





Oxy Mesa Verde BS Unit 23H Gyro + MWD 0-21125' MD Survey Geodetic Report

(Def Survey)

Report Date: September 11, 2018 - 04:52 PM
Client: OXY
Field: NM Lea County (NAD 83)
Structure / Slot: Oxy Mesa Verde BS Unit 23H / Mesa Verde BS Unit 23H
Well: Mesa Verde BS Unit 23H
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Oxy Mesa Verde BS Unit 23H Gyro + MWD 0-21125' MD
Survey Date: September 10, 2018
Tort / AHD / DDI / ERD Ratio: 281.492' / 10850.983 ft / 8.774 / 0.999
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 12' 39.42888", W 103° 41' 2.86648"
Location Grid N/E Y/X: N 441084.940 RUS, E 742122.660 RUS
CRS Grid Convergence Angle: 0.3461°
Grid Scale Factor: 0.99995526
Version / Patch: 2.10.740.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.860° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB=28.5'
TVD Reference Elevation: 3594.700 ft above MSL
Seabed / Ground Elevation: 3568.200 ft above MSL
Magnetic Declination: 6.783°
Total Gravity Field Strength: 998.4319mgn (9.80685 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47965.876 nT
Magnetic Dip Angle: 59.908°
Declination Date: September 10, 2018
Magnetic Declination Model: HDGM 2018
North Reference: Grid North
Grid Convergence Used: 0.3461°
Total Corr Mag North->Grid North: 6.4371°
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
RKB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	441084.94	742122.66	N 32 12 39.43 W 103 41	2.87
Ground Level	26.50	0.00	0.00	26.50	0.00	0.00	0.00	0.00	441084.94	742122.66	N 32 12 39.43 W 103 41	2.87
	51.08	0.49	260.18	51.08	-0.02	-0.02	-0.10	1.99	441084.92	742122.56	N 32 12 39.43 W 103 41	2.87
	145.87	0.99	264.42	145.86	-0.16	-0.17	-1.32	0.53	441084.77	742121.34	N 32 12 39.43 W 103 41	2.88
	240.66	0.97	272.14	240.64	-0.20	-0.22	-2.93	0.14	441084.72	742119.73	N 32 12 39.43 W 103 41	2.90
	335.45	0.87	266.33	335.42	-0.21	-0.23	-4.45	0.14	441084.71	742118.21	N 32 12 39.43 W 103 41	2.92
	430.24	0.81	268.96	430.20	-0.26	-0.29	-5.84	0.08	441084.65	742116.82	N 32 12 39.43 W 103 41	2.93
	525.03	0.67	280.92	524.98	-0.16	-0.20	-7.06	0.22	441084.74	742115.60	N 32 12 39.43 W 103 41	2.95
	619.82	0.53	299.98	619.76	0.17	0.13	-7.98	0.26	441085.07	742114.68	N 32 12 39.43 W 103 41	2.96
	714.81	0.46	319.46	714.55	0.69	0.63	-8.81	0.19	441085.57	742114.05	N 32 12 39.44 W 103 41	2.97
	809.40	0.46	326.82	809.34	1.30	1.24	-9.06	0.06	441086.18	742113.60	N 32 12 39.44 W 103 41	2.97
904.19	0.49	344.74	904.12	2.01	1.95	-9.38	0.16	441086.89	742113.28	N 32 12 39.45 W 103 41	2.98	
998.98	0.37	340.93	998.91	2.69	2.63	-9.58	0.13	441087.57	742113.08	N 32 12 39.46 W 103 41	2.98	
1093.77	0.25	325.71	1093.70	3.15	3.09	-9.80	0.15	441088.03	742112.86	N 32 12 39.46 W 103 41	2.98	
1188.56	0.20	322.15	1188.49	3.45	3.39	-10.02	0.05	441088.33	742112.64	N 32 12 39.46 W 103 41	2.98	
1283.35	0.19	322.22	1283.28	3.71	3.65	-10.22	0.01	441088.59	742112.44	N 32 12 39.47 W 103 41	2.99	
1378.14	0.18	318.30	1378.07	3.95	3.88	-10.41	0.02	441088.82	742112.25	N 32 12 39.47 W 103 41	2.99	
1472.93	0.15	340.26	1472.86	4.17	4.11	-10.55	0.07	441089.05	742112.11	N 32 12 39.47 W 103 41	2.99	
1567.72	0.15	32.38	1567.65	4.40	4.33	-10.53	0.14	441089.27	742112.13	N 32 12 39.47 W 103 41	2.99	
1662.51	0.15	75.33	1662.44	4.53	4.47	-10.34	0.12	441089.41	742112.32	N 32 12 39.47 W 103 41	2.99	
1757.30	0.17	351.64	1757.23	4.70	4.64	-10.24	0.23	441089.58	742112.42	N 32 12 39.48 W 103 41	2.99	
1852.09	0.17	65.76	1852.02	4.90	4.84	-10.14	0.22	441089.78	742112.53	N 32 12 39.48 W 103 41	2.98	
1946.88	0.15	19.97	1946.80	5.07	5.01	-9.96	0.13	441089.95	742112.70	N 32 12 39.48 W 103 41	2.98	
2041.67	0.15	17.36	2041.59	5.30	5.25	-9.89	0.01	441090.19	742112.78	N 32 12 39.48 W 103 41	2.98	
2136.46	0.20	174.68	2136.38	5.26	5.20	-9.83	0.36	441090.14	742112.83	N 32 12 39.48 W 103 41	2.98	
2231.25	0.14	56.39	2231.17	5.16	5.10	-9.72	0.31	441090.04	742112.94	N 32 12 39.48 W 103 41	2.98	
2326.04	0.15	341.12	2325.96	5.34	5.28	-9.66	0.19	441090.22	742113.00	N 32 12 39.48 W 103 41	2.98	
2420.83	0.16	325.52	2420.75	5.57	5.51	-9.78	0.05	441090.45	742112.88	N 32 12 39.48 W 103 41	2.98	
2515.62	0.15	266.88	2515.54	5.67	5.61	-9.98	0.16	441090.55	742112.68	N 32 12 39.48 W 103 41	2.98	
2610.41	0.14	3.71	2610.33	5.78	5.72	-10.10	0.23	441090.66	742112.57	N 32 12 39.49 W 103 41	2.98	
2705.20	0.17	354.30	2705.12	6.03	5.97	-10.10	0.04	441090.91	742112.56	N 32 12 39.49 W 103 41	2.98	
2799.99	0.17	297.20	2799.91	6.24	6.18	-10.24	0.17	441091.12	742112.42	N 32 12 39.49 W 103 41	2.99	
2894.78	0.15	289.42	2894.70	6.35	6.28	-10.48	0.03	441091.22	742112.18	N 32 12 39.49 W 103 41	2.99	
2989.57	0.17	294.62	2989.49	6.45	6.38	-10.73	0.03	441091.32	742111.93	N 32 12 39.49 W 103 41	2.99	
3084.36	0.11	5.08	3084.28	6.60	6.53	-10.85	0.18	441091.47	742111.81	N 32 12 39.49 W 103 41	2.99	
3179.15	0.14	29.56	3179.07	6.79	6.72	-10.76	0.06	441091.66	742111.88	N 32 12 39.50 W 103 41	2.99	
3273.94	0.13	5.03	3273.86	7.00	6.93	-10.72	0.06	441091.87	742111.94	N 32 12 39.50 W 103 41	2.99	
3368.73	0.12	38.43	3368.65	7.18	7.12	-10.64	0.08	441092.06	742112.02	N 32 12 39.50 W 103 41	2.99	
3463.52	0.13	7.08	3463.44	7.36	7.30	-10.57	0.07	441092.24	742112.09	N 32 12 39.50 W 103 41	2.99	
3558.31	0.15	253.25	3558.23	7.44	7.37	-10.68	0.25	441092.31	742111.99	N 32 12 39.50 W 103 41	2.99	
3653.10	0.14	215.55	3653.02	7.31	7.24	-10.86	0.10	441092.18	742111.80	N 32 12 39.50 W 103 41	2.99	
3747.89	0.18	111.66	3747.81	7.16	7.09	-10.79	0.27	441092.03	742111.87	N 32 12 39.50 W 103 41	2.99	
3842.68	0.15	53.19	3842.60	7.18	7.11	-10.55	0.17	441092.05	742112.11	N 32 12 39.50 W 103 41	2.99	
3937.47	0.13	280.97	3937.39	7.27	7.21	-10.56	0.27	441092.15	742112.10	N 32 12 39.50 W 103 41	2.99	
4032.26	0.18	287.65	4032.18	7.34	7.27	-10.81	0.06	441092.21	742111.85	N 32 12 39.50 W 103 41	2.99	
4127.05	0.12	109.49	4126.97	7.35	7.29	-10.85	0.32	441092.22	742111.81	N 32 12 39.50 W 103 41	2.99	
4221.84	0.23	264.24	4221.76	7.30	7.23	-10.95	0.36	441092.17	742111.71	N 32 12 39.50 W 103 41	2.99	
4316.63	0.15	159.14	4316.55	7.16	7.10	-11.10	0.32	441092.04	742111.57	N 32 12 39.50 W 103 41	3.00	
4411.42	0.27	302.74	4411.34	7.17	7.10	-11.24	0.42	441092.04	742111.42	N 32 12 39.50 W 103 41	3.00	
4506.21	0.15	314.55	4506.13	7.38	7.31	-11.52	0.13	441092.25	742111.15	N 32 12 39.50 W 103 41	3.00	
4601.00	0.18	299.82	4600.92	7.54	7.47	-11.73	0.05	441092.41	742110.93	N 32 12 39.50 W 103 41	3.00	
4624.00	0.11	97.16	4623.92	7.56	7.49	-11.74	1.24	441092.43	742110.92	N 32 12 39.50 W 103 41	3.00	
4824.00	0.08	250.58	4823.92	7.48	7.41	-11.69	0.09	441092.35	742110.97	N 32 12 39.50 W 103 41	3.00	
4918.10	0.07	216.95	4918.02	7.42	7.35	-11.78	0.05	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4918.20	0.07	299.93	4918.12	7.42	7.35	-11.78	88.78	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4918.30	0.06	298.59	4918.22	7.42	7.35	-11.78	3.36	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4918.40	0.02	7.01	4918.32	7.42	7.35	-11.78	58.62	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4918.50	0.16	243.41	4918.42	7.42	7.35	-11.78	169.53	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4918.60	0.07	323.28	4918.52	7.42	7.35	-11.78	159.24	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4918.00	0.06	209.47	4917.92	7.42	7.35	-11.79	7.43	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4918.10	0.07	187.30	4918.02	7.42	7.35	-11.79	25.10	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4924.20	0.03	351.36	4924.12	7.42	7.35	-11.79	1.58	441092.29	742110.87	N 32 12 39.50 W 103 41	3.00	
4924.30	0.03	241.87	4924.22	7.42	7.35	-11.79	50.63	441092.29	742110.87	N 32 12 39.50 W 103 41	3.00	
4924.40	0.03	235.54	4924.32	7.42	7.35	-11.79	3.42	441092.29	742110.87	N 32 12 39.50 W 103 41	3.00	
4924.60	0.03	133.62	4924.52	7.42	7.35	-11.79	24.08	441092.29	742110.87	N 32 12 39.50 W 103 41	3.00	
4928.10	0.03	63.56	4928.02	7.42	7.35	-11.78	1.02	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4928.50	0.03	291.29	4928.42	7.42	7.35	-11.78	14.18	441092.29	742110.88	N 32 12 39.50 W 103 41	3.00	
4981.00	0.07	29.48	4980.92	7.45	7.38	-11.78	0.15	441092.32	742110.88	N 32 12 39.50 W 103 41	3.00	
5076.00	0.04	62.28	5075.92	7.51	7.44	-11.73	0.05	441092.38	742110.93	N 32 12 39.50 W 103 41	3.00	
5171.00	0.04	64.89	5170.92	7.54	7.47	-11.67	0.00	441092.41	742110.99	N 32 12 39.50 W 103 41	3.00	
5265.00	0.04	277.75	5264.92	7.56	7.49	-11.67	0.08	441092.43	742110.99	N 32 12 39.50 W 103 41	3.00	
5360.00	0.04	75.97	5359.92	7.57	7.50	-11.67	0.08	441092.44	742110.99	N 32 12 39.50 W 103 41	3.00	
5454.00	0.04	46.24	5453.92	7.60	7.53	-11.62	0.02	441092.47	742111.04	N 32 12 39.50 W 103 41	3.00	
5549.00	0.04	183.48	5548.92	7.59	7.52	-11.60	0.07	441092.46	742111.06	N 32 12 39.50 W 103 41	3.00	
5644.00	0.04	66.59	5643.92	7.57	7.50	-11.58	0.07	441092.44	742111.08	N 32 12 39.50 W 103 41	3.00	
5739.00	0.04	132.73	5738.92	7.58	7.49	-11.53	0.04	441092.43	742111.13	N 32 12 39.50 W 103 41	3.00	
5833.00	0.04	109.38	5832.92	7.53	7.46	-11.47	0.02	441092.40	742111.19	N 32 12 39		

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (NUS)	Easting (EUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	8117.00	0.01	121.23	8116.92	7.45	7.38	-11.48	0.03	441062.32	742111.21	N 32 12 39.50 W 103 41	3.00
	8212.00	0.04	194.91	8211.92	7.42	7.35	-11.45	0.04	441062.29	742111.21	N 32 12 39.50 W 103 41	3.00
	8306.00	0.07	260.38	8305.92	7.38	7.31	-11.52	0.07	441062.25	742111.14	N 32 12 39.50 W 103 41	3.00
	8401.00	0.04	45.97	8400.92	7.39	7.32	-11.55	0.11	441062.26	742111.11	N 32 12 39.50 W 103 41	3.00
	8495.00	0.04	165.54	8494.92	7.38	7.31	-11.53	0.07	441062.25	742111.14	N 32 12 39.50 W 103 41	3.00
	8590.00	0.04	85.95	8589.92	7.36	7.30	-11.49	0.06	441062.24	742111.17	N 32 12 39.50 W 103 41	3.00
	8779.00	0.06	257.36	8778.92	7.37	7.30	-11.53	0.05	441062.24	742111.13	N 32 12 39.50 W 103 41	3.00
	8874.00	0.04	157.82	8873.92	7.33	7.26	-11.56	0.08	441062.20	742111.10	N 32 12 39.50 W 103 41	3.00
	8968.00	0.04	237.80	8967.92	7.29	7.22	-11.58	0.05	441062.18	742111.08	N 32 12 39.50 W 103 41	3.00
	9157.00	0.01	106.60	9156.92	7.25	7.18	-11.61	0.02	441062.12	742111.05	N 32 12 39.50 W 103 41	3.00
	9252.00	0.04	292.81	9251.92	7.26	7.19	-11.63	0.05	441062.13	742111.03	N 32 12 39.50 W 103 41	3.00
	9347.00	0.01	121.77	9346.92	7.26	7.19	-11.65	0.05	441062.13	742111.01	N 32 12 39.50 W 103 41	3.00
	9441.00	0.06	222.95	9440.92	7.22	7.15	-11.67	0.07	441062.09	742110.99	N 32 12 39.50 W 103 41	3.00
	9538.00	0.01	171.22	9537.92	7.18	7.11	-11.70	0.05	441062.05	742110.96	N 32 12 39.50 W 103 41	3.00
	9631.00	0.07	191.70	9630.92	7.11	7.04	-11.71	0.06	441061.98	742110.95	N 32 12 39.50 W 103 41	3.00
	9725.00	1.59	200.58	9724.90	5.84	5.78	-12.18	1.82	441060.70	742110.48	N 32 12 39.49 W 103 41	3.01
	9820.00	3.84	198.60	9819.79	1.80	1.51	-13.66	2.36	441060.45	742109.00	N 32 12 39.44 W 103 41	3.03
	9914.00	5.99	197.08	9913.44	-8.06	-8.16	-16.11	2.30	441078.78	742108.55	N 32 12 39.37 W 103 41	3.05
	10008.00	7.87	197.52	10007.74	-16.99	-17.10	-19.52	1.97	441067.84	742103.14	N 32 12 39.26 W 103 41	3.09
	10062.00	8.39	197.46	10060.21	-24.12	-24.25	-21.77	0.98	441060.69	742100.89	N 32 12 39.19 W 103 41	3.12
	10104.00	8.91	197.89	10103.73	-30.13	-30.27	-23.68	1.28	441054.67	742098.98	N 32 12 39.13 W 103 41	3.14
	10198.00	9.38	197.84	10197.52	-44.49	-44.65	-26.29	0.49	441040.29	742094.37	N 32 12 38.99 W 103 41	3.20
	10388.00	8.91	207.47	10387.13	-72.07	-72.31	-39.76	0.85	441012.63	742082.90	N 32 12 38.72 W 103 41	3.33
	10482.00	8.53	216.49	10481.05	-84.10	-84.38	-47.27	1.51	441000.57	742075.39	N 32 12 38.60 W 103 41	3.42
	10577.00	8.16	218.64	10576.04	-94.98	-95.31	-55.67	0.51	440989.63	742068.99	N 32 12 38.49 W 103 41	3.52
Bone Spring Intersection	8654.00	7.58	215.72	8653.31	-103.34	-103.71	-62.05	0.91	440981.24	742060.61	N 32 12 38.41 W 103 41	3.60
	8671.00	7.46	215.01	8670.17	-105.14	-105.52	-63.34	0.91	440979.42	742059.33	N 32 12 38.39 W 103 41	3.61
	8766.00	6.82	211.52	8765.43	-114.97	-115.38	-69.82	0.81	440969.56	742052.84	N 32 12 38.29 W 103 41	3.69
	8860.00	6.49	208.19	8859.80	-124.38	-124.83	-75.25	0.54	440960.12	742047.41	N 32 12 38.20 W 103 41	3.75
	8955.00	6.49	201.65	8954.19	-134.07	-134.55	-79.77	0.78	440950.40	742042.89	N 32 12 38.10 W 103 41	3.80
	9050.00	7.16	183.39	9049.53	-144.95	-145.44	-82.10	2.38	440939.50	742040.56	N 32 12 37.99 W 103 41	3.83
	9144.00	7.79	174.14	9143.73	-157.14	-157.63	-81.79	1.44	440927.32	742040.87	N 32 12 37.87 W 103 41	3.83
	9238.00	8.02	183.94	9237.83	-169.93	-170.41	-79.30	1.49	440914.54	742043.36	N 32 12 37.75 W 103 41	3.80
	9334.00	8.87	156.94	9333.80	-183.07	-183.52	-74.60	1.40	440901.43	742048.07	N 32 12 37.62 W 103 41	3.75
	9428.00	8.55	150.45	9427.72	-195.86	-196.26	-68.31	1.10	440888.69	742054.35	N 32 12 37.49 W 103 41	3.68
	9523.00	8.59	133.04	9522.68	-208.89	-209.25	-59.65	2.72	440877.70	742063.02	N 32 12 37.38 W 103 41	3.58
	9617.00	8.84	119.07	9616.81	-215.26	-215.55	-48.21	2.28	440869.40	742074.45	N 32 12 37.30 W 103 41	3.44
	9652.00	8.58	114.37	9651.20	-217.67	-217.93	-43.48	2.18	440867.02	742079.18	N 32 12 37.28 W 103 41	3.39
	9711.00	7.84	101.83	9710.60	-220.36	-220.57	-35.53	3.28	440864.38	742087.13	N 32 12 37.25 W 103 41	3.30
	9747.00	8.04	96.68	9746.26	-221.18	-221.37	-30.63	2.08	440863.58	742092.03	N 32 12 37.24 W 103 41	3.24
	9897.00	11.44	64.49	9896.16	-218.13	-218.17	-6.78	4.19	440888.78	742115.90	N 32 12 37.29 W 103 41	2.96
	9929.00	11.55	63.18	9928.54	-213.35	-213.38	-1.04	0.89	440871.59	742121.62	N 32 12 37.32 W 103 41	2.89
	10023.00	9.63	45.78	10022.96	-203.70	-203.63	13.00	3.95	440881.32	742135.66	N 32 12 37.41 W 103 41	2.73
	10118.00	8.28	36.33	10117.80	-192.71	-192.58	22.75	2.10	440892.37	742145.41	N 32 12 37.52 W 103 41	2.62
	10213.00	7.34	20.17	10212.93	-181.53	-181.37	28.89	2.50	440903.58	742151.55	N 32 12 37.63 W 103 41	2.54
	10307.00	5.84	9.56	10306.31	-171.20	-171.01	31.76	2.05	440913.94	742154.42	N 32 12 37.73 W 103 41	2.51
KOP Actual	10402.00	6.80	5.24	10401.73	-160.65	-160.65	33.08	1.12	440924.30	742155.73	N 32 12 37.84 W 103 41	2.49
100' FSL Cross	10473.00	11.04	354.94	10472.86	-149.88	-149.89	32.86	6.37	440935.26	742155.52	N 32 12 37.95 W 103 41	2.49
	10496.00	12.46	353.12	10495.38	-145.22	-145.03	32.37	6.37	440939.92	742155.03	N 32 12 37.99 W 103 41	2.50
	10511.00	14.16	351.78	10510.98	-141.80	-141.61	31.91	11.49	440943.34	742154.57	N 32 12 38.03 W 103 41	2.51
	10591.00	24.30	350.77	10590.41	-115.78	-115.61	27.88	12.68	440969.33	742150.52	N 32 12 38.28 W 103 41	2.55
	10686.00	38.07	353.69	10685.50	-87.10	-86.97	21.48	14.58	441017.97	742144.14	N 32 12 38.76 W 103 41	2.62
	10781.00	46.34	355.30	10780.81	-3.80	-3.50	15.44	8.78	441081.44	742138.10	N 32 12 39.39 W 103 41	2.69
	10875.00	56.02	356.84	10874.87	89.40	89.47	10.35	10.38	441154.40	742133.01	N 32 12 40.12 W 103 41	2.74
	10970.00	65.29	356.04	10969.18	151.98	152.02	5.05	9.77	441236.95	742127.71	N 32 12 40.93 W 103 41	2.80
	11064.00	78.72	355.11	11063.37	241.17	241.16	-1.89	15.38	441326.09	742120.77	N 32 12 41.82 W 103 41	2.87
	11159.00	87.34	356.15	11158.07	335.26	335.21	-9.07	8.10	441420.13	742113.59	N 32 12 42.75 W 103 41	2.95
	11190.00	87.65	356.30	11189.42	366.17	366.11	-11.11	1.10	441451.03	742111.55	N 32 12 43.05 W 103 41	2.97
	11235.00	88.42	355.95	11234.97	411.06	410.98	-14.15	1.87	441495.90	742108.51	N 32 12 43.50 W 103 41	3.00
	11327.00	89.31	356.28	11326.93	502.86	502.75	-20.38	1.04	441587.67	742102.28	N 32 12 44.40 W 103 41	3.07
	11419.00	91.76	356.02	11418.93	594.68	594.53	-26.56	2.67	441679.44	742096.10	N 32 12 45.31 W 103 41	3.13
	11511.00	91.21	353.92	11510.56	686.34	686.14	-34.62	2.36	441771.05	742088.04	N 32 12 46.22 W 103 41	3.22
	11603.00	91.38	356.18	11602.88	778.01	777.77	-42.56	2.47	441862.67	742080.10	N 32 12 47.13 W 103 41	3.31
	11695.00	91.38	357.86	11694.87	869.88	869.62	-47.34	1.82	441954.51	742075.32	N 32 12 48.04 W 103 41	3.36
	11786.00	90.48	358.42	11785.80	960.84	960.55	-50.30	1.16	442045.45	742072.37	N 32 12 48.94 W 103 41	3.38
	11877.00	88.76	0.29	11876.40	1051.82	1051.54	-51.32	2.79	442136.43	742071.34	N 32 12 49.84 W 103 41	3.39
	11969.00	88.45	3.43	11968.63	1143.72	1143.45	-48.33	3.43	442228.34	742074.33	N 32 12 50.75 W 103 41	3.35
	12063.00	88.14	2.87	12062.43	1237.51	1237.28	-43.33	0.87	442322.16	742079.33	N 32 12 51.67 W 103 41	3.28
	12156.00	88.49	4.18	12155.23	1332.06	1332.06	-37.65	1.63	442416.94	742085.01	N 32 12 52.61 W 103 41	3.21
	12252.00	88.62	4.29	12251.60	1425.93	1425.78	-30.72	0.19	442510.65	742091.95	N 32 12 53.54 W 103 41	3.12
	12346.00	89.79	2.97	12345.89	1519.69	1519.57	-24.77	1.87	442604.44	742097.89	N 32 12 54.47 W 103 41	3.05
	12441.00	90.41	2.58	12440.12	1614.55	1614.46	-20.17	0.77	442699.33	742102.49	N 32 12 55.41 W 103 41	2.99
	12535.00	90.35	1.87	12534.10	1708.46	1708.39	-16.53	0.76	442793.25	742106.13	N 32 12 56.33 W 103 41	2.94
	12629.00	90.45	1.45	12628.45	1802.40	1802.35	-13.81	0.45	442887.20	742108.85	N 32 12 57.26 W 103 41	2.90
	12724.00	90.28	1.56	12723.85	1897.35	1897.31	-11.31	0.21	442982.16	742111.35	N 32 12 58.20 W 103 41	2.86
	12819.00	90.59	3.48	12818.14	1992.22	1992.21	-7.13	2.05	443077.06	742115.53	N 32 12 59.14 W 103 41	2.81
	12913.00	90.59	1.98	12912.18	2086.08	2086.08	-2.65	1.60	443170.94	742120.01	N 32 13 0.07 W 103 41	2.75
	13007.00	90.48	3.95	13006.30	2179.91	2179.96	2.21	2.10	443264.80	742124.87	N 32 13 1.00 W 103 41	2.69
	13102.00											

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	18506.00	90.96	358.25	10844.92	5876.45	5876.26	-48.37	0.69	446760.93	742074.29	N 32 13 35.60 W 103 41 3.03	
	18601.00	91.00	359.67	10843.30	5771.42	5771.23	-50.09	1.49	446855.90	742072.57	N 32 13 36.54 W 103 41 3.04	
	18696.00	91.55	0.24	10841.18	5866.40	5866.20	-50.17	0.84	446950.87	742072.50	N 32 13 37.48 W 103 41 3.04	
	18885.00	91.45	358.41	10838.25	8055.32	8055.12	-52.40	0.97	447139.78	742070.27	N 32 13 39.35 W 103 41 3.05	
	18979.00	91.38	357.37	10833.93	8149.25	8149.02	-55.86	1.11	447233.68	742068.80	N 32 13 40.28 W 103 41 3.08	
	17074.00	91.83	357.89	10831.28	8244.15	8243.91	-59.79	0.72	447328.55	742062.87	N 32 13 41.22 W 103 41 3.12	
	17168.00	91.07	358.41	10828.90	8338.09	8337.83	-62.83	0.98	447422.47	742059.84	N 32 13 42.15 W 103 41 3.15	
	17357.00	91.55	1.69	10824.59	8527.01	8526.75	-62.67	1.75	447611.38	742059.99	N 32 13 44.01 W 103 41 3.14	
	17451.00	91.48	359.93	10822.10	8620.95	8620.70	-61.35	1.87	447705.33	742061.32	N 32 13 44.94 W 103 41 3.11	
	17546.00	91.00	359.46	10820.05	8715.93	8715.68	-61.86	0.71	447800.31	742060.81	N 32 13 45.88 W 103 41 3.11	
	17641.00	89.97	359.07	10819.25	8810.92	8810.67	-63.08	1.16	447895.29	742059.58	N 32 13 46.82 W 103 41 3.12	
	17735.00	90.41	359.63	10818.94	8904.92	8904.66	-64.15	0.76	447989.28	742058.51	N 32 13 47.75 W 103 41 3.13	
	17830.00	87.66	359.55	10820.54	8999.90	8999.83	-64.83	2.90	448084.25	742057.83	N 32 13 48.69 W 103 41 3.13	
	17920.55	90.59	359.30	10821.92	7090.42	7090.16	-65.74	3.24	448174.77	742056.92	N 32 13 49.59 W 103 41 3.13	
	18019.00	89.42	359.51	10821.92	7188.87	7188.60	-66.77	1.21	448273.21	742055.90	N 32 13 50.56 W 103 41 3.14	
	18113.00	90.69	0.80	10821.84	7282.88	7282.60	-66.51	1.93	448367.20	742056.15	N 32 13 51.49 W 103 41 3.13	
	18208.00	91.89	1.09	10819.70	7377.81	7377.56	-64.94	1.31	448462.15	742057.72	N 32 13 52.43 W 103 41 3.10	
	18302.00	90.72	357.95	10817.55	7471.78	7471.52	-65.73	3.56	448556.11	742058.94	N 32 13 53.36 W 103 41 3.11	
	18396.00	91.34	359.21	10815.85	7565.74	7565.47	-68.05	1.49	448650.06	742054.61	N 32 13 54.29 W 103 41 3.13	
	18491.00	89.69	358.58	10815.00	7660.73	7660.45	-69.89	1.86	448745.03	742052.78	N 32 13 55.23 W 103 41 3.14	
	18585.00	91.48	358.86	10814.04	7754.70	7754.41	-71.98	1.93	448838.99	742050.68	N 32 13 56.16 W 103 41 3.16	
	18680.00	90.79	359.29	10812.16	7849.68	7849.38	-73.52	0.85	448933.96	742049.15	N 32 13 57.10 W 103 41 3.17	
	18869.00	90.45	1.17	10810.11	8038.65	8038.38	-72.77	1.01	449122.93	742049.90	N 32 13 58.97 W 103 41 3.15	
	18964.00	91.34	1.75	10808.63	8133.59	8133.32	-70.34	1.12	449217.86	742052.32	N 32 13 59.91 W 103 41 3.11	
	19059.00	92.96	3.42	10805.06	8228.39	8228.15	-66.06	2.44	449312.70	742056.60	N 32 14 0.85 W 103 41 3.06	
	19153.00	91.07	1.26	10801.76	8322.22	8322.00	-62.23	3.05	449406.55	742060.44	N 32 14 1.78 W 103 41 3.01	
	19248.00	92.20	1.99	10799.05	8417.13	8416.92	-59.53	1.42	449501.47	742063.13	N 32 14 2.72 W 103 41 2.97	
	19342.00	91.79	2.92	10795.77	8510.96	8510.78	-55.51	1.08	449595.32	742067.15	N 32 14 3.65 W 103 41 2.91	
	19532.00	91.65	2.76	10790.06	8700.58	8700.46	-46.11	0.11	449784.99	742076.55	N 32 14 5.52 W 103 41 2.79	
	19721.00	91.41	1.34	10785.01	8889.34	8889.27	-39.35	0.78	449973.79	742083.31	N 32 14 7.39 W 103 41 2.70	
	19815.00	91.24	3.05	10782.84	8983.22	8983.17	-35.76	1.82	450067.69	742086.91	N 32 14 8.32 W 103 41 2.65	
	20005.00	89.17	3.64	10782.15	9172.82	9172.83	-24.67	1.13	450257.34	742097.99	N 32 14 10.20 W 103 41 2.51	
	20099.00	88.45	359.98	10784.10	9266.71	9266.75	-21.70	3.98	450351.26	742100.98	N 32 14 11.12 W 103 41 2.47	
	20194.00	88.62	0.17	10786.53	9361.68	9361.72	-21.58	0.28	450446.22	742101.08	N 32 14 12.06 W 103 41 2.46	
	20289.00	88.31	0.53	10789.06	9456.64	9456.68	-21.00	0.50	450541.18	742101.68	N 32 14 13.00 W 103 41 2.45	
	20383.00	88.25	357.57	10791.89	9550.58	9550.62	-22.58	3.15	450635.11	742100.10	N 32 14 13.93 W 103 41 2.46	
	20478.00	88.49	359.09	10794.60	9645.51	9645.53	-25.33	1.63	450730.02	742097.33	N 32 14 14.87 W 103 41 2.48	
	20572.00	88.80	358.14	10796.83	9739.47	9739.48	-27.59	1.06	450823.96	742095.07	N 32 14 15.80 W 103 41 2.50	
	20667.00	88.59	359.05	10799.00	9834.43	9834.42	-29.92	0.98	450918.90	742092.74	N 32 14 16.74 W 103 41 2.52	
	20856.00	87.97	357.27	10804.67	10023.27	10023.23	-35.99	1.00	451107.70	742086.67	N 32 14 18.61 W 103 41 2.58	
	20951.00	88.28	358.58	10807.78	10118.17	10118.12	-39.43	1.42	451202.58	742083.24	N 32 14 19.55 W 103 41 2.61	
	21045.00	88.42	357.93	10810.49	10212.11	10212.03	-42.29	0.71	451296.50	742080.37	N 32 14 20.48 W 103 41 2.64	
100' FNL Cross	21047.00	88.42	357.89	10810.55	10214.10	10214.03	-42.36	1.95	451298.49	742080.30	N 32 14 20.50 W 103 41 2.64	
Final MWD	21084.00	88.42	357.17	10811.57	10251.06	10250.98	-43.96	1.95	451335.44	742078.71	N 32 14 20.86 W 103 41 2.66	
Survey	21125.00	88.42	357.17	10812.70	10292.01	10291.92	-45.98	0.01	451376.38	742076.68	N 32 14 21.27 W 103 41 2.68	
Proj to Bit												

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	26.500	1/98.425	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / Oxy Mesa Verde BS Unit 23H Gyro + MWD 0-21125' MD
	1	26.500	26.500	Act Sins	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / Oxy Mesa Verde BS Unit 23H Gyro + MWD 0-21125' MD
	1	26.500	4601.000	Act Sins	30.000	30.000	NAL_NSG+MSHOT	Original Borehole / Oxy Mesa Verde BS Unit 23H Gyro + MWD 0-21125' MD
	1	4601.000	4824.000	Act Sins	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	Original Borehole / Oxy Mesa Verde BS Unit 23H Gyro + MWD 0-21125' MD
	1	4824.000	21125.000	Act Sins	30.000	30.000	NAL_MWD_IFR1+MS	Original Borehole / Oxy Mesa Verde BS Unit 23H Gyro + MWD 0-21125' MD

Oilfield Services, Central U.S. Land
Schlumberger Drilling and Measurements
Drilling Group
Geo Market Area: South West Texas Basin
7220 W I-H 20
Midland, Texas 79706
Phone : (432) 742-5400 (Main)
Fax : (432) 742-5606 (Shared)

HOBBS OCD

FFR 2 02019

RECEIVED

Schlumberger

September 29, 2018

OXY USA INC

16, 24 South, 32 East, LEA NM
N 32.21095 W -103.68413

Re:

CLIENT: OXY USA INC
WELL: Mesa Verde BS Unit 23H
FIELD: Mesa Verde Bone Spring

RIG: H&P 617
COUNTY: LEA
API NO: 30-025-44560
JOB NO: 18MLD3929

Enclosed, please find the original copy of the survey performed on the referenced well by Drilling & Measurements, a division of Schlumberger Technology Corporation (P-5 No. 754900).
Other information required by your office is as follows.

<u>Name & Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Musab Hassan FS	Mesa Verde BS Unit 23H Original Hole	4824.00 Ft to 21084.00 Ft	August 30, 2018 to September 10, 2018	SlimPulse Third Party Corrected

If any other information is required, please contact the undersigned at the above letterhead and phone number.
Sincerely,

Field Service Manager

Oilfield Services, Central U.S. Land
Schlumberger Drilling and Measurements
Drilling Group
Geo Market Area: South West Texas Basin
7220 W I-H 20
Midland, Texas 79706
Phone : (432) 742-5400 (Main)
Fax : (432) 742-5606 (Shared)

Schlumberger

Well Reference:
16, 24 South, 32 East, LEA NM
N 32.21095 W -103.68413

I, Musab Hassan certify that; I am employed by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I did on the day(s) of August 30, 2018 through September 10, 2018, conduct or supervise the taking of the SlimPulse & Third Party Corrected surveys from a depth of 4824.00 feet to a depth of 21084.00 feet referenced to driller's depth; that the data is true, correct, complete and within the limitations of the tool as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I am authorized and qualified to make this report; that this survey was conducted at the request of OXY USA INC for the Mesa Verde BS Unit 23H Well (Original Hole) API No. 30-025-44560 in New Mexico; and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation.

By
Musab Hassan
FS



Subscribed and Sworn to before me this 29th day of September (month) 2018 (yr)

My Commission expires:

2-16-2022

D. Adams
Notary Public

(signature)

Adams County Colorado
(County State)

