

30-025-43887



Cimarex Hallertau 5 Federal #16H MWD final Survey Geodetic Report

(Def Survey)

Report Date: November 28, 2017 - 08:57 AM
 Client: Cimarex
 Field: NM Lea County (NAD 83)
 Structure / Slot: Cimarex Hallertau 5 Federal #16H / Cimarex Hallertau 5 Federal #16H
 Well: Cimarex Hallertau 5 Federal #16H
 Borehole: Original Borehole
 UWI / API#: Unknown / Unknown
 Survey Name: Cimarex Hallertau 5 Federal #16H MWD final
 Survey Date: October 30, 2017
 Tort / AHD / DDI / ERD Ratio: 231.732 * / 4990.236 ft / 6.200 / 0.414
 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
 Location Lat / Long: N 32° 3' 58.49860", W 103° 42' 16.59183"
 Location Grid N/E Y/X: N 388406.470 RUS, E 736096.040 RUS
 CRS Grid Convergence Angle: 0.3338 °
 Grid Scale Factor: 0.99995253
 Version / Patch: 2.10.565.0
 Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 359.503 ° (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: RKB
 TVD Reference Elevation: 3296.900 ft above MSL
 Seabed / Ground Elevation: 3271.900 ft above MSL
 Magnetic Declination: 6.826 °
 Total Gravity Field Strength: 998.4254mgn (9.80665 Based)
 Gravity Model: GARM
 Total Magnetic Field Strength: 47909.422 nT
 Magnetic Dip Angle: 59.733 °
 Declination Date: November 15, 2017
 Magnetic Declination Model: HDGM 2017
 North Reference: Grid North
 Grid Convergence Used: 0.3338 °
 Total Corr Mag North->Grid North: 6.4918 °
 Local Coord Referenced To: Structure Reference Point

HOBBS OCD
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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 ° ' ")
SHL [490' FSL, 398' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	388406.47	736096.04	N 32	3 58.50 W 103 42 16.59
	170.00	0.62	311.53	170.00	0.62	0.61	-0.69	0.36	388407.08	736095.35	N 32	3 58.50 W 103 42 16.60
	242.00	0.41	348.05	241.99	1.13	1.12	-1.03	0.53	388407.59	736095.01	N 32	3 58.51 W 103 42 16.60
	302.00	0.59	311.75	301.99	1.55	1.54	-1.31	0.59	388408.01	736094.73	N 32	3 58.51 W 103 42 16.61
	392.00	0.39	298.60	391.99	2.01	1.99	-1.92	0.25	388408.46	736094.12	N 32	3 58.52 W 103 42 16.61
	424.00	0.50	320.89	423.99	2.17	2.15	-2.11	0.63	388408.62	736093.93	N 32	3 58.52 W 103 42 16.62
	484.00	0.38	338.48	483.99	2.56	2.54	-2.34	0.30	388409.01	736093.70	N 32	3 58.52 W 103 42 16.62
	575.00	0.43	349.91	574.98	3.18	3.16	-2.52	0.10	388409.63	736093.52	N 32	3 58.53 W 103 42 16.62
	635.00	0.39	323.28	634.98	3.57	3.54	-2.68	0.32	388410.01	736093.36	N 32	3 58.53 W 103 42 16.62
	664.00	0.62	328.15	663.98	3.78	3.75	-2.82	0.81	388410.22	736093.22	N 32	3 58.54 W 103 42 16.62
	758.00	0.29	341.61	757.98	4.44	4.41	-3.16	0.37	388410.88	736092.88	N 32	3 58.54 W 103 42 16.63
	788.00	0.27	8.46	787.98	4.58	4.55	-3.18	0.44	388411.02	736092.86	N 32	3 58.54 W 103 42 16.63
	847.00	0.54	12.71	846.98	4.99	4.96	-3.09	0.46	388411.43	736092.95	N 32	3 58.55 W 103 42 16.63
	908.00	0.67	5.96	907.97	5.62	5.60	-2.99	0.24	388412.07	736093.05	N 32	3 58.55 W 103 42 16.63
	970.00	0.64	358.74	969.97	6.33	6.30	-2.96	0.14	388412.77	736093.08	N 32	3 58.56 W 103 42 16.63
	1005.00	0.54	23.01	1004.97	6.68	6.65	-2.90	0.76	388413.12	736093.14	N 32	3 58.56 W 103 42 16.63
	1111.00	0.88	9.33	1110.96	7.94	7.91	-2.58	0.36	388414.38	736093.46	N 32	3 58.58 W 103 42 16.62
	1211.00	0.99	23.93	1210.95	9.48	9.46	-2.10	0.26	388415.93	736093.94	N 32	3 58.59 W 103 42 16.62
	1305.00	0.54	25.06	1304.94	10.62	10.61	-1.58	0.48	388417.08	736094.46	N 32	3 58.60 W 103 42 16.61
	1400.00	0.68	4.40	1399.93	11.58	11.57	-1.35	0.27	388418.04	736094.69	N 32	3 58.61 W 103 42 16.61
	1494.00	0.53	354.44	1493.93	12.57	12.56	-1.35	0.19	388419.03	736094.69	N 32	3 58.62 W 103 42 16.61
	1588.00	0.83	5.61	1587.92	13.68	13.67	-1.33	0.35	388420.14	736094.71	N 32	3 58.63 W 103 42 16.61
	1683.00	0.84	337.02	1682.91	15.01	15.00	-1.53	0.43	388421.47	736094.51	N 32	3 58.65 W 103 42 16.61
	1777.00	1.09	353.45	1776.90	16.54	16.52	-1.90	0.39	388422.99	736094.14	N 32	3 58.66 W 103 42 16.61
	1872.00	1.70	357.26	1871.87	18.84	18.83	-2.07	0.65	388425.30	736093.97	N 32	3 58.69 W 103 42 16.61
	1966.00	1.94	355.78	1965.82	21.82	21.81	-2.26	0.26	388425.27	736093.78	N 32	3 58.71 W 103 42 16.62
	2060.00	1.93	354.67	2059.77	24.99	24.97	-2.52	0.04	388431.44	736093.52	N 32	3 58.75 W 103 42 16.62
	2155.00	2.41	357.45	2154.70	28.58	28.56	-2.76	0.52	388435.03	736093.28	N 32	3 58.78 W 103 42 16.62
	2249.00	1.46	327.98	2248.65	31.58	31.55	-3.48	1.43	388438.02	736092.96	N 32	3 58.81 W 103 42 16.63
	2344.00	0.50	268.97	2343.63	32.80	32.57	-4.54	1.34	388439.03	736091.50	N 32	3 58.82 W 103 42 16.64
	2438.00	1.96	180.96	2437.61	30.99	30.95	-4.97	2.13	388437.42	736091.07	N 32	3 58.87 W 103 42 16.65
	2532.00	4.02	186.86	2531.48	26.12	26.07	-5.39	2.21	388432.54	736090.65	N 32	3 58.76 W 103 42 16.65
	2627.00	5.57	183.87	2626.14	18.22	18.16	-6.10	1.65	388424.63	736089.94	N 32	3 58.68 W 103 42 16.66
	2721.00	5.75	186.89	2719.69	9.00	8.94	-6.98	0.37	388415.41	736089.06	N 32	3 58.59 W 103 42 16.67
	2815.00	5.82	179.40	2813.21	-0.44	-0.50	-7.49	0.81	388405.97	736088.55	N 32	3 58.49 W 103 42 16.68
	2909.00	6.77	168.41	2906.64	-10.64	-10.70	-6.33	1.63	388395.77	736089.71	N 32	3 58.39 W 103 42 16.67
	3004.00	6.60	166.17	3001.00	-21.45	-21.48	-3.90	0.33	388384.99	736092.14	N 32	3 58.29 W 103 42 16.64
	3098.00	6.33	168.38	3094.40	-31.79	-31.80	-1.56	0.39	388374.67	736094.48	N 32	3 58.18 W 103 42 16.61
	3192.00	5.93	176.21	3187.87	-41.72	-41.72	-0.20	0.98	388364.75	736095.84	N 32	3 58.09 W 103 42 16.60
	3287.00	5.55	176.17	3282.39	-51.21	-51.21	0.43	0.40	388355.27	736096.47	N 32	3 57.99 W 103 42 16.59
	3381.00	4.65	174.76	3376.02	-59.54	-59.54	1.08	0.97	388346.94	736097.12	N 32	3 57.91 W 103 42 16.58
	3475.00	4.24	180.23	3469.73	-66.81	-66.80	1.42	0.63	388339.67	736097.46	N 32	3 57.84 W 103 42 16.58
	3570.00	3.65	185.97	3564.51	-73.33	-73.32	1.09	0.75	388333.15	736097.13	N 32	3 57.77 W 103 42 16.58
	3664.00	3.61	191.76	3658.32	-79.20	-79.20	0.18	0.39	388327.28	736096.22	N 32	3 57.71 W 103 42 16.60
	3758.00	4.05	179.61	3752.11	-85.41	-85.41	-0.40	0.98	388321.06	736095.64	N 32	3 57.65 W 103 42 16.60
	3852.00	5.61	166.60	3845.78	-93.21	-93.20	0.68	2.02	388313.27	736096.72	N 32	3 57.58 W 103 42 16.59
	3947.00	4.64	166.06	3940.40	-101.47	-101.45	2.68	1.02	388305.03	736098.72	N 32	3 57.49 W 103 42 16.57
	4041.00	5.47	165.07	4034.03	-109.51	-109.47	4.75	0.89	388297.01	736100.79	N 32	3 57.42 W 103 42 16.54
	4135.00	6.32	157.87	4127.53	-118.65	-118.59	7.86	1.20	388287.88	736103.90	N 32	3 57.32 W 103 42 16.51
	4230.00	6.29	160.42	4221.96	-128.43	-128.34	11.57	0.30	388278.14	736107.61	N 32	3 57.23 W 103 42 16.47
	4324.00	3.90	160.13	4315.58	-136.32	-136.20	14.38	2.54	388270.28	736110.42	N 32	3 57.15 W 103 42 16.43
	4418.00	1.75	182.25	4409.46	-140.77	-140.64	15.41	2.52	388265.84	736111.45	N 32	3 57.11 W 103 42 16.42
	4513.00	1.18	225.40	4504.43	-142.90	-142.77	14.66	1.26	388263.70	736110.70	N 32	3 57.08 W 103 42 16.43
	4607.00	1.48	229.67	4598.41	-144.35	-144.24	13.05	0.34	388262.24	736109.09	N 32	3 57.07 W 103 42 16.45
	4701.00	1.30	236.55	4692.38	-145.71	-145.61	11.23	0.26	388260.86	736107.27	N 32	3 57.06 W 103 42 16.47
	4796.00	1.00	244.76	4787.36	-146.64	-146.56	9.58	0.36	388259.92	736105.62	N 32	3 57.05 W 103 42 16.49
	4890.00	1.27	226.89	4881.34	-147.69	-147.62	8.08	0.47	388258.85	736104.12	N 32	3 57.04 W 103 42 16.51
	4984.00	1.04	241.50	4975.33	-148.79	-148.74	6.57	0.40	388257.74	736102.61	N 32	3 57.03 W 103 42 16.53
	5079.00	0.72	236.48	5070.31	-149.52	-149.48	5.31	0.35	388256.99	736101.35	N 32	3 57.02 W 103 42 16.54
	5173.00	0.79	243.91	5164.31	-150.12	-150.09	4.24	0.13	388256.38	736100.28	N 32	3 57.01 W 103 42 16.55
	5268.00	0.91	218.21	5259.30	-151.00	-150.97	3.19	0.42	388255.50	736099.23	N 32	3 57.00 W 103 42 16.57
	5362.00	1.15	228.43	5353.28	-152.20	-152.19	2.02	0.32	388254.29	736098.06	N 32	3 56.99 W 103 42 16.58
	5456.00	0.54	230.70	5447.27	-153.10	-153.09	0.97	0.65	388253.38	736097.01	N 32	3 56.98 W 103 42 16.59
	5551.00	0.72	45.65	5542.27	-152.96	-152.96	1.05	1.33	388253.52	736097.09	N 32	3 56.98 W 103 42 16.59
	5645.00	0.31	74.69	5636.26	-152.49	-152.48	1.72	0.50	388254.00	736097.76	N 32	3 56.99 W 103 42 16.58

MD	Inc1	Atm Grd	TVD	VSEC	NS	EV	DLS	North	East	Lat	Long
(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
5730.00	0.22	73.68	5730.26	-152.37	-152.36	2.14	2.14	38254.12	38254.12	N 32	W 103
5720.00	0.25	73.69	5720.26	-152.30	-152.29	2.58	2.58	38254.19	38254.19	N 32	W 103
5710.00	0.23	73.69	5710.26	-152.28	-152.28	3.06	3.06	38254.22	38254.22	N 32	W 103
5700.00	0.25	73.70	5700.26	-152.28	-152.28	3.06	3.06	38254.22	38254.22	N 32	W 103
6022.00	0.16	73.70	6012.26	-152.13	-152.13	3.73	3.73	38254.35	38254.35	N 32	W 103
6116.00	0.53	73.73	6107.26	-151.83	-151.83	4.18	4.18	38254.63	38254.63	N 32	W 103
6210.00	0.11	73.73	6201.26	-151.65	-151.65	4.48	4.48	38254.64	38254.64	N 32	W 103
6304.00	0.39	73.74	6295.26	-151.87	-151.87	4.54	4.54	38254.64	38254.64	N 32	W 103
6398.00	0.27	73.74	6390.26	-152.22	-152.22	4.98	4.98	38254.29	38254.29	N 32	W 103
6492.00	0.32	73.74	6484.26	-152.67	-152.67	5.13	5.13	38253.85	38253.85	N 32	W 103
6586.00	0.27	73.74	6579.26	-152.90	-152.90	5.03	5.03	38253.54	38253.54	N 32	W 103
6680.00	0.32	73.74	6673.26	-153.20	-153.20	4.99	4.99	38252.72	38252.72	N 32	W 103
6774.00	0.38	73.74	6767.26	-153.79	-153.79	4.85	4.85	38253.21	38253.21	N 32	W 103
6868.00	0.28	73.74	6861.26	-154.20	-154.20	4.65	4.65	38252.32	38252.32	N 32	W 103
6962.00	0.26	73.74	6955.26	-154.77	-154.77	4.56	4.56	38251.95	38251.95	N 32	W 103
7056.00	0.17	73.74	7049.26	-154.66	-154.66	4.52	4.52	38251.86	38251.86	N 32	W 103
7150.00	0.34	73.74	7143.26	-154.78	-154.78	5.33	5.33	38251.70	38251.70	N 32	W 103
7244.00	0.31	73.74	7237.26	-155.26	-155.26	5.60	5.60	38251.26	38251.26	N 32	W 103
7338.00	0.22	73.74	7331.26	-155.92	-155.92	6.09	6.09	38250.58	38250.58	N 32	W 103
7432.00	0.22	73.74	7425.26	-156.52	-156.52	6.46	6.46	38249.91	38249.91	N 32	W 103
7526.00	0.78	73.74	7519.26	-156.22	-156.22	6.21	6.21	38250.31	38250.31	N 32	W 103
7620.00	0.92	73.74	7613.26	-154.93	-154.93	5.87	5.87	38251.59	38251.59	N 32	W 103
7714.00	0.76	73.74	7707.26	-153.66	-153.66	5.24	5.24	38252.86	38252.86	N 32	W 103
7808.00	1.07	73.74	7801.26	-152.32	-152.32	4.41	4.41	38254.19	38254.19	N 32	W 103
7902.00	0.76	73.74	7895.26	-153.66	-153.66	5.24	5.24	38252.86	38252.86	N 32	W 103
8000.00	0.51	73.74	7989.26	-150.13	-150.13	3.16	3.16	38256.37	38256.37	N 32	W 103
8094.00	0.79	73.74	8083.26	-149.77	-149.77	2.79	2.79	38256.73	38256.73	N 32	W 103
8188.00	0.67	73.74	8177.26	-149.40	-149.40	2.59	2.59	38257.09	38257.09	N 32	W 103
8282.00	0.72	73.74	8271.26	-149.02	-149.02	2.73	2.73	38257.46	38257.46	N 32	W 103
8376.00	0.60	73.74	8365.26	-148.89	-148.89	2.28	2.28	38257.57	38257.57	N 32	W 103
8470.00	0.69	73.74	8459.26	-148.89	-148.89	2.02	2.02	38257.17	38257.17	N 32	W 103
8564.00	0.82	73.74	8553.26	-148.29	-148.29	1.85	1.85	38257.19	38257.19	N 32	W 103
8658.00	0.47	73.74	8647.26	-148.29	-148.29	1.02	1.02	38257.48	38257.48	N 32	W 103
8752.00	0.38	73.74	8741.26	-148.29	-148.29	0.80	0.80	38257.19	38257.19	N 32	W 103
8846.00	0.36	73.74	8835.26	-148.29	-148.29	0.80	0.80	38257.19	38257.19	N 32	W 103
8940.00	0.82	73.74	8929.26	-149.11	-149.11	0.15	0.15	38257.23	38257.23	N 32	W 103
9034.00	0.94	73.74	9023.26	-149.54	-149.54	0.44	0.44	38256.17	38256.17	N 32	W 103
9128.00	1.34	73.74	9117.26	-151.02	-151.02	0.44	0.44	38255.65	38255.65	N 32	W 103
9222.00	1.43	73.74	9211.26	-151.74	-151.74	0.10	0.10	38254.64	38254.64	N 32	W 103
9316.00	0.96	73.74	9305.26	-152.52	-152.52	0.51	0.51	38253.85	38253.85	N 32	W 103
9410.00	0.75	73.74	9400.26	-153.27	-153.27	0.32	0.32	38253.09	38253.09	N 32	W 103
9504.00	0.32	73.74	9495.26	-153.88	-153.88	0.47	0.47	38252.47	38252.47	N 32	W 103
9600.00	0.38	73.74	9590.26	-154.36	-154.36	0.08	0.08	38251.99	38251.99	N 32	W 103
9694.00	0.54	73.74	9684.26	-154.81	-154.81	0.35	0.35	38251.53	38251.53	N 32	W 103
9788.00	0.49	73.74	9778.26	-155.36	-155.36	0.39	0.39	38250.98	38250.98	N 32	W 103
9882.00	0.59	73.74	9872.26	-155.88	-155.88	0.46	0.46	38250.50	38250.50	N 32	W 103
9976.00	0.66	73.74	9966.26	-156.51	-156.51	0.50	0.50	38249.82	38249.82	N 32	W 103
10070.00	0.72	73.74	10062.26	-157.33	-157.33	0.34	0.34	38248.44	38248.44	N 32	W 103
10164.00	0.95	73.74	10156.26	-158.25	-158.25	0.29	0.29	38248.06	38248.06	N 32	W 103
10258.00	1.10	73.74	10250.26	-159.08	-159.08	0.58	0.58	38247.22	38247.22	N 32	W 103
10352.00	1.33	73.74	10344.26	-159.69	-159.69	0.24	0.24	38246.63	38246.63	N 32	W 103
10446.00	1.34	73.74	10438.26	-160.44	-160.44	0.23	0.23	38245.82	38245.82	N 32	W 103
10540.00	0.97	73.74	10532.26	-161.19	-161.19	0.42	0.42	38245.06	38245.06	N 32	W 103
10634.00	1.42	73.74	10626.26	-162.30	-162.30	0.76	0.76	38243.93	38243.93	N 32	W 103
10728.00	1.93	73.74	10720.26	-164.42	-164.42	0.57	0.57	38241.80	38241.80	N 32	W 103
10822.00	1.24	73.74	10814.26	-166.27	-166.27	0.88	0.88	38239.93	38239.93	N 32	W 103
10916.00	1.13	73.74	10908.26	-166.67	-166.67	1.03	1.03	38239.52	38239.52	N 32	W 103
11010.00	1.09	73.74	11002.26	-166.81	-166.81	0.06	0.06	38239.86	38239.86	N 32	W 103
11104.00	0.91	73.74	11096.26	-165.82	-165.82	0.40	0.40	38240.34	38240.34	N 32	W 103
11200.00	1.09	73.74	11190.26	-165.08	-165.08	0.20	0.20	38241.07	38241.07	N 32	W 103
11294.00	1.16	73.74	11284.26	-164.41	-164.41	0.30	0.30	38241.72	38241.72	N 32	W 103
11388.00	1.08	73.74	11378.26	-163.77	-163.77	0.38	0.38	38242.11	38242.11	N 32	W 103
11482.00	0.80	73.74	11472.26	-163.83	-163.83	0.14	0.14	38242.28	38242.28	N 32	W 103
11576.00	0.76	73.74	11566.26	-164.01	-164.01	0.80	0.80	38243.47	38243.47	N 32	W 103
11670.00	1.27	73.74	11660.26	-164.89	-164.89	0.40	0.40	38244.62	38244.62	N 32	W 103
11764.00	3.05	73.74	11754.26	-165.69	-165.69	0.69	0.69	38245.82	38245.82	N 32	W 103
11858.00	4.37	73.74	11848.26	-166.58	-166.58	0.68	0.68	38245.52	38245.52	N 32	W 103
11952.00	6.00	73.74	11942.26	-167.50	-167.50	0.52	0.52	38247.05	38247.05	N 32	W 103
12046.00	6.32	73.74	12036.26	-168.44	-168.44	0.43	0.43	38247.55	38247.55	N 32	W 103
12140.00	9.29	73.74	12130.26	-169.40	-169.40	10.43	10.43	38248.30	38248.30	N 32	W 103
12234.00	12.24	73.74	12224.26	-169.40	-169.40	9.52	9.52	38247.08	38247.08	N 32	W 103
12328.00	11.69	73.74	12318.26	-169.40	-169.40	8.15	8.15	38245.05	38245.05	N 32	W 103
12422.00	11.70	73.74	12412.26	-169.40	-169.40	8.25	8.25	38243.95	38243.95	N 32	W 103
12516.00	11.61	73.74	12506.26	-169.40	-169.40	11.79	11.79	38242.16	38242.16	N 32	W 103
12610.00	12.57	73.74	12600.26	-169.40	-169.40	12.90	12.90	38239.27	38239.27	N 32	W 103
12704.00	12.96	73.74	12694.26	-169.40	-169.40	14.42	14.42	38231.94	38231.94	N 32	W 103
12798.00	13.79	73.74	12788.26	-169.40	-169.40	13.43	13.43	38227.19	38227.19	N 32	W 103
12892.00	13.64	73.74	12882.26	-169.40	-169.40	12.43	12.43	38216.47	38216.47	N 32	W 103
12986.00	14.50	73.74	12976.26	-169.40	-169.40	12.50	12.50	38205.26	38205.26	N 32	W 103
13080.00	14.81	73.74	13070.26	-169.40	-169.40	12.87	12.87	38204.15	38204.15	N 32	W 103
13174.00	14.96	73.74	13164.26	-169.40	-169.40	13.43	13.43	38203.45	38203.45	N 32	W 103
13268.00	14.96	73.74	13258.26	-169.40	-169.40	13.13	13.13	38202.86	38202.86	N 32	W 103
13362.00	14.96	73.74	13352.26	-169.40	-169.40	12.87	12.87	38202.26	38202.26	N 32	W 103
13456.00	14.96	73.74	13446.26	-169.40	-169.40	12.50	12.50	38201.64	38201.64	N 32	W 103
13550.00	14.96	73.74	13540.26	-169.40	-169.40	12.13	12.13	38201.02	38201.02	N 32	W 103
13644.00	14.96	73.74	13634.26	-169.40	-169.40	11.76	11.76	38200.40	38200.40	N 32	W 103
13738.00	14.96	73.74	13728.26	-169.40	-169.40	11.39	11.39	38200.00	38200.00	N 32	W 103
13832.00	14.96	73.74	13822.26	-169.40	-169.40	11.02	11.02	38200.00	38200.00	N 32	W 103
13926.00	14.96	73.74	13916.26	-169.40	-169.40	10.65	10.65	38200.00	38200.00	N 32	W 103
14020.00	14.96	73.74	14010.26	-169.40	-169.40	10.28	10.28	38200.00	38200.00	N 32	W 103
14114.00	14.96	73.74	14104.26	-169.40	-169.40						

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 ° ' ")
	14674.00	88.93	0.05	12046.47	2664.93	2664.84	-21.22	3.16	391071.18	736074.82	N 32 4 24.87	W 103 42 16.66
	14768.00	89.48	359.67	12047.78	2758.92	2758.83	-21.45	0.71	391165.17	736074.59	N 32 4 25.80	W 103 42 16.65
	14862.00	90.48	0.55	12047.81	2852.91	2852.83	-21.27	1.42	391259.16	736074.77	N 32 4 26.73	W 103 42 16.65
	14957.00	91.65	0.48	12046.04	2947.88	2947.81	-20.42	1.23	391354.13	736075.62	N 32 4 27.67	W 103 42 16.63
	15051.00	88.93	356.27	12045.57	3041.83	3041.74	-23.08	5.33	391448.06	736072.96	N 32 4 28.60	W 103 42 16.65
	15145.00	89.04	356.38	12047.23	3135.67	3135.53	-29.11	0.17	391541.85	736066.93	N 32 4 29.53	W 103 42 16.72
	15239.00	89.42	358.74	12048.50	3229.60	3229.43	-33.11	2.54	391635.74	736062.93	N 32 4 30.46	W 103 42 16.76
	15333.00	89.31	358.68	12049.54	3323.58	3323.40	-35.23	0.13	391729.71	736060.82	N 32 4 31.39	W 103 42 16.78
	15428.00	90.03	356.92	12050.09	3418.54	3418.33	-38.87	2.00	391824.63	736057.17	N 32 4 32.33	W 103 42 16.81
	15522.00	89.52	358.35	12050.45	3512.48	3512.24	-42.75	1.62	391918.54	736053.29	N 32 4 33.26	W 103 42 16.85
	15616.00	89.17	1.06	12051.53	3606.47	3606.23	-43.23	2.91	392012.52	736052.81	N 32 4 34.19	W 103 42 16.85
	15711.00	91.20	4.31	12051.22	3701.30	3701.11	-38.79	4.03	392107.39	736057.26	N 32 4 35.12	W 103 42 16.79
	15805.00	89.93	0.01	12050.30	3795.17	3795.01	-35.24	4.77	392201.29	736060.80	N 32 4 36.05	W 103 42 16.74
	15900.00	90.21	0.09	12050.18	3890.17	3890.01	-35.16	0.31	392296.29	736060.88	N 32 4 36.99	W 103 42 16.74
	15994.00	90.52	0.92	12049.58	3984.15	3984.00	-34.33	0.94	392390.28	736061.71	N 32 4 37.92	W 103 42 16.72
	16088.00	90.00	0.05	12049.15	4078.14	4078.00	-33.54	1.08	392484.27	736062.50	N 32 4 38.85	W 103 42 16.71
	16182.00	90.17	0.21	12049.01	4172.13	4172.00	-33.32	0.25	392578.26	736062.72	N 32 4 39.78	W 103 42 16.70
	16276.00	90.07	0.39	12048.82	4266.12	4266.00	-32.83	0.22	392672.25	736063.21	N 32 4 40.71	W 103 42 16.68
	16371.00	90.21	0.75	12048.59	4361.10	4360.99	-31.89	0.41	392767.24	736064.15	N 32 4 41.65	W 103 42 16.67
	16465.00	90.28	359.27	12048.18	4455.10	4454.99	-31.87	1.58	392861.24	736064.17	N 32 4 42.58	W 103 42 16.66
	16485.00	90.55	0.37	12048.04	4475.09	4474.99	-31.93	5.66	392881.23	736064.11	N 32 4 42.78	W 103 42 16.66
TD, project to bit	16529.00	90.55	0.37	12047.62	4519.09	4518.98	-31.65	0.00	392925.23	736064.39	N 32 4 43.22	W 103 42 16.65

Survey Type: Def Survey

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

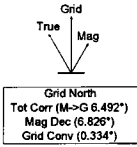
Survey Program:

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	25.000	1/98.425	30.000	30.000	NAL_MWD_PLUS_0.5_DEG-Depth Only	Original Borehole / Cimarex Hallertau 5 Federal #16H MWD final
	1	25.000	25.000	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG-Depth Only	Original Borehole / Cimarex Hallertau 5 Federal #16H MWD final
	1	25.000	16529.000	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	Original Borehole / Cimarex Hallertau 5 Federal #16H MWD final

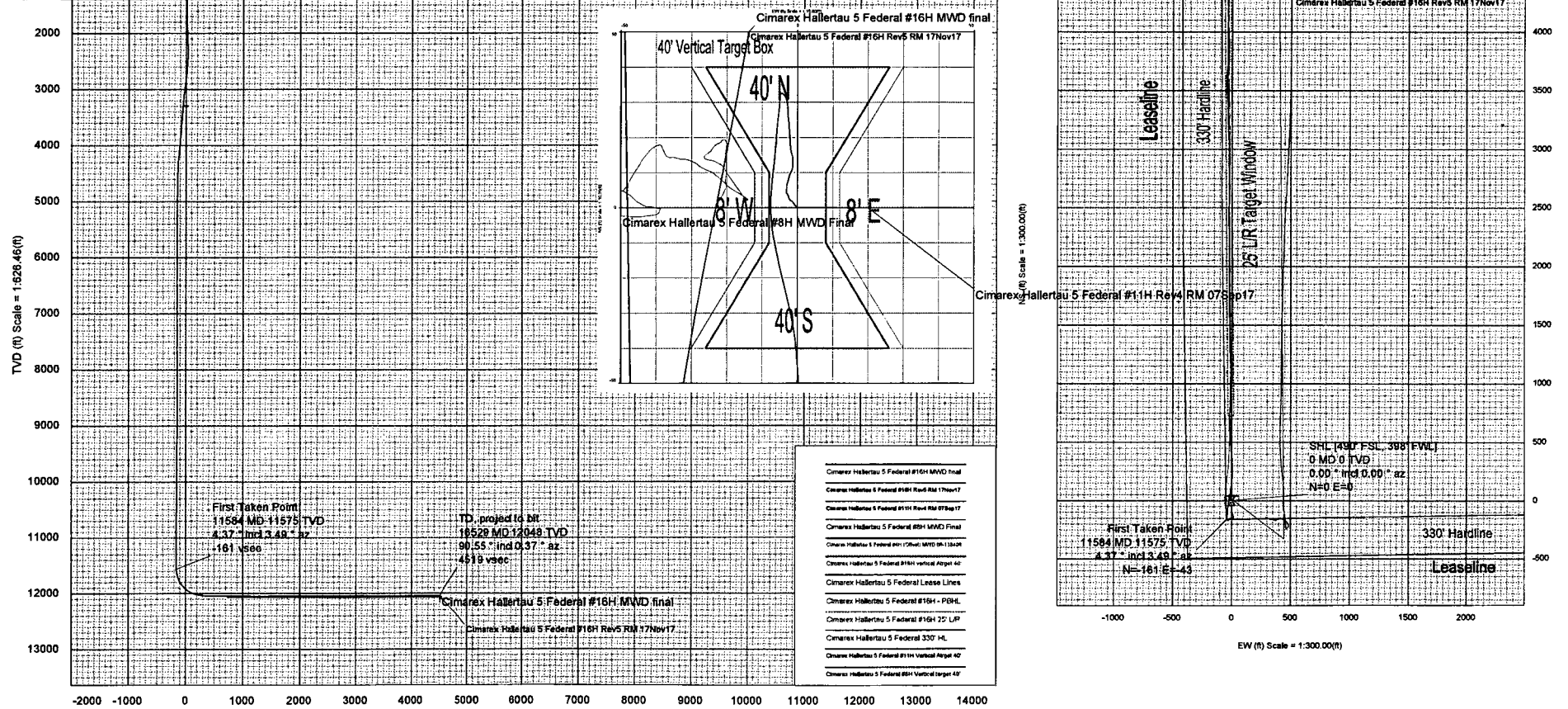
Borehole: Original Borehole	Well: Cimarex Hallertau 5 Federal #16H	Field: NM Lea County (NAD 83)	Structure: Cimarex Hallertau 5 Federal #16H
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Gravity & Magnetic Parameters Model: HDGM 2017 MagDec: 6.826°	Dip: 59.733° FS: 47909.422mT	Date: 15-Nov-2017 Gravity FS: 998.425mgm (9.80665 Based)	Surface Location Lat: N 32 3 58.50 Lon: W 103 42 16.59	NAD83 New Mexico State Plane, Eastern Zone, US Feet Northing: 388406.47MUS Easting: 736096.04MUS	Grid Conv: 0.3338° Scale Fact: 0.99995253	Miscellaneous Cimarex Hallertau 5 Federal #16H Plan: Cimarex Hallertau 5 Federal #16H MWD final	TVD Ref: RKB(3296.9ft above MSL)
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Critical Points								
Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [490' FSL, 398' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
First Taken Point	11584.00	4.37	3.49	11574.66	-160.58	-160.96	-42.71	9.68
TD, project to bit	16529.00	90.55	0.37	12047.62	4519.09	4518.98	-31.65	0.00



CONTROLLED	
Plan ref	Cimarex Hallertau 5 Federal #16H MWD final
Drawing ref	
Copy number	of 3
Date	29-Nov-2017
1	Client
2	Client
3	Office
4	Office
Copy number	for



- Cimarex Hallertau 5 Federal #16H MWD final
- Cimarex Hallertau 5 Federal #16H Rev5 RM 17Nov17
- Cimarex Hallertau 5 Federal #11H Rev4 RM 07Sep17
- Cimarex Hallertau 5 Federal #8H MWD Final
- Cimarex Hallertau 5 Federal #11H Rev4 RM 07Sep17
- Cimarex Hallertau 5 Federal #16H Vertical Target 40'
- Cimarex Hallertau 5 Federal Lease Lines
- Cimarex Hallertau 5 Federal #16H - PDKL
- Cimarex Hallertau 5 Federal #16H 25' LR
- Cimarex Hallertau 5 Federal 330' HL
- Cimarex Hallertau 5 Federal #11H Vertical Target 40'
- Cimarex Hallertau 5 Federal #8H Vertical Target 40'