

Cimarex Cotton Draw 9L Federal #5H Rev4 RM 25July18 Proposal Geodetic Report (Def Plan)



Report Date: July 25, 2018 - 05:38 PM
Client: Cimarex
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Cotton Draw 9L Federal #5H / Cimarex Cotton Draw 9L Federal #5H
Well: Cimarex Cotton Draw 9L Federal #5H
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Cotton Draw 9L Federal #5H Rev4 RM 25July18
Survey Date: June 20, 2018
Tort / AHD / DDI / ERD Ratio: 174.587 * / 5618.324 ft / 6.154 / 0.531
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 8' 20.30261", W 103° 40' 49.38476"
Location Grid N/E Y/X: N 414906.640 RUS, E 743439.820 RUS
CRS Grid Convergence Angle: 0.3474 *
Grid Scale Factor: 0.99995587
Version / Patch: 2.10.706.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.693 * (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3470.600 ft above MSL
Seabed / Ground Elevation: 3444.600 ft above MSL
Magnetic Declination: 6.762 *
Total Gravity Field Strength: 998.4270mgm (9.80865 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47906.739 nT
Magnetic Dip Angle: 59.806 *
Declination Date: July 25, 2018
Magnetic Declination Model: HDGM 2018
North Reference: Grid North
Grid Convergence Used: 0.3474 *
Total Corr Mag North->Grid North: 6.4150 *
Local Coord Referenced To: Well Head

HOBBS OGD

AUG 08 2018

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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 [470' FSL, 2545' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	414906.64	743439.82	N 32 8 20.30	W 103 40 49.38
	212.00	0.47	162.72	212.00	-0.83	-0.83	0.26	0.22	414905.81	743440.08	N 32 8 20.29	W 103 40 49.38
	303.00	0.25	131.32	303.00	-1.32	-1.32	0.52	0.32	414905.32	743440.34	N 32 8 20.29	W 103 40 49.38
	393.00	0.30	156.89	392.99	-1.67	-1.66	0.76	0.15	414904.98	743440.58	N 32 8 20.29	W 103 40 49.38
	485.00	0.37	228.48	484.99	-2.09	-2.08	0.63	0.43	414904.56	743440.45	N 32 8 20.28	W 103 40 49.38
	575.00	0.40	232.51	574.99	-2.47	-2.47	0.16	0.04	414904.17	743439.98	N 32 8 20.28	W 103 40 49.38
	665.00	0.50	260.77	664.99	-2.72	-2.72	-0.47	0.27	414903.92	743439.35	N 32 8 20.28	W 103 40 49.39
	710.00	0.56	262.77	709.99	-2.77	-2.78	-0.89	0.14	414903.86	743438.93	N 32 8 20.28	W 103 40 49.40
	850.00	0.64	252.34	849.98	-3.09	-3.10	-2.31	0.10	414903.54	743437.51	N 32 8 20.27	W 103 40 49.41
	944.00	0.35	265.43	943.98	-3.27	-3.29	-3.10	0.33	414903.35	743436.72	N 32 8 20.27	W 103 40 49.42
	1038.00	0.49	264.73	1037.97	-3.32	-3.34	-3.78	0.15	414903.30	743436.04	N 32 8 20.27	W 103 40 49.43
	1132.00	0.52	310.83	1131.97	-3.08	-3.10	-4.51	0.42	414903.54	743435.32	N 32 8 20.27	W 103 40 49.44
	1226.00	0.68	285.00	1225.96	-2.65	-2.68	-5.37	0.33	414903.96	743434.45	N 32 8 20.28	W 103 40 49.45
	1320.00	0.65	287.53	1319.96	-2.34	-2.37	-6.41	0.04	414904.27	743433.41	N 32 8 20.28	W 103 40 49.46
	1414.00	0.56	312.02	1413.95	-1.87	-1.91	-7.26	0.29	414904.73	743432.56	N 32 8 20.28	W 103 40 49.47
	1509.00	1.00	306.28	1508.94	-1.06	-1.11	-8.28	0.47	414905.53	743431.54	N 32 8 20.29	W 103 40 49.48
	1603.00	0.19	297.66	1602.94	-0.50	-0.55	-9.08	0.86	414906.09	743430.74	N 32 8 20.30	W 103 40 49.49
	1697.00	0.05	165.76	1696.94	-0.47	-0.52	-9.20	0.24	414906.12	743430.62	N 32 8 20.30	W 103 40 49.49
	1791.00	0.38	348.24	1790.94	-0.20	-0.25	-9.26	0.46	414906.39	743430.56	N 32 8 20.30	W 103 40 49.49
	1885.00	0.17	300.97	1884.94	0.18	0.13	-9.44	0.31	414906.77	743430.38	N 32 8 20.30	W 103 40 49.49
	1979.00	0.40	337.74	1978.94	0.55	0.50	-9.68	0.30	414907.14	743430.14	N 32 8 20.31	W 103 40 49.50
	2073.00	0.69	35.32	2072.93	1.32	1.27	-9.48	0.62	414907.91	743430.34	N 32 8 20.32	W 103 40 49.49
	2167.00	0.74	57.35	2166.92	2.10	2.06	-8.64	0.30	414908.70	743431.18	N 32 8 20.32	W 103 40 49.49
	2260.00	0.72	75.74	2259.92	2.57	2.53	-7.57	0.25	414909.17	743432.25	N 32 8 20.33	W 103 40 49.47
	2355.00	0.77	65.53	2354.91	2.97	2.94	-6.41	0.15	414909.58	743433.41	N 32 8 20.33	W 103 40 49.48
	2449.00	1.03	43.33	2448.90	3.84	3.81	-5.28	0.46	414910.45	743434.56	N 32 8 20.34	W 103 40 49.45
	2543.00	1.13	43.67	2542.88	5.12	5.10	-4.04	0.11	414911.74	743435.78	N 32 8 20.35	W 103 40 49.43
	2637.00	1.90	40.85	2636.85	6.96	6.95	-2.38	0.82	414913.59	743437.44	N 32 8 20.37	W 103 40 49.41
	2731.00	1.84	47.27	2730.80	9.16	9.16	-0.26	0.24	414915.80	743439.56	N 32 8 20.39	W 103 40 49.39
	2826.00	0.47	103.51	2825.78	10.09	10.10	1.24	1.71	414916.74	743441.06	N 32 8 20.40	W 103 40 49.37
	2920.00	0.58	61.77	2919.77	10.22	10.24	2.03	0.41	414918.88	743441.65	N 32 8 20.40	W 103 40 49.38
	3014.00	0.78	30.73	3013.77	11.00	11.01	2.78	0.44	414917.65	743442.60	N 32 8 20.41	W 103 40 49.35
	3108.00	0.87	24.84	3107.76	12.19	12.21	3.41	0.13	414918.85	743443.23	N 32 8 20.42	W 103 40 49.34
	3202.00	0.43	57.06	3201.75	13.03	13.05	4.00	0.59	414919.69	743443.82	N 32 8 20.43	W 103 40 49.34
	3296.00	0.46	65.04	3295.75	13.37	13.40	4.64	0.07	414920.04	743444.46	N 32 8 20.43	W 103 40 49.33
	3390.00	1.38	19.74	3389.74	14.59	14.62	5.37	1.18	414921.26	743445.19	N 32 8 20.45	W 103 40 49.32
	3485.00	1.88	34.54	3484.70	16.95	16.98	6.64	0.68	414923.62	743446.46	N 32 8 20.47	W 103 40 49.31
	3579.00	1.41	18.30	3578.66	19.31	19.35	7.87	0.70	414925.99	743447.69	N 32 8 20.49	W 103 40 49.29
	3673.00	0.85	357.64	3672.64	21.10	21.15	8.21	0.73	414927.79	743448.03	N 32 8 20.51	W 103 40 49.29
	3767.00	0.34	263.85	3766.64	21.77	21.81	7.90	1.00	414928.45	743447.72	N 32 8 20.52	W 103 40 49.29
	3861.00	0.44	216.23	3860.64	21.45	21.49	7.41	0.35	414928.13	743447.23	N 32 8 20.51	W 103 40 49.30
	3955.00	0.91	167.85	3954.83	20.43	20.47	7.36	0.74	414927.11	743447.17	N 32 8 20.50	W 103 40 49.30
	4050.00	0.75	148.85	4049.62	19.16	19.20	7.84	0.33	414925.84	743447.66	N 32 8 20.49	W 103 40 49.29
	4144.00	0.98	151.11	4143.61	17.93	17.97	8.54	0.25	414924.61	743448.36	N 32 8 20.48	W 103 40 49.28
	4238.00	2.11	158.41	4237.57	15.61	15.66	9.57	1.22	414922.30	743449.39	N 32 8 20.46	W 103 40 49.27
	4332.00	2.63	159.34	4331.49	11.97	12.03	10.96	0.55	414918.67	743450.78	N 32 8 20.42	W 103 40 49.26
	4426.00	2.33	163.93	4425.41	8.11	8.18	12.25	0.38	414914.82	743452.07	N 32 8 20.38	W 103 40 49.24
	4473.00	1.50	190.85	4472.38	6.59	6.66	12.40	2.56	414913.30	743452.22	N 32 8 20.37	W 103 40 49.24
	4568.00	1.55	195.89	4567.34	3.36	3.42	11.63	0.11	414910.08	743451.45	N 32 8 20.34	W 103 40 49.25
	4662.00	2.41	203.97	4661.28	0.34	0.39	10.48	0.96	414907.03	743450.30	N 32 8 20.31	W 103 40 49.26
	4756.00	4.00	219.66	4755.13	-3.98	-3.94	7.59	1.92	414902.70	743447.41	N 32 8 20.26	W 103 40 49.30
	4851.00	5.73	225.73	4849.78	-9.81	-9.80	2.07	1.90	414896.84	743441.89	N 32 8 20.21	W 103 40 49.36
	4975.00	6.54	234.44	4973.25	-16.16	-16.19	-5.64	1.31	414890.45	743434.18	N 32 8 20.14	W 103 40 49.45
	5069.00	7.73	238.70	5066.52	-22.50	-22.58	-15.40	1.38	414884.06	743424.42	N 32 8 20.08	W 103 40 49.57
	5164.00	8.88	241.15	5160.52	-29.30	-29.44	-27.28	1.27	414877.20	743412.54	N 32 8 20.01	W 103 40 49.70
	5258.00	9.37	241.51	5253.33	-36.38	-36.59	-40.36	0.52	414870.05	743399.46	N 32 8 19.94	W 103 40 49.86
	5352.00	9.38	241.77	5346.08	-43.58	-43.87	-53.83	0.05	414862.78	743385.99	N 32 8 19.87	W 103 40 50.01
	5446.00	8.79	240.54	5438.90	-50.66	-51.02	-66.84	0.66	414855.62	743372.99	N 32 8 19.80	W 103 40 50.17
	5540.00	8.51	239.46	5531.83	-57.66	-58.09	-79.08	0.34	414848.55	743360.74	N 32 8 19.73	W 103 40 50.31
	5634.00	8.63	238.64	5624.78	-64.80	-65.29	-91.09	0.18	414841.35	743348.73	N 32 8 19.66	W 103 40 50.45
	5728.00	8.64	238.27	5717.71	-72.12	-72.68	-103.12	0.06	414833.97	743336.70	N 32 8 19.59	W 103 40 50.59
	5823.00	8.31	236.37	5811.67	-79.61	-80.23	-114.91	0.46	414826.41	743324.92	N 32 8 19.52	W 103 40 50.73
	5917.00	8.60	234.96	5904.65	-87.35	-88.03	-126.32	0.38	414818.62	743313.51	N 32 8 19.44	W 103 40 50.86
	6011.00	8.67	239.06	5997.59	-94.97	-95.71	-138.15	0.66	414810.94	743301.68	N 32 8 19.36	W 103 40 51.00
	6105.00	8.63	239.04	6090.52	-102.17	-102.98	-150.27	0.04	414803.67	743289.56	N 32 8 19.29	W 103 40 51.14
	6199.00	8.48	237.74	6183.47	-109.43	-110.30	-162.18	0.26	414796.34	743277.65	N 32 8 19.22	W 103 40 51.28
	6294.00	8.35	237.39	6277.45	-116.83	-117.76	-173.91	0.15	414788.88	743265.91	N 32 8 19.15	W 103 40 51.42
	6388.00	8.02	236.43	6370.49	-124.07	-125.07	-185.13	0.38	414781.58	743254.70	N 32 8 19.08	W 103 40 51.55
	6482.00	8.67	243.05	6463.50	-130.85	-131.90	-196.91	1.23	414774.74	743242.92	N 32 8 19.01	W 103 40 51.68
	6577.00	8.82	245.67	6557.40	-137.02	-138.15	-209.93	0.45	414768.50	743229.90	N 32 8 18.95	W 103 40 51.84
	6671.00	8.86	243.45	6650.28	-143.16	-144.35	-222.97	0.37	414762.29	743216.86	N 32 8 18.89	W 103 40 51.99
	6765.00	8.80	243.01	6743.17	-149.59	-150.85	-235.85	0.10	414755.80	743203.98	N 32 8 18.82	W 103 40 52.14
	6860.00	8.88	242.00	6837.04	-156.26	-157.59	-248.80	0.18	414749.06	743191.03	N 32 8 18.76	W 103 40 52.29
	6954.00	8.82	241.36	6929.92	-163.05	-164.45	-261.53	0.12	414742.20	743178.30	N 32 8 18.69	W 103 40 52.4

Comments	MD	Incl	Azin Grd	TVD	VSEC	NS	EW	DLS	Northing	Easting	Latitude	Longitude
	(m)	(°)	(°)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(°N - °S)	(°E - °W)
	7231.00	8.86	239.62	7209.52	-164.17	-165.76	-298.66	0.18	4141720.87	413140.16	N 32° 8' 18.48"	W 103° 40' 52.88"
	7331.00	8.69	230.87	7302.42	-191.24	-192.92	-324.22	0.25	4141717.73	413115.82	N 32° 8' 18.34"	W 103° 40' 53.03"
	7425.00	8.18	235.88	7489.38	-205.21	-214.20	-335.94	0.29	4141706.75	413103.80	N 32° 8' 18.20"	W 103° 40' 53.31"
	7514.00	8.18	235.88	7582.43	-212.43	-221.89	-347.16	0.34	4141692.36	413082.87	N 32° 8' 18.20"	W 103° 40' 53.44"
	7708.00	8.42	238.02	7875.44	-219.97	-228.88	-358.41	0.26	4141684.76	413061.43	N 32° 8' 18.13"	W 103° 40' 53.57"
	7803.00	8.34	233.40	7968.43	-221.90	-229.88	-369.71	0.41	4141676.77	413040.13	N 32° 8' 18.05"	W 103° 40' 53.70"
	7887.00	7.88	234.43	7962.48	-235.70	-243.19	-380.48	0.47	4141668.91	413019.35	N 32° 8' 17.97"	W 103° 40' 53.83"
	7982.00	7.68	234.27	7956.58	-243.19	-245.29	-391.00	0.32	4141661.36	413008.83	N 32° 8' 17.90"	W 103° 40' 53.95"
	8068.00	6.95	232.13	8049.82	-250.30	-252.45	-400.59	0.83	4141654.20	412988.25	N 32° 8' 17.83"	W 103° 40' 54.08"
	8180.00	5.21	233.85	8143.29	-256.26	-258.45	-408.53	1.86	4141648.20	412967.30	N 32° 8' 17.77"	W 103° 40' 54.15"
	8275.00	3.56	241.93	8238.01	-260.15	-262.67	-416.52	1.85	4141642.27	412946.21	N 32° 8' 17.73"	W 103° 40' 54.28"
	8369.00	2.90	240.64	8331.86	-262.67	-264.92	-419.27	0.71	4141641.74	412925.57	N 32° 8' 17.71"	W 103° 40' 54.23"
	8463.00	2.91	239.71	8425.74	-265.01	-267.29	-423.40	0.05	4141639.78	412904.43	N 32° 8' 17.68"	W 103° 40' 54.33"
	8557.00	3.05	236.48	8519.61	-267.58	-269.87	-427.55	0.23	4141636.37	412883.29	N 32° 8' 17.66"	W 103° 40' 54.38"
	8667.00	2.96	235.73	8629.46	-270.72	-273.09	-432.34	0.09	4141633.57	412862.50	N 32° 8' 17.63"	W 103° 40' 54.43"
	8761.00	1.58	242.18	8723.39	-272.72	-275.08	-435.48	1.49	4141631.60	412841.35	N 32° 8' 17.61"	W 103° 40' 54.47"
	8855.00	0.67	306.55	8817.37	-273.93	-275.93	-437.06	1.52	4141631.32	412820.77	N 32° 8' 17.60"	W 103° 40' 54.49"
	8950.00	0.64	298.19	8912.36	-274.75	-275.93	-437.99	0.11	4141631.90	412800.85	N 32° 8' 17.61"	W 103° 40' 54.51"
	9044.00	0.93	282.56	9008.35	-271.93	-274.34	-439.20	0.38	4141632.32	412779.87	N 32° 8' 17.61"	W 103° 40' 54.51"
	9138.00	1.27	262.88	9100.34	-271.93	-274.34	-440.97	0.53	4141632.35	412758.87	N 32° 8' 17.61"	W 103° 40' 54.51"
	9233.00	1.95	264.04	9195.30	-272.21	-274.59	-443.63	0.72	4141632.06	412737.81	N 32° 8' 17.61"	W 103° 40' 54.56
	9327.00	1.96	257.83	9289.25	-272.70	-275.10	-446.79	0.23	4141631.55	412716.81	N 32° 8' 17.61"	W 103° 40' 54.60
	9421.00	2.34	252.27	9383.18	-273.61	-276.02	-450.19	0.46	4141630.63	412695.85	N 32° 8' 17.60"	W 103° 40' 54.64
	9515.00	1.24	241.64	9477.13	-274.66	-277.09	-452.81	1.22	4141629.56	412674.89	N 32° 8' 17.59"	W 103° 40' 54.67
	9609.00	0.88	231.04	9572.11	-275.65	-276.09	-454.45	0.35	4141628.56	412653.93	N 32° 8' 17.58"	W 103° 40' 54.68
	9704.00	1.10	217.62	9666.10	-276.86	-276.31	-455.62	0.29	4141627.34	412632.97	N 32° 8' 17.57"	W 103° 40' 54.70
	9798.00	0.21	271.65	9760.09	-277.57	-278.02	-456.35	1.05	4141626.63	412612.01	N 32° 8' 17.56"	W 103° 40' 54.71
	9892.00	0.33	312.19	9854.08	-277.38	-278.83	-456.72	0.23	4141626.82	412591.05	N 32° 8' 17.56"	W 103° 40' 54.72
	10042.00	1.71	226.01	10004.07	-278.58	-280.16	-457.72	1.19	4141626.50	412570.09	N 32° 8' 17.56"	W 103° 40' 54.74
	10093.00	1.27	216.87	10055.04	-279.81	-282.26	-458.86	0.81	4141624.38	412549.13	N 32° 8' 17.54"	W 103° 40' 54.75
	10124.00	1.97	239.85	10088.03	-280.41	-282.88	-460.50	3.11	4141623.77	412528.17	N 32° 8' 17.53"	W 103° 40' 54.76
	10168.00	2.67	357.21	10118.02	-279.84	-282.31	-460.84	10.76	4141624.34	412507.21	N 32° 8' 17.54"	W 103° 40' 54.76
	10187.00	6.03	358.72	10148.82	-277.94	-282.31	-460.92	10.64	4141626.69	412486.26	N 32° 8' 17.56"	W 103° 40' 54.76
	10218.00	7.48	10211.27	10179.71	-273.43	-275.56	-460.30	8.91	4141630.23	412465.30	N 32° 8' 17.59"	W 103° 40' 54.76
	10250.00	11.48	24.81	10211.27	-269.10	-271.56	-458.29	12.85	4141635.09	412444.34	N 32° 8' 17.64"	W 103° 40' 54.73
	10282.00	15.94	21.84	10242.35	-262.14	-264.58	-455.33	14.13	4141642.07	412423.38	N 32° 8' 17.71"	W 103° 40' 54.70
	10313.00	20.83	14.35	10271.78	-252.90	-255.33	-452.40	16.80	4141651.32	412402.42	N 32° 8' 17.80"	W 103° 40' 54.66
	10376.00	27.82	8.16	10329.20	-227.63	-230.03	-447.30	11.89	4141676.62	412381.46	N 32° 8' 18.05"	W 103° 40' 54.80
	10422.00	36.11	7.51	10368.04	-203.43	-176.04	-443.73	17.74	4141701.22	412360.50	N 32° 8' 18.30"	W 103° 40' 54.86
	10470.00	41.89	5.08	10405.55	-173.66	-143.64	-440.53	12.72	4141730.61	412339.54	N 32° 8' 18.59"	W 103° 40' 54.92
	10516.00	47.97	2.37	10438.11	-141.29	-103.70	-438.46	15.85	4141763.00	412318.58	N 32° 8' 19.28"	W 103° 40' 54.98
	10564.00	55.28	0.19	10467.88	-103.70	-65.56	-437.66	15.64	4141800.59	412297.62	N 32° 8' 19.28"	W 103° 40' 54.98
	10610.00	63.85	1.39	10481.86	-63.22	-25.56	-437.06	18.43	4141841.08	412276.66	N 32° 8' 19.68"	W 103° 40' 54.97
	10664.00	75.10	0.58	10513.70	-43.32	-6.06	-436.06	17.85	4141889.98	412255.70	N 32° 8' 20.26"	W 103° 40' 54.96
	10722.00	77.92	358.58	10524.90	42.34	40.01	-436.44	7.14	4141946.64	412234.74	N 32° 8' 20.72"	W 103° 40' 54.96
	10768.00	79.58	358.85	10533.87	87.45	85.11	-437.44	3.65	4141991.75	412213.78	N 32° 8' 21.17"	W 103° 40' 54.97
	10816.00	81.11	0.09	10541.92	134.77	132.43	-437.88	4.08	4141939.06	412192.82	N 32° 8' 21.64"	W 103° 40' 54.97
	10862.00	82.02	0.81	10548.67	180.27	177.93	-437.88	4.08	4141984.56	412171.86	N 32° 8' 22.09"	W 103° 40' 54.97
	10910.00	83.71	1.01	10554.63	227.89	225.55	-436.93	3.62	4141932.81	412150.90	N 32° 8' 22.56"	W 103° 40' 54.95
	10958.00	84.90	0.63	10559.20	273.65	271.32	-436.27	2.71	4141917.94	412129.94	N 32° 8' 23.01"	W 103° 40' 54.94
	11004.00	85.87	359.97	10565.02	321.49	319.16	-436.02	2.62	4141925.79	412108.98	N 32° 8' 23.49"	W 103° 40' 54.93
	11048.00	86.88	359.99	10567.24	413.99	411.06	-436.05	3.10	4141931.69	412088.02	N 32° 8' 24.42"	W 103° 40' 54.93
	11094.00	87.88	358.38	10570.72	449.75	447.82	-435.34	2.65	4141936.32	412067.06	N 32° 8' 24.82"	W 103° 40' 54.93
	11138.00	88.88	358.13	10572.88	452.18	450.25	-434.66	2.03	4141944.17	412046.10	N 32° 8' 25.17"	W 103° 40' 54.93
	11182.00	89.70	359.21	10576.00	461.38	459.45	-434.00	1.57	4141952.07	412025.14	N 32° 8' 25.47"	W 103° 40' 54.93
	11226.00	90.64	359.21	10578.12	461.38	459.45	-434.00	2.03	4141960.00	412004.18	N 32° 8' 25.77"	W 103° 40' 54.93
	11270.00	91.33	359.21	10580.24	461.38	459.45	-434.00	2.03	4141968.00	411983.22	N 32° 8' 26.07"	W 103° 40' 54.93
	11314.00	92.00	359.21	10582.36	461.38	459.45	-434.00	2.03	4141976.00	411962.26	N 32° 8' 26.37"	W 103° 40' 54.93
	11358.00	92.67	359.21	10584.48	461.38	459.45	-434.00	2.03	4141984.00	411941.30	N 32° 8' 26.67"	W 103° 40' 54.93
	11402.00	93.34	359.21	10586.60	461.38	459.45	-434.00	2.03	4141992.00	411920.34	N 32° 8' 26.97"	W 103° 40' 54.93
	11446.00	94.01	359.21	10588.72	461.38	459.45	-434.00	2.03	4142000.00	411900.38	N 32° 8' 27.27"	W 103° 40' 54.93
	11490.00	94.68	359.21	10590.84	461.38	459.45	-434.00	2.03	4142008.00	411879.42	N 32° 8' 27.57"	W 103° 40' 54.93
	11534.00	95.35	359.21	10592.96	461.38	459.45	-434.00	2.03	4142016.00	411858.46	N 32° 8' 27.87"	W 103° 40' 54.93
	11578.00	96.02	359.21	10595.08	461.38	459.45	-434.00	2.03	4142024.00	411837.50	N 32° 8' 28.17"	W 103° 40' 54.93
	11622.00	96.69	359.21	10597.20	461.38	459.45	-434.00	2.03	4142032.00	411816.54	N 32° 8' 28.47"	W 103° 40' 54.93
	11666.00	97.36	359.21	10599.32	461.38	459.45	-434.00	2.03	4142040.00	411795.58	N 32° 8' 28.77"	W 103° 40' 54.93
	11710.00	98.03	359.21	10601.44	461.38	459.45	-434.00	2.03	4142048.00	411774.62	N 32° 8' 29.07"	W 103° 40' 54.93
	11754.00	98.70	359.21	10603.56	461.38	459.45	-434.00	2.03	4142056.00	411753.66	N 32° 8' 29.37"	W 103° 40' 54.93
	11798.00	99.37	359.21	10605.68	461.38	459.45	-434.00	2.03	4142064.00	411732.70	N 32° 8' 29.67"	W 103° 40' 54.93
	11842.00	100.04	359.21	10607.80	461.38	459.45	-434.00	2.03	4142072.00	411711.74	N 32° 8' 29.97"	W 103° 40' 54.93
	11886.00	100.71	359.21	10609.92	461.38	459.45	-434.00	2.03	4142080.00	411690.78	N 32° 8' 30.27"	W 103° 40' 54.93
	11930.00	101.38	359.21	10612.04	461.38	459.45	-434.00	2.03	4142088.00	411669.82	N 32° 8' 30.57"	W 103° 40' 54.93
	11974.00	102.05	359.21	10614.16	461.38	459.45	-434.00	2.03	4142096.00	411648.86	N 32° 8' 30.87"	W 103° 40' 54.93
	12018.00	102.72	359.21	10616.28	461.38	459.45	-434.00					

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Cimarex Cotton Draw 9L Federal #5H - PBHL [100' FNL, 2116' FWL]	15395.40	90.85	359.89	10536.60	4711.64	4709.21	-465.50	0.00	419615.63	742974.34	N 32 9 6.93	W 103 40 54.47

Survey Type: Def Plan

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)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.000	Act Stns	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Original Borehole / Cimarex Cotton Draw 9L Federal #5H 0ft to Update
	1	26.000	12512.000	Act Stns	30.000	30.000		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Cotton Draw 9L Federal #5H 0ft to
	1	12512.000	15395.400	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Cotton Draw 9L Federal #5H Rev4

Cimarex Cotton Draw 9L Federal #5H Rev4 RM 25July18 Proposal Geodetic Report

(Def Plan)



Report Date: July 25, 2018 - 05:38 PM
Client: Cimarex
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Cotton Draw 9L Federal #5H / Cimarex Cotton Draw 9L Federal #5H
Well: Cimarex Cotton Draw 9L Federal #5H
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Cotton Draw 9L Federal #5H Rev4 RM 25July18
Survey Date: June 20, 2018
Tort / AHD / DDI / ERD Ratio: 174.567 ° / 5616.324 ft / 6.154 / 0.531
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 8' 20.30261", W 103° 40' 49.38478"
Location Grid N/E Y/X: N 414906.640 ftUS, E 743439.820 ftUS
CRS Grid Convergence Angle: 0.3474 °
Grid Scale Factor: 0.99995587
Version / Patch: 2.10.706.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.893 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3470.600 ft above MSL
Seabed / Ground Elevation: 3444.600 ft above MSL
Magnetic Declination: 6.762 °
Total Gravity Field Strength: 998.4270mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47906.739 nT
Magnetic Dip Angle: 59.806 °
Declination Date: July 25, 2018
Magnetic Declination Model: HDGM 2018
North Reference: Grid North
Grid Convergence Used: 0.3474 °
Total Corr Mag North->Grid North: 6.4150 °
Local Coord Referenced To: Well Head

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 ° ' ")
Tie In	12512.00	89.27	2.86	10582.62	1828.86	1826.43	-458.79	N/A	416732.98	742981.06	N 32 8 38.40	W 103 40 54.59
PTB - 2°/100'	12569.00	89.27	2.86	10583.35	1885.78	1883.38	-458.14	0.00	416789.92	742983.70	N 32 8 38.97	W 103 40 54.58
DLS												
Align to Target	12584.00	89.51	2.84	10583.51	1900.76	1898.34	-455.42	2.00	416804.90	742984.42	N 32 8 39.11	W 103 40 54.55
2°/100' DLS												
Hold to Lateral	12765.78	91.33	359.69	10582.18	2082.44	2080.05	-451.40	2.00	416986.59	742988.44	N 32 8 40.91	W 103 40 54.49
Target												
Build 2deg/100'	13549.56	91.33	359.69	10564.00	2866.00	2863.80	-455.62	0.00	417770.11	742984.22	N 32 8 48.67	W 103 40 54.48
DLS												
Hold to Target	13573.63	90.85	359.69	10563.54	2890.07	2887.67	-455.75	2.00	417764.17	742984.09	N 32 8 48.90	W 103 40 54.48
Turn to BHL	15165.48	90.85	359.69	10540.00	4481.74	4479.32	-464.27	0.00	419385.75	742975.57	N 32 9 4.65	W 103 40 54.47
Cimarex Cotton Draw 9L Federal #5H - PBHL [100' FNL, 2116' FWL]	15395.40	90.85	359.69	10536.60	4711.64	4709.21	-465.50	0.00	419615.63	742974.34	N 32 9 6.93	W 103 40 54.47

Survey Type: Def Plan

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)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.000	Act Stns	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Original Borehole / Cimarex Cotton Draw 9L Federal #5H Drt to Update
	1	26.000	12512.000	Act Stns	30.000	30.000		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Cotton Draw 9L Federal #5H Drt to Update
	1	12512.000	15395.400	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Cotton Draw 9L Federal #5H Rev4

Cimarex Cotton Draw 9L Federal #5H Rev4 RM 25July18 Anti-Collision Summary Report

Analysis Date-24hr Time: July 25, 2018 - 17:37

Client: Cimarex
 Field: NM Lea County (NAD 83)
 Structure: Cimarex Cotton Draw 9L Federal #5H
 Slot: Cimarex Cotton Draw 9L Federal #5H
 Well: Cimarex Cotton Draw 9L Federal #5H
 Borehole: Original Borehole
 Scan MD Range: 12512.00ft - 15395.40ft

Analysis Method: 3D Least Distance

Reference Trajectory:

Depth Interval:

Rule Set:

Min Pts:

Version / Patch:

Database \ Project:

Cimarex Cotton Draw 9L Federal #5H Rev4 RM 25July18 (Def Plan)
 Every 10.00 Measured Depth (ft)
 NAL Procedure: D&M AntiCollision Standard S002
 All local minima indicated.
 2.10.706.0
 US1153APP452.dir.sib.com\drilling-NM Lea County 2.10

Trajectory Error Model: ISCWSA0 3-D 95.000% Confidence 2.7955 sigma, for subject well. For offset wells, error model version is specified with each well respectively.

Offset Trajectories Summary

Offset Selection Criteria

Wellhead distance scan:

Selection filters:

Not performed!

Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans

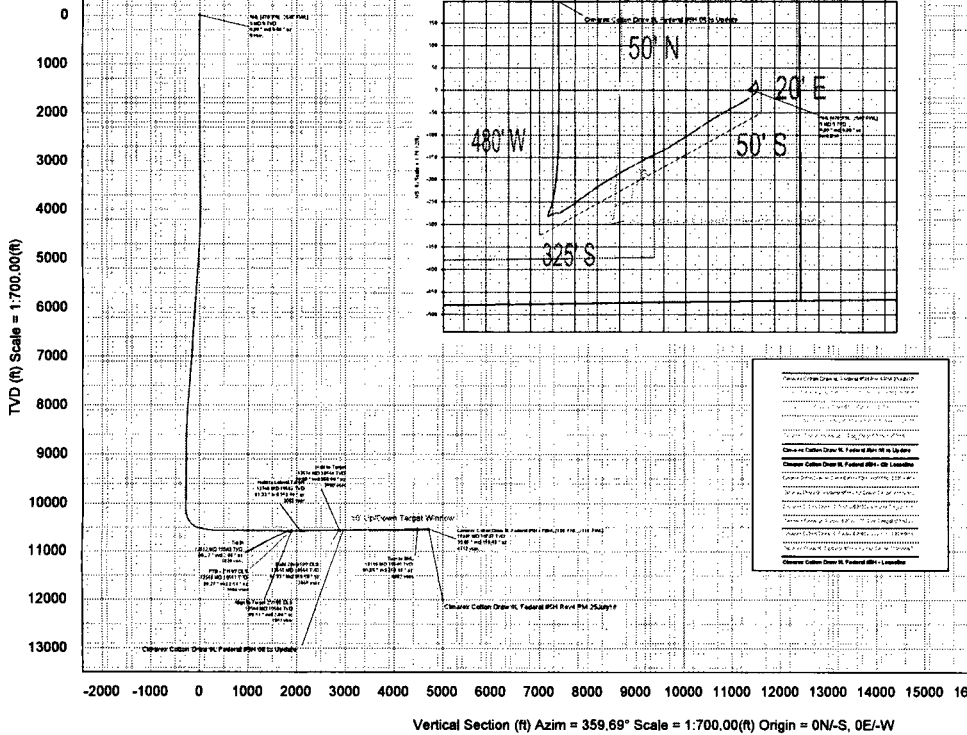
- All Non-Def Surveys when no Def-Survey is set in a borehole - All Non-Def Plans when no Def-Plan is set in a borehole

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
Tascoco Cotton Draw 9L 1 Inc. Only 0ft to 13585ft (Def Survey)													
	1226.69	1047.16	527.56	179.53	1.78	OSF1.50	12512.00	10582.62	OSF<5.00			Enter Alert	Warning Alert
	3344.78	1044.26	2647.75	2300.50	4.81	OSF1.50	15395.40	10536.60					TD
Cimarex Cotton Draw 9L Federal #2H Gyro+MWD 11200ft to 16265ft MD (Def Survey)													
	1200.75	72.85	1151.35	1127.90	25.55	OSF1.50	12650.00	10583.69				MinPt-CtCt	Pass
	1201.17	74.47	1150.69	1126.70	24.98	OSF1.50	12710.00	10583.20				MINPt-O-EOU	
	1201.57	74.94	1150.77	1126.63	24.83	OSF1.50	12730.00	10582.89				MinPt-O-ADP	
	1219.36	85.24	1181.70	1134.12	22.06	OSF1.50	13080.00	10574.89				MINPt-O-EOU	
	1220.33	86.32	1161.95	1134.02	21.79	OSF1.50	13120.00	10573.96				MinPt-O-ADP	
	1317.40	146.38	1218.97	1171.01	13.71	OSF1.50	15165.48	10540.00				MinPt-O-ADP	
	1321.92	147.48	1222.76	1174.43	13.65	OSF1.50	15250.00	10538.75				MinPt-O-SF	
	1342.18	148.06	1242.64	1194.12	13.81	OSF1.50	15395.40	10536.60				TD	
Cimarex Cotton Draw 9L Federal Com #3H Gyro+MWD 0ft to 16340ft (Def Survey)													
	2088.15	95.28	2023.80	1992.87	33.72	OSF1.50	12512.00	10582.62				MinPta	Pass
	2086.50	173.80	1969.80	1912.70	18.25	OSF1.50	14070.00	10556.20				MinPt-CtCt	
	2089.70	184.30	1966.00	1905.40	17.22	OSF1.50	14330.00	10552.36				MINPt-O-EOU	
	2093.73	189.07	1966.85	1904.66	16.81	OSF1.50	14450.00	10550.58				MinPt-O-ADP	
	2144.66	261.27	1969.65	1883.40	12.42	OSF1.50	15200.00	10539.49				MinPta	
	2145.14	261.33	1970.08	1883.81	12.42	OSF1.50	15210.00	10539.34				MinPt-O-SF	
	2182.33	281.58	1987.11	1900.75	12.50	OSF1.50	15395.40	10536.60				TD	
Cimarex Cotton Draw 9L Federal #2H Gyro+MWD 0ft to 12100ft MD (Def Survey)													
	2103.38	32.81	2092.02	2070.57	237.35	MAS = 10.00 (m)	12512.00	10582.62				MinPta	Pass
	4981.96	32.81	4968.92	4948.75	491.13	MAS = 10.00 (m)	15395.40	10536.60				TD	

Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Cotton Draw 9L Federal #5H	NM Lea County (NAD 83)	Cimarex Cotton Draw 9L Federal #5H

Survey & Magnetics Parameters	Dr: 15.000"	Date: 15-JUL-2018	Surface Location	IMAGS New Mexico State Plane, Eastern Zone, LR Feet	Grid Cont:	6.3474'	Remarks:
Model: NODM 2018	FB: 47995.732mT	Gravity FB: 980.627m/s ² (0.0001 Based)	Lat: 35 32 9.20.38	Northings: 414594.643US	Scale Feet:	6.38995587	Cimarex Cotton Draw 9L
Magn: 6.702"			Lon: W 102 49 45.10	Eastings: 743435.629US			Federal #5H
							Cimarex Cotton Draw 9L Federal #5H Revd RM 25July18

Critical Points							
Critical Point	MD	BVCL	AZIM	TYD	VSEC	N(+)/S(-)	E(+)/W(-)
Tie In	12512.00	89.27	2.86	10562.82	1826.86	1826.43	-456.79
PTB - 2' / 100' DLS	12569.00	89.27	2.86	10563.35	1885.78	1883.36	-456.14
Align to Target 2' / 100' DLS	12584.00	89.51	2.84	10563.51	1900.76	1898.34	-455.42
Hold to Lateral Target	12765.78	91.33	399.69	10582.18	2082.44	2080.06	-451.40
Build 28mg/100' DLS	13649.56	91.33	399.69	10564.00	2866.00	2863.60	-455.82
Hold to Target	13673.63	90.85	398.68	10563.54	2889.07	2887.67	-455.75
Turn to BH4	15165.48	90.85	356.69	10540.00	4481.74	4479.32	-464.27
Cimarex Cotton Draw 9L Federal #5H - PBH4 (100' PHL 2118 PHL)	15389.40	90.85	356.69	10536.90	4711.64	4709.21	-465.50



Grid North
True North
Mag Dec (0.415°)
Mag Dec (0.762°)
Grid Conv (0.347°)

CONTROLLED	
Drawn by	
Checked by	
Reviewed by	
Approved by	
Date	
Scale	
Notes	

