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Cimarex Hallertau 5 Federal #3H XEM + MWD 0ft to 16552 Survey
Geodetic Report
(Non-Def Survey)



30-025-40455

Report Date: February 16, 2015 - 02:24 PM
Client: Cimarex
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Hallertau 5 Federal #3H / Cimarex Hallertau 5 Federal #3H
Well: Cimarex Hallertau 5 Federal #3H
Borehole: ST01
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Hallertau 5 Federal #3H XEM + MWD 0ft to 16552
Survey Date: January 25, 2015
Tort / AHD / DDI / ERD Ratio: 195.041 ° / 5000.282 ft / 6.126 / 0.414
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 3' 56.95550", W 103° 41' 57.92706"
Location Grid N/E Y/X: N 388259.934 ftUS, E 737703.024 ftUS
CRS Grid Convergence Angle: 0.3365 °
Grid Scale Factor: 0.99995325
Version / Patch: 2.7.1043.0
Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 2.871 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3292.000 ft above MSL
Seabed / Ground Elevation: 3272.000 ft above MSL
Magnetic Declination: 7.082 °
Total Gravity Field Strength: 998.4260mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 48175.563 nT
Magnetic Dip Angle: 59.808 °
Declination Date: February 13, 2015
Magnetic Declination Model: HDGM 2014
North Reference: Grid North
Grid Convergence Used: 0.3365 °
Total Corr Mag North->Grid North: 6.7450 °
Local Coord Referenced To: Structure Reference Point

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 ° ' ")
SHL - Cimarex Hallertau 5 Federal #3H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	388259.93	737703.02	N 32 3 56.96 W 103 41 57.93	
	211.00	0.62	14.85	211.00	1.12	1.10	0.29	0.29	388261.04	737703.32	N 32 3 56.97 W 103 41 57.92	
	332.00	0.22	340.87	331.99	1.97	1.96	0.38	0.38	388261.89	737703.41	N 32 3 56.97 W 103 41 57.92	
	652.00	0.71	358.32	651.98	4.52	4.52	0.12	0.16	388264.45	737703.15	N 32 3 57.00 W 103 41 57.93	
	747.00	0.62	15.87	746.97	5.61	5.60	0.25	0.23	388265.53	737703.27	N 32 3 57.01 W 103 41 57.92	
	842.00	0.62	33.54	841.97	6.55	6.52	0.67	0.20	388266.46	737703.70	N 32 3 57.02 W 103 41 57.92	
	936.00	0.71	34.91	935.96	7.48	7.43	1.29	0.10	388267.36	737704.31	N 32 3 57.03 W 103 41 57.91	
	1032.00	0.71	33.94	1031.96	8.49	8.41	1.96	0.01	388268.34	737704.98	N 32 3 57.04 W 103 41 57.90	
	1119.00	1.02	61.70	1118.95	9.36	9.22	2.94	0.59	388269.15	737705.97	N 32 3 57.05 W 103 41 57.89	
	1215.00	1.10	40.46	1214.93	10.53	10.33	4.29	0.42	388270.26	737707.32	N 32 3 57.06 W 103 41 57.88	
	1310.00	1.02	34.03	1309.91	11.97	11.72	5.36	0.15	388271.65	737708.38	N 32 3 57.07 W 103 41 57.86	
	1405.00	1.10	48.48	1404.90	13.34	13.03	6.51	0.29	388272.96	737709.54	N 32 3 57.08 W 103 41 57.85	
	1500.00	1.19	47.07	1499.88	14.68	14.30	7.92	0.10	388274.24	737710.94	N 32 3 57.10 W 103 41 57.83	
	1593.00	1.10	47.38	1592.86	16.01	15.57	9.28	0.10	388275.50	737712.31	N 32 3 57.11 W 103 41 57.82	
	1688.00	1.33	66.73	1687.84	17.15	16.62	10.97	0.49	388276.55	737713.99	N 32 3 57.12 W 103 41 57.80	
	1783.00	1.41	71.84	1782.81	18.05	17.42	13.09	0.15	388277.35	737716.11	N 32 3 57.13 W 103 41 57.77	
	1878.00	1.59	67.74	1877.78	19.03	18.28	15.42	0.22	388278.21	737718.44	N 32 3 57.14 W 103 41 57.75	
	1973.00	1.72	70.74	1972.74	20.13	19.25	17.99	0.16	388279.18	737721.01	N 32 3 57.14 W 103 41 57.72	
	2068.00	2.12	76.64	2067.69	21.16	20.13	21.04	0.47	388280.06	737724.06	N 32 3 57.15 W 103 41 57.68	
	2164.00	2.12	80.03	2163.62	22.05	20.85	24.52	0.13	388280.78	737727.54	N 32 3 57.16 W 103 41 57.64	
	2259.00	2.21	77.83	2258.55	22.91	21.54	28.04	0.13	388281.47	737731.06	N 32 3 57.17 W 103 41 57.60	

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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 ° ' ")
	2354.00	2.43	75.76	2353.47	23.98	22.42	31.78	0.25	388282.35	737734.80	N 32	3 57.18 W 103 41 57.56
	2446.00	2.43	80.96	2445.39	24.96	23.20	35.60	0.24	388283.14	737738.62	N 32	3 57.18 W 103 41 57.51
	2542.00	2.30	47.38	2541.32	26.75	24.83	39.03	1.43	388284.76	737742.05	N 32	3 57.20 W 103 41 57.47
	2637.00	2.61	39.23	2636.23	29.85	27.79	41.80	0.49	388287.73	737744.82	N 32	3 57.23 W 103 41 57.44
	2733.00	1.02	24.20	2732.18	32.41	30.27	43.53	1.71	388290.20	737746.55	N 32	3 57.25 W 103 41 57.42
	2828.00	0.31	12.35	2827.17	33.45	31.29	43.93	0.76	388291.22	737746.95	N 32	3 57.26 W 103 41 57.41
	2923.00	0.49	9.75	2922.17	34.11	31.94	44.05	0.19	388291.87	737747.08	N 32	3 57.27 W 103 41 57.41
	3019.00	0.49	2.42	3018.16	34.92	32.75	44.14	0.07	388292.69	737747.16	N 32	3 57.28 W 103 41 57.41
	3114.00	0.49	358.63	3113.16	35.74	33.57	44.15	0.03	388293.50	737747.17	N 32	3 57.29 W 103 41 57.41
	3209.00	0.40	10.28	3208.16	36.47	34.30	44.20	0.13	388294.23	737747.22	N 32	3 57.29 W 103 41 57.41
	3302.00	0.62	6.56	3301.15	37.29	35.12	44.31	0.24	388295.05	737747.34	N 32	3 57.30 W 103 41 57.41
	3397.00	0.62	37.24	3396.15	38.23	36.04	44.68	0.35	388295.97	737747.71	N 32	3 57.31 W 103 41 57.41
	3492.00	0.80	33.41	3491.14	39.23	37.00	45.36	0.20	388296.93	737748.38	N 32	3 57.32 W 103 41 57.40
	3587.00	0.62	32.44	3586.13	40.25	37.99	46.00	0.19	388297.92	737749.02	N 32	3 57.33 W 103 41 57.39
	3683.00	0.80	20.37	3682.13	41.34	39.06	46.51	0.24	388298.99	737749.53	N 32	3 57.34 W 103 41 57.38
	3779.00	0.88	57.91	3778.12	42.40	40.08	47.37	0.57	388300.01	737750.39	N 32	3 57.35 W 103 41 57.37
	3873.00	1.19	68.84	3872.10	43.21	40.81	48.89	0.39	388300.74	737751.91	N 32	3 57.36 W 103 41 57.36
	3967.00	1.33	76.16	3966.08	43.92	41.42	50.86	0.23	388301.36	737753.88	N 32	3 57.36 W 103 41 57.33
	4062.00	1.41	95.59	4061.05	44.18	41.57	53.10	0.49	388301.51	737756.12	N 32	3 57.36 W 103 41 57.31
	4158.00	1.72	106.12	4157.02	43.80	41.06	55.65	0.44	388300.99	737758.68	N 32	3 57.36 W 103 41 57.28
	4253.00	2.03	108.55	4251.97	43.01	40.13	58.62	0.34	388300.06	737761.64	N 32	3 57.35 W 103 41 57.24
	4326.00	2.21	107.31	4324.92	42.31	39.30	61.19	0.25	388299.23	737764.21	N 32	3 57.34 W 103 41 57.21
	4425.00	2.12	105.64	4423.85	41.43	38.24	64.77	0.11	388298.17	737767.80	N 32	3 57.33 W 103 41 57.17
	4521.00	2.21	106.03	4519.78	40.62	37.25	68.26	0.09	388297.18	737771.28	N 32	3 57.32 W 103 41 57.13
	4616.00	2.21	106.74	4614.71	39.76	36.21	71.78	0.03	388296.15	737774.80	N 32	3 57.31 W 103 41 57.09
	4711.00	2.12	108.15	4709.64	38.86	35.14	75.20	0.11	388295.07	737778.22	N 32	3 57.30 W 103 41 57.05
	4804.00	2.12	105.51	4802.57	38.03	34.14	78.49	0.11	388294.07	737781.51	N 32	3 57.29 W 103 41 57.01
	4996.00	2.02	109.25	4994.45	36.30	32.08	85.11	0.09	388292.01	737788.13	N 32	3 57.27 W 103 41 56.94
	5091.00	2.21	104.14	5089.38	35.47	31.08	88.47	0.28	388291.01	737791.49	N 32	3 57.26 W 103 41 56.90
	5186.00	2.03	100.53	5184.32	34.89	30.32	91.90	0.24	388290.26	737794.92	N 32	3 57.25 W 103 41 56.86
	5281.00	2.21	101.10	5279.25	34.40	29.66	95.35	0.19	388289.59	737798.37	N 32	3 57.24 W 103 41 56.82
	5374.00	2.30	104.14	5372.18	33.78	28.86	98.92	0.16	388288.79	737801.94	N 32	3 57.24 W 103 41 56.78
	5469.00	2.30	102.82	5467.11	33.08	27.97	102.63	0.06	388287.91	737805.65	N 32	3 57.23 W 103 41 56.73
	5564.00	2.43	101.01	5562.03	32.46	27.17	106.46	0.16	388287.10	737809.48	N 32	3 57.22 W 103 41 56.69
	5659.00	2.30	101.63	5656.94	31.89	26.40	110.31	0.14	388286.33	737813.32	N 32	3 57.21 W 103 41 56.64
	5754.00	1.19	105.42	5751.90	31.38	25.75	113.12	1.17	388285.68	737816.14	N 32	3 57.20 W 103 41 56.61
	5819.00	1.19	109.03	5816.88	31.05	25.35	114.41	0.12	388285.28	737817.43	N 32	3 57.20 W 103 41 56.60
	5945.00	1.19	98.72	5942.86	30.55	24.72	116.94	0.17	388284.66	737819.96	N 32	3 57.19 W 103 41 56.57
	6040.00	1.33	96.60	6037.83	30.38	24.45	119.01	0.16	388284.38	737822.03	N 32	3 57.19 W 103 41 56.54
	6135.00	1.41	97.79	6132.81	30.21	24.16	121.27	0.09	388284.10	737824.28	N 32	3 57.19 W 103 41 56.52
	6231.00	1.50	97.00	6228.78	30.02	23.85	123.68	0.10	388283.78	737826.70	N 32	3 57.18 W 103 41 56.49
	6323.00	1.33	101.72	6320.75	29.76	23.49	125.92	0.22	388283.42	737828.94	N 32	3 57.18 W 103 41 56.46
	6419.00	1.41	105.42	6416.72	29.34	22.95	128.15	0.12	388282.88	737831.17	N 32	3 57.18 W 103 41 56.44
	6514.00	1.33	106.83	6511.69	28.82	22.32	130.34	0.09	388282.25	737833.35	N 32	3 57.17 W 103 41 56.41
	6609.00	1.33	104.14	6606.67	28.34	21.73	132.46	0.07	388281.66	737835.48	N 32	3 57.16 W 103 41 56.39
	6704.00	1.50	109.96	6701.64	27.75	21.03	134.70	0.23	388280.97	737837.72	N 32	3 57.16 W 103 41 56.36
	6798.00	1.41	112.86	6795.61	27.00	20.16	136.92	0.12	388280.10	737839.94	N 32	3 57.15 W 103 41 56.33
	6893.00	1.50	116.87	6890.58	26.09	19.15	139.11	0.14	388279.08	737842.12	N 32	3 57.14 W 103 41 56.31
	6988.00	1.59	120.36	6985.54	24.98	17.92	141.35	0.14	388277.85	737844.37	N 32	3 57.12 W 103 41 56.28

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 ° ' ")
	7083.00	1.50	126.79	7080.51	23.68	16.51	143.49	0.21	388276.44	737846.50	N 32 3 57.11 W 103 41 56.26	
	7179.00	1.41	119.34	7176.48	22.45	15.18	145.52	0.22	388275.11	737848.54	N 32 3 57.10 W 103 41 56.24	
	7274.00	1.50	121.15	7271.45	21.34	13.96	147.60	0.11	388273.90	737850.62	N 32 3 57.09 W 103 41 56.21	
	7370.00	1.41	117.76	7367.42	20.25	12.76	149.73	0.13	388272.70	737852.74	N 32 3 57.07 W 103 41 56.19	
	7466.00	1.41	123.79	7463.39	19.14	11.56	151.75	0.15	388271.49	737854.77	N 32 3 57.06 W 103 41 56.16	
	7559.00	1.33	122.87	7556.36	18.01	10.33	153.61	0.09	388270.27	737856.63	N 32 3 57.05 W 103 41 56.14	
	7653.00	1.33	125.16	7650.34	16.89	9.11	155.42	0.06	388269.05	737858.43	N 32 3 57.04 W 103 41 56.12	
	7749.00	1.19	132.91	7746.31	15.65	7.79	157.06	0.23	388267.73	737860.07	N 32 3 57.02 W 103 41 56.10	
	7843.00	1.33	130.71	7840.29	14.35	6.42	158.60	0.16	388266.35	737861.62	N 32 3 57.01 W 103 41 56.08	
	7939.00	1.50	128.68	7936.26	12.93	4.90	160.43	0.18	388264.84	737863.44	N 32 3 56.99 W 103 41 56.06	
	8035.00	1.33	140.10	8032.23	11.38	3.26	162.12	0.34	388263.20	737865.14	N 32 3 56.98 W 103 41 56.04	
	8127.00	1.33	142.35	8124.21	9.79	1.60	163.46	0.06	388261.53	737866.47	N 32 3 56.96 W 103 41 56.03	
	8222.00	1.33	143.93	8219.18	8.09	-0.16	164.78	0.04	388259.77	737867.80	N 32 3 56.94 W 103 41 56.01	
	8317.00	1.10	152.26	8314.16	6.45	-1.86	165.85	0.30	388258.07	737868.87	N 32 3 56.93 W 103 41 56.00	
	8413.00	1.19	158.65	8410.14	4.75	-3.61	166.65	0.16	388256.33	737869.66	N 32 3 56.91 W 103 41 55.99	
	8508.00	1.10	149.75	8505.12	3.08	-5.31	167.47	0.21	388254.62	737870.48	N 32 3 56.89 W 103 41 55.98	
	8602.00	0.62	152.66	8599.11	1.89	-6.54	168.15	0.51	388253.39	737871.17	N 32 3 56.88 W 103 41 55.97	
	8696.00	0.40	172.40	8693.11	1.13	-7.32	168.43	0.30	388252.61	737871.45	N 32 3 56.87 W 103 41 55.97	
	8791.00	0.49	200.87	8788.10	0.41	-8.03	168.33	0.25	388251.91	737871.35	N 32 3 56.87 W 103 41 55.97	
	8887.00	0.88	217.04	8884.10	-0.59	-9.00	167.74	0.45	388250.93	737870.75	N 32 3 56.86 W 103 41 55.98	
	8982.00	1.10	210.91	8979.08	-2.00	-10.37	166.83	0.26	388249.57	737869.85	N 32 3 56.84 W 103 41 55.99	
	9075.00	1.10	203.78	9072.07	-3.62	-11.95	166.01	0.15	388247.99	737869.03	N 32 3 56.83 W 103 41 56.00	
	9171.00	1.19	197.08	9168.05	-5.45	-13.74	165.35	0.17	388246.19	737868.36	N 32 3 56.81 W 103 41 56.01	
	9266.00	1.19	190.25	9263.03	-7.38	-15.66	164.88	0.15	388244.28	737867.90	N 32 3 56.79 W 103 41 56.01	
	9361.00	1.72	166.01	9358.00	-9.72	-18.01	165.05	0.84	388241.92	737866.07	N 32 3 56.77 W 103 41 56.01	
	9457.00	2.12	173.72	9453.94	-12.85	-21.18	165.59	0.50	388238.76	737868.61	N 32 3 56.74 W 103 41 56.00	
	9552.00	2.12	178.44	9548.88	-16.34	-24.68	165.83	0.18	388235.26	737868.85	N 32 3 56.70 W 103 41 56.00	
	9647.00	2.12	177.73	9643.81	-19.84	-28.19	165.95	0.03	388231.74	737868.97	N 32 3 56.67 W 103 41 56.00	
	9740.00	1.72	173.32	9736.76	-22.93	-31.30	166.18	0.46	388228.64	737869.20	N 32 3 56.64 W 103 41 56.00	
	9835.00	1.50	182.84	9831.72	-25.58	-33.95	166.29	0.36	388225.98	737869.30	N 32 3 56.61 W 103 41 56.00	
	9930.00	1.02	214.92	9926.70	-27.54	-35.89	165.74	0.88	388224.05	737868.76	N 32 3 56.59 W 103 41 56.00	
	10027.00	0.88	221.45	10023.69	-28.86	-37.16	164.75	0.18	388222.78	737867.77	N 32 3 56.58 W 103 41 56.02	
	10120.00	0.80	232.46	10116.68	-29.84	-38.09	163.77	0.19	388221.85	737866.78	N 32 3 56.57 W 103 41 56.03	
	10216.00	0.62	234.18	10212.67	-30.59	-38.80	162.81	0.19	388221.14	737865.83	N 32 3 56.56 W 103 41 56.04	
	10312.00	0.88	266.26	10308.66	-31.00	-39.15	161.66	0.50	388220.79	737864.67	N 32 3 56.56 W 103 41 56.05	
	10408.00	1.33	276.40	10404.64	-31.02	-39.07	159.81	0.51	388220.86	737862.83	N 32 3 56.56 W 103 41 56.07	
	10502.00	1.19	271.99	10498.62	-30.97	-38.92	157.75	0.18	388221.02	737860.77	N 32 3 56.56 W 103 41 56.10	
	10691.00	1.33	281.91	10687.58	-30.65	-38.40	153.65	0.14	388221.54	737856.66	N 32 3 56.57 W 103 41 56.14	
	10786.00	0.80	288.03	10782.56	-30.31	-37.97	151.94	0.57	388221.97	737854.95	N 32 3 56.57 W 103 41 56.16	
	10881.00	0.49	298.17	10877.55	-29.96	-37.57	150.95	0.35	388222.37	737853.97	N 32 3 56.57 W 103 41 56.18	
	10977.00	1.02	326.64	10973.54	-29.10	-36.66	150.12	0.66	388223.28	737853.13	N 32 3 56.58 W 103 41 56.19	
	11074.00	0.71	336.68	11070.53	-27.86	-35.39	149.40	0.35	388224.55	737852.42	N 32 3 56.60 W 103 41 56.19	
	11167.00	1.10	312.89	11163.52	-26.77	-34.25	148.52	0.57	388225.68	737851.54	N 32 3 56.61 W 103 41 56.20	
	11263.00	1.02	290.72	11259.51	-25.91	-33.32	147.05	0.43	388226.61	737850.06	N 32 3 56.62 W 103 41 56.22	
Tie-In - Pilot Hole	11358.00	0.62	297.07	11354.50	-25.44	-32.79	145.80	0.43	388227.15	737848.82	N 32 3 56.62 W 103 41 56.24	
	11479.00	0.52	340.63	11475.49	-24.67	-31.97	145.03	0.36	388227.96	737848.05	N 32 3 56.63 W 103 41 56.24	
	11606.00	9.88	12.39	11601.83	-13.36	-20.76	147.19	7.43	388239.17	737850.20	N 32 3 56.74 W 103 41 56.22	

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 ° ' ")
Cross Hard Line	11637.00	13.57	12.97	11632.18	-7.16	-14.62	148.57	11.91	388245.32	737851.59	N 32 3 56.80 W	103 41 56.20
	11669.00	17.38	15.69	11663.02	1.20	-6.36	150.71	12.12	388253.58	737853.73	N 32 3 56.88 W	103 41 56.18
	11690.00	20.10	18.80	11682.90	7.73	0.08	152.72	13.82	388260.02	737855.74	N 32 3 56.95 W	103 41 56.15
7" Casing Shoe	11701.00	21.55	20.13	11693.18	11.48	3.77	154.03	13.82	388263.70	737857.04	N 32 3 56.98 W	103 41 56.14
	11732.00	25.40	23.76	11721.61	23.13	15.20	158.67	13.26	388275.14	737861.68	N 32 3 57.10 W	103 41 56.08
	11764.00	28.31	27.36	11750.16	36.45	28.23	164.92	10.41	388288.16	737867.94	N 32 3 57.23 W	103 41 56.01
	11796.00	30.53	30.34	11778.03	50.57	41.98	172.51	8.31	388301.92	737875.53	N 32 3 57.36 W	103 41 55.92
	11827.00	33.84	30.58	11804.27	65.21	56.22	180.89	10.69	388316.15	737883.90	N 32 3 57.50 W	103 41 55.82
	11859.00	37.39	29.49	11830.28	81.78	72.35	190.20	11.27	388332.28	737893.22	N 32 3 57.66 W	103 41 55.71
	11890.00	40.65	28.26	11854.36	99.33	89.44	199.62	10.81	388349.37	737902.63	N 32 3 57.83 W	103 41 55.60
	11922.00	44.86	26.45	11877.85	119.10	108.73	209.59	13.70	388368.66	737912.60	N 32 3 58.02 W	103 41 55.48
	11953.00	49.11	24.34	11898.99	140.03	129.21	219.29	14.58	388389.14	737922.31	N 32 3 58.22 W	103 41 55.37
	11985.00	53.12	22.58	11919.08	163.35	152.06	229.20	13.24	388411.98	737932.21	N 32 3 58.45 W	103 41 55.25
	12016.00	57.19	20.61	11936.79	187.44	175.71	238.55	14.13	388435.64	737941.56	N 32 3 58.68 W	103 41 55.14
	12048.00	60.74	19.23	11953.28	213.65	201.49	247.88	11.69	388461.41	737950.89	N 32 3 58.93 W	103 41 55.03
	12079.00	63.32	16.16	11967.83	240.11	227.57	256.19	12.07	388487.49	737959.20	N 32 3 59.19 W	103 41 54.93
	12111.00	64.73	11.34	11981.85	268.35	255.50	263.02	14.24	388515.42	737966.03	N 32 3 59.47 W	103 41 54.85
	12143.00	66.77	6.95	11994.99	297.34	284.30	267.65	14.04	388544.22	737970.66	N 32 3 59.75 W	103 41 54.80
	12174.00	69.51	3.16	12006.54	326.09	312.95	270.17	14.38	388572.86	737973.18	N 32 4 0.04 W	103 41 54.77
	12198.00	73.01	0.70	12014.25	348.80	335.66	270.93	17.52	388595.57	737973.94	N 32 4 0.26 W	103 41 54.76
	12215.00	73.99	0.26	12019.08	365.09	351.95	271.07	6.29	388611.87	737974.08	N 32 4 0.42 W	103 41 54.75
	12297.00	78.75	358.21	12038.39	444.59	431.61	269.99	6.29	388691.52	737973.00	N 32 4 1.21 W	103 41 54.76
	12328.00	80.11	358.22	12044.08	474.97	462.07	269.04	4.39	388721.98	737972.05	N 32 4 1.51 W	103 41 54.77
	12360.00	81.89	358.85	12049.09	506.48	493.66	268.24	5.89	388753.57	737971.25	N 32 4 1.82 W	103 41 54.78
	12392.00	83.98	358.18	12053.02	538.14	525.41	267.41	6.85	388785.32	737970.42	N 32 4 2.14 W	103 41 54.78
	12424.00	84.73	358.60	12056.17	569.89	557.24	266.52	2.68	388817.15	737969.53	N 32 4 2.45 W	103 41 54.79
	12455.00	85.22	359.12	12058.89	600.70	588.11	265.90	2.30	388848.02	737968.91	N 32 4 2.76 W	103 41 54.80
	12487.00	85.39	359.04	12061.50	632.52	620.00	265.39	0.59	388879.91	737968.40	N 32 4 3.08 W	103 41 54.80
	12519.00	86.35	358.98	12063.81	664.36	651.91	264.84	3.01	388911.82	737967.85	N 32 4 3.39 W	103 41 54.80
	12551.00	86.70	359.50	12065.75	696.24	683.85	264.42	1.96	388943.75	737967.43	N 32 4 3.71 W	103 41 54.81
	12583.00	88.42	0.27	12067.11	728.17	715.82	264.35	5.89	388975.72	737967.36	N 32 4 4.02 W	103 41 54.81
	12646.00	91.07	2.05	12067.39	791.13	778.80	265.63	5.07	389038.70	737968.64	N 32 4 4.65 W	103 41 54.79
	12742.00	89.42	0.89	12066.98	887.09	874.76	268.09	2.10	389134.65	737971.10	N 32 4 5.60 W	103 41 54.75
	12837.00	90.72	2.25	12066.87	982.06	969.72	270.69	1.98	389229.61	737973.70	N 32 4 6.54 W	103 41 54.72
	12932.00	89.62	2.45	12066.58	1077.06	1064.64	274.59	1.18	389324.52	737977.60	N 32 4 7.47 W	103 41 54.66
	13027.00	91.41	2.81	12065.73	1172.05	1159.53	278.95	1.92	389419.41	737981.96	N 32 4 8.41 W	103 41 54.61
	13123.00	89.04	359.99	12065.35	1268.00	1255.49	281.29	3.84	389515.36	737984.30	N 32 4 9.36 W	103 41 54.57
	13218.00	89.45	359.80	12066.60	1362.86	1350.48	281.12	0.48	389610.35	737984.13	N 32 4 10.30 W	103 41 54.57
	13313.00	89.11	356.06	12067.80	1457.49	1445.39	277.69	3.95	389705.26	737980.70	N 32 4 11.24 W	103 41 54.60
	13409.00	89.04	355.82	12069.35	1552.77	1541.14	270.89	0.26	389801.00	737973.90	N 32 4 12.19 W	103 41 54.67
	13504.00	89.79	357.57	12070.32	1647.21	1635.97	265.41	2.00	389895.83	737968.43	N 32 4 13.13 W	103 41 54.73
	13600.00	90.24	359.99	12070.29	1742.96	1731.94	263.37	2.56	389991.79	737966.38	N 32 4 14.08 W	103 41 54.75
	13695.00	90.00	359.46	12070.09	1837.82	1826.94	262.92	0.61	390086.79	737965.93	N 32 4 15.02 W	103 41 54.75
	13791.00	89.62	356.24	12070.41	1933.44	1922.86	259.31	3.38	390182.70	737962.33	N 32 4 15.97 W	103 41 54.78
	13886.00	92.38	358.58	12068.75	2027.97	2017.73	255.02	3.81	390277.57	737958.03	N 32 4 16.91 W	103 41 54.83
	13981.00	90.34	359.06	12066.50	2122.70	2112.68	253.07	2.21	390372.51	737956.08	N 32 4 17.85 W	103 41 54.84
	14077.00	90.31	359.99	12065.96	2218.54	2208.67	252.27	0.97	390468.50	737955.28	N 32 4 18.80 W	103 41 54.84
	14172.00	92.68	0.80	12063.48	2313.41	2303.63	252.92	2.64	390563.45	737955.94	N 32 4 19.74 W	103 41 54.83

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 ° ' ")
	14267.00	88.66	359.77	12062.37	2408.29	2398.60	253.40	4.37	390658.42	737956.41	N 32 4 20.68 W 103 41 54.82	
	14362.00	88.55	358.89	12064.68	2503.08	2493.57	252.29	0.93	390753.38	737955.30	N 32 4 21.62 W 103 41 54.82	
	14458.00	90.34	358.81	12065.61	2598.83	2589.54	250.36	1.87	390849.35	737953.37	N 32 4 22.56 W 103 41 54.84	
	14553.00	90.48	357.73	12064.93	2693.52	2684.49	247.49	1.15	390944.30	737950.50	N 32 4 23.50 W 103 41 54.87	
	14649.00	90.55	358.42	12064.07	2789.18	2780.43	244.27	0.72	391040.23	737947.28	N 32 4 24.45 W 103 41 54.90	
	14744.00	90.24	357.94	12063.41	2883.86	2875.38	241.25	0.60	391135.18	737944.26	N 32 4 25.39 W 103 41 54.93	
	14839.00	91.86	359.36	12061.67	2978.58	2970.34	239.01	2.27	391230.13	737942.02	N 32 4 26.33 W 103 41 54.95	
	14935.00	92.82	359.71	12057.75	3074.34	3066.25	238.23	1.06	391326.04	737941.25	N 32 4 27.28 W 103 41 54.95	
	15030.00	91.51	359.74	12054.16	3169.12	3161.18	237.78	1.38	391420.96	737940.79	N 32 4 28.22 W 103 41 54.95	
	15126.00	90.48	359.62	12052.50	3264.96	3257.16	237.24	1.08	391516.94	737940.25	N 32 4 29.17 W 103 41 54.95	
	15221.00	90.58	0.33	12051.62	3359.83	3352.16	237.20	0.75	391611.93	737940.21	N 32 4 30.11 W 103 41 54.94	
	15316.00	90.34	359.33	12050.85	3454.69	3447.15	236.92	1.08	391706.92	737939.93	N 32 4 31.05 W 103 41 54.94	
	15411.00	89.83	359.51	12050.71	3549.52	3542.15	235.96	0.57	391801.91	737938.97	N 32 4 31.99 W 103 41 54.94	
	15506.00	91.00	0.57	12050.02	3644.40	3637.14	236.02	1.66	391896.90	737939.04	N 32 4 32.93 W 103 41 54.94	
	15602.00	91.07	359.44	12048.29	3740.26	3733.13	236.03	1.18	391992.88	737939.04	N 32 4 33.88 W 103 41 54.93	
	15697.00	90.76	359.33	12046.77	3835.07	3828.11	235.01	0.35	392087.86	737938.02	N 32 4 34.82 W 103 41 54.93	
	15792.00	90.24	359.22	12045.94	3929.88	3923.10	233.81	0.56	392182.84	737936.82	N 32 4 35.76 W 103 41 54.94	
	15888.00	90.10	359.06	12045.66	4025.68	4019.09	232.37	0.22	392278.82	737935.38	N 32 4 36.71 W 103 41 54.95	
	15983.00	89.97	359.02	12045.60	4120.47	4114.07	230.78	0.14	392373.81	737933.79	N 32 4 37.65 W 103 41 54.96	
	16078.00	90.00	357.51	12045.63	4215.16	4209.03	227.90	1.59	392468.75	737930.91	N 32 4 38.59 W 103 41 54.99	
	16174.00	90.24	357.81	12045.43	4310.76	4304.95	223.98	0.40	392564.67	737926.99	N 32 4 39.54 W 103 41 55.03	
	16269.00	90.14	358.52	12045.11	4405.44	4399.90	220.94	0.75	392659.61	737923.95	N 32 4 40.48 W 103 41 55.06	
	16365.00	89.69	359.57	12045.25	4501.22	4495.88	219.34	1.19	392755.60	737922.35	N 32 4 41.43 W 103 41 55.07	
	16461.00	90.38	0.15	12045.19	4597.09	4591.88	219.11	0.94	392851.59	737922.12	N 32 4 42.38 W 103 41 55.07	
Final Survey - 16-Feb-2015	16508.00	90.83	0.64	12044.70	4644.04	4638.88	219.43	1.42	392898.58	737922.44	N 32 4 42.85 W 103 41 55.06	
TD - Projection to Bit	16552.00	90.83	0.64	12044.06	4688.01	4682.87	219.92	0.00	392942.57	737922.93	N 32 4 43.28 W 103 41 55.05	

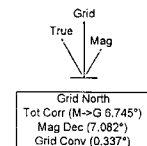
Survey Type: Non-Def Survey

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	20.000	Act Stns	30.000	30.000	SLB_MWD-STD-Depth Only	Pilot Hole / Cimarex Hallertau 5 Federal #3H XEM + MWD 0ft to
	1	20.000	332.000	Act Stns	30.000	30.000	SLB_MWD-STD	Pilot Hole / Cimarex Hallertau 5 Federal #3H XEM + MWD 0ft to
	1	332.000	652.000	1/98.425	30.000	30.000	SLB_MWD-STD	Pilot Hole / Cimarex Hallertau 5 Federal #3H XEM + MWD 0ft to
	1	652.000	11358.000	Act Stns	30.000	30.000	SLB_MWD-STD	Pilot Hole / Cimarex Hallertau 5 Federal #3H XEM + MWD 0ft to
	1	11358.000	16508.000	Act Stns	30.000	30.000	SLB_MWD-STD	ST01 / Cimarex Hallertau 5 Federal #3H XEM + MWD 0ft to
	1	16508.000	16552.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	ST01 / Cimarex Hallertau 5 Federal #3H XEM + MWD 0ft to



Gravity & Magnetic Parameters				Surface Location				Miscellaneous							
Model:	HQDM 2014	Dip:	59.800°	Date:	13-Feb-2015	Lat:	N 32 33 58.96	Northing:	380259.934US	Grid Conv:	0.3365°	Slot:	Hallertau 5H	TVD Ref:	
Model:	7.082°	FS:	49176.563nT	Gravity FS:	989.426mN (R.80656 Banded)	Long:	W 103 41 57.83	Easting:	737703.024US	Scale Fact:	0.98999325	Station:	ST01 RevD: PCG	13-Feb-15	RKB(32922ft above MSL)



C	CONTROLLED
Plan ref	ETB Revd PCF 13-Feb-15
Drawing ref	
Issued by	I al I
Date	18-Feb-2015
1 Designer	Chris Gieslen
2 IE Sign Off Authority	
3 SEM Line Manager	
4 E&S	