Schlumberger

Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H ST01 MWD 0ft-22279ft (Surcon Corrected) Survey Geodetic Report

(Non-Def Survey)

CIMAREX

HOBBS OCD
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Report Date:	February 08, 2019 - 03:56 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex	**Vertical Section Azimuth:**	359.630 ° (Grid North)
Field:	NM Lea County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Vaca Draw 20-17 Federal #4H / Cimarex Vaca Draw 20-17 Federal #4H	**TVD Reference Datum:**	RKB
Well:	Cimarex Vaca Draw 20-17 Federal #4H	**TVD Reference Elevation:**	3440.700 ft above MSL
Borehole:	ST01	**Seabed / Ground Elevation:**	3417.700 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	6.681 °
Survey Name:	Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H ST01 MWD 0ft-22279ft (Surcon Corrected)	**Total Gravity Field Strength:**	998.4304mgn (9.80665 Based)
Survey Date:	January 12, 2019	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	271.913 ° / 11196.691 ft / 6.738 / 0.903	**Total Magnetic Field Strength:**	47812.550 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	59.735 °
Location Lat / Long:	N 32° 6' 35.65929", W 103° 35' 47.58310"	**Declination Date:**	January 31, 2019
Location Grid N/E Y/X:	N 404499.610 ftUS, E 769461.170 ftUS	**Magnetic Declination Model:**	HDGM 2019
CRS Grid Convergence Angle:	0.3916 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99996869	**Grid Convergence Used:**	0.3916 °
Version / Patch:	2.10.753.0	**Total Corr Mag North->Grid North:**	6.2894 °
		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 ° ' ")	Closure Azimuth (°)	Closure (ft)
SHL [390' FSL, 1950' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404499.61	769461.17	N 32 6 35.66	W 103 35 47.58	0.00	0.00
	193.00	0.49	276.39	193.00	0.10	0.09	-0.82	0.25	404499.70	769460.35	N 32 6 35.66	W 103 35 47.59	276.39	0.83
	303.00	0.09	232.28	303.00	0.10	0.09	-1.36	0.39	404499.70	769459.81	N 32 6 35.66	W 103 35 47.60	273.85	1.36
	395.00	0.18	232.59	395.00	-0.03	-0.04	-1.53	0.10	404499.57	769459.64	N 32 6 35.66	W 103 35 47.60	268.48	1.53
	487.00	0.66	109.50	486.99	-0.30	-0.31	-1.14	0.84	404499.30	769460.03	N 32 6 35.66	W 103 35 47.60	255.05	1.18
	578.00	0.71	109.28	577.99	-0.67	-0.67	-0.12	0.06	404498.94	769461.05	N 32 6 35.65	W 103 35 47.58	189.95	0.68
	669.00	0.78	108.56	668.98	-1.06	-1.05	1.00	0.08	404498.56	769462.17	N 32 6 35.65	W 103 35 47.57	136.32	1.45
	763.00	0.72	119.38	762.97	-1.56	-1.54	2.12	0.16	404498.07	769463.29	N 32 6 35.64	W 103 35 47.56	126.00	2.63
	853.00	0.61	119.09	852.97	-2.07	-2.05	3.04	0.12	404497.56	769464.20	N 32 6 35.64	W 103 35 47.55	124.08	3.66
	947.00	0.64	128.07	946.96	-2.65	-2.62	3.89	0.11	404496.99	769465.06	N 32 6 35.63	W 103 35 47.54	124.00	4.69
	953.00	0.57	143.63	952.96	-2.69	-2.67	3.93	2.96	404496.94	769465.10	N 32 6 35.63	W 103 35 47.54	124.15	4.75
	1040.00	0.87	118.31	1039.95	-3.36	-3.33	4.77	0.49	404496.28	769465.94	N 32 6 35.63	W 103 35 47.53	124.91	5.81
	1134.00	1.18	105.40	1133.94	-3.96	-3.92	6.33	0.41	404495.69	769467.50	N 32 6 35.62	W 103 35 47.51	121.79	7.45
	1229.00	0.97	109.46	1228.92	-4.50	-4.45	8.03	0.24	404495.16	769469.20	N 32 6 35.61	W 103 35 47.49	118.99	9.18
	1324.00	1.52	93.03	1323.90	-4.85	-4.78	10.05	0.68	404494.83	769471.22	N 32 6 35.61	W 103 35 47.47	115.46	11.13
	1418.00	2.77	86.77	1417.83	-4.81	-4.72	13.56	1.35	404494.89	769474.73	N 32 6 35.61	W 103 35 47.43	109.20	14.36
	1606.00	5.13	84.85	1605.37	-3.88	-3.71	26.47	1.26	404495.90	769487.64	N 32 6 35.62	W 103 35 47.28	97.98	26.73
	1796.00	7.36	85.46	1794.23	-2.29	-1.99	47.06	1.17	404497.62	769508.23	N 32 6 35.64	W 103 35 47.04	92.42	47.10
	1891.00	7.57	84.92	1888.43	-1.33	-0.95	59.36	0.23	404498.66	769520.53	N 32 6 35.65	W 103 35 46.89	90.92	59.37
	1985.00	8.10	88.49	1981.55	-0.69	-0.22	72.15	0.76	404499.39	769533.32	N 32 6 35.65	W 103 35 46.74	90.18	72.15
	2080.00	8.50	88.14	2075.55	-0.36	0.19	85.86	0.42	404499.80	769547.02	N 32 6 35.66	W 103 35 46.58	89.87	85.86
	2175.00	7.98	92.49	2169.57	-0.51	0.13	99.46	0.85	404499.74	769560.63	N 32 6 35.65	W 103 35 46.43	89.92	99.46
	2270.00	7.13	93.37	2263.75	-1.22	-0.50	111.94	0.90	404499.11	769573.10	N 32 6 35.65	W 103 35 46.28	90.26	111.94
	2365.00	7.48	91.76	2357.98	-1.84	-1.04	124.00	0.43	404498.57	769585.17	N 32 6 35.64	W 103 35 46.14	90.48	124.01
	2490.00	7.76	89.43	2481.87	-2.11	-1.20	140.57	0.33	404498.41	769601.74	N 32 6 35.64	W 103 35 45.95	90.49	140.58
	2555.00	7.59	95.50	2546.29	-2.53	-1.57	149.23	1.27	404498.04	769610.40	N 32 6 35.63	W 103 35 45.85	90.60	149.24
	2650.00	6.79	100.08	2640.55	-4.20	-3.16	161.01	1.04	404496.45	769622.17	N 32 6 35.62	W 103 35 45.71	91.12	161.04
	2745.00	5.91	91.23	2734.96	-5.35	-4.24	171.43	1.38	404495.37	769632.59	N 32 6 35.61	W 103 35 45.59	91.42	171.48
	2840.00	6.21	86.64	2829.43	-5.22	-4.05	181.45	0.60	404495.56	769642.61	N 32 6 35.61	W 103 35 45.47	91.28	181.49

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 ° ' ")	Closure Azimuth (°)	Closure (ft)
	2934.00	6.45	87.99	2922.86	-4.80	-3.56	191.80	0.30	404496.05	769652.96	N 32 6 35.61	W 103 35 45.35	91.06	191.83
	3029.00	7.25	85.56	3017.18	-4.22	-2.91	203.11	0.90	404496.70	769664.27	N 32 6 35.62	W 103 35 45.22	90.82	203.13
	3124.00	7.80	86.49	3111.36	-3.45	-2.05	215.52	0.59	404497.56	769676.68	N 32 6 35.62	W 103 35 45.08	90.55	215.53
	3219.00	7.42	89.59	3205.53	-3.09	-1.62	228.09	0.59	404497.99	769689.25	N 32 6 35.63	W 103 35 44.93	90.41	228.09
	3313.00	7.92	87.32	3298.69	-2.82	-1.27	240.63	0.62	404498.34	769701.79	N 32 6 35.63	W 103 35 44.79	90.30	240.63
	3407.00	7.48	90.90	3391.84	-2.70	-1.06	253.21	0.69	404498.55	769714.38	N 32 6 35.63	W 103 35 44.64	90.24	253.22
	3596.00	6.88	103.60	3579.37	-5.70	-3.92	276.52	0.90	404495.69	769737.68	N 32 6 35.60	W 103 35 44.37	90.81	276.55
	3692.00	6.32	101.77	3674.73	-8.20	-6.35	287.28	0.62	404493.26	769748.44	N 32 6 35.58	W 103 35 44.24	91.27	287.35
	3786.00	6.57	93.66	3768.14	-9.67	-7.75	297.71	1.00	404491.86	769758.87	N 32 6 35.56	W 103 35 44.12	91.49	297.81
	3881.00	6.46	96.25	3862.53	-10.67	-8.68	308.45	0.33	404490.94	769769.61	N 32 6 35.55	W 103 35 44.00	91.61	308.57
	3976.00	6.37	94.73	3956.93	-11.75	-9.69	319.01	0.20	404489.92	769780.17	N 32 6 35.54	W 103 35 43.88	91.74	319.16
	4071.00	5.86	94.93	4051.39	-12.67	-10.54	329.10	0.54	404489.07	769790.26	N 32 6 35.53	W 103 35 43.76	91.83	329.27
	4166.00	5.73	92.79	4145.90	-13.38	-11.19	338.67	0.27	404488.42	769799.82	N 32 6 35.53	W 103 35 43.65	91.89	338.85
	4261.00	7.30	89.31	4240.29	-13.60	-11.35	349.44	1.70	404488.26	769810.60	N 32 6 35.52	W 103 35 43.52	91.86	349.62
	4356.00	7.07	87.89	4334.54	-13.39	-11.06	361.32	0.31	404488.55	769822.47	N 32 6 35.53	W 103 35 43.38	91.75	361.49
	4450.00	7.51	90.95	4427.78	-13.36	-10.95	373.24	0.62	404488.66	769834.40	N 32 6 35.53	W 103 35 43.24	91.68	373.40
	4545.00	8.49	93.84	4521.86	-14.02	-11.52	386.44	1.11	404488.09	769847.60	N 32 6 35.52	W 103 35 43.09	91.71	386.62
	4640.00	8.41	103.51	4615.83	-16.20	-13.61	400.20	1.50	404486.00	769861.35	N 32 6 35.50	W 103 35 42.93	91.95	400.43
	4732.00	8.15	100.45	4706.87	-19.04	-16.37	413.15	0.56	404483.24	769874.31	N 32 6 35.47	W 103 35 42.78	92.27	413.48
	4735.00	8.15	101.98	4709.84	-19.12	-16.45	413.57	7.23	404483.16	769874.72	N 32 6 35.47	W 103 35 42.78	92.28	413.90
	4830.00	6.54	92.14	4804.06	-20.80	-18.05	425.56	2.14	404481.56	769886.72	N 32 6 35.45	W 103 35 42.64	92.43	425.95
	4925.00	5.97	83.02	4898.50	-20.47	-17.65	435.87	1.20	404481.96	769897.03	N 32 6 35.46	W 103 35 42.52	92.32	436.23
	5020.00	6.12	85.83	4992.97	-19.56	-16.69	445.83	0.35	404482.93	769906.98	N 32 6 35.46	W 103 35 42.40	92.14	446.14
	5115.00	6.58	85.03	5087.39	-18.79	-15.85	456.30	0.49	404483.77	769917.46	N 32 6 35.47	W 103 35 42.28	91.99	456.58
	5210.00	7.24	82.81	5181.70	-17.64	-14.62	467.66	0.75	404484.99	769928.82	N 32 6 35.48	W 103 35 42.15	91.79	467.89
	5304.00	7.27	80.79	5274.95	-16.03	-12.93	479.41	0.27	404486.68	769940.56	N 32 6 35.50	W 103 35 42.01	91.55	479.58
	5398.00	7.49	81.81	5368.17	-14.28	-11.11	491.35	0.27	404488.50	769952.50	N 32 6 35.52	W 103 35 41.87	91.29	491.47
	5493.00	8.11	83.90	5462.29	-12.77	-9.51	504.14	0.72	404490.10	769965.29	N 32 6 35.53	W 103 35 41.72	91.08	504.23
	5587.00	7.88	84.51	5555.37	-11.53	-8.19	517.14	0.26	404491.42	769978.30	N 32 6 35.54	W 103 35 41.57	90.91	517.21
	5680.00	8.25	82.38	5647.45	-10.12	-6.70	530.10	0.51	404492.91	769991.26	N 32 6 35.56	W 103 35 41.42	90.72	530.15
	5775.00	8.33	87.08	5741.46	-8.95	-5.44	543.73	0.72	404494.17	770004.88	N 32 6 35.57	W 103 35 41.26	90.57	543.76
	5964.00	7.71	93.36	5928.62	-9.17	-5.49	570.06	0.57	404494.12	770031.21	N 32 6 35.57	W 103 35 40.96	90.55	570.09
	6059.00	7.30	90.85	6022.80	-9.71	-5.95	582.46	0.55	404493.66	770043.61	N 32 6 35.56	W 103 35 40.81	90.59	582.49
	6249.00	7.29	89.01	6211.27	-9.84	-5.92	606.58	0.12	404493.69	770067.73	N 32 6 35.56	W 103 35 40.53	90.56	606.61
	6344.00	6.59	90.52	6305.57	-9.86	-5.87	618.06	0.76	404493.74	770079.21	N 32 6 35.56	W 103 35 40.40	90.54	618.09
	6439.00	7.07	89.77	6399.89	-9.96	-5.89	629.36	0.51	404493.72	770090.51	N 32 6 35.56	W 103 35 40.27	90.54	629.38
	6534.00	7.01	94.04	6494.18	-10.42	-6.28	640.99	0.55	404493.33	770102.13	N 32 6 35.55	W 103 35 40.13	90.56	641.02
	6628.00	6.95	95.64	6587.48	-11.45	-7.24	652.37	0.22	404492.37	770113.52	N 32 6 35.54	W 103 35 40.00	90.64	652.41
	6723.00	7.17	96.02	6681.76	-12.72	-8.43	663.98	0.24	404491.18	770125.13	N 32 6 35.53	W 103 35 39.86	90.73	664.04
	6817.00	7.13	94.27	6775.03	-13.84	-9.48	675.63	0.24	404490.13	770136.78	N 32 6 35.52	W 103 35 39.73	90.80	675.70
	6911.00	7.18	94.74	6868.30	-14.84	-10.40	687.31	0.08	404489.21	770148.45	N 32 6 35.51	W 103 35 39.59	90.87	687.38
	7005.00	7.34	93.00	6961.55	-15.71	-11.20	699.16	0.29	404488.41	770160.30	N 32 6 35.50	W 103 35 39.46	90.92	699.25
	7193.00	7.43	92.66	7147.99	-17.06	-12.39	723.29	0.05	404487.22	770184.44	N 32 6 35.49	W 103 35 39.18	90.98	723.40
	7288.00	7.56	95.28	7242.17	-18.00	-13.25	735.65	0.38	404486.36	770196.80	N 32 6 35.48	W 103 35 39.03	91.03	735.77
	7383.00	7.21	96.49	7336.39	-19.33	-14.50	747.80	0.40	404485.11	770208.94	N 32 6 35.47	W 103 35 38.89	91.11	747.94
	7478.00	6.96	96.85	7430.66	-20.76	-15.86	759.44	0.27	404483.75	770220.58	N 32 6 35.45	W 103 35 38.76	91.20	759.60
	7572.00	6.48	94.62	7524.02	-21.94	-16.97	770.38	0.58	404482.65	770231.52	N 32 6 35.44	W 103 35 38.63	91.26	770.56
	7667.00	6.69	94.06	7618.39	-22.83	-17.79	781.24	0.23	404481.82	770242.38	N 32 6 35.43	W 103 35 38.50	91.30	781.44
	7762.00	6.44	95.05	7712.77	-23.76	-18.65	792.07	0.29	404480.96	770253.21	N 32 6 35.42	W 103 35 38.38	91.35	792.29
	7951.00	6.20	94.40	7900.62	-25.61	-20.37	812.80	0.13	404479.25	770273.94	N 32 6 35.40	W 103 35 38.14	91.44	813.06
	8046.00	6.25	90.61	7995.06	-26.13	-20.81	823.09	0.44	404478.80	770284.23	N 32 6 35.40	W 103 35 38.02	91.45	823.35
	8140.00	6.32	88.90	8088.49	-26.15	-20.77	833.38	0.21	404478.84	770294.52	N 32 6 35.40	W 103 35 37.90	91.43	833.63
	8234.00	6.41	87.95	8181.91	-25.93	-20.48	843.79	0.15	404479.13	770304.93	N 32 6 35.40	W 103 35 37.77	91.39	844.04
	8329.00	6.40	88.16	8276.32	-25.64	-20.12	854.38	0.03	404479.49	770315.53	N 32 6 35.40	W 103 35 37.65	91.35	854.62
	8388.00	6.25	88.99	8334.96	-25.52	-19.96	860.88	0.30	404479.65	770322.02	N 32 6 35.40	W 103 35 37.58	91.33	861.11
	8424.00	6.51	88.87	8370.74	-25.47	-19.89	864.88	0.72	404479.73	770326.02	N 32 6 35.40	W 103 35 37.53	91.32	865.11
	8518.00	6.77	89.77	8464.11	-25.41	-19.76	875.75	0.30	404479.85	770336.89	N 32 6 35.40	W 103 35 37.40	91.29	875.97
	8613.00	6.32	89.50	8558.49	-25.41	-19.69	886.58	0.47	404479.92	770347.72	N 32 6 35.40	W 103 35 37.28	91.27	886.80
	8707.00	6.09	92.16	8651.94	-25.62	-19.83	896.73	0.39	404479.78	770357.87	N 32 6 35.40	W 103 35 37.16	91.27	896.95
	8801.00	5.74	93.53	8745.44	-26.16	-20.31	906.41	0.40	404479.30	770367.55	N 32 6 35.40	W 103 35 37.05	91.28	906.64
	8895.00	4.06	99.41	8839.09	-27.05	-21.14	914.38	1.88	404478.47	770375.52	N 32 6 35.39	W 103 35 36.95	91.32	914.63
	8990.00	2.67	110.10	8933.92	-28.39	-22.45	919.78	1.60	404477.16	770380.92	N 32 6 35.37	W 103 35 36.89	91.40	920.05

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 ° ' ")	Closure Azimuth (°)	Closure (ft)
	9085.00	1.51	134.04	9028.86	-30.04	-24.08	922.76	1.50	404475.53	770383.90	N 32 6 35.36	W 103 35 36.86	91.50	923.07
	9180.00	1.17	135.34	9123.84	-31.61	-25.64	924.34	0.36	404473.97	770385.48	N 32 6 35.34	W 103 35 36.84	91.59	924.70
	9275.00	0.41	272.10	9218.83	-32.29	-26.32	924.68	1.57	404473.29	770385.82	N 32 6 35.34	W 103 35 36.83	91.63	925.06
	9370.00	1.36	289.24	9313.82	-31.90	-25.94	923.28	1.03	404473.67	770384.42	N 32 6 35.34	W 103 35 36.85	91.61	923.64
	9465.00	1.68	293.45	9408.78	-30.96	-25.01	920.94	0.36	404474.60	770382.07	N 32 6 35.35	W 103 35 36.88	91.56	921.28
	9655.00	0.95	311.11	9598.73	-28.79	-22.87	917.19	0.44	404476.74	770378.33	N 32 6 35.37	W 103 35 36.92	91.43	917.48
	9750.00	0.47	56.72	9693.73	-28.06	-22.14	916.93	1.23	404477.47	770378.07	N 32 6 35.38	W 103 35 36.92	91.38	917.19
	9845.00	0.24	134.15	9788.73	-27.99	-22.06	917.39	0.50	404477.55	770378.53	N 32 6 35.38	W 103 35 36.92	91.38	917.66
	9938.00	0.46	191.49	9881.73	-28.49	-22.56	917.46	0.42	404477.05	770378.60	N 32 6 35.37	W 103 35 36.92	91.41	917.74
	10035.00	0.47	221.43	9978.72	-29.17	-23.24	917.12	0.25	404476.37	770378.26	N 32 6 35.37	W 103 35 36.92	91.46	917.41
	10130.00	0.17	324.98	10073.72	-29.34	-23.42	916.78	0.56	404476.19	770377.92	N 32 6 35.37	W 103 35 36.93	91.46	917.08
	10224.00	0.61	280.95	10167.72	-29.13	-23.21	916.21	0.53	404476.40	770377.35	N 32 6 35.37	W 103 35 36.93	91.45	916.50
	10318.00	0.48	296.27	10261.71	-28.85	-22.94	915.36	0.21	404476.67	770376.50	N 32 6 35.37	W 103 35 36.94	91.44	915.65
	10412.00	0.35	328.19	10355.71	-28.43	-22.52	914.86	0.28	404477.09	770376.00	N 32 6 35.37	W 103 35 36.95	91.41	915.14
	10507.00	0.63	321.83	10450.71	-27.77	-21.87	914.38	0.30	404477.74	770375.52	N 32 6 35.38	W 103 35 36.95	91.37	914.65
	10601.00	0.72	323.78	10544.70	-26.88	-20.98	913.72	0.10	404478.63	770374.86	N 32 6 35.39	W 103 35 36.96	91.32	913.96
	10697.00	0.46	323.37	10640.70	-26.08	-20.19	913.13	0.27	404479.42	770374.27	N 32 6 35.40	W 103 35 36.97	91.27	913.35
	10791.00	0.38	86.18	10734.70	-25.76	-19.88	913.20	0.77	404479.75	770374.34	N 32 6 35.40	W 103 35 36.97	91.25	913.42
	10885.00	1.15	173.63	10828.69	-26.68	-20.78	913.60	1.27	404478.83	770374.74	N 32 6 35.39	W 103 35 36.96	91.30	913.84
	10980.00	1.15	233.80	10923.67	-28.19	-22.29	912.94	1.21	404477.32	770374.07	N 32 6 35.38	W 103 35 36.97	91.40	913.21
	11074.00	1.67	267.62	11017.65	-28.79	-22.91	910.81	1.02	404476.70	770371.95	N 32 6 35.37	W 103 35 37.00	91.44	911.09
	11263.00	3.68	254.10	11206.43	-30.51	-24.68	902.22	1.11	404474.93	770363.36	N 32 6 35.35	W 103 35 37.10	91.57	902.56
	11358.00	5.91	238.81	11301.10	-33.83	-28.05	895.10	2.69	404471.56	770356.24	N 32 6 35.32	W 103 35 37.18	91.80	895.54
	11471.00	4.99	238.40	11413.59	-39.36	-33.64	885.94	0.81	404465.97	770347.08	N 32 6 35.27	W 103 35 37.29	92.17	886.58
	11565.00	5.23	235.45	11507.21	-43.89	-38.21	878.93	0.38	404461.40	770340.07	N 32 6 35.22	W 103 35 37.37	92.49	879.76
	11660.00	5.40	233.67	11601.80	-48.94	-43.32	871.76	0.25	404456.30	770332.90	N 32 6 35.17	W 103 35 37.45	92.84	872.84
	11756.00	5.31	236.41	11697.38	-54.03	-48.45	864.42	0.28	404451.16	770325.56	N 32 6 35.12	W 103 35 37.54	93.21	865.78
	11856.00	6.73	18.06	11797.15	-51.00	-45.43	862.38	11.38	404454.18	770323.52	N 32 6 35.15	W 103 35 37.56	93.02	863.57
	11888.00	9.73	11.95	11828.82	-46.57	-41.00	863.52	9.75	404458.61	770324.66	N 32 6 35.20	W 103 35 37.55	92.72	864.49
	11919.00	15.01	11.95	11859.09	-40.09	-34.50	864.89	17.03	404465.11	770326.03	N 32 6 35.26	W 103 35 37.53	92.28	865.58
	11951.00	20.33	12.95	11888.57	-30.62	-25.03	867.00	16.65	404474.58	770328.14	N 32 6 35.35	W 103 35 37.51	91.65	867.36
	11983.00	26.32	12.58	11918.94	-18.29	-12.67	869.79	18.72	404486.94	770330.93	N 32 6 35.47	W 103 35 37.47	90.83	869.88
	12014.00	31.75	11.33	11946.04	-3.59	2.04	872.89	17.62	404501.65	770334.03	N 32 6 35.62	W 103 35 37.43	89.87	872.90
	12046.00	35.58	9.54	11972.66	13.83	19.49	876.09	12.36	404519.09	770337.23	N 32 6 35.79	W 103 35 37.40	88.73	876.31
	12078.00	38.49	11.58	11998.21	32.74	38.43	879.63	9.87	404538.03	770340.78	N 32 6 35.98	W 103 35 37.35	87.50	880.47
	12109.00	40.64	17.00	12022.11	51.83	57.54	884.52	13.11	404557.15	770345.67	N 32 6 36.17	W 103 35 37.30	86.28	886.39
	12141.00	42.88	18.96	12045.98	72.05	77.80	891.11	8.10	404577.41	770352.25	N 32 6 36.37	W 103 35 37.22	85.01	894.50
	12172.00	44.77	18.38	12068.34	92.34	98.14	897.98	6.23	404597.75	770359.12	N 32 6 36.57	W 103 35 37.14	83.76	903.33
	12203.00	44.87	17.33	12090.33	113.09	118.94	904.68	2.41	404618.54	770365.82	N 32 6 36.77	W 103 35 37.06	82.51	912.46
	12235.00	46.30	14.91	12112.73	135.01	140.90	911.02	7.01	404640.50	770372.16	N 32 6 36.99	W 103 35 36.98	81.21	921.85
	12267.00	49.63	11.74	12134.16	158.10	164.02	916.48	12.74	404663.62	770377.62	N 32 6 37.22	W 103 35 36.92	79.85	931.04
	12298.00	52.47	8.91	12153.65	181.78	187.73	920.79	11.59	404687.34	770381.92	N 32 6 37.45	W 103 35 36.86	78.48	939.73
	12330.00	54.43	8.06	12172.70	207.18	213.16	924.58	6.49	404712.76	770385.72	N 32 6 37.71	W 103 35 36.82	77.02	948.83
	12361.00	55.23	7.62	12190.56	232.26	238.26	928.03	2.83	404737.86	770389.17	N 32 6 37.95	W 103 35 36.77	75.60	958.13
	12393.00	57.17	6.91	12208.36	258.62	264.64	931.39	6.34	404764.24	770392.53	N 32 6 38.21	W 103 35 36.73	74.14	968.26
	12424.00	60.98	5.98	12224.29	285.02	291.06	934.37	12.56	404790.66	770395.51	N 32 6 38.48	W 103 35 36.70	72.70	978.66
	12455.00	65.69	3.69	12238.20	312.60	318.65	936.70	16.56	404818.25	770397.83	N 32 6 38.75	W 103 35 36.67	71.21	989.41
	12465.00	66.65	2.98	12242.24	321.72	327.78	937.23	11.59	404827.38	770398.37	N 32 6 38.84	W 103 35 36.66	70.72	992.89
	12549.00	71.31	359.90	12272.37	400.06	406.14	939.16	6.52	404905.73	770400.30	N 32 6 39.61	W 103 35 36.63	66.61	1023.22
	12581.00	72.57	0.68	12282.29	430.48	436.56	939.32	4.57	404936.15	770400.46	N 32 6 39.92	W 103 35 36.63	65.07	1035.81
	12612.00	73.80	1.38	12291.25	460.15	466.23	939.85	4.52	404965.82	770400.99	N 32 6 40.21	W 103 35 36.62	63.62	1049.14
	12707.00	78.58	2.94	12313.92	552.28	558.38	943.34	5.28	405057.98	770404.48	N 32 6 41.12	W 103 35 36.57	59.38	1096.22
	12802.00	82.31	2.42	12329.69	645.81	651.95	947.72	3.96	405151.54	770408.86	N 32 6 42.05	W 103 35 36.51	55.48	1150.31
	12897.00	86.18	359.27	12339.22	740.28	746.43	949.10	5.24	405246.01	770410.24	N 32 6 42.98	W 103 35 36.49	51.82	1207.46
	12992.00	87.11	359.11	12344.78	835.12	841.26	947.76	0.99	405340.84	770408.90	N 32 6 43.92	W 103 35 36.50	48.41	1267.27
	13087.00	87.45	357.83	12349.29	929.99	936.11	945.23	1.39	405435.69	770406.37	N 32 6 44.86	W 103 35 36.52	45.18	1330.33
	13182.00	87.25	356.57	12353.68	1024.80	1030.90	940.59	1.34	405530.47	770401.73	N 32 6 45.80	W 103 35 36.57	42.38	1395.51
	13277.00	87.76	358.59	12357.81	1119.64	1125.72	936.59	2.19	405625.29	770397.73	N 32 6 46.73	W 103 35 36.60	39.76	1464.39
	13371.00	87.80	358.63	12361.46	1213.56	1219.62	934.31	0.06	405719.19	770395.45	N 32 6 47.66	W 103 35 36.62	37.45	1536.36
	13466.00	88.25	358.48	12364.73	1308.49	1314.53	931.91	0.50	405814.10	770393.05	N 32 6 48.60	W 103 35 36.64	35.33	1611.35
	13561.00	88.90	358.39	12367.09	1403.43	1409.47	929.32	0.69	405909.03	770390.46	N 32 6 49.54	W 103 35 36.67	33.40	1688.26
	13656.00	88.87	358.23	12368.94	1498.39	1504.41	926.52	0.17	406003.97	770387.66	N 32 6 50.48	W 103 35 36.69	31.63	1766.83

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 ° ' ")	Closure Azimuth (°)	Closure (ft)
	13751.00	89.00	358.41	12370.71	1593.35	1599.35	923.73	0.23	406098.91	770384.87	N 32 6 51.42	W 103 35 36.72	30.01	1846.94
	13846.00	89.28	358.03	12372.13	1688.31	1694.29	920.78	0.50	406193.85	770381.92	N 32 6 52.36	W 103 35 36.74	28.52	1928.33
	13941.00	89.38	357.97	12373.24	1783.27	1789.23	917.47	0.12	406288.78	770378.61	N 32 6 53.30	W 103 35 36.77	27.16	2010.74
	14036.00	89.21	358.06	12374.41	1878.22	1884.16	914.18	0.20	406383.71	770375.32	N 32 6 54.24	W 103 35 36.80	25.88	2094.23
	14131.00	89.31	359.71	12375.64	1973.20	1979.13	912.33	1.74	406478.68	770373.47	N 32 6 55.18	W 103 35 36.82	24.75	2179.29
	14226.00	89.14	359.79	12376.92	2068.19	2074.12	911.92	0.20	406573.67	770373.06	N 32 6 56.12	W 103 35 36.82	23.73	2265.74
	14321.00	89.35	359.79	12378.18	2163.18	2169.12	911.57	0.22	406668.65	770372.71	N 32 6 57.06	W 103 35 36.81	22.79	2352.87
	14416.00	89.55	0.26	12379.09	2258.18	2264.11	911.61	0.54	406763.65	770372.75	N 32 6 58.00	W 103 35 36.80	21.93	2440.74
	14511.00	89.11	359.94	12380.20	2353.17	2359.10	911.77	0.57	406858.63	770372.91	N 32 6 58.94	W 103 35 36.79	21.13	2529.17
	14606.00	89.24	359.97	12381.57	2448.16	2454.09	911.70	0.14	406953.62	770372.84	N 32 6 59.88	W 103 35 36.79	20.38	2617.97
	14701.00	87.97	357.50	12383.88	2543.11	2549.03	909.60	2.92	407048.56	770370.74	N 32 7 0.82	W 103 35 36.80	19.64	2706.46
	14795.00	89.35	0.35	12386.08	2637.06	2642.98	907.84	3.37	407142.50	770368.98	N 32 7 1.75	W 103 35 36.82	18.96	2794.55
	14890.00	89.90	0.02	12386.70	2732.05	2737.98	908.15	0.68	407237.49	770369.29	N 32 7 2.69	W 103 35 36.81	18.35	2884.66
	14985.00	90.03	0.17	12386.76	2827.05	2832.98	908.31	0.21	407332.49	770369.45	N 32 7 3.63	W 103 35 36.80	17.78	2975.02
	15080.00	89.76	0.47	12386.93	2922.04	2927.97	908.84	0.42	407427.49	770369.98	N 32 7 4.57	W 103 35 36.78	17.24	3065.78
	15175.00	89.79	359.98	12387.31	3017.04	3022.97	909.21	0.52	407522.48	770370.35	N 32 7 5.51	W 103 35 36.77	16.74	3156.74
	15269.00	89.72	357.85	12387.71	3111.02	3116.95	907.43	2.27	407616.46	770368.57	N 32 7 6.44	W 103 35 36.78	16.23	3246.35
	15364.00	89.83	0.18	12388.08	3206.01	3211.93	905.80	2.46	407711.43	770366.94	N 32 7 7.38	W 103 35 36.80	15.75	3337.21
	15459.00	90.03	0.33	12388.20	3301.01	3306.93	906.22	0.26	407806.43	770367.36	N 32 7 8.32	W 103 35 36.78	15.32	3428.85
	15555.00	89.14	359.47	12388.89	3397.00	3402.92	906.05	1.29	407902.42	770367.19	N 32 7 9.27	W 103 35 36.78	14.91	3521.48
	15650.00	89.62	359.56	12389.92	3491.99	3497.91	905.25	0.51	407997.41	770366.39	N 32 7 10.21	W 103 35 36.78	14.51	3613.15
	15745.00	89.93	0.38	12390.29	3586.99	3592.91	905.20	0.92	408092.40	770366.34	N 32 7 11.15	W 103 35 36.77	14.14	3705.18
	15839.00	89.38	0.45	12390.86	3680.98	3686.91	905.88	0.59	408186.39	770367.02	N 32 7 12.08	W 103 35 36.76	13.80	3796.56
	15934.00	89.83	0.09	12391.51	3775.97	3781.90	906.33	0.61	408281.39	770367.47	N 32 7 13.02	W 103 35 36.74	13.48	3888.99
	16029.00	89.86	359.89	12391.77	3870.97	3876.90	906.31	0.21	408376.38	770367.45	N 32 7 13.96	W 103 35 36.74	13.16	3981.43
	16124.00	89.93	359.79	12391.95	3965.97	3971.90	906.04	0.13	408471.38	770367.18	N 32 7 14.90	W 103 35 36.73	12.85	4073.93
	16219.00	89.59	359.94	12392.34	4060.97	4066.90	905.82	0.39	408566.38	770366.96	N 32 7 15.84	W 103 35 36.73	12.56	4166.56
	16314.00	89.72	359.31	12392.92	4155.96	4161.90	905.20	0.68	408661.37	770366.34	N 32 7 16.78	W 103 35 36.73	12.27	4259.20
	16409.00	90.41	0.03	12392.81	4250.96	4256.89	904.65	1.05	408756.36	770365.79	N 32 7 17.72	W 103 35 36.73	12.00	4351.96
	16504.00	90.52	0.10	12392.04	4345.96	4351.89	904.76	0.14	408851.36	770365.90	N 32 7 18.66	W 103 35 36.72	11.74	4444.95
	16599.00	90.93	359.97	12390.83	4440.95	4446.88	904.82	0.45	408946.34	770365.96	N 32 7 19.60	W 103 35 36.71	11.50	4538.00
	16694.00	91.10	0.30	12389.15	4535.93	4541.87	905.04	0.39	409041.33	770366.18	N 32 7 20.54	W 103 35 36.70	11.27	4631.16
	16789.00	90.72	359.86	12387.64	4630.91	4636.85	905.17	0.61	409136.31	770366.31	N 32 7 21.48	W 103 35 36.69	11.05	4724.38
	16884.00	90.83	0.39	12386.36	4725.90	4731.85	905.38	0.57	409231.30	770366.52	N 32 7 22.42	W 103 35 36.68	10.83	4817.68
	16979.00	90.88	359.99	12384.96	4820.88	4826.83	905.70	0.42	409326.28	770366.84	N 32 7 23.36	W 103 35 36.67	10.63	4911.07
Section Crossing [2402' FEL]	*17046.50*	*90.98*	*359.76*	*12383.87*	*4888.38*	*4894.33*	*905.55*	*0.38*	*409393.77*	*770366.69*	*N 32 7 24.03*	*W 103 35 36.66*	*10.48*	*4977.39*
	17074.00	91.03	359.67	12383.39	4915.87	4921.82	905.41	0.38	409421.27	770366.55	N 32 7 24.30	W 103 35 36.66	10.42	5004.41
	17169.00	90.89	0.00	12381.80	5010.86	5016.81	905.14	0.38	409516.25	770366.28	N 32 7 25.24	W 103 35 36.66	10.23	5097.81
	17264.00	89.72	0.67	12381.29	5105.85	5111.80	905.70	1.42	409611.24	770366.84	N 32 7 26.18	W 103 35 36.65	10.05	5191.42
	17359.00	91.48	1.43	12380.30	5200.81	5206.78	907.44	2.02	409706.21	770368.58	N 32 7 27.12	W 103 35 36.62	9.89	5285.26
	17454.00	91.31	359.29	12377.98	5295.77	5301.74	908.03	2.26	409801.17	770369.17	N 32 7 28.06	W 103 35 36.60	9.72	5378.94
	17548.00	90.86	358.56	12376.20	5389.74	5395.71	906.27	0.91	409895.14	770367.41	N 32 7 28.99	W 103 35 36.62	9.53	5471.29
	17643.00	91.41	359.61	12374.32	5484.72	5490.67	904.75	1.25	409990.10	770365.89	N 32 7 29.93	W 103 35 36.63	9.36	5564.72
	17738.00	92.10	359.59	12371.41	5579.67	5585.63	904.09	0.73	410085.05	770365.23	N 32 7 30.87	W 103 35 36.63	9.19	5658.32
	17833.00	92.30	358.58	12367.77	5674.60	5680.54	902.58	1.08	410179.96	770363.72	N 32 7 31.81	W 103 35 36.64	9.03	5751.80
	17929.00	92.58	0.09	12363.68	5770.50	5776.45	901.46	1.60	410275.86	770362.60	N 32 7 32.76	W 103 35 36.64	8.87	5846.36
	18023.00	91.48	358.29	12360.35	5864.44	5870.37	900.13	2.24	410369.79	770361.27	N 32 7 33.69	W 103 35 36.65	8.72	5938.98
	18118.00	92.13	358.45	12357.36	5959.37	5965.29	897.43	0.70	410464.70	770358.57	N 32 7 34.63	W 103 35 36.67	8.56	6032.42
	18213.00	92.13	358.20	12353.83	6054.28	6060.18	894.66	0.26	410559.59	770355.80	N 32 7 35.56	W 103 35 36.70	8.40	6125.86
	18308.00	92.24	358.48	12350.20	6149.18	6155.07	891.91	0.32	410654.48	770353.05	N 32 7 36.50	W 103 35 36.72	8.25	6219.36
	18403.00	92.51	358.49	12346.27	6244.08	6249.96	889.40	0.28	410749.36	770350.54	N 32 7 37.44	W 103 35 36.74	8.10	6312.92
	18498.00	91.27	358.71	12343.13	6339.01	6344.87	887.08	1.33	410844.27	770348.22	N 32 7 38.38	W 103 35 36.76	7.96	6406.59
	18593.00	91.38	0.02	12340.94	6433.99	6439.84	886.03	1.38	410939.24	770347.17	N 32 7 39.32	W 103 35 36.77	7.83	6500.51
	18688.00	91.10	359.17	12338.88	6528.96	6534.82	885.35	0.94	411034.21	770346.49	N 32 7 40.26	W 103 35 36.77	7.72	6594.52
	18783.00	89.55	357.36	12338.34	6623.93	6629.76	882.48	2.51	411129.15	770343.62	N 32 7 41.20	W 103 35 36.79	7.58	6688.24
	18879.00	89.28	357.38	12339.32	6719.85	6725.66	878.07	0.28	411225.04	770339.21	N 32 7 42.15	W 103 35 36.84	7.44	6782.73
	18974.00	88.52	1.04	12341.15	6814.81	6820.61	876.76	3.93	411320.00	770337.90	N 32 7 43.09	W 103 35 36.85	7.32	6876.74
	19069.00	88.25	0.54	12343.82	6909.75	6915.57	878.07	0.60	411414.95	770339.21	N 32 7 44.03	W 103 35 36.82	7.24	6971.09
	19164.00	89.21	1.42	12345.93	7004.70	7010.53	879.70	1.37	411509.90	770340.84	N 32 7 44.97	W 103 35 36.80	7.15	7065.51
	19259.00	88.21	0.46	12348.07	7099.65	7105.49	881.26	1.46	411604.86	770342.40	N 32 7 45.91	W 103 35 36.77	7.07	7159.93

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 ° ' ")	Closure Azimuth (°)	Closure (ft)
	19354.00	88.80	1.02	12350.55	7194.60	7200.45	882.48	0.86	411699.82	770343.62	N 32 7 46.85	W 103 35 36.75	6.99	7254.32
	19449.00	88.14	359.66	12353.08	7289.55	7295.41	883.05	1.59	411794.78	770344.19	N 32 7 47.79	W 103 35 36.73	6.90	7348.66
	19544.00	90.21	4.61	12354.45	7384.42	7390.30	886.58	5.65	411889.66	770347.72	N 32 7 48.73	W 103 35 36.69	6.84	7443.29
	19639.00	89.17	4.30	12354.97	7479.08	7485.01	893.96	1.14	411984.37	770355.10	N 32 7 49.66	W 103 35 36.59	6.81	7538.20
	19734.00	88.28	0.74	12357.08	7573.92	7579.88	898.14	3.86	412079.23	770359.28	N 32 7 50.60	W 103 35 36.54	6.76	7632.90
	19829.00	88.73	0.67	12359.56	7668.87	7674.84	899.31	0.48	412174.19	770360.45	N 32 7 51.54	W 103 35 36.52	6.68	7727.35
	19924.00	88.59	358.53	12361.78	7763.84	7769.80	898.64	2.26	412269.15	770359.78	N 32 7 52.48	W 103 35 36.52	6.60	7821.60
	20019.00	87.76	357.66	12364.81	7858.75	7864.70	895.49	1.27	412364.05	770356.63	N 32 7 53.42	W 103 35 36.54	6.50	7915.52
	20113.00	88.93	356.58	12367.52	7952.62	7958.54	890.77	1.69	412457.89	770351.91	N 32 7 54.35	W 103 35 36.59	6.39	8008.24
	20208.00	88.49	356.17	12369.66	8047.44	8053.33	884.76	0.63	412552.67	770345.90	N 32 7 55.29	W 103 35 36.65	6.27	8101.78
	20303.00	89.14	356.55	12371.63	8142.27	8148.11	878.73	0.79	412647.45	770339.87	N 32 7 56.23	W 103 35 36.72	6.16	8195.36
	20398.00	90.00	357.38	12372.34	8237.16	8242.98	873.70	1.26	412742.31	770334.84	N 32 7 57.16	W 103 35 36.77	6.05	8289.15
	20493.00	89.69	358.01	12372.60	8332.11	8337.90	869.88	0.74	412837.23	770331.02	N 32 7 58.10	W 103 35 36.80	5.96	8383.15
	20588.00	89.93	359.22	12372.91	8427.09	8432.87	867.59	1.30	412932.20	770328.73	N 32 7 59.04	W 103 35 36.82	5.87	8477.38
	20683.00	90.14	359.04	12372.85	8522.09	8527.86	866.14	0.29	413027.18	770327.28	N 32 7 59.98	W 103 35 36.83	5.80	8571.73
	20779.00	90.03	0.55	12372.71	8618.08	8623.85	865.80	1.58	413123.18	770326.94	N 32 8 0.93	W 103 35 36.83	5.73	8667.21
	20873.00	90.03	1.86	12372.66	8712.04	8717.83	867.78	1.39	413217.15	770328.92	N 32 8 1.86	W 103 35 36.80	5.68	8760.91
	20969.00	89.83	359.47	12372.78	8808.02	8813.82	868.89	2.50	413313.13	770330.03	N 32 8 2.81	W 103 35 36.78	5.63	8856.54
	21064.00	90.07	1.77	12372.86	8903.00	8908.80	869.92	2.43	413408.12	770331.06	N 32 8 3.75	W 103 35 36.76	5.58	8951.18
	21158.00	90.17	359.93	12372.66	8996.98	9002.79	871.31	1.96	413502.10	770332.45	N 32 8 4.68	W 103 35 36.73	5.53	9044.86
	21253.00	90.83	0.53	12371.83	9091.97	9097.78	871.69	0.94	413597.09	770332.84	N 32 8 5.62	W 103 35 36.72	5.47	9139.45
	21348.00	89.83	359.34	12371.29	9186.96	9192.78	871.59	1.64	413692.08	770332.73	N 32 8 6.56	W 103 35 36.72	5.42	9234.01
	21443.00	89.76	358.98	12371.63	9281.96	9287.77	870.19	0.39	413787.07	770331.34	N 32 8 7.50	W 103 35 36.72	5.35	9328.45
	21538.00	89.83	358.02	12371.97	9376.94	9382.73	867.71	1.01	413882.03	770328.85	N 32 8 8.44	W 103 35 36.75	5.28	9422.77
	21633.00	90.00	358.57	12372.11	9471.91	9477.69	864.88	0.61	413976.99	770326.02	N 32 8 9.38	W 103 35 36.77	5.21	9517.07
	21728.00	90.03	358.74	12372.08	9566.90	9572.67	862.65	0.18	414071.96	770323.79	N 32 8 10.32	W 103 35 36.79	5.15	9611.46
	21823.00	89.83	0.12	12372.20	9661.89	9667.66	861.71	1.47	414166.95	770322.85	N 32 8 11.26	W 103 35 36.79	5.09	9705.99
	21918.00	89.79	0.34	12372.51	9756.89	9762.66	862.09	0.24	414261.94	770323.23	N 32 8 12.20	W 103 35 36.78	5.05	9800.65
	22013.00	90.03	0.35	12372.66	9851.88	9857.66	862.66	0.25	414356.94	770323.80	N 32 8 13.14	W 103 35 36.77	5.00	9895.33
	22107.00	90.03	0.86	12372.61	9945.87	9951.65	863.65	0.54	414450.93	770324.79	N 32 8 14.07	W 103 35 36.75	4.96	9989.06
	22202.00	89.76	0.59	12372.79	10040.85	10046.64	864.85	0.40	414545.92	770326.00	N 32 8 15.01	W 103 35 36.73	4.92	10083.80
Last Legal Take Point [100' FNL,2409' FEL]	*22229.50*	*89.79*	*0.16*	*12372.90*	*10068.35*	*10074.14*	*865.03*	*1.57*	*414573.42*	*770326.18*	*N 32 8 15.28*	*W 103 35 36.72*	*4.91*	*10111.21*
Last Survey	22234.00	89.79	0.09	12372.91	10072.85	10078.64	865.04	1.57	414577.92	770326.19	N 32 8 15.33	W 103 35 36.72	4.91	10115.70
TD, PTB [51' FNL, 2409' FEL]	22279.00	89.79	0.09	12373.08	10117.84	10123.64	865.11	0.00	414622.91	770326.26	N 32 8 15.77	W 103 35 36.72	4.88	10160.54

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	23.000	1/98.425	14.750	10.750	NAL_MWD_IFR1+MS-Depth Only	ST01 / Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H ST01 MWD 0ft-22279ft (Surcon
	1	23.000	23.000	Act Stns	14.750	10.750	NAL_MWD_IFR1+MS-Depth Only	ST01 / Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H ST01 MWD 0ft-22279ft (Surcon
	1	23.000	1018.000	Act Stns	14.750	10.750	NAL_MWD_IFR1+MS	ST01 / Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H
	1	1018.000	11435.000	Act Stns	9.875	7.625	NAL_MWD_IFR1+MS	ST01 / Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H
	1	11435.000	12526.000	Act Stns	8.750	7.625	NAL_MWD_IFR1+MS	ST01 / Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H

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 ° ' ")	Closure Azimuth (°)	Closure (ft)
		1	12526.000	22279.000	Act Stns	6.750	4.500	NAL_MWD_IFR1+MS		ST01 / Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H				

Schlumberger **Cimarex** Final PvA **CIMAREX**

Borehole:	Well:	Field:	Structure:
ST01	Cimarex Vaca Draw 20-17 Federal #4H	NM Lea County (NAD 83)	Cimarex Vaca Draw 20-17 Federal #4H

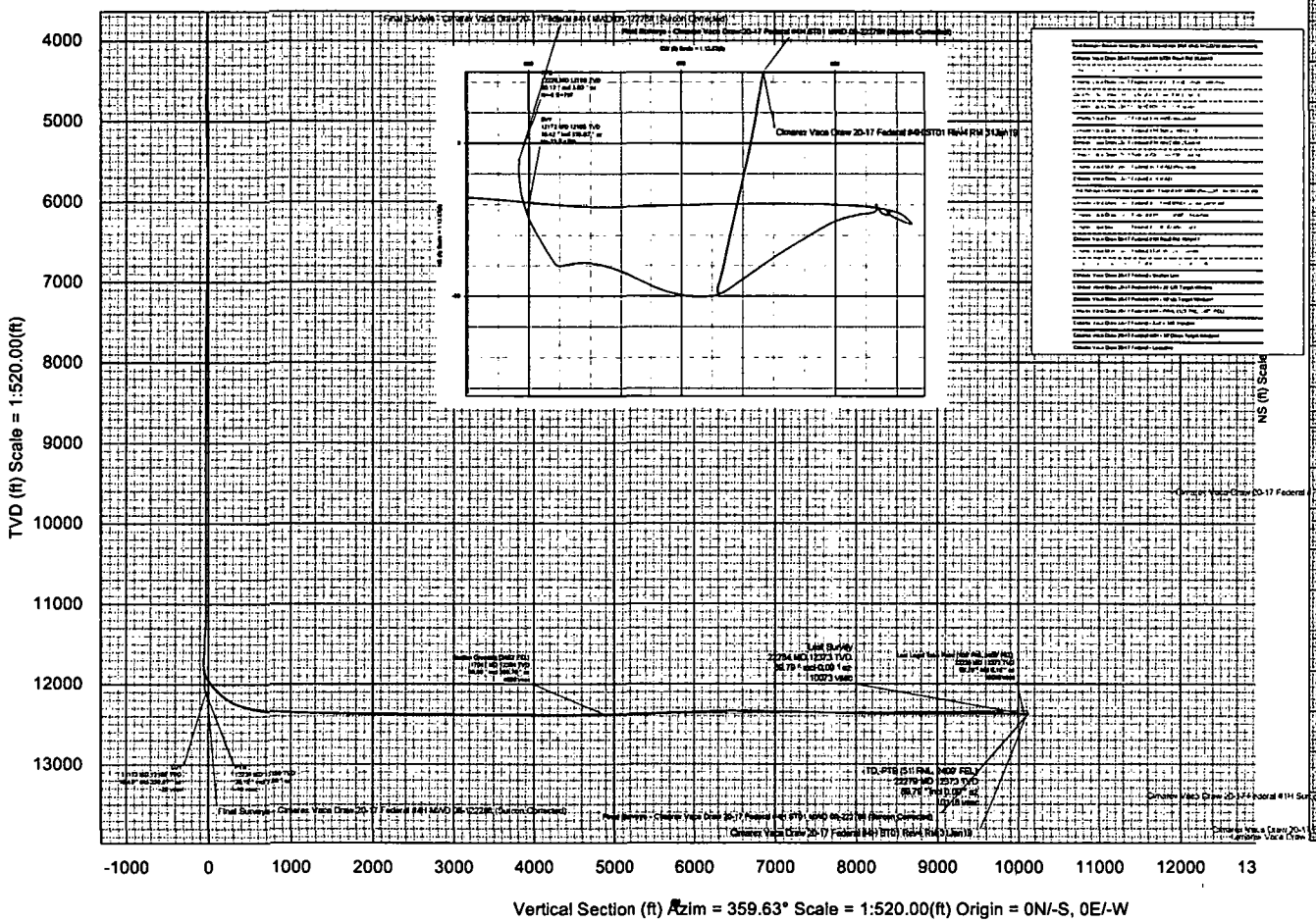
Gravity & Magnetic Parameters						Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet					Miscellaneous		
Model:	HDGM 2019	Dip:	59.739°	Date:	31-Jan-2019	Lat:	N 32 6 38.66	Northing:	404489.81RUS	Grid Conv:	0.3916°	Slot:	Cimarex Vaca Draw 20-17 Federal #4H	TVD Ref:	RKB(3440.7ft above MSL)
MagDec:	6.681°	FS:	47912.55nT	Gravity FS:	998.43mgn (9.80655 Based)	Lon:	W 103 36 47.59	Easting:	769481.17RUS	Scale Fact:	0.99996269	Plan:	Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H ST01 MWD 06-22278ft (Surcon Corrected)		

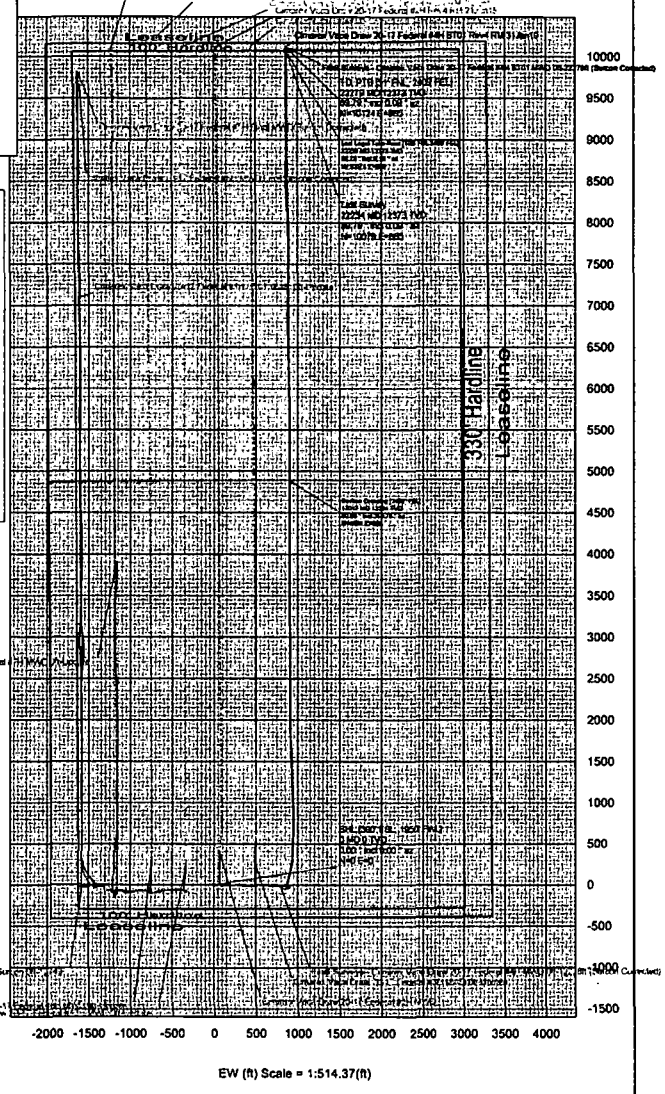
Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [390' FSL, 1950' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Section Crossing [2402' FEL]	17046.50	90.98	359.76	12383.87	4888.38	4894.33	905.55	0.38
Last Legal Take Point [100' FNL, 2409' FEL]	22229.50	89.79	0.18	12372.90	10068.35	10074.14	883.03	1.57
Last Survey	22334.00	89.79	0.09	12372.91	10072.85	10078.64	883.04	1.57
TD, PTB [51' FNL, 2409' FEL]	22379.00	89.79	0.09	12373.08	10117.84	10123.64	883.11	0.00

CONTROLLED

Grid North
Tot Corr (M->G 6.289°)
Mag Dec (6.681°)
Grid Conv (0.392°)





Cimarex Energy Co.
600 N. Marienfeld St. ♦ Suite 600 ♦ Midland, TX 79701 ♦ (432) 620-1938 ♦ Fax (432) 620-1940
A subsidiary of Cimarex Energy Co. • A NYSE Listed Company • "XEC"

August 28, 2019

State of New Mexico
Oil Conservation Division – District 1
1625 N. French Drive
Hobbs, NM 88240

Re: Request for Exception to Rule 107J
Tubingless Completion
Vaca Draw 20-17 Federal #4H – 30-025-44304
Lea County, NM

Dear Sir:

Cimarex Energy Co. respectfully requests an exception to NMOCD Rule 107J, well tubing requirements. Cimarex request a tubingless completions for our Vaca Draw 20-17 Federal #4H well to allow for greater flowback after frac stimulation.

Cimarex plans to install production tubing as soon as flow decreases, which should occur within 6 months.

Thank you for your consideration of this request. Please feel free to contact me if you need additional information.

Sincerely,

Fatima Vasquez
Regulatory Analyst
432-620-1933