65 usft	Latitude:	32° 44' 22.880 N
From: Map		Easting:	847,524.56 usft	Longitude:	103° 12' 11.270 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.61 °

Well	NHU 26-672					
Well Position	+N/-S	0.00 usft	Northing:	629,168.00 usft	Latitude:	32° 43' 28.960 N
	+E/-W	0.00 usft	Easting:	843,212.89 usft	Longitude:	103° 13' 2.419 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,675.50 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/30/2018	6.80	60.72	48,066.50000000

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	0.00	

Survey Program	Date 2/20/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
12.50	1,593.00	Gyrodata Gyro (Wellbore #1)	GYD_G003_GC+DROP+	Gyrodata Stationary Tool drop on BHA on open h	
1,748.00	4,620.00	Scout MWD Survey (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	
12.50	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	
Ground Level at 12.5' MD										
100.34	0.26	172.99	100.34	-0.20	0.02	-0.20	0.30	0.30	0.00	
285.93	0.59	198.96	285.92	-1.52	-0.23	-1.52	0.20	0.18	13.99	
466.27	0.22	193.27	466.26	-2.73	-0.62	-2.73	0.21	-0.21	-3.16	
645.75	0.44	192.02	645.74	-3.74	-0.84	-3.74	0.12	0.12	-0.70	
830.11	0.49	171.80	830.09	-5.22	-0.87	-5.22	0.09	0.03	-10.97	



Survey Report



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Site:	North Hobbs G/SA Unit	MD Reference:	GL 3675.5' + 12.5' KB @ 3688.00usft (Precision 194)
Well:	NHU 26-672	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)
1,011.81	0.65	190.23	1,011.78	-7.00	-0.95	-7.00	0.13	0.09	10.14
1,056.54	0.51	164.45	1,056.51	-7.44	-0.94	-7.44	0.65	-0.31	-57.63
1,235.38	0.02	189.30	1,235.35	-8.24	-0.73	-8.24	0.28	-0.27	13.90
1,414.41	0.19	201.24	1,414.38	-8.55	-0.84	-8.55	0.10	0.09	6.67
1,593.00	0.13	297.09	1,592.97	-8.73	-1.13	-8.73	0.13	-0.03	53.67
1,748.00	0.26	29.57	1,747.97	-8.34	-1.11	-8.34	0.19	0.08	59.66
First Scout MWD Survey at 1748.0' MD									
1,927.00	3.60	353.53	1,926.84	-2.41	-1.55	-2.41	1.90	1.87	-20.13
2,105.00	4.88	348.70	2,104.35	10.57	-3.66	10.57	0.75	0.72	-2.71
2,284.00	4.40	8.83	2,282.77	24.82	-4.10	24.82	0.94	-0.27	11.25
2,463.00	5.67	17.62	2,461.08	40.04	-0.37	40.04	0.83	0.71	4.91
2,641.00	5.93	22.45	2,638.17	56.92	5.81	56.92	0.31	0.15	2.71
2,820.00	5.41	25.53	2,816.30	73.08	12.98	73.08	0.34	-0.29	1.72
2,999.00	5.01	6.10	2,994.57	88.46	17.44	88.46	1.01	-0.22	-10.85
3,177.00	4.35	7.33	3,171.98	102.89	19.13	102.89	0.38	-0.37	0.69
3,356.00	3.16	10.58	3,350.59	114.47	20.90	114.47	0.68	-0.66	1.82
3,534.00	3.03	17.44	3,528.33	123.78	23.21	123.78	0.22	-0.07	3.85
3,712.00	3.30	29.74	3,706.06	132.72	27.16	132.72	0.41	0.15	6.91
3,891.00	4.04	16.91	3,884.70	143.23	31.55	143.23	0.62	0.41	-7.17
4,070.00	4.48	15.07	4,063.20	156.01	35.21	156.01	0.26	0.25	-1.03
4,248.00	4.84	15.51	4,240.61	169.96	39.02	169.96	0.20	0.20	0.25
4,427.00	5.05	13.22	4,418.95	184.90	42.84	184.90	0.16	0.12	-1.28
4,553.00	5.27	11.20	4,544.43	195.98	45.23	195.98	0.23	0.17	-1.60
Last Scout MWD Survey at 4553.0' MD									
4,596.84	5.27	11.20	4,588.09	199.93	46.02	199.93	0.00	0.00	0.00
NHU 26-672 PBHL									
4,620.00	5.27	11.20	4,611.15	202.02	46.43	202.02	0.00	0.00	0.00
Projection to TD at 4620.0' MD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
12.50	12.50	0.00	0.00	Ground Level at 12.5' MD
1,748.00	1,747.97	-8.34	-1.11	First Scout MWD Survey at 1748.0' MD
4,553.00	4,544.43	195.98	45.23	Last Scout MWD Survey at 4553.0' MD
4,620.00	4,611.15	202.02	46.43	Projection to TD at 4620.0' MD

Checked By: _____ Approved By: _____ Date: _____



Project: Lea County, NM
 Site: North Hobbs G/SA Unit
 Well: NHU 26-672
 Depth Reference: GL 3675.5' + 12.5' KB @ 3688.00usft (Precision 194)
 SHL Northing: 629168.00
 SHL Easting: 843212.89
 Rig: Precision 194
 Plan: plan2



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	
2062.61	0.00	0.00	2062.61	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
2312.61	5.00	0.00	2312.29	10.90	0.00	2.00	0.00	10.90	Start 2284.40 hold at 2312.61 MD
4597.01	5.00	0.00	4588.00	210.00	0.01	0.00	0.00	210.00	TD at 4597.01' MD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1650.06	1650.06	Rustler
1676.00	1676.00	Salt
2916.76	2919.39	Yates
3153.79	3157.32	Seven Rivers
3708.45	3714.10	Queen
4035.81	4042.71	Grayburg
4290.11	4297.98	San Andres 1

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
NHU 26-672 PBHL	4588.00	210.00	0.01	629378.00	843212.90	Circle (Radius: 100.00)



Azimuths to Grid North
 True North: -0.80°
 Magnetic North: 6.20°

Magnetic Field
 Strength: 48066.5nT
 Dip Angle: 60.72°
 Date: 11/30/2018
 Model: HDGM

