



Job Number: SVMO-150655
 Company: OXY USA, Inc.
 Lease/Well: South Hobbs Unit 251
 Location: Lea County, NM
 Rig Name: H&P #340
 RKB: 16.5'
 G.L. or M.S.L.: GL

State/Country: New Mexico/USA
 Declination: 6.07°
 Grid: East To Grid North
 File name: W:\WINSER-12015SU-10XYMOSOUTH-1251.SVY
 Date/Time: 31-Aug-15 / 11:52
 Curve Name: Surface - 1528' M.D. (Rate Gyro) (API 30-025-42592)

HOBBS OCD
FEB 26 2016
RECEIVED

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

MS Survey

We hereby certify that our survey data from
 Surface MD to 1528' MD is, to the best of
 our knowledge a true and accurate account of
 the well bore.
Austin McBaine 8/24/15
 MS Energy Services Date

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Ground Level	.00	.00	16.50	.00	.00	.00	.00	.00	.00
16.50	.51	111.57	100.00	-14	.35	-14	.37	111.57	.61
100.00	.89	101.76	199.99	-46	1.52	-46	1.59	106.79	.40
200.00	.75	90.26	299.98	-62	2.93	-62	3.00	101.93	.22
300.00	.74	80.39	399.97	-51	4.23	-51	4.26	96.95	.13
400.00									
500.00	.65	77.84	499.97	-29	5.42	-29	5.42	93.04	.10
600.00	.76	73.48	599.96	.02	6.61	.02	6.61	89.82	.12
700.00	.76	78.07	699.95	.35	7.89	.35	7.90	87.49	.06
800.00	.83	61.06	799.94	.83	9.17	.83	9.21	84.81	.25
900.00	1.00	61.64	899.93	1.60	10.58	1.60	10.70	81.40	.17

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 Severly Deg/100
1000.00	.97	46.08	999.91	2.60	11.95	2.60	12.23	77.73	.27
1100.00	.95	33.15	1099.90	3.88	13.02	3.88	13.58	73.40	.22
1200.00	.78	51.14	1199.89	5.00	14.00	5.00	14.87	70.34	.32
1300.00	.62	40.73	1299.88	5.84	14.88	5.84	15.99	68.58	.20
1400.00	.61	63.91	1399.87	6.48	15.71	6.48	17.00	67.58	.25
1500.00	.51	56.21	1499.87	6.97	16.56	6.97	17.97	67.19	.12
Last Survey Depth Recorded									
1528.00	.69	67.21	1527.87	7.10	16.82	7.10	18.26	67.12	.76



Job Number: SVMO-150687
 Company: OXY USA, Inc.
 Lease/Well: South Hobbs Unit 251
 Location: Lea County, NM
 Rig Name: Pulling Unit
 RKB: 16.5'
 G.L. or M.S.L.: GL

State/Country: New Mexico/USA
 Declination: 6.53°
 Grid: East To Grid North
 File name: W:\WINSER-12015SU-10XYMOSOUTH-1251.SVY
 Date/Time: 11-Sep-15 / 08:20
 Curve Name: 3900' - 4467' M.D. (SRG) (API 30-025-42592)

MS Survey

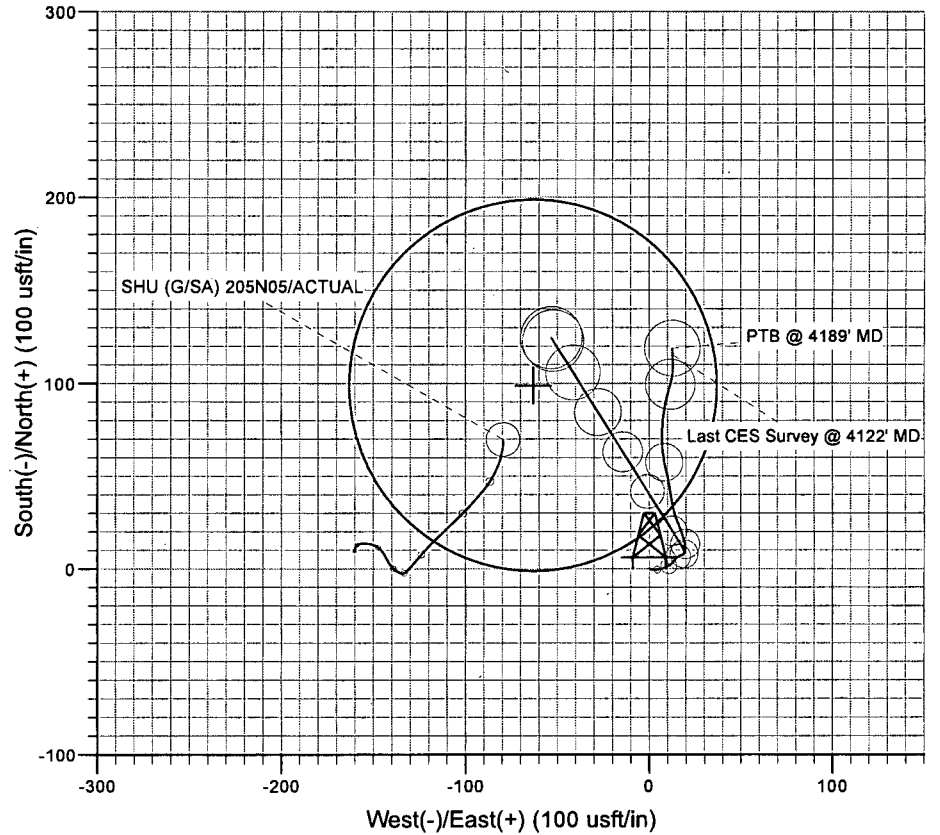
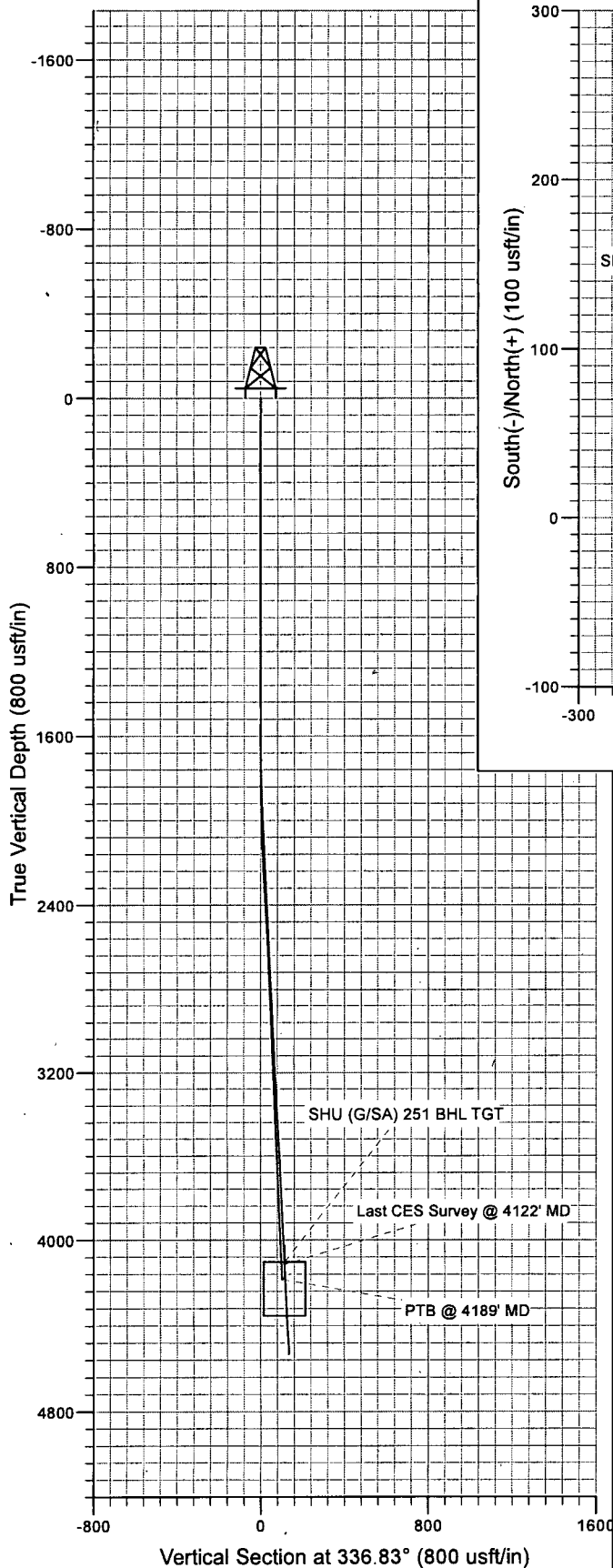
WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 336.83
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

We hereby certify that our survey data from
3900' MD to 4467' MD is, to the best of
 our knowledge a true and accurate account of the
 well bore.
Daniel Lust 9/10/15
 MS Energy Services Date

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Depth	N-S FT	E-W FT	Vertical Section FT	Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
3813.00	3.20	17.90	3810.58	99.37	11.55	86.81	100.04		.00
Tied SRG Surveys Into Cathedra Surveys - Information Provided By Operator									
3900.00	3.26	10.46	3897.44	104.11	12.75	90.70	104.89		.49
4000.00	3.04	4.06	3997.29	109.55	13.45	95.43	110.38		.41
4200.00	3.13	357.74	4197.00	120.30	13.61	105.24	121.07		.18
4400.00	3.46	.70	4396.67	131.79	13.47	115.86	132.48		.19
Last Survey Depth Recorded									
4467.00	3.49	357.64	4463.55	135.85	13.41	119.62	136.51		.28



Project: HOBBS, SOUTH
Site: SOUTH HOBBS GRAYBURG-SA UNIT
Well: SHU (G/SA) 251
Wellbore: ST00
Design: Final
Rig: H&P 340



Azimuths to Grid North
True North: -0.63°
Magnetic North: 6.33°

Magnetic Field
Strength: 48550.3snT
Dip Angle: 60.58°
Date: 4/6/2015
Model: IGRF2010

Cathedral Energy Services

Survey Report

Company:	OXY USA PERMIAN EOR	Local Co-ordinate Reference:	Well SHU (G/SA) 251
Project:	HOBBS, SOUTH	TVD Reference:	DFE @ 3628.7usft
Site:	SOUTH HOBBS GRAYBURG-SA UNIT	MD Reference:	DFE @ 3628.7usft
Well:	SHU (G/SA) 251	North Reference:	Grid
Wellbore:	ST00	Survey Calculation Method:	Minimum Curvature
Design:	Final	Database:	USA EDM 5000 Multi Users DB

Project:	HOBBS, SOUTH, North America, HOBBS, SOUTH - ALTURA HOBBS-OP		
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:	SOUTH HOBBS GRAYBURG-SA UNIT		
Site Position:		Northing:	617,518.60 usft
From:	Map	Easting:	859,408.09 usft
Position Uncertainty:	1.0 usft	Slot Radius:	600"
		Latitude:	32.692216
		Longitude:	-103.165105
		Grid Convergence:	0.63 °

Well:	SHU (G/SA) 251		
Well Position	+N/-S	0.0 usft	Latitude: 32.682854
	+E/-W	0.0 usft	Longitude: -103.172826
Position Uncertainty	0.0 usft	Wellhead Elevation:	3,612.2 usft
		Ground Level:	3,612.2 usft

Wellbore:	ST00		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	4/6/2015	6.96
			(°)
			60.58
			48,550

Design:	Final		
Audit Notes:			
Version:	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction 336.83
			(°)

Survey Program	Date 8/31/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
16.5	1,528.0	Gyro (ST00)	GYRO-NS_A020Ga
1,653.0	4,189.0	Survey #2 (ST00)	MWD+HDGM+AX+SAG_B0(OWSG MWD + HDGM + Axial Corr + Sag Correction

Survey:									
Measured	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Formations /		
Depth	Depth	(usft)	(usft)	Section	Rate	Rate	Comments		
(usft)	(usft)	(usft)	(usft)	(usft)	(°/100usf)	(°/100u)			
0.0	0.0	0.0	0.0	0.0	0.00	0.00			
16.5	0.00	0.00	0.0	0.0	0.00	0.00			
100.0	0.51	111.57	-0.1	-0.3	0.61	0.61			
200.0	0.89	101.76	-0.5	-1.0	0.40	0.38			
300.0	0.75	90.26	-0.6	-1.7	0.22	-0.14			
400.0	0.74	80.39	-0.5	-2.1	0.13	-0.01			
500.0	0.65	77.84	-0.3	-2.4	0.10	-0.09			
600.0	0.76	73.48	0.0	-2.6	0.12	0.11			
700.0	0.76	78.07	0.3	-2.8	0.06	0.00			
800.0	0.83	61.06	0.8	-2.8	0.25	0.07			
900.0	1.00	61.64	1.6	-2.7	0.17	0.17			
1,000.0	0.97	46.08	2.6	-2.3	0.27	-0.03			

Cathedral Energy Services

Survey Report

Company:	OXY USA PERMIAN EOR	Local Co-ordinate Reference:	Well SHU (G/SA) 251
Project:	HOBBS, SOUTH	TVD Reference:	DFE @ 3628.7usft
Site:	SOUTH HOBBS GRAYBURG-SA UNIT	MD Reference:	DFE @ 3628.7usft
Well:	SHU (G/SA) 251	North Reference:	Grid
Wellbore:	ST00	Survey Calculation Method:	Minimum Curvature
Design:	Final	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 (°/100usft)	Build Rate (°/100u)	Formations / Comments
1,100.0	0.95	33.15	1,099.9	3.9	13.0	-1.6	0.22	-0.02	
1,200.0	0.78	51.14	1,199.9	5.0	14.0	-0.9	0.32	-0.17	
1,300.0	0.62	40.73	1,299.9	5.8	14.9	-0.5	0.20	-0.16	
1,400.0	0.61	63.91	1,399.9	6.5	15.7	-0.2	0.25	-0.01	
1,500.0	0.51	56.21	1,499.9	7.0	16.6	-0.1	0.12	-0.10	
1,528.0	0.69	67.21	1,527.9	7.1	16.8	-0.1	0.76	0.64	Gyro TD @ 1528' MD
1,653.0	0.50	79.80	1,652.9	7.5	18.1	-0.2	0.18	-0.15	
1,833.0	1.00	23.10	1,832.8	9.1	19.4	0.7	0.47	0.28	
2,013.0	1.80	348.20	2,012.8	13.3	19.5	4.5	0.63	0.44	
2,193.0	2.80	337.30	2,192.6	20.1	17.2	11.7	0.60	0.56	
2,373.0	3.80	341.20	2,372.3	29.8	13.6	22.1	0.57	0.56	
2,553.0	3.00	358.20	2,552.0	40.2	11.5	32.4	0.71	-0.44	
2,733.0	2.90	343.80	2,731.8	49.2	10.1	41.3	0.41	-0.06	
2,913.0	2.50	349.00	2,911.6	57.5	8.1	49.7	0.26	-0.22	
3,093.0	2.40	355.30	3,091.4	65.1	7.0	57.1	0.16	-0.06	
3,273.0	2.60	2.10	3,271.3	72.9	6.9	64.3	0.20	0.11	
3,453.0	2.70	5.70	3,451.1	81.2	7.4	71.7	0.11	0.06	
3,633.0	3.00	12.80	3,630.8	90.0	8.9	79.3	0.26	0.17	
3,813.0	3.20	17.90	3,810.6	99.4	11.5	86.9	0.19	0.11	
3,993.0	2.90	357.70	3,990.3	108.7	12.8	94.9	0.62	-0.17	
4,122.0	3.00	359.00	4,119.2	115.4	12.7	101.1	0.09	0.08	Last CES Survey @ 4122' MD
4,189.0	3.00	359.00	4,186.1	118.9	12.6	104.3	0.00	0.00	PTB @ 4189' MD

Targets									
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude Longitude
SHU (G/SA) 251 BHL TC		0.00	0.00	4,104.0	98.8	-63.1	614,185.10	857,006.60	32.683128 -103.173028
- actual wellpath misses target center by 77.4usft at 4106.1usft MD (4103.3 TVD, 114.5 N, 12.7 E)									
- Circle (radius 100.0)									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,528.0	1,527.9	7.1	16.8	Gyro TD @ 1528' MD
4,122.0	4,119.2	115.4	12.7	Last CES Survey @ 4122' MD
4,189.0	4,186.1	118.9	12.6	PTB @ 4189' MD

Checked By: _____ Approved By: _____ Date: _____