



Job Number: SVMO-150576
Company: OXY USA, Inc.
Lease/Well: North Hobbs Unit 957-18
Location: Lea County, NM
Rig Name: H&P #340
RKB: 0'
G.L. or M.S.L.: GL

State/Country: New Mexico/USA
Declination: 6.40°
Grid: East To Grid North
File name: W:\WINSER-1\2015SU-1\OXYMOMNORTH-1\95718.SVY
Date/Time: 28-Jul-15 / 10:15
Curve Name: Surface - 1520' M.D. (Rate Gyro) (API 30-025-42471)

MS Survey

HOBBS OGD
OCT 21 2015
RECEIVED

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane .00
Vertical Coordinates Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

We hereby certify that our survey data from
Surface MD to 1520' MD is, to the best of
our knowledge a true and accurate account of the
Well bore
Danton Turner 7/28/15
MS Energy Services Date

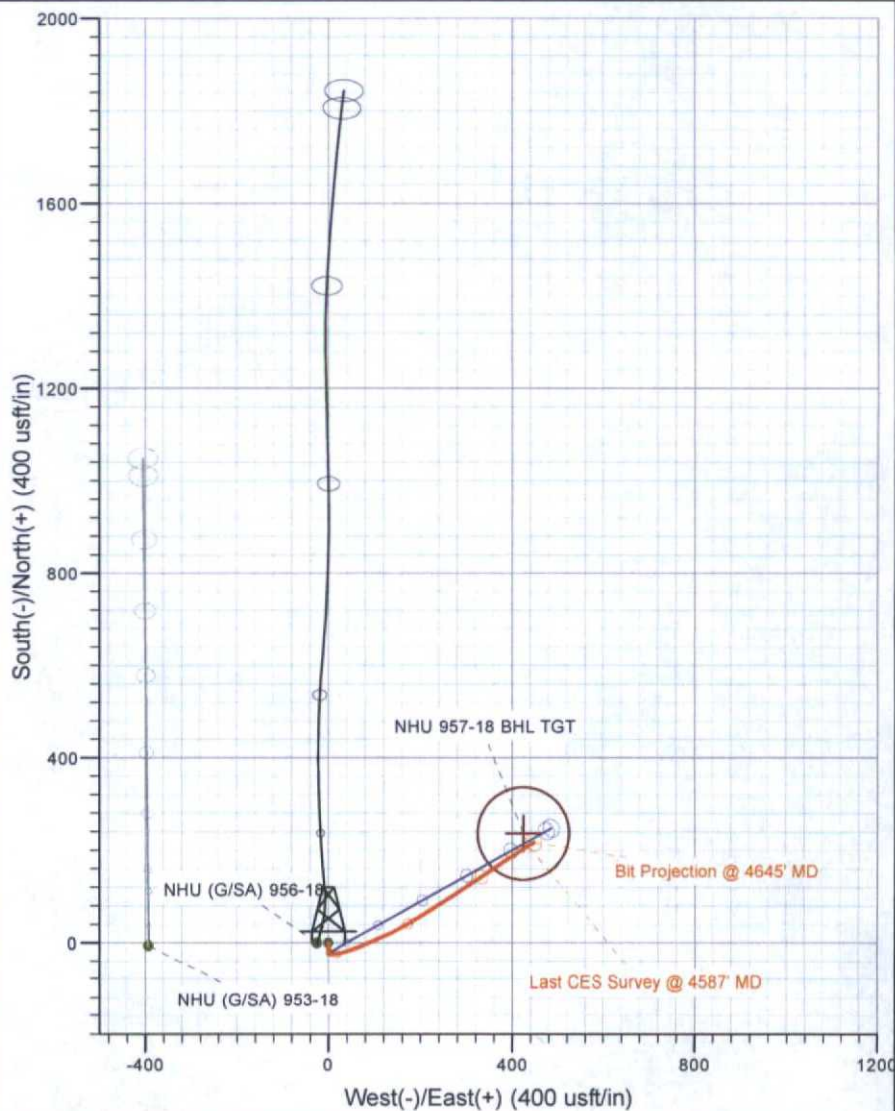
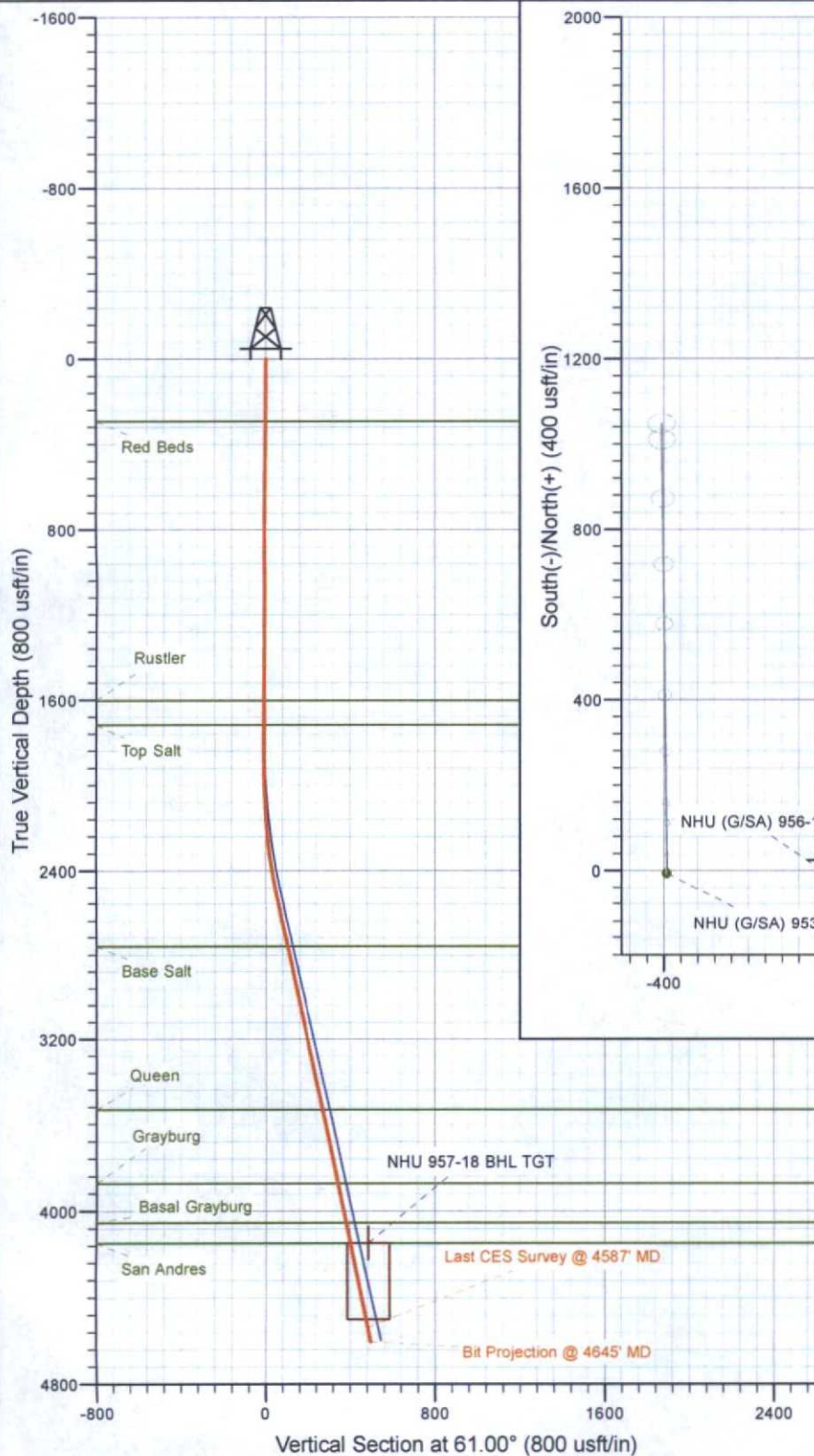
DEC 11 2015

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
200.00	.57	180.91	100.00	-.50	-.01	-.50	.50	180.91	.57
300.00	.69	161.75	199.99	-1.57	.17	-1.57	1.58	173.71	.24
400.00	1.00	176.08	299.98	-3.01	.42	-3.01	3.04	172.04	.37
	1.07	181.62	399.97	-4.81	.45	-4.81	4.83	174.61	.12
500.00	1.12	180.48	499.95	-6.72	.42	-6.72	6.74	176.43	.05
600.00	1.04	178.90	599.93	-8.61	.43	-8.61	8.62	177.15	.09
700.00	1.03	180.17	699.91	-10.41	.44	-10.41	10.42	177.56	.03
800.00	.80	171.97	799.90	-12.00	.54	-12.00	12.02	177.43	.26
900.00	.44	156.93	899.89	-13.05	.79	-13.05	13.07	176.55	.39
1000.00	.28	169.45	999.89	-13.64	.98	-13.64	13.68	175.88	.18
1100.00	.59	154.31	1099.89	-14.35	1.25	-14.35	14.40	175.02	.33
1200.00	.46	144.87	1199.88	-15.14	1.70	-15.14	15.23	173.58	.16

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
1300.00	.64	165.49	1299.88	-16.01	2.07	-16.01	16.14	172.62	.26
1400.00	.71	166.64	1399.87	-17.15	2.36	-17.15	17.31	172.17	.07
1500.00	.90	187.43	1499.86	-18.53	2.40	-18.53	18.69	172.62	.35
Last Survey Depth Recorded									
1520.00	.91	185.05	1519.86	-18.85	2.37	-18.85	18.99	172.85	.19



Project: HOBBS, NORTH
Site: NORTH HOBBS GRAYBURG-SA UNIT
Well: NHU (G/SA) 957-18
Wellbore: ST00
Design: Final
Rig: H&P 340



Azimuths to Grid North
True North: -0.62°
Magnetic North: 6.37°

Magnetic Field
Strength: 48607.7 nT
Dip Angle: 60.64°
Date: 1/13/2015
Model: IGRF2010

Survey Report

Company:	OXY USA PERMIAN EOR	Local Co-ordinate Reference:	Well NHU (G/SA) 957-18
Project:	HOBBS, NORTH	TVD Reference:	DFE @ 3672.8usft
Site:	NORTH HOBBS GRAYBURG-SA UNIT	MD Reference:	DFE @ 3672.8usft
Well:	NHU (G/SA) 957-18	North Reference:	Grid
Wellbore:	ST00	Survey Calculation Method:	Minimum Curvature
Design:	Final	Database:	USA EDM 5000 Multi Users DB

Project	HOBBS, NORTH, North America, North West Hobbs, 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		Using geodetic scale factor

Site		NORTH HOBBS GRAYBURG-SA UNIT			
Site Position:		Northing:	635,270.89 usft	Latitude:	32° 44' 28.21 N
From:	Map	Easting:	853,897.68 usft	Longitude:	103° 10' 56.59 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.62 °

Well	NHU (G/SA) 957-18					
Well Position	+N/-S	0.0 usft	Northing:	635,724.79 usft	Latitude:	32° 44' 32.68 N
	+E/-W	0.0 usft	Easting:	854,109.26 usft	Longitude:	103° 10' 54.06 W
Position Uncertainty		1.0 usft	Wellhead Elevation:	3,656.3 usft	Ground Level:	3,656.3 usft

Wellbore	ST00				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/13/2015	6.99	60.64	48,608

Design	Final			
Audit Notes:				
Version:	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	61.00

Survey Program	Date	7/29/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	1,520.0	Gyro (ST00)	GYRO-MWD_A019Ga	OWSG Gyro MWD
1,652.0	4,656.0	Survey #2 (ST00)	MWD+HDGM+AX+SAG_B0(	OWSG MWD + HDGM + Axial Corr + Sag Correction

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.57	180.91	100.0	-0.5	0.0	-0.2	0.57	0.57	
200.0	0.69	161.75	200.0	-1.6	0.2	-0.6	0.24	0.12	
300.0	1.00	176.08	300.0	-3.0	0.4	-1.1	0.37	0.31	
400.0	1.07	181.62	400.0	-4.8	0.5	-1.9	0.12	0.07	
500.0	1.12	180.48	499.9	-6.7	0.4	-2.9	0.05	0.05	
600.0	1.04	178.90	599.9	-8.6	0.4	-3.8	0.09	-0.08	
700.0	1.03	180.17	699.9	-10.4	0.4	-4.7	0.03	-0.01	
800.0	0.80	171.97	799.9	-12.0	0.5	-5.3	0.26	-0.23	
900.0	0.44	156.93	899.9	-13.0	0.8	-5.6	0.39	-0.36	
1,000.0	0.28	169.45	999.9	-13.6	1.0	-5.8	0.18	-0.16	
1,100.0	0.59	154.31	1,099.9	-14.3	1.2	-5.9	0.33	0.31	

Survey Report

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 Wellbore: ST00
 Design: Final

Local Co-ordinate Reference: Well NHU (G/SA) 957-18
 TVD Reference: DFE @ 3672.8usft
 MD Reference: DFE @ 3672.8usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,200.0	0.46	144.87	1,199.9	-15.1	1.7	-5.8	0.16	-0.13	
1,300.0	0.64	165.49	1,299.9	-16.0	2.1	-5.9	0.26	0.18	
1,400.0	0.71	166.64	1,399.9	-17.2	2.4	-6.3	0.07	0.07	
1,500.0	0.90	187.43	1,499.9	-18.5	2.4	-6.9	0.35	0.19	
1,520.0	0.91	185.05	1,519.9	-18.8	2.4	-7.1	0.19	0.05	
1,652.0	1.10	204.70	1,651.8	-21.0	1.7	-8.7	0.30	0.14	
1,832.0	1.10	133.90	1,831.8	-23.8	2.3	-9.6	0.71	0.00	
2,012.0	2.50	91.70	2,011.7	-25.1	7.4	-5.7	1.02	0.78	
2,192.0	5.00	77.90	2,191.3	-23.6	19.0	5.2	1.47	1.39	
2,372.0	8.70	72.20	2,370.0	-17.8	39.7	26.1	2.09	2.06	
2,552.0	11.70	69.80	2,547.2	-7.3	69.8	57.5	1.68	1.67	
2,732.0	13.10	67.10	2,723.0	6.9	105.7	95.8	0.84	0.78	
2,911.0	11.80	63.30	2,897.7	23.0	140.7	134.3	0.86	-0.73	
3,092.0	11.80	59.00	3,074.9	40.9	173.1	171.2	0.49	0.00	
3,272.0	12.00	58.80	3,251.1	60.1	204.9	208.3	0.11	0.11	
3,452.0	12.40	57.50	3,427.0	80.1	237.2	246.3	0.27	0.22	
3,632.0	12.00	56.70	3,602.9	100.8	269.2	284.3	0.24	-0.22	
3,811.0	12.30	57.60	3,777.9	121.2	300.8	321.9	0.20	0.17	
3,991.0	12.60	56.00	3,953.7	142.5	333.3	360.6	0.25	0.17	
4,171.0	11.70	55.80	4,129.6	163.7	364.6	398.3	0.50	-0.50	
4,351.0	11.50	57.50	4,306.0	183.6	394.9	434.4	0.22	-0.11	
4,587.0	11.70	58.20	4,537.1	208.9	435.0	481.8	0.10	0.08	Last CES Survey @ 4587' MD
4,656.0	11.70	58.20	4,604.7	216.2	446.9	495.7	0.00	0.00	Bit Projection @ 4645' MD