

## Survey Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well Herren 1E-33H-H367
<b>Project:</b>	Sec 33 T3N-R67W	<b>TVD Reference:</b>	WELL @ 4871.0ft (Original Well Elev)
<b>Site:</b>	Herren Pad	<b>MD Reference:</b>	WELL @ 4871.0ft (Original Well Elev)
<b>Well:</b>	Herren 1E-33H-H367	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	Sec 33 T3N-R67W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		Herren Pad			
Site Position:		Northing:	1,310,206.92 ft	Latitude:	40.183282
From:	Map	Easting:	3,171,259.40 ft	Longitude:	-104.887065
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.40 °

Well	Herren 1E-33H-H367					
Well Position	+N/-S	0.0 ft	Northing:	1,310,185.70 ft	Latitude:	40.183224
	+E/-W	0.0 ft	Easting:	3,171,238.19 ft	Longitude:	-104.887142
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,848.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM_FILE	12/15/2018	8.40	66.57	52,130.60000000

Design	FINAL			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	289.80

<b>Survey Program</b>	<b>Date</b>	12/19/2018			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
177.0	1,943.0	Survey #1 (Wellbore #1)	GYRO-MWD	OWSG Gyro MWD	
2,074.0	12,014.0	Survey #2 (Wellbore #1)	MWD+HDGM	OWSG MWD + HDGM	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
177.0	0.35	127.71	177.0	-0.3	0.4	-0.5	0.20	0.20	
366.0	0.97	84.46	366.0	-0.5	2.5	-2.5	0.40	0.33	
461.0	1.58	78.22	461.0	-0.2	4.6	-4.4	0.66	0.64	
555.0	3.17	70.14	554.9	1.0	8.3	-7.5	1.72	1.69	
649.0	4.75	60.21	648.7	3.8	14.1	-12.0	1.83	1.68	
744.0	6.42	43.24	743.2	9.6	21.1	-16.6	2.45	1.76	
838.0	8.27	28.74	836.4	19.4	28.0	-19.8	2.77	1.97	
913.0	9.81	23.59	910.5	29.9	33.2	-21.0	2.32	2.05	
1,007.0	12.14	19.56	1,002.8	46.6	39.7	-21.5	2.61	2.48	
1,102.0	14.95	19.75	1,095.1	67.6	47.2	-21.5	2.96	2.96	
1,197.0	16.20	16.58	1,186.6	91.8	55.1	-20.7	1.59	1.32	

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<b>Site:</b>	Herren Pad	<b>MD Reference:</b>	WELL @ 4871.0ft (Original Well Elev)
<b>Well:</b>	Herren 1E-33H-H367	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
1,291.0	16.68	21.93	1,276.8	116.9	63.9	-20.5	1.69	0.51	
1,386.0	15.98	29.05	1,368.0	141.0	75.3	-23.1	2.23	-0.74	
1,480.0	13.95	25.32	1,458.8	162.5	86.4	-26.3	2.39	-2.16	
1,575.0	12.67	24.81	1,551.2	182.3	95.7	-28.3	1.35	-1.35	
1,669.0	11.00	20.38	1,643.2	200.1	103.1	-29.3	2.02	-1.78	
1,763.0	10.20	22.96	1,735.6	216.2	109.5	-29.8	0.99	-0.85	
1,857.0	11.48	22.60	1,828.0	232.5	116.4	-30.7	1.36	1.36	
1,943.0	12.46	22.85	1,912.1	248.9	123.3	-31.7	1.14	1.14	
2,074.0	11.78	19.31	2,040.2	274.5	133.2	-32.3	0.77	-0.52	
2,168.0	12.88	17.55	2,132.0	293.6	139.5	-31.8	1.24	1.17	
2,262.0	14.81	14.83	2,223.3	315.2	145.7	-30.3	2.17	2.05	
2,356.0	16.79	16.76	2,313.7	339.8	152.7	-28.6	2.18	2.11	
2,450.0	17.36	19.92	2,403.6	366.0	161.4	-27.9	1.16	0.61	
2,545.0	18.19	26.16	2,494.0	392.6	172.8	-29.6	2.19	0.87	
2,639.0	18.63	29.42	2,583.2	418.9	186.6	-33.7	1.19	0.47	
2,734.0	17.84	26.69	2,673.5	445.1	200.6	-38.0	1.22	-0.83	
2,828.0	16.22	28.71	2,763.3	469.5	213.4	-41.7	1.83	-1.72	
2,922.0	14.72	26.52	2,853.9	491.7	225.0	-45.2	1.71	-1.60	
3,016.0	14.24	35.48	2,945.0	511.8	237.1	-49.7	2.43	-0.51	
3,111.0	12.92	33.72	3,037.3	530.1	249.8	-55.4	1.46	-1.39	
3,206.0	11.56	33.64	3,130.1	546.9	260.9	-60.2	1.43	-1.43	
3,300.0	10.59	23.79	3,222.4	562.6	269.6	-63.1	2.26	-1.03	
3,395.0	12.04	22.65	3,315.5	579.8	277.0	-64.2	1.54	1.53	
3,489.0	11.69	20.54	3,407.5	597.7	284.1	-64.8	0.59	-0.37	
3,583.0	11.73	22.56	3,499.6	615.5	291.1	-65.4	0.44	0.04	
3,678.0	11.43	24.93	3,592.6	632.9	298.8	-66.7	0.59	-0.32	
3,795.0	16.04	20.10	3,706.3	658.6	309.2	-67.8	4.06	3.94	
3,889.0	16.04	25.72	3,796.6	682.5	319.3	-69.2	1.65	0.00	
3,984.0	16.92	29.86	3,887.7	706.4	331.9	-73.0	1.54	0.93	
4,078.0	15.21	27.66	3,978.0	729.1	344.4	-77.1	1.93	-1.82	
4,173.0	14.77	23.18	4,069.8	751.3	355.0	-79.5	1.30	-0.46	
4,268.0	14.24	21.68	4,161.8	773.3	364.1	-80.6	0.68	-0.56	
4,362.0	14.37	28.89	4,252.9	794.3	374.0	-82.8	1.90	0.14	
4,457.0	14.59	25.29	4,344.9	815.4	384.8	-85.8	0.98	0.23	
4,551.0	16.96	30.82	4,435.3	837.9	396.9	-89.6	2.98	2.52	
4,646.0	16.00	28.45	4,526.4	861.3	410.2	-94.2	1.23	-1.01	
4,740.0	13.18	21.86	4,617.4	882.6	420.4	-96.5	3.48	-3.00	
4,835.0	14.02	19.75	4,709.7	903.5	428.3	-96.9	1.03	0.88	
4,929.0	15.60	23.97	4,800.6	925.8	437.3	-97.8	2.03	1.68	
5,024.0	16.61	28.71	4,891.9	949.4	449.0	-100.8	1.74	1.06	
5,118.0	14.68	25.81	4,982.4	971.9	460.6	-104.2	2.21	-2.05	
5,212.0	15.16	26.87	5,073.2	993.6	471.4	-106.9	0.59	0.51	
5,307.0	13.89	32.76	5,165.2	1,014.2	483.1	-111.0	2.05	-1.34	
5,402.0	13.01	37.50	5,257.6	1,032.3	495.8	-116.8	1.48	-0.93	
5,496.0	13.67	39.44	5,349.1	1,049.3	509.3	-123.8	0.85	0.70	
5,591.0	14.77	34.78	5,441.1	1,067.9	523.4	-130.7	1.67	1.16	
5,685.0	15.12	32.58	5,532.0	1,088.1	536.8	-136.5	0.71	0.37	
5,780.0	15.73	27.57	5,623.5	1,109.9	549.4	-141.0	1.54	0.64	
5,874.0	16.22	29.33	5,713.9	1,132.7	561.8	-144.9	0.73	0.52	
5,968.0	15.69	20.72	5,804.3	1,156.0	572.7	-147.2	2.58	-0.56	
6,063.0	14.72	22.30	5,896.0	1,179.2	581.8	-148.0	1.11	-1.02	
6,157.0	13.71	19.05	5,987.1	1,200.8	590.0	-148.4	1.37	-1.07	
6,251.0	13.84	21.15	6,078.4	1,221.8	597.7	-148.5	0.55	0.14	

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<b>Well:</b>	Herren 1E-33H-H367	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
6,346.0	14.63	22.56	6,170.5	1,243.5	606.4	-149.3	0.91	0.83	
6,441.0	14.50	24.06	6,262.4	1,265.4	615.8	-150.8	0.42	-0.14	
6,535.0	14.63	23.88	6,353.4	1,287.0	625.4	-152.5	0.15	0.14	
6,630.0	18.37	357.78	6,444.6	1,313.0	629.7	-147.7	8.64	3.94	
6,677.0	21.80	347.58	6,488.8	1,328.9	627.5	-140.3	10.41	7.30	
6,724.0	25.18	337.03	6,531.9	1,346.7	621.8	-128.8	11.45	7.19	
6,771.0	27.29	334.48	6,574.0	1,365.6	613.2	-114.4	5.09	4.49	
6,818.0	30.23	327.45	6,615.2	1,385.3	602.2	-97.4	9.53	6.26	
6,865.0	33.09	318.84	6,655.3	1,404.9	587.4	-76.8	11.37	6.09	
6,914.0	34.28	312.51	6,696.0	1,424.3	568.4	-52.3	7.56	2.43	
6,961.0	37.93	303.90	6,734.0	1,441.4	546.6	-26.1	13.28	7.77	
7,008.0	41.70	296.87	6,770.2	1,456.5	520.7	3.5	12.48	8.02	
7,055.0	44.91	287.81	6,804.4	1,468.7	490.9	35.6	14.87	6.83	
7,103.0	47.90	284.74	6,837.5	1,478.4	457.5	70.3	7.76	6.23	
7,150.0	49.26	279.11	6,868.6	1,485.6	423.1	105.2	9.43	2.89	
7,197.0	50.41	274.81	6,898.9	1,490.0	387.4	140.2	7.41	2.45	
7,244.0	51.11	274.63	6,928.6	1,493.0	351.2	175.3	1.52	1.49	
7,292.0	52.03	274.89	6,958.5	1,496.1	313.7	211.6	1.96	1.92	
7,339.0	54.76	275.07	6,986.5	1,499.4	276.1	248.1	5.82	5.81	
7,386.0	55.81	275.86	7,013.3	1,503.0	237.6	285.5	2.63	2.23	
7,433.0	58.84	275.77	7,038.6	1,507.0	198.3	323.9	6.45	6.45	
7,481.0	61.70	273.40	7,062.4	1,510.4	156.8	364.1	7.34	5.96	
7,528.0	63.98	272.79	7,083.9	1,512.6	115.0	404.2	4.99	4.85	
7,576.0	66.40	272.87	7,104.0	1,514.8	71.5	445.9	5.04	5.04	
7,623.0	69.21	272.96	7,121.8	1,517.0	28.0	487.5	5.98	5.98	
7,670.0	70.53	273.40	7,138.0	1,519.4	-16.0	529.8	2.94	2.81	
7,717.0	71.68	274.02	7,153.2	1,522.3	-60.4	572.5	2.75	2.45	
7,735.2	72.58	273.78	7,158.8	1,523.5	-77.7	589.1	5.09	4.93	TPZ - 7735.2' MD (755 FNL, 460 FEL)
7,764.0	74.00	273.40	7,167.0	1,525.2	-105.2	615.6	5.09	4.94	
7,811.0	78.93	272.87	7,178.0	1,527.7	-150.8	659.4	10.55	10.49	
7,859.0	83.80	272.08	7,185.2	1,529.8	-198.2	704.7	10.28	10.15	
7,954.0	88.24	271.03	7,191.8	1,532.3	-292.9	794.7	4.80	4.67	
8,048.0	90.66	270.41	7,192.7	1,533.5	-386.9	883.5	2.66	2.57	
8,142.0	90.75	270.06	7,191.6	1,533.9	-480.9	972.1	0.38	0.10	
8,237.0	90.09	269.09	7,190.9	1,533.2	-575.9	1,061.2	1.23	-0.69	
8,331.0	89.96	269.53	7,190.9	1,532.1	-669.9	1,149.3	0.49	-0.14	
8,426.0	90.53	272.87	7,190.4	1,534.0	-764.9	1,239.3	3.57	0.60	
8,521.0	91.06	273.05	7,189.1	1,539.0	-859.7	1,330.2	0.59	0.56	
8,615.0	90.84	272.79	7,187.6	1,543.7	-953.6	1,420.1	0.36	-0.23	
8,709.0	90.97	272.79	7,186.1	1,548.3	-1,047.5	1,510.0	0.14	0.14	
8,803.0	90.62	272.43	7,184.8	1,552.6	-1,141.4	1,599.8	0.53	-0.37	
8,898.0	90.62	271.99	7,183.8	1,556.3	-1,236.3	1,690.4	0.46	0.00	
8,992.0	90.84	271.99	7,182.6	1,559.5	-1,330.2	1,779.8	0.23	0.23	
9,087.0	90.18	271.29	7,181.7	1,562.2	-1,425.2	1,870.1	1.01	-0.69	
9,181.0	90.31	272.17	7,181.3	1,565.1	-1,519.1	1,959.5	0.95	0.14	
9,276.0	90.31	274.28	7,180.8	1,570.4	-1,614.0	2,050.5	2.22	0.00	
9,370.0	90.57	273.93	7,180.1	1,577.1	-1,707.7	2,141.0	0.46	0.28	
9,465.0	90.75	273.75	7,179.0	1,583.5	-1,802.5	2,232.3	0.27	0.19	
9,559.0	91.10	273.49	7,177.5	1,589.4	-1,896.3	2,322.6	0.46	0.37	
9,653.0	91.41	273.05	7,175.4	1,594.8	-1,990.1	2,412.7	0.57	0.33	
9,748.0	92.02	272.87	7,172.6	1,599.7	-2,085.0	2,503.6	0.67	0.64	
9,842.0	90.84	273.05	7,170.2	1,604.6	-2,178.8	2,593.5	1.27	-1.26	
9,937.0	91.01	273.84	7,168.7	1,610.3	-2,273.6	2,684.7	0.85	0.18	

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Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
10,031.0	90.70	273.93	7,167.3	1,616.6	-2,367.4	2,775.1	0.34	-0.33	
10,125.0	90.26	273.58	7,166.5	1,622.8	-2,461.2	2,865.4	0.60	-0.47	
10,220.0	89.82	273.49	7,166.4	1,628.7	-2,556.0	2,956.6	0.47	-0.46	
10,314.0	90.13	271.29	7,166.5	1,632.6	-2,649.9	3,046.3	2.36	0.33	
10,409.0	90.35	269.71	7,166.1	1,633.4	-2,744.9	3,135.9	1.68	0.23	
10,503.0	89.25	267.78	7,166.4	1,631.3	-2,838.9	3,223.7	2.36	-1.17	
10,597.0	89.52	267.51	7,167.4	1,627.5	-2,932.8	3,310.7	0.41	0.29	
10,692.0	88.42	266.46	7,169.1	1,622.5	-3,027.7	3,398.3	1.60	-1.16	
10,787.0	88.90	266.19	7,171.3	1,616.4	-3,122.4	3,485.4	0.58	0.51	
10,881.0	88.73	265.23	7,173.3	1,609.4	-3,216.2	3,571.2	1.04	-0.18	
10,976.0	87.76	266.98	7,176.2	1,602.9	-3,310.9	3,658.1	2.11	-1.02	
11,071.0	89.69	268.65	7,178.3	1,599.3	-3,405.8	3,746.2	2.69	2.03	
11,165.0	89.69	268.30	7,178.8	1,596.8	-3,499.7	3,833.7	0.37	0.00	
11,260.0	89.47	268.74	7,179.5	1,594.3	-3,594.7	3,922.3	0.52	-0.23	
11,354.0	88.86	268.92	7,180.9	1,592.4	-3,688.7	4,010.0	0.68	-0.65	
11,449.0	88.73	269.01	7,182.9	1,590.7	-3,783.6	4,098.8	0.17	-0.14	
11,544.0	88.24	269.18	7,185.4	1,589.2	-3,878.6	4,187.6	0.55	-0.52	
11,638.0	87.67	267.51	7,188.7	1,586.5	-3,972.5	4,275.1	1.88	-0.61	
11,732.0	87.01	267.34	7,193.1	1,582.3	-4,066.3	4,361.9	0.72	-0.70	
11,827.0	87.98	268.13	7,197.2	1,578.5	-4,161.1	4,449.8	1.32	1.02	
11,922.0	86.88	268.57	7,201.5	1,575.8	-4,256.0	4,538.2	1.25	-1.16	
11,946.0	86.48	268.48	7,202.9	1,575.2	-4,279.9	4,560.5	1.71	-1.67	LAST SURVEY - 11946.0' MD
12,014.0	86.48	268.48	7,207.1	1,573.4	-4,347.8	4,623.7	0.00	0.00	PTB - 12014.0' MD (759 FNL, 466 FWL)

## Survey Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well Herren 1E-33H-H367
<b>Project:</b>	Sec 33 T3N-R67W	<b>TVD Reference:</b>	WELL @ 4871.0ft (Original Well Elev)
<b>Site:</b>	Herren Pad	<b>MD Reference:</b>	WELL @ 4871.0ft (Original Well Elev)
<b>Well:</b>	Herren 1E-33H-H367	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Herren 1E-33H-H367 TF - actual wellpath misses target center by 12.7ft at 7731.9ft MD (7157.8 TVD, 1523.3 N, -74.5 E) - Point	0.00	0.00	7,150.0	1,513.7	-77.7	1,311,698.83	3,171,150.06	40.187380	-104.887420
Herren 1E 2733' TGT - actual wellpath misses target center by 14.0ft at 10397.0ft MD (7166.1 TVD, 1633.4 N, -2732.9 E) - Point	0.00	0.00	7,169.0	1,619.8	-2,733.0	1,311,786.55	3,168,494.06	40.187670	-104.896924
Herren 1E-33H-H367 Bf - actual wellpath misses target center by 12.0ft at 12014.0ft MD (7207.1 TVD, 1573.4 N, -4347.8 E) - Point	0.00	0.00	7,199.0	1,567.6	-4,354.4	1,311,723.16	3,166,873.03	40.187526	-104.902727
Herren 1E 1745' TGT - actual wellpath misses target center by 4.4ft at 9407.4ft MD (7179.7 TVD, 1579.7 N, -1745.0 E) - Point	0.00	0.00	7,184.0	1,580.7	-1,745.0	1,311,754.28	3,169,482.31	40.187563	-104.893387
Herren 1E 77' TGT - actual wellpath misses target center by 41.0ft at 7745.8ft MD (7161.9 TVD, 1524.1 N, -87.8 E) - Point	0.00	0.00	7,200.0	1,513.7	-77.0	1,311,698.81	3,171,150.73	40.187380	-104.887417

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,735.2	7,158.8	1,523.5	-77.7	TPZ - 7735.2' MD (755 FNL, 460 FEL)
11,946.0	7,202.9	1,575.2	-4,279.9	LAST SURVEY - 11946.0' MD
12,014.0	7,207.1	1,573.4	-4,347.8	PTB - 12014.0' MD (759 FNL, 466 FWL)

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_