

SCHUMBERGER
Survey Report

24-Jul-2014

HOBBS OCD

OCT 08 2014

RECEIVED

Client..... Cimarex Energy Co.
Field..... Abo Wildcat

Well..... San Jacinto 4 Federal Com
API number..... 30-005-29209-01
Engineer..... J. White

Spud date..... 13-Apr-14
Last survey date..... 10-May-14
Total accepted surveys..... 70
MD of first survey..... 8153.00 ft
MD of last survey..... 12998.00 ft

County..... Chaves
State..... New Mexico
Rig..... Cactus 104

Latitude..... 33° 2' 18.778" N
Longitude..... 103° 50' 3.64" W

----- Survey calculation methods-----
Method for positions... Minimum curvature
Method for DLS..... Lubinski

----- Depth reference -----
Permanent datum..... MSL
Depth reference..... Driller's Depth
GL above permanent..... 4433.00
KB above permanent..... 4453.00
DF above permanent..... 4453.00

----- Vertical section origin-----
Latitude (+N/S-)..... 0.00 ft
Departure (+E/W-)..... 0.00 ft

----- Grid Coordinates -----
NAD27 Texas State Plane, Central Zone, US Feet
X..... 694250.00 ft
Y..... 741924.80 ft

Azimuth from Vsect Origin to target: 89.22 degrees

----- MWD Survey Reference Criteria-----

-----Run1----- Calculation Date: 27-Apr-2014
Location G..... 998.94325 mgn Tolerance G..... 2.50 mgn
Location B..... 48758.29 nT Tolerance B..... 300.00 nT
Magnetic Dip: 60.8117 degrees Tolerance Dip: 0.45 degrees

-----Run2----- Calculation Date: 2-May-2014
Location G..... 998.94325 mgn Tolerance G..... 2.50 mgn
Location B..... 48756.69 nT Tolerance B..... 300.00 nT
Magnetic Dip: 60.8113 degrees Tolerance Dip: 0.45 degrees

-----Run3----- Calculation Date: 4-May-2014
Location G..... 998.94325 mgn Tolerance G..... 2.50 mgn
Location B..... 48756.05 nT Tolerance B..... 300.00 nT
Magnetic Dip: 60.8112 degrees Tolerance Dip: 0.45 degrees

-----Run4----- Calculation Date: 7-May-2014
Location G..... 998.94325 mgn Tolerance G..... 2.50 mgn
Location B..... 48755.08 nT Tolerance B..... 300.00 nT
Magnetic Dip: 60.8109 degrees Tolerance Dip: 0.45 degrees

BGGM Model: 2013

-----Run1-----
Magnetic dec (+E/W-)..... 7.5402 degrees
Grid Conv (+E/W-)..... 0.2702 degrees
Total Azim Corr (+E/W-)..... 7.27 degrees

-----Run2-----
Magnetic dec (+E/W-)..... 7.5387 degrees
Grid Conv (+E/W-)..... 0.2687 degrees
Total Azim Corr (+E/W-)..... 7.27 degrees

-----Run3-----
Magnetic dec (+E/W-)..... 7.5381 degrees
Grid Conv (+E/W-)..... 0.2681 degrees
Total Azim Corr (+E/W-)..... 7.27 degrees

-----Run4-----
Magnetic dec (+E/W-)..... 7.5372 degrees
Grid Conv (+E/W-)..... 0.2672 degrees
Total Azim Corr (+E/W-)..... 7.27 degrees

-----Survey Correction Index Description-----
0 = Uncorrected 1 = Sag Corrected
2 = DMAG Corrected 3 = Sag + DMAG Corrected

Seq	Stn	Loc	Loc	Dist	Course	Survey List	TV	Sec	N/S	E/W	Closure	at Az	DLS	Tool	Correction
	(ft)	(deg)	(deg)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(deg)	(deg/100ft)		
1	0.00	0.00	0.00	-999.25	0.00	0.00	0.00	0.00	0.00	0.00	0	90.00	0.00	TIP	0
2	92.00	0.79	286.51	92.00	92.00	-0.61	0.18	-0.61	0.18	-0.61	0.63	286.51	0.86	Other	0
3	183.00	0.31	308.40	91.00	182.99	-1.40	0.51	-1.40	0.51	-1.40	1.49	290.03	0.57	Other	0
4	271.00	0.31	218.49	88.00	270.99	-1.73	0.47	-1.74	0.47	-1.74	1.8	285.23	0.50	Other	0
5	340.00	0.09	153.49	69.00	339.99	-1.83	0.28	-1.83	0.28	-1.83	1.85	278.65	0.41	Other	0
6	377.00	0.22	298.82	37.00	376.99	-1.87	0.29	-1.88	0.29	-1.88	1.9	278.68	0.81	Other	0
7	467.00	0.40	274.91	90.00	466.99	-2.34	0.40	-2.34	0.40	-2.34	2.38	279.61	0.24	Other	0
8	583.00	0.31	231.89	116.00	582.99	-2.99	0.24	-2.99	0.24	-2.99	3	274.54	0.24	Other	0
9	708.00	0.31	245.38	175.00	707.99	-3.57	-0.11	-3.57	-0.11	-3.57	3.57	268.20	0.06	Other	0
10	833.00	0.31	231.80	125.00	832.98	-4.15	-0.46	-4.14	-0.46	-4.14	4.17	263.64	0.06	Other	0
11	928.00	0.31	240.68	95.00	927.98	-4.58	-0.75	-4.57	-0.75	-4.57	4.63	260.71	0.05	Other	0
12	1023.00	0.31	239.80	95.00	1022.98	-5.03	-1.00	-5.01	-1.00	-5.01	5.11	258.70	0.01	Other	0
13	1118.00	0.40	279.48	95.00	1117.98	-5.58	-1.08	-5.56	-1.08	-5.56	5.66	259.05	0.27	Other	0
14	1214.00	0.09	246.79	96.00	1213.98	-5.97	-1.05	-5.96	-1.05	-5.96	6.05	260.00	0.34	Other	0
15	1308.00	0.09	251.31	94.00	1307.98	-6.11	-1.10	-6.10	-1.10	-6.10	6.2	259.74	0.01	Other	0
16	1403.00	0.22	257.90	95.00	1402.98	-6.36	-1.17	-6.35	-1.17	-6.35	6.45	259.59	0.14	Other	0
17	1498.00	0.31	242.30	95.00	1497.98	-6.77	-1.32	-6.75	-1.32	-6.75	6.88	258.91	0.12	Other	0
18	1593.00	0.31	247.80	95.00	1592.98	-7.24	-1.54	-7.22	-1.54	-7.22	7.38	257.96	0.03	Other	0
19	1687.00	0.40	252.02	94.00	1686.97	-7.79	-1.74	-7.77	-1.74	-7.77	7.96	257.39	0.10	Other	0
20	1783.00	0.40	273.90	96.00	1782.97	-8.44	-1.82	-8.42	-1.82	-8.42	8.61	257.82	0.16	Other	0
21	1878.00	0.22	228.59	95.00	1877.97	-8.91	-1.92	-8.89	-1.92	-8.89	9.09	257.83	0.31	Other	0
22	1974.00	0.09	113.19	96.00	1973.97	-8.98	-2.07	-8.96	-2.07	-8.96	9.19	257.00	0.28	Other	0
23	2068.00	0.22	21.30	94.00	2067.97	-8.85	-1.93	-8.82	-1.93	-8.82	9.03	257.67	0.26	Other	0
24	2163.00	0.31	19.02	95.00	2162.97	-8.69	-1.52	-8.67	-1.52	-8.67	8.8	260.09	0.10	Other	0
25	2258.00	0.31	60.02	95.00	2257.97	-8.38	-1.14	-8.37	-1.14	-8.37	8.44	262.21	0.23	Other	0
26	2353.00	0.40	6.90	95.00	2352.97	-8.11	-0.69	-8.10	-0.69	-8.10	8.13	265.16	0.34	Other	0
27	2448.00	0.31	352.39	95.00	2447.96	-8.10	-0.10	-8.10	-0.10	-8.10	8.1	269.27	0.13	Other	0
28	2543.00	0.31	52.42	95.00	2542.96	-7.92	0.31	-7.93	0.31	-7.93	7.93	272.23	0.33	Other	0
29	2630.00	0.31	98.60	87.00	2629.96	-7.50	0.42	-7.51	0.42	-7.51	7.52	273.18	0.28	Other	0
30	2723.00	0.31	61.69	103.00	2732.96	-6.98	0.51	-6.99	0.51	-6.99	7.01	274.15	0.19	Other	0
31	2828.00	0.09	84.32	95.00	2827.96	-6.68	0.64	-6.69	0.64	-6.69	6.72	275.44	0.24	Other	0
32	2923.00	0.22	283.39	95.00	2922.96	-6.78	0.69	-6.79	0.69	-6.79	6.83	275.77	0.32	Other	0
33	3017.00	0.31	88.01	94.00	3016.96	-6.70	0.74	-6.71	0.74	-6.71	6.75	276.27	0.56	Other	0
34	3112.00	0.40	6.71	95.00	3111.96	-6.40	1.08	-6.42	1.08	-6.42	6.51	279.51	0.49	Other	0
35	3206.00	0.22	358.32	94.00	3205.96	-6.36	1.58	-6.38	1.58	-6.38	6.58	283.91	0.20	Other	0
36	3302.00	0.48	34.40	96.00	3301.96	-6.13	2.10	-6.16	2.10	-6.16	6.51	288.80	0.34	Other	0
37	3397.00	0.40	30.31	95.00	3396.95	-5.73	2.71	-5.77	2.71	-5.77	6.38	295.17	0.09	Other	0
38	3491.00	0.31	30.09	94.00	3490.95	-5.43	3.22	-5.48	3.22	-5.48	6.35	300.42	0.10	Other	0
39	3586.00	0.48	12.29	95.00	3585.95	-5.21	3.83	-5.26	3.83	-5.26	6.51	306.02	0.22	Other	0
40	3681.00	0.48	13.48	95.00	3680.94	-5.02	4.60	-5.09	4.60	-5.09	6.86	312.14	0.01	Other	0
41	3776.00	0.40	350.41	95.00	3775.94	-4.98	5.32	-5.05	5.32	-5.05	7.33	316.48	0.20	Other	0
42	3868.00	0.31	6.10	92.00	3867.94	-5.00	5.88	-5.08	5.88	-5.08	7.77	319.20	0.14	Other	0
43	3963.00	0.48	10.01	95.00	3962.94	-4.89	6.53	-4.98	6.53	-4.98	8.21	322.67	0.18	Other	0
44	4058.00	0.48	5.09	95.00	4057.93	-4.77	7.32	-4.87	7.32	-4.87	8.79	326.32	0.04	Other	0
45	4152.00	0.48	12.51	94.00	4151.93	-4.64	8.09	-4.75	8.09	-4.75	9.39	329.57	0.07	Other	0
46	4247.00	0.48	4.30	95.00	4246.93	-4.52	8.88	-4.64	8.88	-4.64	10.02	332.41	0.07	Other	0
47	4343.00	0.62	6.19	96.00	4342.92	-4.42	9.80	-4.55	10.8	-4.55	10.8	335.07	0.15	Other	0
48	4438.00	0.62	351.20	95.00	4437.92	-4.43	10.81	-4.58	11.74	-4.58	11.74	337.07	0.17	Other	0
49	4533.00	0.48	350.19	95.00	4532.91	-4.56	11.71	-4.72	12.63	-4.72	12.63	338.05	0.15	Other	0
50	4628.00	0.62	10.80	95.00	4627.91	-4.52	12.61	-4.69	13.46	-4.69	13.46	339.59	0.25	Other	0
51	4723.00	0.62	12.90	95.00	4722.90	-4.30	13.62	-4.48	14.34	-4.48	14.34	341.78	0.02	Other	0
52	4818.00	0.70	3.29	95.00	4817.90	-4.13	14.70	-4.33	15.32	-4.33	15.32	343.57	0.14	Other	0
53	4913.00	0.62	1.79	95.00	4912.89	-4.07	15.79	-4.28	16.36	-4.28	16.36	344.82	0.09	Other	0
54	5008.00	1.41	42.48	95.00	5007.88	-3.25	17.17	-3.48	17.52	-3.48	17.52	348.54	1.08	Other	0
55	5103.00	1.01	8.30	95.00	5102.86	-2.31	18.86	-2.57	19.03	-2.57	19.03	352.24	0.85	Other	0
56	5198.00	0.88	2.58	95.00	5197.84	-2.14	20.41	-2.42	20.56	-2.42	20.56	353.25	0.17	Other	0
57	5292.00	0.88	4.21	94.00	5291.83	-2.03	21.86	-2.33	21.98	-2.33	21.98	353.91	0.03	Other	0
58	5387.00	0.88	3.51	95.00	5386.82	-1.91	23.31	-2.23	23.42	-2.23	23.42	354.53	0.01	Other	0
59	5482.00	1.01	352.69	95.00	5481.81	-1.95	24.87	-2.29	24.98	-2.29	24.98	354.73	0.23	Other	0
60	5577.00	0.88	353.18	95.00	5576.80	-2.13	26.42	-2.49	26.54	-2.49	26.54	354.62	0.14	Other	0
61	5673.00	1.01	348.08	96.00	5672.78	-2.37	27.98	-2.75	28.12	-2.75	28.12	354.39	0.16	Other	0
62	5768.00	0.79	338.81	95.00	5767.77	-2.76	29.41	-3.16	29.58	-3.16	29.58	353.87	0.28	Other	0
63	5863.00	0.88	342.02	95.00	5862.76	-3.20	30.72	-3.62	30.93	-3.62	30.93	353.28	0.11	Other	0
64	5958.00	0.79	342.10	95.00	5957.75	-3.61	32.04	-4.05	32.29	-4.05	32.29	352.80	0.09	Other	0
65	6053.00	0.88	331.51	95.00	6052.74	-4.14	33.30	-4.60	33.62	-4.60	33.62	352.14	0.19	Other	0
66	6148.00	0.70	342.10	95.00	6147.78	-4.65	34.49	-5.12	34.87	-5.12	34.87	351.55	0.24	Other	0
67	6243.00	0.70	335.12	95.00	6242.72	-5.06	35.57	-5.55	36	-5.55	36	351.14	0.09	Other	0
68	6338.00	0.79	340.92	95.00	6337.72	-5.50	36.72	-6.00	37.21	-6.00	37.21	350.71	0.12	Other	0
69	6434.00	0.79	335.82	96.00	6433.71	-5.97	37.95	-6.49	38.5	-6.49	38.5	350.29	0.07	Other	0
70	6529.00	1.32	341.49	95.00	6528.69	-6.57	39.58	-7.11	40.21	-7.11	40.21	349.82	0.57	Other	0
71	6624.00	0.88	336.30	95.00	6623.67	-7.18	41.29	-7.75	42.01	-7.75	42.01	349.37	0.47	Other	0
72	6719.00	0.79	326.11	95.00	6718.66	-7.83	42.50	-8.41	43.32	-8.41	43.32	348.81	0.18	Other	0
73	6815.00	0.70	332.61	96.00	6814.65	-8.45	43.57	-9.04	44.5	-9.04	44.5	348.27	0.13	Other	0
74	6910.00	0.79	329.58	95.00	6909.65	-9.03	44.65	-9.64	45.68	-9.64	45.68	347.81	0.10	Other	0
75	7005.00	0.70	319.38	95.00	7004.64	-9.73	45.65	-10.35	46.81	-10.35	46.81	347.22	0.17	Other	0
76	7100.00	0.70	317.32	95.00	7099.63	-10.49	46.52	-11.12	47.83	-11.12	47.83	346.55	0.03	Other	0
77	7195.00	0.70	314.59	95.00	7194.62	-11.28	47.36	-11.93	48.84	-11.93	48.84	345.86	0.04	Other	0

