



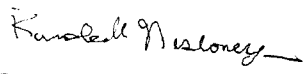
7821 Will Rogers Blvd.
Fort Worth, Texas 76140

817.568.1038 (office)
817.568.1499 (fax)
www.msenergyservices.com

Survey Company: MS Energy Services
MWD Surveyor Name: Randall Nesloney
Survey Type: MWD
Operating Company: Murchison Oil & Gas Inc.
Well Name & Number: Jawbone State COM 004H
API Number: 30-015-43986
Surveyed Depths: 412' – 11,961' MD

Dates Performed: 03/06/2017 – 03/20/2017
Location: Eddy County, NM

I certify that the data is true, correct and complete and within the limitations of the tool set forth by MS Energy Services; that I am authorized and qualified to make this report and that I have reviewed this report and find it conforms to the principles and procedures as set forth by MS Energy Services.

Digitally signed by: 
Title: MWD Field Specialist
Date: 2017-03-28
Email: rnesloney@msenergyservices.com

NM OIL CONSERVATION
ARTESIA DISTRICT
APR 28 2017
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SURVEY CALCULATION PROGRAM

3/28/17 15:15

Company:	Murchison Oil & Gas, Inc.
Well Name:	Jawbone State COM 004H
Location:	Eddy County, NM
Rig:	Nabors M55
Job Number:	DDMO-170192
API #:	30-015-43986

REFERENCED TO GRID NORTH

Magnetic Declination:

7.33

Proposed Direction:

198.37

Survey Calculation Method:				Minimum Curvature											
PTB:	MD	12,014		INC		AZM		TVD		N/S		E/W		VS	
	Depth	Feet	Inc	Degrees	Azm	Degrees	Feet	N/S	Feet	E/W	Feet	Surface	Distance	DLS/	BUR/
#														100	100'
TIE IN		274	1.20		109.00		273.95		-0.34	4.25	-1.02	4.26	94.57		
1		412	0.40		249.60		411.94		-0.98	5.16	-0.70	5.26	100.73	1.11	-0.58
2		599	1.30		266.80		598.92		-1.32	2.44	0.49	2.77	118.54	0.49	0.48
3		695	1.00		271.20		694.90		-1.37	0.51	1.14	1.46	159.54	0.33	-0.31
4		790	1.00		245.50		789.89		-1.69	-1.07	1.95	2.01	212.35	0.47	0.00
5		885	0.70		234.20		884.88		-2.38	-2.30	2.98	3.31	224.03	0.36	-0.32
6		980	0.60		251.10		979.87		-2.88	-3.24	3.75	4.33	228.38	0.23	-0.11
7		1,075	0.60		256.90		1074.86		-3.15	-4.19	4.31	5.25	233.08	0.06	0.00
8		1,169	0.30		178.40		1168.86		-3.51	-4.67	4.80	5.84	233.06	0.65	-0.32
9		1,264	0.80		104.40		1263.86		-3.92	-4.02	4.99	5.62	225.68	0.81	0.53
10		1,360	1.20		112.50		1359.84		-4.47	-2.44	5.01	5.10	208.60	0.44	0.42
11		1,455	1.30		127.60		1454.82		-5.51	-0.67	5.44	5.55	186.90	0.36	0.11
12		1,551	0.70		132.80		1550.81		-6.58	0.63	6.04	6.60	174.56	0.63	-0.63
13		1,646	0.30		86.50		1645.80		-6.95	1.30	6.19	7.07	169.41	0.57	-0.42
14		1,741	0.20		98.00		1740.80		-6.96	1.71	6.07	7.17	166.18	0.12	-0.11
15		1,835	0.50		125.80		1834.80		-7.22	2.21	6.16	7.55	163.01	0.36	0.32
16		1,921	0.50		88.70		1920.80		-7.44	2.89	6.15	7.98	158.78	0.37	0.00
17		2,017	1.70		297.70		2016.78		-6.76	2.05	5.78	7.07	163.18	2.24	1.25
18		2,112	1.70		299.10		2111.74		-5.42	-0.43	5.28	5.44	184.57	0.04	0.00
19		2,208	3.80		279.10		2207.63		-4.23	-4.82	5.53	6.41	228.74	2.37	2.19
20		2,302	6.70		276.10		2301.22		-3.15	-13.35	7.20	13.72	256.71	3.10	3.09
21		2,397	6.70		275.20		2395.58		-2.06	-24.38	9.64	24.47	265.17	0.11	0.00
22		2,492	8.60		271.70		2489.73		-1.35	-37.00	12.94	37.02	267.91	2.06	2.00
23		2,587	11.40		270.80		2583.27		-1.01	-53.49	17.81	53.50	268.92	2.95	2.95
24		2,682	13.60		272.80		2676.02		-0.33	-74.04	23.65	74.04	269.74	2.36	2.32
25		2,778	15.80		271.00		2768.87		0.45	-98.38	30.58	98.38	270.26	2.34	2.29
26		2,873	17.50		274.20		2859.88		1.72	-125.56	37.94	125.57	270.79	2.03	1.79
27		2,968	18.70		281.40		2950.19		5.78	-154.74	43.28	154.85	272.14	2.67	1.26
28		3,063	18.70		279.20		3040.18		11.22	-184.70	47.56	185.04	273.48	0.74	0.00
29		3,159	18.10		277.00		3131.27		15.50	-214.69	52.95	215.25	274.13	0.96	-0.62
30		3,254	17.80		277.20		3221.65		19.12	-243.75	58.67	244.50	274.49	0.32	-0.32
31		3,349	17.30		277.00		3312.23		22.66	-272.17	64.27	273.11	274.76	0.53	-0.53
32		3,444	18.50		275.50		3402.63		25.83	-301.20	70.41	302.30	274.90	1.35	1.26
33		3,539	18.50		275.70		3492.72		28.77	-331.20	77.07	332.44	274.96	0.07	0.00



V08 04 02

SURVEY CALCULATION PROGRAM

3/28/17 15:15

Company:	Murchison Oil & Gas, Inc.
Well Name:	Jawbone State COM 004H
Location:	Eddy County, NM
Rig:	Nabors M55
Job Number:	DDMO-170192
API #:	30-015-43986

Magnetic Declination: 7.33

REFERENCED TO GRID NORTH

Proposed Direction: 198.37

Vertical Section Azimuth: 198.37

Survey Calculation Method: Minimum Curvature

#	Depth Feet	Inc		Azm		TVD		N/S		E/W		Surface		Closure		DLS/	
		MD	12,014	Degrees	Degrees	Feet	Feet	Feet	Feet	Feet	Feet	Vert Sec	Vert Sec	Distance	Azm	100	100'
34	3,634			18.00		275.80	3582.94	31.75	-360.80	7153.17	-4902.73	83.57	83.57	362.19	275.03	0.53	-0.53
35	3,730			17.60		275.60	3674.34	34.66	-390.00			90.01	90.01	391.54	275.08	0.42	-0.42
36	3,825			18.90		276.80	3764.56	37.89	-419.57			96.27	96.27	421.28	275.16	1.42	1.37
37	3,921			18.20		276.80	3855.57	41.50	-449.90			102.40	102.40	451.81	275.27	0.73	-0.73
38	4,016			17.50		276.50	3946.00	44.88	-478.82			108.31	108.31	480.92	275.35	0.74	-0.74
39	4,112			20.10		277.10	4036.87	48.55	-509.54			114.50	114.50	511.85	275.44	2.72	2.71
40	4,206			20.40		277.30	4125.06	52.63	-541.82			120.81	120.81	544.37	275.55	0.33	0.32
41	4,301			19.60		277.20	4214.33	56.73	-574.05			127.07	127.07	576.84	275.64	0.84	-0.84
42	4,396			19.00		276.60	4303.99	60.50	-605.22			133.31	133.31	608.23	275.71	0.67	-0.63
43	4,491			18.20		275.90	4394.03	63.81	-635.34			139.67	139.67	638.53	275.74	0.87	-0.84
44	4,586			17.30		275.70	4484.51	66.74	-664.15			145.97	145.97	667.50	275.74	0.95	-0.95
45	4,682			20.30		276.10	4575.37	69.92	-694.92			152.65	152.65	698.43	275.75	3.13	3.13
46	4,777			20.20		275.80	4664.50	73.33	-727.62			159.72	159.72	731.31	275.75	0.15	-0.11
47	4,872			19.40		274.80	4753.89	76.31	-759.66			166.99	166.99	763.49	275.74	0.91	-0.84
48	4,967			18.80		274.10	4843.66	78.72	-790.66			174.46	174.46	794.57	275.69	0.68	-0.63
49	5,062			17.90		273.50	4933.82	80.71	-820.50			181.98	181.98	824.46	275.62	0.97	-0.95
50	5,157			17.40		272.80	5024.35	82.30	-849.26			189.54	189.54	853.24	275.53	0.57	-0.53
51	5,252			19.20		274.40	5114.54	84.19	-879.02			197.13	197.13	883.04	275.47	1.97	1.89
52	5,347			18.60		274.70	5204.42	86.63	-909.70			204.48	204.48	913.81	275.44	0.64	-0.63
53	5,443			18.30		275.00	5295.49	89.20	-939.97			211.58	211.58	944.19	275.42	0.33	-0.31
54	5,538			16.90		274.20	5386.04	91.51	-968.60			218.41	218.41	972.91	275.40	1.50	-1.47
55	5,633			18.30		275.60	5476.59	93.97	-997.22			225.09	225.09	1001.64	275.38	1.54	1.47
56	5,728			18.80		274.20	5566.65	96.55	-1027.33			232.13	232.13	1031.85	275.37	0.70	0.53
57	5,824			19.10		275.10	5657.45	99.08	-1058.40			239.53	239.53	1063.03	275.35	0.44	0.31
58	5,919			17.80		274.80	5747.57	101.68	-1088.35			246.50	246.50	1093.09	275.34	1.37	-1.37
59	6,014			18.80		274.60	5837.76	104.12	-1118.08			253.55	253.55	1122.92	275.32	1.05	1.05
60	6,109			20.70		276.90	5927.17	107.36	-1150.01			260.53	260.53	1155.01	275.33	2.16	2.00
61	6,204			19.50		275.10	6016.38	110.79	-1182.47			267.51	267.51	1187.65	275.35	1.42	-1.26
62	6,299			17.90		274.00	6106.37	113.22	-1212.83			274.78	274.78	1218.11	275.33	1.72	-1.68
63	6,392			19.20		275.00	6194.53	115.55	-1242.33			281.86	281.86	1247.69	275.31	1.44	1.40
64	6,487			20.50		278.30	6283.89	119.31	-1274.35			288.38	288.38	1279.92	275.35	1.81	1.37
65	6,582			19.60		278.00	6373.13	123.93	-1306.59			294.16	294.16	1312.45	275.42	0.95	-0.95
66	6,622			19.10		278.40	6410.87	125.82	-1319.71			296.50	296.50	1325.69	275.45	1.29	-1.25
67	6,669			19.90		266.90	6455.19	126.51	-1335.31			300.76	300.76	1341.29	275.41	8.33	1.70

SURVEY CALCULATION PROGRAM

3/28/17 15:15

Company:	Murchison Oil & Gas, Inc.
Well Name:	Jawbone State COM 004H
Location:	Eddy County, NM
Rig:	Nabors M55
Job Number:	DDMO-170192
API #:	30-015-43986

REFERENCED TO GRID NORTH

Magnetic Declination: 7.33

Proposed Direction: 198.37

198.37

Survey Calculation Method: Minimum Curvature

#	Depth Feet	Inc		Azim		TVD		N/S		E/W		Surface		Closure		DLS/	
		MD	12.014	Degrees	Degrees	Feet	Feet	Feet	Feet	Feet	Feet	Vert Sec	Vert Sec	Distance	Azm	100	BUR/ 100'
PTB:																	
68	6,717			22.40	252.80	6499.98	123.36	-1352.22	309.08	7153.17	-4902.73	N/S	N/S	-1601.31	275.21	11.77	5.21
69	6,764			25.00	241.60	6543.04	115.99	-1369.52	321.53						274.84	11.04	5.53
70	6,812			27.10	230.10	6586.19	104.14	-1386.84	338.23						274.29	11.37	4.38
71	6,859			28.80	218.10	6627.74	88.35	-1402.05	358.01						273.61	12.48	3.62
72	6,908			32.30	209.50	6669.95	67.65	-1415.79	381.99						272.74	11.41	7.14
73	6,955			36.00	204.50	6708.84	44.14	-1427.71	408.06						271.77	9.88	7.87
74	7,003			39.90	201.00	6746.69	16.92	-1439.08	437.48						270.67	9.28	8.13
75	7,050			43.00	197.10	6781.92	-12.49	-1449.20	468.57						269.51	8.58	6.60
76	7,098			47.50	193.60	6815.71	-45.35	-1458.18	502.59						268.22	10.71	9.38
77	7,145			50.60	191.50	6846.51	-80.00	-1465.88	537.90						266.88	7.41	6.60
78	7,193			53.40	189.30	6876.06	-117.19	-1472.69	575.34						265.45	6.86	5.83
79	7,240			57.60	187.10	6902.68	-155.52	-1478.20	613.45						263.99	9.73	8.94
80	7,289			61.70	185.40	6927.44	-197.55	-1482.79	654.78						262.41	8.89	8.37
81	7,336			65.80	183.80	6948.22	-239.55	-1486.16	695.71						260.84	9.24	8.72
82	7,384			69.90	183.10	6966.31	-283.92	-1488.83	738.66						259.20	8.65	8.54
83	7,431			73.40	183.20	6981.11	-328.46	-1491.28	781.70						257.58	7.45	7.45
84	7,480			76.70	183.30	6993.75	-375.72	-1493.96	827.39						255.88	6.74	6.73
85	7,527			79.60	183.40	7003.40	-421.63	-1496.65	871.82						254.27	6.17	6.17
86	7,575			83.00	183.30	7010.66	-468.99	-1499.42	917.64						252.63	7.09	7.08
87	7,622			86.30	183.10	7015.04	-515.71	-1502.03	962.79						251.05	7.03	7.02
88	7,670			87.10	182.80	7017.80	-563.56	-1504.50	1008.99						249.46	1.78	1.67
89	7,765			86.50	182.70	7023.11	-658.30	-1509.05	1100.34						246.43	0.64	-0.63
90	7,860			86.60	182.80	7028.82	-753.02	-1513.60	1191.66						243.55	0.15	0.11
91	7,955			86.30	182.70	7034.70	-847.73	-1518.15	1282.98						240.82	0.33	-0.32
92	8,050			86.00	182.10	7041.08	-942.43	-1522.12	1374.11						238.24	0.70	-0.32
93	8,145			87.60	181.10	7046.39	-1037.24	-1524.77	1464.92						235.77	1.99	1.68
94	8,240			87.70	179.90	7050.28	-1132.16	-1525.59	1555.26						233.42	1.27	0.11
95	8,335			87.20	178.90	7054.51	-1227.06	-1524.60	1645.01						231.17	1.18	-0.53
96	8,430			88.10	181.80	7058.41	-1321.96	-1525.18	1735.26						229.08	3.19	0.95
97	8,525			87.50	182.10	7062.05	-1416.84	-1528.41	1826.32						227.17	0.71	-0.63
98	8,620			88.70	183.50	7065.20	-1511.67	-1533.05	1917.78						225.40	1.94	1.26
99	8,715			89.10	183.10	7067.03	-1606.49	-1538.52	2009.50						223.76	0.60	0.42
100	8,811			89.50	182.70	7068.20	-1702.36	-1543.37	2102.01						222.20	0.59	0.42
101	8,906			89.20	182.00	7069.28	-1797.28	-1547.27	2193.31						220.73	0.80	-0.32



V09 04.02

Company: Murchison Oil & Gas, Inc.
Well Name: Jawbone State COM 004H
Location: Eddy County, NM
Rig: Nabors M55
Job Number: DDMO-170192
API #: 30-015-43986

Vertical Section Azimuth: 198.37

Survey Calculation Method: Minimum Curvature

PTB: MD 12.014 INC 90.8 AZM 180.4

Magnetic Declination: 7.33

REFERENCED TO GRID NORTH

Proposed Direction: 198.37

SURVEY CALCULATION PROGRAM

3/28/17 15:15

#	Depth Feet	Inc		Azimuth	TVD Feet	N/S		E/W		Surface		Closure		DLS/ 100'	BUR/ 100'
		Degrees	Minutes			Feet	Seconds	Feet	Seconds	Feet	Seconds	Distance	Azimuth		
102	9,001	89.20		181.40	7070.60	-1892.23		-1550.09		2284.31		2446.08	219.32	0.63	0.00
103	9,096	89.70		181.10	7071.51	-1987.20		-1552.16		2375.10		2521.54	217.99	0.61	0.53
104	9,192	90.00		180.70	7071.77	-2083.19		-1553.67		2466.67		2598.76	216.72	0.52	0.31
105	9,287	88.60		181.50	7072.93	-2178.16		-1555.49		2557.38		2676.55	215.53	1.70	-1.47
106	9,382	89.40		181.20	7074.58	-2273.12		-1557.73		2648.20		2755.64	214.42	0.90	0.84
107	9,478	89.60		181.10	7075.42	-2369.09		-1559.65		2739.90		2836.39	213.36	0.23	0.21
108	9,573	86.00		181.40	7079.07	-2463.98		-1561.72		2830.60		2917.23	212.37	3.80	-3.79
109	9,668	86.10		181.30	7085.61	-2558.73		-1563.96		2921.23		2998.85	211.43	0.15	0.11
110	9,764	86.20		181.30	7092.06	-2654.49		-1566.13		3012.79		3082.06	210.54	0.10	0.10
111	9,858	86.60		181.70	7097.96	-2748.27		-1568.59		3102.57		3164.41	209.72	0.60	0.43
112	9,954	87.20		182.10	7103.15	-2844.08		-1571.76		3194.49		3249.50	208.93	0.75	0.63
113	10,049	87.20		182.00	7107.79	-2938.91		-1575.16		3285.56		3334.41	208.19	0.11	0.00
114	10,144	87.00		181.90	7112.60	-3033.73		-1578.39		3376.57		3419.77	207.49	0.24	-0.21
115	10,239	86.70		182.00	7117.82	-3128.53		-1581.62		3467.55		3505.60	206.82	0.33	-0.32
116	10,334	87.10		180.60	7122.96	-3223.36		-1583.77		3558.23		3591.43	206.17	1.53	0.42
117	10,429	87.10		180.70	7127.76	-3318.24		-1584.84		3648.61		3677.28	205.53	0.11	0.00
118	10,524	88.80		181.00	7131.16	-3413.16		-1586.25		3739.14		3763.76	204.93	1.82	1.79
119	10,620	89.70		180.70	7132.42	-3509.14		-1587.68		3830.68		3851.60	204.34	0.99	0.94
120	10,715	90.60		180.90	7132.17	-3604.13		-1589.00		3921.25		3938.87	203.79	0.97	0.95
121	10,814	88.40		180.10	7133.03	-3703.12		-1589.87		4015.46		4029.98	203.24	2.36	-2.22
122	10,909	88.80		180.40	7135.35	-3798.09		-1590.28		4105.72		4117.58	202.72	0.53	0.42
123	11,005	89.90		180.70	7136.44	-3894.08		-1591.20		4197.11		4206.63	202.23	1.19	1.15
124	11,099	87.70		179.90	7138.41	-3988.05		-1591.69		4286.45		4293.95	201.76	2.49	-2.34
125	11,195	89.00		179.90	7141.18	-4084.00		-1591.53		4377.46		4383.16	201.29	1.35	1.35
126	11,290	89.80		180.30	7142.17	-4179.00		-1591.69		4467.67		4471.86	200.85	0.94	0.84
127	11,385	87.00		180.70	7144.82	-4273.95		-1592.52		4558.04		4561.00	200.44	2.98	-2.95
128	11,480	88.00		181.30	7148.97	-4368.84		-1594.18		4648.62		4650.61	200.05	1.23	1.05
129	11,575	89.10		180.90	7151.37	-4463.79		-1596.00		4739.31		4740.53	199.67	1.23	1.16
130	11,670	89.90		181.20	7152.20	-4558.77		-1597.74		4829.99		4830.65	199.31	0.90	0.84
131	11,765	88.80		180.60	7153.28	-4653.75		-1599.23		4920.60		4920.87	198.96	1.32	-1.16
132	11,860	89.80		180.50	7154.44	-4748.74		-1600.15		5011.04		5011.09	198.62	1.06	1.05
133	11,961	90.80		180.40	7153.91	-4849.73		-1600.94		5107.14		5107.14	198.27	1.00	0.99