

PathFinder Energy Services, Inc.

AUG 22 2019

Survey Report

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Tie-in Date: 04/17/2019

Date Completed: 05/07/2019

CAZA PETROLEUM, LLC
ALISA OGDEN 15 #1H
EDDY COUNTY, NM
Rig:NABORS M51
PathFinder Office Supervisor:
PathFinder Field Engineers: Magid Ibrahim
John MacMurrough

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.18.5.5917 N LON:104.10.13.0792 W
GRID Reference:NAD83 new mexico east Transverse Mercator
Ref GRID Coord: X: 591709.8811 Y: 473475.8848
North Aligned To:TRUE NORTH
Total Magnetic Correction: 7.14° EAST TO TRUE
Vertical Section Plane: 273.76
Survey Vert. Reference: 22.00' Rotary Table To Ground
Altitude:3127.00' Ground To MSL

Survey Calculations by RX4 using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/30M)	TEM (F)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00@	0.00	0.00	0
231.00	0.64	42.79	231.00	231.00	-0.81	0.95 N	0.88 E	1.29@	42.79	0.27	90
318.00	0.64	3.09	317.99	87.00	-1.11	1.79 N	1.23 E	2.17@	34.58	0.49	86
483.00	0.84	16.47	482.98	165.00	-1.37	3.87 N	1.63 E	4.20@	22.79	0.16	90
560.00	0.84	25.69	559.97	77.00	-1.70	4.92 N	2.03 E	5.32@	22.43	0.17	101
651.00	0.79	18.12	650.96	91.00	-2.11	6.12 N	2.51 E	6.61@	22.35	0.13	108
745.00	0.52	19.35	744.95	94.00	-2.38	7.13 N	2.86 E	7.68@	21.83	0.28	111
839.00	0.30	36.62	838.95	94.00	-2.63	7.73 N	3.15 E	8.35@	22.13	0.26	108
933.00	0.11	73.44	932.95	94.00	-2.85	7.96 N	3.38 E	8.64@	23.01	0.23	108
1027.00	0.13	141.09	1026.95	94.00	-3.01	7.90 N	3.53 E	8.65@	24.09	0.14	104
1122.00	0.13	171.04	1121.95	95.00	-3.10	7.71 N	3.62 E	8.52@	25.13	0.07	111
1216.00	0.24	236.42	1215.95	94.00	-2.97	7.50 N	3.47 E	8.26@	24.84	0.23	115
1310.00	0.60	150.96	1309.95	94.00	-3.08	6.96 N	3.54 E	7.81@	27.00	0.66	115
1405.00	1.28	121.82	1404.93	95.00	-4.29	5.96 N	4.69 E	7.58@	38.17	0.84	111
1499.00	2.24	124.14	1498.89	94.00	-6.80	4.38 N	7.10 E	8.34@	58.34	1.01	111
1592.00	1.91	117.51	1591.83	93.00	-9.78	2.64 N	9.98 E	10.32@	75.17	0.43	108
1686.00	1.73	95.19	1685.78	94.00	-12.64	1.79 N	12.78 E	12.91@	82.03	0.76	108
1780.00	2.61	92.57	1779.71	94.00	-16.19	1.57 N	16.33 E	16.41@	84.53	0.93	111
1874.00	3.54	70.68	1873.58	94.00	-21.00	2.43 N	21.21 E	21.35@	83.47	1.55	111
1968.00	3.41	69.03	1967.41	94.00	-26.21	4.39 N	26.56 E	26.92@	80.61	0.17	111
2062.00	2.55	38.74	2061.28	94.00	-29.95	7.02 N	30.48 E	31.28@	77.03	1.85	108
2156.00	2.16	42.64	2155.21	94.00	-32.26	9.96 N	32.99 E	34.46@	73.21	0.44	111
2250.00	1.81	50.59	2249.15	94.00	-34.46	12.20 N	35.33 E	37.38@	70.95	0.47	115
2344.00	2.99	21.28	2343.07	94.00	-36.28	15.43 N	37.37 E	40.43@	67.57	1.74	115
2437.00	5.13	20.58	2435.83	93.00	-38.21	21.58 N	39.71 E	45.20@	61.48	2.27	111
2532.00	4.81	21.63	2530.47	95.00	-40.66	29.26 N	42.67 E	51.74@	55.56	0.35	108
2626.00	4.75	22.50	2624.14	94.00	-43.12	36.52 N	45.62 E	58.43@	51.32	0.10	108
2720.00	4.27	23.68	2717.85	94.00	-45.56	43.32 N	48.51 E	65.04@	48.23	0.51	104
2814.00	3.98	23.93	2811.61	94.00	-47.88	49.51 N	51.24 E	71.25@	45.98	0.30	108

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/30M)	TEM (F)
2909.00	3.65	24.93	2906.40	95.00	-50.11	55.26 N	53.85 E	77.16@	44.26	0.35	108
3003.00	3.17	23.20	3000.23	94.00	-52.06	60.37 N	56.14 E	82.43@	42.92	0.51	111
3098.00	2.93	22.75	3095.10	95.00	-53.72	65.02 N	58.11 E	87.20@	41.79	0.25	111
3193.00	2.76	23.64	3189.98	95.00	-55.29	69.35 N	59.97 E	91.68@	40.85	0.18	111
3286.00	2.79	25.18	3282.87	93.00	-56.88	73.45 N	61.83 E	96.01@	40.09	0.08	111
3380.00	2.43	27.23	3376.77	94.00	-58.51	77.29 N	63.71 E	100.17@	39.50	0.39	111
3474.00	2.14	28.76	3470.70	94.00	-60.04	80.61 N	65.47 E	103.84@	39.08	0.31	108
3568.00	2.19	28.41	3564.63	94.00	-61.53	83.72 N	67.17 E	107.34@	38.74	0.06	108
3663.00	1.95	29.35	3659.57	95.00	-62.99	86.73 N	68.82 E	110.72@	38.43	0.25	108
3757.00	1.77	32.04	3753.52	94.00	-64.37	89.35 N	70.38 E	113.74@	38.22	0.21	111
3851.00	1.79	33.17	3847.48	94.00	-65.77	91.81 N	71.95 E	116.65@	38.08	0.04	111
3945.00	1.73	28.74	3941.43	94.00	-67.09	94.29 N	73.44 E	119.51@	37.91	0.16	111
4040.00	1.42	30.02	4036.40	95.00	-68.22	96.56 N	74.71 E	122.09@	37.73	0.32	111
4135.00	1.56	27.43	4131.36	95.00	-69.26	98.73 N	75.90 E	124.53@	37.55	0.16	108
4229.00	1.42	27.53	4225.33	94.00	-70.24	100.90 N	77.03 E	126.94@	37.36	0.15	111
4324.00	1.33	21.68	4320.30	95.00	-71.06	102.97 N	77.98 E	129.16@	37.14	0.17	111
4419.00	1.08	21.48	4415.28	95.00	-71.67	104.82 N	78.71 E	131.09@	36.90	0.26	111
4513.00	2.01	26.46	4509.25	94.00	-72.58	107.12 N	79.77 E	133.56@	36.67	0.98	115
4608.00	2.35	29.54	4604.18	95.00	-74.07	110.31 N	81.47 E	137.14@	36.45	0.37	119
4701.00	2.36	25.47	4697.10	93.00	-75.60	113.70 N	83.24 E	140.91@	36.21	0.18	119
4795.00	2.33	25.02	4791.02	94.00	-77.01	117.18 N	84.88 E	144.69@	35.92	0.04	122
4889.00	2.41	23.80	4884.94	94.00	-78.38	120.72 N	86.48 E	148.50@	35.62	0.10	119
4984.00	3.37	28.15	4979.82	95.00	-80.22	125.01 N	88.61 E	153.22@	35.33	1.02	122
5078.00	4.08	34.43	5073.62	94.00	-83.07	130.20 N	91.80 E	159.31@	35.19	0.86	126
5173.00	3.94	37.21	5168.39	95.00	-86.59	135.59 N	95.69 E	165.95@	35.21	0.25	126
5267.00	3.84	36.57	5262.17	94.00	-90.07	140.69 N	99.51 E	172.33@	35.27	0.11	126
5362.00	3.81	37.71	5356.96	95.00	-93.56	145.74 N	103.34 E	178.66@	35.34	0.08	126
5457.00	3.75	37.86	5451.75	95.00	-97.07	150.69 N	107.18 E	184.92@	35.42	0.06	129
5533.00	3.84	40.54	5527.59	76.00	-99.98	154.58 N	110.36 E	189.93@	35.52	0.26	129
5673.00	3.15	36.75	5667.33	140.00	-104.88	161.23 N	115.71 E	198.45@	35.67	0.51	111
5766.00	2.34	50.08	5760.22	93.00	-107.65	164.50 N	118.69 E	202.84@	35.81	1.09	119
5860.00	2.79	37.73	5854.12	94.00	-110.31	167.54 N	121.56 E	206.99@	35.96	0.74	126
5954.00	3.58	29.12	5947.98	94.00	-112.85	171.91 N	124.39 E	212.19@	35.89	0.96	126
6049.00	4.18	21.08	6042.76	95.00	-115.15	177.73 N	127.08 E	218.49@	35.57	0.84	129
6144.00	5.71	15.37	6137.41	95.00	-117.13	185.52 N	129.58 E	226.29@	34.93	1.66	133
6238.00	5.71	16.35	6230.94	94.00	-119.09	194.52 N	132.13 E	235.15@	34.19	0.10	133
6332.00	6.35	24.65	6324.42	94.00	-121.97	203.73 N	135.62 E	244.74@	33.65	1.13	137

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6426.00	7.18	26.11	6417.77	94.00	-126.05	213.73 N	140.37 E	255.70@	33.30	0.89	137
6521.00	5.61	23.75	6512.17	95.00	-129.90	223.31 N	144.85 E	266.18@	32.97	1.65	140
6615.00	7.71	24.45	6605.53	94.00	-133.70	233.26 N	149.32 E	276.95@	32.62	2.20	140
6710.00	8.02	24.86	6699.64	95.00	-138.33	245.07 N	154.74 E	289.83@	32.27	0.33	140
6805.00	8.52	33.64	6793.66	95.00	-144.23	256.94 N	161.42 E	303.44@	32.14	1.41	140
6899.00	8.59	39.25	6886.61	94.00	-151.77	268.18 N	169.72 E	317.37@	32.33	0.88	137
6993.00	7.49	38.53	6979.68	94.00	-159.34	278.40 N	177.98 E	330.43@	32.59	1.16	140
7087.00	6.01	46.87	7073.03	94.00	-166.20	286.56 N	185.39 E	341.30@	32.90	1.85	140
7181.00	5.80	41.48	7166.53	94.00	-172.47	293.48 N	192.13 E	350.78@	33.21	0.62	144
7276.00	6.19	45.94	7261.02	95.00	-178.84	300.64 N	198.99 E	360.53@	33.50	0.63	148
7371.00	7.08	36.51	7355.38	95.00	-185.45	308.91 N	206.15 E	371.38@	33.72	1.45	148
7466.00	6.76	32.80	7449.69	95.00	-191.33	318.32 N	212.66 E	382.82@	33.75	0.57	148
7561.00	5.23	31.23	7544.17	95.00	-196.04	326.72 N	217.94 E	392.74@	33.71	1.59	148
7655.00	5.92	24.92	7637.72	94.00	-199.77	334.78 N	222.20 E	401.81@	33.57	0.97	148
7750.00	5.05	20.68	7732.29	95.00	-202.75	343.13 N	225.74 E	410.73@	33.34	0.99	148
7844.00	5.05	24.05	7825.92	94.00	-205.39	350.78 N	228.89 E	418.85@	33.12	0.31	148
7938.00	5.41	14.67	7919.53	94.00	-207.67	358.85 N	231.70 E	427.15@	32.85	0.97	148
8032.00	5.05	9.55	8013.14	94.00	-208.92	367.21 N	233.51 E	435.17@	32.45	0.62	144
8126.00	6.57	10.91	8106.66	94.00	-210.01	376.57 N	235.21 E	444.00@	31.99	1.60	148
8221.00	6.67	18.13	8201.02	95.00	-212.05	387.16 N	237.96 E	454.44@	31.58	0.87	151
8314.00	4.68	23.48	8293.57	93.00	-214.68	395.77 N	241.15 E	463.45@	31.35	2.18	151
8400.00	3.25	34.68	8379.36	86.00	-217.11	400.99 N	243.93 E	469.36@	31.31	1.85	151
8440.00	2.81	33.30	8419.30	40.00	-218.18	402.74 N	245.12 E	471.47@	31.33	1.10	140
8535.00	2.67	289.09	8514.24	95.00	-217.19	405.41 N	244.30 E	473.33@	31.07	4.48	148
8582.00	3.13	296.69	8561.18	47.00	-214.95	406.35 N	242.12 E	473.02@	30.79	1.25	151
8629.00	4.43	271.78	8608.08	47.00	-211.96	406.98 N	239.16 E	472.05@	30.44	4.33	151
8676.00	7.59	263.82	8654.81	47.00	-207.09	406.70 N	234.26 E	469.35@	29.94	6.83	155
8723.00	12.39	257.93	8701.09	47.00	-199.17	405.31 N	226.24 E	464.18@	29.17	10.27	155
8770.00	17.39	260.12	8746.50	47.00	-187.49	403.05 N	214.38 E	456.52@	28.01	10.53	158
8817.00	21.67	259.66	8790.78	47.00	-172.24	400.29 N	198.92 E	446.99@	26.42	8.97	158
8865.00	23.27	258.27	8835.14	48.00	-154.51	396.77 N	180.91 E	436.07@	24.51	3.46	162
8912.00	24.48	255.92	8878.12	47.00	-136.29	392.51 N	162.38 E	424.78@	22.47	3.22	158
8997.00	29.10	259.56	8953.98	85.00	-99.46	384.48 N	124.95 E	404.27@	18.00	5.67	144
9045.00	30.78	266.45	8995.58	48.00	-75.96	381.60 N	101.20 E	394.79@	14.85	7.84	151
9092.00	33.52	271.44	9035.38	47.00	-51.05	381.18 N	76.22 E	388.73@	11.31	7.99	155
9139.00	38.88	273.70	9073.29	47.00	-23.32	382.46 N	48.50 E	385.53@	7.23	11.57	155
9186.00	44.38	272.73	9108.41	47.00	7.89	384.20 N	17.34 E	384.59@	2.58	11.60	155

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/30M)	TEM (F)
9281.00	56.86	273.14	9168.57	95.00	81.17	387.98 N	55.85 W	391.97@	351.81	12.93	158
9375.00	69.57	272.52	9210.84	94.00	164.90	392.08 N	139.49 W	416.16@	340.42	13.32	158
9424.00	76.07	271.44	9225.31	49.00	211.67	393.69 N	186.25 W	435.53@	334.68	13.22	162
9468.00	81.90	270.58	9233.71	44.00	254.79	394.45 N	229.41 W	456.31@	329.82	13.18	166
9515.00	84.39	269.87	9239.32	47.00	301.36	394.63 N	276.07 W	481.61@	325.02	5.42	169
9562.00	88.37	269.99	9242.29	47.00	348.15	394.58 N	322.97 W	509.90@	320.70	8.34	169
9584.00	89.89	269.81	9242.62	22.00	370.10	394.54 N	344.97 W	524.08@	318.83	6.85	169
9656.00	90.90	268.97	9242.12	72.00	441.88	393.77 N	416.96 W	573.51@	313.36	1.80	173
9715.00	91.68	268.20	9240.79	59.00	500.63	392.32 N	475.93 W	616.78@	309.50	1.83	173
9760.00	92.52	269.43	9239.15	45.00	545.43	391.39 N	520.88 W	651.54@	306.92	3.26	155
9855.00	92.69	269.25	9234.83	95.00	640.05	390.29 N	615.78 W	729.05@	302.37	0.26	162
9950.00	90.84	269.23	9231.90	95.00	734.70	389.03 N	710.72 W	810.23@	298.70	1.92	166
10043.00	90.34	268.90	9230.95	93.00	827.39	387.52 N	803.70 W	892.25@	295.74	0.63	169
10138.00	90.73	269.15	9230.06	95.00	922.06	385.90 N	898.69 W	978.04@	293.24	0.48	173
10232.00	91.46	269.57	9228.26	94.00	1015.76	384.85 N	992.66 W	1064.65@	291.19	0.88	173
10326.00	91.96	269.27	9225.46	94.00	1109.45	383.90 N	1086.62 W	1152.44@	289.46	0.61	169
10420.00	92.30	268.82	9221.96	94.00	1203.07	382.33 N	1180.54 W	1240.91@	287.95	0.59	169
10514.00	90.95	269.41	9219.30	94.00	1296.72	380.88 N	1274.49 W	1330.18@	286.64	1.54	173
10609.00	92.02	269.71	9216.83	95.00	1391.43	380.15 N	1369.45 W	1421.23@	285.51	1.15	173
10703.00	89.66	268.93	9215.46	94.00	1485.13	379.04 N	1463.43 W	1511.72@	284.52	2.60	173
10798.00	90.00	268.68	9215.74	95.00	1579.78	377.05 N	1558.40 W	1603.37@	283.60	0.44	158
10893.00	90.84	268.26	9215.04	95.00	1674.37	374.52 N	1653.37 W	1695.25@	282.76	0.97	162
10988.00	91.68	268.55	9212.95	95.00	1768.93	371.87 N	1748.31 W	1787.42@	282.01	0.92	169
11083.00	92.47	268.41	9209.51	95.00	1863.46	369.36 N	1843.21 W	1879.85@	281.33	0.83	173
11177.00	91.29	269.41	9206.43	94.00	1957.07	367.57 N	1937.14 W	1971.70@	280.74	1.62	176
11271.00	91.40	269.01	9204.22	94.00	2050.75	366.27 N	2031.10 W	2063.87@	280.22	0.43	176
11365.00	92.52	269.43	9201.01	94.00	2144.40	364.99 N	2125.04 W	2156.16@	279.75	1.25	173
11459.00	90.84	268.85	9198.25	94.00	2238.05	363.58 N	2218.98 W	2248.57@	279.31	1.86	176
11553.00	91.29	269.16	9196.51	94.00	2331.71	361.95 N	2312.95 W	2341.10@	278.89	0.57	180
11647.00	92.41	268.99	9193.47	94.00	2425.35	360.44 N	2406.89 W	2433.73@	278.52	1.19	176
11741.00	92.97	268.79	9189.06	94.00	2518.90	358.62 N	2500.77 W	2526.35@	278.16	0.62	176
11835.00	93.48	268.86	9183.77	94.00	2612.41	356.69 N	2594.60 W	2619.00@	277.83	0.54	180
11929.00	93.42	269.21	9178.12	94.00	2705.92	355.11 N	2688.42 W	2711.77@	277.52	0.37	180
12023.00	91.68	270.78	9173.93	94.00	2799.61	355.10 N	2782.32 W	2804.89@	277.27	2.45	184
12118.00	91.57	270.12	9171.24	95.00	2894.42	355.85 N	2877.27 W	2899.20@	277.05	0.69	187
12212.00	90.34	270.10	9169.67	94.00	2988.21	356.03 N	2971.26 W	2992.51@	276.83	1.29	187
12306.00	90.28	270.33	9169.16	94.00	3082.03	356.38 N	3065.26 W	3085.91@	276.63	0.25	187

PathFinder Energy Services, Inc.

Survey Report

CAZA PETROLEUM, LLC
ALISA OGDEN 15 #1H
EDDY COUNTY, NM
RIG:NABORS M51

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/30M)	TE (F)
12401.00	91.01	270.20	9168.09	95.00	3176.85	356.82 N	3160.25 W	3180.33@	276.44	0.77	187
12495.00	91.46	270.63	9166.07	94.00	3270.66	357.50 N	3254.23 W	3273.80@	276.27	0.65	187
12589.00	90.73	269.38	9164.27	94.00	3364.44	357.51 N	3348.21 W	3367.24@	276.09	1.52	184
12684.00	89.61	268.01	9163.99	95.00	3459.07	355.35 N	3443.18 W	3461.46@	275.89	1.83	187
12778.00	89.55	268.13	9164.68	94.00	3552.60	352.18 N	3537.12 W	3554.61@	275.69	0.14	191
12872.00	90.22	268.48	9164.87	94.00	3646.18	349.40 N	3631.08 W	3647.85@	275.50	0.79	191
12967.00	90.22	267.90	9164.50	95.00	3740.73	346.40 N	3726.03 W	3742.10@	275.31	0.60	191
13061.00	90.84	268.29	9163.63	94.00	3834.26	343.28 N	3819.97 W	3835.37@	275.14	0.77	187
13156.00	89.83	267.67	9163.08	95.00	3928.78	339.93 N	3914.91 W	3929.64@	274.96	1.23	191
13251.00	90.22	267.20	9163.04	95.00	4023.20	335.68 N	4009.82 W	4023.84@	274.79	0.63	191
13345.00	90.45	266.73	9162.49	94.00	4116.53	330.70 N	4103.68 W	4116.98@	274.61	0.55	191
13440.00	90.67	266.66	9161.56	95.00	4210.81	325.22 N	4198.52 W	4211.10@	274.43	0.24	191
13534.00	91.34	266.42	9159.91	94.00	4304.05	319.55 N	4292.33 W	4304.21@	274.26	0.75	191
13629.00	91.68	266.52	9157.41	95.00	4398.25	313.70 N	4387.12 W	4398.32@	274.09	0.37	194
13724.00	92.30	266.88	9154.11	95.00	4492.47	308.24 N	4481.90 W	4492.49@	273.93	0.74	194
13818.00	90.73	266.76	9151.62	94.00	4585.75	303.03 N	4575.72 W	4585.75@	273.79	1.65	191
13903.00	89.89	266.81	9151.16	85.00	4670.11	298.26 N	4660.59 W	4670.12@	273.66	0.97	194
13982.00 ✓	90.30	267.00	9151.03 ✓	79.00	4748.55	293.99 N	4739.47 W	4748.58@	273.55	0.56	0

This survey is true and accurate to the best of my knowledge.

