



OCCIDENTAL PERMIAN LTD

**SOUTH HOBBS UNIT
SEC. 9, T19S, R38E
SHU 270**

SHU 270

Design: SHU 270

Standard Survey Report

08 May, 2016

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**GEOGUIDANCE
DRILLING SERVICES, INC.**



GEOGUIDANCE DRILLING
Survey Report



Company: OCCIDENTAL PERMIAN LTD
Project: SOUTH HOBBS UNIT
Site: SEC. 9, T19S, R38E
Well: SHU 270
Wellbore: SHU 270
Design: SHU 270

Local Co-ordinate Reference: Well SHU 270
TVD Reference: SHU 270 @ 3617.3usft (H&P 340)
MD Reference: SHU 270 @ 3617.3usft (H&P 340)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	SOUTH 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. 9, T19S, R38E			
Site Position:		Northing:	612,000.00 usft	Latitude: 32° 40' 36.987 N
From:	Map	Easting:	863,000.00 usft	Longitude: 103° 9' 13.072 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.64 °

Well	SHU 270, SUR. N 613648.16 E 861268.44			
Well Position	+N/-S	0.0 usft	Northing:	613,648.16 usft
	+E/-W	0.0 usft	Easting:	861,268.44 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	3,617.3 usft
			Ground Level:	3,600.8 usft

Wellbore	SHU 270				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/16/2016	6.93	60.57	48,382

Design	SHU 270			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	33.05

Survey Program	Date	5/8/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
168.0	1,477.0	EMS Surveys SHU 270 (SHU 270)	EMS+IGRF	OWSG EMS + IGRF or WMM
1,575.0	5,260.0	SHU 270 MWD Surveys (SHU 270)	MWD+IGRF	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
168.0	0.90	302.70	168.0	0.7	-1.1	0.0	0.54	0.54	0.00
Start of Multi Shot Surveys									
198.0	1.00	296.60	198.0	1.0	-1.5	0.0	0.47	0.33	-20.33
226.0	1.10	296.30	226.0	1.2	-2.0	-0.1	0.36	0.36	-1.07
256.0	1.20	296.40	256.0	1.5	-2.5	-0.2	0.33	0.33	0.33
287.0	1.00	299.50	287.0	1.7	-3.1	-0.2	0.67	-0.65	10.00
317.0	1.20	295.40	317.0	2.0	-3.6	-0.3	0.72	0.67	-13.67
347.0	1.20	299.20	347.0	2.3	-4.1	-0.3	0.27	0.00	12.67
423.0	1.20	285.10	422.9	2.9	-5.6	-0.6	0.39	0.00	-18.55



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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)	Build Rate (°/100usft)	Turn Rate (°/100usft)
468.0	1.20	298.80	467.9	3.2	-6.5	-0.8	0.64	0.00	30.44
513.0	1.10	296.50	512.9	3.6	-7.3	-0.9	0.24	-0.22	-5.11
602.0	1.10	295.60	601.9	4.4	-8.8	-1.1	0.02	0.00	-1.01
692.0	0.90	293.40	691.9	5.1	-10.2	-1.3	0.23	-0.22	-2.44
737.0	0.90	298.70	736.9	5.4	-10.9	-1.4	0.18	0.00	11.78
782.0	0.80	307.80	781.9	5.7	-11.4	-1.4	0.37	-0.22	20.22
827.0	0.80	313.50	826.9	6.1	-11.9	-1.3	0.18	0.00	12.67
872.0	0.90	312.80	871.9	6.6	-12.4	-1.2	0.22	0.22	-1.56
917.0	0.80	302.80	916.9	7.0	-12.9	-1.2	0.40	-0.22	-22.22
962.0	0.80	312.70	961.9	7.4	-13.4	-1.1	0.31	0.00	22.00
1,007.0	0.80	303.20	1,006.9	7.8	-13.9	-1.1	0.29	0.00	-21.11
1,097.0	0.60	309.00	1,096.9	8.4	-14.8	-1.0	0.24	-0.22	6.44
1,142.0	0.50	317.20	1,141.9	8.7	-15.1	-0.9	0.28	-0.22	18.22
1,187.0	0.60	321.60	1,186.9	9.0	-15.4	-0.8	0.24	0.22	9.78
1,232.0	0.60	327.50	1,231.8	9.4	-15.7	-0.6	0.14	0.00	13.11
1,276.0	0.60	332.90	1,275.8	9.8	-15.9	-0.4	0.13	0.00	12.27
1,321.0	0.60	334.50	1,320.8	10.2	-16.1	-0.2	0.04	0.00	3.56
1,366.0	0.50	336.60	1,365.8	10.6	-16.3	0.0	0.23	-0.22	4.67
1,411.0	0.50	338.20	1,410.8	11.0	-16.4	0.3	0.03	0.00	3.56
1,477.0	0.50	342.30	1,476.8	11.5	-16.6	0.6	0.05	0.00	6.21
End of Multi Shot Surveys									
1,575.0	0.10	328.70	1,574.8	12.0	-16.8	0.9	0.41	-0.41	-13.88
1,755.0	3.00	44.60	1,754.8	15.5	-13.6	5.6	1.65	1.61	42.17
1,934.0	7.80	42.30	1,932.9	27.8	-2.1	22.2	2.68	2.68	-1.28
2,114.0	9.00	30.70	2,111.0	49.0	13.3	48.3	1.15	0.67	-6.44
2,294.0	8.66	34.72	2,288.9	72.2	28.2	75.9	0.39	-0.19	2.23
2,474.0	8.83	37.49	2,466.8	94.3	44.3	103.2	0.25	0.09	1.54
2,653.0	8.96	40.13	2,643.6	115.9	61.7	130.8	0.24	0.07	1.47
2,833.0	8.61	40.39	2,821.5	136.9	79.5	158.0	0.20	-0.19	0.14
3,012.0	7.91	40.70	2,998.6	156.4	96.2	183.5	0.39	-0.39	0.17
3,192.0	7.03	39.86	3,177.1	174.2	111.3	206.8	0.49	-0.49	-0.47
3,372.0	6.15	38.90	3,355.9	190.2	124.4	227.3	0.49	-0.49	-0.53
3,552.0	5.45	36.04	3,535.0	204.6	135.5	245.4	0.42	-0.39	-1.59
3,732.0	5.29	39.32	3,714.2	217.9	145.8	262.2	0.19	-0.09	1.82
3,929.0	5.40	31.80	3,910.4	232.9	156.4	280.5	0.36	0.06	-3.82
4,091.0	4.04	27.52	4,071.8	244.4	163.1	293.8	0.87	-0.84	-2.64
4,289.0	3.16	28.17	4,269.4	255.4	168.9	306.2	0.44	-0.44	0.33
4,451.0	3.25	25.93	4,431.2	263.5	173.0	315.2	0.10	0.06	-1.38
4,649.0	3.56	22.29	4,628.8	274.2	177.8	326.8	0.19	0.16	-1.84
4,829.0	3.47	21.50	4,808.5	284.4	181.9	337.6	0.06	-0.05	-0.44
5,008.0	3.38	22.64	4,987.1	294.3	185.9	348.1	0.06	-0.05	0.64
5,188.0	3.43	22.46	5,166.8	304.2	190.0	358.6	0.03	0.03	-0.10
5,260.0	3.43	22.46	5,238.7	308.2	191.7	362.9	0.00	0.00	0.00



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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)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Projected to TD									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
155.0	155.0	Top Red Beds		0.00	
1,505.2	1,505.0	Rustler (Base Red Beds)		0.00	
1,655.2	1,655.0	Top Salt		0.00	
2,725.3	2,715.0	Base Salt (Yates)		0.00	
3,521.9	3,505.0	Queen		0.00	
3,833.2	3,815.0	Grayburg		0.00	
4,009.0	3,990.0	Basal Grayburg		0.00	
4,119.3	4,100.0	San Andres		0.00	

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
168.0	168.0	0.7	-1.1	Start of Multi Shot Surveys
1,477.0	1,476.8	11.5	-16.6	End of Multi Shot Surveys
5,260.0	5,238.7	308.2	191.7	Projected to TD

Checked By: _____ Approved By: _____ Date: _____

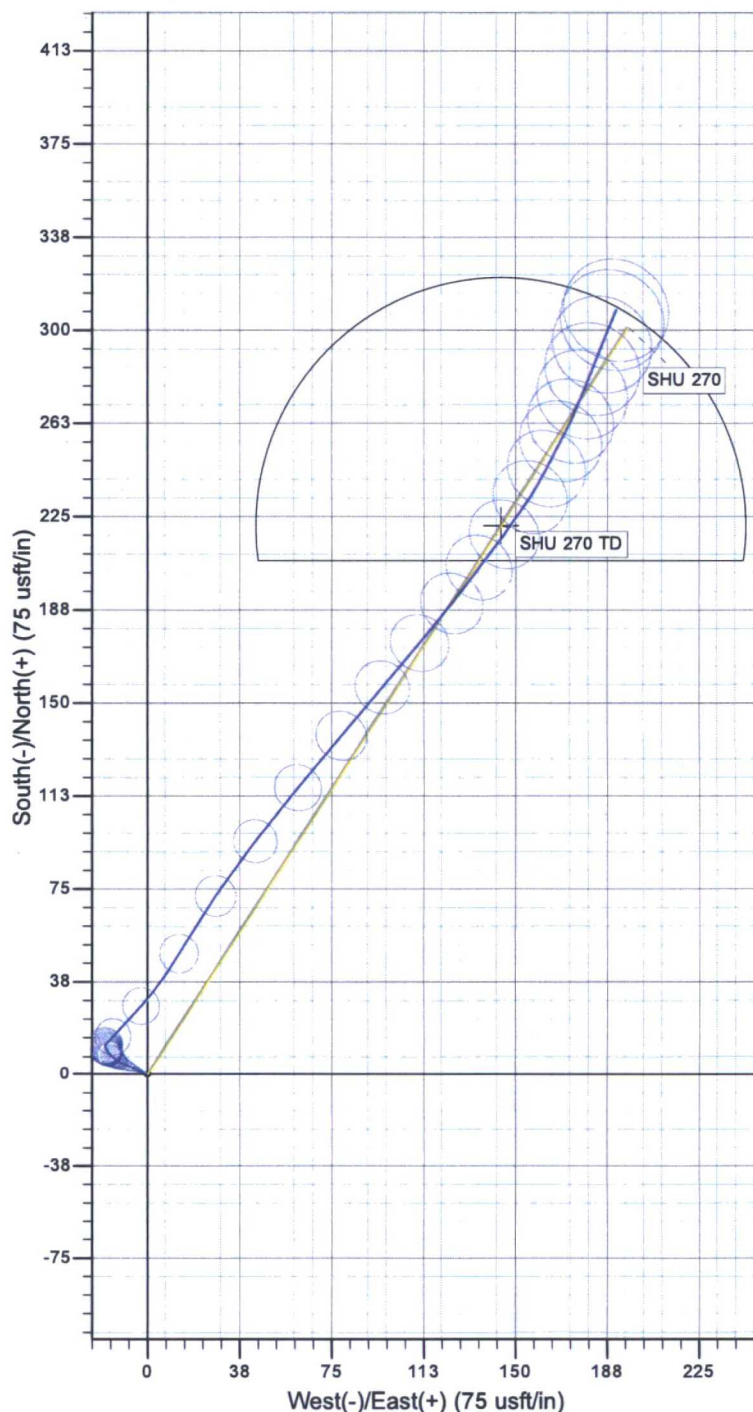
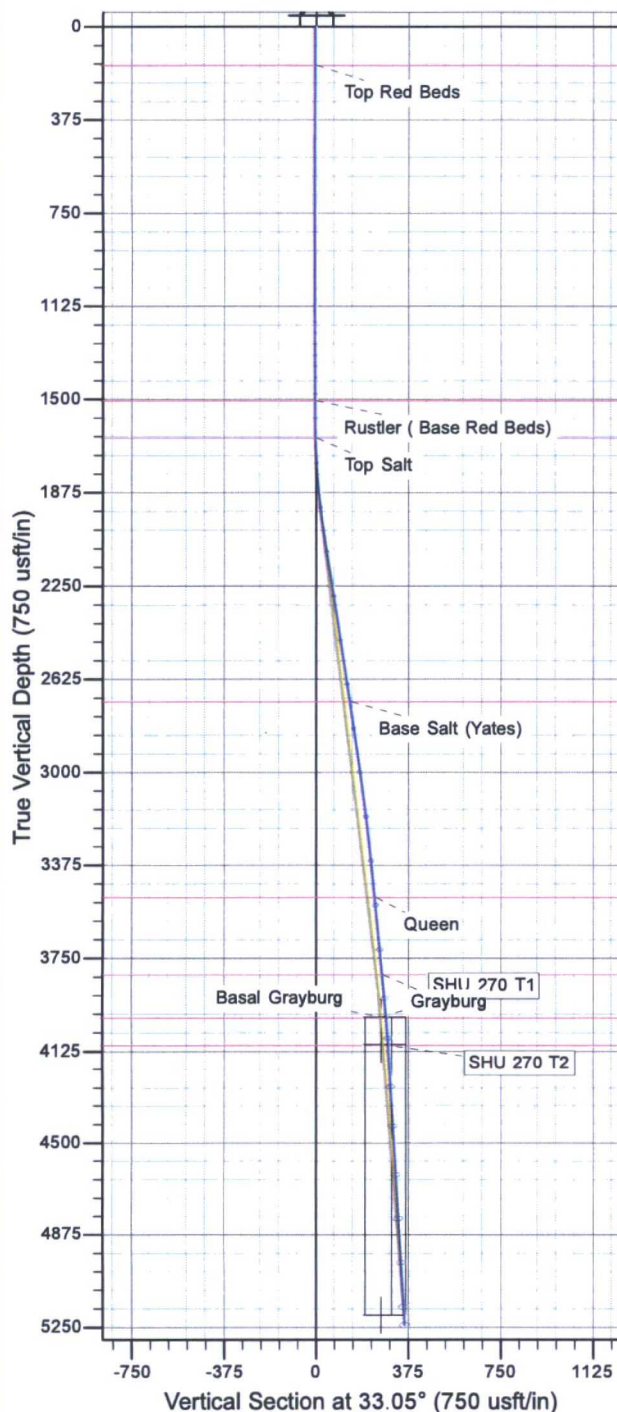


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Project: SOUTH HOBBS UNIT
 Site: SEC. 9, T19S, R38E
 Well: SHU 270
 Wellpath: SHU 270
 Design: SHU 270



Azimuths to Grid North
 True North: -0.63°
 Magnetic North: 6.29°
 Magnetic Field
 Strength: 48381.8snT
 Dip Angle: 60.57°
 Date: 3/16/2016
 Model: IGRF2015



LEGEND

- △ SHU 270, SHU 270, 031616 V1 V0
- SHU 270

SECTION DETAILS

No plan data is available