



OCCIDENTAL PERMIAN LTD

NORTH HOBBS UNIT

SEC. 24, T18S, R37E

NHU 24-669

NHU 24-669

Survey: NHU 24-669 Surveys

HOBBS OCD
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Standard Survey Report

15 March, 2016



GEOGUIDANCE
DRILLING SERVICES, INC.



GEOGUIDANCE DRILLING

Survey Report



Company:	OCCIDENTAL PERMIAN LTD	Local Co-ordinate Reference:	Well NHU 24-669
Project:	NORTH HOBBS UNIT	TVD Reference:	NHU 24-669 @ 3685.6usft (H&P 340)
Site:	SEC. 24, T18S, R37E	MD Reference:	NHU 24-669 @ 3685.6usft (H&P 340)
Well:	NHU 24-669	North Reference:	Grid
Wellbore:	NHU 24-669	Survey Calculation Method:	Minimum Curvature
Design:	NHU 24-669	Database:	EDM 5000.1 Single User Db

Project	NORTH HOBBS UNIT		
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	SEC. 24, T18S, R37E		
Site Position:		Northing:	632,000.00 usft
From:	Map	Easting:	847,000.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 43' 56.582 N
		Longitude:	103° 12' 17.743 W
		Grid Convergence:	0.61 °

Well	NHU 24-669, SUR. N 632702.16 E 849230.94		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	3,685.6 usft
		Latitude:	32° 44' 3.293 N
		Longitude:	103° 11' 51.542 W
		Ground Level:	3,669.1 usft

Wellbore	NHU 24-669		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	2/29/2016	6.95
			Dip Angle (°)
			60.61
			Field Strength (nT)
			48,413

Design	NHU 24-669		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°)
			29.91

Survey Program	Date 3/15/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
187.0	4,757.0	NHU 24-669 Surveys (NHU 24-669)	MWD+IGRF
			Description
			OWSG MWD + IGRF or WMM

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
187.0	0.44	186.60	187.0	-0.7	-0.1	-0.7	0.24	0.24	0.00
368.0	0.31	137.03	368.0	-1.8	0.2	-1.4	0.19	-0.07	-27.39
551.0	3.60	45.20	550.9	1.9	4.6	4.0	1.98	1.80	-50.18
736.0	8.20	40.40	734.8	16.1	17.3	22.5	2.50	2.49	-2.59
899.0	10.20	30.60	895.8	37.4	32.1	48.4	1.55	1.23	-6.01
1,079.0	12.00	30.90	1,072.4	67.1	49.9	83.1	1.00	1.00	0.17
1,258.0	13.90	34.50	1,246.8	100.8	71.6	123.1	1.15	1.06	2.01
1,438.0	14.46	31.87	1,421.3	137.7	95.7	167.1	0.47	0.31	-1.46
1,593.0	13.30	30.40	1,571.8	169.5	115.0	204.3	0.78	-0.75	-0.95



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Design:	NHU 24-669	Database:	EDM 5000.1 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)
1,774.0	17.65	32.10	1,746.2	210.8	140.1	252.5	2.42	2.40	0.94
1,953.0	19.53	34.10	1,915.9	258.5	171.3	309.5	1.11	1.05	1.12
2,133.0	19.40	30.40	2,085.6	309.2	203.3	369.4	0.69	-0.07	-2.06
2,313.0	17.10	29.30	2,256.5	358.1	231.4	425.8	1.29	-1.28	-0.61
2,493.0	15.21	32.44	2,429.4	401.1	257.0	475.8	1.16	-1.05	1.74
2,672.0	13.70	33.50	2,602.7	438.6	281.3	520.4	0.86	-0.84	0.59
2,852.0	12.90	35.50	2,777.9	472.7	304.7	561.7	0.51	-0.44	1.11
3,032.0	12.04	35.70	2,953.7	504.3	327.3	600.4	0.48	-0.48	0.11
3,212.0	11.51	33.89	3,129.9	534.5	348.3	637.0	0.36	-0.29	-1.01
3,392.0	10.57	35.12	3,306.5	562.9	367.8	671.3	0.54	-0.52	0.68
3,572.0	10.80	32.80	3,483.4	590.6	386.5	704.6	0.27	0.13	-1.29
3,751.0	10.60	34.80	3,659.3	618.2	404.9	737.8	0.24	-0.11	1.12
3,930.0	9.71	35.52	3,835.5	644.0	423.1	769.2	0.50	-0.50	0.40
4,110.0	9.71	35.96	4,012.9	668.6	440.8	799.4	0.04	0.00	0.24
4,290.0	9.89	39.21	4,190.3	692.9	459.5	829.8	0.32	0.10	1.81
4,470.0	10.24	42.46	4,367.5	716.7	480.1	860.6	0.37	0.19	1.81
4,650.0	10.24	45.36	4,544.7	739.7	502.3	891.7	0.29	0.00	1.61
4,699.0	10.55	45.10	4,592.9	746.0	508.6	900.2	0.64	0.63	-0.53
4,705.0	10.55	45.10	4,598.7	746.7	509.3	901.3	0.00	0.00	0.00
4,757.0	10.55	45.10	4,649.9	753.5	516.1	910.4	0.00	0.00	0.00

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
234.7	234.7	Top Red Beds			
1,516.9	1,497.8	Rustler (Base Red Beds)			
1,637.1	1,614.6	Top Salt			
2,779.8	2,707.6	Base Salt			
3,551.8	3,463.6	Queen			
3,869.7	3,776.1	Grayburg			
4,044.1	3,948.0	Basal Grayburg			
4,145.9	4,048.3	San Andres			

Checked By: _____ Approved By: _____ Date: _____



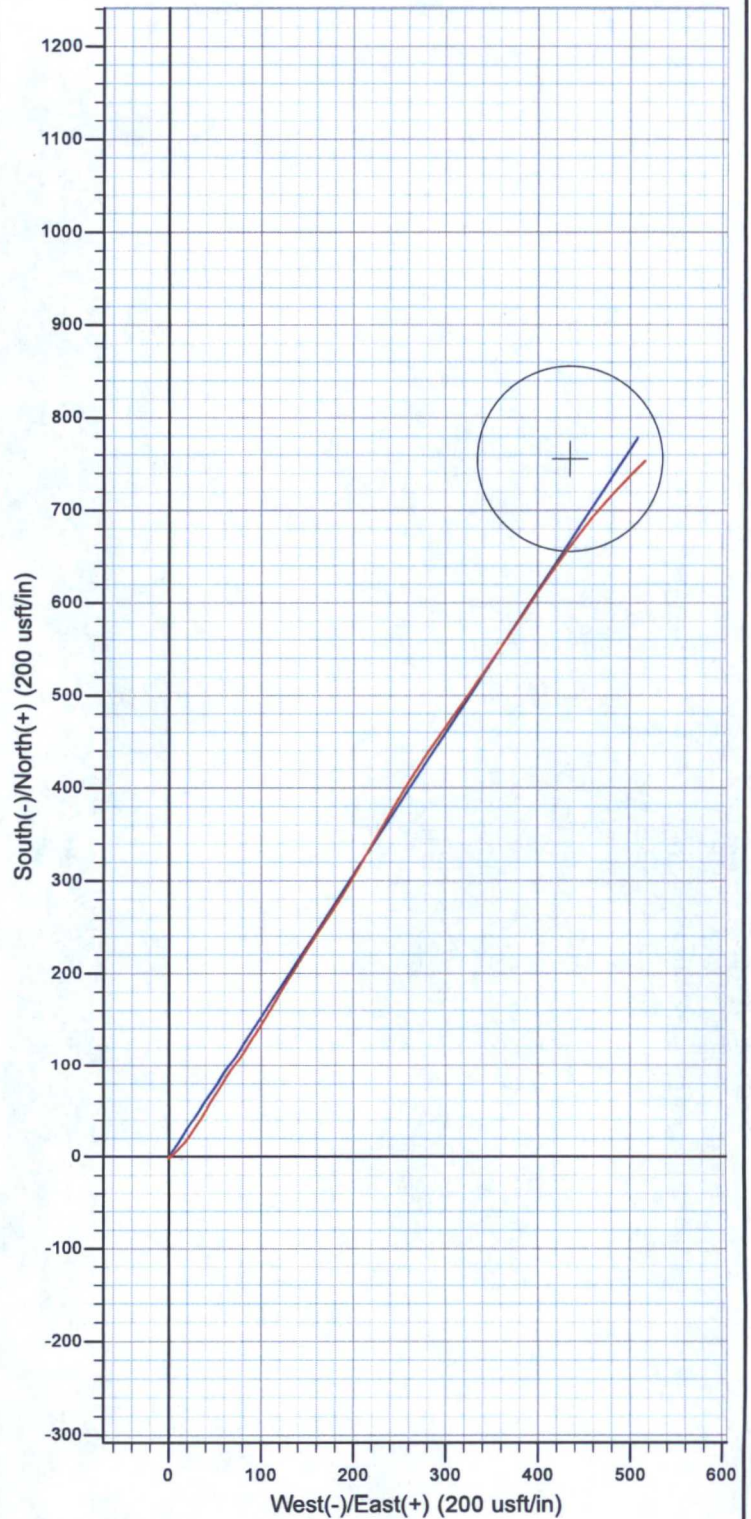
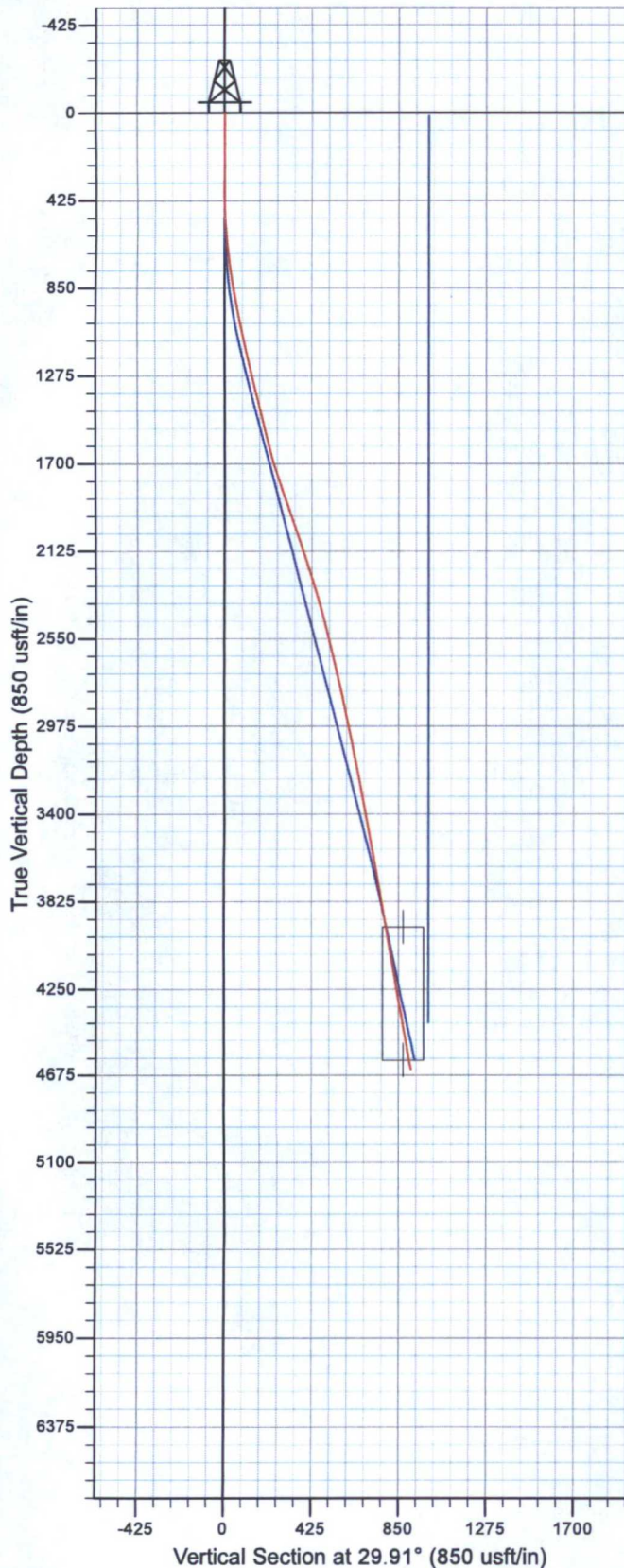
OCCIDENTAL PERMIAN LTD

Project: NORTH HOBBS UNIT
Site: SEC. 24, T18S, R37E
Well: NHU 24-669
Wellpath: NHU 24-669
Design: NHU 24-669



Azimuths to Grid North
True North: -0.61°
Magnetic North: 6.34°

Magnetic Field
Strength: 48413.2nT
Dip Angle: 60.61°
Date: 2/29/2016
Model: IGRF2015



FINAL PLOT