

Final Surveys - Cimarex Lea 7 Federal Com 30H MWD 0ft-16076ft MD (Surcon Corrected) Survey Geodetic Report (Def Survey)



Report Date: December 27, 2018 - 01:22 PM
 Client: Cimarex
 Field: NM Lea County (NAD 83)
 Structure / Slot: Cimarex Lea 7 Federal Com 30H / Cimarex Lea 7 Federal Com 30H
 Well: Cimarex Lea 7 Federal Com 30H
 Borehole: Original Borehole
 UWI / API#: Unknown / Unknown
 Survey Name: Final Surveys - Cimarex Lea 7 Federal Com 30H MWD 0ft-16076ft MD (Surcon Corrected)
 Survey Date: November 16, 2018
 Test / AHD / DDI / ERD Ratio: 184.903 / 5548.297 / 6.165 / 0.492
 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
 Location Lat / Long: N 32° 34' 51.37965", W 103° 29' 30.25868"
 Location Grid N/E Y/X: N 576101.490 RUS, E 800567.480 RUS
 CRS Grid Convergence Angle: 0.4532°
 Grid Scale Factor: 0.99998605
 Version / Patch: 2.10.753.0

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 359.534° (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: RKB
 TVD Reference Elevation: 3702.600 ft above MSL
 Seabed / Ground Elevation: 3676.600 ft above MSL
 Magnetic Declination: 6.591°
 Total Gravity Field Strength: 998.5062mgm (8.00665 Based)
 Gravity Model: GARM
 Total Magnetic Field Strength: 48116.606 nT
 Magnetic Dip Angle: 60.503°
 Declination Date: December 13, 2018
 Magnetic Declination Model: HDGM 2018
 North Reference: Grid North
 Grid Convergence Used: 0.4532°
 Total Cor Mag North-Grid North: 6.1373°
 Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	Closure (ft)	Closure Azimuth (°)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ° '")	Longitude (E/W ° ° '")
SHL [191° FSL, 1139° FEL]	0.00	0.00	0.00	0.00	-3702.60	0.00	0.00	0.00	N/A	0.00	0.00	576101.49	800567.48	N 32°34'51.38	W 103°29'30.26
	181.00	0.20	127.85	181.00	-3521.60	-0.20	-0.19	0.25	0.11	0.32	127.85	576101.30	800567.73	N 32°34'51.38	W 103°29'30.26
	227.00	0.86	324.75	227.00	-3405.60	0.39	0.39	-0.09	0.91	0.40	346.66	576101.88	800567.39	N 32°34'51.38	W 103°29'30.26
	388.00	0.85	325.34	387.99	-3314.61	1.51	1.51	-0.87	0.01	1.74	329.95	576103.00	800566.61	N 32°34'51.39	W 103°29'30.27
	478.00	0.89	13.64	477.98	-3224.62	2.74	2.73	-1.09	0.79	2.94	338.34	576104.22	800566.39	N 32°34'51.41	W 103°29'30.27
	569.00	1.25	33.19	568.96	-3133.64	4.25	4.25	-0.38	0.56	4.27	354.95	576105.74	800567.10	N 32°34'51.42	W 103°29'30.26
	659.00	1.12	25.81	658.94	-3043.66	5.86	5.86	0.54	0.22	5.89	5.30	576107.35	800566.02	N 32°34'51.44	W 103°29'30.25
	750.00	1.13	28.40	749.92	-2952.68	7.44	7.45	1.36	0.06	7.58	10.33	576108.94	800565.84	N 32°34'51.45	W 103°29'30.24
	841.00	1.10	29.60	840.91	-2861.69	8.99	9.00	2.22	0.04	9.27	13.83	576110.49	800565.70	N 32°34'51.47	W 103°29'30.23
	932.00	1.16	33.01	931.89	-2770.71	10.51	10.54	3.15	0.10	11.00	16.65	576112.03	800565.63	N 32°34'51.48	W 103°29'30.22
	1026.00	1.08	32.49	1025.87	-2678.73	12.05	12.08	4.14	0.09	12.77	18.93	576113.57	800565.57	N 32°34'51.50	W 103°29'30.21
	1120.00	1.02	28.32	1119.88	-2582.74	13.52	13.56	5.02	0.10	14.46	20.30	576115.05	800565.50	N 32°34'51.51	W 103°29'30.20
	1214.00	1.08	27.29	1213.84	-2488.76	15.04	15.09	5.82	0.07	16.17	21.09	576116.58	800565.30	N 32°34'51.53	W 103°29'30.19
	1308.00	1.15	28.35	1307.82	-2394.78	16.71	16.71	6.67	0.08	17.99	21.78	576118.20	800565.15	N 32°34'51.54	W 103°29'30.18
	1402.00	0.94	80.89	1401.81	-2300.79	17.85	17.91	7.80	0.68	18.53	23.52	576119.40	800565.29	N 32°34'51.56	W 103°29'30.17
	1496.00	0.88	84.61	1495.80	-2206.80	18.28	18.35	8.19	0.40	20.53	28.59	576119.84	800565.67	N 32°34'51.56	W 103°29'30.15
	1591.00	0.71	84.94	1590.79	-2111.81	18.39	18.47	10.50	0.18	21.25	29.61	576119.96	800567.98	N 32°34'51.56	W 103°29'30.13
	1675.00	0.74	93.30	1674.78	-2027.82	18.39	18.49	11.56	0.13	21.81	32.02	576119.98	800567.94	N 32°34'51.56	W 103°29'30.12
	1781.00	0.69	104.35	1780.77	-1921.83	18.19	18.29	12.86	0.14	22.36	35.11	576119.78	800580.34	N 32°34'51.56	W 103°29'30.11
	1875.00	0.60	93.84	1874.77	-1827.83	18.00	18.12	13.90	0.16	22.84	37.50	576119.61	800581.38	N 32°34'51.56	W 103°29'30.09
	1969.00	0.67	95.22	1968.78	-1733.84	17.91	18.04	14.94	0.08	23.42	39.64	576119.52	800582.42	N 32°34'51.56	W 103°29'30.08
	2063.00	0.76	126.08	2062.75	-1639.85	17.83	17.96	16.11	0.10	24.13	41.89	576119.45	800583.59	N 32°34'51.56	W 103°29'30.07
	2157.00	0.80	85.67	2156.74	-1545.86	17.85	18.00	17.47	0.18	25.06	44.15	576119.49	800584.95	N 32°34'51.56	W 103°29'30.05
	2252.00	0.87	85.10	2251.73	-1450.87	17.96	18.11	18.83	0.03	26.20	46.27	576119.60	800586.41	N 32°34'51.56	W 103°29'30.04
	2346.00	0.92	84.00	2345.72	-1356.88	18.09	18.25	20.39	0.06	27.37	48.17	576119.74	800587.87	N 32°34'51.56	W 103°29'30.02
	2440.00	0.95	85.23	2439.71	-1262.89	18.08	18.26	21.92	0.20	28.53	50.20	576119.75	800589.40	N 32°34'51.56	W 103°29'30.00
	2534.00	1.05	92.88	2533.69	-1168.91	17.95	18.15	23.56	0.11	29.74	52.39	576119.64	800591.04	N 32°34'51.56	W 103°29'29.98
	2628.00	1.11	83.58	2627.68	-1074.92	18.00	18.21	25.32	0.20	31.19	54.28	576119.70	800592.80	N 32°34'51.56	W 103°29'29.96
	2723.00	1.18	80.83	2722.68	-979.94	18.24	18.47	27.20	0.09	32.68	55.83	576119.95	800594.68	N 32°34'51.56	W 103°29'29.94
	2817.00	0.68	133.42	2816.65	-885.95	18.01	18.25	28.55	1.00	33.88	57.42	576119.74	800596.03	N 32°34'51.56	W 103°29'29.92
	2911.00	0.79	178.06	2910.64	-791.96	16.99	17.23	28.97	0.60	33.70	59.26	576118.72	800598.44	N 32°34'51.55	W 103°29'29.92
	3005.00	0.95	148.89	3004.63	-697.97	15.99	15.93	29.41	0.52	33.45	61.58	576117.42	800599.89	N 32°34'51.55	W 103°29'29.91
	3099.00	1.00	136.94	3098.62	-603.98	14.43	14.67	30.40	0.19	33.76	64.23	576116.16	800601.88	N 32°34'51.52	W 103°29'29.90
	3193.00	1.26	114.52	3192.60	-510.00	13.39	13.65	31.50	0.54	34.70	66.84	576115.14	800603.98	N 32°34'51.51	W 103°29'29.88
	3288.00	0.62	125.52	3287.58	-415.02	12.56	12.83	32.15	0.38	35.58	69.67	576114.32	800606.07	N 32°34'51.50	W 103°29'29.87
	3382.00	0.42	247.44	3381.58	-321.02	12.05	12.32	33.21	0.91	35.42	69.65	576113.81	800608.69	N 32°34'51.50	W 103°29'29.87
	3476.00	0.14	93.83	3475.58	-227.02	11.91	12.18	33.01	0.58	35.18	69.75	576113.67	800610.49	N 32°34'51.50	W 103°29'29.87
	3570.00	0.22	203.58	3569.58	-133.02	11.73	12.00	33.05	0.32	35.16	70.04	576113.49	800610.53	N 32°34'51.50	W 103°29'29.87
	3665.00	0.61	228.86	3664.58	-38.02	11.24	11.50	32.60	0.44	34.57	70.58	576112.99	800610.08	N 32°34'51.49	W 103°29'29.88
	3759.00	0.82	229.47	3758.57	55.97	10.48	10.74	31.71	0.22	33.48	71.29	576112.23	800609.19	N 32°34'51.48	W 103°29'29.89
	3853.00	1.23	221.95	3852.56	149.96	9.30	9.56	30.52	0.46	31.98	72.62	576111.04	800608.00	N 32°34'51.47	W 103°29'29.90
	3947.00	1.48	228.62	3946.53	243.93	7.76	8.00	28.94	0.31	30.02	74.55	576109.49	800606.42	N 32°34'51.46	W 103°29'29.92
	4042.00	1.72	231.61	4041.49	338.89	6.08	6.30	28.90	0.27	27.63	78.82	576107.79	800604.38	N 32°34'51.44	W 103°29'29.94
	4230.00	2.00	228.68	4229.39	528.79	2.21	2.39	22.22	0.16	22.34	83.86	576103.88	800606.70	N 32°34'51.40	W 103°29'30.00
	4324.00	1.99	228.60	4323.34	620.74	0.07	0.23	19.76	0.01	19.76	89.33	576101.72	800608.24	N 32°34'51.38	W 103°29'30.03
	4418.00	1.95	228.92	4417.28	714.68	-0.04	-1.90	17.33	0.04	17.43	96.25	576099.59	800608.81	N 32°34'51.36	W 103°29'30.08
	4512.00	1.91	228.01	4511.23	808.63	-4.12	-4.00	14.98	0.05	15.48	104.96	576097.49	800606.44	N 32°34'51.34	W 103°29'30.08
	4607.00	1.94	228.18	4605.18	902.57	-8.09	-8.09	12.55	0.08	13.94	115.86	576095.40	800605.03	N 32°34'51.32	W 103°29'30.11
	4701.00	1.72	226.78	4700.13	997.53	-8.15	-8.07	10.30	0.26	13.08	128.09	576093.42	800607.78	N 32°34'51.30	W 103°29'30.14
	4795.00	1.57	224.21	4794.09	1091.49	-10.03	-9.86	8.37	0.18	13.01	139.96	576091.53	800607.85	N 32°34'51.28	W 103°29'30.16
	4889.00	1.54	226.42	4888.05	1185.45	-11.81	-11.75	6.56	0.07	13.46	150.84	576089.74	800607.04	N 32°34'51.26	W 103°29'30.18
	4983.00	1.28	218.80	4982.02	1279.42	-13.48	-13.44	4.98	0.34	14.34	159.66	576088.05	800607.48	N 32°34'51.25	W 103°29'30.20
	5078.00	1.30	224.24	5077.00	1374.40	-15.07	-15.04	3.57	0.13	15.48	168.66	576086.45	800607.05	N 32°34'51.23	W 103°29'30.22
	5172.00	1.25	221.45	5170.98	1469.38	-16.61	-16.60	2.05	0.05	16.72	172.97	576084.89	800606.89	N 32°34'51.22	W 103°29'30.24
	5266.00	1.51	216.05	5264.95	1562.35	-18.39	-18.39	0.54	0.28	18.40	178.31	576083.10	800606.02	N 32°34'51.20	W 103°29'30.25
	5360.00	1.31	228.69	5358.92	1656.32	-20.09	-20.10	-0.99	0.39	20.12	182.83	576081.39	800606.49	N 32°34'51.18	W 103°29'30.27
	5455.00	1.23	216.20	5453.89	1751.29	-21.62	-21.64	-2.41	0.30	21.77	188.38	576079.85	800606.05	N 32°34'51.17	W 103°29'30.29
	5550.00	1.12	231.42	5548.87	1846.27	-23.01	-23.04	-3.74	0.35	23.34	189.22	576078.45	800605.74	N 32°34'51.15	W 103°29'30.30
	5645.00	1.08	226.33	5644.84	1932.24	-25.31	-25.38	-4.41	0.08	26.18	194.18				

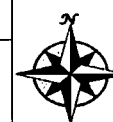
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Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Lea 7 Federal Com 30H	NM Lea County (NAD 83)	Cimarex Lea 7 Federal Com 30H

Gravity & Magnetic Parameters	Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Microstratigraphy
Model: HDGM 3018	Lat: N 32 34 51.38	Northings: 879101.43N1/2	Site: Cimarex Lea 7 Federal Com 30H
Mag Dec: 6.891°	Lon: W 103 29 30.38	Bearings: 800547.28N1/2	Plan: Cimarex Lea 7 Federal Com 30H
Dip: 60.803°		Grid Conv: 0.4532°	TVD Ref: RKB(3702.81 above MSL)
FB: 49116.80mT		Scale Fact: 0.88888886	Final Surveys - Cimarex Lea 7 Federal Com 30H MWD 01-180781 MD (Surcon Corrected)
Date: 13-Dec-2018			
Gravity FB: 986.528mgn (R,30885 Based)			

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DL8
SHL (101° FSL, 113° FEL)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
330° Hardline Crossing (184° FSL, 989° FEL)	7188.47	12.65	83.87	7172.72	-8.85	-8.83	149.50	0.53
Final Survey	16024.00	88.75	1.38	11177.79	4942.72	4948.80	458.76	1.75
TD, PTB (100° FHL, 847° FWL)	16078.00	88.75	1.38	11180.74	4994.81	4998.50	458.81	0.00

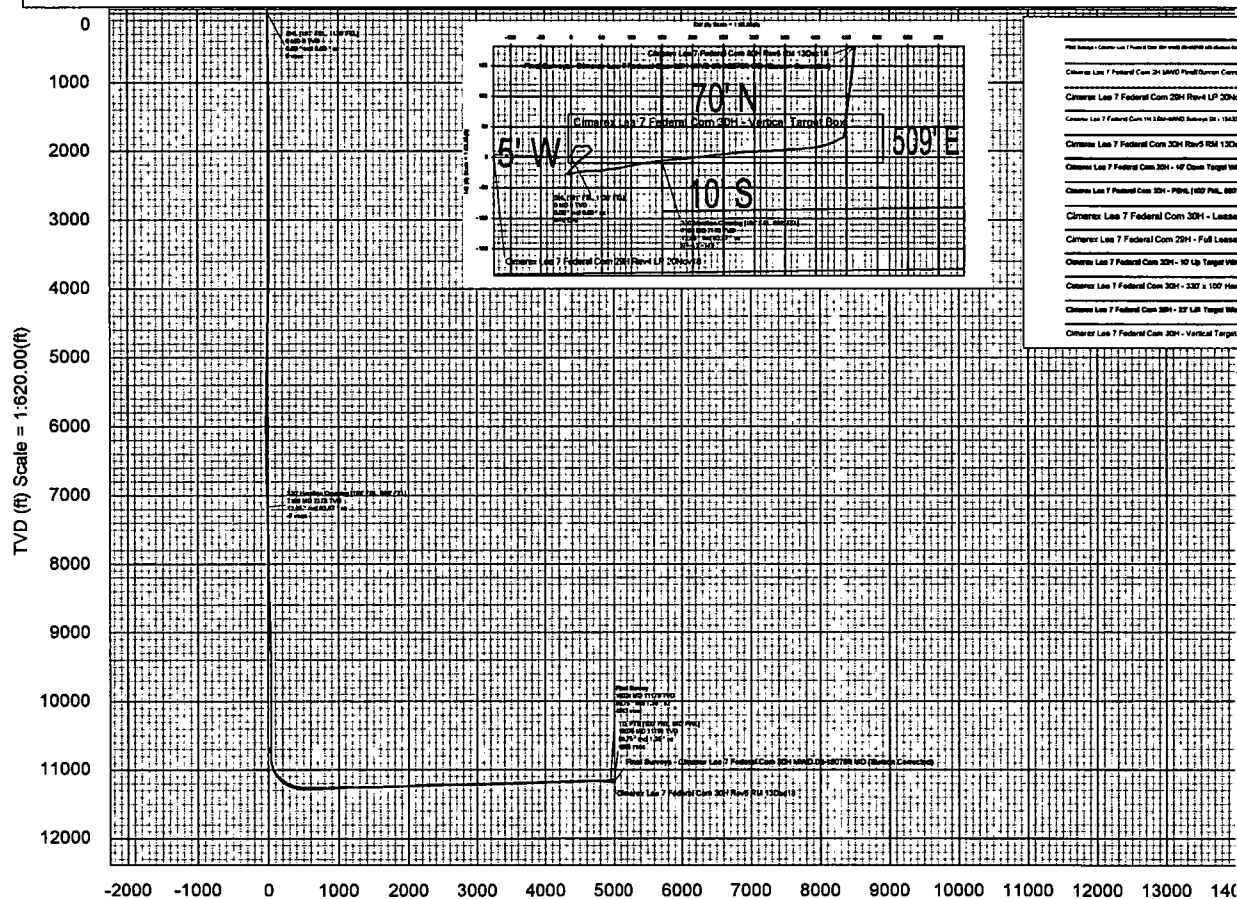


Grid
True
Mag

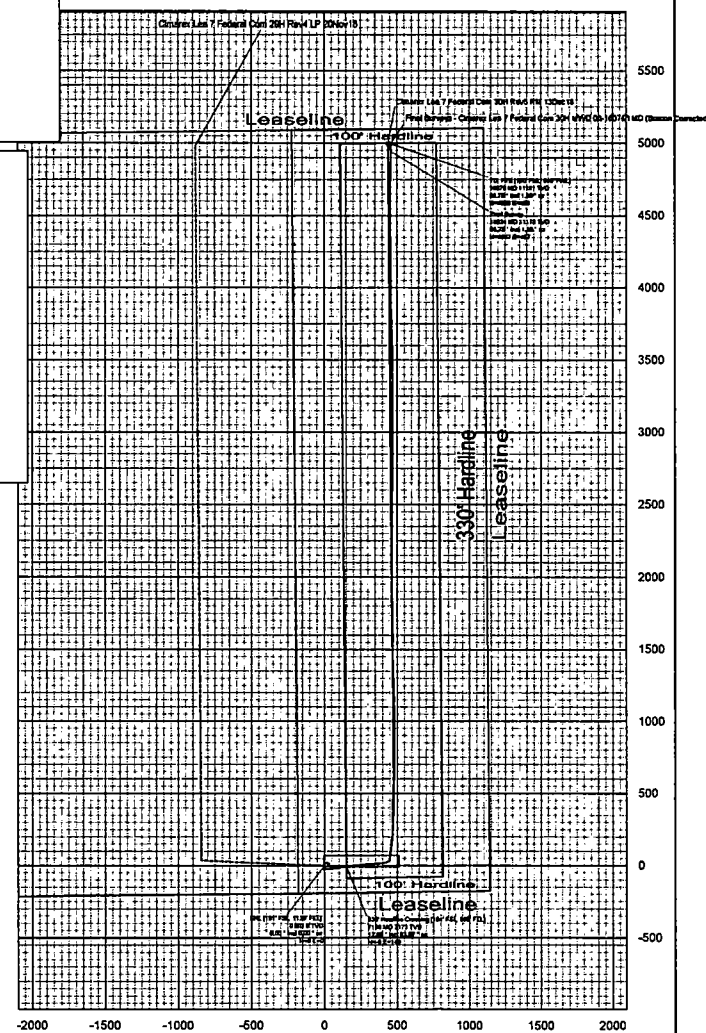
Grid North
Tot Corr (M→G 8.137°)
Mag Dec (8.591°)
Grid Conv (0.453°)

CONTROLLED

Drawn by	Checked by
Drawn on	Checked on
Drawn at	Checked at
Drawn for	Checked for
Drawn by	Checked by
Drawn on	Checked on
Drawn at	Checked at
Drawn for	Checked for



Vertical Section (ft) Azim = 359.53° Scale = 1:620.00(ft) Origin = 0N/-S, 0E/-W



EW (ft) Scale = 1:294.93(ft)