

300541803



Job Number: SVMO-141584

Company: OXY USA, Inc.

Lease/Well: Federal 23 12H

Location: Eddy County, NM

Rig Name: H&P 0620

RKB: 25'

G.L. or M.S.L.: GL

State/Country: New Mexico/USA

Declination: 6.98°

Grid: East To Grid North

File name: S:\2014SU-1\OXY\MO\FEDERAL\2312H.SVY

Date/Time: 26-Nov-14 / 08:54

Curve Name: Surface - 822' M.D. (Rate Gyro) (API 30-016-41803)

MS SURVEY

WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method

Vertical Section Plane .00

Vertical Section Referenced to Wellhead

Rectangular Coordinates Referenced to Wellhead

We hereby certify that our survey data from
Surface MD to 822' MD is, to the best of
our knowledge a true and accurate account of
the well bore.

Curtis Birge 11/26/14
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	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
52.00	.21	155.92	52.00	-.09	.04	-.09	.10	155.91	.40
143.00	.54	140.87	143.00	-.57	.38	-.57	.69	146.57	.38
234.00	.95	179.87	233.99	-1.66	.65	-1.66	1.78	158.61	.69
325.00	.84	183.39	324.98	-3.08	.61	-3.08	3.14	168.76	.14
416.00	.82	188.00	415.97	-4.39	.48	-4.39	4.42	173.73	.08
507.00	.77	188.43	506.96	-5.64	.30	-5.64	5.65	176.94	.06
596.00	.67	195.92	595.95	-6.73	.07	-6.73	6.73	179.39	.15
689.00	.63	197.96	688.95	-7.74	-.24	-7.74	7.74	181.74	.05
778.00	.62	201.36	777.94	-8.65	-.56	-8.65	8.67	183.71	.04

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
Last Survey Depth Recorded									
822.00	.56	200.78	821.94	-9.08	-.72	-9.08	9.11	184.56	.14

OXY

Federal (New Mexico)

Federal 23 12H

Federal 23 12H

Original Wellbore

Design: OH

Standard Survey Report

10 December, 2014

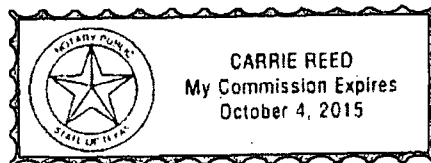
This survey is correct to the best of my knowledge and is supported by actual field data.

L. Wharton

Notarized this date 4th of March, 2015.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling

www.scientificdrilling.com

Survey Report

Company:	OXY	Local Co-ordinate Reference:	Well Federal 23 12H
Project:	Federal (New Mexico)	TVD Reference:	KB @ 3570.30usft
Site:	Federal 23 12H	MD Reference:	KB @ 3570.30usft
Well:	Federal 23 12H	North Reference:	Grid
Wellbore:	Original Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland District

Project:	Federal (New Mexico) New Mexico		
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:	(Federal 23 12H)				
Site Position:		Northing:	497,723.50 usft	Latitude:	32° 22' 1.312 N
From:	Map	Easting:	678,539.70 usft	Longitude:	103° 45' 18.280 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 "

Well:	Federal 23 12H					
Well Position	+N-S	0.00 usft	Northings:	497,723.50 usft	Latitude:	32° 22' 1.312 N
	+E-W	0.00 usft	Easting:	678,539.70 usft	Longitude:	103° 45' 18.280 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,548.30 usft

Wellbore	Original Wellbore				
Magnetics	Model Name	Sample Date	Declination ($^{\circ}$)	Dip Angle ($^{\circ}$)	Field Strength (μT)
	IGRF2010	1/6/2014	7.37	60.22	48,425

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00

Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction
	(usft)	(usft)	(usft)	(bearing)
	0.00	0.00	0.00	1.03

Survey Program		Date	12/10/2014		
From (uoft)	To (uoft)	Survey (Wellbore)	Tool Name	Description	
52.00	778.00	MS Gyro (Original Wellbore)	Generic Gyro	Generic Gyro	
822.00	12,278.00	SDI MWD (Original Wellbore)	SDI MWD	SDI MWD - Standard ver 1.0.1	

Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(bearing)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52.00	0.21	155.92	52.00	-0.09	0.04	-0.09	0.40	0.40	0.00
143.00	0.54	140.87	143.00	-0.57	0.38	-0.56	0.38	0.36	-16.54
234.00	0.95	179.87	233.99	-1.66	0.65	-1.65	0.69	0.45	42.86
325.00	0.84	183.39	324.98	-3.08	0.61	-3.07	0.14	-0.12	3.87
418.00	0.82	188.00	415.97	-4.39	0.48	-4.38	0.08	-0.02	5.07
507.00	0.77	188.43	506.98	-5.64	0.30	-5.63	0.06	-0.05	0.47
596.00	0.67	195.92	595.95	-6.73	0.07	-6.73	0.15	-0.11	8.42
689.00	0.63	197.96	688.95	-7.74	-0.24	-7.74	0.05	-0.04	2.19
776.00	0.62	201.36	777.94	-8.65	-0.56	-8.66	0.04	-0.01	3.82

Survey Report

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Project:	Federal (New Mexico)	TVD Reference:	KB @ 3570.30usft
Site:	Federal 23 12H	MD Reference:	KB @ 3570.30usft
Well:	Federal 23 12H	North Reference:	Grid
Wellbore:	Original Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland District

Measured			Vertical			Vertical	Dogleg	Build	Turn
Depth	Inclination	Azimuth	Depth	N/S	E/W	Section	Rate	Rate	Rate
(usft)	(°)	(bearing)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
822.00	0.56	200.78	821.94	-9.08	-0.72	-9.09	0.14	-0.14	-1.32
969.00	0.94	173.19	968.93	-10.95	-0.84	-10.96	0.35	0.26	-18.77
1,064.00	0.47	169.14	1,063.92	-12.10	-0.67	-12.11	0.50	-0.49	-4.28
1,158.00	0.48	161.51	1,157.92	-12.85	-0.47	-12.88	0.07	0.01	-8.12
1,253.00	0.48	195.95	1,252.91	-13.61	-0.46	-13.62	0.30	0.00	36.25
1,347.00	0.42	178.44	1,346.91	-14.34	-0.56	-14.35	0.16	-0.08	-18.63
1,442.00	0.17	132.71	1,441.91	-14.78	-0.44	-14.79	0.34	-0.26	-48.14
1,537.00	0.19	181.10	1,536.91	-15.03	-0.34	-15.04	0.16	0.02	50.94
1,631.00	0.24	185.10	1,630.91	-15.39	-0.36	-15.39	0.06	0.05	4.26
1,726.00	0.33	128.19	1,725.91	-15.75	-0.18	-15.75	0.30	0.09	-59.91
1,820.00	0.14	70.80	1,819.91	-15.88	0.16	-15.88	0.30	-0.20	-81.05
1,915.00	0.24	173.69	1,914.91	-16.04	0.29	-16.04	0.32	0.11	108.31
2,010.00	0.23	160.41	2,009.91	-16.42	0.37	-16.41	0.08	-0.01	-13.98
2,104.00	0.18	142.75	2,103.91	-16.72	0.53	-16.70	0.09	-0.05	-18.79
2,199.00	0.17	156.26	2,198.91	-16.96	0.67	-16.95	0.04	-0.01	14.22
2,293.00	0.17	105.95	2,292.90	-17.13	0.88	-17.11	0.15	0.00	-53.52
2,387.00	0.17	28.93	2,386.90	-17.05	1.07	-17.02	0.23	0.00	-81.94
2,482.00	0.24	144.21	2,481.90	-17.08	1.25	-17.08	0.37	0.07	121.35
2,576.00	0.08	214.26	2,575.90	-17.30	1.33	-17.27	0.24	-0.17	74.52
2,670.00	0.13	145.90	2,669.90	-17.44	1.35	-17.41	0.13	0.05	-72.72
2,764.00	0.10	201.13	2,763.90	-17.61	1.38	-17.58	0.12	-0.03	58.76
2,858.00	0.20	341.21	2,857.90	-17.53	1.30	-17.50	0.30	0.11	149.02
2,953.00	0.21	351.68	2,952.90	-17.20	1.22	-17.17	0.04	0.01	11.02
3,047.00	0.22	308.28	3,046.90	-16.91	1.05	-16.89	0.17	0.01	-46.17
3,141.00	0.20	354.09	3,140.90	-16.64	0.89	-16.62	0.18	-0.02	48.73
3,236.00	0.14	288.09	3,235.90	-16.42	0.78	-16.40	0.18	-0.06	-58.95
3,330.00	0.12	310.14	3,329.90	-16.30	0.80	-16.29	0.04	-0.02	12.82
3,424.00	0.12	209.94	3,423.90	-16.32	0.47	-16.31	0.20	0.00	-106.60
3,518.00	0.38	68.64	3,518.90	-16.29	0.71	-16.27	0.51	0.27	-150.84
3,613.00	0.56	116.72	3,612.90	-16.37	1.41	-16.34	0.46	0.19	53.28
3,708.00	0.78	98.09	3,707.89	-16.64	2.45	-16.60	0.32	0.21	-21.72
3,802.00	0.75	112.24	3,801.88	-16.94	3.64	-16.87	0.23	-0.01	17.18
3,896.00	0.71	95.31	3,895.88	-17.23	4.79	-17.14	0.23	-0.04	-18.01
3,991.00	0.72	104.42	3,990.87	-17.43	5.95	-17.32	0.12	0.01	9.59
4,085.00	0.91	101.59	4,084.86	-17.73	7.26	-17.60	0.21	0.20	-3.01
4,179.00	1.04	108.96	4,178.85	-18.16	8.80	-18.00	0.19	0.14	7.84
4,274.00	0.78	95.47	4,273.83	-18.50	10.25	-18.31	0.35	-0.27	-14.20
4,368.00	0.62	86.67	4,367.83	-18.53	11.40	-18.32	0.20	-0.17	-9.36
4,398.00	0.63	86.77	4,397.82	-18.51	11.73	-18.30	0.03	0.03	-0.33
4,557.00	0.70	41.73	4,556.81	-17.74	13.25	-17.50	0.32	0.04	-28.33
4,652.00	2.88	6.98	4,651.76	-14.94	13.92	-14.68	2.46	2.28	-36.58
4,746.00	6.12	10.21	4,745.46	-7.66	15.10	-7.38	3.46	3.45	3.44
4,840.00	8.95	10.93	4,838.52	5.25	17.53	5.57	4.08	4.07	0.77

Survey Report

Company:	OXY	Local Co-ordinate Reference:	Well Federal 23,12H
Project:	Federal (New Mexico)	TVD Reference:	KB @ 3570.30usft
Site:	Federal 23,12H	MD Reference:	KB @ 3570.30usft
Well:	Federal 23,12H	North Reference:	Grid
Wellbore:	Original Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland District

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	N-S (usft)	E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,935.00	12.93	2.76	4,931.63	23.93	19.59	24.28	3.58	3.14	-8.60
5,029.00	13.56	355.36	5,023.13	45.44	19.21	45.78	1.93	0.69	-7.87
5,124.00	14.18	354.99	5,115.36	68.15	17.29	68.45	0.64	0.63	-0.39
5,218.00	13.93	354.41	5,206.54	90.88	15.18	91.14	0.31	-0.27	-0.62
5,312.00	12.84	0.61	5,297.99	112.58	14.19	112.82	1.92	-1.16	6.60
5,407.00	12.56	359.91	5,390.67	133.47	14.29	133.70	0.34	-0.29	-0.74
5,501.00	12.78	359.11	5,482.38	154.08	14.11	154.31	0.30	0.23	-0.85
5,596.00	12.64	359.00	5,575.05	174.98	13.77	175.20	0.15	-0.15	-0.12
5,690.00	12.76	359.15	5,666.75	195.65	13.43	195.86	0.13	0.13	0.16
5,785.00	13.28	359.87	5,759.31	217.05	13.25	217.25	0.57	0.55	0.78
5,879.00	13.39	359.39	5,850.78	238.73	13.11	238.93	0.17	0.12	-0.51
5,973.00	13.13	358.33	5,942.27	260.28	12.68	260.47	0.38	-0.28	-1.13
6,067.00	12.61	357.55	6,033.91	281.21	11.83	281.38	0.58	-0.55	-0.83
6,161.00	12.18	358.18	6,125.72	301.37	11.18	301.52	0.48	-0.48	0.65
6,255.00	11.85	358.42	6,217.66	320.93	10.59	321.07	0.36	-0.35	0.28
6,349.00	11.69	358.67	6,309.68	340.10	10.11	340.22	0.18	-0.17	0.27
6,443.00	11.82	358.97	6,401.69	359.32	9.71	359.44	0.25	0.24	0.32
6,475.00	13.10	0.58	6,432.93	366.25	9.69	366.37	3.84	3.69	5.03
6,506.00	15.26	2.88	6,462.99	373.84	9.93	373.96	7.20	6.97	7.42
6,538.00	17.33	3.90	6,493.70	382.80	10.46	382.93	6.53	6.47	3.19
6,569.00	19.97	3.40	6,523.07	392.70	11.09	392.83	8.53	8.52	-1.61
6,601.00	22.79	3.17	6,552.86	404.34	11.76	404.49	8.82	8.81	-0.72
6,632.00	25.52	2.57	6,581.15	417.01	12.39	417.17	8.84	8.81	-1.94
6,664.00	28.49	2.19	6,609.66	431.53	12.99	431.69	9.30	9.28	-1.19
6,695.00	31.79	2.69	6,636.46	447.08	13.66	447.25	10.68	10.65	1.81
6,727.00	34.62	2.74	6,663.23	464.58	14.49	464.76	8.84	8.84	0.16
6,758.00	37.93	2.02	6,688.22	482.90	15.24	483.10	10.77	10.68	-2.32
6,790.00	40.55	1.45	6,713.00	503.13	15.85	503.34	8.26	8.19	-1.78
6,821.00	42.07	1.13	6,738.29	523.59	16.31	523.80	4.95	4.90	-1.03
6,852.00	44.29	1.28	6,758.89	544.80	16.76	545.01	7.17	7.16	0.42
6,883.00	46.65	2.15	6,780.63	566.89	17.42	567.11	7.88	7.61	2.87
6,915.00	47.72	2.38	6,802.38	590.34	18.35	590.57	3.39	3.34	0.72
6,946.00	49.58	1.78	6,822.86	613.59	18.19	613.84	6.17	6.00	-1.84
6,977.00	51.85	0.47	6,842.49	637.58	19.66	637.83	8.02	7.32	-4.23
7,008.00	53.96	359.83	6,861.79	663.10	19.72	663.35	6.78	6.59	-2.00
7,040.00	57.36	359.23	6,879.27	688.70	19.51	688.94	11.08	10.97	-1.94
7,071.00	59.32	359.12	6,895.54	715.08	19.13	715.31	6.33	6.32	-0.35
7,103.00	61.26	359.02	6,911.40	742.87	18.68	743.08	6.07	6.06	-0.31
7,134.00	63.49	358.69	6,925.77	770.33	18.13	770.53	7.26	7.19	-1.06
7,166.00	66.16	358.40	6,939.38	799.27	17.39	799.48	8.38	8.34	-0.91
7,197.00	68.38	358.08	6,951.36	827.85	16.51	828.01	7.22	7.16	-1.03
7,228.00	70.21	358.10	6,962.32	858.83	15.55	858.97	5.90	5.90	0.06
7,260.00	72.44	358.84	6,972.57	887.13	14.74	887.26	7.30	6.97	2.31

Survey Report

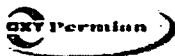
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Design:	OH	Database:	Midland District

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	N-S (usft)	E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,291.00	75.20	359.87	6,981.20	916.90	14.40	917.01	9.48	8.90	3.32
7,322.00	77.97	0.73	6,988.40	947.05	14.56	947.16	9.33	8.94	2.77
7,354.00	80.37	1.70	6,994.41	978.47	15.23	978.59	8.07	7.50	3.03
7,385.00	82.19	2.72	6,999.11	1,009.09	16.41	1,009.22	6.71	5.87	3.29
7,417.00	84.95	4.21	7,002.69	1,040.83	18.34	1,040.99	9.79	8.63	4.66
7,448.00	87.18	3.47	7,004.82	1,071.68	20.41	1,071.87	7.58	7.19	-2.39
7,480.00	89.09	3.47	7,005.88	1,103.60	22.34	1,103.83	5.97	5.97	0.00
7,511.00	90.77	3.34	7,005.90	1,134.55	24.18	1,134.80	5.44	5.42	-0.42
7,543.00	92.12	3.31	7,005.09	1,166.48	26.04	1,166.76	4.22	4.22	-0.09
7,574.00	92.76	3.28	7,003.77	1,197.40	27.82	1,197.71	2.07	2.06	-0.10
7,606.00	91.31	2.51	7,002.63	1,229.34	29.43	1,229.67	5.13	-4.53	-2.41
7,641.00	91.14	2.33	7,001.89	1,264.30	30.91	1,264.65	0.71	-0.49	-0.51
7,647.56	90.99	2.26	7,001.76	1,270.86	31.17	1,271.22	2.48	-2.23	-1.08
F2312H PP									
7,754.00	88.62	1.11	7,002.12	1,377.24	34.30	1,377.64	2.48	-2.23	-1.08
7,848.00	87.11	1.01	7,005.62	1,471.16	36.04	1,471.57	1.61	-1.61	-0.11
7,943.00	89.03	1.81	7,008.82	1,566.07	38.38	1,566.51	2.19	2.02	0.84
8,037.00	89.56	2.47	7,009.98	1,659.99	41.89	1,660.48	0.90	0.56	0.70
8,131.00	88.29	2.16	7,011.74	1,753.90	45.68	1,754.44	1.39	-1.35	-0.33
8,225.00	88.86	2.16	7,014.08	1,847.80	49.22	1,848.39	0.61	0.61	0.00
8,319.00	89.16	359.80	7,015.71	1,941.77	50.83	1,942.37	2.53	0.32	-2.51
8,414.00	93.40	0.25	7,013.58	2,036.72	50.87	2,037.31	4.49	4.46	0.47
8,508.00	93.50	0.13	7,007.93	2,130.55	51.18	2,131.13	0.17	0.11	-0.13
8,602.00	94.31	1.02	7,001.53	2,224.33	52.13	2,224.91	1.28	0.88	0.95
8,696.00	88.82	355.98	6,998.96	2,318.19	49.66	2,318.71	7.93	-5.84	-5.36
8,791.00	90.30	356.32	6,999.69	2,412.97	43.28	2,413.36	1.60	1.56	0.36
8,886.00	89.63	357.87	6,999.75	2,507.85	38.47	2,508.13	1.78	-0.71	1.63
8,980.00	89.36	359.73	7,000.57	2,601.82	36.50	2,602.05	2.00	-0.29	1.98
9,074.00	91.34	0.34	7,000.00	2,695.81	36.56	2,696.03	2.20	2.11	0.65
9,168.00	90.77	1.18	6,998.27	2,789.78	37.80	2,790.02	1.08	-0.61	0.89
9,262.00	90.60	2.96	6,997.15	2,883.72	41.20	2,883.99	1.90	-0.18	1.89
9,357.00	88.32	1.89	6,998.04	2,978.62	45.22	2,978.95	2.65	-2.40	-1.13
9,451.00	88.42	2.70	7,000.71	3,072.50	48.98	3,072.89	0.87	0.11	0.86
9,545.00	90.71	4.82	7,001.43	3,166.29	55.15	3,166.77	3.32	2.44	2.26
9,640.00	89.90	4.32	7,000.92	3,260.98	62.71	3,261.58	1.00	-0.85	-0.53
9,734.00	89.87	4.38	7,001.11	3,354.71	69.84	3,355.43	0.07	-0.03	0.08
9,828.00	88.25	359.64	7,002.65	3,448.81	73.14	3,449.37	5.33	-1.72	-5.04
9,922.00	90.84	357.52	7,003.40	3,542.57	70.81	3,543.27	3.56	2.76	-2.28
10,016.00	91.25	355.18	7,001.69	3,636.35	64.83	3,636.93	2.53	0.44	-2.49
10,110.00	89.39	354.46	7,001.16	3,729.96	58.34	3,730.37	2.12	-1.88	-0.77
10,205.00	90.44	355.01	7,001.30	3,824.56	47.62	3,824.80	1.25	1.11	0.58
10,299.00	90.27	354.15	7,000.72	3,918.14	38.75	3,918.20	0.93	-0.18	-0.91
10,392.00	90.77	354.51	6,999.88	4,010.88	29.56	4,010.56	0.66	0.54	0.39
10,487.00	92.16	353.55	6,997.45	4,105.13	19.68	4,104.82	1.78	1.46	-1.01

Survey Report

Company:	OXY	Local Co-ordinate Reference:	Well Federal 23 12H
Project:	Federal (New Mexico)	TVD Reference:	KB @ 3570.30usft
Site:	Federal 23 12H	MD Reference:	KB @ 3570.30usft
Well:	Federal 23 12H	North Reference:	Grid
Wellbore:	Original Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland District

Survey	Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
	10,581.00	91.81	354.90	6,994.19	4,198.59	10.23	4,198.09	1.48	-0.37	1.44
	10,675.00	92.83	357.35	6,990.39	4,292.29	3.88	4,291.68	2.82	1.09	2.61
	10,769.00	92.36	0.84	6,988.13	4,386.17	2.40	4,385.50	3.74	-0.50	3.71
	10,864.00	91.11	3.29	6,983.25	4,481.06	5.82	4,480.43	2.89	-1.32	2.58
	10,958.00	89.76	4.47	6,982.54	4,574.83	12.18	4,574.31	1.91	-1.44	1.26
	11,053.00	88.32	5.69	6,984.13	4,669.44	20.59	4,669.05	1.99	-1.52	1.28
	11,147.00	88.56	5.72	6,986.69	4,762.94	29.93	4,762.71	0.26	0.26	0.03
	11,241.00	90.50	8.33	6,987.46	4,856.22	41.43	4,856.18	3.46	2.06	2.78
	11,336.00	91.18	7.04	6,986.07	4,950.36	54.13	4,950.53	1.53	0.72	-1.36
	11,430.00	89.09	6.01	6,985.85	5,043.74	64.81	5,044.09	2.48	-2.22	-1.10
	11,524.00	88.88	4.90	6,987.53	5,137.30	73.75	5,137.79	1.21	-0.24	-1.18
	11,619.00	89.33	3.79	6,989.03	5,232.01	80.94	5,232.62	1.27	0.49	-1.17
	11,712.00	90.00	4.26	6,989.57	5,324.78	87.47	5,325.49	0.88	0.72	0.51
	11,807.00	90.74	2.92	6,988.96	5,419.59	93.42	5,420.39	1.81	0.78	-1.41
	11,900.00	91.14	2.06	6,987.43	5,512.49	97.46	5,513.35	1.02	0.43	-0.92
	11,995.00	91.51	1.88	6,985.24	5,607.41	100.72	5,608.31	0.43	0.39	-0.19
	12,090.00	91.75	2.23	6,982.53	5,702.31	104.13	5,703.26	0.45	0.25	0.37
	12,184.00	91.04	1.49	6,980.24	5,796.23	107.18	5,797.22	1.08	-0.76	-0.79
	12,227.00	90.30	1.71	6,979.74	5,839.21	108.38	5,840.21	1.80	-1.72	0.51
MWD Survey:	12,258.16	90.30	1.71	6,979.58	5,870.35	109.31	5,871.37	0.00	0.00	0.00
F2312H PBHL:	12,278.00	90.30	1.71	6,979.47	5,890.18	109.90	5,891.21	0.00	0.00	0.00
Projection to TD:										



Federal 23 12H
Federal (New Mexico)
Northing: 497723.50
Easting: 678539.70
Design #2



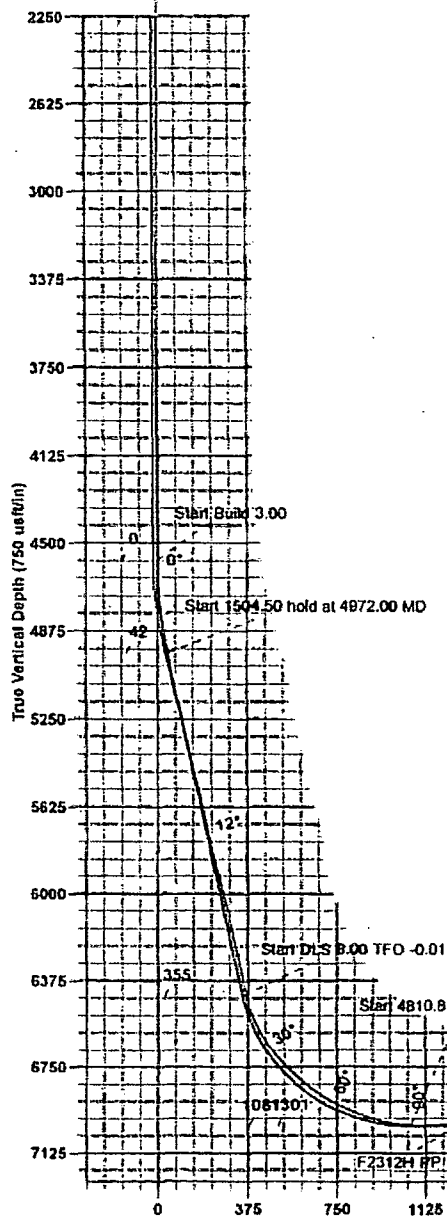
To convert Magnetic North to Grid, Add 7.06°
To convert True North to Grid, Subtract 0.31°

Azimuths to Grid North
True North: -0.31°
Magnetic North: 7.06°

Magnetic Field
Strength: 48424.8nT
Dip Angle: 60.22°
Date: 1/8/2014
Model: IGRF2010



KB @ 3570.30usft
Gr @ 3546.30



Vertical Section at 1.03bearing (750 usf/in)

WELL DETAILS Federal 23 12H

Ground Level: 3546.30

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	497723.50	678539.70	32° 22' 1.312 N	103° 45' 18.280 W

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4572.00	0.00	0.00	4572.00	0.00	0.00	0.00	0.00	0.00	
4972.00	12.00	1.04	4969.08	41.73	0.76	3.00	1.04	41.74	
6476.50	12.00	1.04	6440.71	354.48	6.44	0.00	0.00	354.54	
7457.11	90.45	1.03	7007.97	1060.52	10.19	8.00	-0.01	1060.69	
12267.92	90.45	1.03	6970.30	5870.40	106.00	0.00	0.00	5871.36	F2312H PBHL

DESIGN TARGET DETAILS

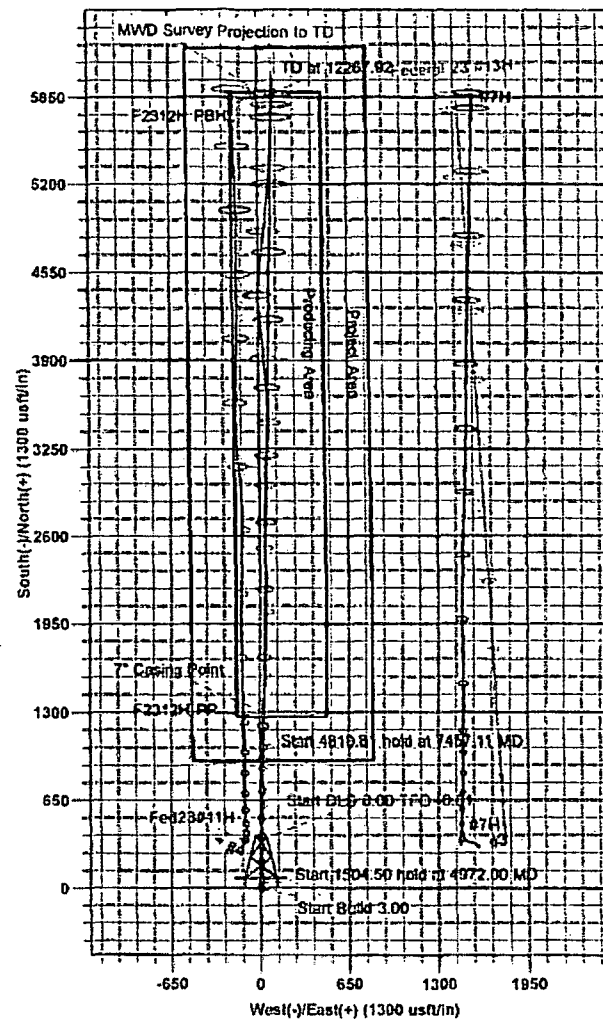
Name	TVD	+N/-S	+E/-W	Northing	Easting
F2312H PBHL	6970.30	5870.40	106.00	503593.90	678645.70
F2312H PP	7006.30	1271.10	22.90	498994.60	678562.60

SITE DETAILS:

Federal 23 12H
Site Centre Northing: 497723.50
Easting: 678539.70
Positional Uncertainty: 0.00
Convergence: 0.31
Local North: Grid

PROJECT DETAILS:

Federal (New Mexico)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level



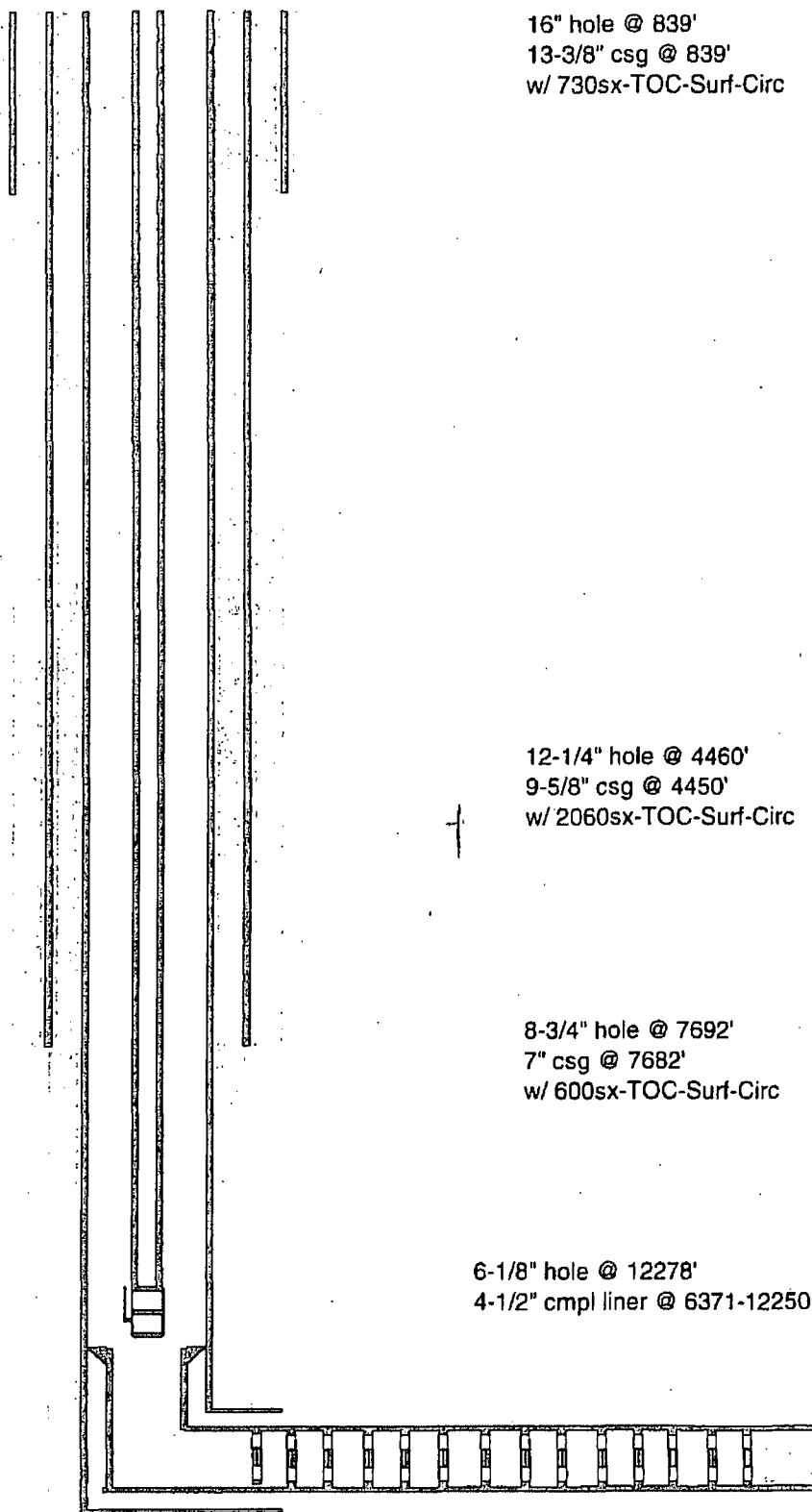
TD at 12267.92

MWD Survey Projection to TD

F2312H PBHL

OXY USA INC.
Federal 23 #12H
API No. 30-015-41803

2-7/8" lbg w/ ESP @ 6296'



Sliding Sleeves @ 7776-12193'

TD-12278'M 6979'V



Weatherford®

Surface Logging Systems

P.O. Box 80531
Midland, Texas 79708
432.687.1823 Main
432.687.1689 Fax

Logging Personnel:

DAN M. ALLE

RYAN JENNINGS

Unit No.: 055

Rig: H&P 620

Filename: OXY-FEDERAL-23-12H.mlw

COMPANY: OXY USA INC.

WELL: FEDERAL 23 #12H

FIELD: LIVINGSTON RIDGE DELAWARE

COUNTY: EDDY STATE: NM

LOCATION: 941' FNL, 490' FWL, SEC. 26, T-22-S, R-31-E

Spud Date: 11/24/14

Started: 11/26/14 At: 800'

Ended: 12/11/14 At: 12278'

Api No.: 30-015-41803

G.L.: 3546.3'

K.B.: 3570.3'

Geologist: SASWATI CHAKRABORTY

Abbreviations:

NB...New Bit	DST...Drill Stem Test
CO...Circ Out	DS...Directional Survey
NR...No Returns	CG...Connection gas
TG...Trip Gas	LAT...Logged After Trip
WOB...Wt on Bit	PP...Pump Pressure
RPM...Rev/Min	SPM...Strokes/Min
SG...Survey Gas	DTG...Down Time Gas

Mud Data

Lithology Symbols:

	Anhydrite		Salt		Granite
	Siltstone		Chert		Sandstone
	Dolomite		Conglomerate		Limestone
	Coal		Shale		Bentonite
	Carb Shale		Granite Wash		Quartz Wash
	Red Sh		Org Sh		Green Sh
	Cust Sh1		Cust Sh2		Cust Sh3
	Cust Sh4		Cust Sh5		Cust Sh6

Acropenriac

Gas Chromatograph Analysis:

HW	-----
C1	-----
C2	-----
C3	-----
IC4	-----
NC4	-----
IC5	-----

WEATHERFORD SLS

COMPANY: OXY USA INC.

WELL: FEDERAL 23 #12H

LOCATION: 941' FNL, 490' FWL, SEC. 28, T-22-S, R-31-E

COUNTY: EDDY STATE: NM

GL: 3546.3' KB: 3570.3'

Start Date 11/26/14 End Date 12/11/14

Start Depth 800' End Depth 12278'

API NO: 30-015-41803

FILE: OXY-FEDERAL-23-12H.mtw

LOGGERS: DAN M. ALLE, RYAN JENNINGS

GEOLOGIST: SASWATI CHAKRABORTY

Sand	Dolo	Lime	Chert	Anhydrite
Shale	Carb Sh	Salt	Granite	Siltstone
Coal	Bentonite	Granite Wash	Quartz Wash	
Carb Wash	Conglomerate	Cement		

ACCESSORIES

GLAUC'C	PYRITE	FOSSILS	OOLITES	FRACTURES
---------	--------	---------	---------	-----------

HW ----- 1 to 10000

C1 -----

C2 -----

C3 -----

IC4 -----

NC4 -----

Horz -----

Rop ----- 1 to 2.5

Gamma ----- 1 to 150

CUT (PFG)
FLU 0-100% (PFG)
POR (PFG)

SLIDE

